

INFORMATION HANDOUT

WATER QUALITY

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
(WASTE DISCHARGE REQUIREMENTS AND WATER QUALITY CERTIFICATION 401 PERMIT)
BOARD ORDER NO. R2-2006-0033**

PERMIT

UNITED STATES ARMY CORPS OF ENGINEERS

**(404 PERMIT)
PERMIT # 28771S**

AGREEMENTS

**STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME
(1602 LAKE AND STREAMBED ALTERATION AGREEMENT)
NOTIFICATION NO.1600-2006-0059-3**

UNITED STATES FISH AND WILDLIFE SERVICE

(BIOLOGICAL OPINION)

MATERIALS INFORMATION

CONCEPTUAL STORMWATER POLLUTION PREVENTION PLAN (CSWPPP)

California Regional Water Quality Control Board San Francisco Bay Region



Dan Skopec
Acting Agency Secretary

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Arnold Schwarzenegger
Governor

Date: **MAY 18 2006**
File No. 2199.9457 (BJT)
Site No. 02-01-C0884

Certified Mail No. 70033110000265559131

Mr. Ron Kiaaina
California Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, CA 94623

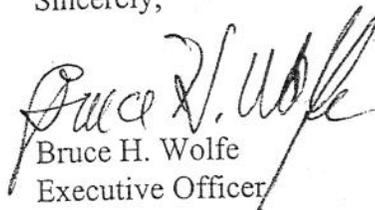
**Subject: Waste Discharge Requirements and Water Quality Certification for the Pigeon Pass
Route 84 Realignment Project**

Dear Mr. Kiaaina:

The San Francisco Bay Regional Water Quality Control Board adopted Order No. R2-2006-0033, Waste Discharge Requirements and Water Quality Certification for the Pigeon Pass Route 84 Realignment Project, on May 10, 2006. The adopted Order is attached.

If you have any questions, comments, or concerns, please contact Brendan Thompson of my staff at (510) 622-2506, or via e-mail to BThompson@waterboards.ca.gov.

Sincerely,


Bruce H. Wolfe
Executive Officer

cc: Mr. Oscar Balaguer, SWRCB-DWQ
Mr. Hal Durio, Regulatory Branch, USACE
Ms. Marcia Grefsrud, CDFG, Yountville
✓ Hardeep Takhar, Caltrans

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. R2-2006-0033

WASTE DISCHARGE REQUIREMENTS AND WATER QUALITY CERTIFICATION FOR:
CALIFORNIA DEPARTMENT OF TRANSPORTATION

PIGEON PASS STATE ROUTE 84 REALIGNMENT PROJECT, ALAMEDA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter Water Board, finds that:

1. The California Department of Transportation (hereinafter the Department) proposes to realign a 2.3-mile portion of State Route 84 (hereinafter SR 84), from Post Mile 20.7 to Post Mile 23.0, between the City of Livermore and Interstate 680, in an unincorporated area of Alameda County. The Project consists of the following elements:
 - a. Improvement of the existing SR 84 by realigning steep and winding portions, installing truck-climbing lanes, and widening to current Federal Highway standards;
 - b. Conversion of portions of the existing SR 84 alignment to frontage road; and
 - c. Obliteration of portions of the existing SR 84.
2. Project construction is expected to occur over a three-year period, beginning in March 2007, and ending in October 2010. Construction will be divided into three phases:
 - a. Construction of the westernmost two-thirds of the new frontage road and temporary detour road;
 - b. Construction of the majority of the realigned Route 84; and
 - c. Construction of the last one-third of the frontage road, removal of the temporary detour, and smoothing the transitions between the new and existing roadway.
3. There are approximately 4.66 acres of jurisdictional waters of the United States, including creeks and wetlands, on the Project site that are waters of the State and delineated waters of the United States. The site's waters are comprised of:
 - a. Approximately 5,318 linear feet (0.61 acres) of freshwater seasonal creeks; and
 - b. Approximately 4.05 acres freshwater seasonal wetlands.
4. The Project will result in the placement of approximately 654,000 cubic yards of cut and fill, with all cut being used on-site, and no import of fill material. 4,130 cubic yards of earth will permanently fill approximately 2.21 acres of jurisdictional waters of the United States, comprised of 1.87 acres of fresh seasonal wetlands and 2,775 linear feet (0.34 acres) of freshwater seasonal creeks, which includes mature oak woodland riparian forest. Project activities will temporarily disturb 0.42 acres of jurisdictional waters of the United States, comprised of 0.35 acres of freshwater seasonal wetlands, and 440 linear feet (0.07 acres) of freshwater seasonal creeks.

5. Portions of the waters on the Project site serve as habitat for the federally and state-listed threatened California red-legged frog (*Rana aurora draytonii*, hereinafter CRLF) and California tiger salamander (*Ambystoma californiense*, hereinafter CTS). The Project site also provides habitat for the federally-listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*, hereinafter VPFS).
6. **Mitigation Plan:** To mitigate for permanent and temporary fill of 2.21 and 0.42 acres of wetlands, respectively, a combination of on and off-site mitigation will be implemented, as described in the Department's Draft Revised Water Quality Certification Mitigation and Monitoring Report (hereinafter Draft Report), dated, "Revised Draft 2006," and received by the Water Board on March 13, 2006. The Draft Report does not propose mitigation sufficient to fully address the proposed Project impacts. This Order requires the Department to complete additional mitigation to fully address all impacts. The Draft Report's proposed mitigation consists of the following:
 - a. **On-site creation.** 0.92 acres of freshwater seasonal wetland and 791 linear feet (0.18 acres) of freshwater seasonal creeks will be created on-site. Existing freshwater seasonal wetlands will be expanded to create 0.43 acres of new wetlands. 0.49 acres of freshwater seasonal wetlands will be created on-site, at locations not historically wetlands, using excavated soil from permanently impacted wetland areas on-site. Approximately 791 feet (0.18 acres) of seasonal creek channel will be created adjacent to the existing tributary to Arroyo del Valle, which is proposed to be permanently impacted by the Project.
 - b. **On-site restoration.** To mitigate for a portion of the Project's 0.42 acres of temporary impacts to habitat, the Department is proposing to restore 0.42 acres of temporarily disturbed areas within the Project site. Temporarily disturbed areas will be restored on an ongoing basis throughout the life of the Project immediately following completion of construction in each section.
 - c. **On-site enhancement.** The Department also proposes to enhance approximately 1,510 linear feet (460 meters) of riparian oak woodland habitat along the ephemeral creek paralleling Highway 84 from Station 72+80 through 77+40, downstream from the relocated creek channel.
 - d. **On-site creek relocation.** An estimated 535 linear feet of the 2,775 feet of impacted channel are being relocated at the east end of the project from stations 80+35 to 81+05, and 81+50 to 82+40. Caltrans has not proposed taking credit for this channel relocation as mitigation to offset channel loss since a future project may result in impacts to the relocated channel. These relocated channel portions are anticipated to be in place at least until the completion of the Alameda 84 realignment project, in 2010, and at least 5 years prior to any future impacts, thus serving to offset temporal losses on the project.
 - e. **Off-site enhancement and creation.** The Department has proposed wetland creation and riparian enhancement mitigation on privately owned and actively grazed rangeland on the southern side of Patterson Pass Road, immediately east of Cross Rd.

in the city of Livermore (Sweet Property). The site contains hillside seeps and an unnamed tributary to the Arroyo Mocho. Proposed mitigation at the Sweet Property includes creation of 2.5 acres of freshwater seasonal wetlands, enhancement of 5,410 linear feet of degraded creek, preservation of 52 acres of contiguous upland grassland, a grazing management plan, and conservation easements over the mitigation areas.

The mitigation proposed in the Draft Report would not fully mitigate for the proposed creek impacts, in part because the Department has not yet been able to identify or does not yet have fully in place all mitigation locations, mitigation site functions and values, detailed mitigation designs, draft conservation easement agreements, a timeline identifying when mitigation would be completed, and appropriate compensation for permanent impacts to riparian waters. The Department will also be permanently impacting special-status species habitat and a significant length and area of mature oak riparian forest. Additionally, while the proposed mitigation would be in-kind, significant portions would be located off-site. Pursuant to the California Wetlands Conservation Policy and the Basin Plan, the Board shall generally require additional mitigation when the mitigation is implemented off-site. Therefore, this Order requires that jurisdictional wetlands and waters be mitigated by ensuring the successful restoration or creation of, at a minimum, a total of 5.6 acres of freshwater seasonal wetlands, and 11,900 linear feet of enhanced freshwater seasonal creeks, at one or more locations that are simultaneously within Alameda County and within the Alameda Creek Watershed. The remaining required mitigation after implementation of the 1,510 linear feet of proposed on-site creek enhancement and off-site mitigation comprised of creation of 2.5 acres of freshwater seasonal wetlands and enhancement of 5,400 linear feet of creek at the Sweet Property will be 2.1 acres of wetlands creation and 4,980 linear feet of creek enhancement.

The Water Board recognizes that some mitigation sites may also provide opportunities to complete preservation and enhancement of waters and wetlands. The Department may propose a creek and wetland mitigation package that substitutes preservation and enhancement for a portion of the required restoration and creation. Such substitution must be in all cases beyond the overall benefit provided by the wetland and creek restoration and creation required by this Order.

Mitigation will be provided on private lands as identified by the Alameda County Conservation Partnership (ACCP). The ACCP is a joint project of the Alameda County Resource Conservation District and the Natural Resources Conservation Service (NRCS) that has crafted a streamlined permit process and implementation plan for improving and preserving special-status wildlife habitat on private ranch lands. The ACCP has identified approximately 25 deteriorating agricultural stock ponds throughout Alameda County that are in need of immediate repair to prevent complete failure and loss of wildlife habitat. The Department will ensure the restoration and preservation in perpetuity of wetlands and waters on these private lands. Upon restoration, conservation easements will be placed on all mitigation areas.

Restoration work is proposed to commence in the fall of 2006. In the event that mitigation goals at the Sweet Property cannot be provided on or before January 31, 2008, the remaining required mitigation at the Sweet Property, plus an additional one-fifth of that remaining required mitigation, shall be constructed prior to January 31, 2009. For every year of delay thereafter, the required amount of remaining off-site mitigation shall be increased by one-fifth, on an areal basis for seasonal wetlands, and on a linear foot basis for riparian waters. Construction of all off-site mitigation requirements shall be provided on or before January 31, 2010.

7. On-site wetlands and waters will be created and enhanced in the following areas, as the highway runs from the southwest to the northeast (station numbers correspond to the proposed roadway, and are in meters):
 - a. 0.05 acres of freshwater seasonal wetlands will be created between stations 58+80 and 60+80, where 0.24 of 0.60 acres of an old livestock stock pond are to be permanently filled. A new berm will be installed at the uphill end of the existing wetland area to allow additional ponding to the east and north.
 - b. 0.37 acres of shallow, freshwater seasonal wetlands will be created on the northeastern side of the proposed roadway, between stations 62+80 and 63+60. To accommodate the new wetlands, culverts will be removed at the existing location and the site will be graded to promote ponding. The new wetlands will drain into ephemeral tributaries of San Antonio Reservoir.
 - c. 0.47 acres of 1.22 acres of existing wetlands will be expanded by 0.27 acres at its southern and northern portions, between stations 67+00 and 68+80. The 1.22 acres of wetlands provide breeding habitat for the CTS and VPFS, and has been found to contain CTS larva and VPFS cysts. 0.75-acres of the wetlands will be permanently impacted by the proposed Project.
 - d. On-site creation of waters consists of filling and relocating an ephemeral creek channel from its existing location to the toe of a new slope where the slope intersects the bank of the existing creek. The proposed channel will be broken into four segments totaling 791 linear feet (0.18 acres) between stations 69+65 and 72+80. 220 linear feet are proposed to be unvegetated, rock-lined channels, and 571 linear feet are proposed to have a combination of natural and rock-lined bottom. Rock weirs will be placed within the channel at locations to create two freshwater seasonal wetland areas, as mentioned below in e and f. The area of the in-stream created wetlands will not be calculated into the linear feet or acreage totals for created freshwater seasonal creeks, but rather, totaled into the acreage totals for created seasonal freshwater wetlands.
 - e. 0.07-acres of freshwater seasonal wetlands are planned to be created immediately adjacent to the western side of the proposed roadway, between stations 70+10 and 70+40. The wetlands would lie adjacent to the former location of 0.12 acres of freshwater seasonal wetlands, which is proposed to be permanently impacted by the Project. The wetlands will be created between two in-stream rock weirs.
 - f. 0.05 acres of freshwater seasonal wetlands are proposed for the western side of the roadway, between stations 71+50 and 71+80. The wetlands will be created between two in-stream rock weirs.

To minimize impacts to the CTS, the Department will:

- Restrict construction around the CTS pond to a period when the pond is dry and there is not CTS breeding activity;
- Prohibit ground disturbance activities between October 31 and March 1 outside the limits of the established road bed; and,
- Work with the California Department of Fish and Game (CDFG) to find and relocate CTS one year prior to Project construction.

11. **California Red-Legged Frog:** The proposed Project is within critical habitat proposed for the CRLF by the USFWS. The Department has been given terms and conditions by the USFWS, in the Project's Biological Opinion issued February 28, 2005, and the Amendment to the Biological Opinion, dated April 27, 2005, to ensure the implementation of Reasonable and Prudent Measures to minimize Project impacts to the CRLF. To mitigate for the potential impacts to the CRLF, the Department has purchased 25 acres of CRLF habitat at the Ohlone Preservation Conservation Bank. A CRLF survey and relocation program will be completed on the Project site prior to the initiation of Project construction.
12. **Conservation Easement:** The Department shall submit a Final Mitigation and Monitoring Report (Final Mitigation Plan) that is acceptable to the Executive Officer, and that modifies the Draft Report. The Final Mitigation Plan will include how the mitigation lands are to be managed and preserved under the conservation easements. The long-term management of the mitigation sites will be provided using CDFG's model Conservation Easement (CE) as a template (see Attachment 1), and the management guidelines of the NRCS, acceptable to the Executive Officer. The CE shall identify the entities responsible for the long-term management of the mitigation sites. The accepted conservation easements shall be recorded not later than January 31, 2011, and within one year of the date of mitigation construction completion on any parcel with mitigation, whichever is earlier.
13. **Long-term Management:** This Order requires the Department to submit, prior to the start of Project construction, Property Analysis Records (PAR), or equivalent analyses estimating the endowment amounts necessary for the appropriate management, in perpetuity, of the mitigation areas. This Order requires these amounts be included as part of the Final Mitigation Plan.
14. **Post-construction stormwater management:** Operation of the reconfigured SR84 will impact beneficial uses through the discharge of stormwater containing automobile-related pollutants (e.g. oil, grease, heavy metals, etc.). To address the Project's post-construction impacts to beneficial uses, the Department proposed to install biofiltration strips along portions of the reconfigured SR 84. The strips would treat pollutants from approximately 12 acres, or 50% of the impervious surfaces within the Project limits.

Post-construction stormwater treatment controls (e.g., biofiltration strips) were not incorporated into the project design during the planning phase, but rather, the placement of treatment controls were evaluated for feasibility within the spatial limits of the final Project design. Consequently, the amount of impervious area that could be treated by stormwater

treatment controls is necessarily limited by the remaining available right-of-way within the Project area. Opportunities for treatment of roadway pollutants are further limited, given that portions of the proposed treatment controls are planned in areas subject to planned future roadway expansion. As such, to provide post-construction stormwater treatment to the maximum extent practicable, as required in State Water Resources Control Board Water Quality Order No. 99-06-DWQ, the NPDES Statewide Permit for Storm Water Discharges From the State of California Department of Transportation Properties, Facilities, and Activities (hereinafter Statewide Permit), the Department may collaborate with the City of Livermore (City) and the Alameda County Zone 7 Flood Control District (Zone 7) to provide for the treatment of dry weather urban runoff from approximately 1536 acres of existing residential and commercial areas discharging to the Arroyo Las Positas, nearby the Springtown Golf Course in the City of Livermore. The treatment would involve capture and filtration of dry-weather urban runoff through the use of a vegetated basin and swale(s). The Department would provide a water quality benefit equivalent to effectively treating 80 – 90% of average annual runoff from the SR84 Project site. Any additional treatment provided above that level of water quality benefit would be applied to future Department projects with stormwater requirements. Should this proposal prove infeasible, then the Department will provide alternate treatment, which may include treatment of stormwater runoff from the reconfigured SR84.

In the event that an arrangement cannot be reached between Zone 7 and the City, the Department shall provide the Water Board with alternate treatment that provides a water quality benefit equivalent to effectively treating 80 – 90% of average annual runoff from the Project.

15. **Hydromodification:** Project implementation will result in an increase of 14.2 acres of impervious surface. As a result, in comparison with the pre-Project conditions, stormwater runoff will be discharged from the Project site at greater volumes and over a shorter period of time following storm events. Consequently, operation of the Project will increase the potential for creek bed and bank erosion impacts downstream of the Project site.

The Department has submitted hydrologic data and analysis that represents changes in impervious surface and runoff coefficients for each watershed within the Project limits. Based upon an analysis of the data, the Department has concluded that changes in impervious surfaces will not result in significant hydromodification impacts downstream of the Project site. Based on a review of the submitted analyses and their underlying data, additional mitigation to address potential hydromodification impacts is not required in this Order.

16. On January 18, 2006, the Department submitted an initial application for Water Quality Certification and Waste Discharge Requirements for the Project. That application was subsequently completed by additional submittals.
17. The Water Board has determined to regulate the proposed discharge of fill materials into waters of the State by issuance of Waste Discharge Requirements (WDRs) pursuant to Section 13263 of the California Water Code (CWC) and 23 CCR §3857, in addition to issuing certification pursuant to 23 CCR §3859. The Water Board considers WDRs

necessary to adequately address impacts and mitigation to beneficial uses of waters of the State from this project, to meet the objectives of the California Wetlands Conservation Policy (Executive Order W-59-93), and to accommodate and require appropriate changes over the life of the project and its construction.

18. The Water Board, on June 21, 1995, adopted, in accordance with Section 13244 et seq. of the CWC, a revised Water Quality Control Plan, San Francisco Bay Basin (Basin Plan). This updated and consolidated revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in 23 CCR Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters. This Order is in compliance with the Basin Plan.

19. The subject wetlands, seasonal creeks, and other waters on the Project site are located in the South Bay Basin, and are tributaries to either Arroyo Valle, Vallecitos Creek, or San Antonio Reservoir. Vallecitos Creek is a tributary to Arroyo de la Laguna and Alameda Creek. The Basin Plan does not explicitly designate beneficial uses for waters on the Project site. However, the Basin Plan states that “[t]he beneficial uses of any specifically identified waterbody generally apply to all of its tributaries.” The following existing beneficial uses defined in the Basin Plan for identified waterbodies are:

- Agricultural supply (Alameda Creek);
- Cold freshwater habitat (Alameda Creek, Arroyo Valle, San Antonio Reservoir);
- Groundwater recharge (Alameda Creek, Arroyo de la Laguna, Arroyo Valle);
- Fish migration (Alameda Creek, Arroyo de la Laguna);
- Municipal and domestic water supply (Arroyo Valle, San Antonio Reservoir);
- Water contact recreation (Alameda Creek, Arroyo de la Laguna,);
- Non-contact water recreation (Alameda Creek, Arroyo de la Laguna, San Antonio Reservoir);
- Fish spawning (Alameda Creek, Arroyo de la Laguna, Arroyo Valle, San Antonio Reservoir);
- Warm freshwater habitat (Alameda Creek, San Antonio Reservoir); and,
- Wildlife habitat (Alameda Creek, Arroyo de la Laguna, Arroyo Valle, San Antonio Reservoir).

Additionally, waters on the Project site provide habitat for the preservation of protected species, including the federally and state-listed threatened CRLF and CTS. The Project site also provides habitat for the federally-listed threatened VPFS.

20. The Basin Plan Wetland Fill Policy (policy) establishes that there is to be no net loss of wetland acreage and no net loss of wetland value, when the project and any proposed mitigation are evaluated together, and that mitigation for wetland fill projects is to be located in the same area of the Region, whenever possible, as the project. The policy further establishes that wetland disturbance should be avoided whenever possible, and if not possible, should be minimized, and only after avoidance and minimization of impact should mitigation for lost wetlands be considered.

21. The goals of the California Wetlands Conservation Policy (Executive Order W-59-93, signed August 23, 1993,) include ensuring “no overall loss” and achieving a “...long-term net gain in the quantity, quality, and permanence of wetland acreage and values...” Senate Concurrent Resolution No. 28 states that “[i]t is the intent of the legislature to preserve, protect, restore, and enhance California’s wetlands and the multiple resources which depend upon them for benefit of the people of the State.” Section 13142.5 of the CWC requires that the “[h]ighest priority shall be given to improving or eliminating discharges that adversely affect...wetlands, estuaries, and other biologically sensitive areas.”
22. With the successful implementation of the mitigation measures described in these findings and the provisions, the Water Board finds that the Project will comply with the California Wetlands Conservation Policy and Basin Plan Wetland Fill Policy referenced in Findings 20 and 21.
23. This Order applies to the temporary and permanent fill and indirect impacts to waters of the State associated with the Project, which is comprised of the components listed in Finding 1.
24. The Department has submitted an Alternatives Analysis to show that appropriate effort was made to avoid and then to minimize wetland disturbance, as required by the Basin Plan. Water Board and federal agency staff held additional discussions with the Department regarding its Alternatives Analysis. The Water Board concurs with the conclusions of the Alternatives Analysis.
25. Discharges of stormwater associated with construction activity will occur. The Department is responsible for obtaining appropriate permits for these discharges, including complying with the rules and regulations of National Pollutant Discharge Elimination System (NPDES) permit requirements. This includes complying with the requirements of its Statewide Permit.
26. Because of the Project’s proximity to sensitive resources, including special status species habitat, and potential to discharge materials that could significantly impact those resources, this Order requires the Department to submit a Storm Water Pollution Prevention Plan (SWPPP) for the Project, prepared pursuant to the provisions of its Statewide Permit, at least 60 days prior to the beginning of construction for the Project.
27. Discharges of ground water or other non-storm water during construction may be required. This Order considers such discharges covered by the Statewide Permit, contingent on submittal of an acceptable discharge plan at least 30 days prior to such a discharge.
28. The California Environmental Quality Act (CEQA) requires all projects approved by State agencies to be in full compliance with CEQA, and requires a lead agency to prepare an appropriate environmental document (e.g., Environmental Impact Report or Negative Declaration) for such projects. The Water Board has reviewed the Project’s environmental documents, and finds that all environmental impacts have been identified for the project activities it is required to approve, and that with compliance with the conditions of this Order, that mitigation measures and/or alternatives have been incorporated to reduce those

impacts to a level of insignificance. On April 19, 2005, the Department issued a Negative Declaration indicating that the Project would not have a significant impact on the environment.

29. The Department has applied to the U.S. Army Corps of Engineers (Corps) for an Individual Permit for the Project under Section 404 of the Clean Water Act.
30. In February 2005, the United States Fish and Wildlife Service (USFWS) issued a Biological Opinion, and an amendment in April 2005, for the Project (USFWS File No. 1-1-04-F-0115), finding that it is not likely to jeopardize the existence of either the CRLF, CTS, or the VPFS.
31. Pursuant to 23 CCR Sections 3857 and 3859, the Board is issuing WDRs and Water Quality Certification for the Project as described herein.
32. The Water Board has notified the Corps, Alameda County, the City of Livermore, the City of Pleasanton, USFWS, CDFG, and other interested agencies and persons of its intent to prescribe WDRs and Water Quality Certification for this discharge.
33. The Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
34. Project files are maintained at the Water Board under file number 2199.9457 and site number 02-01-C0884.

IT IS HEREBY ORDERED that the Department, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, shall comply with the following, pursuant to authority under CWC Sections 13263 and 13267:

A. Discharge Prohibitions

1. The direct discharge of wastes, including rubbish, refuse, bark, sawdust, concrete, asphalt, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plains, is prohibited.
2. The discharge of floating oil or other floating materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.
3. The discharge of silt, sand, clay, or other earthen materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.
4. The wetland fill activities subject to these requirements shall not cause a nuisance as defined in CWC § 13050(m).

5. The discharge of decant water from active dredging or fill sites and dredged material/wet sediment stockpile or storage areas to surface waters or surface water drainage courses is prohibited, except as conditionally allowed following the submittal of a discharge plan or plans as described in the Provisions.
6. The groundwater in the vicinity of the Project shall not be degraded as a result of the Project activities or placement of fill for the Project.
7. The discharge of materials other than stormwater, which are not otherwise regulated by a separate NPDES permit or allowed by this Order, to waters of the State is prohibited.
8. The discharge of drilling muds to waters of the State, or where such muds could be discharged to waters of the State, is prohibited.

B. Receiving Water Limitations

1. The discharges shall not cause the following conditions to exist in waters of the State at any place:
 - a. Floating, suspended, or deposited macroscopic particulate matter or foam in concentrations that cause nuisance or adversely affect beneficial uses;
 - b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;
 - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
 - e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.
2. The discharges shall not cause nuisance, or adversely affect the beneficial uses of the receiving water.
3. The discharges shall not cause the following limits to be exceeded in waters of the State at any one place within one foot of the water surface:
 - a. Dissolved Oxygen: 5.0 mg/L, minimum

The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, then the discharges shall not cause further reduction in ambient dissolved oxygen concentrations.

- c. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH by more than 0.5 pH units.
- e. Nutrients: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

C. Provisions

1. The Department shall comply with all Prohibitions, Receiving Water Limitations, and Provisions of this Order immediately upon adoption of this Order or as provided below.
2. The Department shall submit copies of all necessary approvals and/or permits for the Project and mitigation projects from applicable government agencies, including, but not limited to, CDFG, USFWS, and the Corps, for each Project component applicable to that component, prior to the start of construction on that component.

Project Implementation Deadlines

3. Not later than 90 days following the adoption of the Order, the Department shall submit a Final Mitigation and Monitoring Plan that is acceptable to the Executive Officer, and that modifies the Draft Report and is consistent with the requirements of this Order, including dates and deadlines, and which provides for mitigation monitoring and maintenance until the regulatory agencies concur that the mitigation has been successfully completed. The Final Mitigation and Monitoring Plan shall not be deemed acceptable until the Department has received written notification of such acceptance from the Executive Officer. Similarly, the Department is responsible for monitoring and maintenance of Project mitigation until it has received a letter from the Executive Officer accepting the mitigation as complete. The Final Mitigation and Monitoring Plan must include a complete mitigation and monitoring plan for both the proposed on-site and off-site creek and seasonal wetland mitigation, including:
 - a. Planting plans and details for all on- and off-site mitigation, such as designs and construction drawings for in-stream structures, pond reconstructions, grading, planting, and irrigation plans, and all other information, as appropriate;
 - b. A minimum 5-year monitoring period for all wetland restoration activities, including creation and enhancement;

- c. A minimum 10-year monitoring period for all riparian restoration activities, including creation and enhancement;
- d. Performance standards and success criteria for mitigation;
- e. Specific locations and descriptions of reference sites to be used for evaluation of on-site and off-site mitigation success criteria;
- f. For the proposed mitigation locations, the proposed final conservation easements that identify, among other things, the entity or entities that will hold those easements after the monitoring period specified in 3.b and 3.c above;
- g. A finalized financial assurance proposal with all appropriate detail on financial assurances being provided to ensure the establishment and success, in perpetuity, of the proposed mitigation, and including appropriately detailed finalized estimates on the amount of the related financial assurances; and,
- h. A plan to ensure the restoration of temporarily disturbed areas on the Project site immediately following completion of construction in each section.

The Final Mitigation and Monitoring Plan may be amended subject to the review and approval of the Executive Officer. Project construction may not commence until the Final Mitigation and Monitoring Plan has been accepted in writing by the Executive Officer.

4. Not later than 90 days following the adoption of the Order, the Department shall provide, subject to the approval of the Executive Officer, a work plan identifying a timeline to implement the remaining mitigation requirements of this Order. The work plan should include dates for submission of all appropriate mitigation details.
5. The accepted conservation easements shall be recorded not later than January 31, 2011, and within one year of the date of mitigation construction completion on any parcel with mitigation, whichever is earlier.
6. To fully mitigate for proposed Project impacts, the Department shall ensure the successful creation and enhancement on-site of 791 and 1,510 linear feet, respectively, of freshwater seasonal creeks, and the creation of 0.92 acres of freshwater seasonal wetlands. Additionally, the Department shall ensure the successful restoration or creation of, at a minimum, 5.6 acres of freshwater seasonal wetlands, and the enhancement of 11,900 linear feet of freshwater seasonal creeks, to be completed no later than January 31, 2008. The 1,510 linear feet of on-site enhancement shall be applied towards the total required creek enhancement. If the Department cannot meet its off-site mitigation requirements on or before January 31, 2008, then additional mitigation requirements and implementation deadlines will apply, as described below in Provision 7. Additionally, the Water Board recognizes that some mitigation sites may also provide opportunities to complete preservation and enhancement of wetlands and waters. The Department may propose a creek and wetland mitigation package, acceptable to the Executive Officer, that substitutes preservation and enhancement for a portion of the required restoration and creation. Such substitution must be in all cases beyond the overall benefit provided by the wetland and creek restoration and creation required by this Order.

7. If all required off-site mitigation proposed in the Final Mitigation and Monitoring Plan as occurring in Fall 2006 through Fall 2007 (specifically, the creek enhancement, wetland creation, and related work on the Sweet property adjacent to Patterson Pass Road) is not constructed by January 31, 2008, the Department shall submit, subject to approval by the Executive Officer, a mitigation proposal to provide the balance of the remaining mitigation required on the Sweet property, plus an additional one-fifth of that remaining required mitigation, to be constructed prior to January 31, 2009. For every year of delay thereafter, the required amount of remaining off-site mitigation shall be increased by one-fifth, on an areal basis for seasonal wetlands, and on a linear foot basis for riparian waters.
8. Construction of all off-site mitigation shall be completed by January 31, 2010. Construction, not including monitoring and establishment, of all on-site mitigation requirements shall be completed within one year of Project construction completion. The Department shall notify the Executive Officer of the completed construction, by letter, not later than one week after construction has been completed.
9. Off-site mitigation shall be located within the Arroyo de la Laguna and Upper Alameda Creek sub-watersheds of the Alameda Creek Watershed, on sites that are also within Alameda County and within the boundaries of this Water Board.
10. Should the mitigation that the Department implements to satisfy the requirements of this Order result in a level of mitigation beyond what is required in this Order, in terms of quality, or in terms of implementation preceding the impacts they are mitigating for, the level of additional benefit may be applied as mitigation credit, subject to the approval of the Executive Officer, to this, or other Department projects impacting Waters of the State.
11. Not later than 90 days following adoption of the Order, the Department shall submit an updated alternate stormwater treatment proposal acceptable to the Executive Officer that includes all appropriate plans, calculations, narrative description of the proposal, design details, and related information. If a complete proposal cannot be submitted as identified above, then the Department shall submit a work plan for submitting all appropriate plans, calculations, narrative description of the proposal, design details, and related information, with deadlines for submittal of detailed plans and the completion of construction for the proposed stormwater controls. This proposal can be submitted as part of the Final Mitigation and Monitoring Plan, and shall include a level of treatment that has equivalent water quality benefit to effectively treating 80 – 90% of average annual runoff from the Project.
12. The Department shall fully implement any alternate stormwater treatment proposal prior to completion of the third stage of Project construction, as identified in Finding 2.
13. The Department shall submit annual mitigation monitoring reports acceptable to the Executive Officer no later than January 31 of each year until the mitigation sites have met their performance standards and final success criteria and the Executive Officer has accepted a notice of mitigation completion for each site, but for not less than a period of

five years and no less than a period of two years after any mitigation habitat irrigation systems have been terminated. If the mitigation and monitoring program indicates that establishment of the habitat is not progressing in a manner or rate consistent with the success criteria proposed and approved by the Executive Officer, the annual mitigation monitoring reports shall evaluate the probable cause(s) of any problems and propose appropriate corrective measures.

14. Not later than 60 days prior to commencement of each major phase of Project activities, as identified in Finding 2, the Department shall submit a schedule of Project implementation that includes the dates of impact, restoration, and/or creation as well as areas and lengths, of wetlands and waters to be temporarily and permanently impacted, restored, and/or created. The Department shall notify the Water Board immediately upon deviation from the submitted schedule of implementation.
15. Following the end of each construction season (April 1 – October 31), and no later than December 31, the Department shall provide an updated summary detailing the extent of impacts to wetlands and waters, with dates and waterbodies identified, as well as areas that have been restored during that year.
16. Not later than 60 days prior to the beginning of construction of any Project component, the Department shall submit, acceptable to the Executive Officer, a final SWPPP, prepared pursuant to its Statewide Permit, to address the Project's expected construction stage impacts.
17. As-built plans for the mitigation sites shall be prepared and submitted to the Water Board within 90 days of the completion of mitigation site construction.
18. The portion of the mitigation activities that will be scheduled to be completed prior to January 31, 2008 shall be identified in the Final Mitigation and Monitoring Plan. Identification of these activities shall include site location and detailed design plans, wetland acreage, linear feet of riparian restoration and preservation, and other appropriate details.
19. No construction shall occur within 150 feet of any Waters of the State, on any Project component, until off-site pond and riparian restoration mitigation activities identified in the approved Final Mitigation and Monitoring Plan as being planned prior to construction (specifically, the creek enhancement, wetland creation, and related work on the Sweet property adjacent to Patterson Pass Road) are in a stage of active construction.
20. The Department shall ensure the purchase of at least 2.06 acres of VPFS habitat, and 80 credit acres of CTS habitat, pending USFWS identification of appropriate habitat, prior to October 1, 2010, at a location or locations subject to the approval of the Executive Officer.

Other Provisions

21. Any substantive modifications to the Final Mitigation and Monitoring Plan or other documents referenced in the Provisions must be approved in writing by the Executive Officer, prior to implementation of the modification.
22. All Reports pursuant to these Provisions shall be prepared under the supervision of suitable professionals registered in the State of California, if such registration is required or offered in the profession of the subject field.
23. The Department shall immediately notify the Board staff by telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of the conditions of this Order, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. Pursuant to CWC §13267(b), a written notification of the adverse condition shall be submitted to the Water Board within two weeks of occurrence. The written notification shall identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to any modifications by the Water Board staff, for the remedial actions.
24. The Department shall at all times fully comply with the engineering plans, specifications, and technical reports submitted with its application for water quality certification and the completed report of waste discharge.
25. All discharges of ground water or other non-storm water during construction are covered under the Statewide Permit, contingent on submittal of an acceptable discharge plan at least 30 days prior to such a discharge.
26. The Department is considered to have full responsibility for correcting any and all problems that arise in the event of a failure that results in an unauthorized release of waste or wastewater.
27. Any hazardous, designated or non-hazardous waste as defined in Title 23, Division 3, Chapter 15 of the California Administrative Code, shall be disposed of in accordance with applicable state and federal regulations.
28. The Department shall clean up and abate any wastes that are discharged at any sites in violation of this Order.
29. In accordance with CWC §13260, the Discharger shall file with the Water Board a report of any material change or proposed change in the ownership, character, location, or quantity of this waste discharge. Any proposed material change in operation shall be reported to the Executive Officer at least 30 days in advance of the proposed implementation of any change. This shall include, but not be limited to, all significant new soil disturbances, all proposed expansion of development, or any change in drainage characteristics at the Project site. For the purpose of this Order, this includes any

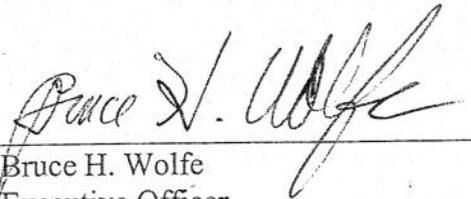
proposed change in the boundaries of the area of wetland/waters of the United States to be filled.

30. The following standard conditions apply to this Order:
 - a. Every certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to CWC §13330 and 23 CCR §3867.
 - b. Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and 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 §3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
 - c. Certification is conditioned upon total payment of any fee required pursuant to 23 CCR §3833 and owed by the Department.
31. An annual fee for Waste Discharge Requirements pursuant to Section 13260 of the California Water Code is required and shall be paid by the Department in a timely manner.
32. The Department shall maintain a copy of this Order at the Project site so as to be available at all times to site operating personnel and agencies.
33. The Department shall permit the Water Board or its authorized representative at all times, upon presentation of credentials:
 - a. Entry onto Project premises, including all areas on which wetland fill or wetland mitigation is located or in which records are kept.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this Order.
 - d. Sampling of any discharge or surface water covered by this Order.
34. This Order does not authorize commission of any act causing injury to the property of another or of the public; does not convey any property rights; does not remove liability under federal, state, or local laws, regulations or rules of other programs and agencies, nor does this Order authorize the discharge of wastes without appropriate permits from

other agencies or organizations.

35. The Water Board will consider rescission of this Order upon Project completion and the Executive Officer's acceptance of notices of completion of mitigation for all mitigation, creation, and enhancement projects required or otherwise permitted now or subsequently under this Order.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 10, 2006.



Bruce H. Wolfe
Executive Officer

DEPARTMENT OF THE ARMY PERMIT

PERMITTEE: California Department of Transportation

PERMIT NO.: 28771S

ISSUING OFFICE: San Francisco District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate District or Division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below:

PROJECT DESCRIPTION:

You are authorized to discharge into jurisdictional Waters of the U.S. including wetlands approximately 11 cubic yards of rock slope protection (RSP) and 4075 cubic yards of clean, granular fill material (from on-site sources). The above mentioned discharge material will fill 1.87 acres of wetlands and 0.34 acres of others waters of the U.S. that are associated with two unnamed drainages in the Vallecitos Hills adjacent to SR 84 southwest of Livermore. All jurisdictional sites where fill material will be discharged are illustrated on the maps shown in Appendix A of the *Pigeon Pass Realignment Project, Individual Permit Application*, dated January 2006.

The project will realign and widen a portion of State Route (SR) 84 through Pigeon Pass also known as the Vallecitos Hills, located southwest of Livermore in Alameda County, California. It begins near the intersection of Sabel Drive / Kalthoff Common with SR 84 and continues southwesterly to about 0.7 mile east of the SR 84 junction at Vallecitos Atomic Laboratory Road. The widening is being constructed to accommodate a passing lane for the uphill traffic in both the east and west bound direction. The project will also correct the existing vertical and horizontal alignment which in the existing highway is below standard and unsafe. This construction is needed for both safety and congestion relive purposes.

PROJECT LOCATION:

The project is located southwest of Livermore in Alameda County, California on SR 84 in the Vallecitos Hills. This section of highway is also known as Pigeon Pass.

PERMIT CONDITIONS:

GENERAL CONDITIONS:

1. The time limit for completing the work authorized ends **October 15, 2011**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should

you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. 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 of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity 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.

7. You understand and agree that, if future operations by the United States require the removal, relocation or other alteration of the structure or work authorized herein, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, you will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

SPECIAL CONDITIONS:

1. This Corps permit does not authorize you to take an endangered species. In order to legally take a listed species, you must have a separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit or a Biological Opinion (BO) under ESA Section 7 with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service (USFWS) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California* (BO), pages 63 – 74, dated February 25, 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 BO. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take authorized by the attached BO, whose terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take and it would also constitute non-compliance with this Corps permit. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

2. Caltrans shall adhere to the conditions of the RWQCB Clean Water Act 401 Certification dated May 18, 2006.

3. Caltrans will create on the project site at a ratio of 1:1, a minimal of 0.65 acres of seasonal wetland to offset impacts to .65 acres of impacts to seasonal wetlands. The on site wetlands will be created approximately as shown in Figures 2 – 7 in the *Pigeon Pass Realignment Project Addendum to Individual Permit Application*, dated February 2006 unless Caltrans gets an approved modification from the Corps.

4. Caltrans will create on the project site at a 1:1 ratio a minimal of 0.18 acres of ephemeral creek channel to offset impacts to 0.18 acres of ephemeral creek channel. The on site channels will be created approximately as shown in Figures 2 – 7 in the *Pigeon Pass Realignment Project Addendum to Individual Permit Application*, dated February 2006 unless Caltrans gets an approved modification from the Corps.

5. Caltrans will create 1.61 acres of new wetland on the Sweet Ranch site **before the start of construction on the Pigeon Pass Realignment Project.** These wetland areas will be created as described in the preliminary Sweet Ranch mitigation proposal or as modified with Corps approval to meet Corps requirements. This mitigation is described in a small document written by Caltrans entitled *Sweet Ranch Mitigation Site, Off Site Mitigation Proposal for Impacts at Pigeon Pass for Army Corps Jurisdictional Waters of the U.S. including wetlands*, dated May 19, 2006.

6. Appropriate best management practices (BMPs) shall be implemented throughout the project site to minimize erosion and reduce sedimentation into adjacent waterways. BMPs shall include, but not necessarily be limited to, placement of silt fencing and fiber rolls, or hay bales to all exposed slopes adjacent to waterways to intercept sediments and stabilize all exposed areas. Erosion control blankets and/or seeding with appropriate seed mixes will be used at project completion to control erosion on all disturbed sites.

7. The seasonal pond at the top of the saddle east of SR 84 by Station 68+00 called Wetland #1F shall not be filled as shown in figure 1 in the *Addendum to Individual Permit Application* dated February 2006 until the pond has dried up for the season or is at its low for the season.

8. The pond at Station 60+50 known as Wetland # 3B, shall not be filled as shown in figure 1 in the *Addendum to Individual Permit Application* dated February 2006 until it has dried up for the season or is at its low for the season.

9. Work in the all wetlands and waters within the project will occur after the sites are dry for the season and will be completed for the season by October 15th.

10. Before project implementation, Caltrans shall provide the Corps with project plans showing all Environmentally Sensitive Areas (ESA) that will be clearly marked on the ground during construction areas.

11. Caltrans shall provide the Corps with detailed **pre-construction maps** or aerial photos of all off site mitigation required by the Corps showing existing waters of the U.S. including wetlands. All jurisdictional waters of the U.S. including wetlands shall be delineated by the Corps.

12. Caltrans shall provide the Corps with detailed **post-construction maps** or aerial photos of all off site mitigation required by the Corps showing existing waters of the U.S. including wetlands. All jurisdictional waters of the U.S. including wetlands shall be re-delineated by the Corps to demonstrate the increases created for the mitigation.

13. Caltrans shall provide the Corps with a set of Landscape Erosion Control and Planting Plans for the project areas and mitigation sites when such plans become available.

14. Caltrans shall submit a Final Mitigation, Monitoring, and Maintenance Plan to the Corps. The plan should include planting plans and details of all on-site and off-site mitigation, such as designs and construction drawings for in-stream structures, pond reconstruction, grading, planting, irrigation plans, and all other information, as appropriate. The plan should also include approximate completion dates, performance standards and success criteria.

All mitigation sites shall be monitored at least once annually and monitoring shall continue for 5 years or longer until the Corps determines that the mitigation is successful. A yearly monitoring report shall be sent to the San Francisco Corps Office by December 31 each season. The reports should also include recommendations for remedial action as needed.

The Final Mitigation, Monitoring, and Maintenance Plan may be amended subject to a review and approval by the Corps.

15. Provide the Corps with the proposed mitigation locations, copies of the proposed final conservation easements, or other legal documents that identify, among other things, the entity or entities that will hold those easements after the monitoring period is completed and how the mitigation sites will be preserved in perpetuity.

FURTHER INFORMATION:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

- () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- (X) Section 404 of the Clean Water Act (33 U.S.C. Section 1344).
- () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization:

- a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability: In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

DEPARTMENT OF FISH AND GAME

CENTRAL COAST REGION

(707) 944-5520

Mailing address:

POST OFFICE BOX 47

YOUNTVILLE CALIFORNIA 94599

Street address:

7329 SILVERADO TRAIL

NAPA CALIFORNIA 94558



June 19, 2006

Notification Number: 1600-2006-0059-3

Ron Kiaaina / California Department of Transportation
Post Office Box 23660
Oakland, CA 95623-0660

1602 LAKE AND STREAMBED ALTERATION AGREEMENT

This agreement is issued by the Department of Fish and Game pursuant to Division 2, Chapter 6 of the California Fish and Game Code:

WHEREAS, the applicant Ron Kiaaina / California Department of Transportation, hereafter called the Operator, submitted a signed NOTIFICATION proposing to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed or lake of the following water: various streams, located near State Route 84, in the County of Alameda, State of California; and

WHEREAS, the Department has determined that such operations may substantially adversely affect existing fish and wildlife resources including water quality, hydrology, aquatic or terrestrial plant or animal species; and

WHEREAS, the project has undergone the appropriate review under the California Environmental Quality Act; and

WHEREAS, the Operator shall undertake the project as proposed in the signed PROJECT DESCRIPTION and PROJECT CONDITIONS (attached). If the Operator changes the project from that described in the PROJECT DESCRIPTION and does not include the PROJECT CONDITIONS, this agreement is no longer valid; and

WHEREAS, the agreement shall expire on December 31, 2010; with the work to occur between May 1 and October 31; and

WHEREAS, nothing in this agreement authorizes the Operator to trespass on any land or property, nor does it relieve the Operator of the responsibility for compliance with applicable Federal, State, or local laws or ordinances. Placement, or removal, of any material below the level of ordinary high water may come under the jurisdiction of the U. S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act;

THEREFORE, the Operator may proceed with the project as described in the PROJECT DESCRIPTION and PROJECT CONDITIONS. A copy of this agreement, with attached PROJECT DESCRIPTION and PROJECT CONDITIONS, shall be provided to contractors and subcontractors and shall be in their possession at the work site.

Failure to comply with all conditions of this agreement may result in legal action.

This agreement is approved by:

A handwritten signature in black ink, appearing to read "R. W. Floerke".

Robert W. Floerke
Regional Manager
Central Coast Region

cc: Warden Garrett
Lieutenant Christensen

DEPARTMENT OF FISH AND GAME

CENTRAL COAST REGION

(707) 944-5520

Mailing address:

POST OFFICE BOX 47

YOUNTVILLE, CALIFORNIA 94599

Street address:

7329 SILVERADO TRAIL

NAPA, CALIFORNIA 94558



Notification Number: **1600-2006-0059-3**
Pigeon Pass, Alameda County

Ron Kiaaina / California Department of Transportation
Post Office Box 23660
Oakland, CA 95623-0660

PROJECT DESCRIPTION and PROJECT CONDITIONS**Description**

The project is located southwest of Livermore on SR 84 in Alameda County beginning near the Ruby Hills Drive/Kalthoff and SR 84 intersection and continues west to Post Mile 23.0. The project is necessary to correct existing horizontal and vertical alignment deficiencies. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills/Pigeon Pass area. Below is a description of each project identified by and described by Caltrans.

Project 1 (Water 1A)

This project affects an unnamed ephemeral creek (labeled as Water 1A on the maps) which runs parallel to State Route 84 (SR 84) on the south side. This water is a tributary of Arroyo del Valle. The drainage in this area is shallow and characterized by indistinct banks vegetated with nonnative annual grasses typical for the area. See the attached habitat description for annual grassland. The area is devoid of a woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 63 square feet (0.001 ac; 10 linear ft) and associated temporary impacts totaling approximately 528 sq. ft (0.01 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland. No access roads within the streambed are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area.

Project 2 (Wetland 1A)

This project affects a seasonal wetland (labeled as Wetland 1A on the maps), which is tributary to the Arroyo del Valle. In the past, check dams made of rock were placed within the ephemeral creek (Water 1A) at this location. This has created a bottleneck, allowing wetland characteristics to evolve within the creek. The wetland is heavily vegetated with cattails. The area is devoid of woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 7,866 sq ft (0.18 ac) and associated temporary impacts totaling approximately 1,159 sq ft (0.03 ac). Three natural bottom ponds will be constructed at the toe of slope of the new alignment from approximately station number 80+40 to 82+40 (see maps) to direct the upstream flow. A ditch will connect the three ponds. The ditches will be lined with rock slope protection (RSP) at the outfalls of each pond to slow water velocity. Construction of the pond and ditch complex, as opposed to a straight channel, will reduce velocity through the area.

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area, as well as the newly created ponds.

Project 3 (Water 1B)

This ephemeral drainage (labeled as Water 1B on the map) is located upstream of the Wetland 1A along the southern edge of SR 84, and is tributary to Arroyo del Valle. It is a heavily incised, oak riparian stream corridor with steep banks leading to the channel bed at the toe of slope of SR 84. This drainage is connected to the adjacent, upstream wetland 1C by a culvert that passes under a residential driveway.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 4,081 sq ft (0.09 ac; 895 linear ft) and associated temporary impacts totaling approximately 982 sq ft (0.02 ac). The temporary impacts include the installation of a temporary culvert which will provide access between the east and west sides of the creek. Construction activities will also result in 0.36 acre of temporary impacts, and 1.46 acre of permanent impacts to oak riparian habitat.

Access to the location will be via the adjacent existing highway, driveways, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, the temporary culvert will be removed and the ground recontoured to its pre-project condition. Caltrans proposes to reseed the temporarily disturbed area and to replant the riparian corridor areas.

Project 4 (Wetland 1B)

This is a 0.01 acre seasonal wetland, labeled as Wetland 1B on the map, within the Water 1 system. It forms at the inlet of a culvert that passes under SR 84 and can best be described as a vegetated channel. The channel is devoid of woody riparian overstory.

Placement of fill or construction of the new alignment will result in permanent impacts totaling approximately 55 sq ft (0.001 ac) and associated temporary impacts totaling approximately 13 sq ft (0.0003 ac). Access to the location will be via the adjacent existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area.

Project 5 (Wetland 1C)

This is a 0.67 acre seasonal wetland (labeled as Wetland 1C on the map) south of SR 84. This wetland is a combination of flow from Water 1C and the nearby hills. It can best be described as a combination of swale and wet meadow. There is a small area of oak riparian habitat associated with the west end of this wetland. The riparian habitat is part of the riparian corridor that runs along Water 1C described below.

Placement of fill for the construction of the new alignment and installation of a 48-inch culvert and a 12-inch culvert to facilitate drainage under the new alignment will result in permanent impacts to wetlands totaling approximately 18,297 sq ft (0.42 ac) and associated temporary impacts totaling approximately 4,150 sq ft (0.10 ac). Construction activities will also result in 0.12 acre of temporary impacts to riparian habitat.

Access to the location will be via the adjacent existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed area.

Project 6 (Water 1C)

This heavily incised, ephemeral drainage (labeled as Water 1C on the map) receives flow from the bermed Wetland 1D via a spillway/culvert. This drainage, which has an associated dense oak

riparian corridor, discharges into the downstream Wetland 1C. It is a tributary of Arroyo del Valle.

There will be no impacts to the bed and bank of this drainage; however, there is the potential to temporarily impact 0.15 acre of the outer edge of the oak riparian habitat due to construction equipment and work activities associated with adjacent roadwork.

Access to the location will be through the adjacent upland areas. No access roads within the stream zone are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed riparian area.

Wetland 1D

This 0.35 acre seasonal wetland (labeled as Wetland 1D on the map) is south of SR 84. It is fed by Water 1D and drained by Water 1C. A wet meadow-type wetland has formed where Water 1D has braided out in this area behind a man-made berm. This area will be avoided during the construction therefore there will be no impacts.

Project 7 (Water 1D)

This ephemeral drainage (labeled as Water 1D) is located upstream of Wetland 1D and flows parallel to SR 84. This segment of the Water 1 system receives drainage from the upstream Wetland 1E, is moderately incised and has a dense oak/willow riparian habitat. It is a tributary of Arroyo del Valle.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,952 sq ft (0.14 ac; 917 linear feet) and associated temporary impacts totaling approximately 718 sq ft (0.02 ac). Work activities will also result in 0.24 acre of temporary impacts and 1.18 acre of permanent impacts to riparian habitat. The creek channel will be realigned from its existing location to the north toe of the new slope from approximately station numbers 69+65 to 72+80. This new channel will have a combination of natural bottom and some rock protection in areas where the additional erosion protection is needed, with rock weirs placed at appropriate locations along the new channel to create seasonally ponded wetland areas to mitigate impacts to Wetlands 1C, 1D, and 1E.

Access to the location will be via the adjacent existing highway or upland areas. There are no access roads within the stream zone planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed waters and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The recreated channel will, at minimum, be seeded with the wetland/waters species proposed in the submitted Revegetation Plan. If conditions are suitable to support riparian vegetation after construction, the area will also be augmented with riparian species proposed in the Revegetation Plan.

Project 8 (Wetland 1E)

This 0.12 acre seasonal wetland (labeled as Wetland 1E) is located above the origin of Water 1E in a low-lying area that slopes towards Water 1D. It receives water from sheet flow runoff from the adjacent hills and from a culvert under SR 84. Under heavy storm conditions, it has the potential to receive water from Wetland 1F. It is vegetated with wetland grasses and has no woody overstory.

This wetland will be completely filled by the construction project. Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,365 sq ft (0.12 ac).

Project 9 (Water 1E)

This drainage, labeled as Water 1E on the map, connects the headwaters Wetland 1F with all downstream jurisdictional features. It is a very shallow, indistinct drainage that has no associated riparian overstory and is vegetated only with nonnative annual grasses. It is a tributary of Arroyo del Valle.

This drainage will be completely filled by the construction project. Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 557 sq ft (0.01 ac; 277 linear ft). This drainage area will be recreated and vegetated as described in the Project 8, as the two projects are connected and will be similarly impacted.

Project 10 (Wetland 1F)

This large 1.2 acre seasonal wetland (labeled as Wetland 1F on the maps) forms in a low area immediately adjacent to the existing roadway on the east side of the Pigeon Pass saddle, and accepts roadway runoff and sheet flow from the surrounding uplands. Wet season observation, topography, and drainage patterns indicate that this system is not typically hydrologically connected to a jurisdictional water body, except possibly during heavy storm conditions, when it may overflow into Wetland 1E. The edges are populated with wetland plants such as *Eleocharis* sp., *Carex* sp., and *Juncus* sp. during the growing season with open water comprising the remaining inner portion. The area is devoid of a riparian overstory.

Placement of fill necessary to construct the new alignment will result in permanent impacts to wetlands totaling approximately 33,971 sq ft (0.78 ac) and associated temporary impacts totaling approximately 5,799 sq ft (0.13 ac).

Access to the location will be via the adjacent existing highway, driveway, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area.

Project 11 (Wetland 2)

This 0.07 acre wetland (labeled as Wetland 2 on the map) is the result of a spring at the beginning of a seasonal drainage, at the top of a hill. A small plateau at the spring creates an area for water to saturate the ground, and sometimes pool, before it overflows down the hill during the wet season. The wetland is vegetated with *Juncus* sp., *Eleocharis* sp., *Cyperus* sp., and *Rumex* sp. This wetland will be completely filled by the new alignment. Placement of fill necessary to construct the new alignment and installation of a 750 mm (29.5 inch) culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 3,162 sq ft (0.07 ac).

Project 12 (Wetland 3A)

This 0.06 acre seasonal wetland (labeled as Wetland 3A on the map) is partially within a creek bed and a backwater area of a creek (Water 2). It is sparsely vegetated with wetland plants such as *Rumex* sp., *Cyperus* sp., *Eleocharis* sp. and *Juncus* sp., but is devoid of a riparian overstory. This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill necessary to construct the new alignment and installation of a 28-inch culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 2,323 sq ft (0.05 ac) and associated temporary impacts to wetlands totaling approximately 88 sq ft (0.002 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project 13 (Wetland 3B)

This 0.60 acre seasonal wetland (labeled as Wetland 3B on the map) accepts both roadway runoff and sheet flow from the adjacent hills. It is a combination of a wet meadow, man-made stock pond, and vegetated channel. It drains into a natural, ephemeral drainage (Water 2), which then drains into Wetland 3A. This wetland has a woody willow riparian overstory around its eastern

edge.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for construction of the new alignment will result in permanent impacts to wetlands totaling approximately 10,071 sq ft (0.23 ac) and associated temporary impacts totaling approximately 1,595 sq ft (0.04 ac). Construction activities will also result in .04 acre of temporary and .19 acre of permanent impacts to riparian habitat. Access to the location will be by driving across the adjacent upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the submitted Revegetation Plan. The Revegetation Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project 14 (Water 2)

This water, labeled as Water 2 on the map, includes the heavily incised ephemeral drainage which flows from Wetland 3B into Wetland 3A. This drainage system eventually flows into the San Antonio Reservoir. It does not have an associated riparian corridor.

Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 447 sq ft (0.01 ac; 106 linear ft). This drainage will be completely filled by the project.

Project 15 (Water 3)

This water (labeled as Water 3 on the map) includes the ephemeral creek, which runs perpendicular to SR 84 and terminates in the San Antonio Reservoir. It is heavily incised and the associated oak riparian habitat includes approximately 4-5 oaks growing at the top of the banks. There are two impact areas along this drainage. Impact Area 1 involves the temporary placement of fill necessary to accommodate the relocation of a Pacific Gas & Electric pipeline. This relocation will result in temporary impacts totaling approximately 58 sq ft (0.001 ac). Impact Area 2 includes partially filling the drainage for the new alignment. This activity will result in permanent impacts totaling approximately 3,759 sq ft (0.09 ac; 570 linear ft) and associated temporary impacts totaling approximately 755 sq ft (0.02 ac). Construction activities will also result in 0.17 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland or along a farm road. Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed drainage areas.

Project 16 (Wetland 4)

This 0.16 acre seasonal wetland (labeled as Wetland 4 on the map) can best be described as a heavily incised, vegetated channel. It is located on both sides of SR 84. It receives water from the surrounding hills northwest of SR 84, travels under the highway through a culvert and transitions into Water 3. This wetland has an associated oak riparian corridor along the top of its banks.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for the construction of the new alignment will result in permanent impacts to wetlands totaling approximately 141 sq ft (0.003 ac) and associated temporary impacts totaling approximately 693 sq ft (0.01 ac). Construction activities will also result in .05 acre of temporary impacts to riparian habitat.

Access to the location will be by the existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed wetland and oak riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the submitted Revegetation Plan. The Revegetation Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project 17 (Wetlands 5A-5D)

These seasonal wetlands (0.20 ac, 0.30 ac, 0.01 ac, and 0.04 ac, respectively) are found along drainages that originate outside of the project area, north of SR 84 (5A and B), with 5C extending into the project area north of SR 84, then traveling under the highway through a culvert, and emerging again as 5D, outside the construction project area, south of SR 84. They are best described as a channel vegetated with wetland plants such as *Juncus* sp and *Carex* sp. They do not have an associated riparian corridor.

Portions of Wetland 5B will be temporarily disturbed during construction due to roadwork. The roadwork will temporarily impact 1,909 sq ft (0.04 ac).

Access to the location will be via the existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes. After construction Caltrans proposes to restore the temporarily disturbed wetland area.

Water 4

This ephemeral drainage, which runs parallel to SR 84 on the north side, connects two wetlands,

which are outside of the construction project area. This system eventually drains into the San Antonio Reservoir. This water will not be impacted by the project.

Wetlands 6A-6C

These seasonal wetlands (0.01 ac, 0.001 ac, and 0.03 ac, respectively) originate along a wetland drainage (6A) north of SR 84, and travel under the highway through a culvert, emerging again as Wetlands 6B and 6C, south of SR 84. This wetland drainage is tributary to the San Antonio Reservoir, located about 1 mile downstream. This system is described by Caltrans as a swale-like drainage. This area will not be impacted by the project.

Total Impacts

Total impacts related to the proposed project include 2.21 acres of waters of the State including 1.87 acres of fresh seasonal wetlands and 2,775 linear feet (0.34 acres) of freshwater seasonal creeks. Project activities will temporarily disturb 0.42 acres of jurisdictional waters of the U.S comprised of 0.35 acres of freshwater seasonal wetlands, and 440 linear feet (0.07 acres) of freshwater seasonal creeks. The project will also permanently impact 3.0 acres of permanent riparian habitat and 0.96 acres of temporary impacts.

Listed Species

Portions of the waters on the Project site serve as habitat for several special status species, the California red-legged frog (*Rana aurora draytonii*; CRLF), California tiger salamander (*Ambystoma californiense*; CTS) and vernal pool fairy shrimp (*Branchinecta lynchi*, hereinafter VPFS).

Conditions

1. Work within the stream/riparian corridor shall be confined to the period May 1 to October 31. Revegetation work is not confined to this time period.
2. If the Operator needs more time to complete the authorized activity, the work period may be extended on a day-to-day basis by Marcia Grefsrud at mgrefsrud@dfg.ca.gov, or the Yountville office at (707) 944-5520.
3. Work within the stream bed shall be restricted to periods of no stream flow and dry weather. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities shall cease and all reasonable erosion control measures shall be implemented prior to the onset of precipitation. Construction activities halted due to precipitation may resume when precipitation ceases and the 72-hour weather forecast from the National Weather Service indicates a 20% or less chance of precipitation, provided no work occurs in the stream bed if water is flowing.
4. If a construction phase may cause the introduction of sediments into the stream, no phase of the project shall be started in May or in October or any year, unless all work for that phase and all associated erosion control measures are completed prior to the onset of precipitation. If a construction phase may cause the introduction of sediments into the

stream, no phase of the project shall be started unless all equipment and materials are removed from the channel at least 12 hours prior to the onset of precipitation and all associated erosion control measures are in place prior to the onset of precipitation. After any storm event, the Operator shall inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sedimentation problems and take corrective action as needed. Seventy-two-hour weather forecasts from the National Weather Service shall be consulted prior to start up of any phase of the project that may result in sediment runoff to the stream, and construction plans made to meet this condition.

5. To protect and maintain riparian wetland systems and to ensure a "No Net Loss" in wildlife value or acreage of wetlands, the Operator shall submit to the Department a Mitigation Plan by December 31, 2006, which amounts to a 3:1 ratio for the acreage of bed and bank permanently impacted by the construction (0.34 x 3=1.02 acres), a 1:1 ratio for the acreage of bed and bank temporarily impacted by the construction (0.07), a 3:1 ratio for the acreage of wetlands permanently impacted (1.87x3=5.61 acres), a 1:1 ratio for the acreage of wetlands temporarily impacted (0.35 acres), and a 3:1 ratio for the acreage of riparian habitat permanently impacted (3x3=9 acres), and 1:1 ratio for the acreage of riparian habitat temporarily impacted by the project activities (0.96 acres). The mitigation can include a combination of on-site creation or restoration, off-site restoration or creation, or purchase and donation of wetlands/riparian land to an Alameda County non-profit organization along with funding and a restoration plan for the site to be protected in perpetuity. The Mitigation Plan and location of the mitigation must be approved in writing by the Department of Fish and Game prior to the start of construction. The mitigation area must be as close to the work site as is possible, preferably in the same drainage. Restoration of the stream bank and riparian zone shall include site preparation/earth movement, revegetation with native locally occurring riparian species. Work on the waterway shall not begin until the Department has approved the off-site mitigation location and Mitigation Plan or receipt of the donation has been provided.
6. The Final Mitigation Plan shall describe all both off site and on-site mitigation, design and construction plans, and survival performance criteria based on conditions #8-11.
7. Mitigation implementation shall be completed by January 31, 2008. On site temporary impacts shall be restored immediately following that portion of construction. If mitigation is not complete during the required time period, additional mitigation will be required for the additional temporal loss of habitat. The additional mitigation shall increase at a 1:5 ratio for each year the mitigation is not completed.
8. All trees and shrubs installed have an 80% survival performance criterion during the 3-year plant establishment period. In Year 5, two years after the completion of plant establishment, survival should not be lower than 70% or all failed plantings on the mitigation site should be replanted with live plantings and monitored an additional 3 years to achieve at least 80% total survival. In Year 5, species richness will be the same as the as-built condition. If a particular species suffers 100% mortality at any point in the

monitoring, it will be replaced in totality, unless a more appropriate substitution is recommended and approved by the Department based on specific environmental factors of the site conditions.

9. All disturbed slopes around and on the banks shall be seeded, mulched and fertilized with a blend of a minimum of three local grass species from the following list: California brome: 6# per acre, Purple needle grass (*Nasella pulchra*): 3# per acre, California wildflower mix or shrub seed: 5# per acre. If hydroseeding, extra tackifier and mulch shall be added. Erosion control seeding shall be at a rate of at least 25 pounds per acre, pure live seed. Monofilament shall not be used.
10. For erosion control cover there shall be a minimum of 80% cover with no bare areas larger than 3 feet x 3 feet.
11. If the survival and/or cover requirements are not meeting these goals, the Operator is responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for five years after planting. An annual status report on the mitigation shall be provided to the Department of Fish and Game by December 31 of each year. This report shall include the survival, percent cover, and height of both tree and shrub species. The number by species of plants replaced, an overview of the revegetation effort, and the method used to assess these parameters shall also be included. Photos from designated photo stations shall be included.
12. If construction, grading, or other project-related activities are scheduled during the nesting season of protected raptors and migratory birds (February 1 to July 31), a focused survey for active nest of such birds shall be conducted by a qualified biologist (as determined by a combination of academic training and professional experience in biological sciences and related resource management activities) within 15 days prior to the beginning to project-related activities. The results of the survey shall be faxed to (707)944-5595. Refer to Notification Number 1600-2006-0059-3 when submitting the survey to the Department. If nesting birds are found a 50-foot radius buffer should be established around the nest, a 300-foot radius buffer in the case of hawks and owls. The area should be fenced and avoided until the young have fledged, as determined by a qualified biologist. If a lapse in project-related work of 15 days or longer occurs, another focused survey and if required, consultation with the Department and United States Fish and Wildlife Service, will be required before project work can be reinitiated.
13. The project site has been identified as an area that is potentially inhabited by a listed species, the California red-legged frog, California tiger salamander, and San Joaquin kit fox and by a species of special concern, the Western burrowing owl. The Operator is required to comply with all applicable state and federal laws, including the California and Federal Endangered Species Acts. This agreement does not authorize the take of any state or federally listed species. Liability for any take or incidental take of such listed

species remains the responsibility of the Operator for the duration of the project. Any unauthorized take of such listed species may result in prosecution and nullification of the agreement.

14. Surveys and relocation shall be done in accordance with the Biological Opinion 1-1-04-F-0115 dated February 28, 2005.
15. The operator shall hire a biologist, with all necessary State and Federal permits, to relocate all fish/amphibians within the work site prior to dewatering. Captured fish/amphibians shall be moved to the nearest appropriate site on the stream. This condition does not allow for the take or disturbance of any state or federally listed species, or state listed species of special concern. A record shall be maintained of all fish/amphibians captured and moved, and the record shall be provided to the Department (c/o 1600 program, Post Office Box 47, Yountville, California 94599) with appropriate Streambed Alteration Notification number.
16. Qualified biological monitors shall be present on a continuous basis for all activities that could result in the take of a listed or protected species. The biological monitors shall ensure compliance with the measures provided in this Agreement. The biologists shall be given the authority to stop any work that may result in the take of listed or protected species. The Department shall be notified within 24 hours by email at mgregsrud@dfg.ca.gov if the biologist exercises this authority.
17. Work must be performed in isolation from the flowing stream. If there is any flow when the work is done, the operator shall construct coffer dams upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. The coffer dams may be constructed with clean river gravel or sand bags, and may be sealed with sheet plastic. Sand bags and any sheet plastic shall be removed from the stream upon project completion. Clean river gravel may be left in the stream, but the coffer dams must be breached to return the stream flow to its natural channel.
18. When any dam (any artificial obstruction) is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain fish life below the dam pursuant to Fish and Game Code Section 5937.
19. Flow diversions shall be done in a manner that shall prevent pollution and/or siltation and which shall provide flows to downstream reaches. Flows to downstream reaches shall be provided during all times that the natural flow would have supported aquatic life. Said flows shall be sufficient quality and quantity, and of appropriate temperature to support fish and other aquatic life both above and below the diversion. Normal flow shall be restored to the affected stream immediately upon completion of work at that location.
20. The temporary stream crossings shall be constructed using a temporary bridge with a gravel approach ramp or temporary culverts backfilled with clean round river cobble and

topped with a gravel road base.

21. Storm drains lines/culverts shall be adequately sized to carry peak storm flows for the drainage to one outfall structure. The storm drain lines/culverts and the outfall structure shall be properly aligned within the stream and otherwise engineered, installed and maintained, to assure resistance to washout, and erosion of the stream bed, stream banks and/or fill. Water velocity shall be dissipated at the outfall, to reduce erosion.
22. The bottom of permanent culverts shall be placed at or below stream grade.
23. Prior to removal of existing culverts they shall be inspected for wildlife. If any wildlife is encountered during the course of the maintenance, said wildlife shall be allowed to leave the maintenance area unharmed, and shall be flushed, hazed, or herded in a safe direction away from the project site. This condition does not allow for the take or disturbance of any state or federally listed species, or state listed species of special concern.
24. Streambank areas receiving rock slope protection (rip rap) shall be back-filled with appropriate topsoil. The topsoil fill should be placed to fill the voids in the rock slope protection and provide a substrate for revegetation efforts where appropriate.
25. Rip rap will be set below grade and keyed into the bank. Rip rap rock shall be of the proper size and weight to withstand high flows.
26. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of the stream channel and banks, avoiding areas of concentrated ground squirrel burrows suitable for use by CTS or burrowing owls. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream shall be positioned over drip-pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles must be moved away from the stream prior to refueling and lubrication.
27. The construction area shall be flagged to identify the limits of the agreed work area to prevent damage to adjacent habitat.
28. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations.
29. Silt control measures shall be utilized throughout all phases of the project where silt and/or earthen fill threaten to enter Waters of the State. Silt control structures shall be monitored for effectiveness and shall be repaired or replaced as needed. Build up of soil behind the fence shall be removed promptly and any breaches or undermined areas repaired at once.
30. A copy of this agreement must be provided to the contractor and all subcontractors who work within the stream zone and must be in their possession at the work site.

31. Building materials and/or construction equipment shall not be stockpiled or stored where they could be washed into the water or where they will cover aquatic or riparian vegetation.
32. Debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake, by Operator or any party working under contract, or with the permission of the Operator, shall be removed immediately.
33. The contractor shall not dump any litter or construction debris within the riparian/stream zone. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site.
34. Department personnel or its agents may inspect the work site at any time.
35. The Operator is liable for compliance with the terms of this Agreement, including violations committed by the contractors and/or subcontractors. The Department reserves the right to suspend construction activity described in this Agreement if the Department determines any of the following has occurred:
 - A). Failure to comply with any of the conditions of this Agreement
 - B). Information provided in support of the Agreement is determined by the Department to be inaccurate.
 - C). Information becomes available to the Department that was not known when preparing the original conditions of this Agreement (including, but not limited to, the occurrence of State or federally listed species in the area or risk to resources not previously observed)
 - D). The project as described in the Agreement has changed or conditions affecting fish and wildlife resources change.

Any violation of the terms of this Agreement may result in the project being stopped, a citation being issued, or charges being filed with the District Attorney. Contractors and subcontractors may also be liable for violating the conditions of this agreement.

Amendments and Extension to Expiration Date

The Operator shall notify the Department before any modifications are made in the project plans submitted to the Department. Project modifications may require an amendment or a new notification. To modify the project, a written request for an amendment must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599). An amendment requires a fee. The Fee Schedule can be obtained at www.dfg.ca.gov/1600 or by phone at (707) 944-5520. Amendments to the original Agreement are issued at the discretion of the Department.

To renew the Agreement beyond the expiration date, a written request for an extension must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599) for consideration at least 30 days before the Agreement expiration date. An extension requires a fee. Extensions of the original Agreement are issued at the discretion of the Department.

This Agreement is transferable to subsequent owners of the project property by requesting an amendment.

Please note that you may not proceed with construction until your proposed project has undergone CEQA review and the Department signs the Agreement.

I, the undersigned, state that the above is the final description of the project I am submitting to the Department for CEQA review, leading to an Agreement, and agree to implement the conditions above required by the Department as part of that project. I will not proceed with this project until the Department signs the Agreement. I also understand that the CEQA review may result in the addition of measures to the project to avoid, minimize, or compensate for significant environmental impacts:

Operator's name (print): RON K. KIAAINA

Operator's signature: Ron K. Kia

Signed the 13th day of JUNE, 2006

1600-2006 - For Department Use Only

Notification Number:	0059-3	Date Received	2/10/06	Date Completed	
Fee Enclosed?	<input checked="" type="checkbox"/> Yes \$ 4,000.00		<input type="checkbox"/> No		
Action Taken/Notes	# 082-893429 DEPT. OF TRANSPORTATION				

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

GRETS RUD
GARRETT
LT. CHRISTENSEN

Fish & Game

FEB 10 2006

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

All fields must be completed unless otherwise indicated.
(See enclosures for instructions.)

Yountville

Notification Type	
<input type="checkbox"/> Timber Harvesting Plan (No. _____)	<input type="checkbox"/> Water Application (No. _____)
<input type="checkbox"/> Commercial Gravel Extraction (No. _____)	<input checked="" type="checkbox"/> Other

Application Information			
	Name	Address	Telephone/FAX
Applicant:	California Department of Transportation (Caltrans)	See contact person	Business: See contact person Fax:
Operator:	Ron Kiaaina (Project Manager)	P.O. Box 23660 Oakland, Ca 95623-0660	Business: 510-286-4193 Fax: 510-286-5122
Contractor: (if known)	unknown		Business: Fax:
Contact Person: (if not applicant)	Shanna Zahner (Biologist)	703 B Street Marysville, Ca 95901	Business: 530-740-4815 Fax: 530-741-4457
Property Owner:	Multiple-see Attachment 2		Business: Fax:

Project Location				
Location Description:	Alameda County, State Route 84 southwest edge of the city of Livermore			
County		Assessor's Parcel Number		
Alameda		See Attachment 2		
USGS Map	Township	Range	Section	Latitude/Longitude
See Attachment 1				37° 38' 26" N/ 121° 47' 43" W
Name of River, Stream, or Lake:	Unnamed creeks			
Tributary To?	Arroyo Valle, San Antonio Reservoir			

Name of Applicant: Caltrans

Project Description							
Project Name:	Pigeon Pass (Alameda-84 Curve Realignment)						
Start Date:	2007	Completion Date:	2009	Project Cost:	\$25 million	Number of Stream Encroachments: (Timber Harvesting Plans Only)	NA
Describe project below: (Attach separate pages if necessary)							
See Attachment 1							
<input checked="" type="checkbox"/> Continued on separate page (s)							

Attachments/Enclosures		
Attach or enclose the required documents listed below and check the corresponding boxes.		
<input checked="" type="checkbox"/> Project Description	<input checked="" type="checkbox"/> Map showing project location, including distances and/or directions from nearest city or town	<input checked="" type="checkbox"/> Construction plans and drawings pertaining to the project
Completed CEQA documents:	<input type="checkbox"/> Notice of Exemption <input type="checkbox"/> Negative Declaration <input type="checkbox"/> Draft or Final Environmental Impact Report	<input type="checkbox"/> Mitigated Negative Declaration <input checked="" type="checkbox"/> Notice of Determination
Copies of applicable local, State, or federal permits, agreements, or other authorizations:	<input type="checkbox"/> Local. Describe:	
	<input checked="" type="checkbox"/> State. Describe: Army Corps of Engineers 404 permit; Regional Water Quality Control Board 401 Cert (all pending)	

I hereby certify that all information contained in this notification is true and correct and that I am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider this notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand that this notification is valid only for the project described herein and that I may be subject to civil or criminal prosecution for undertaking a project that differs from the one described herein, unless I have notified the Department of that project in accordance with Fish and Game Code Section 1602.

I understand that a Department representative may need to inspect the property where the project described herein will take place before issuing a Lake or Streambed Alteration Agreement pursuant to this notification. In the event the Department determines that a site inspection is necessary, I hereby authorize the Department to enter the property where the project described herein will take place to inspect the property at any reasonable time and certify that I am authorized to grant the Department permission to access the property.

I request the Department to first contact me at (insert telephone number) _____ to schedule a date and time to enter the property where the project described herein will take place and understand that this may delay the Department's evaluation of the project described herein.

Jean L Baker
Operator or Operator's Representative

Jan 12, 2006
Date

Attachment 1

Purpose and Need

The segment of SR 84 through the Vallecitos Hills / Pigeon Pass area has become functionally obsolete due to the combination of the existing features of the highway and increased volume of traffic. SR 84 has a winding alignment that generally follows the natural topography. Grades on SR 84 reach a maximum of 10 % and there are locations where stopping sight distance is limited by the curvature of the highway. Shoulder widths do not meet current design standards. There are no opportunities to pass slower vehicles. During peak hours, traffic is congested due to the winding alignment of the roadway through the Vallecitos Hills / Pigeon Pass area.

The project under consideration would correct existing horizontal and vertical alignment deficiencies on SR 84. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills / Pigeon Pass area. The average accident rate per million vehicle miles for a two-lane conventional highway is expected to be about 1.32 acc/mvm. The actual accident rate for SR 84 through the Vallecitos Hills / Pigeon Pass area is 1.42 acc/mvm. Improving the alignment and adding truck-climbing lanes to the roadway is expected to result in lower overall accident rates on SR 84.

Project Location and Description

The project is located southwest of Livermore on SR 84 in Alameda County. It begins near the Ruby Hills Drive/Kalthoff and SR 84 intersection and continues west to Post Mile 23.0. It can be found on the Livermore and La Costa Valley quadrangles, R 1E, and R 2E. Township and Sections are not available because the land was originally part of a Spanish Land Grant and has not been surveyed.

From I-580 take the 1st St/Springtown exit through Livermore. 1st St. will turn into Holmes, which turns into Vallecitos Rd (SR 84). Take Vallecitos Rd to the Ruby Hills/Kalthoff and Vallecitos intersection. From I-680 take the SR84/Vallecitos Rd exit. Follow to the Ruby Hills/Kalthoff and Vallecitos Rd. intersection.

Project Descriptions

Below is a description of each project (i.e. activity), as defined by the Department of Fish and Game, within the proposed Caltrans construction project known as Pigeon Pass.

Attached is a table that quantifies temporary and permanent impacts for each project.

Equipment to be used at each location will most likely include but is not limited to bulldozers, backhoes, excavators, compactors, and dump trucks.

Construction is expected to begin August 1, 2006 and end November 1, 2009.

Project 1 (Water 1A)

This project affects an unnamed ephemeral creek (labeled as Water 1A on the maps) which runs parallel to State Route 84 (SR 84) on the south side. This water is a tributary of Arroyo del Valle. The drainage in this area is shallow and characterized by indistinct banks vegetated with nonnative annual grasses typical for the area. See the attached habitat description for annual grassland. The area is devoid of a woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 63 ft² (0.001 ac; 10 linear ft) and associated temporary impacts totaling approximately 528 ft² (0.01 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland. No access roads within the streambed are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Cost of Project: \$50.00

Permit Fee: \$200.00

Project 2 (Wetland 1A)

This project affects a seasonal wetland (labeled as Wetland 1A on the maps), which is tributary to the Arroyo del Valle. In the past, check dams made of rock were placed within the ephemeral creek (Water 1A) at this location. This has created a bottleneck, allowing wetland characteristics to evolve within the creek. The wetland is heavily vegetated with cattails. The area is devoid of woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 7,866 ft² (0.18 ac) and associated temporary impacts totaling

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approximately 1, 159 ft² (0.03 ac). The streambed alterations at this location will require that a series of three natural bottom ponds be constructed at the toe of slope of the new alignment from approximately station number 80+40 to 82+40 (see maps) to direct the upstream flow. A ditch will connect the three ponds. The ditches will be lined with rock slope protection (RSP) at the outfalls of each pond to slow water velocity. Construction of the pond and ditch complex, as opposed to a straight channel, will reduce velocity through the area.

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area, as well as the newly created ponds. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Cost of Project: \$3,600.00

Permit Fee: \$200.00

Project 3 (Water 1B)

This ephemeral drainage (labeled as Water 1B on the map) is located upstream of the Wetland 1A along the southern edge of SR 84, and is tributary to Arroyo del Valle. It is a heavily incised, oak riparian stream corridor with steep banks leading to the channel bed at the toe of slope of SR 84. This drainage is connected to the adjacent, upstream wetland 1C by a culvert that passes under a residential driveway.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 4,081 ft² (0.09 ac; 895 linear ft) and associated temporary impacts totaling approximately 982 ft² (0.02 ac). The temporary impacts include the installation of a temporary culvert which will provide access between the east and west sides of the creek. Construction activities will also result in .36 acre of temporary, and 1.46 acre of permanent impacts to oak riparian habitat.

Access to the location will be via the adjacent existing highway, driveways, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, the temporary culvert will be removed and the ground recontoured to its pre-project condition. Caltrans proposes to reseed the temporarily disturbed area and to replant the riparian corridor areas. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters and riparian species to be used.

Project Cost: \$9,900.00

Permit Fee: \$250.00

Project 4 (Wetland 1B)

This is a 0.01 acre seasonal wetland, labeled as Wetland 1B on the map, within the Water 1 system. It forms at the inlet of a culvert that passes under SR 84 and can best be described as a vegetated channel. The channel is devoid of woody riparian overstory.

Placement of fill or construction of the new alignment will result in permanent impacts totaling approximately 55 ft² (0.001 ac) and associated temporary impacts totaling approximately 13 ft² (0.0003 ac).

Access to the location will be via the adjacent existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$80.00

Permit Fee: \$200.00

Project 5 (Wetland 1C)

This is a 0.67 acre seasonal wetland (labeled as Wetland 1C on the map) south of SR 84. This wetland is a combination of flow from Water 1C and the nearby hills. It can best be described as a combination of swale and wet meadow. There is a small area of oak riparian habitat associated with the west end of this wetland. The riparian habitat is part of the riparian corridor that runs along Water 1C described below.

Placement of fill for the construction of the new alignment and installation of a 48 inch (in) culvert and a 12 in culvert to facilitate drainage under the new alignment will result in permanent impacts to wetlands totaling approximately 18,297 ft² (0.42 ac) and associated temporary impacts totaling approximately 4,150 ft² (0.10 ac). Construction activities will also result in .12 acre of temporary impacts to riparian habitat.

Access to the location will be via the adjacent existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters and riparian species to be used.

Project Cost: \$28,000.00

Permit Fees: \$750.00

Project 6 (Water 1C)

This heavily incised, ephemeral drainage (labeled as Water 1C on the map) receives flow from the bermed Wetland 1D via a spillway/culvert. This drainage, which has an associated dense oak riparian corridor, discharges into the downstream Wetland 1C. It is a tributary of Arroyo del Valle.

There will be no impacts to the bed and bank of this drainage; however, there is the potential to temporarily impact .15 acre of the outer edge of the oak riparian habitat due to construction equipment and work activities associated with adjacent roadwork.

Access to the location will be through the adjacent upland areas. No access roads within the stream zone are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed riparian area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the riparian species to be used.

Project Cost: \$200.00

Permit Fee: \$200.00

Wetland 1D

This 0.35 acre seasonal wetland (labeled as Wetland 1D on the map) is south of SR 84. It is fed by Water 1D and drained by Water 1C. A wet meadow-type wetland has formed where Water 1D has braided out in this area behind a man-made berm. This area will be avoided during the construction therefore there will be no impacts.

Project 7 (Water 1D)

This ephemeral drainage (labeled as Water 1D) is located upstream of Wetland 1D and flows parallel to SR 84. This segment of the Water 1 system receives drainage from the upstream Wetland 1E, is moderately incised and has a dense oak/willow riparian habitat. It is a tributary of Arroyo del Valle.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,952 ft² (0.14 ac; 917 linear feet) and associated temporary impacts totaling approximately 718 ft² (0.02 ac). Work activities will also result in .24 acre of temporary, and 1.18 acre of permanent impacts to riparian habitat. The creek channel will be realigned from its existing location to the north toe of the new slope from approximately station numbers 69+65 to 72+80. This new channel will have a combination of natural bottom and some rock protection in areas where the additional erosion protection is needed, with rock weirs placed at appropriate locations along the new channel to create seasonally ponded wetland areas to mitigate impacts to Wetlands 1C, 1D, and 1E.

Access to the location will be via the adjacent existing highway or upland areas. There are no access roads within the stream zone planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed waters and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The recreated channel will, at minimum, be seeded with the wetland/waters species proposed in the previously submitted Revegetation Plan. If conditions are suitable to support riparian vegetation after construction, the area will also be augmented with riparian species proposed in the Revegetation Plan.

Project Cost: \$1,200

Permit Fee: \$200.00

Project 8 (Wetland 1E)

This 0.12 acre seasonal wetland (labeled as Wetland 1E) is located above the origin of Water 1E in a low-lying area that slopes towards Water 1D. It receives water from sheet flow runoff from the adjacent hills and from a culvert under SR 84. Under heavy storm

conditions, it has the potential to receive water from Wetland 1F. It is vegetated with wetland grasses and has no woody overstory.

This wetland will be completely filled by the construction project. Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,365 ft² (0.12 ac).

Project Cost: \$5,200

Permit Fee: \$250.00

Project 9 (Water 1E)

This drainage, labeled as Water 1E on the map, connects the headwaters Wetland 1F with all downstream jurisdictional features. It is a very shallow, indistinct drainage that has no associated riparian overstory and is vegetated only with nonnative annual grasses. It is a tributary of Arroyo del Valle.

This drainage will be completely filled by the construction project. Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 557 ft² (0.01 ac; 277 linear ft). This drainage area will be recreated and vegetated as described in the Project 8, as the two projects are connected and will be similarly impacted.

Project Cost: \$4,900.00

Permit Fee: \$200.00

Project 10 (Wetland 1F)

This large 1.2 acre seasonal wetland (labeled as Wetland 1F on the maps) forms in a low area immediately adjacent to the existing roadway on the east side of the Pigeon Pass saddle, and accepts roadway runoff and sheet flow from the surrounding uplands. Wet season observation, topography, and drainage patterns indicate that this system is not typically hydrologically connected to a jurisdictional water body, except possibly during heavy storm conditions, when it may overflow into Wetland 1E. The edges are populated with wetland plants such as *Eleocharis* sp., *Carex* sp., and *Juncus* sp. during the growing season with open water comprising the remaining inner portion. The area is devoid of a riparian overstory.

Placement of fill necessary to construct the new alignment will result in permanent impacts to wetlands totaling approximately 33,971 ft² (0.78 ac) and associated temporary impacts totaling approximately 5,799 ft² (0.13 ac).

Access to the location will be via the adjacent existing highway, driveway, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$180,000.00

Permit Fee: \$1,100.00

Project 11 (Wetland 2)

This 0.07 acre wetland (labeled as Wetland 2 on the map) is the result of a spring at the beginning of a seasonal drainage, at the top of a hill. A small plateau at the spring creates an area for water to saturate the ground, and sometimes pool, before it overflows down the hill during the wet season. The wetland is vegetated with *Juncus* sp., *Eleocharis* sp., *Cyperus* sp., and *Rumex* sp.

This wetland will be completely filled by the new alignment. Placement of fill necessary to construct the new alignment and installation of a 750 mm (29.5 in) culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 3,162 ft² (0.07 ac).

Project Cost: \$3,000.00

Permit Fee: \$200.00

Project 12 (Wetland 3A)

This 0.06 acre seasonal wetland (labeled as Wetland 3A on the map) is partially within a creek bed and a backwater area of a creek (Water 2). It is sparsely vegetated with wetland plants such as *Rumex* sp., *Cyperus* sp., *Eleocharis* sp. and *Juncus* sp., but is devoid of a riparian overstory.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill necessary to construct the new alignment and installation of a 28 in culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 2,323 ft² (0.05 ac) and associated temporary impacts to wetlands totaling approximately 88 ft² (0.002 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$3,000.00

Permit Fee: \$200.00

Project 13 (Wetland 3B)

This 0.60 acre seasonal wetland (labeled as Wetland 3B on the map) accepts both roadway runoff and sheet flow from the adjacent hills. It is a combination of a wet meadow, man-made stock pond, and vegetated channel. It drains into a natural, ephemeral drainage (Water 2), which then drains into Wetland 3A. This wetland has a woody willow riparian overstory around its eastern edge.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for construction of the new alignment will result in permanent impacts to wetlands totaling approximately 10,071 ft² (0.23 ac) and associated temporary impacts totaling approximately 1,595 ft² (0.04 ac). Construction activities will also result in .04 acre of temporary and .19 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project Cost: \$19,200.00

Permit Fee: \$500.00

Project 14 (Water 2)

This water, labeled as Water 2 on the map, includes the heavily incised ephemeral drainage which flows from Wetland 3B into Wetland 3A. This drainage system eventually flows into the San Antonio Reservoir. It does not have an associated riparian corridor.

Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 447 ft² (0.01 ac; 106 linear ft). This drainage will be completely filled by the project.

Project Cost: \$180.00

Permit Fee: \$200.00

Project 15 (Water 3)

This water (labeled as Water 3 on the map) includes the ephemeral creek, which runs perpendicular to SR 84 and terminates in the San Antonio Reservoir. It is heavily incised and the associated oak riparian habitat includes approximately 4-5 oaks growing at the top of the banks.

There are two impact areas along this drainage. Impact Area 1 involves the temporary placement of fill necessary to accommodate the relocation of a Pacific Gas & Electric pipeline. This relocation will result in temporary impacts totaling approximately 58 ft² (0.001 ac). Impact Area 2 includes partially filling the drainage for the new alignment. This activity will result in permanent impacts totaling approximately 3,759 ft² (0.09 ac; 570 linear ft) and associated temporary impacts totaling approximately 755 ft² (0.02 ac). Construction activities will also result in .17 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland or along a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed drainage areas. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost (Impact Area 1): \$700.00

Permit Fee: \$200.00

Project Cost (Impact Area 2): \$66,500.00

Permit Fee: \$750.00

Project 16 (Wetland 4)

This 0.16 acre seasonal wetland (labeled as Wetland 4 on the map) can best be described as a heavily incised, vegetated channel. It is located on both sides of SR 84. It receives water from the surrounding hills northwest of SR 84, travels under the highway through a culvert and transitions into Water 3. This wetland has an associated oak riparian corridor along the top of its banks.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for the construction of the new alignment will result in permanent impacts to wetlands totaling approximately 141 ft² (0.003 ac) and associated temporary impacts totaling approximately 693 ft² (0.01 ac). Construction activities will also result in .05 acre of temporary impacts to riparian habitat.

Access to the location will be by the existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed wetland and oak riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project Cost: \$16,000.00

Permit Fee: \$500.00

Project 17 (Wetlands 5A-5D)

These seasonal wetlands (0.20 ac, 0.30 ac, 0.01 ac, and 0.04 ac, respectively) are found along drainages that originate outside of the project area, north of SR 84 (5A and B), with 5C extending into the project area north of SR 84, then traveling under the highway through a culvert, and emerging again as 5D, outside the construction project area, south of SR 84. They are best described as a channel vegetated with wetland plants such as *Juncus* sp and *Carex* sp. They do not have an associated riparian corridor.

Portions of Wetland 5B will be temporarily disturbed during construction due to roadwork. The roadwork will temporarily impact 1,909 ft² (0.04 ac).

Access to the location will be via the existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$ 4,900.00

Permit Fee: \$200.00

Water 4

This ephemeral drainage, which runs parallel to SR 84 on the north side, connects two wetlands, which are outside of the construction project area. This system eventually drains into the San Antonio Reservoir. This water will not be impacted by the project.

Wetlands 6A-6C

These seasonal wetlands (0.01 ac, 0.001 ac, and 0.03 ac, respectively) originate along a wetland drainage (6A) north of SR 84, and travel under the highway through a culvert, emerging again as Wetlands 6B and 6C, south of SR 84. This wetland drainage is tributary to the San Antonio Reservoir, located about 1 mi downstream. This system can best be described as a swale-like drainage. This area will not be impacted by the project.

Habitat Type Descriptions

Oak Woodland, Riparian and Upland: The valley oak woodland plant community, which correspond with the CNPS's valley oak series, can be found along some of the ephemeral creeks and scattered in the upland nonnative grassland (URS 2002). It is dominated by valley oak (*Quercus lobata*) and includes coast live oak (*Quercus agrifolia*) and California buckeye (*Aesculus californica*) (URS 2002). The woodlands interspersed in the upland are lower in density than the riparian habitat and are typical of oak woodlands that have a nonnative grassland understory (URS 2002). The riparian areas also include western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), sandbar willow (*Salix exigua*), red willow (*Salix laevigata*), and arroyo willow (*Salix lasiolepis*) in the tree layer. The shrub layer consists of California rose (*Rosa californica*), Pacific blackberry (*Rubus ursinus*), blue elderberry (*Sambucus mexicana*), common snowberry (*Symphoricarpos albus* var. *laevigatus*), and poison oak (*Toxicodendron diversilobum*). A complete list of vegetation identified during botanical surveys is found in Appendix B.

Annual Grassland: Nonnative grassland is the dominant vegetation community within the LOD and surrounding area. Most of this grassland is completely open, with some scattered oaks. This plant community corresponds to the CNPS's California annual grassland series (URS 2002). The dominant species within the grassland include slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), perennial ryegrass (*Lolium multiflorum*), and Medusa-head (*Taeniatherum caput-medusae*) (URS 2002). Native and nonnative herbaceous species are also present, as well as patches of creeping wildrye (*Leymus triticoides*) (CNPS's creeping ryegrass series) and purple needlegrass (*Nassella pulchra*) (URS 2002). A complete list of all vegetation identified during botanical surveys is found in Appendix B.

Hydrophytic Vegetation: The seasonal wetlands located within the area support vegetation that is normally only found growing under anaerobic conditions characteristic of wetlands. Wetlands occur as narrow linear bands along channels, in pockets at culvert inlet and outlets, in natural swales and depressions and in man-made features where water collects. The wetland habitats in the project area are dominated by herbaceous vegetation that include tall flatsedge (*Cyperus eragrostis*), spikerush (*Eleocharis macrostachya*), fringed willow herb (*Epilobium ciliatum* ssp. *ciliatum*), spreading rush (*Juncus patens*), rabbit foot grass (*Polypogon monspeliensis*), low club rush (*Scirpus cernuus*), and mulefat (*Baccharis salicifolia*). Shrub and tree species, such as red willow (*Salix laevigata*), arroyo willow (*Salix lasiolpis*) and mulefat (*Baccharis salicifolia*) are present

within or along wetland edges at several locations. Grasses, such as Bermuda grass (*Cynodon dactylon*), Italian ryegrass (*Lolium multiflorum*), Dallis grass (*Paspalum dilatatum*), ditch grasses (*Polypogon* sp) and other nonnative annuals dominate many of these wetland areas. A complete list of vegetation identified during botanical surveys is found in Appendix B.



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



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In reply refer to:
1-1-04-F-0115

February 28, 2005

Mr. Gene Fong
Federal Highway Administration
Department of Transportation
650 Capital Mall, Suite 4-100
Sacramento, California 95814

Subject: Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California

Dear Mr. Fong:

This is in response to your February 17, 2004, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass) in Alameda County, California. Your request was received in this Field Office on February 18, 2004. This document represents the Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*); and conference opinion on the effects of the action on the proposed critical habitats for the California tiger salamander and the California red-legged frog. This document is issued pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

This biological opinion is based on: (1) a letter from the Federal Highway Administration to the Service dated February 17, 2004; (2) *Early Evaluation for the San Joaquin Kit Fox for the Pigeon Pass Curve Correction Project* dated August 22, 2002, that was prepared by the California Department of Transportation; (3) *Biological Assessment Pigeon Pass Curve Realignment, Alameda County State Route 84, southwest of Livermore, Ca 04-Ala-84-33.3-37.0 (20.6-23.0) 04-172400* (Biological Assessment) dated February 2004, that was received by the Service on February 18, 2004; (4) *Large Branchiopod Dry (2002) and Wet (2002-2003) Season Surveys Caltrans SR 84 Curve realignment Project* dated May 2003 that was prepared by URS; (5) a visit to the project site by Chris Nagano of the Service on November 8, 2004; (6) a meeting

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on November 9, 2004, between Cay Goude and Susan Moore of the Service, and Gary Winters, Susan Chang, and Jeff Jensen of the California Department of Transportation; (7) a telephone conference between Chris Nagano, and John Webb, Shanna Zahner, Jeanie Baker, and Chris Collision on November 18, 2004; (8) a letter from the California Department of Transportation to the Service dated November 18, 2004; a meeting between Chris Nagano, Cay Goude, Susan Moore, Catrina Martin, and Jim Browning of the Service and Jeff Jensen, Chuck Morton, and other staff of the California Department of Transportation; (9) a e-mail dated December 15, 2004, from Chris Collision of the California Department of Transportation to the Service; (10) a letter from the California Department of Transportation to the Service dated February 15, 2005; (11) e-mail and telephone conversations between the California Department of Transportation and the Service; and (12) other information available to the Service.

CONSULTATION HISTORY

- August 29, 2002: The Service received the *Early Evaluation for the San Joaquin Kit Fox for the Pigeon Pass Curve Correction Project*.
- September 19, 2002: Heather Bell and Adam Zerrenner of the Service met with Shanna Zahner of the California Department of Transportation to discuss the San Joaquin kit fox.
- February 18, 2004: A letter requesting initiation of formal consultation dated February 17, 2004, and the Biological Assessment from the Federal Highway Administration were received by the Service.
- August 11, 2004: Ann Bowers of the Service met with Shanna Zahner of the California Department of Transportation to discuss the San Joaquin kit fox, California tiger salamander, and California red-legged frog.
- October 4, 2004: Shanna Zahner advised the Service that nighttime construction may be necessary to complete the action within three construction seasons.
- November 8, 2004: Chris Nagano of the Service conducted a field visit at the proposed project site.
- November 9, 2004: Susan Moore and Cay Goude of the Service, and Gary Winters, Susan Chang and Jeff Jensen of the California Department of Transportation discussed the proposed project.
- November 18, 2004: Chris Nagano, and John Webb, Shanna Zahner, Jeanie Baker, and Chris Collision of the California Department of Transportation discussed the proposed project on the telephone.
- November 18, 2004: The California Department of Transportation sent a letter dated November 18, 2004, via e-mail to the Service that stated they will provide protection in perpetuity for habitat affected by the proposed project (3:1 for permanent loss; 1:1 for temporary loss; temporary impacts to California red-legged frog would be restored on-site).
- November 18, 2004: The Service sent an e-mail to the California Department of Transportation requesting habitat protection in perpetuity be provided for the loss of California red-legged frog habitat, and an assessment of effects to the habitat of this species in the southern portion of the proposed project.

- November 23, 2004: In response to a request from the Service, the California Department of Transportation sent an e-mail of a photo and plans for the driveway undercrossings of State Route 84.
- November 20, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the culvert undercrossings intended for wildlife at the proposed project.
- November 25, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the lighting that will be used at the proposed project due to the potential effect on the nocturnal activities of the fox, frog, and salamander.
- November 28, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the vernal pools that will be affected by the proposed project.
- December 5, 2004: The California Department of Transportation sent an e-mail containing portions of the information that the Service had requested in order to complete the analysis necessary for the formal consultation.
- December 8, 2004: Chris Nagano, Cay Goude, Susan Moore, Catrina Martin, and Jim Browning of the Service discussed the project with Jeff Jensen, Chuck Morton, and other members of the California Department of Transportation. The California Department of Transportation stated they would compensate for the adverse effects of the project on the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp.
- December 14, 2004: The California Department of Transportation sent an e-mail containing portions of the information that the Service had requested in order to complete the analysis necessary for the formal consultation.
- December 15, 2004: Chris Collision of the California Department of Transportation sent an e-mail to Chris Nagano of the Service stating that the Marysville office of the California Department of Transportation, not their Oakland office, was responsible for all negotiations and decisions on the formal consultation on the Pigeon Pass Project.
- December 20, 2004: The Service sent an e-mail to the California Department of Transportation requesting information on night lighting, vernal pools, and the California red-legged frog at the project site.
- January 7, 2005: Chris Nagano, Wayne White, Susan Moore, and Cay Goude discussed the proposed project with Susan Chang and Jeff Jensen of the California Department of Transportation.
- February 15, 2005: The Service received a letter from Susan Chang of the California Department of Transportation regarding the habitat for the California tiger salamander, California red-legged frog, San Joaquin kit fox, and the vernal pool fairy shrimp that will be protected as compensation for adverse effects resulting from the proposed project.

BIOLOGICAL OPINION

Description of Proposed Action

It is our understanding, the Pigeon Pass Project is intended to correct existing horizontal and vertical alignment deficiencies on State Route 84 south of Livermore in Alameda County, California. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills/Pigeon Pass area, thereby reducing the accident rate for this corridor.

The westbound truck-climbing lane would begin west of the signalized intersection at Ruby Hills Drive/State Route 84 and continue approximately 1600 feet west of the crest in the vertical profile of Pigeon Pass. The eastbound truck-climbing lane begins prior to the 6% uphill grade west of Pigeon Pass and continues over Pigeon Pass to the intersection of Ruby Hills Drive. There will be a 11.8 feet wide paved median, intended to function as a left turn and acceleration lane. The paved width of the new alignment will vary from 43.3 to 78.7 feet, and from Pigeon Pass to the west end it varies from 78.7 to 43.3 feet. The project requires the relocation of a 2 foot diameter natural gas transmission pipeline located approximately 1,792 feet west of Pigeon Pass. The earthwork is balanced, and therefore, a disposal site is not necessary. Approximately 17,655,367 cubic feet will be excavated and reused as fill within the cut and fill units.

Construction of the project is expected to begin in 2005 and be complete by 2007. It will most likely be constructed in three phases. The first phase will include construction of the westerly two-thirds of the frontage road (private landowner access) and temporary detour; the second phase will include constructing the last one-third of the frontage road, removal of temporary detour, and completing the conforms. The third phase will include constructing the last one-third of the frontage road, removal of temporary detour, and completing the conforms. At this time blasting and pile driving activities are not expected. Equipment used to perform the work could include, but is not limited to, scrapers, dozers, graders, and dump trucks. Nighttime construction of an unknown duration and extent will be conducted at the project site.

Avoidance and Protection Measures – Listed Species

According to the Biological Assessment, the February 15, 2005, letter from California to the Service, and other information available to the Service, the California Department of Transportation proposes to avoid, minimize, and compensate for effects to listed species through the following measures:

1. No ground disturbing activities will be conducted between October 31st and March 1st outside the limits of the established road bed. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads.
2. The potential for adverse effects caused by poor water quality will be avoided by implementing temporary and permanent Best Management Practices outlined in section 7-7.01G of the California Department of Transportation's Standard Specifications.

3. The contractor shall be required to submit a Storm Water Pollution Prevention Plan as required by the National Pollutant Discharge Elimination System permit.
4. Additional water quality protection measures required by other permits such as the California Department of Fish and Game's Lake and Streambed Alteration Agreement will be implemented.
5. Twelve drainage culverts and two driveway under crossings will be installed throughout the project area, which can provide a method of crossing under the new highway.
6. A qualified biologist shall be on-site or on-call during all activities that could result in the take of listed species. The qualification of the biologist(s) shall be presented to the Service for review and approval at least 60 calendar days prior to any groundbreaking at the project site. The biologist(s) shall be given the authority to stop any work that may result in the take of listed species. If the biologist(s) exercises this authority, the Service and the California Department of Fish and Game shall be notified by telephone and electronic mail within one (1) working day. The Service contact is the Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone 916/414-6600.
7. Environmentally sensitive areas (ESAs) will be established, and marked in the field with standard orange mesh ESA fencing, around known avoidable vernal pools, amphibian breeding and aestivation areas, and any active, or potentially active, kit fox dens. Under the direction of the California Department of Transportation Resident Engineer, with the aid of the Service approved biologist, the ESA fence will be erected around the ESAs to prevent areas from being disturbed during construction.
8. The limits of the construction area will be flagged, if not already marked by right of way, or other, fencing, and all activity will be confined within the marked area. All access to and from the project area will be clearly marked in the field with appropriate flagging and signs. Prior to commencing construction activities, the contractor will determine construction vehicle parking and all access.
9. Project-related vehicles shall observe a 20-mile per hour speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when California red-legged frogs, California tiger salamanders, and kit foxes are most active.
10. To the extent possible, nighttime construction should be minimized. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads.

11. An employee education program shall be conducted, consisting of a brief presentation by persons knowledgeable in vernal pool, California tiger salamander, red-legged frog, and kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and any other personnel involved in the project. The program should include the following: a description of the species and their habitat needs; a report of the occurrence of these species in the project area; an explanation of the status of these species and their protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the above-mentioned people and anyone else who may enter the project site. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.
12. For compensation for permanent and temporary loss of habitat listed below, where habitat is suitable for both the San Joaquin kit fox and the California tiger salamander, its preservation may be counted toward the preservation of both species.
13. The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander and providing payment for 52 acres into the Service's San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credits at the Ohlone Conservation Bank. The California Department of Transportation will pay \$650,000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

Avoidance and Protection Measures - San Joaquin Kit Fox

1. Preconstruction/pre-activity surveys shall be conducted by a Service approved biological monitor according to the *Standard Recommendation for the Protection of the San Joaquin kit fox Prior to or During Ground Disturbance* (Standard Recommendations) (U.S. Fish and Wildlife Service 1997) no less than 14 days and no more than 30 days prior to the beginning of project implementation. Surveys shall identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, and assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped in accordance with the survey protocol.
2. Written results of preconstruction/pre-activity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities. If a natal/pupping den is discovered within the project area or within (200-feet) of the project boundary, the Service shall be immediately notified. In accordance with the Standard Recommendations, after preconstruction surveys, dens which are determined by California Department of Transportation to be unavoidable

during construction may be destroyed by excavation, with the exception of natal/pupping dens.

3. Following preconstruction den searches and excavations of unavoidable dens but before construction begins, the Resident Engineer, with the assistance of the Service approved biologist, will establish Environmentally Sensitive Areas around those kit fox dens which are determined by the California Department of Transportation to be reasonably avoidable. ESA radii will be: potential den = (50 feet); known den = (100 feet); natal or pupping den = to be determined on a case-by-case basis in coordination with the Service and the California Department of Fish and Game.
4. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than (2 feet) deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals.
5. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of (4-inches) or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes prior to commencing construction activities for the day, or, at the latest, before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. If necessary, and under the direct supervision of the Service approved biological monitor, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped.
6. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.
7. California Department of Transportation employees, contractors, and contractors' employees shall not have firearms on the project site. This shall not apply to authorized security personnel, or local, State, or Federal law enforcement officials.
8. The California Department of Transportation Resident Engineer is the point of contact in the event that any employee or contractor might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The Resident Engineer will be identified in the employee education program. The Resident Engineer's name and phone number will be provided to the Service.

9. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. shall be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game, and revegetation experts.

Avoidance and Protection Measures - California Tiger Salamander

1. To minimize direct mortality to breeding adults and juveniles using the pool that will be filled, construction at the pool will be restricted to a period after the pool has completely dried (normally by mid-July).

Avoidance and Protection Measures - California Red-Legged Frog

1. A survey and relocation program for California red-legged frogs will be implemented no less than 14 days and no more than 30 days prior to the onset of construction. All red-legged frog habitat previously identified in the Biological Assessment will be surveyed for red-legged frogs by a Service approved biologist. If frogs are found they will be relocated to Ruby Hills/Vineyard Estates mitigation site, pending final written approval from the site managers. If final approval can not be obtained for the Ruby Hills/Vineyard Estates mitigation site, the California Department of Transportation will submit a new location for consideration. No relocation activities will begin until the California Department of Transportation has received written approval of the alternate relocation site from the Service. All biologists involved with the surveying/handling of the red-legged frogs will employ sterilization techniques appropriate to avoid the transmission of chytrid fungus to or from the site.
2. All fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 60 feet from any riparian habitat or water body. The California Department of Transportation shall ensure contamination of habitat does not occur during such operations. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
3. Areas of red-legged frog habitat that are avoidable will be fenced with standard orange mesh Environmentally Sensitive Area fencing.
4. The California Department of Transportation will purchase 25 acres of California red-legged frog habitat. The Service has agreed that 25 acres of the 80 credit acres that will be purchased at the Ohlone Conservation Bank also will be credited towards the listed frog.

Avoidance and Protection Measures - Vernal Pool Fairy Shrimp

1. The California Department of Transportation will purchase 2.06 acres or 2.06 acre credits of habitat for the vernal pool fairy shrimp. The California Department of Transportation will ensure the Service approves of the means of compensation that will be used for this listed crustacean prior to construction.

STATUS OF SPECIES/ENVIRONMENTAL BASELINE

San Joaquin Kit Fox

The San Joaquin kit fox was listed as an endangered species on March 11, 1967 (U.S. Fish and Wildlife Service 1967) and it was listed by the State of California as a threatened species on June 27, 1971. The *Recovery Plan for Upland Species of the San Joaquin Valley, California* includes this listed canine (U.S. Fish and Wildlife Service 1998).

In the San Joaquin Valley before 1930, the range of the San Joaquin kit fox extended from southern Kern County north to Tracy in San Joaquin County, on the west side, and near La Grange in Stanislaus County, on the east side (Grinnell *et al.* 1937; U.S. Fish and Wildlife Service 1998). 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 Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by man. 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 (U.S. Fish and Wildlife Service 1998). There are a limited number of observations of San Joaquin kit foxes foraging in trees in urban areas (Murdoch *et al.* 2005). 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).

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; U.S. Fish and Wildlife Service 1998). 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 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 5 miles (Scrivner *et al.* 1987a), dispersal distances of up to 76.3 miles have been documented for the San Joaquin kit fox (Scrivner *et al.* 1993; U.S. Fish and Wildlife Service 1998). 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.

San Joaquin 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 1983). 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 (U.S. Fish and Wildlife Service 1998). 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 1983), with the average slope at den sites ranging from 0 to 22 degrees (California Department of Fish and Game 1980; O'Farrell 1983; 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 1983; Spiegel *et al.* 1996a).

Natal and pupping dens of the San Joaquin kit fox 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 1983). Active natal dens are generally 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 1983). 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 San Joaquin 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.* 2001). 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 320 to 482 acres (Morrell 1972). An average den density of one den per 69 to 92 acres was reported by O'Farrell (1984) in the southern San Joaquin Valley.

Dens are used by San Joaquin 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. 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 (*Ammospermophilus nelsoni*), black-tailed hares (*Lepus californicus*), and chukar (*Alectoris chukar*) (Jensen 1972; Archon 1992). 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 San Joaquin 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 Reserve (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 (White and Ralls 1993, Spiegel 1996; White and Garrott 1997). 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). Ralls *et al.* (2001) found that foxes sometimes share dens with foxes from other groups; many of these cases involved unpaired individuals and appeared to be unsuccessful attempts at pair formation. 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. 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 3.11 per square mile in optimal habitats in good years (U.S. Fish and Wildlife Service 1998). 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 (U.S. Fish and Wildlife Service 1998). Kit fox home ranges vary in size from approximately 1 to 12 square miles (Spiegel *et al.* 1996b; U.S. Fish and Wildlife Service 1998). Knapp (1978) estimated that a home range in agricultural areas is approximately 1 square mile. Individual home ranges overlap considerably, at least outside the core activity areas (Morrell 1972; Spiegel *et al.* 1996b).

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 sections.

Loss of Habitat

Less than 20 percent of the habitat within the historical range of the kit fox remained when the animal 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 (U.S. Fish and Wildlife 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 (U.S. Fish and Wildlife Service 1995a). 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; U.S. Fish and Wildlife Service 1980). Data from the California Department of Fish and Game (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, Service file 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. 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 (U.S. Fish and Wildlife Service 1998).

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 (U.S. Fish and Wildlife 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 (Paul Kelly, Endangered Species Recovery Program, Fresno, California, personal communication to P. White, U.S. Fish and Wildlife Service, Sacramento, California 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 rabbits (*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, and golden eagles (*Aquila chrysaetos*) will kill kit foxes. Badgers, coyotes, and red foxes also may compete for den sites (U.S. Fish and Wildlife Service 1998). 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 non-native red foxes into areas inhabited by the San Joaquin kit fox. Historically, the geographic range of the red fox did not overlap with that of the 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 (Paul Kelly, pers. comm. to P.J. White, 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 the closely-related swift fox (*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 (U.S. Fish and Wildlife 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 (U.S. Fish and Wildlife 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 kit 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 (U.S. Fish and Wildlife Service 1998). This lack of information is problematic because Williams (in litt., 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 litt., 1989) documented another case of pesticide use near Raisin City in 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, Service file 1-1-00-F-0056, February 29, 2000).

A September 22, 1993, biological opinion issued by the U.S. Fish and Wildlife 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 (U.S. Fish and Wildlife 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)(U.S. Fish and Wildlife 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 habitat occupied by the San Joaquin kit fox 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" 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 parties. Incidental take is defined as take that is "...incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." If no permit is obtained for the incidental take of listed species, the individuals or entities responsible for these actions could be liable under 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.

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 (U.S. Fish and Wildlife Service 1998). 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. J. White, 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 (U.S. Fish and Wildlife Service 1998). 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, Montana, pers. comm. to P.J. White, March 23, 2000). 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 already may 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, pers. Comm. to P. J. White, March 23, 2000). 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 for Upland Species of the San Joaquin Valley, California* (U.S. Fish and Wildlife 1998) 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 including the Millerton Lake area of Fresno County, around the bottom of the Valley, and cross-valley corridors in Kern, Fresno, and Merced counties.

From 1991 to 2000, the Service authorized incidental take for thirteen projects in Alameda, Contra Costa, San Joaquin, and Stanislaus Counties that have resulted in the loss or degradation of approximately 2,644 acres of San Joaquin kit fox habitat (U.S. Fish and Wildlife Service 2001). Compensation measures for these projects protected or will protect 3,016 acres of kit fox habitat within this area. However, much of these conservation measures are in the form of conservation easements, and for the most part, the lands are not actively managed for kit fox.

The Service also recently issued an incidental permit for projects occurring in San Joaquin County as identified in the San Joaquin Multi-species Open Space and Conservation Plan. Since the issuance of this section 10(a)(1)(B) permit in July of 2001, three projects within the kit fox corridor have been or are in the process of being permitted. These projects will impact approximately 204 acres of kit fox habitat. The San Joaquin County Council of Governments will purchase lands at a ratio of 3:1 for natural lands and 1:1 for disturbed lands to mitigate for these impacts. In 2002, the McDonald Kit Fox Preserve was acquired in southwest San Joaquin County, to compensate for impacts of current and future actions that will affect the kit fox (San Joaquin County 2003).

Although there have been sightings of kit fox in the northern range through the years by qualified biologists, population studies in this area have been limited. In 1982 and 1983, a family of kit foxes was radio collared and monitored near Bethany Reservoir (Hall 1983). From 1985 to 1989, kit fox surveys in the Kellogg Creek watershed found a total of 114 potential and possibly active dens, most of which were associated with ground squirrel colonies (Jones & Stokes Associates 1989).

The small size of the population and its isolation from other established populations make this northern most population vulnerable to extinction owing to predation and competition from coyotes and red foxes, inbreeding, catastrophic events, and disease epidemics (White *et al.* 2000). Genetic studies conducted by Schwartz *et al.* (2000) found that individuals in the Los Banos population near San Luis Reservoir only breed with animals in the northern population in Alameda and Contra Costa counties. Thus, projects in Alameda and Contra Costa County that significantly reduce travel corridors and population size could potentially impact the Los Banos kit fox population. The long term viability of both populations depends, at least in part, on periodic immigration and gene flow from between the populations.

Habitat in the northern range is highly fragmented by highways, canals, and development. Interstate 580 runs southeast to northwest as it splits from Interstate 5, and turns west through the Altamont Pass area; thus it impedes both north-south and west-east movement of San Joaquin kit foxes. Although the canal system facilitates north-south migration along its length, it also impedes lateral east-west kit fox travel. Recent development proposals, including those described above, will further impede the movement of kit fox and isolate the northern population from more southern populations. These and other developments are slowly diminishing the last remaining kit fox habitat, and development pressures are expected to increase in the future (see *Cumulative Effects* section of this biological opinion). The protection of the remaining travel corridor, including grasslands west of Interstate 580, and lands between the California aqueduct and the Delta Mendota Canal, is vital to the survival of this population.

Suitable kit fox habitat in the form of grasslands is abundant in the action area, and contiguous within a 10-mile radius of the project (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted

at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest kit fox sighting to the proposed project is approximately 5 miles from the project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the project, as well as the nearby observations of this listed species.

California Tiger Salamander

The final rule listing the California tiger salamander as a threatened species was published on August 4, 2004 (U.S. Fish and Wildlife 2004).

The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998; Stebbins 2003). California tiger salamanders exhibit sexual dimorphism; males tend to be larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. As adults, California tiger salamanders tend to have the creamy yellow to white spotting on the sides with much less on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the top of the animals.

Historically, the California tiger salamander inhabited low elevation grassland and oak savanna plant communities of the Central Valley, and adjacent foothills, and the inner coast ranges in California (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species occurs from near sea level up to approximately 3900 feet in the coast ranges and up to about 1600 feet in the Sierra Nevada foothills (Shaffer *et al.* 2004). Along the coast ranges, the species occurred from the Santa Rosa area of Sonoma County south to the vicinity of Buellton in Santa Barbara County. In the Central Valley and surrounding foothills, the species occurred from northern Yolo County southward to northwestern Kern County and northern Tulare County.

The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae salamanders develop in the vernal pools and ponds in which they were born, they are otherwise terrestrial salamanders that spend most of their postmetamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Subadult and adult California tiger salamanders spend the dry summer and fall months of the year in the burrows of small mammals, such as California ground squirrels and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loreda and Van Vuren 1996; Petranka 1998; Trenham 1998a). Camel crickets and other invertebrates within these burrows likely are prey for California tiger salamanders, as well as protection from the sun and wind associated with the dry California climate that can cause desiccation (drying out) of amphibian skin. Although California tiger salamanders are members of a family known as "burrowing salamanders," California tiger

salamanders are not known to create their own burrows in the wild, perhaps due to the hardness of soils in the California ecosystems in which they are found. Because they live underground in the burrows of mammals, they are rarely encountered by humans even where they are abundant. The burrows may be active or inactive, but because they collapse within approximately 18 months if not maintained, an active population of burrowing mammals is necessary to sustain

sufficient underground refugia for the species (Loredo *et al.* 1996). California tiger salamanders also may utilize leaf litter or desiccation cracks in the soil.

The upland burrows inhabited by California tiger salamanders have often been referred to as "estivation" sites, which implies a state of inactivity, however, recent studies show that the animals move, feed, and remain active in their burrows (Trenham 2001; Van Hattem 2004). Researchers have long inferred that they are feeding while underground because the animals arrive at breeding ponds in good condition and are heavier when entering a pond than when leaving. Thus, upland habitat is a more accurate description of the terrestrial areas used by California tiger salamanders.

Once fall or winter rains begin, the salamanders emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993). Adult salamanders mate in the breeding ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Historically, the California tiger salamander utilized vernal pools, but the animals also currently breed in livestock stockpools. Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). In ponds with no or limited vegetation, they may be attached to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). After breeding, adults leave the pool and return to the small mammal burrows (Loredo *et al.* 1996; Trenham 1998a), although they may continue to come out nightly for approximately the next two weeks to feed (Shaffer *et al.* 1993). In drought years, the seasonal pools may not fill and the adults can not breed (Barry and Shaffer 1994).

Salamander eggs hatch in ten to 14 days with newly hatched larvae salamanders ranging from 0.45 to 0.56 inch in total length (Petranka 1998). The larvae are aquatic. They are yellowish gray in color and have broad flat heads, possess large, feathery external gills, and broad dorsal fins that extend well onto their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume smaller tadpoles of Pacific treefrogs (*Pseudacris regilla*) and California red-legged frogs (*Rana aurora*) (J. Anderson 1968; P. Anderson 1968). The larvae are among the top aquatic predators in the seasonal pool ecosystems. They often rest on the bottom in shallow water, but also may be found at different layers in the water column in deeper water. The young salamanders are wary and when approached by potential predators, will dart into vegetation on the bottom of the pool (Storer 1925).

The larval stage of the California tiger salamander usually last three to six months, as most seasonal ponds and pools dry up during the summer (Petranka 1998). Amphibian larvae must

grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left the breeding pools 60 to 94 days after the eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. The longer the ponding duration, the larger the larvae and metamorphosed juveniles are able to grow, and the more likely they are to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). The larvae will perish if a site dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1988) found a strong positive correlation with ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 pools sampled supported larval California tiger salamanders, and 5 of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only six (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998). In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave them and enter upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Unlike during their winter migration, the wet conditions that California tiger salamanders prefer do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find temporary upland sites for the dry summer months, waiting until the next winter's rains to move further into suitable upland refugia. Once juvenile California tiger salamanders leave their birth ponds for upland refugia, they typically do not return to ponds to breed for an average of 4 to 5 years. However, they remain active in the uplands, coming to the surface during rainfall events to disperse or forage (Trenham and Shaffer, unpublished manuscript).

Lifetime reproductive success for California and other tiger salamanders is low. Trenham *et al.* (2000) found the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in roughly 11 metamorphic offspring over the lifetime of a female. Two reasons for the low reproductive success are the preliminary data suggest that most individuals of the California tiger salamanders require two years to become sexually mature, but some individuals may be slower to mature (Shaffer *et al.* 1993); and some animals do not breed until they are four to six years old. While individuals may survive for more than ten years, many breed only once, and in some populations, less than 5 percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as from human caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

Dispersal and migration movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where

they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). Following breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before breeding again (Trenham *et al.* 2000).

California tiger salamanders are known to travel large distances from breeding ponds into upland habitats. Maximum distances moved are generally difficult to establish for any species, but California tiger salamanders in Santa Barbara County have been recorded to disperse 1.3 miles from breeding ponds (Sweet 1998). California tiger salamanders are known to travel between breeding ponds; one study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during migration to or dispersal from ponds, California tiger salamanders may reside in burrows that are far from ponds. At one site in Contra Costa County, hundreds of California tiger salamanders have been captured three years in a row in upland habitat approximately 0.75 mile from the nearest breeding pond (Orloff 2003).

Although the observations above show that California tiger salamanders can travel far, typically they stay closer to breeding ponds. Evidence suggests that juvenile California tiger salamanders disperse further into upland habitats than adult California tiger salamanders. A trapping study conducted in Solano County during winter of 2002/2003 found that juveniles used upland habitats further from breeding ponds than adults (Trenham and Shaffer in press). More juvenile salamanders were captured at distances of 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Large numbers, approximately 20 percent of total captures, were found 1,312 feet from a breeding pond. Fitting a distribution curve to the data revealed that 95 percent of juvenile salamanders could be found within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-04 trapping efforts detected juvenile California tiger salamanders at even further distances, with a large proportion of the total salamanders caught at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2100 feet, were still moving away from ponds (Ben Fitzpatrick, University of California at Davis, pers. comm. 2004). In Santa Barbara County, juvenile California tiger salamanders have been trapped approximately 1,200 feet away while dispersing from their natal pond (Science Applications International Corporation, unpublished data). These data show that many California tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration, radio-equipped adult California tiger salamanders were tracked to burrows 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders having depleted physical reserves post-breeding, or also due to the drier weather conditions that can occur during the period when adults leave the ponds.

In addition, rather than staying in a single burrow, most individuals used several successive burrows at increasing distances from the pond. Although the studies discussed above provide an approximation of the distances that California tiger salamanders regularly move from their breeding ponds, upland habitat features will drive the details of movements in a particular

landscape. Trenham (2001) found that radio-tracked adults favored grasslands with scattered large oaks, over more densely wooded areas. A drift-fence survey at a Santa Barbara County pond that is bordered by a strawberry field found that many emigrating juveniles moved towards the strawberry field; however, no adults were captured entering the pond from this direction. Most of the California tiger salamanders entered the pond from extensive, overgrazed grassy flats rather than sandhill or eucalyptus habitats in other quadrants (Steve Sykes, University of California at Santa Barbara, unpublished data 2003). Based on radio-tracked adults, there is no indication that certain habitat types are favored as corridors for terrestrial movements (Trenham 2001). In addition, at two ponds completely encircled by drift fences and pitfall traps, captures of arriving adults and dispersing new metamorphs were distributed roughly evenly around the ponds. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Several species prey have either been documented or likely prey upon the California tiger salamander including coyotes (*Canis latrans*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), egrets (*Egretta* species), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), bullfrogs (*Rana catesbeiana*), mosquito fish (*Gambusia affinis*), and crayfish (*Procambarus* species). Domestic dogs (*Canis familiaris*) have been observed eating California tiger salamanders at Lake Lagunitas at Stanford University (Sean Barry, ENTRIX, pers. comm. to C. Nagano July 2004).

The California tiger salamander is imperiled throughout its range by a variety of human activities (U.S. Fish and Wildlife Service 2004). Current factors associated with declining populations of the salamander include continued degradation and loss of habitat due to agriculture and urbanization, hybridization with non-native eastern tiger salamanders (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003), and introduced predators. Fragmentation of existing habitat and the continued colonization of existing habitat by non-native tiger salamanders (*Ambystoma tigrinum* and other species) may represent the most significant current threats to California tiger salamanders, although populations are likely threatened by more than one factor. Isolation and fragmentation of habitats within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). Other threats are predation and competition from introduced exotic species; possible commercial overutilization; disease; various chemical contaminants; road-crossing mortality; and certain unrestrictive mosquito and rodent control operations. The various primary and secondary threats are not currently being offset by existing Federal, State, or local regulatory mechanisms. The California tiger salamander also is vulnerable to chance environmental or demographic events, to which small populations are particularly vulnerable.

Thirty-one percent (221 of 711 records and occurrences) of all Central California tiger salamander records and occurrences are in Alameda, Santa Clara, San Benito (excluding the extreme western end of the County), southwestern San Joaquin, western Stanislaus, western Merced, and southeastern San Mateo counties, most of them are in eastern Alameda and Santa Clara counties (Buckingham in litt. 2003; California Department of Fish and Game 2003; U.S.

Fish and Wildlife Service 2004). Thirteen of these records in the Bay Area region are considered extirpated or likely to be extirpated by the California Department of Fish and Game (2003).

The East Bay and Livermore Valley areas have undergone intensive urban development in recent years (California Department of Conservation 1996, 1998, 2000, 2002). The total human population of the counties in the Bay Area Region increased by approximately 17 percent between 1990 and 2000 (4.5 million people to 5.3 million people) (California Department of Forestry 1998). Most of the California tiger salamander natural historic habitat (vernal pool grasslands) available in this region has been lost due to urbanization and conversion to intensive agriculture (Keeler-Wolf *et al.* 1998). California tiger salamanders are now primarily restricted to artificial breeding ponds, such as bermed ponds or stock ponds which are typically located at higher elevations (California Department of Fish and Game 2003).

Of 140 California tiger salamander localities where wetland type was identified, only 7 percent were located in vernal pools (California Department of Fish and Game 2003). The Bay Area region occurs within the Central Coast and Livermore vernal pool regions (Keeler-Wolf *et al.* 1998). Vernal pools within the Coast Range are more sporadically distributed than vernal pools in the Central Valley (Holland 2003). In San Benito and Santa Clara counties, Central Coast vernal pools have been destroyed and degraded due to agriculture. The vernal pools at Stanford in Santa Clara County have been destroyed and degraded due to recreation and development (Keeler-Wolf *et al.* 1998). The annual loss of vernal pools from 1994 to 2000 in Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura counties was 2 to 3 percent; this rate of loss suggests that vernal pools in these counties are disappearing faster than previously reported (Holland 2003). Most of the vernal pools in the Livermore Region in Alameda County have been destroyed or degraded by urban development, agriculture, water diversions, and poor water quality, and long-term overgrazing (Keeler-Wolf *et al.* 1998). During the 1980s and 1990s, vernal pools were lost at a 1.1 percent annual rate in Alameda County (Holland 1998).

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many California tiger salamander breeding sites consist of artificial water bodies. Overall, 89 percent (124) of the records for which the water body was identified are in stock, farm, or berm ponds used by cattle grazing and as a temporary source of water for small farm irrigation (California Department of Fish and Game 2003), possibly placing California tiger salamanders at great risk of hybridization with non-native tiger salamanders especially in Santa Clara and San Benito counties. Without long-term maintenance the longevity of these artificial breeding habitats is also much shorter than their natural breeding habitat, which are vernal pools (Shaffer *in litt.* 2003).

Shaffer *et al.* (1993) found that the East Bay counties of Alameda and Contra Costa supported the greatest concentrations of California tiger salamander. California tiger salamander populations in the Livermore Valley are severely threatened by the ongoing conversion of grazing land to subdivisions and vineyards (Stebbins 1989; East Bay Regional Park District 1999). One project within Alameda County in the Bay Area region that may affect California tiger salamander totals 700 acres (East Bay Regional Parks District 2003). Projects that are likely to threaten California tiger salamanders in the Bay Area region include one in Alameda

County totaling 310 acres, two in San Joaquin County totaling 12,427 acres and one in Santa Clara County totaling 19 acres.

Larvae California tiger salamander were observed in the large pool designated as Site 1 in the fairy shrimp survey (URS 2003), and there are numerous recent sightings in this area recorded in the California Natural Diversity Data Base (California Department of Fish and Game 2004). Suitable salamander breeding habitat also exists in a 60-acre mitigation site for the California red-legged frog and the California tiger salamander at the east end of the project area and north of State Route 84. The site was established to mitigate for impacts resulting from the Ruby Hills and Vineyard Estates subdivision. Juvenile salamanders were observed during fairy shrimp surveys in seasonal pools within the action area. Suitable California tiger salamander habitat in the form of grasslands is abundant in the action area (Nagano pers. obs. November 2004; California Department of Transportation 2002). There is an abundance of ground squirrels, whose burrows provide underground upland habitat for the amphibian (Nagano pers. obs. November 2004; California Department of Transportation 2004). Therefore, the Service has determined it is reasonable to conclude the California tiger salamander inhabits the action area, based on the biology and ecology of the species, the presence of suitable habitat, as well as the recent observations of this animal.

California Tiger Salamander Proposed Critical Habitat

Critical habitat for the California tiger salamander was proposed on August 10, 2004 (U.S. Fish and Wildlife Service 2004). The Service divided the current range of the Central population into four regions: (1) Central Valley; (2) Southern San Joaquin Valley; (3) East Bay; and (4) Central Coast. The project area is located in the East Bay region.

The Service determined that conserving the California tiger salamander over the long-term requires a five-pronged approach: (1) Maintaining the current genetic structure across the species range; (2) maintaining the current geographical, elevational, and ecological distribution; (3) protecting the hydrology and water quality of breeding pools and ponds; (4) retaining or providing for connectivity between locations for genetic exchange and recolonization; (5) protecting sufficient barrier-free upland habitat around each breeding location to allow for sufficient survival and recruitment to maintain a breeding population over the long-term (U.S. Fish and Wildlife Service 2004).

The Service believes that areas proposed for critical habitat may require certain management considerations or protections due to the following threats: (1) Activities that introduce or promote the occurrence of bullfrogs and fish; (2) Activities that could disturb aquatic habitats during the breeding season; (3) Activities that impair the water quality of aquatic breeding habitats; (4) Activities that would reduce small mammal populations to the point that there is insufficient underground Central population refugia used for foraging, protection from predators, and shelter from the elements; (5) Activities that create barriers impassible for salamanders or road crossings that increase mortality in upland habitat between extant occurrences in breeding habitat; (6) Activities on adjacent uplands that disrupt vernal pool complexes' ability to support California tiger salamander breeding function; (7) Activities that introduce non-native tiger

salamanders in areas where the California tiger salamander is threatened with hybridization (U.S. Fish and Wildlife Service 2004).

In determining which areas to designate as critical habitat, the Service considers those physical and biological features (primary constituent elements) that are essential to the conservation of the species, and that may require special management considerations and protection (50 CFR § 424.14). The Service lists the known primary constituent elements together with the proposed critical habitat description. Such physical and biological features include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements for the California tiger salamander are aquatic and upland areas, including vernal pool complexes, where suitable breeding and non-breeding habitats are interspersed throughout the landscape, and are interconnected by continuous dispersal habitat. All areas proposed as critical habitat for the central population contain one or more of the primary constituent elements (U.S. Fish and Wildlife Service 2004).

Breeding Habitat. Standing bodies of fresh water, including natural and man-made (e.g. stock) ponds, vernal pools, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a sufficient length of time necessary for the species to complete its life cycle (U.S. Fish and Wildlife Service 2004).

Breeding California tiger salamander are found in vernal pools, vernal pool complexes, and seasonal ponds in associated annual grasslands, oak savannah, and coastal bay scrub plant communities of the Bay Area (Santa Clara Valley), Central Coast, Central Valley, and Southern San Joaquin Valley. The California tiger salamander also have adapted to using artificial water bodies, such as stock ponds during their aquatic phase. However, stockponds are often not optimum breeding habitat because the hydroperiod is so short there is not sufficient time for larvae to metamorphose, or it is so long that predatory fish and bullfrogs can colonize the pond. Permanent wetlands can support breeding California tiger salamander if fish are not present, but extirpation of the salamander is likely to occur if fish are introduced. Periodic maintenance to remove silt from stockponds and other artificial waterbodies may also cause a temporary loss of functioning aquatic habitat. Regardless of vernal pool, pond, or seasonal wetland type, successful breeding ponds for California tiger salamander need to be inundated for a minimum of 21 weeks to allow for successful metamorphosis (U. S. Fish and Wildlife Service 2004).

Non-Breeding Habitat. California tiger salamanders spend the majority of their lives in barrier-free upland habitats adjacent to breeding ponds. Within these upland habitats, adult California tiger salamander spend part of their lives in the underground burrows of mammals, especially the burrows of the California ground squirrel and valley pocket gopher, with depths ranging from 20 centimeters to 1 meter beneath the ground surface. Small mammals are essential in creating the underground habitat that adult California tiger salamander depend on for food, shelter, and

protection from the elements and from predation. Although California tiger salamanders are members of a family of burrowing tiger salamanders, California tiger salamanders are not known to create their own burrows in the wild and require small mammal burrows for survival. The upland component of the Central population habitat typically consists of vernal pool grassland or grassland savannah with scattered oak trees. However, some occupied California tiger salamander breeding ponds exist within mixed grassland and woodland habitats, in woodlands, scrub, or chaparral habitats (U.S. Fish and Wildlife Service 2004).

Dispersal and Migration. Movements made by California tiger salamanders can be grouped into two main categories: (1) Breeding migration, and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years (on average, four years). Upon reaching sexual maturity, most individuals return to their natal (birth) pond to breed, while 20 percent disperse to other ponds (U. S. Fish and Wildlife Service 2004).

Essential dispersal habitats generally consist of upland areas adjacent to essential aquatic habitats which are not isolated from other essential aquatic habitats by barriers that California tiger salamanders cannot cross. Essential dispersal habitats provide connectivity among California tiger salamander suitable aquatic and upland habitats. While California tiger salamanders can bypass many obstacles, and do not require a particular type of habitat for dispersal, the habitats connecting essential aquatic and upland habitats need to be free of barriers (e.g. a physical or biological feature that prevents salamanders from dispersing beyond the feature) to function effectively (U. S. Fish and Wildlife Service 2004).

The Service proposed critical habitat that allowed for dispersal between extant occurrences within 0.7 mile of each other. This distance was selected because it provides for 99 percent of the chances that individual salamanders can move and breed between extant occurrences, and, thereby, provides for genetic exchange between individuals within the region (U.S. Fish and Wildlife Service 2004).

The proposed Pigeon Pass Project is located in Unit 3 of critical habitat proposed by the Service (U.S. Fish and Wildlife Service 2004b). The project area is relatively undeveloped, with the highway corridor, the Ruby Hills and Vineyard Estates developments, and several ranches in the project vicinity. The surrounding habitat includes several vegetation communities, including valley oak woodland, annual non-native grassland, seasonally wetted areas with associated vegetation, and ponds. A 60-acre California red-legged frog/California tiger salamander mitigation site for the Ruby Hills/Vineyard Estates consists of a series of artificial ponds connected by drainages, and the surrounding upland habitat. As described in the Biological Assessment, essentially all undeveloped lands on and adjacent to the action area contain the constituent elements of proposed California tiger salamander critical habitat, including aquatic habitat, associated uplands, and dispersal habitat.

California Red-Legged Frog

The California red-legged frog was listed as a threatened species on May 23, 1996, (U.S. Fish and Wildlife Service 1996). Please refer to the final rule and the *Recovery Plan for the California Red-Legged Frog (Rana aurora draytonii)* (U.S. Fish and Wildlife Service 2002) for additional information on this species.

This species is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 1985). The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 1985), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). California red-legged frogs breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). Individuals occurring in coastal drainages are active year-round (Jennings et al. 1992), whereas those found in interior sites are normally less active during the cold season.

The historic range of the red-legged frog extended coastally from the vicinity of Point Reyes National Seashore, Marin County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985; Hayes and Krempels 1986). The California Red-legged frog was historically documented with 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (U.S. Fish and Wildlife Service 2002). Red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (California Department of Fish and Game 2002).

California red-legged frogs have been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, California red-legged frogs have been documented in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

Adult California red-legged frogs prefer dense, shrubby or emergent riparian vegetation closely associated with deep (>2.3 feet), still, or slow-moving water (Hayes and Jennings 1988).

However, frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of California red-legged frogs currently are associated with deep pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). California red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat. Sheltering habitat for California red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay ricks may also be used. Incised stream channels with portions narrower than 46 centimeters (18 inches) and depths greater than 46 cm (18 in) may also provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival. During winter rain events, juvenile and adult California red-legged frogs are known to disperse up to 0.54-1.08 miles (Rathbun and Holland, unpublished data, cited in Rathbun *et al.* 1997). Dispersing frogs in northern Santa Cruz County traveled distances from 0.25 mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger, unpublished data).

Egg masses contain about 2,000 to 5,000 moderate sized (0.08 to 0.11 inches in diameter), dark reddish brown eggs and are typically attached to vertical emergent vegetation, such as bulrushes (*Scirpus* spp.) or cattails (Jennings *et al.* 1992). California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992); eggs exposed to salinity levels greater than 4.5 parts per thousand result in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1990). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925; Jennings and Hayes 1985). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations of California red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful (e.g., drought).

The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. Vertebrates, such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). Tadpoles likely eat algae (Jennings *et al.* 1992).

Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (*Rana catesbeiana*) (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculus*), and several species of warm water fish including sunfish (*Lepomis* spp.), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range.

Several researchers in central California have noted the decline and eventual disappearance of California red-legged frog populations once bullfrogs became established at the same site (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs (*Rana aurora aurora*), and suggested that bullfrogs could prey on subadult northern red-legged frogs as well. In addition to predation, bullfrogs may have a competitive advantage over California red-legged frogs; bullfrogs are larger, possess more generalized food habits (Bury and Whelan 1984), have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977), and larvae are unpalatable to predatory fish (Kruse and Francis 1977). In addition to competition, bullfrogs also interfere with California red-legged frog reproduction. Both California and northern red-legged frogs have been observed in amplexus with (mounted on) both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; M. Jennings, in litt. 1993; R. Stebbins in litt. 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat. The urbanization of land within and adjacent to California red-legged frog habitat has also impacted California red-legged frogs. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks California red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs. This report further identifies the conversion and isolation of perennial pool habitats resulting from urbanization as an ongoing impact to California red-legged frogs.

The recovery plan for the California red-legged frog identifies eight recovery units. Each recovery unit reflects areas with similar conservation needs. The strategy for recovery of California red-legged frogs includes promoting and protecting populations that are geographically distributed in a manner that allows for the continued existence of viable metapopulations. The California red-legged frog has been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, California red-legged frogs have been documented in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

This project is located within the East San Francisco Bay Recovery Unit, which extends from the northernmost portion of Contra Costa County, includes a portion of San Joaquin County south to

Santa Clara County, includes the eastern portion of San Mateo County, and all of San Francisco County (U. S. Fish and Wildlife Service 2002). Contra Costa and Alameda counties contain the majority of known California red-legged frog localities within the eastern San Francisco Bay area. Within this recovery unit, the listed amphibian seem to have been nearly eliminated from the western lowland areas near urbanization, they still occur in isolated populations in the East Bay Foothills (between Interstate 580 and Interstate 680), and are abundant in several areas in the eastern portions of Alameda and Contra Costa counties. This recovery unit is essential to the survival and recovery of California red-legged frogs, as it contains the largest number of occupied drainages in the northern portion of its range. The eastern and western edges of this area are heavily urbanized and the northern and southern edges are bounded by major highways. However, there are numerous small drainages flowing underneath both Interstate 580 and Highway 84 that California red-legged frogs could disperse through. Therefore, this area is connected to other populations of red-legged frogs in the foothills of central Alameda and Contra Costa Counties and the populations found in eastern Alameda County. Within this area, the species historically bred in several ponds and drainages within the proposed project area, Garin/Dry Creek Regional Park, Pleasanton Ridge Regional Park, and Sinbad Creek.

There are several recent sightings of the California red-legged frog in the action area and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds. Areas containing aquatic and upland habitat exist within and adjacent to the action area (Nagano pers. obs. November 2004). The action area contains components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

California Red-Legged Frog Proposed Critical Habitat

On March 13, 2001, the final rule determining critical habitat for red-legged frogs was published in the Federal Register (U.S. Fish and Wildlife Service 2001). This rule established 31 critical habitat units based on three primary constituent elements: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat. In November 2002, the U.S. District Court for the District of Columbia vacated most of the 2001 designation and ordered the Service to publish a new critical habitat proposal. On April 13, 2004, the Service re-proposed 4.1 million acres in 28 California counties as critical habitat for the frog (U.S. Fish and Wildlife Service 2004). This proposed rule basically re-proposes the same areas designated critical habitat in the 2001 final rule.

The Service is required to list the known primary constituent elements together with the critical habitat description. Such physical and biological features include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species (U. S. Fish and Wildlife Service 2004).

Due to the complex life history and dispersal capabilities of the California red-legged frog, and the dynamic nature of the environments in which they are found, the primary constituent elements described below are found throughout the watersheds that are proposed as critical habitat. Special management, such as habitat rehabilitation efforts (e.g., removal of nonnative predators), may be necessary in the area designated. The proposed critical habitat for the California red-legged frog provides for breeding and non-breeding habitats and for dispersal between these habitats, as well as allowing for expansion of frog populations vital to the recovery of the subspecies. The proposed critical habitat includes: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat.

Aquatic habitat is essential for providing space, food, and cover, necessary to sustain all life stages of red-legged frogs. It consists of virtually all low-gradient fresh water bodies, including natural and man-made (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds, except deep lacustrine water habitat (e.g., deep lakes and reservoirs 50 acres or larger in size) inhabited by nonnative predators. The subspecies requires a permanent water source to ensure that aquatic habitat is available year-round. Permanent water sources can include, but are not limited to, ponds, perennial creeks, permanent plunge pools within intermittent creeks, seeps, and springs. Aquatic habitat used for breeding usually has a minimum deep water depth of 20 inches, and maintains water during the entire tadpole rearing season (at least March through July). During periods of drought, or less-than-average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but because they support breeding in wetter years these sites would still be considered essential breeding habitat. Ponds that support a small population of red-legged frogs, but are not surrounded by suitable upland habitat, or are cut off from other breeding ponds or permanent water sources by impassable dispersal barriers, do not have the primary constituent elements for proposed California red-legged frog critical habitat.

To be a primary constituent element for California red-legged frog proposed critical habitat, the aquatic components within the designated boundaries must include two or more breeding sites (as defined above) located within 1.25 miles of each other; at least one of the breeding sites must also be a permanent water source; or, the aquatic component can consist of two or more seasonal breeding sites with a permanent non-breeding water source located within 1.25 miles of each breeding site. California red-legged frogs have been documented to travel 2.25 miles in a virtual straight line migration from non-breeding to breeding habitats (U.S. Fish and Wildlife Service 2001a). In addition, breeding sites must be connected by dispersal habitat connecting essential aquatic habitat, described below.

Associated upland and riparian habitat is essential to maintain California red-legged frog populations associated with essential aquatic habitat. The associated uplands and riparian habitat provide food and shelter sites for California red-legged frogs, and assist in maintaining the integrity of aquatic sites by protecting them from disturbance and supporting the normal functions of the aquatic habitat. Key conditions include the timing, duration, and extent of water moving within the system, filtering capacity, and maintaining the habitat to favor red-legged frogs and discourage the colonization of nonnative species such as bullfrogs. Essential upland habitat consists of all upland areas within 300 feet, or no further than the watershed boundary, of the edge of the ordinary high-water mark of essential aquatic habitat (U.S. Fish and Wildlife Service 2001a).

Essential dispersal habitat provides connectivity among California red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to California red-legged frog dispersal.

Dispersal habitat connecting essential aquatic habitat. Essential dispersal habitat provides connectivity among red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to red-legged frog dispersal.

The Pigeon Pass Project occurs within the East Bay-Diablo Range unit (Unit 15), which consists of watersheds within Contra Costa, Alameda, San Joaquin, Santa Clara, Stanislaus, San Benito, Merced, and Fresno counties. The boundary of Unit 15 encompasses approximately 1.05 million acres, of which approximately 87 percent is privately owned. The remaining 13 percent is managed, in part, by various Federal, State, and local land and water management agencies. Because essential aquatic habitat, associated uplands, and essential dispersal habitat has not been widely mapped in the unit, the Service can not accurately estimate the area within the unit that supports primary constituent elements. However, due to the presence of high use roads and

developed areas as well as substantial areas without permanent water, we anticipate that the effective area of Unit 15 will be considerably less than 1.05 million acres.

Unit 15 has been affected by activities that destroy essential aquatic and upland habitats, and dispersal habitats providing connectivity between subpopulations. Degradation and loss of these habitats have occurred through urbanization, mining, inappropriate management of grazing, recreation, invasion of nonnative plants, impoundments, water diversions, degraded water quality, and introduced predators.

The action area is relatively undeveloped, and it contains State Route 84, Ruby Hills and Vineyard Estates developments, and several ranches. The surrounding habitat includes several vegetation communities, including valley oak woodland, annual non-native grassland, seasonally wetted areas with associated vegetation, and ponds. A 60-acre California red-legged frog/California tiger salamander mitigation site for the Ruby Hills/Vineyard Estates consists of a series of artificial ponds connected by drainages, and the surrounding upland habitat. As described in the Biological Assessment, essentially all undeveloped lands on and adjacent to the project site contain the constituent elements of proposed California red-legged frog critical habitat, including essential aquatic habitat, associated uplands, and essential dispersal habitat.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp was listed as threatened on September 19, 1994 (U.S. Fish and Wildlife Service 1994). Simovich *et al.* (1992) and Ericksen and Belk (1999) provide further details about the life history and ecology of this species.

The vernal pool fairy shrimp has a delicate elongate body, large stalked compound eyes, no carapace, and 11 pairs of swimming legs. It swims or glides gracefully upside down by means of complex beating movements of the legs that pass in a wave-like anterior to posterior direction. Fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus. The females carry the eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The "resting" or "summer" eggs are capable of withstanding heat, cold, and prolonged desiccation. When the pools fill in the same or subsequent seasons, some, but not all, of the eggs may hatch. The egg bank in the soil may consist of eggs from several years of breeding (Donald 1983). The eggs hatch when the vernal pools fill with rainwater. The early stages of the vernal pool fairy shrimp develop rapidly into adults. These non-dormant populations often disappear early in the season long before the vernal pools dry up.

The vernal pool fairy shrimp inhabits vernal pools with clear to tea-colored water, most commonly in grass or mud-bottomed swales, or basalt flow depression pools in unplowed grasslands. The vernal pool fairy shrimp has been collected from early December to early May. It can mature quickly, allowing populations to persist in short-lived shallow pools (Simovich *et al.* 1992). Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools (Eng *et al.* 1990; Helm 1998; California Department of Fish and Game 2001). The pool types where the

species has been found include Northern Hardpan, Northern Claypan, Northern Volcanic Mud Flow, and Northern Basalt Flow vernal pools formed on a variety of geologic formations and soil types. Although vernal pool fairy shrimp have been collected from large vernal pools, including one exceeding 25 acres in area (Eriksen and Belk 1999), it is most frequently found in pools measuring fewer than 0.05 acre in area (Helm 1998; Gallagher 1996). The species occurs at elevations from 33 feet to 4,003 feet (Eng *et al.* 1990), and is typically found in pools with low to moderate amounts of salinity or total dissolved solids (Keeley 1984; Syrdahl 1993). Vernal pools are mostly rain fed, resulting in low nutrient levels and dramatic daily fluctuations in pH, dissolved oxygen, and carbon dioxide (Keeley and Zedler 1998). Although there are many observations of the environmental conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species.

The hydrology that maintains the pattern of inundation and drying characteristic of vernal pool habitats is complex. Vernal pool habitats form in depressions above an impervious soil layer (duripan) or rock substrate. After winter rains begin, this impervious layer prevents the downward percolation of water and creates a perched water table causing the depression (or pool) to fill. Due to local topography and geology, the depressions are generally part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages (Nikiforoff 1941; Holland and Jain 1978). These features form an interconnected hydrological unit known as a vernal pool complex. Although vernal pool hydrology is driven by the input of precipitation, water input to vernal pool basins also occurs from surface and subsurface flow from the swale and upland portions of the complex (Zedler 1987, Hanes *et al.* 1990, Hanes and Stromberg 1998). Surface flow through the swale portion of the complex allows vernal pool species to move directly from one vernal pool to another. Upland areas are a critical component of vernal pool hydrology because they directly influence the rate of vernal pool filling, the length of the inundation period, and the rate of vernal pool drying (Zedler 1987; Hanes and Stromberg 1998).

The vernal pool fairy shrimp has evolved unique physical adaptations to survive in vernal pools. Vernal pool environments are characterized by a short inundation phase during the winter, a drying phase during the spring, and a dry phase during the summer (Holland and Jain 1978). The timing and duration of these phases can vary significantly from year to year, and in some years vernal pools may not inundate at all. In order to take advantage of the short inundation phase, vernal pool crustaceans have evolved short reproduction times and high reproductive rates. The listed crustaceans generally hatch within a few days after their habitats fill with water, and can start reproducing within a few weeks (Eng *et al.* 1990; Helm 1998; Eriksen and Belk 1999). Vernal pool crustaceans can complete their entire life cycle in a single season, and some species may complete several life cycles. Vernal pool crustaceans can also produce numerous offspring when environmental conditions are favorable. Some species may produce thousands of cysts during their life spans.

To survive the prolonged heat and desiccation of the vernal pool dry phase, vernal pool crustaceans have developed a dormant stage. After vernal pool crustacean eggs are fertilized in the female's brood sac, the embryos develop a thick, usually multi-layered shell. When embryonic development reaches a late stage, further maturation stops, metabolism is drastically

slowed, and the egg, now referred to as a cyst, enters a dormant state called diapause. The cyst is then either dropped to the pool bottom or remains in the brood sac until the female dies and sinks. Once the cyst is desiccated, it can withstand temperatures near boiling (Carlisle 1968), fire (Wells *et al.* 1997), freezing, and anoxic conditions without damage to the embryo. The cyst wall cannot be affected by digestive enzymes, and can be transported in the digestive tracts of animals without harm (Horne 1967). Most fairy shrimp cysts can remain viable in the soil for a decade or longer (Belk 1998).

Although the exact signals that cause crustacean cysts to hatch are unknown, factors such as soil moisture, temperature, light, oxygen, and osmotic pressure may trigger the embryo's emergence from the cyst (Brendonck 1996). Because the cyst contains a well developed embryo, the animal can quickly develop into a fully mature adult. This allows vernal pool crustaceans to reproduce before the vernal pool enters the dry phase, sometimes within only a few weeks (Helm 1998, Eriksen and Belk 1999). In some species, cysts may hatch immediately without going through a dormant stage, if they are deposited while the vernal pool still contains water. These cysts are referred to as quiescent, and allow the vernal pool crustacean to produce multiple generations in a single wet season as long as their habitat remains inundated.

Another important adaptation of vernal pool crustaceans to the unpredictable conditions of vernal pools is the fact that not all of the dormant cysts hatch in every season. Hathaway and Simovich (1996) found that only 6 percent of endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) cysts hatched after initial hydration, and only 0.18 percent of Riverside fairy shrimp cysts hatched. The cysts that don't hatch remain dormant and viable in the soil. These cysts may hatch in a subsequent year, and form a cyst bank much like the seed bank of annual plants. The cyst bank may be comprised of cysts from several years of breeding, and large cyst banks of viable resting eggs in the soil of vernal pools containing fairy shrimp have been well documented (Belk 1998). Based on a review of other studies (e.g. Belk 1977; Gallagher 1996, Brendonck 1996), Hathaway and Simovich (1996) concluded that species inhabiting more unpredictable environments, such as smaller or shorter lived pools, are more likely to have a smaller percent of their cysts hatch after their vernal pool habitats fill with water. This strategy reduces the probability of complete reproductive failure if a vernal pool dries up prematurely. This kind of "bet-hedging strategy" has been suggested as a mechanism by which rare species may persist in unpredictable environments (Chesson and Huntly 1989; Ellner and Hairston 1994).

Upland areas associated with vernal pools are also an important source of nutrients to vernal pool organisms (Wetzel 1975). Vernal pool habitats derive most of their nutrients from detritus which is washed into the pool from adjacent uplands, and these nutrients provide the foundation for vernal pool aquatic communities food chain. Detritus is a primary food source for the vernal pool crustaceans (Eriksen and Belk 1999).

Vernal pool fairy shrimp generally will not hatch until water temperatures drop to below 50°F (Gallagher 1996; Helm 1998). This species is capable of hatching multiple times within a single wet season if conditions are appropriate. Helm (1998) observed 6 separate hatches of vernal pool

fairy shrimp within a single wet season, and Gallagher (1996) observed 3 separate hatches in vernal pools in Butte County.

Helm (1998) observed vernal pool fairy shrimp living for as long as 147 days. The species can reproduce in as few as 18 days at optimal conditions of 68°F and can complete its life cycle in as little as 9 weeks (Gallagher 1996; Helm 1998). However, maturation and reproduction rates of vernal pool crustaceans are controlled by water temperature and can vary greatly (Eriksen and Brown 1980; Helm 1998). Helm (1998) observed that vernal pool fairy shrimp did not reach maturity until 41 days at water temperatures of 59°F. Vernal pool fairy shrimp has been collected at water temperatures as low as 40°F (Eriksen and Belk 1999), however, the species has not been found in water temperatures above about 73°F (Helm 1998; Eriksen and Belk 1999).

The vernal pool fairy shrimp is known from 32 populations extending from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County (Eng et al. 1990; Fugate 1992; Sugnet and Associates 1993) and a disjunct population on the Agate Desert in Oregon. Five additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County; one in the mountain grasslands of northern Santa Barbara County; one on the Santa Rosa Plateau in Riverside County, one near Rancho California in Riverside County and one on the Agate Desert near Medford, Oregon. Three of these isolated populations each contain only a single pool known to be occupied by the vernal pool fairy shrimp. The genetic characteristics of these species, as well as ecological conditions, such as watershed continuity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools (Fugate 1992). Therefore, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes. Individual vernal pools occupied by these species are most appropriately referred to as subpopulations.

The primary historic dispersal method for the vernal pool fairy shrimp likely was large scale flooding resulting from winter and spring rains which allowed the animals to colonize different individual vernal pools and other vernal pool complexes. This dispersal currently is non-functional due to the construction of dams, levees, and other flood control measures, and widespread urbanization within significant portions of the range of this species. Waterfowl and shorebirds likely are now the primary dispersal agents for vernal pool tadpole shrimp and vernal pool fairy shrimp (Brusca in litt.; 1992, King in litt., 1992; Simovich in litt., 1992). The eggs of these crustaceans are either ingested (Krapu 1974; Swanson *et al.* 1974; Driver 1981; Ahl 1991) and/or adhere to the legs and feathers where they are transported to new habitats.

Vernal pool crustaceans are often dispersed from one pool to another through surface swales that connect one vernal pool to another. These dispersal events allow for genetic exchange between pools and create a population of animals that extends beyond the boundaries of a single pool. Instead, populations of vernal pool crustaceans are defined by the entire vernal pool complex in which they occur (Simovich *et al.* 1992, King 1996). These dispersal events also allow vernal pool crustaceans to move into pools with a range of sizes and depths. In dry years, animals may only emerge in the largest and deepest pools. In wet years, animals may be present in all pools,

or in only the smallest pools. The movement of vernal pool crustaceans into vernal pools of different sizes and depths allows these species to survive the environmental variability that is characteristic of their habitats.

Vernal pool crustaceans are an important food source for a number of aquatic and terrestrial species. Aquatic predators include insects such as backswimmers (Woodward and Kiesecker 1994), predaceous diving beetles and their larvae, and dragonflies and damselfly larvae. Vernal pool tadpole shrimp are another significant predator of fairy shrimp. Vernal pools provide important habitat for resident and migratory birds, particularly waterfowl and shorebirds. Birds are particularly attracted to the pools because they offer foraging habitat at a time of year when resources are limited (Silveira 1998), and vernal pools help link aquatic resources in the California portion of the Pacific Flyway. Vernal pool crustaceans provide important proteins and calcium vital to the energetic needs of migratory bird migration and reproduction (Proctor *et al.* 1967; Silveira 1998). Vernal pool crustaceans are a major food source for a number of terrestrial vertebrate predators including water fowl, wading birds, toads, frogs, and salamanders (Proctor *et al.* 1967; Krapu 1974; Swanson 1974; Morin 1987; Simovich *et al.* 1991; Silveira 1998). Vernal pool crustaceans depend on the absence of water during the summer months to discourage aquatic predator species such as bullfrogs, garter snakes, and fish (Eriksen and Belk 1999).

The vernal pool fairy shrimp is imperiled by a variety of human-caused activities, primarily urban development, water supply/flood control projects, and land conversion for agricultural use. Habitat loss occurs from direct destruction and modification of pools due to filling, grading, discing, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use. The main threat to listed vernal pool crustaceans is the loss of habitat associated with human activities, including urban/suburban development, water supply/flood control development, and conversion of natural lands to intensively farmed agricultural uses. According to the 1997 National Resources Inventory, released by the Natural Resources Conservation Service (1999), California ranked sixth in the nation in number of acres of private land developed between 1992 and 1997, at nearly 695,000 acres. Habitat loss occurs from direct destruction and modification of pools due to filling, grading, discing, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use, alterations of vernal pool hydrology, fertilizer and pesticide contamination, activity, invasions of aggressive non-native plants, gravel mining, and contaminated stormwater runoff. State and local laws and regulations do not protect listed vernal pool crustaceans, while other laws and regulations, including the Clean Water Act, have not effectively maintained habitat necessary to conserve and recover these species. Although developmental pressures continue, only a small fraction of vernal pool habitat is protected from the threat of destruction.

Holland (1978) estimated that between 67 and 88 percent of the area within the Central Valley of California which once supported vernal pools had been destroyed by 1973. However, an analysis of this report by the Service revealed apparent arithmetic errors which resulted in a determination

that a historic loss between 60 and 85 percent may be more accurate. Regardless, in the ensuing years, threats to this habitat type have continued and resulted in a substantial amount of vernal pool habitat being converted for human uses in spite of Federal regulations implemented to protect wetlands. For example, the Corps' Sacramento District has authorized the filling of 467 acres of wetlands between 1987 and 1992 pursuant to Nationwide Permit 26 (U.S. Fish and Wildlife Service 1992). The Service estimates that a majority of these wetland losses within the Central Valley involved vernal pools, the habitat of the vernal pool tadpole shrimp and vernal pool fairy shrimp. Current rapid urbanization and agricultural conversion throughout the ranges of these two species continue to pose the most severe threats to the continued existence of the vernal pool tadpole shrimp and vernal pool fairy shrimp. The Corps' Sacramento District has several thousand vernal pools under its jurisdiction (Coe 1988), which includes most of the known populations of these listed species. It is estimated that within 20 years 60 to 70 percent of these pools will be destroyed by human activities (Coe 1988).

In addition to direct habitat loss, the vernal pool habitat for the vernal pool tadpole shrimp and vernal pool fairy shrimp has been and continues to be highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated vernal pool tadpole shrimp and vernal pool fairy shrimp populations. Ecological theory predicts that such populations will be highly susceptible to extirpation due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986; Goodman 1987a, 1987b). If an extirpation event occurs in a population that has been fragmented, the opportunities for recolonization would be greatly reduced due to physical (geographical) isolation from other (source) populations.

In addition to direct habitat loss, the vernal pool habitat for this listed vernal pool crustacean is also highly fragmented throughout their ranges due to the nature of vernal pool landscapes and the conversion of natural habitat by human activities. Such fragmentation results in small, isolated populations of listed crustaceans which may be more susceptible to extinction due to random demographic, genetic, and environmental events. Should an extirpation event occur in a population that has been fragmented, the opportunities for recolonization would be greatly reduced due to physical (geographical) isolation from other (source) populations.

Vernal pools and ephemeral wetlands are found at seven sites in the action area of the Pigeon Pass Project (California Department of Transportation 2004). Service-approved protocols for sampling for the listed crustacean were not followed at the proposed project. Two of the seven sites were not sampled for vernal pool crustaceans because they were located more than 250 feet from the construction area. Back-to-back dry and wet season surveys were conducted at the remaining five sites (California Department of Transportation 2004). Cysts of fairy shrimp of the genus *Branchinecta* were found at one of the pools; however, the specific identity was not determined. This vernal pool is in the right-of-way and cut-and-fill limits for the Pigeon Pass Project, and will be partially filled as a result of the proposed action. Surveys were discontinued at one of the sites when California red-legged frog egg masses were discovered, however, that site is over 250 feet from the zone of disturbance. The vernal pool fairy shrimp has been recorded within 7 miles of the proposed project (California Department of Fish and Game 2004) and suitable habitat for this listed animal is found in the action area of the project. Therefore, the

Service has determined it is reasonable to conclude the vernal pool fairy shrimp occurs in the action area because of the biology and ecology of the species, the presence of suitable habitat, as well as the nearby observations of this listed crustacean.

Effects of the Proposed Action

The proposed Pigeon Pass Project likely will result in a number of adverse effects to the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp. There is a likelihood the animals may be affected by being crushed, entombed in their burrows, their cysts buried or crushed, hit and injured or killed by vehicle strikes, being shot, chased and injured or killed by domestic pet dogs, poisoned by chemical agents, trapped in erosion control netting, or harassed by noise and vibration. The San Joaquin kit fox, California red-legged frog, and California tiger salamander may be adversely affected by the proposed project blocking travel corridors, or by evening construction disturbing night time foraging, mating, movement, or subjecting them to predation that otherwise would not occur. These four listed animals inhabit the project site and surrounding vicinity (for purposes of this biological opinion the surrounding vicinity is described as 1000 feet outside and adjacent to the project footprint) are likely to be subject to indirect effects including loss of habitat, pesticide or chemical poisoning, exotic predators, competitors, and non-native plants, disease, and a reduction in natural food sources as a result of habitat disturbance and loss.

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within two seasons. Ground disturbance resulting from the proposed Pigeon Pass Project includes substantial grading, excavating, and fill. The California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than two seasons after the construction of the project is completed. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

The proposed Pigeon Pass Project includes two oversized culverts that that will allow adjacent landowners to access their properties, and also twelve drainage culverts. The California Department of Transportation has stated these undercrossing and culverts will function as wildlife movement corridors but adequate information was not made available to the Service on

such factors as the sizes or other data that would have allowed an adequate evaluation of the effectiveness of this proposed conservation measure.

Construction equipment that has been used in different areas and with different species of amphibians including the California tiger salamander and the California red-legged frog may transmit diseases by introducing contaminated soil and other material on the equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytrid fungus may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch *et al.* 2000).

This conference opinion on the proposed critical habitats for the California tiger salamander and the California red-legged frog does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR § 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to the proposed critical habitats.

San Joaquin Kit Fox

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species

Construction related activities are likely to cause disruption of foraging, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Because these animals are nocturnal, when construction is performed at night, associated lighting likely would increase all of the above effects. Lighting associated with night construction will also increase the likelihood of predation on San Joaquin kit foxes by removing the cover of darkness. The animals that avoid construction activities may become displaced into adjacent areas. Nocturnally active mammalian predators may be vulnerable to increased predation, exposure, starvation, or stress through disorientation, loss of shelter, and intraspecific and interspecific aggression (Grigione 2002).

Range-wide habitat loss, fragmentation, and degradation from multiple factors is the primary threat to the San Joaquin kit fox (U.S. Fish and Wildlife Service 1998). Approximately 95% of native habitat for kit fox habitat in the San Joaquin Valley has been destroyed by agricultural, industrial, and urban development (U.S. Fish and Wildlife Service 1998). Loss of natural lands continues to occur further reducing the habitat available for the animal. The amount of historical

and current habitat loss directly attributable to road has not been calculated. Estimates of the area occupied by roads under the jurisdiction of California Department of Transportation includes 591 acres for Kings County, 431 hectares (1065 acres) for Merced County, 2019 acres for Fresno County, and 3669 acres for Kern County (Cypher 2000). These estimates are based on a standard lane width of 11.8 feet, and not all of this area is in kit fox habitat. However, the estimates do not include road shoulders, medians, or associated developments (e.g. Interchanges, signs), and also do not include the area occupied by county and city roads.

The effect of habitat fragmentation on the San Joaquin kit fox is potentially significant and likely will: (1) reduce access to habitat as well as habitat suitability, and (2) disrupt movement, dispersal, and gene flow. The construction of roads through San Joaquin kit fox habitat may restrict or block access to adjacent and formerly contiguous habitat patches. The likelihood of this effect increases with larger road size, higher traffic volume, and the presence of fences or median barriers. 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 2 occasions were animals located on the opposite side of the highway from their primary area of use. Interstate 5 has an effect on kit fox use patterns and restricts movements by the San Joaquin kit fox between habitat blocks.

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 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. Whether or not the patch can be used as part of a San Joaquin kit fox home range will depend upon the nature of the factors causing the fragmentation.

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 also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. Bobcats (*Felis rufus*) in Wisconsin readily crossed dirt roads, but were reluctant to cross paved roads (Lovallo and Anderson 1996). Lynx also exhibit a

reluctance to cross roads (Barnum 1999) as do mountain lions (*Felis concolor*) (Van Dyke *et al.* 1986). In a study in North Carolina, the number of road crossings by black bears (*Ursus americanus*) was inversely related to traffic volume, and bears almost never crossed an interstate highway (Brody and Pelton 1989). Endangered Sonoran pronghorn (*Antilocarpa americana*) in Mexico are reluctant to cross a 2-lane highway, and the planned expansion of the road could further restrict movements (Castillo-Sanchez 1999). Many rodents are reluctant to cross roads (Oxley *et al.* 1974).

The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glareolus*) populations separated by a 50-meter (164 foot) wide highway in Germany (Gerlach and Musolf 2000). In California, local extirpations of mountain lions has occurred when roads and other developments fragmented habitat in small patches and blocked movement corridors thereby isolating the patches and preventing recolonization (Beier 1993). Adequately sized culverts or undercrossings with suitable habitat at each side of the passage significantly increases the ability of mammals to cross highways (Ng *et al.* 2003).

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 San Joaquin kit fox. Thus, vehicle strikes are a direct source of mortality for this listed canine. If vehicle strikes are sufficiently frequent in a given locality, they could result in reduced San Joaquin kit fox abundance. The death of animals 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 Reserve 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. Predators, primarily coyotes and bobcats, were the primary source of mortality at the Naval Petroleum Reserves. In addition, 70 kit foxes, both radio collared and non-collared, were found dead on roads in and around the Naval Petroleum Reserve during 1980-1991 (U.S. Department of Energy 1993). Of these, 34 were hit by vehicles on the approximately

1,600 kilometers (990 miles) of roads at the Reserve, and 36 were struck on the approximately 80 kilometers (50 miles) of State and County roads (e.g., State Route 119, Elk Hills Road), where traffic volumes and average vehicle speeds were higher.

In other 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, 6 non-collared kit foxes were killed by vehicles on the access road. Predators, primarily coyotes, bobcats, and feral dogs were responsible for most deaths in this study. 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%) were attributed to a vehicle strike. At the Camp Roberts National Guard Training Facility 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 western Merced County, 28 San Joaquin kit foxes were radio-collared during 1985-1987 (Briden *et al.* 1992). Seventeen were found dead and 2 (12%) of these deaths were attributed to 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 (123 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.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. However, the precise effect of vehicle strikes on the San Joaquin kit fox has not been adequately investigated. According to Morrell (1970), "The automobile is by far the major cause of reported San Joaquin kit fox deaths - 128 of 152 deaths reported were caused by automobiles." Morrell acknowledged that the numbers were based on non-radio-collared kit foxes and therefore were biased because road-killed foxes are conspicuous and easily observed compared to animals dying from other causes. Predators such as coyotes, bobcats, non-native red foxes, and domestic dogs likely constitute a higher source of mortality than vehicle strikes (U.S. Fish and Wildlife Service 1998; Cypher 2000).

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 the animals 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 this endangered mammal, but for which little data is 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.

Based on a study of another kit fox subspecies, Egoscue (1962) reported that 8 tagged foxes (*Vulpes macrotis nevadensis*) in Utah were killed by vehicles, and 5 of these were pups. Pups appeared to be more vulnerable to vehicle strikes. Many of the foxes killed were residents that were using dens located near roads. O'Neal *et al* (1987) examined 23 dead kit foxes in western Utah in 1983. None were killed by vehicles, possibly due to the remoteness of the study site.

Swift foxes (*Vulpes velox*) are closely related to the San Joaquin kit fox, and are listed as an endangered in Canada. They show numerous ecological similarities with the San Joaquin kit fox. Hines (1980) reported that roads were a major source of swift fox mortality in Nebraska. In Alberta, where the swift fox was extirpated and recently reintroduced, vehicles were responsible for 5 of 89 (6%) of the foxes found dead (Cabyn *et al* 1994). Pups appeared to be especially vulnerable, particularly if the natal dens were located near roads (Cabyn 1998). In western Kansas, 41 adults and 24 juvenile swift foxes were radio collared and monitored during 1996-97 on 2 study sites (Sovada *et al* 1998). Among the adults, 18 were found dead, but none were killed by vehicles. Among the juveniles, 14 were found dead and 4 (29%) of these had been struck by vehicles. All 7 of the juveniles killed by vehicles were found on the same study site. This study site had 90% more roads compared to the other study site where no foxes were killed by vehicles (78 miles vs. 41 miles). At a remote site in Colorado with few roads and restricted public access, swift foxes were rarely struck by vehicles (Covell 1992; Kitchen *et al.* 1999).

Vehicle-related mortality has significantly affected other listed or rare species. Vehicles caused 49% of the mortality documented among endangered Florida panthers (*Felis concolor coryi*) (Maehr *et al.* 1991). With a small remaining population, the loss of any individuals to vehicles could constitute a significant population effect. Similarly, at least 15% of the remaining 250-300 key deer (*Odocoileus virginianus clavium*) are killed annually by vehicles (Tubak 1999), and this mortality is considered to be a limiting factor for this endangered species (U.S. Fish and Wildlife Service 1985). Mortality from vehicles was the primary source of mortality for endangered ocelots (*Felis pardalis*) in Texas (Tubak 1999), and also contributed to the failure of a lynx (*Lynx lynx*) reintroduction project in New York (Aubrey *et al.* 1999). Rudolph *et al.* (1999) estimated that road-associated mortality may have depressed populations of Louisiana pine snakes (*Pituophis ruthveni*) and timber rattlesnakes (*Crotalus horridus*) by over 50% in eastern Texas, and this mortality may be a primary factor in local extirpations of timber rattlesnakes (Rudolph *et al.* 1998). Mortality from vehicles also is contributing to the reduction in the status of the prairie garter snake (*Thamnophis radix radix*) in Ohio (Dalrymple and Reichenbach 1984), and was a limiting factor in the recovery of the endangered American crocodile (*Crocodylus acutus*) in Florida (Kushland 1998). In Florida, threatened Florida scrub-jays (*Aphelocoma coerulescens*) suffered higher mortality in territories near roads, as well as reduced productivity due to vehicle strikes of both breeding adults and young (Mumme *et al.* 1999).

Construction, maintenance, and operational activities associated with roads may result in a disturbance effect on nearby San Joaquin kit foxes. Disturbance can result from noise, vibration, odors, or human activity. 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 increase energetic requirements, decrease reproductive output, decrease 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). Hearing loss was greater in male than in female humans; however, this may be caused by environmental factors (NIH 1990). Also, 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*) (Comman 2001). Increased reproductive failure in laboratory mice (*Mus musculus*) was found to occur after a level of 82-85 dBA for one week (Comman 2001). However, measurable loss of hearing was found to occur in chinchillas (*Chinchilla laniger*) at a sustained level of 70 dBA (Peters 1965). 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 (Comman 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*) (MacArthur 1976; Workman *et al.* 1992 both cited in U.S. National Park Service 1994).

Hearing loss is correlated with distance from the source of the noise. At a level of 110 dBA, guinea pigs (*Cavia porcellus*) suffered long-term hearing loss at distances of 75 and 150 feet, temporary loss at a distance of 100 meters, and no measurable loss at 4500 feet (Gonzales *et al.* 1970). Over water, noise is reduced at a rate of 5 dBA for each doubling of the distance to the

source (Komanoff & Shaw 2000). For instance, a noise that measured 20 dBA at 60 feet registers 10 dBA at 40 meters.

Harassment from long-term noise may cause San Joaquin kit foxes to eventually vacate the project site and adjacent areas. Endangered California condors (*Gymnogyps californianus*) have been shown to abandon nesting sites in response to vehicle noise (Shaw 1970). 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 (Chadwick 1973; McCourt *et al.* 1974; Ballard 1975; Krausman and Hervert 1983; Gunn *et al.* 1985; Bleich 1990; all cited in U.S. National Park Service 1994).

Project effects on San Joaquin kit foxes are expected to be greater during the den selection, pregnancy, and early pup dependency periods of the breeding cycle (December through July) than at other times of the year. San Joaquin kit foxes may exhibit increased sensitivity to disturbance during this period and therefore, ideally, surface-disturbing activities should occur between August and November. Habitat compensation measures are anticipated to minimize habitat effects that result from implementation of the project.

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 (e.. 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. Other animals, some of which were prey species for the kit fox, were found drowned in crude oil at the Naval Petroleum Reserve (U.S. Department of Energy 1993). Such spills potentially can cause local reductions in the abundance of kit foxes and their prey. Construction of 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. These exotic species can spread along roadsides and then into adjacent habitat. Non-native animals may use modified habitats adjacent to road to disperse into kit fox habitat. They could compete with kit foxes for resources such as food or dens, or directly injure or kill San Joaquin kit foxes. Non-native plants and animals may reduce habitat quality for the listed canine or their prey, and reduce the productivity or the local carrying capacity for the endangered species. Introductions of non-native species could cause San Joaquin 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, compete with native plants for resources, does not appear to be used by San Joaquin kit fox prey, dense growth, and may be difficult for the listed canine to move through due its large size (up to 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 San Joaquin 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; U.S. Fish and Wildlife Service 1998), and likely compete with kit foxes for food and dens. Red foxes are considered a threat to the swift fox in Canada (Carbyn 1999). 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. Non-native red foxes and feral cats (*Felis catus*) are reported to use roads as movement corridors in Australia (Bennett 1991).

Negative 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 (1998) described the area affected as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet 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 mile from the road. Rudolph *et al* (1999) detected reduced snake abundance up to 2790 feet from roads in Texas. They estimated snake abundance out to 2790 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 the Lone Star State is within 1640 feet of a road. The "road-zone" effects can be subtle. Van der Zandt *et al.* (1980) reported that lapwings (*Vanellus vanellus*) and black-tailed godwits (*Limosa limosa*) feeding at 1575-6560 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 Frossell (2000) described another type of "road-zone" effect. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, by elevated levels of metals in both soil and plants were detected at ≥ 660 feet) of roads. The "road-zone" apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1000 feet in woodlands, 1197 feet in grasslands, and 2657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The "road zone" and the San Joaquin kit fox has not been adequately investigated; however, it is possible it exists given the effects of roads on the animal.

California Tiger Salamander

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart *et al.* 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their

movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

Construction related activities are likely to cause disruption of surface movement, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Because these animals are nocturnal, if construction is performed at night, associated lighting likely would increase all of the above effects. Wise and Buchanan (2002) reviewed the adverse effects that may result from night time illumination on salamander species. Artificial lighting used during night time construction may increase predation of the California tiger salamanders, if it occurs during periods of fall, winter, or spring rains, because the amphibians will lose the cover of darkness for movement. Nocturnal foraging by salamander species may be affected by artificial lighting. Wise and Buchanan (2002) reported that in one species of salamander, individuals emerged from refugia to forage within one hour after light levels dropped to dramatically following sunset. During such foraging bouts, visual information was used for locating prey. Greater light levels delay emergence, resulting in less foraging time, but could have increased the ability of the salamanders to capture prey; however, they also could make the amphibians more vulnerable to predation. Many salamanders, such as the California tiger salamander, are terrestrial as adults but migrate to ponds to breed and lay eggs. The orientation of some of these terrestrial species away from and toward these ponds is influenced by the spectral characteristics of light (Wise and Buchanan 2002). Artificial lights that emit unusual spectra may disrupt these migration patterns.

The loss of ground squirrel burrows will reduce the amount of available upland habitat within the action area. The loss of the breeding pond will result in significantly reduced breeding opportunities for the California tiger salamander. The addition of impermeable surfaces resulting from the widened realignment will be accompanied by an increase in chemical runoff, which would include gasoline and oil, as well as silt runoff, which will reduce water quality in the project site. A wider highway to cross during dispersal and migration likely will result in increased injury and mortality of California tiger salamanders, and increased fragmentation of their habitat in the action area.

The effect of habitat fragmentation on the California tiger salamander is potentially significant. Fragmentation can have two effects: (1) reduction in access to habitat as well as habitat suitability, and (2) disruption of movements, dispersal, and gene flow. The construction of roads through salamander habitat may restrict or block movement between breeding ponds and upland habitat. The likelihood of this effect will increase with larger road size, higher traffic volume, and the presence of fences or median barriers. In addition to limiting access to breeding ponds or upland habitat, roads also may reduce the suitability of habitat for the California tiger salamander by fragmentation into patches too small for effective use by the animals. As a habitat patch decreases in size, the number of California tiger salamanders the patch can support also decreases. This increases the probability that the animals will be extirpated from each habitat

patch. The possibility for recolonization will depend upon the nature of the factors, e.g., roads, canals, development, etc., that are causing the fragmentation.

Fragmentation factors that effectively isolate patches and limit access also constitute barriers to California tiger salamander dispersal, and gene flow. Movements and dispersal corridors between breeding ponds and upland habitat are critical to this animal's population dynamics, particularly because the animals currently persist as metapopulations with multiple disjunct population centers. Movement and dispersal corridors likely are important for alleviating overcrowding during years when California tiger salamander abundance is high, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glareolus*) populations separated by a 50-meter (164 foot) wide highway in Germany (Gerlach and Musolf 2000).

California tiger salamander mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes occur on rainy nights when the animals are moving to their breeding ponds. Thus, vehicle strikes are a direct source of mortality for the California tiger salamander. If vehicle strikes are sufficiently frequent in a given locality, this could result in reduced abundance of this animal. Especially problematic is the death of females prior to the laying of their eggs because this could result in the loss of an entire cohort, and therefore, reduced recruitment of new individuals into the population.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. Although no systematic, range-wide studies have been conducted, it is known that significant numbers of California tiger salamanders are killed by vehicular traffic while crossing roads (Hansen and Tremper 1993; S. Sweet, *in litt.* 1993; Joe Medeiros, Sierra College, pers. comm. 1993). For example, during a 1-hour period on a road bordering Lake Lagunita on the Stanford University campus, 45 California tiger salamanders were collected, 28 of which had been killed by cars (Twitty 1941). More recently, during one 15-day period in 2001 at a Sonoma County location, 26 road-killed California tiger salamanders were found (D. Cook, pers. comm. 2002). Overall breeding population losses of California tiger salamanders due to road kills have been estimated to be between 25 and 72 percent (Twitty 1941; S. Sweet *in litt.* 1993; Launer and Fee *in litt.* 1996). Mortality may be increased by associated roadway curbs and berms as low as 3.5 to 5 inches, which allow California tiger salamanders access to roadways but prevent their exit from them (Launer and Fee 1996; S. Sweet *in litt.* 1998).

In a recent study along a 0.7 mile high-vehicular-use (21,450 vehicles per day) section of the Trans-Canadian Highway in Alberta, Canada, Clevenger *et al.* (2001) recorded 183 road-killed eastern tiger salamanders in 30 days and concluded it was likely that very little of the local population had survived. In California, vehicular-use levels along various State, interstate, and secondary roads commonly far exceed the level of use reported in the Alberta study. Vehicular usage on California roads is also increasing rapidly and directly with human population and urban expansion. During November 2002, California's estimated total vehicular travel on State highway system roads alone was 14.27 billion miles (this figure and subsequent vehicular-use data from California Department of Transportation's Internet website which was accessed on January 2, 2003). From 1972 to 2001, State highway system total vehicular usage rose steadily from 67.11 to 167.81 billion miles annually. For the 23 California counties in which the California tiger salamander may occur, State highway system total annual vehicular usage in 1999, 2000, and 2001 was 53.27, 55.85, and 57.21 billion miles, respectively. The steady increase of vehicular use is thus continuing. We believe such figures illustrate (1) the general increase in vehicular usage that has been, and is still, occurring in many parts of the California tiger salamander's range, and (2) that additional increments of road-kill losses, which are already a potentially serious problem for the species, are likely occurring.

Vehicle-related mortality has significantly affected other listed or rare species. Rudolph *et al.* (1999) estimated that road-associated mortality may have depressed populations of Louisiana pine snakes (*Pituophis ruthveni*) and timber rattlesnakes (*Crotalus horridus*) by over 50% in eastern Texas, and this mortality may be a primary factor in local extirpations of this species of rattlesnake (Rudolph *et al.* 1998). Mortality from vehicles also is contributing to the reduction in the status of the prairie garter snake (*Thamnophis radix radix*) in Ohio (Dalrymple and Reichenbach 1984), and was a limiting factor in the recovery of the endangered American crocodile (*Crocodylus acutus*) in Florida (Kushland 1998).

Similar to the endangered San Joaquin kit fox California red-legged frog, the presence of roads could introduce chemical agents that contaminate and adversely affect the California tiger salamander and its prey; introduce or improve habitat for non-native species that compete or prey upon this listed amphibian; and also the "road zone" effect may adversely affect this listed animal.

California Tiger Salamander Proposed Critical Habitat

The proposed action is not expected to appreciably diminish the value of the proposed critical habitat for the California tiger salamander, or prevent the proposed critical habitat from sustaining its role in the conservation and recovery of the species. The California Department of Transportation is proposing to implement measures to restore the areas subject to a significant amount of cut and fill to pre-project conditions. There is currently an existing highway within the action area, and, due to the proposed restoration activities, realigning a section of that highway will not significantly interfere with the current capability of the proposed critical habitat to satisfy essential requirements of the species. Constituent elements for the California tiger salamander will remain intact during and after project completion, or will be restored, and will continue to provide suitable habitat.

California Red-legged Frog

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

Changes in light level may disrupt orientation in nocturnal animals. The range of anatomical adaptations to allow night vision is broad (Park 1940), and rapid increases in light can blind animals. For frogs, a quick increase in illumination causes a reduction in visual capability from which the recovery time may be minutes to hours (Buchanan 1993). After becoming adjusted to a light, frogs may be attracted to it as well (Jaeger and Hailman 1973). Laboratory experiments have demonstrated that dark-adapted frog species exposed to rapid increases in illumination may be temporarily "blinded" and unable to gather visual information on prey, predators, or conspecifics until their eyes adapt to the new illumination. Foraging may be facilitated in frog species that hunt around lights because the ambient illumination is increased to a level that allows the frogs to see prey or because lights attract abnormally large numbers of insects and other invertebrate prey. Experiments and anecdotal evidence indicates that both temporary and permanent changes to the night time illumination of an area may affect the reproduction, foraging, predator avoidance, and social interactions of frog species (Buchanan 2002). Reproductive behaviors may be altered by artificial lighting; it may be inhibited in frog species that normally reproduce only at very low illuminations. Female frogs of the species *Physalaemus pustulosus* are less selective about mate choice when light levels are increased, evidently preferring to mate quickly and avoid the increased predation risk of mating activity (Rand *et al.* 1997). Longcore and Rich (2002) reported that frogs in an experimental enclosure stopped mating activity during night football games, when lights from a nearby stadium increased sky glow. Mating choruses only resumes when the enclosure was covered to shield the frogs from light. Increased illumination may allow predators to see frogs that may not normally be visible to them. Circadian rhythms, activity patterns, and intraspecific visual communication also may be affected by increased illuminations.

Breeding habitat, identified as Site 1, will be eliminated by the proposed project. Individual frogs occupying the affected habitat run the risk of being crushed or buried by earth moving activities. Those that do survive will suffer permanent and temporary loss of habitat, and harassment from increased human activity. Construction of an unspecified duration and location will occur at night and the associated lighting may increase predation because frogs will lose the cover of darkness. In addition to the elimination of the breeding pond identified as Site 1, at certain times during construction the movement of frogs from breeding ponds north of State Route 84 to summer habitat south of State Route 84, and visa versa, likely will be impeded by construction activities. Temporary loss of dispersal habitat for the project duration increases

intra-and interspecific competition for food and living space for red-legged frogs in the action area.

The proposed action is likely to result in indirect effects to the red-legged frog that will last beyond the completion of the proposed action. The action would (1) result in permanent and temporal loss of aestivation habitat; (2) reduce water quality in the action area; (3) result in higher mortality of red-legged frogs in the action area; and (4) increase fragmentation of remaining red-legged frog habitat over the longer term.

Similar to the endangered San Joaquin kit fox and the California tiger salamander, the presence of roads could introduce chemical agents that contaminate and adversely affect the California red-legged frog and its prey; introduce or improve habitat for non-native species that compete or prey upon this listed amphibian; and also the "road zone" effect may adversely affect this listed animal.

The addition of impermeable surfaces resulting from the widened realignment will be accompanied by an increase in chemical runoff, which would include gasoline and oil, as well as silt runoff, which will reduce water quality in the project site. The widening of State Route 84 will likely result in higher mortality due to the increased distance that red-legged frogs have to travel over the highway to cross it. Removal of vegetation will likely increase exposure to introduced non-native and/or urban-adapted predators due to the permanent and temporary loss of cover to dispersing red-legged frogs.

California Red-Legged Frog Proposed Critical Habitat

The proposed action is not expected to appreciably diminish the value of the proposed critical habitat for the red-legged frog, or prevent proposed critical habitat from sustaining its role in the conservation and recovery of the species. The California Department of Transportation is proposing to implement measures to restore the areas subject to a significant amount of cut and fill to pre-project conditions. There is currently an existing highway within the action area, and, due to the proposed restoration activities, realigning a section of that highway will not significantly interfere with the current capability of the proposed critical habitat to satisfy essential requirements of the species. Constituent elements for the red-legged frog will remain intact during and after project completion, or will be restored, and will continue to provide suitable habitat.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

The potential adverse effects of the proposed Pigeon Pass Project include habitat fragmentation; altered hydrology; non-point source pollution; dust emissions; erosion; sedimentation; hazardous material spills; human disturbance; and establishment of invasive nonnative plants. The project could potentially result in habitat fragmentation. The results of fragmentation are inhibition of genetic exchange between populations and impediments to recolonization of habitats from which populations have been extirpated. Small, isolated populations are substantially more vulnerable to stochastic events (e.g., aberrant weather patterns, fluctuations in availability of food) and may exhibit reduced adaptability to environmental (natural or anthropogenic) changes.

The Service considers all vernal pool branchiopods and their habitat not considered to be directly affected but within 250 feet of proposed construction activities to be indirectly affected by project implementation. Habitat indirectly affected includes all habitat supported by future destroyed areas and swales, and all habitat otherwise damaged by loss of watershed, human intrusion, introduced species, and pollution that will be caused by the proposed project. The proposed project will directly affect 0.61 acre and 0.2 acre of vernal pool will be indirectly affected by the proposed project. The new alignment will affect the vernal pool fairy shrimp through construction activities and long-term effects occurring within 250 feet of it. Individual branchiopods and their cysts, which may inhabit this seasonal wetland, may be injured or killed by any of the following indirect effects:

Erosion - The ground disturbing activities in the watershed of vernal pools associated with the proposed project action area are expected to result in siltation when pools fill during the wet season following construction. Siltation in pools supporting vernal pool fairy shrimp may result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages, thereby reducing the number of mature adults in future wet seasons. The proposed project construction activities could result in increased sedimentation transport into vernal pool branchiopod habitats during periods of heavy rains.

Changes in hydrology - The biota of vernal pools and swales can change when the hydrologic regime is altered (Bauder 1986, 1987). Survival of aquatic organisms like the vernal pool fairy shrimp are directly linked to the water regime of their habitat (Zedler 1987). Therefore, construction near vernal pool areas will, at times, result in the decline of local sub-populations of vernal pool organisms, including fairy shrimp.

Introduction of non-natives - There is an increased risk of introducing weedy, non-native plants into the vernal pools both during and after project construction due to the soil disturbance from clearing and grubbing operations, and general vegetation disturbance associated with the use of heavy equipment.

Chemical contamination - The runoff from chemical contamination can kill listed species by poisoning. Oils and other hazardous materials associated with construction equipment could be conveyed into the habitat of the vernal pool fairy shrimp by overland runoff during the rainy season, thereby adversely affected water quality. Many of these chemical compounds are thought to have adverse effects on this species. Individuals may be killed directly or suffer reduced

fitness through physiological stress or a reduction in their food base due to the presence of these chemicals.

In addition to the adverse effects detailed above, the proposed project will contribute to a local and range-wide trend of habitat loss and degradation, the principal reasons that the vernal pool fairy shrimp have declined. The proposed project will contribute to the fragmentation and reduction of the acreage of the remaining listed vernal pool branchiopod habitat located in western Alameda and throughout the range of this listed vernal pool branchiopod.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions 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.

From 1995 to 2020, the human population is projected to increase by 18 percent for the San Francisco Bay hydrologic region, while at the same time agricultural crop land use in the region is projected to remain around 65,000 acres (California Department of Water Resources 998). According the California Department of Forestry, from 2000 to 2020, the human population within counties in the Bay Area region is expected to grow by 29 percent (5.3 million people to 6.8 million people), and by 60 percent from 2000 to 2040 (5.3 million people to 8.4 million people) (California Department of Forestry 1998). There will likely be many other development projects that occur during this timeframe due to increases in human population growth that will continue to imperil the California tiger salamander, San Joaquin kit fox, California red-legged frog, and the vernal pool fairy shrimp.

The California Department of Parks and Recreation's Carnegie State Park is operated for use by off-highway vehicles. This State Park unit is located approximately 10 miles east of the Pigeon Pass Project along Corral Hollow Creek. Ongoing habitat degradation by off road vehicle use will continue to marginalize the available upland and riparian habitat along Corral Hollow Creek. Presently, there are plans to expand Carnegie State Park; any expansion of this Park could exacerbate the degradation of habitat in this area.

Within this region of Alameda County, there is a continued demand for new housing. Considering this, the remaining open space adjacent to the Pigeon Pass Project is likely threatened by development. Two developments, Ruby Hills and Vineyard Estates have already been constructed adjacent to the project site. The development of adjacent wildlife habitat will continue to result in the loss of not only breeding, resting, and foraging habitat, but the loss of dispersal corridors between breeding populations, thereby further isolating and fragmenting wildlife populations. Additionally, development of small reservoirs or water bodies, such as golf course hazards, and water diversions may occur which may pose further threats such as disruption of dispersal corridors for terrestrial species, and competition or predation from with non-native species such as bullfrogs for aquatic species.

CONCLUSION

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed. The Service reached the conclusion on the effects on the proposed critical habitat of the California red-legged frog and the California tiger salamander because the effects of the project will be offset by the conservation measures in the project description, including the successful restoration of areas subject to the temporary effects of cut and fill to pre-project conditions.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, 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 California Department of Transportation so they become binding conditions of project authorization for the exemption under 7(o)(2) to apply. The California Department of Transportation has a continuing duty to regulate the activity that is covered by this incidental take statement. If the California Department of Transportation (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of 7(o)(2) may lapse.

Amount or Extent of Take

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity,

it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often is extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the San Joaquin kit fox, California red-legged frog, California tiger salamander. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore will not be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed based on the proposed restoration of the areas subject to temporary disturbance.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the Pigeon Pass Project on the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp:

1. The California Department of Transportation shall implement conservation measures for the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp to minimize (1) the effects of the loss of habitat that will occur as a result of the project; (2) the potential for harassment, harm, injury, and mortality to these four listed species; and (3) the potential for inadvertent capture or entrapment of federally listed wildlife species during construction activities.
2. The California Department of Transportation shall ensure their compliance with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Highway Administration shall ensure the California Department of Transportation complies with the

following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

- A. The following Term and Conditions will implement Reasonable and Prudent Measure number one (1):
1. The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, and appearing in the *Project Description* of this biological opinion.
 2. The California Department of Transportation shall include Special Provisions that include the avoidance and minimization measures of this biological opinion in the solicitation for bid information. In addition, the California Department of Transportation will educate and inform contractors involved in the project as to the requirements of the biological opinion.
 3. As described in the February 15, 2005, letter from the California Department of Transportation to the Service, the 52 acres that will be purchased for the San Joaquin kit fox and the California tiger salamander via the Service's San Joaquin Kit Fox Fund shall be acquired within the geographic area inhabited by the same population segment of the California tiger salamander known as the East Bay Unit that is being adversely affected by the Pigeon Pass Project.
 4. As described in the February 15, 2005, letter from the California Department of Transportation to the Service, prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for preservation credits that are equivalent of 1.45 acres of suitable vernal pool habitat for this listed species. Prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for creation credits that are equivalent of 0.61 acre of suitable vernal pool habitat for this listed species.
 5. The California Department of Transportation biologist shall have oversight over implementation of all the Terms and Conditions in this biological opinion, and shall have the authority to stop project activities, through communication with the California Department of Transportation Resident Engineer, if any of the requirements associated with these Terms and Conditions are not being fulfilled.

- If biologist/construction liaison has requested a stop work due to take of any of the listed species the Service and Fish and Game will be notified within one (1) working day via email or telephone
6. Permanent and temporary construction disturbances and other types of project-related disturbance to San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp habitat shall be minimized to the maximum extent practicable. To minimize temporary disturbances, all project-related vehicle traffic shall be restricted to established roads, construction areas, and other designated areas. These areas also should be included in preconstruction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects.
 7. Project employees shall be directed to exercise caution when commuting within the habitats of the California tiger salamander, California red-legged frog, and the San Joaquin kit fox. A 20-mile per hour speed limit will be strongly encouraged on unpaved roads within listed species habitats.
 8. Cross-country travel by vehicles shall be prohibited, unless authorized by the Service.
 9. Project employees shall be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.
 10. Prior to initiation of ground breaking, the California Department of Transportation or Service-approved biologist will conduct an education and training session for all construction personnel. All individuals who will be involved in the site preparation or construction shall be present, including the project representative(s) responsible for reporting take to the Service and the California Department of Fish and Game. Training sessions shall be repeated for all new employees before they access the project site. Sign up sheets identifying attendees and the contractor/company they represent shall be provided to the Service with the post-construction compliance report. At a minimum, the training shall include a description of the natural history of the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp affected by the Pigeon Pass Project and include information on these four listed species and their habitats, as appropriate. The training shall 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) of the project. To ensure that employees and contractors understand their roles and responsibilities, training shall be conducted in languages other than English, as appropriate.

11. A litter control program shall be instituted at the entire Pigeon Pass Project. All workers 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.
12. No canine or feline pets or firearms (except for Federal, State, or local law enforcement officers and security personnel) shall be permitted at the Pigeon Pass Project to avoid harassment or killing or injuring of the San Joaquin kit fox, California red-legged frog, and the California tiger salamander.
13. All construction activity shall be confined within the Pigeon Pass Project site, which may include temporary access roads, haul roads, and staging areas specifically designated and marked for these purposes, as described in Conservation Condition 18 below. At no time shall equipment or personnel be allowed to adversely affect areas outside the project site without authorization from the Service.
14. The Resident Engineer or their designee shall be responsible for implementing these conservation measures and shall be the point of contact for the Pigeon Pass Project.
15. 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.
16. The California Department of Transportation shall submit to the Service their draft proposal for the restoration of temporarily affected listed species habitat and proposed critical habitat to pre-project conditions at least sixty (60) calendar days prior to initial ground breaking at the Pigeon Pass Project; the final plan shall be submitted for approval by the Service prior to ground breaking at the proposed project. The plan shall include restoration and revegetation work associated with temporary effects using native California plant species 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 practicable (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 listed animal species. The draft and final plan shall contain specific quantifiable criteria to evaluate the success of the restoration.
17. The Pigeon Pass Project construction area shall be delineated with high visibility temporary fencing at least four (4) 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 the site. Actions within the project area shall be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.
18. Prior to any ground disturbance, pre-construction surveys shall be conducted for San Joaquin kit fox, California tiger salamander, and the California red-legged frog. These surveys shall consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species (i.e., kit fox dens and related sign).
 19. Only California Department of Transportation biologist(s) who are familiar with the biology and ecology of the San Joaquin kit fox, California tiger salamander, or the California red-legged frog, or a Service-approved biologist holding valid permit issued pursuant to section 10(a)(1)(A) of the Act will be allowed to capture listed species.
 20. Because dusk and dawn are often the times when San Joaquin kit fox, California red-legged frog, and the California tiger salamander are most actively foraging and dispersing, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Except when necessary for necessary construction, driver or pedestrian safety, lighting of the Pigeon Pass Project site by artificial lighting during night time hours should be minimized to the maximum extent practicable.
 21. Maintenance and construction excavations greater than two (2) feet deep either shall be covered or filled in at the end of each working day. Wooden ramps or other structures of suitable surface that provide adequate footing for the San Joaquin kit fox shall be placed in the trench or pit no greater than 200 feet apart to allow for unaided escape. The trench or pit shall be surveyed in the morning and late afternoon hours to ascertain whether the San Joaquin kit fox, California red-legged frog, and the California tiger salamander have fallen into the trench or pit. If at anytime, a trapped San Joaquin kit fox is discovered, the California Department of Transportation biologist shall immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service and/or the California Department of Fish and Game contacted for further guidance. If a California red-legged frog or California tiger salamander is discovered trapped in a trench or pit, the animal shall be carefully captured by the California Department of Transportation biologist and released at a secure location, such as the entrance to a ground squirrel burrow, within walking distance and is outside of the construction area. The Service shall be notified by telephone and electronic mail within one (1) working day of the incident.

22. Tightly woven fiber netting or similar material shall be used for erosion control or other purposes at the Pigeon Pass Project site to ensure that the California red-legged frog and the/or the California tiger salamander do not get trapped. This limitation will be communicated to the contractor through use of Special Provisions included in the bid solicitation package.
23. Use of rodenticides and herbicides at the Pigeon Pass Project site shall be utilized in such a manner to prevent primary or secondary poisoning of listed species, and the depletion of prey populations on which they depend. 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.
24. The following Term and Condition shall be implemented for borrow sites associated with the Pigeon Pass Project:
 - a. The California Department of Transportation 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.
 - b. The California Department of Transportation 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 Resident Engineer any one of the following:
 - i. a letter from the Service stating use of the borrow pit area will not result in the incidental take of listed species;
 - ii. an incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;
 - iii. 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;
 - iv. letter from the Service concurring with the "no effect" determination for contractor-related activities; or
 - v. Contractor submittal of information to the California Department of Transportation Resident Engineer indicating compliance with the State Mining and Reclamation Act (SMARA) and provide the County land use permits and California Quality Act (CEQA) clearance.

- c. If a borrow site that is in compliance with the Act is not available, the California Department of Transportation shall either:
 - i. identify/select a site that the Service has concurred with the “no effect” determination, or;
 - ii. request reinitiation of formal consultation on the action considered herein based on new information.
25. The California Department of Transportation shall implement the following six general conservation measures for the San Joaquin kit fox:
- a. The presence/absence of San Joaquin kit fox dens (natural or in pipes and culverts) shall be determined.
 - i. Pre-construction surveys within the project area shall be conducted no more than thirty (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.
 - ii. Surveys for dens shall be conducted by qualified biologists with demonstrated experience in identifying San Joaquin kit fox dens.
 - iii. Pipes and culverts shall be searched for kit foxes prior to being moved or sealed to ensure that a San Joaquin kit fox has not been trapped.
 - b. All San Joaquin kit fox dens shall be protected to the maximum extent practicable as determined by the on-site biologist in consultation with the Service.
 - c. The type of den (natal or non-natal) and its status (occupied or unoccupied) shall be identified based on the most current Service guidance (U.S. Fish and Wildlife Service 1999):
 - i. Known den: any existing natural den or human-made structure for which conclusive evidence or circumstantial evidence can show that the den is used or has been used at any time in the past by the San Joaquin kit fox.
 - ii. Potential den: any natural den or burrow within the range of the species that has entrances of appropriate dimensions (4 to 12 inches in diameter) to accommodate San Joaquin kit foxes. The California Department of Transportation shall survey and investigate using photo-detection equipment, track plate, or other

- methods to determine species utilization. If no information is collected that would indicate use by other species, the den shall be treated as a potential kit fox den.
- iii. Pupping den: any known San Joaquin kit fox den (as defined) used by kit foxes to whelp and/or rear their pups.
 - iv. Atypical den: any known San Joaquin kit fox den that has been established in, or in association with, a human-made structure.
- d. The California Department of Transportation shall identify and execute appropriate action(s) regarding notification, buffers, excavation and fill, or seal-off of burrows of this listed species:
- i. Occupied natal den: if an occupied natal den is visible or encountered within the project limits, or other accessible land, or on accessible land within 1000 feet of the project construction area, the Service shall be contacted immediately, before any project action occurs, and the project construction should take place between August 1 and November 30.
 - ii. An adequate buffer or exclusion zone shall be established to protect the physical den and surrounding habitat of unoccupied natal dens and all non-natal dens that can be avoided:
- e. Unoccupied natal dens should be surrounded with a 200 feet buffer and the Service shall be contacted. Occupied and unoccupied non-natal dens should be surrounded with a minimum 100-foot buffer zone.
- f. When occupied dens have been found on or near the project site, ground disturbing activities should be restricted during the period from August 1 and November 30. During this time period, project activities within 0.3 mile of occupied natal dens should be prohibited. Buffer zones shall be delineated with a temporary fence or other suitable barrier that does not prevent movement and dispersal of the San Joaquin fox. Alternately, the project construction area can be delineated with temporary fence, flagging, or other barrier.
- g. Prior to their use, pipes or culverts with a diameter greater than 4 inches at the project site shall be examined by the California Department of Transportation biologist to ascertain if any San Joaquin kit foxes are present in them. Any San Joaquin kit fox found in a pipe or culvert shall be allowed to escape unimpeded.

- h. If an unoccupied natural San Joaquin kit fox den cannot be avoided and must be destroyed, the following actions shall be followed:
 - i. Prior to the destruction of any den, the den shall be monitored for at least three (3) consecutive days to determine its current status. Activity at the den shall be monitored by placing tracking medium at the entrance and by standard spotlighting detection techniques. If no San Joaquin kit fox activity is observed during this period, the den shall be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed at the den during this period, the den shall be monitored for at least five (5) consecutive days from the time of observation to allow any resident animal to move to another den during its normal activities. Use of the den can be discouraged during this period by partially plugging the entrance(s) with soil in such a manner that any resident animal can escape easily. Destruction of the den may begin when, in the judgment of a Service or Service-approved biologist, the animal has moved to a different den. The biologist shall be trained and familiar with San Joaquin kit fox biology. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may be excavated when, in the judgment of the Service-approved biologist, it is temporarily vacant, for example during the animal's normal foraging activities.
 - ii. All San Joaquin kit dens shall be excavated by hand, by or under the supervision of, a Service-approved biologist.
 - iii. The den shall be fully excavated and then filled with dirt and compacted to ensure that San Joaquin kit foxes cannot reenter or use the den during the construction period. If, at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den shall be resumed. Destruction of the den may be resumed, when in the judgment of the Service-approved biologist, the animal has escaped from the partially destroyed den.
 - iv. Non-natal San Joaquin kit dens may be excavated at any time of the year; natal dens shall be excavated only between August 15 and November 1.

B. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

1. If requested, during or upon completion of construction activities, the on-site biologist, and/or a representative from California Department of Transportation shall accompany Service or California Department of Fish and Game personnel on

an on-site inspection of the site to review project effects to the San Joaquin kit fox, California red-legged frog, California tiger salamander, vernal pool fairy shrimp, and their habitats.

2. The Federal Highway Administration shall ensure California Department of Transportation complies with the *Reporting Requirements* of this biological opinion.

Reporting Requirements

Injured San Joaquin kit foxes, California red-legged frogs, and/or California tiger salamanders must be cared for by a licensed veterinarian or other qualified person; dead individuals of any of these three listed species and the vernal pool fairy shrimp should be preserved according to standard museum techniques and held in a secure location. The Service and the California Department of Fish and Game must be notified within one (1) working day of the discovery of death or injury to a San Joaquin kit fox, California red-legged frog, California tiger salamander, and/or vernal pool fairy shrimp that occurs due to project related activities or is observed at the project site. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are Chris Nagano, Chief of the Endangered Species Division (Central Valley) at the Sacramento Fish and Wildlife Office (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 Mr. Ron Schlorff at 1416 9th Street, Sacramento, California 95814, (916) 654-4262.

The California Department of Transportation shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp, if any; (v) occurrences of incidental take of any of these four listed species, if any; and (vi) other pertinent information

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 to implement recovery actions, to help implement recovery plans, to develop information, or otherwise further the purposes of the Act.

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. We propose the following conservation recommendations:

1. The California Department of Transportation should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California red-legged Frog* (U.S. Fish and Wildlife Service 2002).
2. The California Department of Transportation should assist the Service in developing and implementing recovery actions identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (U.S. Fish and Wildlife Service 1998).
3. The California Department of Transportation should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by California tiger salamanders, California red-legged frogs, San Joaquin kit foxes, other listed animals, and wildlife. The California Department of Transportation should include photographs, plans, and other information in their biological assessments if they incorporate "wildlife friendly" crossings into their projects.
4. The Federal Highway Administration and the California Department of Transportation should consider participating in the planning for a regional habitat conservation plan for the San Joaquin kit fox, California tiger salamander, other listed species, and sensitive species.
5. The California Department of Transportation should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California tiger salamander, San Joaquin kit fox, listed crustacean species, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate.
6. Sightings of any listed or sensitive animal species should be reported to the California Natural Diversity Database of the California Department of Fish and Game. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.
7. The California Department of Transportation should provide habitat for bats, including surfaces for bat roosts on the underside of bridges and other structures whenever possible.

REINITIATION - CLOSING STATEMENT

This concludes the conference for effects of the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass Project) in Alameda County, California, on the critical habitats for the California red-legged frog and California tiger salamander. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if either of these critical habitats are designated. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in

the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

This concludes formal consultation on the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass Project) in Alameda County, California. 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 Pigeon Pass Project, please contact the Chief of our Endangered Species Division (Central Valley) at the letterhead address or at telephone 916/414-6600.

Sincerely,



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Cay C. Goude
Acting Field Supervisor

cc:

Susan Chang, Jeff Jensen, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
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United States Department of the Interior

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IN REPLY REFER TO:
1-1-05-F-0116

APR 27 2005

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

RY -
Review - File
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Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0115)

Dear Mr. Fong:

This letter is an amendment to the biological opinion and conference opinion issued for the proposed Pigeon Pass Curve Realignment Project located in Alameda County, California. At issue are the effects of the project on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and proposed critical habitats for the California red-legged frog and the California tiger salamander. This amended biological and conference opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California (1-1-04-F-0115)* dated February 28, 2005, that was prepared by the U.S. Fish and Wildlife Service (Service); (2) a request for an amendment to the Biological Opinion from the Federal Highway Administration, dated March 28, 2005; (3) an April 1, 2005, phone discussion with Chris Collison of Caltrans concerning the distribution of vernal pool fairy shrimp mitigation funds; (4) an additional request for an amendment to the Biological Opinion from the Federal Highway Administration, dated April 15, 2005; and (5) other information available to the Service.

The following changes are made to the February 28, 2005, biological and conference opinion:

1. Change Avoidance and Protection Measures - Listed Species on page 6 from:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander, by purchasing 80

credit acres for the California tiger salamander and providing payment for 52 acres into the Service's San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credit at the Ohlone Conservation Bank. The California Department of Transportation will pay \$650,000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

To:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander, by purchasing 80 credit acres for the California tiger salamander. For the remaining 52 acres, Caltrans will set aside \$650,000.00 (52 acres x \$12,500/acre), which will be held until a Service-approved conservation bank becomes available. At that time, the California Department of Transportation will expend the \$650,000 to purchase credits at the bank.

2. Change Term and Condition A1 page 64 from

The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, and appearing in the *Project Description* of this Biological Opinion.

To:

The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, the letter from the Federal Highway Administration dated March 28, 2005, the letter from the Federal Highway Administration dated April 15, 2005, and appearing in the *Project Description* of this Biological Opinion.

3. Change Term and Condition A3 page 64 from

As described in the February 15, 2005, letter from the California Department of Transportation to the Service, the 52 acres that will be purchased for the San Joaquin kit fox and the California tiger salamander via the Service's San Joaquin Kit Fox Fund shall be acquired within the geographic area inhabited by the same population segment of the California tiger salamander known as the East Bay Unit that is being adversely affected by the Pigeon Pass Project.

To:

As described in the March 28, 2005, letter from FHWA to the Service, the California Department of Transportation will reserve \$650,000 in an internal account for future funding to be used to conserve habitat for both the San Joaquin kit fox and the East Bay Unit of the California tiger salamander. The funds shall be released by Caltrans upon written instructions from the Sacramento Fish and Wildlife Office.

4. Change Term and Condition A4 page 64 from

As described in the February 15, 2005, letter from the California Department of Transportation to the Service, prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for preservation credits that are equivalent of 1.45 acres of suitable vernal pool habitat for this species. Prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for creation credits that are equivalent of 0.61 acre of suitable vernal pool habitat for this species.

To:

As described in the April 15, 2005, letter from FHWA to the Service, the California Department of Transportation will reserve \$216,300.00 (2.06 acres x \$105,000.00/acre) in the Pigeon Pass Project account to be used for in-lieu payments for 2.06 acres of vernal pool fairy shrimp habitat. The funds shall be released by Caltrans upon written instruction from the Sacramento Fish and Wildlife Office.

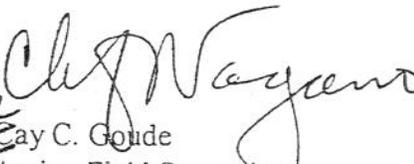
The remainder of the February 28, 2005, biological and conference opinion are unchanged. This concludes formal consultation on the Pigeon Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation of formal consultation is required where discretionary 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 re-initiation.

Mr. Gene Fong

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If you have any questions regarding this amendment to the biological opinion on the Pigeon Pass Curve Realignment Project, please contact Chris Nagano, Chief of our Endangered Species Division, at the letterhead address or at (916) 414-6648.

Sincerely,


For
Cay C. Goude
Acting Field Supervisor

cc:

Larry Vinzant, Federal Highway Administration, Sacramento, California
Jeannie Baker, Christel Little, Shanna Zahner, California Department of Transportation,
Marysville, California
Chris Collison, California Department of Transportation, Sacramento, California
Susan Chang, Jeff Jensen, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
Janice Gan, Carl Wilcox, Scott Wilson, Warden Nicole Kozicki, California Department of Fish
and Game, Yountville, California
Scott Heard, Law Enforcement, FWS, Sacramento, California



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
1-1-07-F-0268

July 20, 2007

Mr. Gene Fong
Federal Highway Administration
Department of Transportation
650 Capital Mall, Suite 4-100
Sacramento, California 95814

Subject: Amendment to the Biological Opinion on the Proposed Pigeon Pass Curve
Realignment, Southwest of Livermore, Alameda County, California (1-1-04-F-
0115)

Dear Mr. Fong:

This is an amendment to the biological opinion on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California. At issue are the adverse effects on the threatened California tiger salamander (*Ambystoma californiense*) and the threatened California red-legged frog (*Rana aurora draytonii*). The Service issued the biological opinion (1-1-04-F-1115) for this Federal action on February 28, 2005. This document is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*)(Act).

On June 27, 2007, the Service visited the Pigeon Pass project site per Term and Condition B.1. of the February 28, 2005, biological opinion. We met with the project engineer and the biological monitor. It was our conclusion that construction-related Conservation Measures and Terms and Conditions are being implemented at the project.

This amended biological opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California*, dated February 13, 2005, that was prepared by the U.S. Fish and Wildlife Service (Service); (2) a telephone discussion between the Service and the California Department of Transportation on July 20, 2007; (3) the June 27, 2007, site visit to the project by the Service; (4) several electronic mail messages between the Service and the California Department of Transportation during the month of July 2007.

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1. The following additions are made to the Conservation Measures on page 6 of the February 28, 2005, biological opinion:

14. All California red-legged frogs and California tiger salamanders encountered in the action area will be relocated to a Service-approved location to the maximum extent possible. The written authorization of the Service shall be obtained by the California Department of Transportation prior to transporting California tiger salamanders and/or California red-legged frogs to a location other than the approved translocation site (i.e., individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service).

15. The Service-approved biologist(s) will use nets or their bare hands to capture California red-legged frogs and California tiger salamanders at the project site. The Service-approved biologist(s) will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two (2) hours before and during periods when they are capturing and relocating either of these two listed species

2. The following addition is made to the Amount or Extent of Take on page 62 second paragraph of the February 28, 2005, biological opinion:

Change:

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

To:

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur

on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, pursue, capture, collect, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

3. The following addition is made to the Amount or Extent of Take on page 62 third paragraph of the February 28, 2005, biological opinion:

Change:

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

To:

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their

breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, pursue, capture, collect, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

4. The following addition is made to the terms and Conditions on page 71 of the February 28, 2005, biological opinion:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, and/or California red-legged frog. The number of Service-approved biologists who are on-site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.

5. The following addition is made to the terms and Conditions on page 71 of the February 28, 2005, biological opinion:

27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders and California red-legged frog shall be done with hand tools whenever possible. The depth to which these two amphibians are found depend on the burrow-specific conditions. Excavation should extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found should be recorded whenever possible and the information should be provided to the Service and the California Department of Fish and Game.

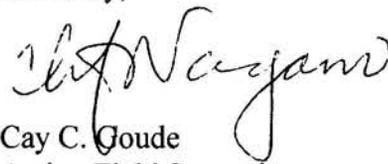
a. Upon capture, individual California tiger salamanders and California red-legged frogs should be placed in a clear plastic container (ie., Tupperware®) of suitable size (e.g. enough room so the animal is not unnecessarily inhibited in its movements). The container should be kept moist with damp paper towels, ¼ inch or ½ inch soft foam rubber, or natural or plastic sponges. The lids of the containers should have small air holes for ventilation. If possible, only one frog or salamander should be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container, however, the two listed species shall not be mixed in order to avoid injury due to jumping by the frogs. Individuals should never be so crowded that they are touching another individual. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.

- b. Individual plastic containers containing salamanders or frogs should be held in an ice chest. Ice packs should be placed on top of the containers to maintain a cool temperature comparable to a refrigerator. The ice chests shall be kept in a cool, dark, quiet secure room
- c. California tiger salamanders and California red-legged frogs should be released as soon as possible but can be held in this manner for 2 to 3 days prior to release.
- d. California tiger salamanders and California red-legged frogs shall be released at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal should be released per burrow. A maximum of three California tiger salamanders or California red-legged frogs may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Frogs and salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals or the two listed species should be released one at a time rather than en masse.

The remainder of the February 28, 2005, biological opinion is unchanged. This concludes formal consultation on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California. 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 Federal Highway Administration 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 amendment to the biological opinion for the biological opinion and conference opinion on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California, please contact Chris Nagano or John Cleckler at the letterhead address or at 916/414-6600.

Sincerely,


Cay C. Goude
Acting Field Supervisor

Mr. Gene Fong

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cc:

Todd Ellwood, CH2M Hill, Oakland, California

Craig Lawrence, CH2M Hill, Oakland, California

Dan Weinberg, CH2M Hill, Oakland, California

Scott Wilson, California Department of Fish and Game, Yountville, California

Janice Gan, California Department of Fish and Game, Yountville, California

Eric Brown, Livermore Community Development Department, Livermore, California

Bill Gray, Gray and Bowen, Walnut Creek, California

Jean Hart, Alameda County Congestion Management Agency, Oakland, California



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:
81420-2008-F-0214

NOV 5 2007

Mr. James B. Richards
Attn: Margaret Gabil
California Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to the Biological Opinion for the Effects of the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0115) on the Endangered San Joaquin Kit Fox, the Threatened California Red-Legged Frog, the Threatened California Tiger Salamander, and Vernal Pool Fairy Shrimp for the Inclusion of the Proposed Sweet Ranch Mitigation Site

Dear Mr. Richards:

This document amends the U. S. Fish and Wildlife Service's (Service) February 28, 2005, *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California (Service File Number: 1-1-04-F-0115)* for the effects of roadway improvement project located on State Route 84 on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), the threatened California red-legged frog (*Rana aurora draytonii*), the threatened California tiger salamander (*Ambystoma californiense*), and the threatened vernal pool fairy shrimp (*Branchinecta lynchi*) to included the proposed enhancement activities at the proposed Sweet Ranch mitigation site. Your request was received in our office on October 12, 2007. This amendment is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). The biological opinion was previously amended on April 21, 2005 (Service File: 1-1-04-F-0116) and again on May 2, 2007 (Service File: 1-1-07-F-0159).

The applicant wishes to amend the project description described in the biological opinion to include the habitat creation and enhancement activities at the proposed Sweet Ranch mitigation site. Caltrans proposes to use the proposed Sweet Ranch mitigation site as compensation for adverse effects to the San Joaquin kit fox, California red-legged frog, and California tiger salamander resulting from the and Pigeon Pass Curve Realignment Project. Therefore, the Sweet Ranch activities are considered as a component of the Pigeon Pass Curve Realignment Project. The Sweet Ranch will be considered for compensation by the Service when Caltrans has satisfied

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the requirements for a conservation easement, management plan, endowment, and presence of the target species within the proposed mitigation area.

This amended biological opinion is based on: (1) the *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California* (Service File Number: 1-1-04-F-0115) dated February 28, 2005, that was prepared by the U. S. Fish and Wildlife Service's (Service); (2) the *Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116), dated April 21, 2005, that was prepared by the Service; (3) the *Amendment to the Formal Section 7 Consultation for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File: 1-1-07-F-0159), dated May 2, 2007, that was prepared by the Service; (3) a letter from the California Department of Transportation (Caltrans) dated October 12, 2007, and received on October 12, 2007, requesting an amendment to the biological opinion; (4) the *Initial Habitat Assessment for the Sweet Ranch Mitigation Area in Alameda County, CA* dated May 4, 2006 and received by the Service on May 8 2006; (5) additional project description information provided via electronic mail message by USDA Natural Resources Conservation Service on October 10, 2007, and by Caltrans on October 24, 2007; and (6) other information available to the Service.

The following changes are made to the February 28, 2005, biological opinion:

1. Add to the Consultation History:

- | | |
|------------------|--|
| May 1, 2006 | The Service visited the proposed Sweet Ranch site. |
| May 8, 2006 | The Service received the <i>Initial Habitat Assessment for the Sweet Ranch Mitigation Area in Alameda County, California</i> . |
| October 10, 2007 | The USDA Natural Resources Conservation Service provided the project description for the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |
| October 12, 2007 | The Service received a request for an amendment to the biological opinion to include activities associated with the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |
| October 24, 2007 | Caltrans provided additional project description information for the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |

2. Add the following to the Description of the Proposed Action:

Sweet Ranch Conservation Site Habitat Restoration, Creation, and Enhancement

Caltrans proposes to use 97.7 acres of the approximately 100 acre Sweet Ranch property off of Patterson Pass Road as a conservation site to compensate for adverse effects to the San Joaquin kit fox, California red-legged frog, and California tiger salamander resulting from Caltrans' projects in Alameda County, including the Pigeon Pass Curve Realignment Project. The Sweet Ranch will be considered for compensation by the Service when Caltrans has satisfied the requirements for an acceptable conservation easement, management plan, endowment, and presence of the target species within the proposed conservation area. Caltrans proposes to implement habitat restoration and creation activities within 97.7 acres of the Sweet Ranch site to enhance its value for the California red-legged frog and California tiger salamander.

The proposed Sweet Ranch site is located approximately 6 miles east of downtown Livermore and 2 miles east of the University of California's Lawrence Livermore Laboratory, in the Altamont Hills region of eastern Alameda County. The site is bordered by Patterson Pass Road to the north and Cross Road to the west. The southern and eastern portions of the proposed mitigation site are bordered by private property primarily used for grazing.

The Sweet Ranch site historically was used for dry-land farming of grains and is now occupied by rolling grassland used for cattle grazing. An approximately 1 linear mile intermittent creek runs east to west and parallel to Patterson Pass Road along the northern border of the mitigation site. The riparian cover along the creek is patchy and includes willow (*salix* species), northern California black walnut (*Juglans californica* var. *hindsii*), blue elderberry (*Sambucus Mexicana*), poison oak (*Toxicodendron diversilobium*), *Eucalyptus* species, and Himalayan blackberry (*Rubus discolor*). The site also has two existing seeps and associated wetlands located along the southern edge of the creek. Caltrans refers to these two seeps as Seep East and Seep West. There is a residence on the ranch that includes a house, barn, and garage. Pacific Gas & Electric (PG&E) maintain a utility easement through the ranch site for an overhead transmission line. The area occupied by the structures and utility easement is not included in the proposed mitigation area.

General Scope of Work

The key elements of the proposed Sweet Ranch conservation site habitat restoration, enhancement, and creation activities will be completed in two phases. The activities associated with the first phase are summarized as follows:

1. Excavation of a shallow seep wetland to create a deeper water wetland/pond suitable for breeding by the California tiger salamander and the California red-legged frog.
2. Eucalyptus tree removal.

The activities included in the second phase are not included in this amendment but will be included in a future request for an amendment to the biological assessment and are summarized as follows:

1. Creation of additional seasonal wetlands in the upland Bowl Area and the Wet Meadow/Meandering Channel Wetland Creation Area.
2. Stream restoration/wet meadow creation in the lowest stream reach near the intersection of Patterson Pass and Cross Roads.
3. Restoration and enhancement of the upper reaches within the existing riparian corridor (debris removal and exotic species removal and control).
4. Boulder weir installation at along the creek to slow head-cutting and potentially expand existing in-stream wetlands.
5. Riparian planting in the lower reaches, where little riparian vegetation exists.
6. Removal and replacement of one large culvert (at the existing driveway).
7. Culvert extension and gully repair at improperly outletted existing culvert along Patterson Pass Road.
8. Construction of approximately 1-mile of boundary and pasture fencing (5-strand barbed wire) to exclude grazing of created wetlands, springs and new plantings.
9. Reconstruction of the one access road to create a finished grade with a 2 % outslope and armour the surface with drain rock to a finished compacted thickness of 6" to reduce erosion and allow vehicle access for monitoring and making repairs in wet weather.

10. Installation of one corral from portable fencing panels and a chute for working livestock.
11. Reconstruction of two high capacity springs and outfencing.
12. Establishing a domestic water supply well on the caretaker residence parcel (outside of the easement) and modifying the current water supply system to service only the wetlands and riparian plantings.

Construction Activities

Western Seep/Spring Pond Creation Area

Activity at this location will include the creation of a pond/wetland that will be fed by an existing seep to create breeding habitat for the California tiger salamander and the California red-legged frog. The existing seep/spring in this area drains through a slightly depressed wetland area towards a bare ground area that is currently occupied by livestock watering troughs. The area around the troughs is heavily impacted by cattle. According to the property owner, this seep/spring is perennial and was once used to supply water to the residence on-site. Caltrans plans to excavate a deep-water pond below Seep West, in an area of bare ground lying south of the Bowl Area creation site. The seep wetland disappears in this area with the water infiltrating below the surface towards the creek. Caltrans' goal is to bring that water to the surface through excavation, allowing flow through to the creek. The maximum pond depth will be three feet, the footprint will be less than 4,000 square feet (0.09 acres), and the net amount of excavated soil will be approximately 200 cubic yards. The pond will be over-excavated approximately one foot and clayey soil re-compacted to form a dense liner. The excavated soil will be stockpiled for use during phase 2 activities at a location away from the creek and outside the path of any surface water flow. The pond creation will not include the construction of a dam, therefore the water should not concentrate in any particular area if the pond overflows. The area where the pond will be constructed is almost flat and there is no existing evidence of concentrated flow. Downhill from the pond there is a grassed path by which surface water drains to the creek; the pond will be graded so that the overflow pattern is not altered, and any overflow would be expected to continue down the grassed swale to the creek. This pond creation would also include a wetland fringe and, potentially, riparian plantings. In phase 1, the western seep/spring would be out-fenced with permanent fencing to exclude livestock. The newly created pond will be out-fenced with permanent fencing in phase 2.

Equipment used would include a bulldozer and/or a small excavator. Work will take place in the timeframe of October 22 to November 1, 2007. The work will take approximately 1 to 2 days to complete. After excavation, a five-foot-wide fringe around the pond will be seeded with a mixture of mugwort (*Artemisia douglasiana*), meadow barley (*Hordeum brachyantherum*), creeping wildrye (*Leymus triticoides*), and blue-eyed

grass (*Sisyrinchium bellum*). Plugs of appropriate wetland species may be planted in the Fall/Winter 2008 to create transitional vegetation around the pond.

Eucalyptus Tree Removal

Caltrans plans to remove four mature Eucalyptus trees from the eastern section of the riparian corridor on the Sweet Ranch site. The Eucalyptus trees will be removed with a crane or excavator, working from either Patterson Pass Road or the Sweet Ranch side of the creek. The trees will be cut, removed, and the stumps directly treated with glyphosphate. Work will take place in the timeframe of October 22 to November 1, 2007. The work will take approximately 1 to 2 days. If necessary, on-going maintenance may include follow-up glyphosphate treatments to the stumps. Replanting with appropriate native trees will occur during Fall 2008 and will be included in a subsequent amendment to the Pigeon Pass Biological Opinion.

Permanent vs. Temporary Effects

For the Sweet Ranch activities, Caltrans describes the permanent effects on listed species habitat as those areas where the character and function is changed or enhanced as a result of the proposed activities. As a result of the proposed activities, habitat characters and values will change but there will be no loss of listed species habitat. These are areas that might be subject to vegetation removal and extensive soil disturbance due to excavation, grading or placement of dirt fill, or to lesser degrees of disturbance due to creation of temporary access roads, use of staging areas with storage of construction materials and parking heavy equipment. Areas subject to temporary disturbance will be restored so that they once again support vegetation and provide wildlife habitat.

Construction Site Restoration

Caltrans plans to restore areas of temporary ground disturbances, including storage and staging areas, and temporary roads. These areas will be re-contoured, if appropriate, and revegetated with seeds and/or cuttings of appropriate plant species to promote restoration of the area to pre-project conditions. Caltrans will be developing a restoration plan that will be submitted to the Service for approval prior to initial ground breaking. According to Caltrans, to the maximum extent practicable (i.e., presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of listed animal species.

Proposed Conservation Measures

Caltrans proposes to avoid and minimize effects to listed species during the Sweet Ranch activities by implementing the measures prescribed for the Pigeon Pass Curve Realignment project and included in the original biological opinion.

Maintenance and Monitoring

Maintenance and monitoring of the Sweet Ranch Conservation Site will be performed by the Alameda County Resource Conservation District. Maintenance activities are expected to include repeat hand removal or herbicide treatment of Eucalyptus, fence maintenance, watering of plantings, and removal of any exotic plant species that may invade the pond. Monitoring will include qualitative and quantitative measures of plant establishment and invasive species reduction, pond water level assessment, and surveys in the pond and surrounding grassland for the California tiger salamander and California red-legged frog.

Reporting

Reporting will be done by the Alameda County Resource Conservation District. Construction and monitoring activities will be documented and monitoring reports will be forwarded to the Service annually for up to 5 years. The first monitoring report will be due no later than December 31st, one year after completion of phase 1, and annually every December 31st for each consecutive monitoring season. An annual report describing construction activities and maintenance and monitoring operations will be submitted to the Service for up to 5 years.

3. Change the first paragraph on page 23 under the Status and Environmental Baseline section for the San Joaquin kit fox from:

Suitable kit fox habitat in the form of grasslands is abundant in the action area, and contiguous within a 10-mile radius of the project (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest kit fox sighting to the proposed project is approximately 5 miles from the project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the project, as well as the nearby observations of this listed species.

TO:

Suitable kit fox habitat in the form of grasslands is abundant in the action areas for the road project and Sweet Ranch enhancement project, and contiguous within a 10-mile

radius of the projects (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest documented kit fox sighting is approximately 5 miles from the road project site and 1 mile from the Sweet Ranch project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius from either project location. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area of the road project and Sweet Ranch because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the projects, as well as the nearby observations of this listed species.

4. Add the following after the last paragraph under the Status and Environmental Baseline section for the California tiger salamander on page 29:

The proposed Sweet Ranch mitigation site is primarily characterized by rolling annual grassland habitat actively grazed by cattle. The site includes numerous active ground squirrel and other small mammal burrows appropriate for tiger salamander occupation. The Sweet Ranch is private property surrounded by extensive and contiguous rangeland with little disturbance or development.

The California Natural Diversity Database includes a California tiger salamander record approximately 1 mile west of the proposed Sweet Ranch mitigation site and a second breeding pond occupied by the species approximately 1,000 feet from the northern boundary of the proposed mitigation site. Although there are currently no potential breeding ponds on the proposed mitigation site, the site does provide likely upland habitat for California tiger salamanders and creation of a suitable and sustainable breeding pond on the site would likely enhance the local habitat value. The Service has determined it is reasonable to conclude the California tiger salamander inhabits the Sweet Ranch project area, based on the biology and ecology of the species, the presence of suitable habitat, as well as nearby observations of this animal.

5. Change the last paragraph under the Status and Environmental Baseline section for the California red-legged frog on page 35 from:

There are several recent sightings of the California red-legged frog in the action area and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy

shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds. Areas containing aquatic and upland habitat exist within and adjacent to the action area (Nagano pers. obs. November 2004). The action area contains components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

TO:

There are several recent sightings of the California red-legged frog in the action area for the road project and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds.

The proposed Sweet Ranch includes California red-legged frog habitat in the unnamed intermittent creek dominated by dense riparian vegetation and along the lower terraces. The riparian habitat and surrounding grasslands offer dispersal, foraging, and aestivation habitat. The frog species has been recorded less than 1 mile away from the Sweet Ranch project area and a likely breeding pond supporting the California tiger salamander occurs within 1,000 feet of the north boundary of the property.

Areas containing aquatic and upland habitat exist within and adjacent to the action area for both projects (Nagano pers. obs. November 2004; Cleckler pers. obs. May 2006). The action area for both projects contain components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area for the road project and the Sweet Ranch project because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

6. Change the second paragraph under the Effects of the Proposed Action section from:

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within two seasons. Ground disturbance resulting from the proposed Pigeon Pass Project includes substantial grading, excavating, and fill. The California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than two seasons after the construction of the project is completed. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

TO:

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within one year of initial disturbance. Ground disturbance resulting from the proposed Pigeon Pass Road Construction Project includes substantial grading, excavating, and fill. Ground disturbance resulting from the proposed phase 1 habitat enhancement activities at the Sweet Ranch property includes equipment access, excavation, and fill stockpiling.

For the road construction project, the California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than one year after the initial ground disturbance. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and

revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland.

7. Change the first paragraph under the San Joaquin kit fox section of the Effects of the Proposed Action section on page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The proposed phase 1 activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and result in possible construction-related harassment of an unknown number of San Joaquin kit foxes.

8. Change the first paragraph under the California tiger salamander section of the Effects of the Proposed Action section on page 54 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities.

Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California tiger salamander. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders.

9. Change the first paragraph under the California red-legged frog section of the Effects of the Proposed Action section on page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. Activities may result in construction related harassment and the death of an unknown number of red-legged frogs.

10. Change the first paragraph under the vernal pool fairy shrimp section of the Effects of the Proposed Action section on page 59 from:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

TO:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed road project would directly

eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County. The proposed phase 1 activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp.

11. Change the Amount or Extent of Take section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is

unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often is extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size, Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all San Joaquin kit foxes inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all California tiger salamanders inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take during the enhancement activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. In addition, all California red-legged frogs inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take during the enhancement activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or napulai are difficult to located in the vernal pools and seasonal wetlands; and the finding

of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

This concludes the reinitiation of the formal consultation on the Pigeon Pass Curve Realignment Project. 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.

If you have any questions regarding this amendment to the biological opinion for the Pigeon Pass Curve Realignment Project, please contact John Cleckler, Ryan Olah, or Chris Nagano of my staff at (916) 414-6625.

Sincerely,



Cay C. Goude
Acting Field Supervisor

cc:

Jeff Jensen, California Department of Transportation, Oakland, California
Margaret Gabil, California Department of Transportation, Oakland, California
Cheryl Davis, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
Dan Gifford, California Department of Fish and Game, Lodi, California

Janice Gan, California Department of Fish and Game, Yountville, California
Carl Wilcox, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Warden Nicole Kozicki, California Department of Fish and Game, Yountville, California



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:
81420-2008-F-0214-2

APR 17 2008

Mr. Jim Richards
Attn: Alison Graff
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California.

Dear Mr. Richards:

This letter is an amendment to the Biological Opinion and Conference Opinion issued for the Pigeon Pass Curve Realignment Project located in Alameda County, California. At issue are the effects of the project on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and proposed critical habitats for the California red-legged frog and the California tiger salamander. This amended biological and conference opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California* (1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0268) dated July 20, 2007; (4) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated April 1, 2008; (5) correspondence between Alison Graff (Caltrans), Margaret Gabil (Caltrans), Derek Jansen (URS Corporation), and Jerry Roe (Service) between March 27, 2008 and April 16, 2008 concerning the installation of 6,593 feet of underground phone line to restore phone service to the Mullenex residence located at 2980 Vallecitos Road; and (6) other information available to the Service.

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The following changes are made to the February 28, 2005 Biological Opinion and Conference Opinion:

1. Add the following to the **Consultation History**:

March 27, 2008 to April 16, 2008	Email correspondence between the Service and Caltrans discussing restoration of phone service to Mullenex, residence.
April 4, 2008	Jerry Roe (Service) visited the proposed project site with biological monitor Derek Jansen (URS Corporation) to evaluate the action area and determine the extent of impacts to listed species and critical habitat.

2. Add the following to the **Description of Proposed Action**:

Installation of an Underground Phone Line to a Single-Family Residence Located at 2980 Vallecitos Road, Livermore, California

General Scope of Work

During construction at the Pigeon Pass Curve Realignment Project in 2007, Caltrans inadvertently disrupted phone service to the Tiffin Mullenex residence located at 2980 Vallecitos Road, Livermore, California. Caltrans proposes to reconnect phone service by installing a new underground phone line to the residence. The phone line will be constructed from station 79+40 southwest to the Mullenex driveway and will run along the west side of State Route 84 (SR 84). It will pass under SR 84 and the new alignment currently under construction, and will continue along the northern side of the driveway to the residence.

Construction Activities

Approximately 6,593 feet of 2-inch c-pc (Schedule 40) conduit and fifteen 30 x 48 x 34 inch pull boxes with traffic covers will be installed. The conduit will be placed at the bottom of a trench 24 inches deep and 6 to 12 inches wide, with the midline of the trench placed 30 inches off the edge of pavement. The pull boxes will be placed such that the side furthest from the road will lay 40 inches from the edge of pavement. Where the line crosses the existing SR 84 to the Mullenex property, the conduit will be placed in a trench as previously described, or through a 130-foot bore hole. The trench will be excavated with a trencher or excavator and backfilled with the excavated earth as the phone line is laid down; no part of the trench will be left unfilled during the construction period. After the trench is backfilled, the fill soil will be compacted with a hand-held compactor (jumping jack) or small roller. All work will be performed either by the Contractor for the road project or a subcontractor. Installation of the line is expected to begin in early April 2008 and will take two weeks to complete. Work will be done during the daytime and no work will take place in the rain or when the soil is excessively moist.

A total length of 1,181 feet of trench will be located inside the cut and fill area described in the Biological Opinion and Conference Opinion dated February 28, 2005 for the Pigeon Pass Curve Realignment Project, and 5,412 feet will be located outside of the cut and fill area. Of the 5,412 feet located outside of the cut and fill area, 2,000 feet will be located along the driveway on the Mullenex property and 3,412 feet will be located within the existing SR 84 right-of-way. Three pull boxes will be located inside the cut and fill and 12 will be located outside the cut and fill area on the SR 84 right-of-way and the Mullenex property.

Permanent and Temporary Effects

Installation of the conduit and pull boxes will disturb approximately 6,734 square feet (0.15-acre) of ruderal and grassland habitat. The Contractor will restore all excavated surfaces over the trench to original or better condition. Trenching and conduit installation will account for 6,593 square feet (0.15-acre) of temporary disturbance. The pull boxes will account for 150 square feet (0.003-acre) of permanent disturbance, since they will replace earthen areas with impermeable surfaces. The area of ground disturbance inside and outside of the project cut and fill lines is shown in Table 1.

Table 1. Area of Ground Disturbance from Phone Line Installation.

Type of Affect	Inside Existing Cut and Fill	Outside Existing Cut and Fill	Total
Trench (Temporary Affect)	1,181 ft ² (0.03 ac)	5,412 ft ² (0.12 ac)	6,593 ft ² (0.15 ac)
Pull Boxes (Permanent Affect)	30 ft ² (0.0007 ac)	120 ft ² (0.003 ac)	150 ft ² (0.003 ac)
Total	1,211 ft² (0.03 ac)	5,532 ft² (0.12 ac)	6,743 ft² (0.15 ac)

Where the trench parallels the Mullenex driveway and turns north towards the residence, it will be excavated in ruderal annual grassland that forms the upland associated with the Mullenex pond. This pond currently supports a breeding population of California tiger salamanders (*Ambystoma californiense*). Approximately, 2,000 feet of the trench and four pull boxes will be located within this upland area, resulting in 2,000 feet of temporary impacts and 40 square feet of permanent impacts outside of the project cut and fill. Where the trench parallels SR 84, it will be located on the shoulder or toe of the slope in highly disturbed ruderal habitat. The toe of slope along this stretch of highway is characterized by tire ruts, gravel, trash, areas of steep banks, and non-native invasive plant species. No small mammal burrowing activity was observed. Along the highway shoulder 1,584 feet to be trenched borders the Ruby Hills mitigation area within disturbed ruderal roadside habitat, 180 feet of which lies within the cut and fill for the Pigeon Pass Curve Realignment Project.

Proposed Conservation Measures

There is the potential that animals may be disturbed or harmed during the installation of the phone line. To avoid this possibility, Caltrans will observe all of the avoidance and minimization measures set forth in the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, including the presence of a biological monitor during all excavation and fill activities. Because all trenches will be backfilled immediately following excavation, Caltrans is proposing to work without erecting Environmentally Sensitive Area (ESA) fencing in the areas outside of the cut and fill for the project. If a burrow is encountered during trenching, the monitor will excavate it by hand to determine whether California tiger salamanders are present. If an animal is found, it will be relocated to the Ruby Hills mitigation area, as per the Biological Opinion. Upon completion of the project, the Contractor will restore all excavated surfaces over the trench to original or better condition.

3. The following additions are made to the **Avoidance and Protection Measures -- Listed Species** on page 6:
 14. All California red-legged frogs and California tiger salamanders encountered in the action area will be relocated to Ruby Hills or a Service-approved location. The written authorization of the Service shall be obtained by the California Department of Transportation prior to transporting California tiger salamanders and/or California red-legged frogs to a location other than the approved translocation site (*i.e.*, individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service).
 15. The Service-approved biologist(s) will use nets or their bare hands to capture California red-legged frogs and California tiger salamanders at the project site. The Service-approved biologist(s) will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two (2) hours before and during periods when they are capturing and relocating either of these two listed species.
 16. Prior to trenching, vegetation along the trench line shall be mowed to a width not to exceed 60 inches measured from edge of pavement to facilitate locating burrows, California tiger salamanders, and California red-legged frogs that may be present within the action area. The biological monitor shall perform clearance surveys within the area to be cleared immediately prior to mowing and shall be onsite during all activities that could result in take.
 17. Trenching and installation of conduit and pull boxes shall be constructed in a manner not to exceed the length that can be trenched, conduit installed, and backfilled in a single day. All trenches shall be backfilled by the end of work each day; no trenches shall be left open overnight.
 18. No work shall occur during or following 24 hours of rain events.
 19. The biological monitor shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying what species, including general wildlife species, were encountered, including the time and location when such species were found; (3) the time the specimen was identified

and by whom and its condition; and (4) a description of any actions taken. The biological monitor shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service upon request. All monitoring records shall be provided to the Service upon completion of the monitoring work.

20. Following completion of the work, erosion control measures shall be implemented for all disturbed areas, which may include reseeding using a noxious weed free native seed mix, hydroseeding, jute matting, or tackifying agents to stabilize soils, control dust and prevent erosion.

4. The following addition is made to the **Terms and Conditions** on page 71:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, and/or California red-legged frog. The number of Service-approved biologists who are on site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.
27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders and California red-legged frogs shall be done with hand tools whenever possible. The depth to which these two amphibians are found depend on the burrow-specific conditions. Excavation should extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found should be recorded whenever possible and the information should be provided to the Service and the California Department of Fish and Game.
 - a. Upon capture, individual California tiger salamanders and California red-legged frogs should be placed in a clear plastic container (*i.e.*, Tupperware® or Rubbermaid®) of suitable size (*e.g.*, enough room so the animal is not unnecessarily inhibited in its movements). The container should be kept moist with damp paper towels, ¼-inch or ½-inch soft foam rubber, or soap-free natural or synthetic sponges. The lids of the containers should have small air holes for ventilation. If possible, only one frog or salamander should be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container; however, the two listed species or the same species of significantly different sizes or life history stages shall not be mixed in order to avoid injury or depredation. Individuals should never be so crowded that they are touching one another. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.
 - b. Individual plastic containers containing salamanders or frogs should be held in an ice chest. Ice packs should be placed on top of the containers to maintain a cool temperature comparable to a refrigerator. The ice chests shall be kept in a cool, dark, quiet, secure place.

- c. California tiger salamanders and California red-legged frogs should be released as soon as possible, but can be held in this manner for 2 to 3 days prior to release.
- d. California tiger salamanders and California red-legged frogs shall be released at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal should be released per burrow. A maximum of three California tiger salamanders and California red-legged frogs may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Frogs and salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals or the two listed species should be released one at a time rather than en masse.

5. Change the **Conclusions** on page 61 from:

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed. The Service reached the conclusion on the effects on the proposed critical habitat of the California red-legged frog and the California tiger salamander because the effects of the project will be offset by the conservation measures in the project description, including the successful restoration of areas subject to the temporary effects of cut and fill to pre-project conditions.

To:

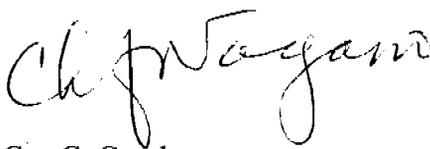
After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated on February 10, 2006 (Federal Register 71: 7117-7167); however none is located in the action area, and therefore none will be affected by the proposed project. On August 23, 2005, the Service issues the final rule for the critical habitat of the Central California population of the California tiger salamander (Federal Register 70: 49379-49458) and critical habitat for the California red-legged frog on April 13, 2006 (Federal Register 71: 19243-19346). Proposed Unit ALA-1C for the California red-legged frog, and Proposed Critical Habitat Unit 4 for the California tiger salamander was not included in the final

critical habitat designations for these two listed species. Therefore, the Pigeon Pass Curve Realignment Project will not result in effects to any proposed or designated critical habitat.

The remainder of the February 28, 2005 Biological Opinion and Conference Opinion is unchanged. This concludes formal consultation on the State Route 84 Pigeon Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation 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 re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe, Endangered Species Biologist, (Jerry_Roe@fws.gov) or (Chris_Nagano@fws.gov) at the letterhead address or at telephone (916) 414-6600 if you have any questions.

Sincerely,


 Cay C. Goude
Acting Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Marcia Grefsrud, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Liam Davis, California Department of Fish and Game, Yountville, California
Melissa Escaron, California Department of Fish and Game, Yountville, California



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:
81420-2008-F-0214-3

OCT 29 2008

Mr. Jim Richards
ATTN: Alison Graff
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for Compensation Activities at Sycamore Grove Regional Park, Livermore, Alameda County, California.

Dear Mr. Richards:

This is in response to your August 18, 2008, request for reinitiation of formal consultation to amend the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No. 1-1-04-F-0115) issued on February 28, 2005. This amendment addresses riparian habitat restoration compensation activities at Sycamore Grove Regional Park located in the City of Livermore, Alameda County, California. This document represents the amended Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and critical habitats for the California red-legged frog and California tiger salamander. This amended biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*) (Act). The biological opinion was previously amended on April 21, 2005 (1-1-04-F-0116), May 2, 2007 (1-1-07-F-0159), July 20, 2007 (1-1-07-F-0268), November 5, 2007 (81420-2008-F-0214), and April 17, 2008 (81420-2008-F-0214-2).

This amended biological and conference opinion is based on: (1) Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California (Service File No. 1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) Amendment to the Biological

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Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-07-F-0159) dated May 2, 2007; (4) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-07-F-0268) dated July 20, 2007; (5) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 81420-2008-F-0214) dated November 5, 2007; (6) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California (Service File No. 81420-2008-F-0214-2) dated April 17, 2008; (7) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated August 18, 2008; (8) Proposal for Riparian Vegetation Establishment at Sycamore Grove "Drainage E" revision dated July 03, 2007; (9) correspondence between Alison Graff (Caltrans), and Jerry Roe (Service) between July 31, 2008 and August 19, 2008; (10) site visit conducted with the Natural Resources Conservation Service, Caltrans, Livermore Area Recreation and Park District (LARPD), and the Service on August 7, 2008; (11) request to include additional conservation measures for Alameda whipsnakes; and (12) other information available to the Service.

The following changes are made to the February 28, 2005 Biological Opinion and Conference Opinion:

1. Add the following to the **Consultation History**:

July 31, 2008 to October 9, 2008	Email correspondence between the Jerry Roe of the Service, and Alison Graff of Caltrans, regarding the proposed compensation activities at Sycamore Grove Regional Park.
August 7, 2008	Jerry Roe of the Service visited the proposed riparian compensation area at Sycamore Grove Regional Park with Jackie Charbonneau of NRCS, Pete Van Hoorn of ACRCDD, Michael Nicholson of LARPD, Alison Graff of Caltrans.
August 18, 2008	The Service received a request from Caltrans to amend the biological opinion via electronic correspondence.
September 3, 2008	The Service received a request from Caltrans to add Conservation Measures for Alameda whipsnake into the Sycamore Grove project description.
September 29, 2008	The Service sent the draft amendment to the biological opinion to Caltrans for review.
October 8, 2008	The Service received comments from Caltrans for the draft amendment to the biological opinion.

2. Add the following to the **Description of Proposed Action**:

Project Summary

The California Department of Transportation (Caltrans) proposes to restore riparian habitat along an unnamed drainage at Sycamore Grove Regional Park as partial compensation for effects to riparian habitat for the Pigeon Pass Curve Realignment Project, pursuant to the requirements of permits from the California Department of Fish and Game (DFG) and the California Regional Water Quality Control Board (RWQCB). Sycamore Grove Regional Park is owned and managed by the Livermore Area Regional Parks District (LARPD). The design and implementation of the proposed compensation activities will be undertaken by the Alameda County Resource Conservation District (ACRCD), in cooperation with the Natural Resources Conservation Service (NRCS).

The area to be planted, Drainage E, consists of 3 acres inside and along a 2,660-foot (ft) grass-lined drainage with ephemeral water flow. Based on the seasonally arid conditions at the site, the ACRCD proposes to revegetate the drainage with a suite of drought tolerant riparian tree and shrub species, primarily valley oaks (*Quercus lobata*) and mulefat (*Baccharis salicifolia*), as well as many species characteristic of a riparian and upland ecotone. The planting plan will consist of both individual design plantings of trees and shrubs and clustered plantings of shrubs and herbaceous species. Long-term, the desired outcome is a naturalistic-looking corridor of valley and coast live oaks, other trees and shrubs, and a persisting and diverse native component in the understory. Work began in February 2008 with the planting of 270 acorns in 90 clusters. A total of approximately 1,400 plants will be installed over the life of the project in hand-dug holes 10 to 18 inches deep and 2 to 4 inches in diameter.

The project will include an irrigation system for plant establishment that will consist of a buried pipeline running from an existing developed spring to a holding tank and from the holding tank to the planting area. Above-ground lines will deliver water from the buried pipe to the plantings. Trenching for the buried lines will be approximately 18 inches deep, 6 inches wide, and 3,660 ft long and will follow existing maintenance roads except for a short portion running down a hillside from the proposed holding tank. The buried pipe will have a maximum diameter of 3 inches. The tank will be installed close to the ridgeline of a low hill, next to an existing road, and will require a 10 foot x 10 foot gravel or concrete pad.

Environmental Setting

The project site is dominated by California non-native annual grassland. It was historically dry-farmed up to the edge of each bank and much of the soil in the drainage appears to be unconsolidated material that was pushed in when the surrounding fields were tilled. Perhaps due to this, the channel is head-cutting and slumping in several places. There is a high level of ground squirrel activity.

Project Schedule

Irrigation system installation is scheduled to occur between May 1 and October 15, 2009. The remaining plantings are scheduled for installation in the fall and early winter of 2008-2009 or 2009-2010, contingent upon the execution of the Cooperative Agreement.

Equipment Used

A bobcat, dump truck, mower, trencher, and hand labor will be required for the installation of the irrigation system. All plantings will be installed using hand labor. A small four-wheel drive utility vehicle will be used for maintenance activities.

Locations of Staging Areas/Access Roads

The staging area for installing the irrigation system will be located in a flat area adjacent to an existing gravel road. This area currently supports California annual grassland. Access to all planting areas will be made via an existing grassy maintenance road.

Construction Site Restoration

All temporary ground disturbances will be restored to pre-project conditions.

Permanent Erosion Control Measures

To control erosion, any trenched area along a slope will be re-seeded using a site-appropriate erosion control seed mix consisting of native grass species and sterile straw will be applied.

Proposed Avoidance and Minimization Measures

The tank pad and trenching locations will be mowed prior to groundbreaking. Prior to mowing and again prior to groundbreaking, an on-site biologist permitted to handle California tiger salamander and California red-legged frog will clear the area. The on-site biologist will be present during all ground-disturbing activities. He/she will inspect trenches before they are filled. Trenches will be filled as the pipe is laid, with no trenches left open overnight.

3. The following additions are made to the **Avoidance and Protection Measures – Listed Species** on page 6:
 14. If California red-legged frogs or California tiger salamanders are encountered in the action area, work within the immediate vicinity should cease immediately and the Service-approved biologist shall be notified. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the California red-legged frog(s) or California tiger salamander(s), the individual(s) shall be left at the location of discovery and monitored by the Service-approved biologist. All project personnel shall be notified of the finding and at no time shall work occur within the vicinity of the listed species without a biological monitor present. If it is determined by the Service-approved biologist that relocating the California red-legged frog(s) or California tiger salamander(s) is necessary, the individual(s) shall be relocated to the nearest suitable habitat within Sycamore Grove Regional Park approved by the Service. Prior to transporting California tiger salamanders or California red-legged frogs to a location other than this approved site (*i.e.*, individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service), written authorization of the Service shall be obtained by the California

Department of Transportation, the Alameda County Resource Conservation District, or the Natural Resources Conservation Service.

15. If California red-legged frogs or California tiger salamanders are encountered in the work area, the Service-approved biologist(s) shall capture California red-legged frogs and California tiger salamanders at the project site by hand, dipnet or other Service-approved methodology. Prior to handling, the Service-approved biologist(s) shall thoroughly wash their hands with soapy water. Oils, creams, lotions, repellents, or solvents of any sort shall not be used within two (2) hours before and during periods when capturing and relocating will occur. Handling of California red-legged frogs and California tiger salamanders shall be minimized to the maximum extent practicable. Immediately following handling, California red-legged frogs and California tiger salamanders shall be placed in a holding container, rinsed with freshwater, transported, and released as soon as practicable the same day of capture.
16. Prior to trenching, vegetation along the trench line shall be mowed to the width necessary to accommodate the trenching equipment and a walking buffer to facilitate locating and avoiding burrows, California tiger salamanders, and California red-legged frogs that may be present within the action area. The biological monitor shall perform clearance surveys within the area to be cleared immediately prior to mowing and shall be onsite during all irrigation installation activities that could result in take, *i.e.* mowing, trenching, vehicular access, *etc.* The biological monitor does not have to be present on site during hand digging of holes or plant installation, but shall be available by phone if a listed species is observed on site.
17. Trenching and installation of irrigation conduit shall be constructed in a manner not to exceed the length that can be trenched, irrigation conduit installed, and backfilled in a single day. All trenches shall be backfilled by the end of work each day; no trenches shall be left open overnight.
18. No work shall occur during or 24 hours following rain events.
19. The biological monitor shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying what species, including general wildlife species, were encountered, including the time and location when such species were found; (3) the time the specimen was identified and by whom and its condition; and (4) a description of any actions taken. The biological monitor shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service upon request. All monitoring records shall be provided to the Service upon completion of the monitoring work.
20. Following completion of the work, erosion control measures shall be implemented for all disturbed areas, which may include reseeding using a noxious weed free native seed mix, hydroseeding, jute matting, or tackifying agents to stabilize soils, control dust and prevent erosion.

4. The following additions are made to the **Avoidance and Protection Measures – Listed Species** on page 6:

Avoidance and Protection Measures – Alameda whipsnake

1. A biological monitor will be present during the construction of the water tank pad and all trenching and backfilling activities and will have oversight over implementation of these measures. The biological monitor will have the authority to stop project activities, through communication with the Alameda County Resource Conservation District and the Operator, if any of these measures are not being fulfilled and if the Alameda whipsnake or any other listed species are encountered. If the biologist has requested work to stop due to observation or take of any of the listed species, the Service and the California Department of Fish and Game will be notified within one (1) working day via email or telephone for instructions.
2. A pre-construction survey will be conducted by a biological monitor within the immediate area of construction and where equipment and construction activities will be located. Any work will be delayed and the Service will be contacted if an Alameda whipsnake is encountered.
3. Prior to construction, a biologist will educate construction workers about the Alameda whipsnake and how to avoid them. If a snake is detected during construction, work will halt and the onsite biological monitor will be notified to identify the snake. If the biologist determines that the animal may be an Alameda whipsnake, a Service-approved specialist will be called in to verify the species' identity. If the animal is determined to be an Alameda whipsnake, the snake will be allowed to leave the site passively and the Service will be contacted prior to any additional work.
4. Snake exclusionary fencing shall be erected around the boundaries of the water tank pad construction area and shall be installed prior to the initiation of construction and shall remain in place until all construction equipment is removed from the site. No project activities will occur outside the exclusionary fencing. Exclusionary fencing shall be installed in the following manner:
 - Exclusion fencing shall be a minimum of 36 inches in height and buried to a minimum depth of 4 inches, backfilled, and compacted to prevent snake from passing under the fence in any areas;
 - Fence stakes shall be placed on construction side of the fence (opposite the normal requirement for sediment control);
 - The fencing shall be erected along the work boundaries adjacent to suitable habitat as determined by the Service and DFG. The fence shall be installed with loop-arounds at the ends and at any access openings needed in the fencing in order to redirect the snakes away from the area. Loop-arounds shall be created by installing the last 10 feet of the fence in the shape of a narrow "u" so that parallels to the main fence and forms a space separated by no more than 12-18 inches;

- Fences must be inspected regularly to ensure the integrity of the fence is maintained. Repairs shall be made immediately following discovery.
 - These fences must be maintained through out the Alameda whipsnake's entire active period (March 1 – November 1) or until all construction and landscaping activities have been completed, whichever occurs first. If the project continues into more seasons, fencing must be maintained during the snake's active season until project completion;
 - Additional sediment control fencing may be required as part of other agency permit conditions.
5. Prior to construction of the water tank pad and excavation of the trench, the construction area will be mowed. A qualified biologist will walk ahead of the mower to clear the area prior to mowing.
 6. A qualified biologist will perform a clearance survey before pad construction and trenching commence.
 7. To prevent inadvertent entrapment of Alameda whipsnakes during construction, the trench will be backfilled as the water pipe is installed. No trenches will be left open overnight.
5. The following additions are made to the **Status of Species/Environmental Baseline** after the first paragraph under **San Joaquin Kit Fox** on page 23:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the San Joaquin kit fox and provides suitable habitat for this species. San Joaquin kit fox have the potential to use habitat within the action area for denning, foraging, or dispersal.

6. The following additions are made to the **Status of Species/Environmental Baseline** after the second paragraph under **California Tiger Salamander** on page 29:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the California tiger salamander and provides suitable habitat for this species. There are known occurrences of California tiger salamanders in livestock ponds located on LARPD property within 0.5-mile of the compensation site. This species may use the action area for aestivation, foraging, and dispersal. California tiger salamanders may be present in rodent burrows or deep cracks in the soil, given that ground disturbance will occur within dispersal distance of the nearby ponds.

7. The following additions are made to the **Status of Species/Environmental Baseline** after the second paragraph under **California Red-Legged Frog** on page 35:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the California red-legged frog and provides suitable habitat for this species. There are known occurrences of California red-legged frog in livestock ponds located on LARPD property within 0.5-mile of the compensation site. This species may use the compensation area for foraging and dispersal. California red-legged frogs are not expected to be present in the action area during the dry season when the irrigation system will be installed.

8. The following additions are made to the **Status of Species/Environmental Baseline** after the first paragraph on page 44:

STATUS OF THE SPECIES

Alameda Whipsnake

The Alameda whipsnake was federally listed as threatened on December 5, 1997, (Service 1997). The animal was listed as threatened by the State of California in 1971. Approximately 406,598 acres of critical habitat was designated for the Alameda whipsnake within Contra Costa, Alameda, Santa Clara, and San Joaquin counties on October 3, 2000 (Service 2000). The critical habitat was vacated and remanded on May 9, 2003; proposed again on October 18, 2005; and designated on October 2, 2006 (Service 2006). A draft Alameda whipsnake recovery plan was included in the *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California*, issued in November 2002 (Service 2002).

Description: The Alameda whipsnake is a slender, fast-moving, diurnal snake with a narrow neck and a relatively broad head with large eyes. The snake's dorsal surface is sooty black with distinct yellow-orange stripes along each side. The coloration of the snake's ventral surface varies along its length: the anterior portion is orange-rufous; the midsection is cream colored; and the posterior and tail are pinkish. Adults range in length from 3 to 4 feet (Service 1997).

The Alameda whipsnake is one of two subspecies of California whipsnake (*Masticophis lateralis*). The Alameda whipsnake (*M. l. euryxanthus*) is distinguished from the other subspecies, the chaparral whipsnake (*M. l. lateralis*), by its sooty black dorsum; wider lateral yellow-orange stripes; the lack of a dark line across the rostral; an uninterrupted light stripe between the rostral and eye; and the virtual absence of spotting on the venter of the head and neck.

Distribution: The Alameda whipsnake inhabits the inner Coast Ranges in western and central Contra Costa and Alameda counties (Jennings 1983; McGinnis 1992; Swaim 1994) where it is found in a variety of vegetation communities including chamise-redshank chaparral, mixed chaparral, coastal scrub, annual grassland, blue oak-foothill pine, blue oak woodland, coastal oak woodland, valley oak woodland, eucalyptus, redwood, and riparian (CDFG 2008).

Habitat Requirements: Scrub and chaparral communities are the primary habitat types essential for providing space, food, and cover necessary to sustain all life stages of the Alameda whipsnake. Associated scrub habitat typically consists of Diablan sage scrub, coyote bush scrub, and chamise chaparral (Swaim 1994), and is also classified as coastal scrub, mixed chaparral, and chamise-redshank chaparral (CDFG 2008). Swaim (1994) found that core scrub habitat areas (areas of concentrated use by Alameda whipsnakes, based on telemetry and trapping data) tended to occur on east, southeast, south or southwest facing slopes and were within 500 feet of open or partially-open canopy or grassland habitat. Alameda whipsnakes have also been found in open chaparral stands with a northern exposure (K. Swaim, Swaim Biological Consulting, personal communication with the Service 2004). As a result of incidental observations and trapping surveys, Alameda whipsnakes have been discovered greater than 600 feet and as much as 21,600 feet from primary scrub and chaparral habitat (K. Swaim, Swaim Biological Consulting, personal communication with the Service 2004).

Alameda whipsnakes are also known to use other habitat types adjacent to their primary scrub and chaparral habitat. McGinnis (1992) has documented Alameda whipsnakes using oak woodland/grassland habitat as a corridor between stands of northern coastal scrub. Grassland habitats appear to be used extensively by male Alameda whipsnakes during the spring mating season (Swaim 1994). Females appear to use these grassland areas more extensively after mating (Swaim 1994), possibly looking for suitable egg-laying sites or for dispersing to other scrub habitat (K. Swaim, Swaim Biological Consulting, personal communication with the Service, 2002). Alvarez et al. (2005) indicated that Alameda whipsnakes use a broader association of habitats including annual grassland, oak woodland, riparian and other non-native and disturbed open habitats at distances averaging 1,041 m (0.6-mile) and exceeding 7,300 m (4.54 miles) from chaparral/scrub plant communities based on occurrence data analyzed from 1948 to 2004. Egg-laying sites have been found close to scrub communities in grasslands with scattered shrubs (Swaim 1994) and in true scrub communities (K. Swaim, Swaim Biological Consulting, personal communication with the Service, 2002). These other habitat areas may be important in the early life history stages of hatchling whipsnakes (Swaim 1994). Rock outcrops, talus, and burrows (mating habitats) need to be within dispersal range of scrub and grassland habitat (egg-laying habitats). Swaim (1994) also observed Alameda whipsnakes mating in rock outcrops.

Alameda whipsnakes require plant canopy covers that supply a suitable range of temperatures, corridors of plant cover and retreats (including rock outcrops) sufficient to provide dispersal pathways between areas of habitat, and plant community patches of sufficient size to prevent the deleterious effects of isolation, such as inbreeding or the loss of a subpopulation due to a catastrophic event. Specific habitat features used by Alameda whipsnakes include, but are not limited to, small mammal burrows, rock outcrops, talus, soil crevices, debris piles, and other forms of cover to provide temperature regulation, shelter from predators, egg-laying sites, and winter hibernacula (Swaim 1994). Adequate insect populations are also necessary to sustain their primary lizard prey populations.

Life History: Survey data suggests that the Alameda whipsnake exhibits a bimodal season activity pattern with peak activity in the spring and late summer/early fall (Swaim 1994). Male Alameda whipsnakes appear to be more active than females in the spring,

which is likely attributed to breeding season behavior (Swaim 1994). The breeding season is thought to be between March and June, and mating appears to typically occur near the female's hibernacula (Swaim 1994). During the mating season, females likely remain near their retreat sites while males disperse throughout their home ranges. In one study, Swaim (1994) estimated a mean individual home range size for four males was 13.6 acres, and 8.4 acres for two females. Gravid female Alameda whipsnakes likely lay eggs between May and July (Stebbins 2003). Clutch sizes are typically between 6 to 11 eggs and the young hatch and emerge in the late-summer to early-fall (Swaim 1994). Male and female snakes appear to exhibit similar movement and activity patterns following the breeding season (Swaim 1994). Increases in late summer/early fall activity may be attributed to emergence of hatchling whipsnakes and the increased availability of hatchling lizard prey (Swaim 1994). Alameda whipsnakes typically retreat into winter hibernacula in November and emerge in March.

Alameda whipsnake above-ground activity cycles appear to be highly temperature dependent. Alameda whipsnakes have the highest documented mean active body temperature (92.1 degrees Fahrenheit) and degree of body temperature stability (stenothermy) than other snake species under natural conditions (Swaim 1994). Maintenance of such a high body temperature likely enables the snake to capture its characteristically fast-moving prey (Swaim 1994). Open and partially open and/or low growing shrub communities provide a mosaic of sunny and shady areas that apparently allow the snake to effectively maintain sufficient body temperature while providing cover from potential predators (Swaim 1994).

The Alameda whipsnake is an active diurnal predator and hunts by holding its head high off the ground to peer over vegetation or rocks for potential prey. This foraging strategy corresponds with the open habitat with which this species is typically associated with (Swaim 1994). Its diet includes lizards, skinks, frogs, small mammals, snakes, nesting birds, and insects. Features such as small mammal burrows, rock outcrops, and talus provide important habitat components such as shelter from predators, egg-laying sites, over-night retreats, and winter hibernacula (Swaim 1994). Their lizard prey is often abundant in these areas as well. Lizards, especially the western fence lizard, appear to be the Alameda whipsnake's primary prey item (Stebbins 2003; Swaim 1994).

Threats: Urban development has fragmented the once contiguous range of the Alameda whipsnake into the following five population centers: (1) the Tilden-Briones population (Sobrante Ridge, Tilden/Wildcat Regional Parks to the Briones Hills, in Contra Costa County); (2) the Oakland-Las Trampas population (Oakland Hills, Anthony Chabot area to Las Trampas Ridge, in Contra Costa County); (3) the Hayward-Pleasanton Ridge population (Hayward Hills, Palomares area to Pleasanton Ridge, in Alameda County); (4) the Mount Diablo-Black Hills population (Mount Diablo vicinity and the Black Hills, in Contra Costa County); and (5) the Sunol-Cedar Mountain population, (Wauhab Ridge, Del Valle area to the Cedar Mountain Ridge) (Service 1997).

Habitat fragmentation appears to have resulted in little to no gene flow or interchange between the five populations. Interchange between the Tilden-Briones, Oakland-Las Trampas, and Hayward-Pleasanton Ridge populations appears to depend on dispersal over the Caldecott Tunnel in Contra Costa County; under State Route 580 in Alameda

County (at the Eden Canyon interchange); under the Dublin Boulevard undercrossing; or where San Lorenzo Creek passes under the highway (Service 1997). Interchange between the Hayward-Pleasanton Ridge and Sunol-Cedar Mountain populations depends on dispersal along Alameda Creek in Alameda County; crossing under I-680 (where the creek passes under the highway); or crossing under the highway at Scott's Corner along Vallecitos Creek, or where two unnamed tributaries to Arroyo de la Laguna cross under I-680 north of Scott's Corner (Service 1997). The Mount Diablo-Black Hills population appears to be completely isolated from the other populations (Service 1997).

Habitat fragmentation makes some Alameda whipsnake populations more vulnerable to extinction. Habitat patches with high edge to interior ratios are known to provide less value for some species than round or square patches (Jimerson and Hoover 1991; Saunders *et al.* 1991). In general, the species most prone to extinction in fragmented habitats are those that depend on native vegetation; require combinations of different habitat types; require large territories; and exist at low densities (Saunders *et al.* 1991). Alameda whipsnakes have been associated with a variety of habitats for different natural history functions. They are primarily associated with native Diablan sage scrub, but are known to forage in adjacent grasslands, and migrate along riparian corridors. Consistent low trap success and high recapture rates suggests Alameda whipsnakes may be sparse, even in suitable habitat (Swaim 1994). The combination of these factors may cause the Alameda whipsnake to be more vulnerable to extinction in small habitat patches resulting from habitat fragmentation.

Small populations with limited breeding partners are prone to inbreeding which often results in problems associated with the lack of genetic diversity (Frankham and Ralls 1998). Populations with less genetic variability or more deleterious genetic material are typically less able to successfully respond to environmental stresses or adapt to even relatively minor changes in environmental conditions. These factors influence the survivability of smaller, genetically isolated populations.

The Alameda whipsnake has a variety of potential native and exotic predators including California kingsnake (*Lampropeltis getula californiae*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginianus*), coyote (*Canis latrans*), gray fox (*Vulpes cinereoargenteus*), red fox (*V. vulpes*), and red-tailed hawk (*Buteo jamaicensis*). Urbanization often facilitates the introduction or spread of non-native predators (Goodrich and Buskirk 1995). Increased predatory pressure may become excessive in situations where Alameda whipsnake habitat is fragmented, isolated, and otherwise degraded by human activities. This may be especially true where alien species, such as rats, feral pigs (*Sus scrofa*), and feral and domestic cats (*Felis domesticus*) and dogs (*Canis familiaris*) are present. These additional threats become particularly acute where urban development immediately adjacent to Alameda whipsnake habitat. A growing movement to maintain feral cats in parklands, such as those managed by East Bay Regional Park District, is a potential threat to a variety of wildlife species (Coleman *et al.* in litt. 1997; Roberto 1995; DeVecchio 1997). Little is known about the predation of Alameda whipsnakes, but feral cats are known to prey on reptiles, including the yellow racer (*Coluber mormon*), a fast, diurnal snake similar to the Alameda whipsnake (Hubbs 1951; Stebbins 2003). The threat of predation and harassment from domestic and feral cats and other non-native species increases as human disturbance from recreational use on

regional and state parks, and urban development encroaches into the current open space buffers between existing developments and Alameda whipsnake habitat on public lands (Coleman *et al.* in litt. 1997).

McGinnis (1992) has suggested that grazing has impacted Alameda whipsnake habitat in many areas east of the Coast Range. Livestock grazing that significantly reduces or eliminates shrub and grass cover can be detrimental to this snake. Many snake species, including the Alameda whipsnake, likely avoid such open areas due to increased danger from predators and lack of prey (McGinnis 1992). Removed native vegetation is often replaced by non-native plant species that significantly degrade habitat values or even replace entire plant communities such that it no longer provides appropriate habitat for the Alameda whipsnake. For instance, radio telemetry data indicates that Alameda whipsnakes tend to avoid dense stands of eucalyptus (Swaim 1994).

The Alameda whipsnake is directly and indirectly threatened by the effects of fire suppression. Fire suppression results in a buildup of fuel (underbrush, thatch, and woody debris). This exacerbates the effects of wildfires by creating conditions for hot, slow-moving fires. The development of a closed scrub canopy also results in a buildup of flammable fuels over time (Parker 1987; Rundel *et al.* 1987). Fire suppression can also result in the spread and proliferation of non-native vegetation, further increasing flammable fuel loads in and around Alameda whipsnake habitat. The threat of wildfire is typically highest in the summer and early fall when accumulated fuel is abundant and dry. This "fire season" coincides with the primary above-ground activity period for hatchling and adult Alameda whipsnakes (Swaim 1994). Therefore, populations are likely to sustain heavy losses from fires during this period.

Changes in the vegetation structure typically results in changes to the micro-climate temperature regime important in maintaining the Alameda whipsnake's high optimal body temperature. For instance, fire suppression may result in increased canopy closure and shading (Parker 1987) from plant species such as poison oak (*Toxicodendron diversilobum*) and coyote brush (*Baccharis pilularis*). Increased vegetative cover can result in ground temperatures that are less than optimal for the Alameda whipsnake. Survey data suggests that Alameda whipsnakes are less likely to be found in areas of scrub habitat with a closed canopy (Swaim 1994).

Encroaching urban development has lead to the implementation of rigorous fire suppression practices in and around adjacent suitable Alameda whipsnake habitat. Frequent fire events are important in maintaining the scrub habitat associated with the Alameda whipsnake. Many native coastal scrub and chaparral plant species require periodic fires to stimulate new sprouting, seedling recruitment, and seed dispersal (Parker 1987; Keeley 1987; Keeley 1992). The optimal frequency of fire events is often disputed but likely ranges from every 10 to 30 years (Keeley 1987; Rundel *et al.* 1987). Depending on the rate of fuel accumulation, any prescribed burn program should take place every 10 to 30 years (J. Ferreira, California Department of Parks and Recreation, personal communication with the Service 1996).

All five remaining populations of the Alameda whipsnake are threatened by a variety of factors. Each of these populations consists of several to numerous subpopulations with

varying degrees of connectivity between them. In the western portion of the species' range, the Tilden-Briones population is threatened by a high potential for catastrophic wildfire and urban development. However, the remaining habitat, regional parklands, and municipal watersheds within this area overlap to the extent that a regional preserve may be possible. The Oakland-Las Trampas population is threatened by a high potential for catastrophic wildfire and the negative effects associated with habitat fragmentation and urban development. The Hayward-Pleasanton Ridge population may be the most susceptible to extirpation. This population is scattered in distribution and is, therefore, more vulnerable to the effects of development and subsequent habitat fragmentation. The Mount Diablo-Black Hills population, in the eastern portion of the species' range, is threatened by a high potential for catastrophic wildfire, development and its associated impacts, and inappropriate grazing practices. If threats associated with urbanization can be controlled, this population is a good candidate for recovery, due to the inclusion of public lands and the potential for improved fire and grazing management on parklands. The Sunol-Cedar Mountain population is threatened by development and inappropriate grazing practices. Overall, the Oakland-Las Trampas and Hayward-Pleasanton Ridge populations are the most immediately imperiled with habitat fragmentation becoming prevalent enough to compromise its long-term viability.

Recovery: Seven recovery units have been identified for the Alameda whipsnake (Service 2002). The proposed compensation site at Sycamore Grove Regional Park is located within the Sunol-Cedar Mountain Recovery Unit (Unit 5). This is the southernmost unit and comprises an area of interface between Alameda whipsnake and San Joaquin whipsnake. Much of this area consists of East Bay Regional Park District, San Francisco Water District, California Department of Parks and Recreation, U.S. Department of Energy (Lawrence Livermore National Laboratory), and private properties. The recovery plan recommends that landowners within Unit 6 implement plans to address health of chaparral/scrub, fire management, recreation, unauthorized collection, and incompatible land uses. The recovery plan also specifies the importance of habitat restoration, including return of fire as a natural disturbance regime, removal of nonnatives or vegetation that overtops chaparral/scrub, and providing rock outcrops or other forms of retreat or hibernacula as being a priority within this unit.

ENVIRONMENTAL BASELINE

Alameda Whipsnake

The California Natural Diversity Database (California Department of Fish and Game 2008) includes two records of Alameda whipsnake observations within 1 mile and three within 3 miles of the action area. The closest of the three observations is an unconfirmed sighting in the orchard immediately adjacent to the subject drainage from a former Sycamore Grove Regional Park employee (K. Swaim pers. comm. on August 20, 2008). The second occurrence is located approximately 0.9-mile to the southeast on the north side of Del Valle Canyon downstream of the Del Valle Reservoir. The third occurrence is located on the east shoreline of Del Valle Reservoir dating back to 1975. Based on the habitat located within and adjacent to the action area, the biology and ecology of the Alameda whipsnake, including its dispersal behavior, and the nearby records of the listed

species, the Service has concluded it is likely this listed animal utilizes the action area for foraging, resting, mating, and other essential behaviors.

9. ADD the following text after the second paragraph of the **Effects of the Proposed Action** on Page 45:

Sycamore Grove Regional Park

The proposed riparian compensation activities consisting of equipment access, trenching, staging, and installation of an irrigation infrastructure at Sycamore Grove Regional Park may result in adverse effects to the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake. There is a likelihood the proposed activities may directly affect individuals of these listed species by causing mortality or injury resulting from being crushed by rocks or equipment, or entombed in dens or in trenches, or harassment from construction noise, vibration or light. These species may be indirectly affected by construction activities temporarily altering foraging, movement patterns or refugia habitat, or subjecting them to predation that otherwise would not occur. The proposed action will result in the temporary loss and degradation of 0.04-acres and the permanent loss of 0.002-acre of the habitat of the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake comprising entirely of non-native annual grassland.

10. Change the first paragraph under *San Joaquin Kit Fox* of the **Effects of the Proposed Action** on Page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species.

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The Phase I activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and possible construction-related harassment

of an unknown number of San Joaquin kit foxes. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of grassland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of grassland habitat resulting from the construction of a holding take. Activities may result in construction related harassment and harm of an unknown number of San Joaquin kit foxes. The riparian compensation activities will have a net beneficial effect to the San Joaquin kit fox by providing greater habitat diversity, increasing prey base of small rodents and insects, increasing protective cover, and stabilizing erosion within the drainage.*

11. Change the first paragraph under *California Tiger Salamander* of the **Effects of the Proposed Action** on Page 53 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as raccoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during nighttime construction. Edible trash left during or after repair activities could attract predators, such as raccoons, skunks, opossums, crows and ravens, that could subsequently prey on the listed amphibian.

Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of upland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of upland habitat for the California tiger salamander. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders. The riparian compensation activities will have a net beneficial effect to the California tiger salamander by increasing protective cover and stabilizing erosion within the drainage.*

12. Change the first paragraph under *California Red-legged Frog* of the **Effects of the Proposed Action** on Page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County. Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of upland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of upland habitat*

for the California red-legged frogs. Activities may result in construction related harassment and the death of an unknown number of California red-legged frogs. The riparian compensation activities will have a net beneficial effect to the California red-legged frog by increasing the prey base, increasing protective cover, and stabilizing erosion within the drainage.

13. ADD the following text at the end of the **Effects of the Proposed Action** on Page 60:

Alameda Whipsnake

Individual Alameda whipsnakes may be directly injured or killed by activities that disturb feeding, sheltering, and dispersal habitat. The proposed action would result in adverse effects to Alameda whipsnake that may be dispersing, foraging, and/or aestivating in the action area, and would result in the temporary loss and degradation of 0.04-acres and the permanent loss of 0.002-acre of the habitat for this listed species. The effects will likely (1) result in the injury and death of an unknown number of Alameda whipsnakes by entombment in burrows; (2) result in construction-related harassment to Alameda whipsnakes in the area; (3) temporarily impede the dispersal or daily movement of Alameda whipsnakes through the area while the action is in progress; and/or (4) increase the likelihood of predation on Alameda whipsnakes.

Construction related activities may cause disruption of foraging, harassment from increased human activity, and permanent and temporary loss of shelter. Because Alameda whipsnakes are diurnal, they will be active while construction is performed. Individuals that avoid construction activities may become displaced into adjacent areas where they may be vulnerable to increased predation, exposure, starvation, or stress through disorientation, loss of shelter, and intraspecific and inter-specific aggression (Grigione 2002). The conservation measures that will be implemented at the proposed project will likely reduce mortality, injury, harassment, or harm to the Alameda whipsnake.

The proposed compensation activities at Sycamore Grove Regional Park would likely improve the habitat quality within the action area by enhancing a sparsely vegetated riparian corridor, thereby increasing refugia, hibernacula, escape cover, and foraging habitat.

14. Change the **Amount or Extent of Take** section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass

Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or napulai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit,

will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, may range over a large territory, is primarily active at night, highly intelligent, and often extremely shy around humans; making finding an injured or dead individual unlikely. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. *In addition, San Joaquin kit foxes inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect, because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels and other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. *In addition, California tiger salamanders inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their

cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. *In addition, California red-legged frogs inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp and will not result in incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service expects that incidental take of the Alameda whipsnake will be difficult to detect or quantify because this animal may range over a large territory and the finding of an injured or dead individual is unlikely because of their relatively small body size and conspicuous coloration. Therefore, the Service is estimating that all of the Alameda whipsnakes inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the Alameda whipsnake caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

15. The following addition is made to the **Terms and Conditions** on page 71:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake. The number of Service-approved biologists who are on site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.
27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders shall be done with hand tools whenever possible. The depth to which this amphibian is found depend on the burrow-specific conditions. Excavation shall extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found shall be recorded whenever possible and the information shall be provided to the Service and the California Department of Fish and Game.
 - a. Prior to handling, the Service-approved biologist(s) shall thoroughly wash their hands with soapy water. Oils, creams, lotions, repellents, or solvents of any sort shall not be used within two (2) hours before and during periods when capturing and relocating will occur. To minimize transmission of infectious agents among amphibians, vinyl gloves shall be worn while handling California tiger salamanders, and changed between individuals. Prior to handling, vinyl gloves shall be rinsed in freshwater to remove any residual surface chemicals used during the production process. Handling of juvenile and adult California tiger salamanders shall be minimized to the maximum extent practicable; handling of larvae shall not exceed 90 seconds. Immediately following handling, California tiger salamanders shall be placed in a holding container, rinsed with freshwater, and observed for a period of 30 minutes prior to release for signs of impairment, tissue necrosis, or mechanical damage associated with contact with gloves, equipment, or improper handling. Note that recent studies by Cashins et al. (2008) indicate that latex or nitrile gloves can be lethal to tadpoles; therefore, such gloves shall not be used to handle amphibians of any life stage of any species. The holding container shall be kept in a cool location with moist with damp paper towels or a saturated soap-free sponge. If possible, only one frog or salamander shall be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container; however, the two listed species or the same species of significantly different sizes or life history stages shall not be mixed in order to avoid injury or depredation. Individuals shall never be so crowded that they are touching one another. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.
 - c. California tiger salamanders shall be released as soon as possible within the same day they are captured. If circumstances dictate that the individual(s) cannot be released the same day the Service shall be contacted immediately for further guidance.

- d. California tiger salamanders shall be released at the nearest location that is outside of the construction area and shall be placed at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal shall be released per burrow. A maximum of three California tiger salamanders may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals shall be released one at a time rather than en masse. The Service-approved biologist shall monitor the released individuals to ensure they retreat to safety and do not return to the construction area.

16. Add the following reference to the **Literature Cited** on page 75:

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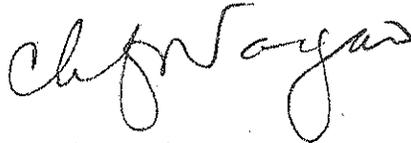
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The remainder of the February 28, 2005 Biological Opinion and Conference Opinion is unchanged. This concludes reinitiation of the formal consultation on the State Route 84 Pigeon

Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation 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 re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe, Endangered Species Biologist, (Jerry.Roe@fws.gov) or (Chris.Nagano@fws.gov) at the letterhead address or at telephone (916) 414-6600 if you have any questions.

Sincerely,



Cay C. Goude
Acting Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Melissa Escaron, California Department of Fish and Game, Yountville, California
Marcia Grefsrud, California Department of Fish and Game, Yountville, California
Liam Davis, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Brendan Thompson, Regional Water Quality Control Board, Oakland, California
Keith Lichten, Regional Water Quality Control Board, Oakland, California
Jackie Charbonneau, Natural Resources Conservation Service, Livermore, California



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:
81420-2008-F-0214-3

APR 27 2010

Mr. Jim Richards
Attn: Laura Ivey
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Reinitiation of Consultation of the Biological Opinion for the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for the Inclusion of Phase II of Mitigation Activities at Sweet Ranch, Livermore, California

Dear Mr. Richards:

This is in response to your April 22, 2008 request for reinitiation of formal consultation to amend the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No.: 1-1-04-F-0115) issued on February 28, 2005. This amendment addresses Phase II activities at the Sweet Ranch property located approximately 6 miles east of downtown Livermore, Alameda County, California. On November 5, 2007 the Service issued an amendment to the Pigeon Pass Biological Opinion (Service File No.: 81420-2008-F-0214) for the first phase of the mitigation activities on the Sweet Ranch property. The activities associated with the first phase (Phase I) of work (*e.g.*, creation of a seasonal pond and exotic species removal) was completed in December 2007. This document represents the Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), and threatened California tiger salamander (Central Valley Distinct Population Segment) (*Ambystoma californiense*). This amended biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

The California Department of Transportation (Caltrans) proposes to use the 97.7 acre Sweet Ranch as compensation for 52 acres for effects to the San Joaquin kit fox and riparian and seasonal wetland habitat resulting from the project. The Sweet Ranch will be considered as compensation for the San Joaquin kit fox by the Service when Caltrans has satisfied the requirements for a conservation easement, habitat management plan, and management

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endowment. In addition, Caltrans would like to consider the remaining easement acreage as future mitigation for San Joaquin kit fox, California tiger salamander and/or California red-legged frog. This proposal was outlined and deemed appropriate in a letter from the Service dated March 21, 2007 (Service File No.: 1-1-07-TA-0780).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California* (Service File No. 1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0159) dated May 2, 2007; (4) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0268) dated July 20, 2007; (5) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 81420-2008-F-0214) dated November 5, 2007; (6) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California* (Service File No. 81420-2008-F-0214-2) dated April 17, 2008; (7) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated April 22, 2008; (8) Sweet Ranch Memorandum from Caltrans dated April 22, 2008 and supporting documentation; (9) correspondence between Alison Graff (Caltrans), and Jerry Roe (Service) on April 22, 2008; (10) site visit conducted with the Natural Resources Conservation Service and Caltrans on May 15, 2008; and (11) other information available to the Service.

The following changes are made to the February 28, 2005 Biological Opinion:

1. Add the following to the **Consultation History**:

April 22, 2008	Email correspondence between the Service and Caltrans regarding the Phase II of mitigation activities on the Sweet Ranch.
April 24, 2008	The Service received a request to amend the February 28, 2005 Biological Opinion and Conference Opinion to include Phase II of the mitigation activities on the Sweet Ranch.
May 15, 2008	The Service attended a site visit to the Sweet Ranch with Caltrans and the Natural Resources Conservation Service to discuss Phase II of the mitigation activities.
June 10, 2008	The Service issued a draft amendment to Caltrans for review and comments with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch.

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| June 24, 2008 | The Service received comments from Caltrans with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch. |
| April 1, 2010 | The Service received final comments from Caltrans with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch. |

2. Add the following to the **Description of Proposed Action:**

Caltrans proposes to restore 4,810 linear feet of creek corridor at the Sweet Ranch, a private property located approximately 6 miles east of downtown Livermore. Along this stretch of creek, 4.7 acres of mixed riparian habitat will be restored/enhanced, 2.4 acres of bed and bank will be improved and 4.0 acres of seasonal wetlands will be created.

An in-perpetuity conservation easement, management endowment and a long-term conservation practices management plan are conditions of the easement. In October 2009, the State and the property owner executed a conservation easement on the Ranch. The State will hold the easement until a successor entity acceptable to the property owner and resource agencies is found to hold the easement and endowment. The conservation easement was reviewed and approved by the Service and the Regional Water Quality Control Board. The Service is a third party signatory to the conservation easement.

Project Summary

The key elements of the proposed Sweet Ranch conservation site habitat restoration, enhancement, and creation activities were divided into two phases. The activities associated with the first phase were completed in December 2007. These activities were included in the November 5, 2007 amendment to the Biological Opinion for the Effects of the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County (Service File No.: 81420-2008-F-0214).

Activities executed during Phase 1 included:

1. Seasonal Pond Creation: Excavation of a seasonal pond suitable for breeding by the California tiger salamander and potentially the California red-legged frog.
2. Exotics Removal: Eucalyptus (*Eucalyptus globulus*) tree removal in the riparian corridor. A total of two trees were removed.

The activities proposed for Phase 2 include:

1. Wetland Creation
 - a. The Bowl Areas: Creation of seasonal wetlands in the two upland bowl areas.
 - b. Wet Meadow: Wet meadow creation in the westernmost reach of the existing riparian corridor.
 - c. Pond/Spring Enhancement: Enhancement of the newly created seasonal pond and existing spring.

2. Riparian Restoration
 - a. Debris and Exotic Species Removal: Removal and control of non-native, invasive plant species and removal of existing debris along the western reach of the existing riparian corridor.
 - b. Riparian Planting: Planting of native riparian vegetation in the eastern reaches of the existing riparian corridor, where little riparian vegetation currently exists.
3. Grade Stabilization
 - a. Boulder Weirs: Installation of rock weirs along the creek to slow head-cutting and potentially expand existing in-stream wetlands.
4. Culvert Improvements
 - a. Culvert Replacement: Removal and replacement of one large culvert (at the existing driveway road behind the house).
 - b. Culvert Extension: Extension of an existing culvert to improve the outfall or placement of rock slope protection to prevent further erosion.
5. Ranch Infrastructure
 - a. Fence: Installation of a temporary livestock exclusion fence around the riparian corridor and wetland creation areas.
 - b. Access Road: Improvement of existing access road.
 - c. Corral: Installation of one corral made from portable fence panels and a chute for working livestock.
 - d. Water Supply: Installation of a livestock water and irrigation system.

Project Scope

Wetland Creation

Bowl Areas

The design for the creation of seasonal wetlands in these two areas includes a series of shallow depressions lined with a bentonite clay liner to allow short-term retention of runoff water. Because of the degree of change in elevation from one end of the basin to the other, a stepped/terraced design will be used in these locations. Wetland areas will be seeded and planted with the appropriate native plants. A total of approximately 1.0-acre of seasonal wetland will be created at these locations.

Wet Meadow

A wet meadow will be created in the gently sloping field at the westernmost reach of the intermittent stream immediately upstream of Cross Road. This will be accomplished by re-grading the field and existing channel and constructing a series of ponded terraces separated by earthen berms. Rock-lined drop structures will be installed as spillway structures between the ponded areas. Wetland areas will be seeded and planted with the appropriate native plants. Approximately 3.0 acres of seasonal wetland will be created at this location.

Pond/Spring Enhancement

The seasonal pond that was constructed during Phase 1 of the project will be tested for bulk density and recompact as necessary to achieve its full water holding potential. The existing western spring originates at the toe slope of the hill, above the newly constructed pond location. Water from the spring flows towards the newly constructed pond for a short distance and then infiltrates into the soils before it reaches the pond. The spring is perennial and was once used to supply water to the on-site residence. The spring will be excavated to bring water to the surface, allowing flow to the new pond, or redeveloped with a new spring box and pipe. Wetland areas will be seeded and planted with the appropriate native plants.

Riparian Restoration

Debris and Exotic Species Removal

Approximately 2,000 linear feet of the eastern reach of the riparian corridor will be enhanced through exotic species and debris removal. This area has an understory dominated by German ivy (*Delawarea odorata*), periwinkle (*Vinca major*), and similarly undesirable invasive exotic species. Two eucalyptus trees were removed during Phase 1 and another dozen will be removed during Phase 2, provided an agreement can be reached with the adjacent landowner (trees are outside of the easement area).

Exotics removal will be accomplished with a combination of mechanical and manual removal techniques and application of the herbicide Rodeo (glyphosate). The herbicide is needed to accomplish habitat enhancement at Sweet Ranch due to the extensive cover of German ivy and periwinkle in the riparian corridor and a net benefit to California red-legged frogs is expected. California red-legged frogs have not been documented at Sweet Ranch; however, individuals have been reported from a livestock pond at least one-half mile from the project site. Herbicides will be applied in the dry season only to treat German ivy and periwinkle between May 1 and October 15 outside of the breeding season, and will not be applied within 72 hours of forecasted precipitation. All exotic vegetation removed manually will be taken off site and disposed of at an approved green waste facility.

Debris (*e.g.* wire rolls, old tires, appliances, old farm equipment, *etc.*) will be removed from the channel. All debris will be taken off site and disposed of at an appropriate waste/recycling facility.

Riparian Plantings

Approximately 4,810 linear feet of riparian corridor will be replanted. Portions of the stream and stream banks currently lacking riparian vegetation will be planted with locally occurring riparian species, *e.g.* arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), blue elderberry (*Sambucus mexicana*), California buckeye (*Aesculus californica*), and valley oak (*Quercus lobata*). Willows and valley oaks will be used along the lower portions of the banks. Transitional species, such as California buckeye and blue elderberry, will be planted along the upper banks. A planting plan is being developed that details species mix and planting locations. An irrigation system will be installed to provide supplemental irrigation as needed during the first 3 years post installation or until establishment. A fence with gates will be installed along both sides of the riparian corridor to exclude livestock until plants

become sufficiently established to withstand grazing and to allow controlled grazing thereafter.

Grade Stabilization

Boulder Weirs

Seven low boulder weirs (½ to 1-ton rock) are proposed within the stream to prevent further head cutting. The rock will be sized and placed to interlock and will cover approximately 400 square feet of channel. The weirs will be placed in the channel at locations that exhibit head cutting and where the immediate upstream channel is fairly level in profile. The boulder structures will allow some water to back up, potentially increasing the area of stream channel saturation directly upstream, while still allowing water to flow through the structure.

Culverts

Culvert Replacement

A culvert that currently crosses under the unpaved driveway behind the existing house will be replaced with twin 36 inch diameter culverts to accommodate a 100-year storm event. The current culvert is undersized and as a result has failed to function properly, causing much of the erosion in this area of the creek. Replacing it with an adequately sized culverts will minimize erosion and improve the health of the creek.

Culvert Extension

An existing roadside culvert along Patterson Pass Road is causing erosion on the north bank of the creek. The culvert will be extended approximately 150 linear feet and placed through an existing gully. The culvert extension will outlet to a rock plunge pool dissipater adjacent to the streambed.

Ranch Infrastructure

Fencing

Approximately 1-mile of boundary and pasture fencing (5-strand barbed wire) will be installed to temporarily exclude livestock from created wetlands, springs, and new plantings.

Access Road

The existing ranch access road will be graded and improved with drainrock to reduce erosion and allow vehicle access for monitoring and making repairs in wet weather.

Corral

The Sweet Ranch conservation property will use cattle grazing as one method of range management as identified by the Sweet Ranch Conservation Practices Management Plan. New corrals made from portable fence panels and a chute for working livestock will be installed near the staging area where a dilapidated barn was recently removed.

Water Supply System

An existing spring is located at the eastern end of the project site. The spring is fenced and currently provides water for livestock. A pipeline will be added to the existing developed spring to supply water for the irrigation system that will service the restoration plantings. Additional troughs will also be added to the system. Location of new livestock water facilities will be determined with the acceptance of the Sweet Ranch Conservation Practices Management Plan. The pipeline will follow the existing access road.

Project Schedule

Wetland creation, debris and exotic species removal, grade stabilization, irrigation system installation, and culvert work, will begin August 2010. All plantings and seeding will occur between October 15 and December 31, 2011. Ranch infrastructure improvement will be ongoing and may occur between July 15 and December 31, 2010, or at a later date.

Equipment Used

Types of equipment used for project implementation will include a bulldozer, excavator, bobcat, backhoe, trencher, dump truck, and hand labor.

Locations of Staging Areas/Access Roads

The project staging area is a heavily impacted area located near the home site at the ranch entrance. All equipment will travel from the staging area on an existing ranch road that runs parallel to the drainage on the property. Equipment will be operated only within the project footprint area.

Temporary Erosion Control Measures

Temporary erosion control measures will follow Caltrans standards and specifications and will include measures to prevent loss of soil from runoff and erosion. Measures include the use of rice straw, straw bales, straw wattles, or similar means provided they do not entangle or block escape and dispersal routes of listed animal species. All disturbed areas will be seeded with an appropriate erosion control mixture.

Construction Site Restoration

All temporary ground disturbances, including storage and staging areas and temporary roads. These areas will be re-contoured, if appropriate, and revegetated with seeds and/or cuttings of appropriate native plant species to promote restoration of the area to pre-project conditions. To the maximum extent practicable (*i.e.*, presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented using the temporary erosion control measures listed above.

Permanent and Temporary Effects to Habitat for Phases I and II

Permanent Effects

Mitigation activities at Sweet Ranch will result in permanent effects to 0.06-acre of aquatic (stream) habitat and 4.02 acres of upland habitat (*i.e.*, 0.02-acres of streambank/riparian

habitat and 4.0 acres of California annual grassland habitat). Approximately 0.06-acre of streambed will be permanently altered by placement of the seven boulder weirs, reconfiguration of the stream channel in the wet meadow wetland creation area, and culvert replacement. In addition, 0.02-acre of eroded stream bank will be repaired. All of the above permanent effects will result in a net improvement to California tiger salamander and California red-legged frog habitat features on Sweet Ranch.

Temporary Effects

Mitigation activities at Sweet Ranch will result in temporary effects to 0.3-acre of aquatic (stream) habitat and 5.7 acres of upland habitat (i.e., one-acre of California annual grassland habitat and 4.7-acres of streambank/riparian habitat). These habitats will be enhanced and will result in a net improvement in habitat quantity and quality when fully restored.

Table 1. Permanent and Temporary Effects to Habitat for Phases I and II

Habitat	Permanent	Temporary
Aquatic (streambed)	0.06 ac	0.30 ac
Upland (streambank/riparian corridor)	0.02 ac	4.70 ac
Upland (California annual grassland)	4.00 ac	1.00 ac
Total:	4.08 ac	6.00 ac

Proposed Conservation Measures

The Avoidance and Protection Measures in the Biological Opinion and Conference Opinion issued on February 28, 2005 for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No. 1-1-04-F-0115) and all amendments to the biological opinion (Service File No. 1-1-04-F-0116, 1-1-07-F-0159, 1-1-07-F-0268, 81420-2008-F-0214, and 81420-2008-F-0214-2) will be implemented during the proposed work. The boundaries of the Environmentally Sensitive Area will be delineated using flagging.

Maintenance/Monitoring/Reporting

Maintenance, monitoring, and reporting will be the responsibility of Caltrans. Monitoring activities will be documented and monitoring reports will be forwarded to the Service annually for 5 to 10 years, as per the Sweet Ranch Conservation Practices Management Plan. The first monitoring report will be due no later than December 31, one year after completion of Phase II and annually every December 31 for each consecutive monitoring season thereafter.

3. Change the third paragraph of **Avoidance and Protection Measure** on Page 6 from:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander and providing payment for 52 acres into the Service’s San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credits at the Ohlone Conservation Bank.

The California Department of Transportation will pay \$650, 000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

TO:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander at Ohlone Conservation Bank and reserving 52 acres of the 97.7 acre Sweet Ranch Conservation Easement for San Joaquin kit fox.

4. Add the following paragraph after the first paragraph under the **Effects of the Proposed Action** on Page 44:

Phase I and II activities at the Sweet Ranch property will result in 6 acres of temporary impacts to aquatic (0.3-acre) and 5.7 acres of upland habitat (i.e., 4.7 acres of streambank/riparian habitat and 1.0-acre of California annual grassland habitat), and permanent effects to 0.06-acre of aquatic (stream) habitat and 4.02 acres of upland habitat (i.e., 0.02-acre of streambank/riparian habitat and 4.0-acre of California annual grassland habitat). Phase II activities at the Sweet Ranch property includes equipment access/staging, debris/exotic species removal, excavation, culvert replacement/extension, infrastructure construction, and fill stockpiling. The proposed restoration and enhancement activities may result in the harm or harassment of individual California red-legged frogs and California tiger salamanders during the construction activities. However, the overall habitat quality will be enhanced for all life history stages for both species by improving upland habitat and creating potential breeding habitat.

5. Change the first paragraph under *San Joaquin Kit Fox* of the **Effects of the Proposed Action** on Page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species.

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through

the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The Phase I activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and possible construction-related harassment of an unknown number of San Joaquin kit foxes. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the San Joaquin kit fox to wetland habitat, and the permanent loss of 0.02-acre of riparian habitat as a result of the construction of boulder weirs and the culvert extension. Activities may result in construction related harassment of individual San Joaquin kit fox.

6. Change the first paragraph under *California Tiger Salamander* of the **Effects of the Proposed Action** on Page 53 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as raccoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during nighttime construction. Edible trash left during or after repair activities could attract predators, such as raccoons, skunks, opossums, crows and ravens, that could subsequently prey on the listed amphibian.

Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander. Phase I activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California tiger salamander. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the California tiger salamander to seasonal wetland habitat intended to function as suitable breeding habitat. A total of 0.08-acre of riparian habitat will be permanently impacted as a result of the construction of boulder weirs and the culvert extension and a total of 6.0 acres of upland habitat will be temporarily impacted. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders.

7. Change the first paragraph under *California Red-legged Frog* of the **Effects of the Proposed Action** on Page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County. Phase I activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the California red-legged frog to

seasonal wetland habitat. A total of 0.02-acre of riparian habitat will be permanently impacted as a result of the construction of boulder weirs and the culvert extension and a total of 6.0 acres of upland habitat will be temporarily impacted. Activities may result in construction related harassment and the death of an unknown number of California red-legged frogs.

8. Change the first paragraph under *Vernal Pool Fairy Shrimp* of the **Effects of the Proposed Action** on Page 58 from:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

TO:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed road project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp.

9. Change the **Amount or Extent of Take** section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17.3 acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal

fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, may range over a large territory, is primarily

active at night, and is highly intelligent and often extremely shy around humans, making finding an injured or dead individual unlikely. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17.3 acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all San Joaquin kit foxes inhabiting the proposed 97.7 acre Sweet Ranch compensation site will be subject to incidental take during the enhancement activities. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat; therefore, the Service is authorizing take incidental to the proposed action as the harm and harassment of all San Joaquin kit fox within the Sweet Ranch action area. No injury or mortality of San Joaquin kit fox are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect, because when this amphibian is not in breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels and other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as the capture, harm and harassment of all California tiger salamanders within the Sweet Ranch action area. No injury or mortality of California tiger salamanders are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their

cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as the capture, harm and harassment of all California red-legged frogs within the Sweet Ranch action area. No injury or mortality of California red-legged frogs are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to locate in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp and will not result in incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The remainder of the February 28, 2005 Biological and Conference Opinion is unchanged. This concludes reinitiation of the formal consultation on the State Route 84 Pigeon Pass Curve Realignment Project in Alameda County, California. 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 re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe or Ryan Olah at (916) 414-6600.

Sincerely,



for
Susan K. Moore
Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Melissa Escaron, California Department of Fish and Game, Yountville, California

CONCEPTUAL STORMWATER POLLUTION PREVENTION PLAN

for

SWEET RANCH MITIGATION PROJECT

CONTRACT NO.: 04-172424

CALTRANS PROJECT IDENTIFIER NUMBER: TBD

RISK LEVEL: 1

Prepared for:

CALIFORNIA DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
OAKLAND, CA 94612

Insert Resident Engineer's Name-then TAB.

Insert R.E.'s Telephone Number-then TAB.

Submitted by:

Insert Contractor's Company Name-then TAB.

Insert Address 1 then press ENTER to insert Address 2 or TAB to next field.

Insert City, State, ZIP-then TAB.

Insert Telephone-then TAB.

Insert Owner/Representative's Name-then TAB.

Project Site Address

IN ALAMEDA COUNTY NEAR LIVERMORE AT THE INTERSECTION OF CROSS
AND PATTERSON PASS ROADS 2.2 MILES SOUTHEAST OF ROUTE 580 AND
NORTH GREENVILLE ROAD UNDERCROSSING

Contractor's Water Pollution Control Manager (WPCM)/Qualified SWPPP Developer(QSD)

Insert WPCM/QSD's Name-then TAB.

Insert Telephone Number(s)-then TAB.

Contractor's Qualified SWPPP Developer (QSD) (if SWPPP not developed by WPCM)

Insert QSD Name-then TAB.

Insert Telephone Number(s)-then TAB.

Contractor's Qualified SWPPP Practitioner (OSP) (if different from WPCM)

Insert Inspectors Name-then TAB.

Insert Telephone Number(s)-then TAB.

SWPPP Developed by:

Insert Company Name-then TAB.

Insert Address-then TAB.

Insert City, State, ZIP-then TAB.

Insert Telephone-then TAB

Insert Name and Title of Preparer-then TAB.

SWPPP Date

July 13, 2010

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INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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Ranch\contract 1 grading\cswppp\cswppp 7-23 no edits 5.doc

**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
Contract No.04-172424**

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SWPPP Attachments

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Attachment B..... Legally Responsible Person Authorization of Approved Signatory
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Attachment DD SWPPP Amendments
Attachment EE..... Risk Level Determination
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SWPPP Appendix

Appendix A..... Annual Certification Of Compliance Form
Appendix B..... SWPPP Amendment Certification and Approval Form
Appendix C Subcontractor/Material Supplier Notification Letter and Contact Information Logs
Appendix D..... Contractor Personnel Stormwater Training Log
Appendix E..... CEM- XXXX Stormwater Site Inspection Report
Appendix XX..... CEM- XXXX Site Inspection Report Corrections Summary
Appendix XX..... Rain Event Action Plan Forms
Appendix XX..... Notice of Discharge
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Appendix XX..... Sampling and Testing Activity Log
Appendix XX..... Stormwater Sample Field Test Results Report Form
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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
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SWPPP Files

File Category 20.01Annual Certification Of Compliance
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File Category 20.06 Material Suppliers Contact Information and Notification Letters
File Category 20.07 Contractor Personnel Stormwater Training Documentation
File Category 20.08 Water Pollution Control Schedule Updates
File Category 20.09 Contractor Site Inspection Reports
File Category 20.10 Rain Event Action Plans
File Category 20.11 Notice of Discharge Reports
File Category 20.12 Site Visual Monitoring Inspection Reports
File Category 20.13 Non-Visible Pollutant Sampling and Test Results
File Category 20.14 Turbidity and pH Sampling and Test Results
File Category 20.15 Numeric Action Limit Exceedance Reports
File Category 20.16 Numeric Effluent Limitaion Violation Reports
File Category 20.17 .. Required Regional Water Board Monitoring Sampling and Test Results
File Category 20.18 ATS Monitoring Sampling and Test Results
File Category 20.19 Field Testing Equipment Maintenance and Calibration Records

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SECTION 100 SWPPP CERTIFICATION & APPROVAL

100.1 CERTIFICATION AND APPROVAL

INSTRUCTIONS:

CALTRANS ADMINISTERED PROJECTS

- When Caltrans is administering the project the Caltrans District Director is the Legally Responsible Person (LRP) authorized representative of the Department for signing, certifying, and submitting the SWPPP to the State Water Board; in conformance with Section H, Provision 8.b.; and Section M, Provision 10 of the Caltrans Permit (CAS000003, Order No. 99-06-DWQ) and Section IV.I of Construction General Permit (CAS000002, Order No. 2009-009-DWQ).
- When the Caltrans District Director authorizes the Caltrans Resident Engineer to be the Approved Signatory, then the Caltrans Resident Engineer is the authorized representative of the Department for signing, certifying, and submitting the SWPPP; in conformance with Section H, Provision 8.b.; and Section M, Provision 10 of the Caltrans Permit (CAS000003, Order No. 99-06-DWQ) and Section IV.I of Construction General Permit (CAS000002, Order No. 2009-009-DWQ).
- If the Caltrans Resident Engineer is the authorized Approved Signatory, the Resident Engineer will provide the Contractor the form completed by the LRP authorizing the Resident Engineer to be the Approved Signatory. The LRP authorization for the Resident Engineer to be the Approved Signatory is Attachment B. The District Director, or Resident Engineer when authorized Approved Signatory, shall sign and date the approval certificate.
- Print the District Director's or Resident Engineer's name and telephone number.
- The SWPPP must be written, amended, and certified by a Qualified SWPPP Developer (QSD); in conformance with Section VII.B.1 of Construction General Permit (CAS000002, Order No. 2009-009-DWQ). A QSD must possess one of the following certifications and or registrations:
 - California registered Professional Civil Engineer
 - California registered Professional Geologist or Engineering Geologist
 - California registered Landscape Architect
 - Professional Hydrologist (American Institute of Hydrology)
 - Certified Professional in Erosion and Sediment Control (CPESC)
 - Certified Professional in Storm Water Quality (CPSWQ)

REQUIRED TEXT WHEN CALTRANS IS ADMINISTERING PROJECT:

The Caltrans District Director as the Legally Responsible Person has authorized the Caltrans Resident Engineer to be the authorized Approved Signatory of Caltrans for approving, signing, and certifying the SWPPP in conformance with Section H, Provision 8.b; and Section M, Provision 10 of the Caltrans Permit (CAS000003, Order No. 99-06-DWQ) and Section IV.I of the

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
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Construction General Permit (CAS000002, Order No. 2009-0009-DWQ). The LRP authorization for the Resident Engineer to be the Approved Signatory is Attachment B. The SWPPP was developed by the Contractor and submitted for review and approval to the Resident Engineer, pursuant to the Special Provisions, the SWPPP/WPCP Preparation Manual, and the Standard Specifications Section 7-1.01G – Water Pollution. The Contractor is responsible and liable at all times for compliance with applicable requirements of the Construction General Permit (CAS000002, Order No. 2009-009-DWQ) for which compliance is ultimately determined by the Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB), and/or the U.S. Environmental Protection Agency (EPA).

For Caltrans Use Only
**Resident Engineer's Approval and
Caltrans Certification of the
Stormwater Pollution Prevention Plan**

Project Name:

Caltrans Contract Number:

"I certify under a penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Resident Engineer's Signature

Date

Resident Engineer's Name

Resident Engineer's Telephone Number

100.2 CONTRACTOR SWPPP CERTIFICATION

INSTRUCTIONS:

Include a Separator and Tab for Section 100 for ready reference.

- The contractor is required by the Special Provisions to have a QSD write, amend, and certify the SWPPP and have a QSD or Qualified SWPPP Practitioner (QSP) implement the SWPPP.
- The SWPPP shall be submitted to the Resident Engineer for review and approval.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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Print the project name and the contract number at the top of the form.

Certification shall be signed and dated by Contractor's QSD; specifically the person appointed to write, amend, and certify the SWPPP with one of the qualifications identified in Section 100.1.

Print the name, title and telephone number of the person signing the certification.

REQUIRED TEXT:

Project Name: SWEET RANCH MITIGATION PROJECT

REQUIRED TEXT CALTRANS ADMINISTERING PROJECT

Caltrans Contract Number: 04-172424

**REQUIRED TEXT LOCAL AGENCY / PRIVATE ENTITY
ADMINISTERING PROJECT**

100.3 AMENDMENTS

100.3.1 SWPPP Amendments Certification and Approval

INSTRUCTIONS:

When changes in the approved SWPPP are required, the contractor's Water Pollution Control Manager (WPCM) shall prepare changes to the SWPPP.

- The WPCM must be a qualified QSD and maintain one of the registrations or certifications required by the Construction General Permit for a QSD (listed in Section 100.1).
- The WPCM shall certify SWPPP amendments and submit them to the Resident Engineer for review and approval.
- The SWPPP shall be amended annually and when:
 - There is a change in construction activities, which may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4);
 - Water pollution control practices are added by contract change order;
 - Objectives for reducing or eliminating pollutants in stormwater discharges have not been achieved, such as, a Numeric Action Level or Numeric Effluent Level are exceeded;
 - There is a Permit violation. If the RWQCB determines that a Permit violation has occurred, the SWPPP shall be amended and implemented within 14 calendar days after notification by the RWQCB;

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
Contract No.04-172424**

- When deemed necessary by the Resident Engineer.
- All SWPPP amendments shall be transmitted in letter format and shall include revised Water Pollution Control Drawing (WPCD) sheets, as appropriate.
- The SWPPP Amendment certification and approval form shall be used as the cover sheet for each amendment.
- All amendments shall be recorded in the SWPPP amendment log in Attachment DD.
- Approved amendments should be inserted into the appropriate SWPPP Section or Attachment when possible and a copy shall be kept in Attachment DD.
- The Contractor certification and Legally Responsible Person, or Resident Engineer if authorized Approved Signatory, approval form for amendments shall be attached to the SWPPP amendment and inserted into Attachment DD.
- The following items shall be included in each amendment:
 - Discuss who requested the amendment;
 - Describe the location of proposed change;
 - Describe reason for change;
 - Describe the original BMP proposed, if any;
 - Describe the new BMP proposed; and
 - Describe any existing implemented BMP(s)

The SWPPP Amendment Certification and Approval form shall be used as the cover sheet for each amendment.

Print the Project name and Caltrans contract number (if applicable Caltrans encroachment permit number).

Print the Contractor's name and telephone number.

The Contractor shall sign and date the SWPPP Amendment Certification and Approval form.

Print the name of the Caltrans Legally Responsible Person, or Resident Engineer if authorized Approved Signatory, and telephone number.

When the amendment is approved, the Caltrans Legally Responsible Person, or Resident Engineer if authorized Approved Signatory, shall sign and date the SWPPP Amendment Certification and Approval form.

- Approved amendments shall be inserted into the SWPPP in Attachment DD. Include approved SWPPP Amendment Certification and Approval forms in Attachment DD.
- All amendments shall be recorded in the SWPPP amendment log in Attachment DD, see Section 100.4.2.

REQUIRED TEXT:

This SWPPP shall be amended annually and when:

- There is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4);

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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- Water pollution control practices are added by contract change order;
- Objectives of reducing or eliminating pollutants in stormwater discharges has not been achieved;
- There is a Permits violation. If the RWQCB determines that a Permit violation has occurred, the SWPPP shall be amended and implemented within 14 calendar days after notification by the RWQCB;
- When deemed necessary by the Resident Engineer.

The following items shall be included in each amendment:

- Who requested the amendment;
- The location of proposed change;
- The reason for change;
- The original BMP proposed, if any; and
- The new BMP proposed.

Approved and certified amendments shall be inserted into the appropriate Section of the SWPPP or attachment and a copy inserted into Attachment DD.

All SWPPP amendments prepared by the WPCM and certified by the contractor shall be approved and certified by the Legally Responsible Person or Approved Signatory. A blank copy of the SWPPP Amendment Certification and Approval form is in Appendix B. For approved amendments, the signed SWPPP Amendment Certification and Approval form is attached to the SWPPP amendment.

Approved and certified amendments shall be inserted into the appropriate Section of the SWPPP or attachment and a copy inserted into Attachment DD. All SWPPP amendments are listed in the SWPPP Amendment Log in Attachment DD.

100.3.2 Amendment Log

INSTRUCTIONS:

- SWPPP amendment(s) prepared and approved as discussed in Section 100.4.1 shall be documented in the Amendment Log and shall be inserted into Attachment DD.
- All amendments shall be dated and listed in the Amendment Log.

Enter the project name, and Caltrans contract number (or Caltrans encroachment permit number) at the top of the form.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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Enter the Amendment number, date, brief description, name of person who requested the Amendment and amendment approval date in the table.

EXAMPLE SWPPP AMENDMENT LOG:

Amendment No.	Date	Brief Description of Amendment	Requested By	Approval Date
001	12/10/2000	Grading schedule changed to begin on Feb. 10, 2001, and will include additional 2 acres. Amended water pollution control drawings showing 2 additional acres.	John Doe, Superintendent	12/20/2000

REQUIRED TEXT:

All approved and certified SWPPP amendments shall be shown on the SWPPP Amendment Log in Attachment DD. The amendment log shall include:

- Amendment number;
- Date;
- Requested by;
- Approval date.

100.4 ANNUAL COMPLIANCE AND APPROVAL

INSTRUCTIONS:

- Include completed and signed Annual Certification of Compliance forms in SWPPP file category 20.01 Annual Certification of Compliance.
- Do not complete the Annual Certification of Compliance during the initial SWPPP development and approval. Annual certifications are completed by July 15 each year. For those projects that start construction on or after July 15, an Annual Certification will not be required until the following July 15.

CALTRANS ADMINISTERED PROJECTS

- The Legally Responsible Person or authorized Approved Signatory shall certify annually that construction activities comply with the requirements of the Construction General Permit and the SWPPP.
- The Contractor's Annual Certification of Compliance shall be completed by the contractor before July 15 of each year and submitted to the Resident Engineer. This Certification is based upon the site inspections required in Section 700. Blank copies of the forms for the Contractor's Annual Certification of Compliance and Annual Certification of Compliance to be signed by the Caltrans (LRP) are provided in Appendix A.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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LOCAL AGENCY / PRIVATE ENTITY ADMINISTERED PROJECT

- When a Local Agency is administering the project, then the LRP for the Local Agency, or the Resident Engineer if authorized to be the Approved Signatory, must sign the Annual Certification of Compliance.

- When a Private Entity is administering the project, then the Private Entity LRP must sign the Annual Certification of Compliance and submit the completed Annual Certification of Compliance to the Caltrans Oversight Engineer by July 15 of each year.

- When a Local Agency / Private Entity is administering the project, then the Caltrans Oversight Engineer must review and sign that the Annual Certification of Compliance is accepted.

REQUIRED TEXT FOR CALTRANS ADMINISTERED PROJECTS:

By July 15 of each year, the contractor shall submit the Contractor's Annual Certification of Compliance to the Resident Engineer stating that the project is in compliance with the terms and conditions of the Permits and the SWPPP. By August 1 of each year, the Caltrans Legally Responsible Person, or Resident Engineer as authorized Approved Signatory, will complete an Annual Certification of Compliance stating that the project is in compliance with the terms and conditions of the Permits and the SWPPP. A blank copy of the Contractor's Annual Certification of Compliance Form and Annual Certification of Compliance Form are included in Appendix A. Completed Annual Certification of Compliance forms will be filed in SWPPP file category 20.01 Annual Certification of Compliance.

SECTION 200 OBJECTIVES

INSTRUCTIONS:

Include a Separator and Tab for Section 200 for ready reference.

- The five primary SWPPP objectives are described in the Construction General Permit, Section XIV, "SWPPP Requirements," and are shown below in the "required text" section. Pollutant source identification and BMP selections shall be documented in the SWPPP to support the four SWPPP objectives.

REQUIRED TEXT:

This SWPPP has five main objectives:

- All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
- Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;
- Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from the construction activity to the BAT/BCT standard;
- Calculations and design details as well as BMP controls for site run-on are complete and correct, and
- Stabilization BMP's installed to reduce or eliminate pollutants after construction is complete.

This SWPPP was developed to conform with the required elements of the Caltrans Permit (SWRCB Order No. 99-06-DWQ, NPDES No. CAS000003) and with the required elements of the Construction General Permit issued by the State of California, State Water Resources Control Board (SWRCB).

This SWPPP is designed to be usefull document for those who must implement the SWPPP on a daily basis in thefield. Most of the information nessary for the daily implementation of the SWPPP is contained in Attachments AA "BMPs for Project", Attachment BB "Water Pollution Control Drawings" and Attachment DD "Amendments."

This SWPPP is also a "living document" because additional information is constantly be added to the SWPPP file categories as the project progresses including:

- Stormwater Site Inspection Reports;
- Stormwater Site Inspections Report Corrections Summary;

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
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- Rain Event Action Plans;
- Contractor Personnel Training Documentation;
- Stormwater Sampling Test Results;
- Notice of Discharges;
- Contact information for additional subcontractors and material suppliers.

The SWPPP will be modified and amended when:

- There are any amendments to the Permits;
- There are any changes in construction or operations that may affect the discharge of pollutants from the construction site to surface waters, groundwaters, or the municipal separate storm sewer system (MS4);
- There are Permit violations;
- The general objective of reducing pollutants in stormwater discharges is not achieved.

The SWPPP will be completely revised if either the number of amendments and amount of information contained the amendments makes implementation of the SWPPP confusing, as determined by the Resident Engineer, or the Contractor requests to revise the SWPPP based on planned changes in activities that would require a major SWPPP amendment.

The SWPPP shall be readily available onsite for the duration of the project.

SECTION 300 PROJECT AND CONTRACTOR INFORMATION

300.1 PROJECT DESCRIPTION

INSTRUCTIONS:

- Include a Separator and Tab for Section 300 for ready reference.
- Provide the project description (county, cities, route and post-mile/kilo-post). Name the receiving waters and describe proximity to receiving waters to which the project will discharge, including surface waters, drainage channels, and drainage systems (identify who owns the drainage system; i.e., municipality or agency.)

EXAMPLE:

The construction project is located in Any County, in Any City, on State Route 42 from Post mile X to Post mile Y. The project will upgrade the westbound two-lane span by replacing the existing substandard steel truss bridge with a four-lane suspension bridge (which includes one HOV lane and a bicycle/pedestrian lane). The receiving water is the Salmon River, and the new suspension bridge consists of two towers in the Strait and a north and south anchorage. The existing maintenance facility will be demolished. This project also includes constructing a vista point at the north end of the bridge and a bicycle lane from the Route 80/29 separation to the south end of the bridge.

REQUIRED TEXT:

The construction project is located on a private ranch in the Altamont hills in Alameda County. The project will create seasonal wetlands by grading the existing terrain to create shallow basins. A clay liner will be installed at the bottom of the wetlands to enhance water retention. Local topsoil will be used as a cover over the liner. Berms with a rock spillway will allow overflow from each basin to flow to basins below each other until the flows are conveyed to an existing creek and culvert. The main receiving water bodies of the unnamed creek are the Arroyo Las Positas and the Arroyo Mocho and both of these water bodies are on the 303d list with TMDLs for urban runoff and Diazinon. Bowl construction will occur at 2 separate locations. Construction is planned to begin in August with a 60 work day period. There is no paving or concrete work on this project. Erosion control materials will be placed on all graded surfaces for sediment control following grading. There is approximately 9 acres of graded surfaces on this project.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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300.2 SITE RISK LEVEL

INSTRUCTIONS:

State the Risk Level for the project site. This information may be provided by Caltrans or the local Agency or private entity administering the project. A summary of how the risk level is calculated is located in Section 500.1.3

REQUIRED TEXT:

The site will be associated with a risk level 1. This risk level will determine the minimum level of BMPs that will be acceptable with the project construction activities and the minimum level of site-specific monitoring and reporting that will be required. The risk level is based on project duration, proximity to impaired receiving waters, and soil conditions. A summary of the Risk Level determination is included in Attachment EE.

300.3 CONSTRUCTION SITES ESTIMATES

INSTRUCTIONS:

Provide an estimate of the following features:

- Construction Site area (acres)
- Anticipated stormwater run-on to the construction site from off-site (cfs)

Show run-on flow calculations in Attachment HH. include references for all calculation input parameters in Attachment HH. Show the run-on area on the vicinity map and note the run-on flows on the WPCDs.

If there is no anticipated stormwater run-on to the site, describe the existing flow conditions that preclude run-on. For example, if the potential run-on is handled by an existing stormwater diversion of lined ditch, a calculation would not be necessary. If the existing diversion feature will be affected by construction, the run-on flow calculation is necessary for designing BMPs to protect the site from run-on.

For calculated run-on, refer to Section 500.3.1 for the run-on control BMPs that will be designed to handle the calculated run-on.

EXAMPLE:

The following are estimates of the construction site:

- Construction site area 10 acres

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- Anticipated stormwater run-on flow to the construction site 12 cfs

Calculations of the run-on flow are included in Attachment D. References for the calculation input parameters are included in Attachment D and Section 500. The run-on area is shown on the Vicinity Map and is noted on the WPCDs. The BMPs designed to handle the run-on flow are included in Section 500.3.1.

REQUIRED TEXT:

The following are estimates of the construction site:

- Construction site area 9 acres_____
- Anticipated stormwater run-on flow to the construction site 4.2 cfs

300.4 VICINITY AND SITE MAP

INSTRUCTIONS:

- Include both a vicinity and site map the SWPPP.

The Vicinity Map shall be a 8-1/2" x 11" color copy of a USGS map or equal and shall extend approximately one-quarter mile beyond the property boundaries of the construction site (an 11" x 17" may be used if needed). Insert the vicinity map as Attachment C and place a reference in Section 300.4. The Office of Water Programs, Water Quality Planning Tool website can be used to obtain images of USGS topographic maps by selecting the 'Post Miles' option on the webpage at: <http://stormwater.water-programs.com/>

To meet the site map requirement, insert a reduced copy (8-1/2" x 11" or 11" x 17") of the project's Title Sheet in Attachment C and make reference to it in Section 300.4.

Provide a brief narrative description of the vicinity to support the map in Attachment C. Describe important features, drainage areas, or receiving waters that could not be shown on the map.

- The vicinity map shall show:
 - Outline of the site's perimeter;
 - Easily identifiable major roadways;
 - Geographic features or landmarks;
 - Water bodies within or adjacent to the construction limits;
 - Construction site perimeter;
 - Staging areas and storage yards;
 - Known wells;
 - Outline of the offsite drainage area(s) that discharge into the construction site;

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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SWPPP Template 06-15-10

Identification of anticipated discharge location(s) where the construction site's stormwater discharges to a municipal separate storm sewer system or other water body;

Other geographic features surrounding the site; and

General topography.

REQUIRED TEXT

The construction project vicinity map showing the project location, surface water boundaries, geographic features, construction site perimeter, staging areas, storage yards, and general topography, is located in Attachment C. The project's contract plans Title Sheet provides more detail regarding the project location and is also included in Attachment C.

300.5 UNIQUE SITE FEATURES

INSTRUCTIONS:

Provide a brief description of any unique site features (water bodies, wetlands, environmentally sensitive areas, endangered or protected species, etc.) and significant or high-risk construction activities that may impact stormwater quality. Include any unique features or activities within or adjacent to water bodies (such as dredging, dewatering, re-use of aerially deposited lead material, large excavations, or work within a water body).

EXAMPLE:

The Salmon River is located within the project limits. A portion of the construction will occur within the river in order to properly construct the towers. The project will also demolish an existing culvert and will replace it with a larger reinforced concrete box within the tributary.

REQUIRED TEXT:

There is an existing seasonal drainage/creek on the property that will accept runoff from the bowl wetlands shown on the plans. At the base of the creek/drainage, 2 ea. 36" diameter culverts will be installed to convey flows to the constructed meadow wetlands. The existing access road/driveway over the existing culverts will be raised in profile to correct an existing sag in the road.

The soil consists of Clear Lake clay and Linne clay loam. According to the National Resource Conservation Service, the predominant Hydrologic Soil Group (HSG) within the limits of this contract is rated "C."

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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Title: Resident Engineer

Agency: Insert Telephone Number(s)-then TAB.

Address: Insert Address 1 then press ENTER to insert Address 2 or TAB to next field.
Insert City, State, ZIP-then TAB.

Phone Number: Insert Telephone Number(s)-then TAB.

Emergency Phone
Number (24/7): Insert Telephone Number(s)-then TAB.

Contractor

Name: Insert WPCM/QSD's Name-then TAB.

Title: Insert Contractor's Company **Name-then TAB.**

Company: Insert Telephone Number(s)-then TAB.

Address: Insert Address 1 then press ENTER to insert Address 2 or TAB to next field.
Insert City, State, ZIP-then TAB.

Phone Number: Insert Telephone Number(s)-then TAB.

Emergency Phone
Number (24/7): Insert Telephone Number(s)-then TAB.

REQUIRED TEXT WHEN CONTRACTOR SITE MANAGER DID NOT CERTIFY THE SWPPP FOR THE CONTRACTOR:

Contractor Site Manager

Name: Insert WPCM/QSD's Name-then TAB.

Title: Insert Contractor's Company **Name-then TAB.**

Company: Insert Telephone Number(s)-then TAB.

Address: Insert Address 1 then press ENTER to insert Address 2 or TAB to next field.
Insert City, State, ZIP-then TAB.

Phone Number: Insert Telephone Number(s)-then TAB.

Emergency Phone
Number (24/7): Insert Telephone Number(s)-then TAB.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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REQUIRED TEXT:

Water Pollution Control Manager (WPCM)

Name: Insert WPCM/QSD's Name-then TAB.
Title: Insert Contractor's Company **Name-then TAB.**
Company: Insert Telephone Number(s)-then TAB.
Address: Insert Address 1 then press ENTER to insert Address 2 or TAB to next field.
Insert City, State, ZIP-then TAB.
Phone Number: Insert Telephone Number(s)-then TAB.
Emergency Phone
Number (24/7): Insert Telephone Number(s)-then TAB.

Erosion and Sediment Control Provider

Name: Insert WPCM/QSD's Name-then TAB.
Title: Insert Contractor's Company **Name-then TAB.**
Company: Insert Telephone Number(s)-then TAB.
Address: Insert Address 1 then press ENTER to insert Address 2 or TAB to next field.
Insert City, State, ZIP-then TAB.
Phone Number: Insert Telephone Number(s)-then TAB.
Emergency Phone
Number (24/7): Insert Telephone Number(s)-then TAB.

Stormwater Sampling and Testing Agent

Name: Insert WPCM/QSD's Name-then TAB.
Title: Insert Contractor's Company **Name-then TAB.**
Company: Insert Telephone Number(s)-then TAB.
Address: Insert Address 1 then press ENTER to insert Address 2 or TAB to next field.
Insert City, State, ZIP-then TAB.
Phone Number: Insert Telephone Number(s)-then TAB.
Emergency Phone

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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Number (24/7): Insert Telephone Number(s)-then TAB.

INSERT ADDITIONAL RESPONSIBILITIES AND/OR NAMES HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert subtitles and/or paragraphs)

300.7 LIST OF SUBCONTRACTOR AND MATERIALS SUPPLIERS

INSTRUCTIONS:

- List the names of all subcontractors. Provide subcontractor contact information in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information shall include subcontractor name, type of work performed, contact name, phone number and emergency telephone number (24/7). This information will be used by the WPCM to implement Rain Event Action Plans.
 - A sample subcontractor SWPPP Notification letter and subcontractor notification log is provided in Appendix C. The subcontractor SWPPP Notification letter should include pertinent subcontractor water pollution control requirements and address subcontractor responsibility for compliance with SWPPP and Construction General Permit. Include copies of subcontractor notification letters in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information.
 - If additional subcontractors are added during the progress of the work:
 - Add the subcontractor to the subcontractor log in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information;
 - Provide subcontractor contact information in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information;
 - Send the subcontractor a SWPPP Notification letter;
 - Include a copy of SWPPP Notification Letter in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information.
- SWPPP amendment is not required for adding subcontractors.
- List the names of major material suppliers who will delivery materials to the project site who must comply with requirements of the SWPPP. Notify the suppliers of pertinent water pollution control best management practice(s) that apply to the type(s) of materials that they will deliver to the project site and the material suppliers responsibility to comply with the SWPPP.
- A sample material supplier SWPPP Notification letter and the material supplier notification log is provided in Appendix C. Include copies of material supplier notification letters in SWPPP file category 20.06 Material Supplier Notification Letters and Contact Information.

EXAMPLE:

The following subcontractors will be working on this project:

1. ABC Construction Inc.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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2. Atlas Fence
3. MBE Electric
4. Mountain Landscaping
5. Quick Pavement Marking

Contact information for each subcontractor will be provided in SWPPP Notification log in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information, Contact information shall include subcontractor name, type of work performed, contact name, phone number and emergency telephone number (24/7).

The following materials suppliers will be delivering materials to the project site and must comply with pertinent SWPPP requirements:

1. Hanson Ready Mix
2. Vulcan Materials

Contact information for each material supplier will be provided in SWPPP Notification log in SWPPP file category 20.06 Material Supplier Notification Letters and Contact Information. Contact information shall include company name, type of material supplied, contact name and phone number.

Special Provision XX has designated XX training for the...

All subcontractors and material suppliers shall be notified that the project is covered by the following permits issued by the California State Water Resources Control Board:

- SWRCB Order No. 99-06-DWQ, NPDES No. CAS000003 (“Permit”), National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation. July 15, 1999.
- SWRCB Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, September 02, 2009.

Each subcontractor and material supplier shall also be notified that the project has a SWPPP and the pertinent water pollution control best management practices that the subcontractor or material supplier must comply with.

A SWPPP Notification letter shall be sent to all subcontractors and material suppliers. A sample notification letter and notification letter log is provided in Appendix C. A copy of SWPPP Notification letters sent to subcontractors and material suppliers are in SWPPP file category 20.05

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
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Subcontractor Notification Letters and Contact Information or 20.06 Material Suppliers Notification Letters and Contact Information. A SWPPP Notification letter log, which also includes contact information, is in SWPPP file category 20.05 Subcontractor Notification Letter and Contact Information and 20.06 Material Supplier Notification Letter and Contact Information. If subcontractors or material suppliers are added during the project, the appropriate SWPPP file shall be updated accordingly.

REQUIRED TEXT:

The following subcontractors will be working on this project:

1. Insert WPCM/QSD's Name-then TAB.
2. Insert Telephone Number(s)-then TAB.
3. Insert Telephone Number(s)-then TAB.
4. Insert Telephone Number(s)-then TAB.
5. Insert Telephone Number(s)-then TAB.

INSERT ADDITIONAL RESPONSIBILITIES AND/OR NAMES HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert subtitles and/or paragraphs)

Contact information for each subcontractor will be provided in SWPPP Notification log in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information. Contact information shall include subcontractor name, type of work performed, contact name, phone number and emergency telephone number (24/7).

The following materials suppliers will be delivering materials to the project site and must comply with pertinent SWPPP requirements:

1. Insert WPCM/QSD's Name-then TAB.
2. Insert Telephone Number(s)-then TAB.
3. Insert Telephone Number(s)-then TAB.

INSERT ADDITIONAL RESPONSIBILITIES AND/OR NAMES HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert subtitles and/or paragraphs)

Contact information for each material supplier will be provided in SWPPP Notification log in SWPPP file category 20.06 Material Supplier Notification Letters and Contact Information. Contact information shall include company name, type of material supplied, contact name and phone number.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
Contract No.04-172424**

All subcontractors and material suppliers shall be notified that the project is covered by the following permits issued by the California State Water Resources Control Board:

- SWRCB Order No. 99-06-DWQ, NPDES No. CAS000003 (“Permit”), National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation. July 15, 1999.
- SWRCB Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, September 02, 2009.

Each subcontractor and material supplier shall also be notified that the project has a SWPPP and the pertinent water pollution control best management practices that the subcontractor or material supplier must comply with.

A SWPPP Notification letter shall be sent to all subcontractors and material suppliers. A sample notification letter and notification letter log is provided in Appendix C. A copy of SWPPP Notification letters sent to subcontractors and material suppliers are in SWPPP file category 20.05 Subcontractor Notification Letters and Contact Information or 20.XX Material Suppliers Notification Letters and Contact Information. A SWPPP Notification letter log, which also includes contact information, is in SWPPP file category 20.05 Subcontractor Notification Letter and Contact Information and 20.XX Material Supplier Notification Letter and Contact Information. If subcontractors or material suppliers are added during the project, the appropriate SWPPP file shall be updated accordingly.

INSERT ADDITIONAL RESPONSIBILITIES AND/OR NAMES HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert subtitles and/or paragraphs)

300.8 TRAINING

INSTRUCTIONS:

- Formal training is required for individuals responsible for SWPPP development, implementation and amending or revising the SWPPP as required by the Construction General Permit. Training is required for those personnel responsible for installation, inspection, maintenance, and repair of BMPs. The SWPPP shall document all training.
- Describe the training for the following individuals responsible for the SWPPP:
 - Water Pollution Control Manager (WPCM)
 - Qualified SWPPP Developer (QSD), if SWPPP not developed by WPCM
 - Qualified SWPPP Practitioner (QSP), if assisting WPCM,
- Describe the types of training that the contractor's or subcontractor's BMP inspection, maintenance, and repair personnel have received or will receive.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
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- Describe the types of training provided for all contractor and subcontractor employees that is directly related to stormwater pollution prevention. Existing contractor and subcontractor employees shall receive stormwater pollution prevention training prior to working on the project. New employees shall receive water pollution control training prior to working on the project site and the training records shall be submitted to the Resident Engineer within 5 days of training.
- Training may be both formal and informal (Caltrans 24 Hour Training Class, Construction General Permit training, etc.).
- Formal stormwater pollution prevention or erosion and sediment control training sessions may include certification as a Certified Professional in Erosion and Sediment Control (CPESC); workshops offered by the SWRCB, RWQCB, Community College or University of California Extension; or other locally recognized agencies or professional organizations such as the International Erosion Control Association (IECA), Association of Bay Area Governments (ABAG), Association of General Contractors (AGC), etc. Contractors are encouraged to contact the RWQCB or the SWRCB to inquire about availability of training.
- A listing of training organizations, subject matter and classes are located at <http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.html>
- The Contractor's WPCM (QSD) shall have a minimum of 24 hours (3 days) of formal stormwater pollution prevention training and required qualifications and training under the Construction General Permit (CAS000002), Section VII, Training Qualifications and Certification Requirements.
- After September 2, 2011 any Qualified SWPPP Developer (QSD) or Qualified SWPPP Practitioner shall have attended a State Water Board-sponsored or approved training course.
- Training of water quality sampling personnel shall be in accordance with the Caltrans *Construction Site Storm Water Quality Guidance Manual, December 2003, or latest edition*
- Onsite informal stormwater pollution prevention training shall be conducted on an ongoing basis.
- Document informal stormwater training using the sample training log sheet provided as Appendix D.
- Document formal stormwater training by providing a list of classes and copies of class completion documentation. Documentation shall be submitted to the Resident Engineer within 24 hours of completion of training.
- Training records shall be updated, documented and reported in SWPPP file category 20.07 Contractor Personnel Stormwater Training Documentation.
- Training information shall be provided in the Stormwater Annual Report consisting of:
 - Documentation of all training for individuals responsible for all activities associated with compliance with Construction General Permit;
 - Documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
 - Documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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EXAMPLE:

The contractor's Water Pollution Control Manager (WPCM) is a Qualified SWPPP Developer (QSD).. John Doe, the WPCM for this project, meets the registration or certification requirement of Section VII., "Training Qualifications and Certification Requirements," of the Construction General Permit based on:

- California Registered Professional Civil Engineer, C XXXXX

The WPCM has received the following training:

- 24-hour Caltrans Training Provided by ABC Consultant
- Attended 2001 IECA 3-day Conference

The WPCM has the following SWPPP development and implementation experience:

- Has developed 24 SWPPPs for complex sites
- Has 15 years of experience as a WPCM working on 14 project sites

The SWPPP for this project was developed by a Qualified SWPPP Developer (QSD). John Doe, Jr. developed the SWPPP and meets the registration or certification requirement of Section VII., "Training Qualifications and Certification Requirements," of the Construction General Permit based on:

- California Registered Landscape Architect, LA XXXX

The QSD has received the following training:

- 24-hour Caltrans Training Provided by Mountain College
- SWPPP Preparation training sponsored by Orange County Storm Water Program, June 2002
- Attended the 1999, 2000, 2001, and 2002 International Erosion Control Association (IECA) 3-day conferences
- Received certification as a Certified Professional in Erosion and Sediment Control (CPESC) in July 2001
- Attended "NPDES Storm Water Permit Compliance" course in spring 2002, sponsored by the American Society of Civil Engineers (ASCE)

The QSD has the following SWPPP development experience:

- Has prepared over 15 project-specific SWPPPs
- Over 15 years of experience in storm drain design, hydrology, and hydraulics

Qualified SWPPP Practitioner will be assisting the WPCM to ensure all required BMPs are implemented and perform non-storm water and stormwater visual observations, sampling and analysis. The QSP for this project is John Doe, II.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
Contract No.04-172424**

By September 2, 2011 the QSP must meet the registration or certification requirement of Section VII., "Training Qualifications and Certification Requirements," of the Construction General Permit. If the QSP qualifies as a QSD or meets the certification requirement for a QSP then it is shown below:

- Not Required

The QSP has received the following training:

- 24-hour Caltrans Training Provided by XYZ Consultant

The QSP has the following SWPPP implementation experience:

- 5-years experience in SWPPP site inspections and visual monitoring

Ongoing, formal training sessions for individuals responsible for SWPPP development and implementation shall be selected from one of the following organizations:

- City of Los Angeles Storm Water Program;
- County of Los Angeles Storm Water Program;
- State of California RWQCB;
- IECA, ABAG and/or AGC sponsored training;
- USEPA sponsored training;
- Recognized municipal stakeholder organizations throughout California;
- Professional organizations and societies in the building and construction field

Contractor or subcontractor employees responsible for water pollution control best management practices (BMPs) installation, maintenance and repair have received the following training:

- BMP Best Practices Provided by ABC Consultants

Contractor and subcontractor employees shall be trained prior to working on the site in the following subjects:

1. Water pollution control rules and regulations.
2. Implementation and maintenance for:
 - 2.1. Temporary Soil Stabilization
 - 2.2. Temporary Sediment Control
 - 2.3. Tracking Control
 - 2.4. Wind Erosion Control
 - 2.5. Material pollution prevention control
 - 2.6. Waste management
 - 2.7. Non-storm water management
 - 2.8. Identifying and handling hazardous substances
 - 2.9. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances.

Informal employee training shall include tailgate site meetings to be conducted weekly and address the following topics:

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
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- Water pollution control best management practices (BMPs) deficiencies and corrective actions;
- BMPs that are required for work activities during the week;
- Spill prevention and control;
- Material delivery, storage, use, and disposal;
- Waste management; and
- Non-storm water management procedures.

A summary of formal and informal training of various personnel is shown in Attachment D. A copy of all training certificate(s) (e.g., Caltrans 24 Hour Training Class and Construction General Permit Training) for the WPCM and the Qualified SWPPP Developer (and others, if applicable,) are included in Attachment D. Training records for project personnel shall be updated by completing the training log shown in Appendix D. A copy of the training log and copies of all training certificates for project personnel will be kept in SWPPP file category 20.07 Contractor Personnel Stormwater Training Documentation. An updated training log and documentation of new training shall be submitted to the Resident Engineer within 5 days of training.

Training information shall be provided in the Stormwater Annual Report consisting of:

- Documentation of all training for individuals responsible for all activities associated with compliance with Construction General Permit;
- Documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
- Documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

REQUIRED TEXT:

The contractor's Water Pollution Control Manager (WPCM) is a Qualified SWPPP Developer (QSD).. (LIST), the WPCM for this project, meets the registration or certification requirement of Section VII., "Training Qualifications and Certification Requirements," of the Construction General Permit based on:

- INSERT COMPANY, NAME AND PROFESSIONAL REGISTRATION OR OTHER QUALIFICATIONS (INCLUDING INFORMATION REGARDING OTHER TRAINING COURSES, SUCH AS CALTRANS SWPPP PREPARATION TRAINING) OF PERSON THAT PREPARED THE SWPPP

The WPCM has received the following training:

- (LIST)

The WPCM has the following SWPPP development and implementation experience:

- (LIST)

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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REQUIRED TEXT WHEN SWPPP IS NOT DEVELOPED BY THE WPCM:

The SWPPP for this project was developed by a Qualified SWPPP Developer (QSD). (LIST) developed the SWPPP and meets the registration or certification requirement of Section VII., “Training Qualifications and Certification Requirements,” of the Construction General Permit based on:

- INSERT COMPANY, NAME AND PROFESSIONAL REGISTRATION OR OTHER QUALIFICATIONS (INCLUDING INFORMATION REGARDING OTHER TRAINING COURSES, SUCH AS CALTRANS SWPPP PREPARATION TRAINING) OF PERSON THAT PREPARED THE SWPPP

The QSD has received the following training:

- (LIST)

The QSD has the following SWPPP development experience:

- (LIST)

REQUIRED TEXT WHEN QSP WILL BE ASSISTING WPCM:

A Qualified SWPPP Practitioner will be assisting the WPCM to ensure all required BMPs are implemented and perform non-storm water and stormwater visual observations, sampling and analysis. The QSP for this project is (LIST).

By September 2, 2011 the QSP must meet the registration or certification requirement of Section VII., “Training Qualifications and Certification Requirements,” of the Construction General Permit. If the QSP qualifies as a QSD or meets the certification requirement for a QSP then it is shown below:

- INSERT COMPANY, NAME AND PROFESSIONAL REGISTRATION OR OTHER QUALIFICATIONS (INCLUDING INFORMATION REGARDING OTHER TRAINING COURSES, SUCH AS CALTRANS SWPPP PREPARATION TRAINING) OF PERSON THAT PREPARED THE SWPPP

The QSP has received the following training:

- (LIST)

The QSP has the following SWPPP implementation experience:

- (LIST)

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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REQUIRED TEXT:

Ongoing, formal training sessions for individuals responsible for SWPPP development and implementation shall be selected from one of the following organizations:

- City of Los Angeles Storm Water Program;
- County of Los Angeles Storm Water Program;
- State of California RWQCB;
- IECA, ABAG and/or AGC sponsored training;
- USEPA sponsored training;
- Recognized municipal stakeholder organizations throughout California;
- Professional organizations and societies in the building and construction field
- (LIST)

Contractor or subcontractor employees responsible for water pollution control best management practices (BMPs) installation, maintenance and repair have received the following training:

- (LIST)

Contractor and subcontractor employees shall be trained prior to working on the site in the following subjects:

1. Water pollution control rules and regulations.
2. Implementation and maintenance for:
 - 2.1. Temporary Soil Stabilization
 - 2.2. Temporary Sediment Control
 - 2.3. Tracking Control
 - 2.4. Wind Erosion Control
 - 2.5. Material pollution prevention control
 - 2.6. Waste management
 - 2.7. Non-storm water management
 - 2.8. Identifying and handling hazardous substances
 - 2.9. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances.

Informal employee training shall include tailgate site meetings to be conducted weekly and address the following topics:

- Water pollution control best management practices (BMPs) deficiencies and corrective actions;
- BMPs that are required for work activities during the week;
- Spill prevention and control;
- Material delivery, storage, use, and disposal;
- Waste management; and
- Non-stormwater management procedures.

A summary of formal and informal training of various personnel is shown in Attachment D. A copy of all training certificate(s) (e.g., Caltrans 24 Hour Training Class and Construction General

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
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Permit Training) for the WPCM and the Qualified SWPPP Developer are included in Attachment D Training records for project personnel shall be updated by completing the training log shown in Appendix D. A copy of the training log and copies of all training certificates for project personnel will be kept in SWPPP file category 20.07 Contractor Personnel Stormwater Training Documentation. An updated training log and documentation of new training shall be submitted to the Resident Engineer within 5 days of training.

Training information shall be provided in the Stormwater Annual Report consisting of:

- Documentation of all training for individuals responsible for all activities associated with compliance with Construction General Permit;
- Documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
- Documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

INSERT HERE ANY ADDITIONAL TEXT REGARDING TRAINING OF PERSONNEL.

SECTION 400 REFERENCES, OTHER PLANS, PERMITS AND AGREEMENTS

INSTRUCTIONS:

Include a Separator and Tab for Section 400 for ready reference.

Identify and prepare a list of the documents referenced in the SWPPP. Contract Plans and Specifications, reports, design, and stormwater management-related documents used to prepare the SWPPP shall also be included in the references.

- Documents that shall be referenced are:
 - All permits that apply to the project (Federal, state and local), such as Fish and Game, U.S. Army Corps of Engineers, DTSC Aerially Deposited Lead Reuse Variance, local RWQCB Permits or specific requirements, etc.
- Referenced materials may also include:
 - Onsite project information such as the Contract Plans and Specifications, Geotechnical Report, Drainage Report, Stormwater Data Report, District-prepared Conceptual SWPPP, other reports provided by the owner, regulatory guidance from federal or state agencies, and published technical specifications.
- The reference for each document shall include:
 - Complete name of the referenced document;
 - Number of the document (if applicable);
 - Author;
 - Date Published;
 - Document date/revision that applies
- Referenced documents shall be kept onsite and be readily available for review.
- The SWPPP shall incorporate appropriate elements of other plans or permits required by local, State, or Federal agencies.
- Include a copy of the Caltrans Statewide Permit No. CAS000003, and the General Permit No. CAS000002 in Attachment E.
- Describe any special requirements for each permit. Insert additional bullets as needed. Delete bullets if not needed.
- Include a copy of all other plans/permits/agreements in Attachment E of the SWPPP.

EXAMPLE:

The following documents are made a part of this SWPPP by reference:

Standard Plans and Standard Specifications, dated May 2006

Contract Plans and Special Provisions for Contract No. xx-xxxxxx

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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SWRCB Order No. 99-06-DWQ, NPDES No. CAS000003 (“Permit”), National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation. July 15, 1999.

SWRCB Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, September 02, 2009.

Caltrans Statewide Storm Water Management Plan (SWMP), dated May, 2003.

Caltrans SWPPP/WPCP Preparation Manual, dated March, 2007.

RWQCB, Los Angeles Region, Water Quality Control Plan, adopted June 13, 1994.

Conceptual Stormwater Pollution Prevention Plan (CSWPPP) prepared for the Division of Toll Bridge Program, Contract No. 04-013014. Prepared by California Department of Transportation, District 04, Division of Toll Bridge Engineering Program, Environmental Engineering Branch, October 1999.

Storm Water Management for Construction Activities – Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92-005, October 1992.

Caltrans "Construction Site Storm Water Quality Guidance Manual" (CTSW-RT-03-116.31.30), December 2003.

Caltrans “Water Quality Data-Reporting Protocols” (CTSW-RT-03-095.51.42), November 2003.

Attachment E includes copies of the Caltrans Statewide Permit, the Construction General Permit, and other local, state, and federal plans and permits. Following is a list of the other local, state, and federal plans and permits included in Attachment E:

RWQCB, Los Angeles Region, Waiver of Clean Water Act Section 401 Water Quality Certification, dated xx/xx/xx.

U.S. Army Corps of Engineers, Clean Water Act Section 404, Nationwide Permit 26-authorization letter, dated xx/xx/xx.

California Department of Fish and Game Streambed Alteration Agreement II 564-xx, dated.xx/xx/xx.

REQUIRED TEXT:

The following documents are made a part of this SWPPP by reference:

- Standard Plans and Specifications, dated May 2006.
- Contract Plans and Special Provisions for Contract No. 04-17242, dated MAY 10, 2010, prepared by CALTRANS.

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- SWRCB Order No. 99-06-DWQ, NPDES No. CAS000003 (“Permit”), National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans), July 1999.
- SWRCB-Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities.
- Caltrans Statewide Storm Water Management Plan (SWMP), dated 2003.
- Caltrans SWPPP/WPCP Preparation Manual, dated MARCH 2007.
- Caltrans Construction Site Storm Water Quality sampling Guidance Manual, dated DECEMBER 2003.
- Caltrans "Water Quality Data-Reporting Protocols" Water Quality Control Plan for the San Francisco Bay Basin
-

Attachment E includes copies of the Caltrans Statewide Permit, the Construction General Permit, and other local, state, and federal plans and permits. Following is a list of the other local, state, and federal plans and permits included in Attachment E:

- Clean Water Act Section 401 Water Quality Certification for the Pigeon Pass Replacement Project, issued by the San Francisco Bay RWQCB, dated 05/18/06.
- Clean Water Act Section 404 Nationwide Permit issued by the U.S. Army Corps of Engineers, dated 05/30/06.
- 1602 Lake and Streambed Alteration Agreement, issued by the California Department of Fish and Game, dated 06/19/06.

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SECTION 500 DETERMINATION OF CONSTRUCTION SITE BEST MANAGEMENT PRACTICES

500.1 POLLUTANT SOURCES

500.1.1 Inventory of Materials and Activities that May Pollute Stormwater

INSTRUCTIONS:

List all construction materials that will be used and construction activities that will have the potential to contribute to the discharge of pollutants to stormwater.

List all construction activities (ie, any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation,) that have the potential to contribute sediment or other pollutants to stormwater discharges.

- Insert as many bullets as necessary to complete the inventory.

EXAMPLE:

The following is a list of construction materials that will be used and activities that will be performed that will have the potential to contribute pollutants, other than sediment, to stormwater runoff:

- Vehicle fluids, including oil, grease, petroleum, and coolants;
- Asphaltic emulsions associated with asphalt-concrete paving operations;
- Cement materials associated with PCC paving operations, drainage structures, median barriers, and bridge construction;
- Base and subbase material;
- Joint and curing compounds;
- Concrete curing compounds (e.g. methacrylate and epoxy resin products);
- Paints;
- Solvents, thinners, acids;
- Sandblasting materials;
- Mortar Mix;
- Raw landscaping materials and wastes (topsoil, plant materials, herbicides, fertilizers, pesticides, mulch);

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- BMP materials (sandbags, liquid copolymer);
- Treated lumber (materials and wastes);
- PCC rubble;
- Masonry block rubble; and
- General litter.

Potential non-stormwater and waste management related discharges are described in Sections 500.4.1 and 500.4.2, respectively.

The following is a list of construction activities that have the potential to contribute sediment to stormwater discharges include:

- Clearing and grubbing operations;
- Grading operations;
- Soil import operations;
- Utility excavation operations;
- Sandblasting operations; and
- Landscaping operations

REQUIRED TEXT:

The following is a list of construction materials that will be used and activities that will be performed that will have the potential to contribute pollutants, other than sediment, to stormwater runoff:

- Vehicle fluids, including oil, grease, petroleum, and coolant;
- Base and subbase material;
- Raw landscaping materials and wastes (topsoil and fertilizers);
- General litter

Potential non-stormwater and waste management related discharges are described in Sections 500.4.1 and 500.4.2, respectively.

The following is a list of construction activities that have the potential to contribute sediment to stormwater discharges include:

- Clearing and grubbing operations;

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- Grading operations;
- Culvert installation;

500.1.2 Potential Pollutants from Site Features or Known Contaminates

INSTRUCTIONS:

Show and/or describe existing site features that, as a result of known past usage, may contribute pollutants to stormwater, (e.g., toxic materials that are known to have been treated, stored, disposed, spilled, or leaked onto the construction site).

Review the contract documents and associated environmental documents to determine the known site contaminants and list them in this section.

EXAMPLE:

Existing site features that, as a result of known past usage, may contribute pollutants to stormwater, (e.g., toxic materials that are known to have been treated, stored, disposed, spilled, or leaked onto the construction site) include:

None

The following listed contaminants are known to exist at the project site locations identified:

This site includes aeriaily deposited lead.....located at.....

REQUIRED TEXT:

500.1.3 Risk Level Determination

INSTRUCTIONS:

- Provide an estimate of the following site features (Refer also to Attachments D and E):
 - Construction site area (acres);
 - Runoff coefficient before and after construction;
 - Percentage impervious area before and after construction; and
 - Anticipated stormwater run-on to the construction site (Show calculations and include as Attachment E).

EXAMPLE:

The following are estimates of the construction site:

Construction site area:	44 acres
-------------------------	----------

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Percentage impervious area before construction:	51.3 % (20.5
acres)	
Runoff coefficient before construction ⁽¹⁾ :	0.68
Percentage impervious area after construction	58.1 % (23.2
acres)	
Runoff coefficient after construction ⁽¹⁾	0.72
Anticipated stormwater flow onto the construction site ⁽²⁾	33.8 cfs

⁽¹⁾ Calculations are shown in Attachment D

⁽²⁾ Calculations are shown in Attachment E.

⁽³⁾ Reference any Hydrology and Hydraulic reports available for the project in Attachments D and E and include in the reference list in Section 400.

REQUIRED TEXT:

The following are estimates of the construction site:

Construction site area	9		acres
Percentage impervious area before construction	5		%
Runoff coefficient before construction	0.52		
Percentage impervious area after construction	5		%
Runoff coefficient after construction	0.56		
Anticipated stormwater flow onto the construction site	4.2		cfs

500.2 PRE-CONSTRUCTION EXISTING STORMWATER CONTROL MEASURES

INSTRUCTIONS:

Identify the existing control measures in place prior to construction. Pre-construction control measures may include any measures used to reduce erosion, sediment or other pollutants in stormwater discharges. Pre-construction control measures may include but not be limited to: Detention basins, infiltration basins, sediment basins, oil water separators, bridge slope protection, rock slope protection, existing erosion control, existing landscaping, lined ditches, energy dissipaters etc.

Describe how the existing control measures will be impacted by the project and how these existing measures will be incorporated into or modified during project implementation.

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EXAMPLE:

The following are existing (pre-construction) control measures encountered within the project site:

- Detention basin located at the southeast end of the project. This basin was designed as a combination flood control and permanent treatment control measure. It is anticipated that the basin will be used as a temporary sediment basin during construction, and will be restored to original condition prior to project completion.
- Slopes under the existing bridge are protected with concrete. No disturbance to these slopes is anticipated.
- There are two existing slopes that have permanent rock slope protection; they are shown on WPCD-6. No disturbance is anticipated on these slopes.

REQUIRED TEXT:

The following are existing (pre-construction) control measures encountered within the project site:

There are no pre-existing control measures.

500.3 BMP SELECTION FOR EROSION AND SEDIMENT CONTROL

INSTRUCTIONS FOR SECTIONS 500.3.1 TO 500.3.4:

BMP SELECTION PROCESS

Using the identified potential pollutant sources in Section 500.1 the BMP selection process identifies the BMPs necessary to reduce or eliminate pollutant discharges from the site.

Identify all contract required BMPs and any other BMPs required by the contract Special Provisions, Contract Plans, Standard Plans, and Standard Specifications, for each section. If a non-standard BMP will be used identify it in the BMP implementation table and provide a narrative description of its use and implementation.

The example text provided in Sections 500.3.1 to 500.3.4 and the example WPCDs provided in Attachment BB are provided only as an examples. Copying example text for project specific basis does not necessarily meet the requirements of the NPDES Permits referenced in Section 1.2.2 of the SWPPP/WPCP Preparation Manual.

Select BMPs to eliminate or reduce the pollutants identified in the Section 500.1.2 inventory list. Complete the BMP consideration checklists in each of the following sections to determine the project selected BMPs:

500.4.1 Soil Stabilization (Erosion Control)

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- 500.4.2 Sediment Control
- 500.4.3 Tracking Control
- 500.4.4 Wind Erosion Control

Show the selected BMPs on the Project Water Pollution Control BMPs List and WPCDs. Use the instructions in Section 500.5 and the SWPPP Checklist (Attachment XX) to confirm that all WPCD requirements are included. Provide a narrative description of the BMPs selected in the appropriate section.

500.3.1 Soil Stabilization (Erosion Control)

INSTRUCTIONS:

- Soil stabilization consists of source control measures that are designed to prevent soil particles from detaching and becoming suspended in stormwater runoff. Soil stabilization BMPs protect the soil surface by covering and/or binding the soil particles.
- Described below is the sequence of steps that shall be used to identify soil stabilization BMPs to be included in the SWPPP.

Step 1: Incorporate the temporary soil stabilization (erosion control) BMPs that are described in:

- Contract Special Provisions;
- Contract Plans;
- Standard Plans; and
- Standard Specifications.

If the BMPs required in Step 1 are inadequate to address soil stabilization requirements, then:

Step 2: Incorporate the temporary soil stabilization (erosion control) BMPs using one or more of the Caltrans minimum requirements listed in Table 1-1 of the SWPPP/ WPCP Preparation Manual.

Step 3: If the BMPs selected from Steps 1 and 2 are inadequate to address soil stabilization requirements, then incorporate the temporary soil stabilization (erosion control) BMPs that are described in Section 4.5 of the SWMP. For reference on these BMPs see the Construction Site Best Management Practices (BMPs) Reference Manual.

For Steps 1 through 3 above, the tables and guidance in the SWPPP/WPCP Preparation Manual, Sections 1.3 through 1.4 and Appendix C may be used to help identify the soil stabilization BMPs that may be required for the project.

When Selecting BMPs for the project site:

- Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site;

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- Consider the degree to which pollutants associated with those materials may be exposed to an mobilized by contact with storm water; and

Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

Complete the BMP selection table in this section to indicate the temporary Soil Stabilization BMPs that have been selected for use on the project. If a particular BMP will not be used or is not applicable check "Not Used" and enter a brief reason. Include non-standard or alternative BMPs selected for the project in the BMP selection table.

List selected temporary soil stabilization BMPs by location on the WPCBMPL in Attachment XX.

Show selected temporary soil stabilization BMPs on the WPCDs in Attachment B. Show BMPs used to divert offsite drainage around and/or through the construction project on the WPCDs.

Provide a narrative description of temporary soil stabilization BMPs. Give a general approach on how temporary soil stabilization BMPs will be implemented on the project.

Discuss the onsite availability of temporary soil stabilization materials (materials kept for temporary soil stabilization BMPs) and proposed mobilization and implementation of temporary soil stabilization BMPs in the event of a predicted storm. Sufficient material(s) needed to install temporary soil stabilization BMPs necessary to completely protect the exposed portions (disturbed soil area) of the site from erosion and to prevent sediment discharges shall be stored on site. Areas that have already been protected from erosion using temporary or permanent physical stabilization or established vegetation stabilization BMPs are not considered to be "exposed DSAs" for purposes of this requirement.

EXAMPLE:

Soil Stabilization, also referred to as erosion control, is a source control measure that is designed to prevent soil particles from detaching and becoming transported in the stormwater runoff. Soil stabilization BMPs protect the soil surface by covering and/or binding the soil particles. This project will incorporate the SWPPP/WPCP Preparation Manual minimum temporary soil stabilization requirements, temporary soil stabilization measures required by the contract documents, and other measures selected by the contractor.

This construction project will implement the following practices to assure effective temporary and final soil stabilization (erosion control) during construction:

- 1) Preserve existing vegetation where required and when feasible.
- 2) Apply temporary soil stabilization (erosion control) to remaining active and non-active areas as required by the Contract Specifications and Special Provisions, and the SWPPP/WPCP Preparation Manual, Appendix C. Reapply as necessary to maintain effectiveness.
- 3) Stabilize non-active areas within 14 days of cessation of construction activities or one day prior to all predicted rain events, whichever occurs first.

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- 4) Control erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding, and lining swales with plastic as required in the Special Provisions and/or as shown on plans.
- 5) Apply seed to areas deemed substantially complete by the Resident Engineer.
- 6) Prior to the completion of construction, apply permanent erosion control to all remaining disturbed soil areas as required in the Special Provisions.

Sufficient soil stabilization materials shall be maintained onsite to allow implementation in conformance with Caltrans requirements and described in this SWPPP. This includes implementation requirements for active areas and non-active areas that require deployment before the onset of rain.

The following soil stabilization BMP selection table indicates the BMPs that shall be implemented to control erosion on the construction site. Temporary soil stabilization BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for temporary soil stabilization BMPs are shown in Attachment BB.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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TEMPORARY SOIL STABILIZATION BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽³⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SS-1	Scheduling	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-2	Preservation of Property/ Preservation of Existing Vegetation	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-3	Temporary Hydraulic Mulch (Bonded Fiber Matrix)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Straw Mulch Used
	Temporary Hydraulic Mulch (Polymer Stabilized Fiber Matrix)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Straw Mulch Used
SS-4	Temporary Erosion Control (With Temporary Seeding)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Straw Mulch used
SS-5	Temporary Soil Stabilizer	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Straw Mulch Used
SS-6	Temporary Erosion Control (Straw Mulch with Stabilizing Emulsion)	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-7	Temporary Erosion Control Blanket (On Slope)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	Temporary Erosion Control Blanket (In swale or ditch)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-7	Temporary Cover (Plastic Covers)	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-8	Temporary Mulch (Wood)		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Straw Mulch Used
SS-9	Earth Dikes / Drainage Swales & Lined Swales		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not required for project
SS-10	Outlet Protection / Velocity Dissipation Devices		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not required for project
SS-11	Slope Drains		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not required for project

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TEMPORARY SOIL STABILIZATION BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIREMENT ⁽³⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SS-12	Streambank Stabilization		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not required for project
ALTERNATIVE SOIL STABILIZATION BMPs USED⁽⁴⁾ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						IF USED, STATE REASON
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME					

Notes:
⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document.
⁽²⁾ The Contractor shall ensure implementation of one of the two measures listed or a combination thereof to achieve and maintain the contract's rainy and non-rainy season requirements.
⁽³⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer.
⁽⁴⁾ Use of alternative BMPs will require written approval by the Resident Engineer.

The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

SS-1, SS-2 Scheduling and Preservation of Existing Vegetation

The project schedule will sequence construction activities with the installation of both soil stabilization and sediment control measures. BMPs will be deployed in a sequence to follow the progress of grading and construction. The construction schedule will be arranged as much as practicable to leave existing vegetation undisturbed until immediately prior to grading.

Run-on Controls

There is an adjoining agricultural area to the east of the project. The run-on calculations for this area indicate 10 cfs during the design rain event. The run-on flow is not currently diverted. To protect disturbed areas from run-on during construction, the following BMPs will be implemented:

- Gravel bag berm – a double high row of gravel bags will be used to divert the flow from the agricultural area adjoining the project. The gravel bags will be placed almost on a level

contour but with a slight elevation change to direct the water to the existing concrete lined ditch to the south.

Run-off Controls

- Check dams – The gravel bag diversion will cause a concentrated flow that will be checked with dams to prevent erosion.
- SC-10 Velocity Dissipation Devices – where the diversion at the up gradient edge of the project flows to the existing lined ditch, a velocity dissipation device of 3 to 6-inch gravel will be used to slow the flow and protect the area immediately above the concrete lined ditch from erosion.

SS-6 Straw Mulch

Straw mulch will be applied to the disturbed areas adjacent to excavations and on shallow slopes surrounding the site. See the WPCBMPL and WPCDs in Attachment BB of this SWPPP for locations where straw mulch will be used.

SS-7 Geotextiles, Plastic Covers and Erosion Control Blankets/Mats

Geotextile blankets will be used to provide temporary and permanent stabilization for the flow line of the vegetated swale on the western boundary of the project. Polyethylene covers will be used throughout the project area to cover small exposed soil areas prior to forecast storm events, and anchored to prevent damage by wind. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

REQUIRED TEXT:

Soil stabilization, also referred to as erosion control, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in stormwater runoff. Soil stabilization BMPs protect the soil surface by covering and/or binding soil particles. This project will incorporate SWPPP/WPCP Preparation Manual minimum temporary soil stabilization requirements, temporary soil stabilization measures required by the contract documents, and other measures selected by the contractor.

Preserve existing vegetation where required and when feasible.

Apply temporary soil stabilization (erosion control) to remaining active and non-active areas as required by the Contract Specifications and Special Provisions and the SWPPP/WPCP Preparation Manual, Tables 1-3 and 1-4, and Appendix D. Reapply as necessary to maintain effectiveness.

Stabilize non-active construction areas within 14 days of cessation of construction activities, or one day prior to all predicted rain events, whichever comes first.

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Control erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding, and lining swales as required in the Special Provisions and/or as shown on plans.

Apply seed to areas deemed substantially complete by the Resident Engineer.

Prior to the completion of construction, apply permanent erosion control to all remaining disturbed soil areas as required in the Special Provisions and/or as shown on plans.

Sufficient soil stabilization materials will be maintained onsite to allow implementation in conformance with Caltrans requirements and described in this SWPPP. This includes implementation requirements for active and non-active areas that require deployment before the onset of rain.

The following soil stabilization BMP selection table indicates the BMPs that shall be implemented to control erosion on the construction site. Temporary soil stabilization BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for temporary soil stabilization BMPs are shown in Attachment BB.

TEMPORARY SOIL STABILIZATION BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽³⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SS-1	Scheduling	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-2	Preservation of Property/ Preservation of Existing Vegetation	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-3	Temporary Hydraulic Mulch (Bonded Fiber Matrix)	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Temporary Hydraulic Mulch (Polymer Stabilized Fiber Matrix)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used
SS-4	Temporary Erosion Control (With Temporary Seeding)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used
SS-5	Temporary Soil Stabilizer	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used
SS-6	Temporary Erosion Control (Straw Mulch with Stabilizing Emulsion)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used

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TEMPORARY SOIL STABILIZATION BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽³⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SS-7	Temporary Erosion Control Blanket (On Slope)	✓ ⁽²⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used
	Temporary Erosion Control Blanket (In swale or ditch)		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used
SS-7	Temporary Cover (Plastic Covers)	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SS-8	Temporary Mulch (Wood)		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used
SS-9	Earth Dikes / Drainage Swales & Lined Swales		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Hydraulic Mulch (Bonded Fiber Matrix) used
SS-10	Outlet Protection / Velocity Dissipation Devices		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	High velocity flow not anticipated.
SS-11	Slope Drains		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
SS-12	Streambank Stabilization		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
ALTERNATIVE SOIL STABILIZATION BMPs USED⁽⁴⁾ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						IF USED, STATE REASON
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME					
	Temporary Fence (Type ESA)	Contract Bid Item				
Notes: ⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document. ⁽²⁾ The Contractor shall ensure implementation of one of the two measures listed or a combination thereof to achieve and maintain the contract's rainy and non-rainy season requirements. ⁽³⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer. ⁽⁴⁾ Use of alternative BMPs will require writtarn approval by the Resident Engineer.						

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**Stormwater Pollution Prevention Plan (SWPPP)
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The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

The Contractor shall monitor the National Weather Service weather forecast on a daily basis throughout duration of the contract. The Contractor may use an alternative weather forecasting service, if approved by the Resident Engineer. Active areas where soil disturbance has occurred, and will continue to occur, during the ensuing 14 days shall be protected using appropriate water pollution control practices within 14 days, or before predicted precipitation, whichever occurs first.

Temporary soil stabilization and sediment control practices will be implemented all year. The Contractor shall implement soil stabilization and sediment control practices using Temporary Hydraulic Mulch, Temporary Silt Fences, Temporary Fiber Rolls and Temporary Cover. The Contractor shall maintain soil stabilization and sediment control materials on site to protect disturbed soil areas.

SCHEDULING:

The construction schedule included in this Conceptual SWPPP considers the amount and duration of soil exposed to erosion by wind, rainfall and vehicle tracking, and minimizes disturbed soil areas. The Contractor will be prepared with sufficient quantities of temporary water pollution control practices, year-round, to deploy soil stabilization and sediment control practices, in response to seasonal and unseasonal rainfall.

PRESERVATION OF EXISTING VEGETATION:

Temporary Fence Type ESA (TFESA) will be installed prior to clearing and grubbing or soil disturbing activities, in order to preserve existing vegetation throughout the project site. TFESA locations have been delineated after consideration of impacts from grade changes to existing vegetation and root zone.

TEMPORARY HYDRAULIC MULCH:

Temporary Hydraulic Mulch (Bonded Fiber Matrix - BFM) will be applied to active and non-active disturbed soil areas that require temporary protection until permanent vegetation is established, or areas that must be redistributed following an extended period of inactivity. Prior to application, embankments and fill areas will be roughened by rolling with a crimping- or punching-type roller or by track-walking. BFM requires 12 to 24 hours to dry to become effective.

TEMPORARY COVER:

Temporary Cover will be used on active disturbed soil areas that are particularly difficult to stabilize, especially stockpiles of soil. Stockpiles shall be located out of floodplains when possible, and at least 50 feet from concentrated flows of stormwater, drainage courses, or inlets,

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unless written approval is obtained from the Resident Engineer. The Contractor may discontinue addition or removal of material for up to 14 days, and a stockpile will still be considered active. The Contractor shall protect active stockpiles with plastic or geotextile cover, soil stabilization measures, or with linear sediment barrier when precipitation is predicted. Active stockpiles of cold mix asphalt concrete shall be placed on an impervious surface and covered with plastic when precipitation is predicted.

The Contractor shall protect inactive soil stockpiles with a plastic or geotextile cover, or with soil stabilization measures at all times. A linear sediment barrier around the perimeter of the stockpile shall also be used. Soil stockpiles shall be covered and protected with a linear sediment barrier when precipitation is predicted. The Contractor shall control wind erosion during dry weather as provided in Section 10, "Dust Control," of the Standard Specifications.

Stockpiles of material containing aerially deposited lead will not be placed where affected by surface run-on or run-off. Stockpiles shall be covered with plastic sheeting 1/2 inch minimum thickness or one foot of nonhazardous material, and linear sediment barrier (temporary gravel bag berm). Stockpiles shall not be placed in environmentally sensitive areas. Stockpiled material shall not enter storm drains, inlets, or waters of the State

Stockpiles of portland cement concrete rubble, asphalt concrete (AC), hot mix asphalt (HMA), AC and HMA rubble, aggregate base, or aggregate subbase shall be covered with plastic or geotextile, or protected with a linear sediment barrier at all times during the rainy season, and also when precipitation is predicted during the non-rainy season.

Stockpiles of cold mix asphalt concrete shall be placed on, and covered with, impermeable material at all times after 14 days of inactivity.

Stockpiles of pressure treated wood shall be covered with impermeable material and placed on pallets at all times after 14 days of inactivity.

The Contractor shall repair or replace linear sediment barriers and covers as needed, or as directed by the Engineer, to keep them functioning properly. Sediment shall be removed when it accumulates to 1/3 of the linear sediment barrier height.

SS-9, SS-10, SS-11:

Dikes, drainage swales, outlet protection/velocity dissipation devices, and slope drains may be used to divert run-on to disturbed soil areas. Run-on calculations to size these BMPs are included in Attachment HH.

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500.3.2 Sediment Control

INSTRUCTIONS:

- Sediment controls are used to complement and enhance the selected soil stabilization measures. Sediment controls are designed to intercept runoff and capture suspended soil particles through a settlement or filtration process.
- Described below is the sequence of steps that shall be used to identify temporary sediment control BMPs to be included in the SWPPP.

Step 1: Incorporate the temporary sediment control BMPs that are described in:

- Contract Special Provisions;
- Contract Plans;
- Standard Plans; and
- Standard Specifications.

If the sediment control BMPs required in Step 1 are inadequate to address temporary sediment control requirements, then:

Step 2: Incorporate the temporary sediment control BMPs using one or more of the Caltrans minimum requirements listed in Table 1-1 of the SWPPP/ WPCP Preparation Manual.

Step 3: If the sediment control BMPs selected from Steps 1 and 2 are inadequate to address temporary sediment control requirements, then incorporate the temporary sediment control BMPs that are described in Section 4.5 of the SWMP. For reference on these BMPs see the Construction Site Best Management Practices (BMPs) Reference Manual.

For Steps 1 through 3 above, the tables and guidance in the SWPPP/WPCP Preparation Manual, Sections 1.3 through 1.4 may be used to help identify the sediment control BMPs that may be required for the project.

Complete the BMP selection tables in this section to indicate the temporary sediment control BMPs that have been selected for use on the project. If a particular BMP will not be used or is not applicable check "Not Used" and enter a brief reason. Include non-standard or alternative BMPs selected for the project in the BMP selection table..

List selected temporary sediment control BMPs on the WPCBMPL in Attachment XX.

Show selected temporary sediment control BMPs on the WPCDs in Attachment B. Show BMPs used to divert offsite drainage around and/or through the construction project on the WPCDs.

Provide a narrative description of temporary sediment control BMPs.. Give a general approach on how temporary sediment control BMPs will be implemented on the project at the draining perimeter of disturbed soil areas, at the toe of slopes, and at inlets and outfall areas at all times.

Discuss the onsite availability of temporary sediment control materials (materials kept for temporary sediment control BMPs) and proposed mobilization and implementation of temporary sediment control BMPs in the event of a predicted storm. A minimum of 10% of the installed quantities of sediment control BMPs is required to be maintained onsite as standby sediment control BMPs that may be installed to prevent sediment discharges from exposed portions of the site shall be stored on site.

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EXAMPLE:

Sediment controls are structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures and reduce sediment discharges from construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. This project will incorporate SWPPP/WPCP Preparation Manual minimum temporary sediment control requirements, temporary sediment control measures required by the contract documents, and other measures selected by the contractor.

Sediment control BMPs will be installed at all appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system.

Temporary sediment control materials, equivalent to 10% of the installed quantities on the site will be maintained onsite throughout the duration of the project for implementation in the event of predicted rain, rapid response to failures or emergencies, in conformance with other Caltrans requirements, and as described in the SWPPP. This includes implementation requirements for active areas and non-active areas before the onset of rain.

The following sediment control BMP selection table indicates the BMPs that shall be implemented to control sediment on the construction site. Temporary sediment control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for temporary sediment control BMPs are shown in Attachment BB.

TEMPORARY SEDIMENT CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽³⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SC-1	Temporary Silt Fence	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SC-2	Temporary Sediment Basin		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Linear Project with no area for basin
SC-3	Temporary Sediment Trap		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Linear Project with no area for a sediment trap
SC-4	Temporary Check Dam		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SC-5	Temporary Fiber Rolls	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SC-6	Temporary Gravel Bag Berm		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SC-7	Street Sweeping	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SC-8	Temporary Sandbag Barrier		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Gravel Bag Berm Used
SC-9	Temporary Straw Bale Barrier		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Gravel Bag Berm Used
SC-10	Temporary Drain Inlet Protection	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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ALTERNATIVE SEDIMENT CONTROL BMPs USED⁽⁴⁾			IF USED, STATE REASON
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

Notes:
⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document.
⁽²⁾ The Contractor shall ensure implementation of one of the two measures listed or a combination thereof to achieve and maintain the contract's rainy and non-rainy season requirements.
⁽³⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer.
⁽⁴⁾ Use of alternative BMPs will require written approval by the Resident Engineer.

The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

SC-1 Temporary Silt Fence

Silt fences will be deployed along the toe of exterior cut and fill slopes to settle out soil particles from stormwater runoff.

SC-4 Temporary Check Dam

Temporary check dams will installed during construction of the temporary earthen channels at the following locations: top of cut slope channel along Coyote Creek between Station 230+00 and 235+00; northerly fill slope between Stations 238+00 and 240+00; and also along Griffith Road between Stations 26+00 and 51+00.

SC-5 Temporary Fiber Rolls

Temporary fiber rolls will be installed along cut and fill slopes at locations shown on the drawings. Fiber rolls installed during stage 1 will be left and protected in place during stage 2 between Stations 236+00 and 237+00 and also between Stations 241+00 and 250+00.

SC-6 Temporary Gravel Bag Berm

Temporary gravel bag berms will be installed along the temporary earthen swales between Stations 206+00 and 225+00 along the southerly edge of the project limits and also along the sides of the roadway between Stations 209+00 to 218+00 during stage 2.

SC-7 Street Sweeping

Street sweeping is described in Section 500.3.3.

SC-10 Temporary Drain Inlet Protection

Storm drain inlet protection will be used at all operational internal inlets to the storm drain system as shown on the WPCDs. Drain inlet protection type is shown on the WPCDs for each inlet for each phase of construction.

REQUIRED TEXT:

Sediment controls are structural measures that are intended to complement and enhance the selected soil stabilization (erosion control) measures and reduce sediment discharges from construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. This project will incorporate SWPPP/WPCP Preparation Manual minimum temporary sediment control requirements, temporary sediment control measures required by the contract documents, and other measures selected by the contractor.

Sediment control BMPs will be installed at all appropriate locations along the site perimeter and at all operational internal inlets to storm drain systems at all times.

Temporary sediment control materials, equivalent to 10% of the installed quantities on the site will be maintained onsite throughout the duration of the project for implementation in event of predicted rain, rapid response to failures or emergencies, in conformance with other Caltrans requirements, and as described in the SWPPP. This includes implementation requirements for active areas and non-active areas before the onset of rain.

The following sediment control BMP selection table indicates the BMPs that shall be implemented to control sediment on the construction site. Temporary sediment control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment B. Any details for temporary sediment control BMPs are shown in Attachment BB.

TEMPORARY SEDIMENT CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽³⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SC-1	Temporary Silt Fence	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SC-2	Temporary Sediment Basin		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
SC-4	Temporary Check Dam		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temporary Fiber Roll used instead.
SC-5	Temporary Fiber Rolls	✓ ⁽²⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SC-6	Temporary Gravel Bag Berm		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
SC-7	Street Sweeping	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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TEMPORARY SEDIMENT CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽³⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SC-8	Temporary Sandbags		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
SC-9	Temporary Straw Bale Barrier		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
SC-10	Temporary Drain Inlet Protection	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No drain inlets on project site.
ALTERNATIVE SEDIMENT CONTROL BMPs USED⁽⁴⁾						IF USED, STATE REASON
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Notes: ⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document. ⁽²⁾ The Contractor shall ensure implementation of one of the two measures listed or a combination thereof to achieve and maintain the contract's rainy and non-rainy season requirements. ⁽³⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer. ⁽⁴⁾ Use of alternative BMPs will require written approval by the Resident Engineer.						

The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

TEMPORARY SILT FENCE:

Temporary Silt Fence will be installed and maintained at locations shown on the plans to allow sediment to settle from run-off, prior to flowing beyond the site.

TEMPORARY FIBER ROLLS:

Temporary Fiber Rolls will be used to minimize erosive effects, by reducing effective slope lengths, of stormwater run-off from active and non-active disturbed soil areas. These will also be used around temporary stockpiles to intercept run-off, reduce velocity, release run-off as sheet flow, and provide removal of sediment.

STREET SWEEPING:

Street Sweeping will be done by using a mechanical sweeper followed by a vacuum-assisted sweeper, or vacuum-assisted dry (waterless) sweeper or regenerative-air sweeper. Street sweeping will occur at the job site entrance and exit locations during: clearing and grubbing activities; earthwork activities; trenching activities; roadway structural section activities; when vehicles are entering and leaving the job site; after soil disturbing activities; after observing off-site tracking of material.

500.3.3 Tracking Control

INSTRUCTIONS:

- Described below is the sequence of steps that shall be used to identify temporary tracking control BMPs to be included in the SWPPP.

Step 1: Incorporate the temporary tracking control BMPs that are described in:

- Contract Special Provisions;
- Contract Plans;
- Standard Plans; and
- Standard Specifications.

If the tracking control BMPs required in Step 1 are inadequate to address tracking control requirements, then:

Step 2: Incorporate the temporary tracking control BMPs using one or more of the Caltrans minimum requirements listed in Table 1-1 of the SWPPP/ WPCP Preparation Manual.

Step 3: If the tracking control BMPs selected from Steps 1 and 2 are inadequate to address tracking control requirements, then incorporate the temporary tracking control BMPs that are described in Section 4.5 of the SWMP. For reference on these BMPs see the Construction Site Best Management Practices (BMPs) Reference Manual.

For Steps 1 through 3 above, the tables and guidance in the SWPPP/WPCP Preparation Manual, Sections 1.3 through 1.5 may be used to help identify the tracking control BMPs that may be required for the project.

- Complete the BMP selection table in this section to indicate the temporary tracking control BMPs that have been selected for use on the project. If a particular BMP will not be used or is not applicable check "Not Used" and enter a brief reason. Include non-standard or alternative BMPs selected for the project in the BMP selection table.

List selected temporary tracking control BMPs on the WPCBMPL in Attachment XX.

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Tracking controls shall be considered and implemented year round and throughout the duration of the project. Show selected tracking control BMPs on the WPCDs in Attachment B.

Provide a narrative description of temporary tracking control BMPs. Give a general approach on how temporary tracking control BMPs will be implemented on the project at all access (ingress/egress) points to the project site where vehicles and/or equipment may track sediment from the construction site onto public or private roadways.

EXAMPLE:

Tracking control BMPs are implemented to reduce sediment tracking from the construction site onto private or public roads. This project will incorporate SWPPP/WPCP Preparation Manual minimum temporary tracking control requirements, temporary tracking control measures required by the contract documents, and other measures selected by the contractor.

The following tracking control BMP selection table indicates the BMPs that shall be implemented to reduce sediment tracking from the construction site onto private or public roads. Temporary tracking control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for temporary tracking control BMPs are shown in Attachment BB.

TEMPORARY TRACKING CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
SC-7	Street Sweeping		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-1	Temporary Construction Entrance		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-2	Stabilized Construction Roadway		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-3	Temporary Entrance / Outlet Tire Wash		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Construction Entrance/Exit with Street Sweeping is sufficient
ALTERNATIVE TRACKING CONTROL BMPs USED⁽²⁾						F USED, STATE REASON
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Notes:						
(1) The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document.						
(2) Use of alternative BMPs will require written approval by the Resident Engineer.						

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The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

TC-1 Temporary Construction Entrance

A stabilized construction entrance/exit will be constructed and maintained at construction site entrances and exits, equipment yard, PCC batch plants and crushing plants, water filling area for water trucks, and the project office location as shown on the site map.

The site entrance/exit will be stabilized to reduce tracking of sediment as a result of construction traffic. The entrance will be designated and graded to prevent runoff from leaving the site. Stabilization material will be 3- to 6-inch crushed aggregate. The entrance will be flared where it meets the existing road to provide an adequate turning radius. A site entrance/exit shall only be installed to reduce tracking of sediment during dirt-hauling activities that extend over a one-week time period.

Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

TC-2 Stabilized Construction Roadway

The construction roadway through the site will also be designated and stabilized to prevent erosion and to control tracking of mud and soil material onto adjacent roads. The roadway will be clearly marked for limited speed to control dust. Refer to the WPCDs for entrance/exit and construction roadway locations. Stabilization material will be 3- to 6-inch crushed aggregate. A regular maintenance program will be conducted to replace sediment-clogged stabilization material with new stabilization material.

SC-7 Street Sweeping

Road sweeping and vacuuming will occur during soil hauling and as necessary to keep streets clear of tracked material and debris. Washing of sediment tracked onto streets into storm drains will not occur.

REQUIRED TEXT:

Tracking control BMPs are implemented to reduce sediment tracking from the construction site onto private or public roads. This project will incorporate SWPPP/WPCP Preparation Manual minimum temporary tracking control requirements, temporary tracking control measures required by the contract documents, and other measures selected by the contractor.

The following tracking control BMP selection table indicates the BMPs that shall be implemented to reduce sediment tracking from the construction site onto private or public roads. Temporary tracking control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for temporary tracking control BMPs are shown in Attachment BB.

TEMPORARY TRACKING CONTROL BMPs					
CONSTRUCTION ----- (1)	BMP NAME	MINIMUM REQUIRE	CONTRACT REQUIRE	BMP USED	IF NOT USED, STATE REASON

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				YES	NO	
SC-7	Street Sweeping		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-1	Temporary Construction Entrance		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-2	Stabilized Construction Roadway		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Existing dirt road does not need stabilization
TC-3	Temporary Entrance / Outlet Tire Wash		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temp. Construction Entrance used
ALTERNATIVE TRACKING CONTROL BMPs USED⁽²⁾						IF USED, STATE REASON
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Notes: ⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document. ⁽²⁾ Use of alternative BMPs will require written approval by the Resident Engineer.						

The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

TEMPORARY CONSTRUCTION ENTRANCE:

Temporary Construction Entrances will be used at points of entrance and exit to reduce tracking of mud and dirt onto public roads by construction vehicles, as shown on the WPCDs included in Attachment B.

TEMPORARY ACCESS:

The Contractor may propose to develop temporary construction roadway to facilitate movement of large equipment and machinery. A Temporary Access Plan will be developed by the Contractor that includes plans and working drawings that show grading, drainage, surfacing materials, fencing details, restoration work to remove access, and post-construction stabilization. The Contractor will prevent heavy erosion, rutting, or migration of surfacing or supporting soils, from encroaching into environmentally sensitive areas. Once the temporary access is no longer needed, it, and all embankment and structural section materials, will be removed and disposed of outside of the right-of-way. Following removal and disposal of materials, the temporary access areas will be graded and restored to conform with adjacent areas and lightly compacted.

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500.3.4 Wind Erosion Control

INSTRUCTIONS:

- Described below is the sequence of steps that shall be used to identify wind erosion control BMPs to be included in the SWPPP.

Step 1: Incorporate the temporary wind erosion control BMPs that are described in:

- Contract Special Provisions;
- Contract Plans;
- Standard Plans; and
- Standard Specifications.

If the wind erosion control BMPs required in Step 1 are inadequate to address wind erosion control requirements, then:

Step 2: Incorporate the wind erosion control BMPs using one or more of the Caltrans minimum requirements listed in Table 1-1 of the SWPPP/ WPCP Preparation Manual.

Step 3: If the wind erosion control BMPs selected from Steps 1 and 2 are inadequate to address wind erosion control requirements, then incorporate the temporary wind erosion control BMPs that are described in Section 4.5 of the SWMP. For reference on these BMPs see the Construction Site Best Management Practices (BMPs) Reference Manual.

- For Steps 1 through 3 above, the tables and guidance in the SWPPP/WPCP Preparation Manual, Sections 1.3 through 1.5 may be used to help identify the wind erosion control BMPs that may be required for the project.
- Complete the BMP selection table in this section to indicate the temporary wind erosion control BMPs that have been selected for use on the project. If a particular BMP will not be used or is not applicable check "Not Used" and enter a brief reason. Include non-standard or alternative BMPs selected for the project in the BMP selection table.

List selected wind erosion control BMPs on the WPCBMPL in Attachment XX.

Provide a narrative description of wind erosion control BMPs. Give a general approach on how wind erosion control BMPs will be implemented on the project to control dust during construction operations, including stockpile operations at all times.

EXAMPLE:

Wind erosion control BMPs are be implemented to reduce sediment form leaving the construction site. This project will incorporate SWPPP/WPCP Preparation Manual minimum temporary wind erosion control requirements, temporary wind erosion control measures required by the contract documents, and other measures selected by the contractor.

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The following temporary wind erosion control BMP selection table indicates the BMPs that shall be implemented to reduce wind erosion at the construction site. Temporary wind erosion control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for temporary wind erosion control BMPs are shown in Attachment BB.

TEMPORARY WIND EROSION CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
WE-1	Wind Erosion Control	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-1	Temporary Construction Entrance		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-2	Stabilized Construction Roadway		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
----	All Soil Stabilization Measures included in Section 500.3.1		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
ALTERNATIVE WIND EROSION CONTROL BMPs USED⁽³⁾						IF USED, STATE REASON
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Notes:						
(1) The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document.						
(2) Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer.						
(3) Use of alternative BMPs will require written approval by the Resident Engineer.						

The following list of BMPs and narrative explain how the selected BMPs shall be incorporated into the project.

WE-1 Wind Erosion Control

Potable water shall be applied to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction. The water will be applied using water trucks. As shown on the project schedule, project soils will be disturbed and exposed from approximately May 1 through December 15. Water applications will be concentrated during the late summer and early fall months and especially during the embankment construction operations scheduled for July. The total water to be applied is expected to be between 0.8 and 1.3 million gallons.

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Wind Erosion Control and Water Conservation Practices BMPs will be implemented to provide dust control and prevent discharges from dust control activities and water supply equipment. Water application rates will be minimized as necessary to prevent runoff and ponding and water equipment leaks will be repaired immediately.

During windy conditions (forecast or actual wind conditions of approximately 25 mph or greater), dust control will be applied to DSAs, including haul roads to adequately control wind erosion.

Stockpile Management using plastic covers will be implemented to prevent wind dispersal of sediment from stockpiles.

REQUIRED TEXT:

Wind erosion control BMPs are to be implemented to reduce sediment from leaving the construction site. This project will incorporate SWPPP/WPCP Preparation Manual minimum temporary wind erosion control requirements, temporary wind erosion control measures required by the contract documents, and other measures selected by the contractor.

The following temporary wind erosion control BMP selection table indicates the BMPs that shall be implemented to reduce wind erosion at the construction site. Temporary wind erosion control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for temporary wind erosion control BMPs are shown in Attachment BB.

CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
WE-1	Wind Erosion Control	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-1	Temporary Construction Entrance		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TC-2	Stabilized Construction Roadway		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
----	All Soil Stabilization Measures included in Section 500.3.1		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
ALTERNATIVE WIND EROSION CONTROL BMPs USED⁽³⁾						IF USED, STATE REASON
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						

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CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
Notes: ⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document. ⁽²⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer. ⁽³⁾ Use of alternative BMPs will require written approval by the Resident Engineer.						

The following list of BMPs and narrative explain how the selected BMPs shall be incorporated into the project.

500.4 BMP SELECTION FOR CONSTRUCTION SITE MANAGEMENT

REQUIRED TEXT:

Construction site management shall consist of controlling potential sources of water pollution before they come in contact with storm water systems or watercourses. The Contractor shall control material pollution and manage waste and non-storm water existing at the construction site by implementing effective handling, storage, use, and disposal practices.

INSTRUCTIONS FOR SECTIONS 500.4.1 TO 500.4.4:

BMP SELECTION PROCESS

Using the identified potential pollutant sources in Section 500.1 the BMP selection process identifies the BMPs necessary to reduce or eliminate pollutant discharges from the site.

Identify all contract required BMPs and any other BMPs required by the contract Special Provisions, Contract Plans, Standard Plans, and Standard Specifications, for each section. If a non-standard BMP will be used identify it in the BMP implementation table and provide a narrative description of its use and implementation.

The example text provided in Sections 500.4.1 to 500.4.2 and the example WPCDs provided in Attachment BB are provided only as an examples. Copying example text for project specific basis does not necessarily meet the requirements of the NPDES Permits referenced in Section 1.2.2 of the SWPPP/WPCP Preparation Manual.

Select BMPs to eliminate or reduce the pollutants identified in the Section 500.1.1 inventory list. Complete the BMP consideration checklists in each of the following sections to determine the project selected BMPs:

500.5.1 Non-Stormwater Control

500.5.2 Waste Management and Materials Pollution Control

Show the selected BMPs on the Project Water Pollution Control BMPs List and WPCDs. Use the instructions in Section 500.5 and the SWPPP Checklist (Attachment XX) to confirm that all WPCD

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requirements are included. Provide a narrative description of the BMPs selected in the appropriate section.

Risk Levels 1, 2 and 3 will all have at a minimum, good housekeeping practices that must be followed. These are described below and shall be addressed by following the necessary guidelines in this SWPPP template.

500.4.1 Non-Stormwater Site Management

INSTRUCTIONS:

- The Caltrans Statewide NPDES Permit defines non-stormwater discharges as follows: “Non-stormwater discharges consist of all discharges from a municipal stormwater conveyance which do not originate from precipitation events (i.e., all discharges from a conveyance system other than stormwater).”
- There are three types of non-stormwater discharges as specified in the Permit:
 - 1) Discharges Authorized by a Separate NPDES Permit: Since these discharges have a separate permit, they are not addressed by this Statewide SWMP.
 - 2) Exempted Discharges: These discharges have not been found to contain pollutants and can therefore be discharged without direct application of BMPs. (Previously described spill prevention, waste management and other practices will be implemented to ensure that these discharges remain uncontaminated.) These discharges include:
 - Flows from riparian habitats or wetlands;
 - Diverted stream flows;
 - Springs;
 - Rising groundwaters; and
 - Uncontaminated groundwater infiltration.
 - 3) Conditionally Exempt Discharges: The conditionally exempt discharges and their associated BMPs are summarized below:

	Non-Stormwater Discharges	BMP Titles
a.	Uncontaminated pumped groundwater	N/A ⁽¹⁾
b.	Foundation drains	N/A ⁽²⁾
c.	Water from crawl space pumps	N/A ⁽²⁾
d.	Footing drains	N/A ⁽²⁾
e.	Air conditioning condensate	N/A ⁽³⁾
f.	Irrigation water	Irrigation Potable (Watering) and Non-Potable (E3b) ⁽⁴⁾
g.	Landscape irrigation	Irrigation (Watering) Potable and Non-Potable (E3b) ⁽⁴⁾
h.	Lawn or garden watering	Irrigation (Watering) Potable and Non-Potable (E3b) ⁽⁴⁾

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	Non-Stormwater Discharges	BMP Titles
i.	Planned and unplanned discharges from potable water sources	Irrigation (Watering) Potable and Non-Potable (E3b) and Water Line Repairs (E3a) ⁽⁵⁾
j.	Water line and hydrant flushing	Water Line Repairs (E3a) ⁽⁵⁾
k.	Individual residential car washing	N/A ⁽⁶⁾
l.	Discharges or flows from emergency fire fighting activities	N/A ⁽⁷⁾

1. Prior to discharge, Caltrans will work directly with the appropriate RWQCB to determine the appropriate monitoring requirements, if needed, for the proposed discharge.
2. These discharges are not known to exist at the Department's facilities.
3. Air-conditioning condensate discharges are not expected to occur. Routinely, the Department's air conditioning systems are so small that any such occurrences will evaporate prior to discharging to receiving waters.
4. Irrigation water, landscape irrigation and lawn or garden watering runoff, though minimized through the Potable Water/Irrigation BMP implementation, occur on a regular basis as a result of excess irrigation water running off vegetated and nearby impervious areas and into storm drains. The preceding statement constitutes notice to the SWRCB and the RWQCBs of such occurrences statewide. The Department is currently conducting characterization studies that may find some irrigation and landscaping practices to be sources of pollutants. If found, BMPs will be implemented to eliminate or reduce the discharge of pollutants associated with irrigation so that such discharges will be conditionally approved under the Permit.
5. Activities by others that generate these discharges will require pollution management as specified in the Permit. Parties that undertake activities on the Department's property that have the potential to result in stormwater discharges of this type will be required to notify the Department and the RWQCB in advance and to implement practices to appropriately manage pollutants.
6. Cleaning of residential cars is not an allowed activity on the Department's property. See the Vehicle and Equipment Cleaning BMP for cleaning of construction vehicles and equipment (not considered an exempt discharge).
7. The Department has no authority over these discharges. The Department will inform all federal, state and local fire officials of the discharge requirements of the Permit and refer them to the SWRCB for advice or assistance in how to achieve these expectations.

■ Non-stormwater discharges into storm drainage systems or waterways, which are not authorized under the Caltrans Permit or authorized under a separate NPDES permit, are prohibited. Examples of prohibited discharges common to construction activities include:

- Vehicle and equipment wash water, including concrete washout water;
- Slurries from concrete cutting and coring operations, PCC grinding or AC grinding operations;
- Slurries from concrete or mortar mixing operations;
- Blast residue from high-pressure washing of structures or surfaces;
- Wash water from cleaning painting equipment;
- Runoff from dust control applications of water or dust palliatives;
- Sanitary and septic wastes; and
- Chemical leaks and/or spills of any kind including but not limited to petroleum, paints, cure compounds, etc.;

■ Some non-stormwater discharges are authorized under the Caltrans Permit and need not be prohibited unless identified as a source of pollutants. However, specific control measures may be required to minimize adverse impacts from these discharges. Some RWQCBs may require a separate NPDES permit or specific monitoring and reporting requirements for authorized discharges. Check with the Resident Engineer or the

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applicable RWQCB for requirements in the project area. Non-stormwater discharges exempted by the Caltrans Permit include:

- Flows from riparian habitats or wetlands;
 - Diverted stream flows;
 - Springs, rising groundwater; and
 - Uncontaminated groundwater infiltration.
- Other discharges such as pumped groundwater, irrigation water, and water line and hydrant flushing (see Caltrans Permit, Section B, Non-stormwater Discharge Prohibitions, Item 3, Conditionally Exempt Discharges, for entire list), are not prohibited if they are identified as not being sources of pollutants to receiving waters or if appropriate control measures (BMPs) to minimize the adverse impacts of such sources are developed and implemented. Some RWQCBs may require a separate NPDES permit or specific monitoring and reporting requirements for the conditionally exempt discharges. Check with the Resident Engineer on what discharges are conditionally exempt.
- Use the following steps to identify non-stormwater pollution control BMPs.

Step 1: Incorporate the non-stormwater pollution control BMPs that are described in:

- Contract Special Provisions;
- Contract Plans;
- Standard Plans; and
- Standard Specifications.

If the non-stormwater pollution control BMPs required in Step 1 are inadequate to address potential pollutants in non-stormwater discharges, then:

Step 2: Incorporate the non-stormwater pollution control BMPs using one or more of the Caltrans minimum requirements listed in Table 1-1 of the SWPPP/ WPCP Preparation Manual.

Step 3: If the non-stormwater pollution control BMPs selected from Steps 1 and 2 are inadequate to address potential pollutants in non-stormwater discharges, then incorporate the temporary non-stormwater pollution control BMPs that are described in Section 4.5 of the SWMP. For reference on these BMPs see the Construction Site Best Management Practices (BMPs) Reference Manual.

- For Steps 1 through 3 above use the following process to identify and select BMPs for non-stormwater management pollution control. List each potential non-stormwater discharge and provide the information requested below.

Identify all potential non-stormwater discharges within the project. Examine all project activities and determine what discharges will be generated or may be required to complete each activity, including mobile-type operations. Discuss how mobile operations, such as maintenance and fueling of large or stationary equipment, will be addressed. Examples of common construction activities that may result in non-stormwater discharges on a project are:

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- Vehicle and equipment cleaning, fueling and maintenance;
- Surface water diversions;
- Dewatering operations;
- Saw-cutting;
- Drilling;
- Boring;
- AC and PCC grinding;
- AC and PCC recycling;
- Concrete mixing;
- Washout of concrete equipment;
- Crushing;
- Bridge cleaning;
- Blasting;
- Painting;
- Hydro-demolition;
- Mortar mixing; and
- Air-blown mortar, etc.

Complete the BMP selection table in this section to indicate the selected BMPs. Identify all contract required BMPs and any other BMPs required by the Special Provisions. If a particular BMP will not be used or is not applicable check "Not Used" and enter a brief reason.

Describe each planned non-stormwater discharge from the project into the storm drain system or waterway, including flow/quantity and expected pollutants. If a flow or quantity cannot be determined, then fully describe the nature and extent of the activity such that the quantity can be inferred. One-time discharges shall be monitored by the WPCM during the time that such discharges are occurring.

Describe each non-stormwater source or activity that may generate a discharge; containment facilities and appurtenances that would be employed; and flow paths of discharge to downstream inlets, drainage facilities, and receiving waters. Where possible, depict BMP locations on the WPCDs.

Indicate the time period and frequency of each activity that generates or may generate a discharge.

Describe mandatory non-stormwater control BMPs and practices required by Caltrans, the RWQCB (such as WDR requirements for projects that reuse Aerially Deposited Lead soils), other permits, or other federal, state, or local agencies. Provide details and schedules as appropriate. Include maintenance, inspection, testing, and reporting requirements. Provide permit information for discharges covered by a separate NPDES permit. List selected non-stormwater BMPs by location on the WPCBMPL in Attachment XX.

Describe contractor-selected non-stormwater control BMPs and practices to minimize, contain, and dispose prohibited discharges or to minimize adverse impacts of authorized discharges from the project into the storm drain system or waterway. BMPs within both the Non-Stormwater Management and the Materials Handling and Waste Management categories may be applicable to non-stormwater discharges. Include maintenance, inspection, testing, and reporting procedures, if applicable. List selected temporary soil stabilization BMPs by location on the WPCBMPL in Attachment XX.

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Indicate how illicit connections and illegal discharges will be handled.

EXAMPLE:

Non-stormwater discharges into storm drainage systems or waterways, which are not authorized under the Caltrans Permit or authorized under a separate NPDES permit shall be prohibited. The selection of non-stormwater BMPs is based on the list of construction activities with a potential for non-stormwater discharges identified in Section 500.1.1. This project will incorporate SWPPP/WPCP Preparation Manual minimum non-stormwater pollution control requirements, non-stormwater pollution temporary wind erosion control measures required by the contract documents, and other measures selected by the contractor.

The following non-stormwater control BMP selection table indicates the BMPs that shall be implemented to prevent non-stormwater discharges construction Site. Non-stormwater pollution control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for non-stormwater pollution control BMPs are shown in Attachment BB.

CONSTRUCTION SITE MANAGEMENT						
NON-STORMWATER POLLUTION CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIREMENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
NS-1	Water Control and Conservation		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-2	Dewatering ⁽³⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Dewatering anticipated.
NS-3	Paving, Sealing, Sawcutting, and Grinding Operations		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-4	Temp Stream Crossing ⁽³⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable to this project because no streams to cross.
NS-5	Clear Water Diversion ⁽³⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable to this project because there are no upstream diversions.
NS-6	Illegal Connection and Illegal Discharge Detection Reporting	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-7	Potable Water / Irrigation		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-8	Vehicle and Equipment Cleaning	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-9	Vehicle and Equipment Fueling	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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CONSTRUCTION SITE MANAGEMENT						
NON-STORMWATER POLLUTION CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
NS-10	Vehicle and Equipment Maintenance	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-11	Pile Driving Operations		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No pile driving on project.
NS-12	Concrete Curing		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-13	Material and Equipment Used Over Water		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No construction over water.
NS-14	Concrete Finishing		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-15	Structure Demolition / Removal Over or Adjacent to Water		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No structure demolition over/adjacent to water.
ALTERNATIVE NON-STORMWATER CONTROL BMPs USED⁽⁴⁾						IF USED, STATE REASON
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Notes: ⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document. ⁽²⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer. ⁽³⁾ The BMPs listed above are incidental and do not include operations included as separate line items in the contract. ⁽⁴⁾ Use of alternative BMPs will require written approval by the Resident Engineer.						

The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

NS-1 Water Control and Conservation / Potable Water and Irrigation

Water application rates will be minimized as necessary to prevent runoff and ponding and water equipment leaks will be repaired immediately. The water truck filling area will be stabilized.

Irrigated areas within the construction limits will be inspected for excess watering. Watering times and schedules will be adjusted to ensure that the appropriate amount of water is being used and to minimize runoff.

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Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

NS-3 Paving, Sealing, Sawcutting, and Grinding Operations

The project will include placement of approximately 20 acres of AC pavement. Paving locations and adjacent storm drain inlets are shown on WPCDs 2, 3, and 5. Paving operations will generally be conducted in August and September as shown on the project schedule in Section 500.7. Paving and Grinding Operations BMPs will be implemented to prevent paving materials from being discharged offsite. Grate inlets within the AC paving area, will be temporarily covered as shown in the detail on the WPCDs. Inlets outside of the AC paving area will be protected with the type of DI protection as called out on the WPCDs. Following paving operations, the area will be swept, inlet covers will be removed, and the inlets will be inspected for paving materials.

The project includes approximately 1,000 feet of concrete saw-cutting at the on- and off-ramp project limits where traffic signal and ramp metering detection loops will be installed. Saw-cutting locations and adjacent storm drain inlets are shown on WPCDs 2, 3, and 4. Estimated saw-cutting dates are shown on the schedule in Section 500.7. Saw-cutting operations shall not be conducted during or immediately prior to rainfall events. Saw-cutting operations are expected to produce approximately 400 gallons of waste slurry consisting of water and fine PCC grit. The slurry shall be vacuumed and discharged to the concrete washout facility located at Button Willow Road. Dried and cured concrete wastes shall be disposed offsite during concrete washout maintenance activities.

NS-6 Illegal Connection and Illegal Discharge Detection Reporting

The contractor will implement the Illegal Connection/Illegal Discharge Detection Reporting BMP throughout the duration of the project.

Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

NS-8, NS-9, NS-10 Vehicle and Equipment Operations

Several types of vehicles and equipment will be used onsite throughout the project, including graders, scrapers, excavators, loaders, paving equipment, rollers, trucks and trailers, backhoes, forklifts, generators, compressors, and traffic control equipment.

Vehicle and Equipment Fueling, and Vehicle and Equipment Maintenance BMPs will be utilized to prevent discharges of fuel and other vehicle fluids. Except for concrete washout, which is addressed in Section 500.4.2, vehicle cleaning will not be performed onsite.

A paved temporary fueling area shall be constructed in the contractor's yard as shown on WPCD-14. All wheeled vehicles shall be fueled offsite or at the temporary fueling area. Fuel trucks, each equipped with absorbent spill clean-up materials, shall be used for all onsite fueling, whether at the temporary fueling area or for mobile fueling elsewhere on the site. Drip pans shall be used

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during all mobile fueling. The fueling truck shall be parked on the paved fueling area during overnight storage.

Drip pans or absorbent pads shall be used during all vehicle and equipment maintenance activities that involve grease, oil, solvents, or other vehicle fluids.

All vehicle maintenance and mobile fueling operations shall be conducted at least 50 feet away from operational inlets and drainage facilities and on a level graded area.

NS-12, NS-14 Concrete Curing and Finishing

Protect drain inlets prior to the application of curing compounds. Excess cure water and water from high pressure blasting will be collected and disposed of, and will not be allowed to runoff to inlets or swales. Wet blankets will be used wherever possible to eliminate excess cure water.

REQUIRED TEXT:

Non-stormwater discharges into storm drainage systems or waterways, which are not authorized under the Caltrans Permit or authorized under a separate NPDES permit shall be prohibited. The selection of non-stormwater BMPs is based on the list of construction activities with a potential for non-stormwater discharges identified in Section 500.4. This project will incorporate SWPPP/WPCP Preparation Manual minimum non-stormwater pollution control requirements, non-stormwater pollution temporary wind erosion control measures required by the contract documents, and other measures selected by the contractor.

The following non-stormwater control BMP selection table indicates the BMPs that shall be implemented to prevent non-stormwater discharges construction Site. Non-stormwater pollution control BMPs are listed by location in the WPCBMPL and shown on the WPCDs in Attachment BB. Any details for non-stormwater pollution control BMPs are shown in Attachment BB.

CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIREMENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
NS-1	Water Control and Conservation		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-2	Dewatering ⁽³⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Dewatering not anticipated.
NS-3	Paving, Sealing, Sawcutting, and Grinding Operations		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NS-4	Temp Stream Crossing ⁽³⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NS-5	Clear Water Diversion ⁽³⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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NS-6	Illegal Connection and Illegal Discharge Detection Reporting	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-7	Potable Water / Irrigation		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NS-8	Vehicle and Equipment Cleaning	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-9	Vehicle and Equipment Fueling	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-10	Vehicle and Equipment Maintenance	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-11	Pile Driving Operations		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NS-12	Concrete Curing		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NS-13	Material and Equipment Used Over Water		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NS-14	Concrete Finishing		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NS-15	Structure Demolition / Removal Over or Adjacent to Water		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
ALTERNATIVE NON-STORMWATER CONTROL BMPs USED⁽⁴⁾						
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No						IF USED, STATE REASON
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME					
Notes: ⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document. ⁽²⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be determined by the Contractor and approved by the Resident Engineer. ⁽³⁾ The BMPs listed above are incidental and do not include operations included as separate line items in the contract. ⁽⁴⁾ Use of alternative BMPs will require writtern approval by the Resident Engineer.						

The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

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This work includes controlling potential sources of pollution before they come in contact with stormwater systems or watercourses. Material pollution and waste and non-stormwater management will be achieved by implementing effective handling, storage, use, and disposal practices.

The Contractor's employees and subcontractors will be trained in these subjects:

1. Material pollution prevention and control
2. Waste management
3. Non-stormwater management
4. Identifying and handling hazardous substances
5. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances

Training will take place before starting work on this job. New employees will receive the complete training before starting work on this job. Weekly meetings will be conducted to discuss and reinforce spill prevention and control; material delivery, storage, use, and disposal; waste management; and non-stormwater management procedures.

WATER CONTROL AND CONSERVATION

Water used for work activities will be managed to prevent erosion or discharge of pollutants into storm drain systems or watercourses. Approval will be obtained before washing anything on the job site with water that could discharge into a storm drain system or watercourse. Discharges will be reported immediately.

If water is used at the job site, conservation practices will be implemented. Water source to broken lines, sprinklers, or valves will be shut off, and breaks will be repaired within 24 hours. If possible, reuse water from waterline flushing for landscape irrigation. Paved areas will be swept and vacuumed and water will not be used.

ILLEGAL CONNECTION AND DISCHARGE DETECTION AND REPORTING

The job site and the site perimeter will be inspected before starting work for evidence of illegal connections, discharges, or dumping. After starting work, the job site and perimeter will be inspected on a daily schedule. When illegal connections, discharges, or dumping are discovered, the Engineer will be notified immediately. No further action will be taken unless ordered by the Engineer. Unlabeled or unidentifiable material will be assumed hazardous.

VEHICLE AND EQUIPMENT CLEANING

Vehicle and equipment cleaning or washing at the job site will be limited, except that which is necessary to control vehicle tracking or hazardous waste. The Engineer will be notified before cleaning vehicles and equipment at the job site with soap, solvents, or steam. Waste will be

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contained and recycled, or disposed of, under "Liquid Waste" or "Hazardous Waste" of the Special Provisions, whichever is applicable. Diesel will not be used to clean vehicles or equipment, and the use of solvents will be minimized.

Vehicle and equipment washing will occur in a structure equipped with disposal facilities. If using a structure is not possible, vehicles and equipment must be cleaned or washed at an outside area:

1. Paved with AC, HMA, or portland cement concrete
2. Surrounded by a containment berm
3. Equipped with a sump to collect and dispose of wash water
4. If within the floodplain, located at least 100 feet from concentrated flows of stormwater, drainage courses, watercourses, or storm drain inlets unless approved
5. If outside the floodplain, located at least 50 feet from concentrated flows of stormwater, drainage courses, watercourses, or storm drain inlets unless approved

When washing vehicles or equipment with water, water use will be minimized. Hoses will be equipped with a positive shut-off valve.

Liquid from wash racks will be discharged to a recycle, or other approved, system. Liquids and sediment will be removed as necessary. The WPCM will inspect vehicle and equipment cleaning facilities daily, when vehicle and equipment cleaning occurs daily, and weekly when vehicle and equipment cleaning does not occur daily.

VEHICLE AND EQUIPMENT FUELING AND MAINTENANCE

When practicable, maintenance on vehicles and equipment will be performed off-site. If fueling or maintenance must be done on-site, areas will be designated, which will be on level ground and protected from stormwater run-on. If within the floodplain, these areas will be located at least 100 feet from concentrated flows of stormwater, drainage courses, watercourses, or storm drain inlets, or if outside the floodplain, these areas will be located at least 50 feet from concentrated flows of stormwater, drainage courses, watercourses, or storm drain inlets.

Containment berms or dikes will be used around the fueling and maintenance area. Adequate quantities of absorbent spill cleanup material and spill kits will be kept in the fueling and maintenance area and on fueling trucks. After use, spill clean-up material and kits will be disposed of immediately. Drip pans or absorbent pads will be used during fueling or maintenance. Fueling or maintenance activities will not be left unattended. Fueling nozzles will be equipped with an automatic shut-off control.

The WPCM will inspect vehicle and equipment maintenance and fueling areas daily, when vehicle and equipment maintenance and fueling occurs daily, and weekly when vehicle and equipment maintenance and fueling does not occur daily.

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The WPCM will inspect vehicles and equipment at the job site for leaks and spills on a daily schedule. Operators will inspect vehicles and equipment each day of use. If leaks cannot be repaired immediately, the vehicle or equipment must be removed from the job site.

500.4.2 Waste Management and Materials Pollution Control

INSTRUCTIONS:

- Waste management consists of implementing procedural and structural BMPs for collecting, handling, storing and disposing of wastes generated by a construction project to prevent the release of waste materials into stormwater discharges. Wastes are going to be generated during construction; however, the methods in which the wastes are collected, stored, and removed will determine the success of the waste management activities. Construction site wastes can range from residues collected from non-stormwater discharges (e.g., paint removal) to general site litter and debris (e.g., empty marker paint cans).
- Material pollution control (materials handling) consist of implementing procedural and structural BMPs for handling, storing and using construction materials to prevent the release of those materials into stormwater discharges. The amount and type of construction materials to be utilized at the site will be dependent upon the type of construction and the length of the construction period. The materials may be used continuously, such as fuel for vehicles and equipment, or the materials may be used for a discrete period, such as fertilizer for landscaping.
- Waste management and materials pollution control BMPs shall be implemented to minimize stormwater contact with construction materials, wastes and service areas, and to prevent materials and wastes from being discharged offsite. The primary mechanisms for stormwater contact that shall be addressed are:
 - Direct contact with precipitation;
 - Contact with stormwater run-on and runoff;
 - Wind dispersion of loose materials; and
 - Direct discharge to the storm drain system through spills or dumping.
- Extended contact with some materials and wastes, such as asphalt cold mix and treated wood products can also leach pollutants into stormwater and needs to be addressed.
- Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
- Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
- Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
- Cover waste disposal containers at the end of every business day and during a rain event.
- Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

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- Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
- Implement procedures that effectively address hazardous and nonhazardous spills.
- Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
- Use the following steps to identify waste management and materials pollution control BMPs.

Step 1: Incorporate the waste management and materials pollution control BMPs that are described in:

- Contract Special Provisions;
- Contract Plans;
- Standard Plans; and
- Standard Specifications.

If the waste management and materials pollution control BMPs required in Step 1 are inadequate to address potential pollutants in stormwater and non-stormwater discharges, then:

Step 2: Incorporate the waste management and materials pollution control BMPs using one or more of the Caltrans minimum requirements listed in Table 1-1 of the SWPPP/ WPCP Preparation Manual.

Step 3: If the waste management and materials pollution control BMPs selected from Steps 1 and 2 are inadequate to address potential pollutants in stormwater and non-stormwater discharges, then incorporate the temporary non-stormwater pollution control BMPs that are described in Section 4.5 of the SWMP. For reference on these BMPs see the Construction Site Best Management Practices (BMPs) Reference Manual.

- For Steps 1 through 3 above use the following guidelines to help select appropriate BMPs:

Review construction activities to identify and quantify likely construction materials and wastes. Identify materials and wastes with special handling or disposal requirements such as lead contaminated soils, concrete saw-cutting liquids, waste chemicals and empty chemical containers. (See Section 500.4.1).

Substitute safer, less polluting products where possible. Substitution of materials and products require approval pursuant to the Standard Specifications.

Use the waste management BMP implementation table in this Section to identify Caltrans minimum requirements and additional BMPs selected to address project-specific activities. If a particular BMP will not be used or is not applicable check "Not Used" in the BMP implementation table and enter a brief a reason.

In the narrative section list the selected BMPs and describe proposed facilities for materials storage and waste management (including onsite storage and disposal of waste). Discuss how

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each stormwater contact mechanism will be addressed. Include schedules, inspection, and maintenance requirements. Show facility locations and details on the WPCDs where possible.

EXAMPLE:

An inventory of construction activities, materials, and waste is provided in Section 500.4.1. The following BMP consideration checklist indicates the BMPs that have been selected to control construction site wastes and materials. The steps outlined in the instructions for this section for identifying waste management and materials pollution control BMPs to be included in the SWPPP have been followed. The applicable Contract Special Provisions, Contract Plans, Standard Plans, and Standard Specifications are provided or listed in Attachment XX. Locations and details of materials handling and waste management BMPs are shown on the WPCDs in Attachment BB. In the narrative description, a list of waste disposal facilities and the type of waste to be disposed at each facility is also provided. The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

KK

CONSTRUCTION SITE MANAGEMENT						
WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
WM-1	Material Delivery and Storage	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-2	Material Use	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-3	Stockpile Management	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-4	Spill Prevention and Control	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-5	Solid Waste Management	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-6	Hazardous Waste Management ⁽³⁾		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-7	Contaminated Soil Management ⁽³⁾		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-8	Concrete Waste Management		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Temporary Concrete Washout Facility		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Temporary Concrete Washout (Portable)		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
WM-9	Sanitary/Septic Waste Management	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-10	Liquid Waste Management		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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CONSTRUCTION SITE MANAGEMENT						
WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE -MENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
ALTERNATIVE WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs USED⁽⁴⁾						IF USED, STATE REASON
<input type="checkbox"/> Yes <input type="checkbox"/> No						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME					

Notes:

⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document.

⁽²⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be verified by the Contractor or determined by Caltrans.

⁽³⁾ The BMPs listed above are incidental and do not include operations included as separate line items in the contract.

⁽⁴⁾ Use of alternative BMPs will require written approval by the Resident Engineer.

- In general, BMPs shall be implemented to help prevent discharges of construction materials during delivery, storage, and use. The general material storage area shall be located in the contractor's yard as shown on WPCD-4. A sandbag barrier shall be provided around the storage area to prevent run-on from adjacent areas. Two types of storage/containment facilities shall be provided within the storage area to minimize stormwater contact with construction materials:
 - Two watertight shipping containers shall be used to store hand tools, small parts, and most construction materials that can be carried by hand, such as paint cans, solvents and grease.
 - A separate covered storage/containment facility shall be constructed adjacent to the shipping containers to provide storage for larger items such as drums and items shipped or stored on pallets. The containment facility shall consist of a 10 ft by 20 ft raised concrete pad with 5-inch curbed sides. A wood frame and corrugated tin roof and sides shall be constructed to protect the facility from sun and rain. The facility shall provide approximately 530 gallons of containment volume. The containment volume is adequate to store 9, 55-gallon drums and the rainfall from a 24-hr, 25-year storm, pursuant to Material Delivery and Storage BMP.

- Very large items, such as light standards, framing materials, and stockpiled lumber, shall be stored in the open in the general storage area. Such materials shall be elevated with wood blocks to minimize contact with run-on.

- Spill clean-up materials, material safety data sheets, a material inventory, and emergency contact numbers shall be maintained and stored in the southern shipping container.

WM-3 Stockpile Management

- BMP WM-3, Stockpile Management shall be implemented to reduce or eliminate pollution of stormwater from stockpiles of soil and paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate subbase, pre-mixed aggregate and asphalt binder (so called “cold mix” asphalt). Stockpiles shall be surrounded with sediment controls (BMP SC-5, Fiber rolls or SC-8, sandbag barrier). Plastic covers, or SS-5, Soil Binders, shall be used.

WM-4 Spill Prevention and Control

- BMP WM-4, Spill Prevention and Control shall be implemented to contain and clean-up spills and prevent material discharges to the storm drain system. Spill prevention is also discussed above in Material Delivery, Storage and Use BMP, and below in the following waste management section.

WM-5, WM-6 Waste Management

- BMP WM-5, Solid Waste Management and BMP WM-6, Hazardous Waste Management BMPs shall be implemented to minimize stormwater contact with waste materials and prevent waste discharges. Solid wastes shall be loaded directly onto trucks for offsite disposal. When onsite storage is necessary, solid wastes shall be stored in watertight dumpsters in the general storage area of the contractor’s yard. Dumpster locations are shown on WPCD-14. Solid waste, including rubble stockpiles, shall be removed and disposed offsite at least weekly. ABC Waste Disposal (License CA9999999) shall provide solid waste disposal services. Liquid hazardous wastes shall be stored in the covered containment area discussed above for materials storage. Solid hazardous waste shall be stored in the shipping container or in the covered containment area. Hazardous wastes shall be appropriate and clearly marked containers and segregated from other non-waste materials. Wastes shall be stored in sealed containers constructed of a suitable material and shall be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172, 173, 178, and 179. All hazardous waste shall be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.

WM-7 Contaminated Soil Management

- When contaminated soils are encountered, the Resident Engineer shall be notified, the contaminated soils shall be contained, covered if stockpiled, and disposed of per the Contaminated Soil Management BMP, and the Special Provisions. Employees shall be instructed to recognize evidence of contaminated soil, such as buried debris, discolored soil, and unusual odors.

WM-8 Concrete Residuals and Washout Wastes

- This project includes placement of approximately 130 yd³ of concrete in four separate pours, the largest pour being approximately 50 yd³. The estimated maximum washout volume is 3.5 ft³. Discharges will consist of rinse water and residual concrete (PCC, aggregates, admixture,

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and water). Estimated pour dates are shown on the project schedule in Section 500.7. Concrete pours shall not be conducted during or immediately prior to rainfall events.

- Concrete Waste Management shall be implemented in accordance with contract documents, and maintained at the contractor's yard as shown on WPCD-14.
- Concrete washout facilities shall be designed in accordance with Standard Detail T59. All excess concrete and concrete washout slurries shall be discharged to the washout facility for drying. BMP maintenance, waste disposal, and BMP removal shall be conducted as described in Concrete Waste Management Special Provision.

WM-9 Sanitary and Septic Wastes

- The contractor shall implement Sanitary and Septic Waste Management BMP. Portable toilets shall be located and maintained at the contractors yard for the duration of the project. Specific locations are shown on WPCD-4. Weekly maintenance shall be provided each Wednesday by ABC Sanitation (license CA0Q45W) and wastes shall be disposed offsite. The toilets shall be located away from concentrated flow paths and traffic flow.

REQUIRED TEXT:

An inventory of construction activities, materials, and waste is provided in Section 500.1.1. The following BMP consideration checklist indicates the BMPs that have been selected to control construction site wastes and materials. The steps outlined in the instructions for this section for identifying waste management and materials pollution control BMPs to be included in the SWPPP have been followed. The applicable Contract Special Provisions, Contract Plans, Standard Plans, and Standard Specifications are provided or listed in Attachment GG. Locations and details of applicable materials handling and waste management BMPs are shown on the WPCDs in Attachment BB. In the narrative description, a list of waste disposal facilities and the type of waste to be disposed at each facility is also provided. The following list of BMPs and narrative explain how the selected BMPs will be incorporated into the project.

CONSTRUCTION SITE MANAGEMENT						
WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIREMENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
WM-1	Material Delivery and Storage	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-2	Material Use	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-3	Stockpile Management	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-4	Spill Prevention and Control	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-5	Solid Waste Management	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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CONSTRUCTION SITE MANAGEMENT						
WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs						
CONSTRUCTION BMP ID NO ⁽¹⁾	BMP NAME	MINIMUM REQUIRE- MENT ⁽²⁾	CONTRACT BID ITEM	BMP USED		IF NOT USED, STATE REASON
				YES	NO	
WM-6	Hazardous Waste Management ⁽³⁾		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-7	Contaminated Soil Management ⁽³⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No contaminated soil on project site.
WM-8	Concrete Waste Management		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No concrete work.
	Temporary Concrete Washout Facility		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No concrete work.
	Temporary Concrete Washout (Portable)		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No concrete work.
WM-9	Sanitary/Septic Waste Management	✓	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-10	Liquid Waste Management		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
ALTERNATIVE WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs USED ⁽⁴⁾						IF USED, STATE REASON
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Notes: ⁽¹⁾ The BMP designations (SS-1, SC-3, etc.) are solely for maintaining continuity with existing Caltrans documents and are not provided to imply that the Construction Site BMP Reference Manual is a required contract document. ⁽²⁾ Not all minimum requirements may be applicable to every project. Applicability to a specific project shall be verified by the Contractor or determined by Caltrans. ⁽³⁾ The BMPs listed above are incidental and do not include operations included as separate line items in the contract. ⁽⁴⁾ Use of alternative BMPs will require written approval by the Resident Engineer.						

MATERIAL MANAGEMENT:

Material will be delivered, used, and stored for this job in a way that minimizes or eliminates discharge of material into the air, storm drain systems, or watercourses. Employees trained in emergency spill clean-up procedures will be present during unloading of hazardous materials or chemicals. Chemical storage areas such as concrete curing compound will be stored in secondary containment system for refueling system, a cover system with side protection will be included to prevent rain water from coming in contact with the refueling system. The contractor must contact the local certified unified program agency (CUPA) to comply with their requirements, such as the preparation of a hazardous materials management plan.

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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STOCKPILE MANAGEMENT:

Following practices described in this section for managing stockpiles will be implemented during the rainy season and during the non-rainy season when the National Weather Service predicts precipitation with a probability of at least 30 percent.

Stockpile management procedures will be used to reduce or eliminate potential air and water pollution from stockpiled material including soil, paving material, or pressure treated wood.

Stockpiles located within the floodplain, at least 100 feet from concentrated flows of stormwater, drainage courses, or inlets, unless approved. If located outside the floodplain, at least 50 feet from concentrated flows of stormwater, drainage courses, or inlets.

Active and inactive soil stockpiles will be covered with soil stabilization measures, plastic sheeting, or geosynthetic fabric and surrounded with a linear sediment barrier. Portland cement concrete rubble, AC, HMA, AC and HMA rubble, aggregate base or aggregate sub-base stockpiles will be covered with plastic sheeting, or geosynthetic fabric and surrounded with a linear sediment barrier.

Pressure treated wood stockpiles will be placed on pallets, covered with impermeable material.

Cold mix asphalt concrete stockpiles will be placed on impervious surface, covered with impermeable material and protected from run-on and run-off.

If material is added or removed for up to 14 days, the stockpile will be considered still active during that period.

Linear sediment barriers and covers will be maintained as needed to keep them functioning properly. If sediment accumulates to 1/3 of the linear sediment barrier height, sediment will be removed.

SPILL PREVENTION AND CONTROL:

Implement spill and leak prevention procedures for chemicals and hazardous substances stored on the job site. As soon as it is safe, contain and clean-up spills of petroleum products, sanitary and septic waste substances listed under CFR Title 40, Parts 110, 117, and 302.

SOLID WASTE MANAGEMENT:

Trash and debris will be removed from the job site at least once a week. If practicable, nonhazardous job site waste and excess material will be recycled. If recycling is not practicable, disposal will comply with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way."

Sufficient number of closed-lid dumpsters with adequate volume to contain the solid waste generated by work activities will be furnished. When refuse reaches the fill line, dumpsters will be emptied. Dumpsters will be watertight. Dumpsters will not be washed at the job site. Additional containers and more frequent pick-ups will be necessary during the demolition phase of construction.

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HAZARDOUS WASTE MANAGEMENT:

Hazardous waste management practices will be used for the following:

1. Petroleum products
2. Asphalt products
3. Concrete curing compound
4. Pesticides
5. Acids
6. Paints
7. Stains
8. Solvents
9. Wood preservatives
10. Roofing tar
11. Road flares
12. Lime
13. Glues and adhesives
14. Materials classified as hazardous by California Code of Regulations, Title 22, Division 4.5; or listed in CFR Title 40, Parts 110, 117, 261, or 302

Containers with adequate storage volume at convenient locations for hazardous waste collection will be furnished. Hazardous wastes will not be mixed and will not be allowed to accumulate on the ground. Store containers of dry waste that are not watertight on pallets. Store hazardous waste away from storm drains, watercourses, moving vehicles, and equipment.

Cleaning water-based or oil-based paint from brushes or equipment within a contained area will be done in a manner that does not contaminate soil, watercourses, or storm drain systems. Paints, thinners, solvents, residues, and sludges that cannot be recycled or reused will be handled and disposed of as hazardous waste. Dry latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths will be disposed of as solid waste.

Within 90 days of being generated, hazardous waste must be disposed. A licensed hazardous waste transporter will be used to take hazardous waste to a Class I Disposal Site. A copy of uniform hazardous waste manifest forms will be submitted within 24 hours of transporting hazardous waste.

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The WPCM will perform daily inspection of storage areas for hazardous materials and wastes, hazardous waste disposal and transporting activities and hazardous material delivery and storage activities.

SANITARY AND SEPTIC WASTE MANAGEMENT:

The WPCM will inspect, at least weekly, sanitary or septic waste storage and monitor disposal procedures. Sanitary facilities that discharge to the sanitary sewer system will be properly connected and free from leaks. Sanitary facilities will be placed at least 50 feet away from storm drains, watercourse, and flow lines. Written approval/permits from local health agency, city, county, and sewer district will be obtained before discharging from a sanitary or septic system directly into a sanitary sewer system, and submit a copy to the Resident Engineer. Local health agency provisions will be complied with while using an on-site disposal system. Temporary sanitary facilities will be serviced on a weekly basis and documented.

LIQUID WASTE MANAGEMENT:

Practices to prevent job site liquid waste from entering storm drain systems or watercourses will be used. Liquid wastes expected on the job site include the following:

1. Drilling slurries or fluids
2. Grease-free or oil-free wastewater or rinse water
3. Dredgings, including liquid waste from drainage system cleaning
4. Liquid waste running off a surface including wash or rinse water
5. Other non-storm water liquids not covered by separate permits

Liquid waste will be held in structurally sound, leak-proof containers such as:

1. Roll-off bins
2. Portable tanks

Liquid waste containers will be of sufficient quantity and volume to prevent overflow, spills and leaks.

Containers will be stored at least 50 feet from moving vehicles and equipment, if within the floodplain, at least 100 feet from concentrated flows of stormwater, drainage courses, watercourses, or storm drain inlets. If outside the floodplain, they will be stored at least 50 feet from concentrated flows of stormwater, drainage courses, watercourses, or storm drain inlets unless approved

Remove and dispose of deposited solids from sediment traps under "Solid Waste," unless the Engineer authorizes another method.

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Liquid waste may require testing to determine hazardous material content before disposal.
Drilling fluids and residue will be disposed outside of the right-of-way.

500.5 WATER POLLUTION CONTROL BMP LIST

INSTRUCTIONS:

- Prepare Water Pollution Control Best Management Practices List (WPCBMPL) in conformance with the following instructions. Include the WPCBMPL as Attachment XX to the SWPPP. A sample WPCBMPL is in Appendix XX of the SWPPP/ WPCP Preparation Manual.

Include a cover sheet(s) listing the BMPs that will be used.

The WPCBMPL shall show by location the BMPs that will be used. The number of locations shown on the WPCBMPL shall be established so that field staff and inspectors can easily identify where BMP's need to be located. The following guidance should be used to determine locations:

- At interchanges identify locations by quadrants.
- Use ½ mile segments for mainline and provide both post mile and stationing identification.
- Structures.
- By road/street when construction activities area.
- Contractor yard.
- Staging area.
- Batch plant or material crushing operation.
- For mobile BMP's such as pavement placement and grinding list the location as Mobile Operation.

The WPCBMPL shall reference appropriate WPCD(s) for each location.

THE WPCBMPL shall show the estimated disturbed soil area for each location.

- List all construction site BMPs on the WPCBMPL. Include necessary additional information to convey site-specific configurations or BMP modifications.

List temporary soil stabilization and temporary sediment control BMPs that will be used during construction. Include temporary onsite drainage(s) to carry concentrated flows, BMPs implemented to divert offsite drainage around or through the construction site, and BMPs that protect stormwater inlets;

List temporary construction entrances for site ingress and egress points and any proposed temporary construction roads;

List BMPs to mitigate or eliminate non-stormwater discharges;

List BMPs for waste management and materials pollution control, including, but not limited to storage of soil or waste; construction material loading, unloading, storage and access areas; and areas designated for waste handling and disposal; and

List BMPs for vehicle and equipment storage, fueling, maintenance, and cleaning.

- The WPCBMPL shall reflect the Contractor's phasing and/or construction staging, and shall address the entire scope of the contract work.

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- Provide an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

EXAMPLE:

Note: Examples of Water Pollution Control Best Management Practices List can be found in Attachment XX of the SWPPP/WPCP Preparation Manual

REQUIRED TEXT:

The Water Pollution Control Best Management Practices List (WPCBMPL) provides by location and project phase/stage the necessary BMPs for the project to be in compliance with the Construction General Permit. The WPCBMPL provides field staff with both a list of necessary BMPs and estimated quantity for each BMP by location and phase/stage of the project. The construction activity Phases used in this SWPPP are the Preliminary Phase, Grading and Land Development

Phase, Streets and Utilities Phase, and the Vertical Construction Phase. The WPCBMPL, Water Pollution Control Drawings and Water Pollution Control Schedule provide the necessary tools for a contractor to plan and implement BMPs to meet the requirements of the project SWPPP. The BMPs listed on the WPCBMPL are the base line for site inspections and visual monitoring.

The WPCBMPL cover sheet includes a list of all BMP's to be used on the project based on Section 500 Determination of Construction Site Best Management Practices.

The names and number of locations listed on the WPCBMPL were established so that field staff and inspectors can easily identify where BMP's need to be located. The WPCBMPL includes all locations that are directly related to the construction activity, including but not limited to staging areas, storage yards, material borrow areas and storage areas, access roads, etc., whether or not they reside within the Caltrans rights-of-way.

Necessary additional information to convey site-specific BMP configurations or BMP modifications are noted on the WPCBMPL.

All all construction site BMPs are listed on the WPCBMPL including the following:

- Temporary soil stabilization and temporary sediment control BMPs that will be used during construction. Include temporary onsite drainage(s) to carry concentrated flows, BMPs implemented to divert offsite drainage around or through the construction site, and BMPs that protect stormwater inlets;
- Temporary construction entrances for site ingress and egress points and any proposed temporary construction roads;
- BMPs to mitigate or eliminate non-stormwater discharges;

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- BMPs for waste management and materials pollution control, including, but not limited to storage of soil or waste; construction material loading, unloading, storage and access areas; and areas designated for waste handling and disposal; and
- BMPs for vehicle and equipment storage, fueling, maintenance, and cleaning.
- Permanent BMP that are a component of the project SWPPP.

The Water Pollution Control Best Management Practices List can be found in Attachment AA of the SWPPP.

500.6 WATER POLLUTION CONTROL DRAWINGS

INSTRUCTIONS:

- Prepare Water Pollution Control Drawings (WPCDs) in conformance with the following instructions and requirements of the Construction General Permit. Include the WPCDs as Attachment BB to the SWPPP. The WPCDs shall be no smaller than the “reduced plans” (approximately 11”x17”) issued by Caltrans. A sample WPCD can be referenced in Attachment BB, Appendix A of the SWPPP/ WPCP Preparation Manual.

The WPCDs shall show locations for the BMPs that will be used.

Include a cover sheet(s) listing the BMPs that will be used along with the associated BMP symbols used on the WPCDs. Standard symbols and linetypes are shown in the SWPPP/WPCP Preparation Manual, Appendix D.

Temporary WPC details are included in the applicable Standard Plans, contract plans and Attachment BB.

Additional details may be necessary to describe site-specific BMP applications. BMP details other than the ones shown in the contract plans and Standard Plans shall be submitted to the Resident Engineer for approval. Use project layout, grading, stage construction, drainage sheets and/or erosion sheets as base sheets for the WPCDs. Use Section 500.1.2 as a guide to identify pollutant sources and BMPs for construction activities. Select BMPs that are appropriate for the site and show their locations on the site map.

- The base sheets shall show the construction project in detail, including:

The construction site perimeter;

Geographic features within or immediately adjacent to the site. Include surface waters such as lakes, streams, springs, wetlands, estuaries, ponds, and the ocean;

Site topography before and after construction. Include roads, paved areas, buildings, slopes, drainage facilities, and areas of known or suspected contamination; and

Permanent (post-construction) BMPs. These are usually shown on the Contract Plans.

- Also delineate the following site information:

Discharge points from the project to offsite storm drain systems or receiving waters;

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Tributary areas and drainage patterns across the project area (show using flow arrows) into each onsite stormwater inlet or receiving water;

Tributary areas and drainage patterns to each onsite stormwater inlet, receiving water or discharge point;

Offsite tributary drainage areas that generate run-on to the project. (Where offsite tributary drainage areas are too large to depict on the drawings, use map notes or inserts illustrating the upstream drainage areas);

Temporary onsite drainage(s) to carry concentrated flows;

Drainage patterns and slopes anticipated after major grading activities are completed;

Outline all areas of existing vegetation, soil cover, or native vegetation that will remain undisturbed during the project;

Outline all areas of soil disturbance (disturbed soil areas, DSAs);

Identify location(s) of contaminated or hazardous soils;

Locate potential non-stormwater discharges and activities, such as dewatering operations, concrete saw-cutting or coring, pressure washing, waterline flushing, diversions, cofferdams, and vehicle and equipment cleaning. If operations can't be located, provide a narrative description.

- Show proposed locations of all construction site BMPs. Include additional detail drawings if necessary to convey site-specific configurations.
 - Show temporary soil stabilization and temporary sediment control BMPs that will be used during construction. Include temporary onsite drainage(s) to carry concentrated flows, BMPs implemented to divert offsite drainage around or through the construction site, and BMPs that protect stormwater inlets;
 - Locate site ingress and egress points and any proposed temporary construction roads;
 - Show BMPs to mitigate or eliminate non-stormwater discharges;
 - Show BMPs for waste management and materials pollution control, including, but not limited to storage of soil or waste; construction material loading, unloading, storage and access areas; and areas designated for waste handling and disposal; and
 - Show BMPs for vehicle and equipment storage, fueling, maintenance, and cleaning.
- The Caltrans Permit states: "The SWPPP shall apply to all areas that are directly related to the construction activity, including but not limited to staging areas, storage yards, material borrow areas and storage areas, access roads, etc., whether or not they reside within the Caltrans rights-of-way."
- The WPCDs shall reflect the Contractor's phasing and/or construction staging, and shall address the entire scope of the contract work.

EXAMPLE:

Note: Examples of Water Pollution Control Drawings can be found in Attachment B of the SWPPP/WPCP Preparation Manual.

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REQUIRED TEXT:

The Water Pollution Control Drawings (WPCDs) are the component of the project SWPPP that show the necessary BMPs by project phase/stage for the project to be in compliance with the Construction General Permit. The construction activity Phases used in this SWPPP are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase. These phases are defined below.

Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)

Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

Grading Phase (part of the Grading and Land Development Phase)

Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

Streets and Utilities Phase

Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

Vertical Construction Phase

The Build out of structures from foundations to roofing, including rough landscaping.

The WPCDs provide field staff with the information on where to install BMPs so that they are effective. The WPCDs, Water Pollution Control Best Management List and Water Pollution Control Schedule provide the necessary tools for a contractor to plan and implement BMPs to meet the requirements of the project SWPPP.

The WPCD cover sheet(s) shall include a listing of the BMPs that will be used along with the associated BMP symbols used on the WPCDs.

WPCDs are provided for all areas that are directly related to the construction activity, including but not limited to staging areas, storage yards, material borrow areas and storage areas, access roads, etc., whether or not they reside within the Caltrans rights-of-way.

The WPCDs shall show the construction project site in detail, including:

- The construction site perimeter;
- Geographic features within or immediately adjacent to the site. Include surface waters such as lakes, streams, springs, wetlands, estuaries, ponds, and the ocean;
- Site topography before and after construction. Include roads, paved areas, buildings, slopes, drainage facilities, and areas of known or suspected contamination; and

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- Permanent (post-construction) BMPs.

The WPCDs shall show the following site information:

- Discharge points from the project to offsite storm drain systems or receiving waters;
- Tributary areas and drainage patterns across the project area (show using flow arrows) into each onsite stormwater inlet or receiving water;
- Tributary areas and drainage patterns to each onsite stormwater inlet, receiving water or discharge point;
- Offsite tributary drainage areas that generate run-on to the project;
- Temporary onsite drainage(s) to carry concentrated flows;
- Drainage patterns and slopes anticipated after major grading activities are completed;
- Outline of all areas of existing vegetation, soil cover, or native vegetation that will remain undisturbed during the project;
- Outline of all areas of planned soil disturbance (disturbed soil areas, DSAs)
- Known location(s) of contaminated or hazardous soils;
- Any potential non-stormwater discharges and activities, such as dewatering operations, concrete saw-cutting or coring, pressure washing, waterline flushing, diversions, cofferdams, and vehicle and equipment cleaning. If operations can't be located on the WPCDs, a narrative description is provided.

The WPCDs show proposed locations of all construction site BMPs. Additional detail drawings are provided if necessary to convey site-specific BMP configurations. The WPCDs shall show construction site BMPs including the following:

- Temporary soil stabilization and temporary sediment control BMPs that will be used during construction. Any temporary onsite drainage(s) to carry concentrated flows, BMPs implemented to divert offsite drainage around or through the construction site, and BMPs that protect stormwater inlets;
- Construction entrances used for site ingress and egress points and any proposed temporary construction roads;
- BMPs to mitigate or eliminate non-stormwater discharges;
- BMPs for waste management and materials pollution control, including, but not limited to storage of soil or waste; construction material loading, unloading, storage and access areas; and areas designated for waste handling and disposal; and
- BMPs for vehicle and equipment storage, fueling, maintenance, and cleaning.

The Water Pollution Control Drawings can be found in Attachment BB of the SWPPP.

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500.7 WATER POLLUTION CONTROL SCHEDULE

INSTRUCTIONS:

- Provide a graphical project schedule. The project schedule may be used for the Water Pollution Control Schedule(WPCS) if it includes all WPCS requirements. The schedule shall contain an adequate level of detail to show major activities sequenced with implementation of construction site BMPs, including:
 - Project start and finish dates, including each stage of the project;
 - SWPPP review and approval;
 - Annual certifications;
 - Mobilization dates;
 - Mass clearing and grubbing/roadside clearing dates;
 - Major grading/excavation dates;
 - Special dates named in other permits such as Fish and Game and Army Corps of Engineers Permits;
 - Dates for submittal SWPPP Amendments required by the Special Provisions;
 - Implementation schedule by location for:
 - Deployment of temporary soil stabilization BMPs;
 - Deployment of temporary sediment control BMPs;
 - Deployment of wind erosion control BMPs;
 - Deployment of tracking control BMPs;
 - Deployment of non-stormwater BMPs;
 - Deployment of waste management and materials pollution control BMPs;
 - Paving, saw-cutting, and any other pavement related operations;
 - Major planned stockpiling operations;
 - Dates for other significant long-term operations or activities that may cause non-stormwater discharges such as dewatering, grinding, etc; and
 - Final stabilization activities staged over time for each area of the project.
- Note: Projects located in the Lake Tahoe, Truckee River, East Fork Carson River, or West Fork Carson River Hydrologic Units, and projects above 5,000 ft in elevations in the portions of Mono County or Inyo County within the Lahontan RWQCB are not allowed to perform removal of vegetation nor disturbance of existing ground surface conditions between October 15 of each year and May 1 of the following year; except when there is an emergency situation that threatens the public health or welfare, or when the project is granted a variance by the RWQCB Executive Officer.

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EXAMPLE: Graphical Schedule

Note: Examples of Water Pollution Control Schedule can be found in Attachment XX of the SWPPP/WPCP Preparation Manual.

REQUIRED TEXT:

The Water Pollution Control Schedule (WPCS) is the component of the project SWPPP that shows the timeline for when BMPs will be installed so that the project is in compliance with the Construction General Permit. The WPCS provides field staff with the information necessary to plan for adequate materials and crews to install BMPs at the right time so that they are effective. The Water Pollution Control Schedule, Water Pollution Control Best Management List, and Water Pollution Control Drawings provide the necessary tools for a contractor to plan and implement BMPs to meet the requirements of the project SWPPP.

The WPCS shall contain an adequate level of detail to show major activities sequenced with implementation of construction site BMPs, including:

- Project start and finish dates, including each stage of the project
- SWPPP review and approval;
- Annual certifications;
- Mobilization dates;
- Mass clearing and grubbing/roadside clearing dates;
- Major grading/excavation dates;
- Dates named in other permits such as Fish and Game and Army Corps of Engineers Permits; and
- Dates for submittal SWPPP Amendments required by the Special Provisions.

The WPCS shall show implementation by location for:

- Deployment of temporary soil stabilization BMPs;
- Deployment of temporary sediment control BMPs;
- Deployment of wind erosion control BMPs;
- Deployment of tracking control BMPs;
- Deployment of non-stormwater BMPs; and
- Deployment of waste management and materials pollution control BMPs.

The WPCS shall include:

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**Stormwater Pollution Prevention Plan (SWPPP)
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- Paving, saw-cutting, and any other pavement related operations;
- Major planned stockpiling operations;
- Dates for other significant long-term operations or activities that may cause non-stormwater discharges such as dewatering, grinding, etc; and
- Final stabilization activities for each distributed soil area of the project.

The WPCS shall be updated quarterly and the quarterly updates shall be filed in SWPPP file category 20.08 Water Pollution Control Schedule Updates.

The Water Pollution Control Schedule can be found in Attachment CC of the SWPPP.

INSERT ADDITIONAL NARRATIVE TEXT FOR NON-STORM WATER POLLUTION CONTROL HERE (Use the "FORMAT OPTIONS" button to insert subtitles and/or paragraphs)

SECTION 600 PROJECT SITE IMPLEMENTATION PROGRAM

600.1 WATER POLLUTION CONTROL MANAGER RESPONSIBILITIES

INSTRUCTIONS:

- The person responsible for water pollution control during construction is the Water Pollution Control Manager (WPCM).
- The WPCM must be a qualified QSD with a certification or registration listed in Section 100.1 of this SWPPP and Section VII.B.1 of the Construction General Permit. Also, effective September 2, 2011, the QSD shall have attended a State Water Board-sponsored or approved QSD training course.
- The WPCM shall be available at all times throughout the duration of the project.
- Duties of the Contractor's WPCM include but are not limited to:
 - Ensuring full compliance with the SWPPP and the Permit;
 - Implementing all elements of the SWPPP and Contract Special Provisions, including but not limited to:
 - Implementing prompt and effective erosion and sediment control measures; and
 - Implementing all non-stormwater management, and materials and waste management activities such as: monitoring discharges (dewatering, diversion devices); general site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than stormwater are discharged in quantities which, will have an adverse effect on receiving waters or storm drain systems; etc.
 - Conducting routine weekly stormwater inspections;
 - Conducting quarterly non-stormwater inspections;
 - Conducting pre-storm inspections for qualified storm events;
 - Conducting daily inspections during qualified storm events;
 - Conducting post-storm inspections for qualified storm events;
 - Monitoring National Weather Forecast and preparing and implementing Rain Event Action Plans for likely precipitation events;
 - For Risk Level 2 projects, submitting Numeric Action Level exceedances to the Resident Engineer;
 - For Risk Level 3 projects, submitting Numeric Effluent Level exceedances to the Resident Engineer
 - For Risk Levels 2 and 3, submitting stormwater sampling and test results to the Resident Engineer.
 - Preparing Amendments to the SWPPP when required in Section 100.3.
 - Preparing Contractor's SWPPP Annual Compliance Certification;
 - Preparing Stormwater Annual Report;

INSERT CONTRACTOR'S COMPANY NAME-THEN TAB.

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- Ensuring elimination of all unauthorized discharges;
 - Mobilizing crews in order to make immediate repairs to the control measures (the Contractor's WPCM shall be assigned authority by the Contractor to mobilize crews);
 - Coordinating with the Resident Engineer to assure all of the necessary corrections/repairs are made immediately, and that the project complies with the SWPPP, the Construction General Permit and approved plans at all times; and
 - Submitting Notices of Discharge and reports of Illicit Connections or Illegal Discharges.
- The Contractor's WPCM shall have primary responsibility and significant authority for the implementation, maintenance, inspection and amendments to the approved SWPPP.
 - The Contractor may appoint a Qualified SWPPP Practitioner (QSP) to assist the WPCM with the implementation of the SWPPP BMPs. The QSP, effective September 2, 2011, shall be either a QSD or have one of the following certifications
 - A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or
 - A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

Effective September 2, 2011, the QSP shall have attended a State Water Board-sponsored or approved QSP training course.

REQUIRED TEXT:

The Water Pollution Control Manger (WPCM) shall have primary responsibility and authority to implement the SWPPP and ensure the project is in compliance with the Construction General Permit. The WPCM is responsible for SWPPP implementation and amending the SWPPP when any of the conditions specified in Section 100 are met. The Contractor has assigned authority to the WPCM to mobilize crews and subcontractors as necessary for SWPPP and Construction General Permit compliance. The WPCM will be available at all times throughout duration of the project.

Duties of the Contractor's WPCM include but are not limited to:

Ensuring full compliance with the SWPPP and the Construction general Permit;

Implementing all elements of the SWPPP, including but not limited to:

- Implementing prompt and effective erosion and sediment control measures; and
- Implementing all non-stormwater management, and materials and waste management activities such as: monitoring discharges (dewatering, diversion devices); general site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than stormwater are discharged in quantities, which will have an adverse effect on receiving waters or storm drain systems, etc.;

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- Conducting routine weekly stormwater site inspections;
- Conducting quarterly non-stormwater site inspections;
- Conducting pre-storm inspections for qualified storm events;
- Conducting daily inspections during qualified storm events;
- Conducting post-storm inspections for qualified storm events;
- Monitoring National Weather Service Forecast Office forecasts for both likely precipitation events and qualifying rain events;

600.2 SITE INSPECTIONS

INSTRUCTIONS:

- Site inspections include both BMP inspections and visual monitoring inspections shown in Section 700 Construction Site Monitoring Program.
- The purpose of BMP inspections is to:
 1. Ensure proper BMP installation;
 2. BMP maintenance;
 3. Evaluate BMP effectiveness and implement repairs or design changes as soon as feasible.
- Inspections shall be conducted by the Contractor's WPCM or other Caltrans approved 24-hour trained staff.
- A Stormwater Site Inspection Report must be completed during each inspection. A blank Stormwater Site Inspection Report is included as Appendix E of the SWPPP.
- Inspections are required:
 - Weekly;
 - Daily inspections shall be conducted for projects within the Lake Tahoe Hydrologic Unit.
- Completed inspection reports shall be submitted to the Resident Engineer within 24 hours of inspection. Copies of the completed reports shall be kept in the SWPPP file category 20.09 Contractor Site Inspection Reports.
- A Stormwater Site Inspection Report Corrections Summary shall be completed for any inspection that identifies deficiencies in BMPs. Copies of the completed correction summary reports shall be attached to the corresponding Stormwater Site Inspection Report and shall be kept in the SWPPP file category 20.09 Contractor Site Inspection Reports.

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EXAMPLE:

Stormwater site inspections and visual monitoring are necessary to ensure that the project is in compliance with the requirements of the Construction General Permit. Project site visual monitoring requirements are covered in Section 700 Construction Site Monitoring Program. Project site inspections of stormwater BMPs are conducted to identify and record:

- That BMPs are properly installed;
- What BMPs need maintenance to operate effectively;
- What BMPs have failed; or
- What BMPs could fail to operate as intended.

The frequencies for conducting stormwater site inspections required for visual monitoring are shown in Section 700.1 Visual Monitoring. Routine stormwater site inspections shall be conducted by the Contractor's WPCM or other 24-hour trained staff at the following minimum frequencies:

- Weekly;
- Daily for projects within the Lake Tahoe Hydrologic Unit.

Stormwater site inspections will be documented on form Construction Engineering Management CEM-XXXX "Stormwater Site Inspection Report" shown in Appendix E. Completed inspection reports shall be submitted to the Resident Engineer within 24 hours of inspection. Copies of the completed reports will be kept in SWPPP file category 20.09 Contractor Site Inspection Reports.

Deficiencies identified in site inspection reports and correction of deficiencies will be tracked on form CEM-XXXX "Stormwater Site Inspection Report Corrections Summary" shown in Appendix XX. Corrections summaries shall be submitted to the Resident Engineer when corrections are completed but must be submitted within 5 days of a site inspection. Copies of the completed correction summary reports will be attached to the corresponding Stormwater Site Inspection Report and shall be kept in SWPPP file category 20.09 Contractor Site Inspection Reports.

REQUIRED TEXT

Stormwater site inspections and visual monitoring are necessary to ensure that the project is in compliance with the requirements of the Construction General Permit. Project site visual monitoring requirements are covered in Section 700 Construction Site Monitoring Program. Project site inspections of stormwater BMPs are conducted to identify and record:

- That BMPs are properly installed;
- What BMPs need maintenance to operate effectively;
- What BMPs have failed; or
- What BMPs could fail to operate as intended.

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Routine stormwater site inspections shall be conducted by the Contractor's WPCM or other 24-hour trained staff at the following minimum frequencies:

- Weekly;
- Daily for projects within the Lake Tahoe Hydrologic Unit;
- At least once each 24-hour period during extended storm events.

The frequencies for conducting stormwater site inspections required for visual monitoring are shown in Section 700.1 Visual Monitoring Site Inspections.

Stormwater site inspections will be documented on form CEM-XXXX "Stormwater Site Inspection Report" shown in Appendix E. Completed inspection reports shall be submitted to the Resident Engineer within 24 hours of inspection. Copies of the completed reports will be kept in SWPPP file category 20.09 Contractor Site Inspection Reports.

Deficiencies identified in site inspection reports and correction of deficiencies will be tracked on form CEM-XXXX "Stormwater Site Inspection Report Corrections Summary" shown in Appendix XX. Corrections summaries shall be submitted to the Resident Engineer when corrections are completed but must be submitted within 5 days of a site inspection. Copies of the completed correction summary reports shall be attached to the corresponding Stormwater Site Inspection Report and shall be kept in SWPPP file category 20.09 Contractor Site Inspection Reports.

INSERT ADDITIONAL NARRATIVE TEXT HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert subtitles and/or paragraphs)

600.3 RAIN EVENT ACTION PLANS

INSTRUCTIONS:

- Rain Event Action Plans (REAP's) are required for risk levels 2 and 3 projects. The REAP must be prepared 72 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecasted to have a 50% or greater probability of producing precipitation in the project area.
- The WPCM is responsible for preparing and implementing the REAP.
- The REAP shall be submitted to the Resident Engineer 72 hours prior to a forecasted likely precipitation event.
- The REAP must be on the jobsite 24 hours before a forecasted likely precipitation event and a printed copy must be included as part of the SWPPP job site with the SWPPP.

Provide descriptions of the REAPs for all construction phases. Examples of phases of construction for REAP's:

- Highway Construction;
- Plant Establishment;

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- Suspension where work activities are inactive.

Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

REQUIRED TEXT FOR RISK LEVEL 1

Rain Event Action Plans are not required for this project based on the determination that this project is risk level 1.

SECTION 700 CONSTRUCTION SITE MONITORING PROGRAM

INSTRUCTIONS:

Include a Separator and Tab for Section 700 for ready reference.

- The objective of the Construction Site Monitoring program is to:
 1. Demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) and Numeric Effluent Limitations (NELs) of the Construction General Permit;
 2. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
 3. To determine whether immediate corrective actions, additional Best Management Practices (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in stormwater discharges and authorized non-stormwater discharges;
 4. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in stormwater discharges and authorized non-stormwater discharges.
- All monitoring on site shall be conducted by the Contractor's WPCM and/or the Contractor's QSP.

REQUIRED TEXT:

This Construction Site Monitoring Program was developed to address the following objectives:

1. Demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) and Numeric Effluent Limitations (NELs) of the Construction General Permit;
2. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
3. To determine whether immediate corrective actions, additional Best Management Practices (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in stormwater discharges and authorized non-stormwater discharges;
4. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in stormwater discharges and authorized non-stormwater discharges.

700.1 SITE VISUAL MONITORING INSPECTIONS

INSTRUCTIONS:

- All project risk levels are required to conduct site visual monitoring inspections.
- The purpose of stormwater site visual monitoring inspections is to:
 1. Demonstrate that the site is in compliance with the Discharge Prohibitions;
 2. Determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;

3. Determine whether immediate corrective actions, additional Best Management Practices (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges;
4. Determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

REQUIRED TEXT:

This Construction Site Monitoring Program includes site visual monitoring inspections of the project site that:

- Demonstrate that the site is in compliance with the Discharge Prohibitions;
- Determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
- Determine whether immediate corrective actions, additional Best Management Practices (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges;

Determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

700.1.1 Visual Observation Locations

INSTRUCTIONS:

- Visual monitoring requirements prior to a qualifying rain event:
 - Visually observe stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
 - Visually observe all BMPs to identify if they have been properly implemented;
 - Visually observe any stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- Visual monitoring requirements at during extended storm events and within 48 hours of a qualifying rain events:
 - Visually observe stormwater discharges at all discharge locations.
 - Visually observe BMPs to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended.
 - Visually observe the discharge of stored or contained stormwater.
- Visual monitoring requirements for non-stormwater discharges:
 - Visually observe each drainage area for the presence of or indications of prior unauthorized and authorized non-stormwater discharges.

REQUIRED TEXT:

If any of the following is not applicable, place cursor in a field and use the “Delete Line” option on the toolbar.

Visual Observation Locations Prior To A Forecasted Qualifying Rain Event

Prior to a qualifying rain event a stormwater visual monitoring site inspection will include observations of the following locations:

Stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;

BMPs to identify if they have been properly implemented;

Any stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

There are [Enter Number] drainage area(s) on the project site and the contractor’s yard, staging areas, and storage areas have been identified as pre-qualifying rain event visual observation location(s). Drainage area(s) are shown on the Water Pollution Control Drawings in Attachment BB and Table 700-1-1 below identifies each drainage area by location.

Table 700-1-1 Site Drainage Areas	
Location No.	Location

BMP locations are listed on the Water Pollution Control Best Management Practices List in Attachment AA and shown on the Water Pollution Control Drawings in Attachment BB.

There are [Enter Number] stormwater storage or containment area(s) are on the project site. These stormwater storage and containment area(s) have been identified as pre-qualifying rain event visual observation location(s). Stormwater storage or containment area(s) are shown on the Water Pollution Control Drawings in Attachment BB and Table 700-1-2 below identifies each stormwater storage or containment area by location.

Table 700-1-2 Stormwater Storage and Containment Areas	
Location No.	Location

Visual Observation Locations During and Within 48 Hours After A Qualifying Rain Event

During extended storm events and within 48 hours after a qualifying rain event a stormwater visual monitoring site inspection is required to observe:

- Stormwater discharges at all discharge locations.
- BMPs to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended.
- The discharge of stored or contained stormwater.

There are [Enter Number] discharge location(s) on the project site. These stormwater discharge location(s) have been identified as required visual observation location(s). Stormwater discharge location(s) are shown on the Water Pollution Control Drawings in Attachment BB and Table 700-1-3 below identifies each stormwater discharge location.

Table 700-1-3 Stormwater Discharge Locations	
Location No.	Location

BMP locations are listed on the Water Pollution Control Best Management Practices List in Attachment AA and shown on the Water Pollution Control Drawings in Attachment BB.

There are [Enter Number] stormwater storage or containment area(s) are on the project site. These stormwater storage and containment area(s) have been identified as pre-qualifying rain event visual observation location(s). Stormwater storage or containment area(s) are shown on the Water Pollution Control Drawings in Attachment BB and are listed on Table 700-1-2 “Stormwater Storage and Containment Areas.”

Visual Observation Locations For Non-Stormwater Discharges

A stormwater visual monitoring site inspection for non-stormwater discharges requires that each drainage area be observed for the presence of or indications of prior unauthorized and authorized non-stormwater discharges.

There are [Enter Number] drainage area(s) on the project site and the contractor's yard, staging areas, and storage areas that have been identified observation location(s) for non-stormwater discharges. Drainage area(s) are shown on the Water Pollution Control Drawings in Attachment BB and are listed in Table 700-1-1 "Drainage Areas."

700.1.2 Visual Monitoring Schedule

INSTRUCTIONS:

- Visual monitoring inspections of the project site shall be conducted:
 - Prior to a forecasted qualifying rain event;
 - At 24-hour intervals during a qualifying rain events;
 - Post qualifying rain event;
 - Quarterly for non-storm water discharges.

REQUIRED TEXT:

Stormwater site visual monitoring inspections shall be conducted at the following minimum frequencies:

- Prior to a forecasted qualifying rain event;
- At 24-hour intervals during a qualifying rain event;
- Post qualifying rain event;
- Quarterly for non-stormwater discharges.

Site visual monitoring inspections for non-stormwater discharges will be conducted once during each of the following periods: January-March, April-June, July-September, and October-December.

If visual monitoring of the site is unsafe because of dangerous weather conditions, such as flooding and electrical storms, then the stormwater site inspector shall document the conditions for why an exception to performing the inspection was necessary. The documentation the site visual monitoring inspection shall be filed in SWPPP 20.XX "Visual Monitoring Site Inspection Reports."

700.1.3 Visual Observation Procedures

INSTRUCTIONS:

- Contractor personnel on a daily basis shall be observant of any discharges. Discharges will be reported to the Resident Engineer verbally upon discovery and in writing within 24 hours of discovery or occurrence. A sample form for reporting discharges is shown in Appendix XX.
- Note: USEPA has issued regulations that define Reportable Quantity (RQ) volumes for oil and hazardous substances. These regulations are found in the Code of Federal Regulations at 40 CFR Part 110, Part 117, or Part 302.

- For example, an oily sheen in stormwater runoff as a result of a spill or release is an exceedance of a RQ level. The RQ level for dieldrin, a pesticide, is 1 kilogram. A spill or release of one or more kg of dieldrin is an exceedance of the RQ threshold.
- Site visual monitoring inspections include inspection of BMP for:
 1. Proper installation;
 2. Maintenance;
 3. Failure;
 4. BMPs that could fail to operate as intended;
 5. Effectiveness so that design changes can be implemented as soon as feasible.
- Implementation of non-stormwater discharge BMPs shall be verified and their effectiveness evaluated.
- One-time discharges of non-stormwater shall be inspected when such discharges occur.

REQUIRED TEXT:

Site visual monitoring inspections shall be conducted by the Contractor's WPCM or QSP with Caltrans approved 24-hour training.

The name(s) and contact number(s) of the site visual monitoring inspection personnel are listed below and their training qualifications are provided in Attachment D:

Assigned inspector: NAME OF INSPECTOR Contact phone: TELEPHONE NUMBER

Alternate inspector: NAME OF INSPECTOR Contact phone: TELEPHONE NUMBER

Daily Visual Monitoring of the Site

On a daily basis the contractor's personnel on the site shall be observant of any discharges or evidence of a prior discharge. If a discharge or evidence of a prior discharge is discovered by the contractor, the contractor shall immediately notify the Resident Engineer, and will file a written report to the Resident Engineer within 24 hours of the discharge event or discovery of evidence of a prior discharge. Corrective measures shall be implemented immediately following the discovery of the discharge.

Discharges requiring reporting include:

- Stormwater from a DSA discharged to a waterway without treatment by an effective combination of temporary erosion and sediment control BMPs;
- Non-stormwater, except conditionally exempted discharges, discharged to a waterway or a storm drain system, without treatment by an approved control measure (BMP);
- Stormwater discharged to a waterway or a storm drain system where the control measures (BMPs) have been overwhelmed or not properly maintained or installed;

- Discharge of hazardous substances above the reportable quantities in 40 CFR 110.3, 117.3 or 302.4;
- Stormwater runoff containing hazardous substances from spills discharged to a waterway or storm drain system.

Visual Monitoring Prior To A Forecasted Qualifying Rain Event

Site visual monitoring for qualifying storm events shall be conducted within 48 hours prior to a forecasted qualifying rain event. The pre-storm site visual monitoring inspection shall visual observe:

All stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;

Any stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

Observations of the site and any recommended corrective actions will be documented on form CEM-XXXX "Stormwater Site Inspection Report." Any photographs used to document observations will be referenced on stormwater site inspection report. Any corrective actions shall be included in the Rain Event Action Plan.

Visual Monitoring During Extended Qualifying Rain Event

Stormwater visual monitoring site inspections shall be conducted at least once each 24-hour period during extended qualifying storm events. The during storm site visual monitoring inspection shall visual observe:

- Stormwater discharges at all discharge locations;
- Any stored or contained stormwater that is derived from and discharged subsequent to the qualifying storm event producing precipitation of ½ inch or more at the time of discharge. Stored or contained stormwater that will likely discharge after working hours due to anticipated precipitation shall be observed prior to the discharge during working hours.

Stormwater discharges and stored or contained stormwater will be observed for the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

During rain event stormwater visual monitoring site inspection will include observation of all site BMPs for:

- Proper installation;
- Maintenance;
- Failure;
- BMPs that could fail to operate as intended;
- Effectiveness so that design changes can be implemented as soon as feasible.

Observations of the site and any recommended corrective actions will be documented on form CEM-XXXX "Stormwater Site Inspection Report." Any photographs used to document observations will be referenced on stormwater site inspection report.

Any corrective actions will be completed as soon as possible but if BMPs require design changes the implementation of changes will begin within 72 hours of identification and the changes will be completed as soon as possible.

Visual Monitoring Within 48 Hours After A Qualifying Rain Event

Site visual monitoring post qualifying storm events shall be conducted within 48 hours of the qualifying rain event. The post-storm site visual monitoring inspection shall visual observe:

- Stormwater discharges at all discharge locations;
- Any stored or contained stormwater that is derived from and discharged subsequent to the qualifying storm event producing precipitation of ½ inch or more at the time of discharge. Stored or contained stormwater that will likely discharge after working hours due to anticipated precipitation shall be observed prior to the discharge during working hours.

Stormwater discharges and stored or contained stormwater will be observed for the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

Post qualifying rain event stormwater visual monitoring site inspection will include observation of all site BMPs for:

- Proper installation;
- Maintenance;
- Failure;
- BMPs that could fail to operate as intended;
- Effectiveness so that design changes can be implemented as soon as feasible.

Observations of the site and any recommended corrective actions will be documented on form CEM-XXXX "Stormwater Site Inspection Report." Any photographs used to document observations will be referenced on stormwater site inspection report.

Any corrective actions will be completed as soon as possible but if BMPs require design changes the implementation of changes will begin within 72 hours of identification and the changes will be completed as soon as possible.

Visual Monitoring Non-Stormwater Discharges

For non-stormwater site visual monitoring visual observations of each drainage area will be made for the presence or prior indications of unauthorized and authorized non-stormwater discharges and their sources. The presence or absence of non-stormwater discharges based on site observations will be documented on form CEM-XXXX "Stormwater Site Inspection Report." Documentation of observed non-stormwater discharges will include presence or absence of

floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

Observations of the site and the response taken to eliminate any unauthorized non-stormwater discharges and to reduce or prevent pollutants from contacting non-stormwater discharges shall be documented on form CEM-XXXX "Stormwater Site Inspection Report." Any photographs used to document observations will be referenced on stormwater site inspection report.

700.1.4 Visual Observation Follow-up and Tracking Procedures

INSTRUCTIONS:

Deficiencies identified in visual monitoring site inspection reports and correction of deficiencies will be tracked on form CEM-XXXX "Stormwater Site Inspection Report Corrections Summary" shown in Appendix E. Corrections summaries shall be submitted to the Resident Engineer when corrections are completed but must be submitted within 5 days of a site inspection. Copies of the completed correction summary reports shall be attached to the corresponding Stormwater Site Inspection Report and shall be kept in SWPPP file category 20.12 Site Visual Monitoring Inspection Reports.

REQUIRED TEXT:

For deficiencies identified by site visual monitoring inspections the required repairs or maintenance of BMPs shall begin and be completed as soon as possible. For deficiencies identified by visual site inspections that require design changes, including additional BMPs, the implementation of changes will begin within 72 hours of identification and be completed as soon as possible. When design changes to BMPs are required the SWPPP shall be amended, including Water Pollution Control Best Management Practices List and Water Pollution Control Drawings.

Deficiencies identified in site visual monitoring inspection reports and correction of deficiencies will be tracked on form CEM-XXXX "Stormwater Site Inspection Report Corrections Summary" shown in Appendix F. Corrections summaries shall be submitted to the Resident Engineer when corrections are completed but must be submitted within 5 days of a site inspection.

700.1.5 Data Management and Reporting

INSTRUCTIONS:

- The results of the visual monitoring inspections shall be recorded on Form CEM-XXXX "Stormwater Site Inspection Report" shown in Appendix E.

A copy of each completed Stormwater Site Inspection Report form used for documenting visual monitoring shall be provided to the Resident Engineer within 24 hours of the inspection, and a copy inserted into SWPPP file category 20.12 Site Visual Monitoring Inspection Reports.

Deficiencies identified in visual monitoring site inspection reports and correction of deficiencies will be tracked on form CEM-XXXX "Stormwater Site Inspection Report Corrections Summary" shown in Appendix F. Copies of the completed correction

summary reports shall be attached to the corresponding Stormwater Site Inspection Report and shall be kept in SWPPP file category 20.12 Site Visual Monitoring Inspection Reports.

- Discharges will be reported to the Resident Engineer verbally upon discovery and in writing within 24 hours of discovery or occurrence. A sample form for reporting discharges is shown in Appendix XX.

REQUIRED TEXT:

Site visual monitoring site inspections will be documented on form CEM-XXXX “Stormwater Site Inspection Report” shown in Appendix E. Completed inspection reports shall be submitted to the Resident Engineer within 24 hours of inspection. Copies of the completed reports will be kept in SWPPP file category 20.12 “Site Visual Monitoring Inspection Reports.”

Deficiencies and correction of deficiencies will be documented on form CEM-XXXX “Stormwater Site Inspection Report Corrections Summary” shown in Appendix F. Corrections summaries shall be submitted to the Resident Engineer when corrections are completed but must be submitted within 5 days of a site inspection. Copies of the completed correction summary reports shall be attached to the corresponding Stormwater Site Inspection Report and shall be kept in SWPPP file category 20.12 “Site Visual Monitoring Inspection Reports.”

If a discharge or evidence of a prior discharge is discovered by the contractor, the contractor shall immediately notify the Resident Engineer, and will file a written report to the Resident Engineer within 24 hours of the discharge event or discovery of evidence of a prior discharge. The written report to the Resident Engineer will contain the following items:

- The date, time, location, and type of unauthorized discharge;
- Nature of operation that caused the discharge;
- Initial assessment of any impacts caused by the discharge;
- The BMPs deployed before the discharge event;
- The date of deployment and type of BMPs deployed after the discharge event, including additional measures installed or planned to reduce or prevent re-occurrence; and
- Steps taken or planned to reduce, eliminate and/or prevent recurrence of the discharge.

Reporting of discharges shall be documented on form Notice of Discharge shown in Appendix XX. Completed Notice of Discharge reports shall be submitted to the Resident Engineer within 24 hours of discharge event or discovery of evidence of a prior discharge. Copies of the Notice of Discharge reports will be kept in SWPPP file category 20.11 “Notice of Discharge Reports.”

700.2 SAMPLING AND ANALYSIS PLAN FOR NON-VISIBLE POLLUTANTS

INSTRUCTIONS:

- The project SWPPP must include a Sampling and Analysis Plan (SAP) for pollutants not visually detectable in stormwater. The purpose of a SAP for Non-Visible Pollutants is to determine if BMPs implemented on the construction site are effective in preventing pollutants not visually detectable in stormwater, from leaving the construction site and potentially impacting water quality objectives.
- All project risk levels are required to include a Sampling and Analysis Plan (SAP), however non-visible pollutant monitoring is only required when the exposure of construction materials occurs and where a discharge can cause or contribute to an exceedance of a water quality objective.

REQUIRED TEXT:

This Sampling and Analysis Plan (SAP) for Non-Visible Pollutants describes the sampling and analysis strategy and schedule for monitoring non-visible pollutants in stormwater discharges from the project site and offsite activities directly related to the project in accordance with the requirements of the Construction General Permit, and applicable requirements of the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010.

700.2.1 Scope of Monitoring Activities

INSTRUCTIONS:

Identify the general sources and locations of potential non-visible pollutants on the project site in the following categories:

- Materials or wastes as identified in Section 500.1.2, containing potential non-visible pollutants and that are not stored under watertight conditions.
- Materials or wastes containing potential non-visible pollutants that are stored under watertight conditions, but (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.
- Construction activities such as application of fertilizers, pesticides, herbicides or non-pigmented curing compounds, that have occurred during a rain event or within 24 hours preceding a rain event, and there is the potential for discharge of pollutants to surface waters or drainage system.
- Existing site features contaminated with non-visible pollutants as identified in Section 500.1.1
- Applications of soil amendments, including soil stabilizing products, with the potential to alter pH levels or other properties of soil (such as chemical properties, engineering properties, or erosion resistance), or contribute toxic pollutants to stormwater runoff, and there is the potential for discharge of pollutants to surface waters or drainage system (unless independent test data are available that demonstrate acceptable concentration levels of non-visible pollutants in the soil amendment).

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- Certain soil amendments identified in Attachment XX "Pollutant Testing Guidance Table," of the Caltrans Construction Site Monitoring Program Guidance Manual, July 2010, do not discharge non-visible pollutants and are not subject to water quality monitoring requirements.
- Stormwater runoff from an area contaminated by historical usage of the site is observed and there is the potential for discharge of pollutants to surface waters or drainage system.
- Stormwater run-on to the Caltrans right-of-way with the potential to contribute non-visible pollutants to discharges from the project.
- Breaches, malfunctions, leakages, or spills from a BMP.

EXAMPLE:

The following construction materials, wastes, or activities, as identified in Section 500.3.1, are potential sources of non-visible pollutants to stormwater discharges from the project. Storage, use, and operational locations are shown on the WPCDs in Attachment BB.

- Solvents, thinners
- Concrete curing
- Treated wood
- Soil stabilizers
- Lime treated subgrade
- Fertilizers, herbicides, and pesticides

The following existing site features, as identified in Section 500.3.2, are potential sources of non-visible pollutants to stormwater discharges from the project. Locations of existing site features contaminated with non-visible pollutants are shown on the WPCDs in Attachment BB.

- Southwest portion of the construction site was previously used as a municipal landfill until 1987 and may have volatile organics in the soil.
- North portion of the construction site was a storage area for a metal plating shop until 1960 and may have metals in the soil.

The following soil amendments have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil and will be used on the project site. Locations of soil amendment application are shown on the WPCDs in Attachment BB.

- None

The project has the potential to receive stormwater run-on with the potential to contribute non-visible pollutants to stormwater discharges from the project. Locations of such run-on to the Caltrans right-of-way are shown on the WPCDs in Attachment BB.

- One location down gradient of the Millennium Chemical Company chemical plant and the Progress Industrial Park is identified as a run-on location to the construction site.
- Two locations are identified as run-on locations along the eastern edge of the construction site boundary.
- The northern boundary of the construction site has one location where run-on is likely.

REQUIRED TEXT:

The following construction materials, wastes or activities, as identified in Section 500.3.1, are potential sources of non-visible pollutants to stormwater discharges from the project. Storage, use, and operational locations are shown on the WPCDs in Attachment BB.

(LIST)

The following existing site features, as identified in Section 500.3.2, are potential sources of non-visible pollutants to stormwater discharges from the project. Locations of existing site features contaminated with non-visible pollutants are shown on the WPCDs in Attachment BB.

(DESCRIBE)

The following soil amendments have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil and will be used on the project site. Locations of soil amendment application are shown on the WPCDs in Attachment BB.

(LIST)

The project has the potential to receive stormwater run-on with the potential to contribute non-visible pollutants to stormwater discharges from the project. Locations of such run-on to the Caltrans right-of-way are shown on the WPCDs in Attachment BB.

(LIST LOCATIONS)

Sampling for non-visible pollutants will be conducted when (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.

700.2.2 Monitoring Strategy

INSTRUCTIONS:

- Describe the sampling schedule for monitoring potential non-visible pollutants in stormwater runoff. Note the specific conditions under which a sampling event for non-visible pollutants is triggered.
- Describe the sampling locations for monitoring non-visible pollutants.
- Describe the rationale for the selection of sampling locations.
- Identify a location for collecting samples of stormwater runoff from each source location of non-visible pollutant identified in Section 700.5.1. Describe exactly where the sample will be collected.
- Identify a location for collecting an uncontaminated background sample of runoff that has not come into contact with the non-visible pollutants identified in Section 700.5.1 or disturbed soil areas of the project. Describe exactly where the sample will be collected.
- Identify a location for collecting samples of stormwater run-on from each of the locations identified in Section 700.5.1 to identify possible sources of contamination

that may originate from off the project site. Describe exactly where the sample will be collected.

- Identify sampling locations at offsite activities directly related to the project such as storage areas, contractor's yard, concrete or asphalt batch plants, etc., whether on not it is located on the Caltrans right-of-way.
- Show all sampling locations on the WPCDs in Attachment BB.
- Locate sampling locations in areas that are safe, out of the path of heavy traffic, and have attainable access.
- Describe or list surrounding areas, such as industrial sites, that may contribute run-on or airborne constituents to the site.

REQUIRED TEXT:

Sampling Schedule

Samples for the applicable non-visible pollutant(s) and a sufficiently large uncontaminated background sample shall be collected during the first two hours of discharge from rain events that result in a sufficient discharge for sample collection. Samples shall be collected during working hours and shall be collected regardless of the time of year and phase of the construction.

In conformance with the U.S. Environmental Protection Agency definition, a minimum of 72 hours of dry weather will be used to distinguish between separate rain events.

Collection of discharge samples for non-visible pollutant monitoring will be triggered when any of the following conditions are observed during the required site inspections conducted before or during rain events:

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) protected by temporary cover and containment that prevents stormwater contact and runoff from the storage area.
- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- A construction activity, including but not limited to those in Section 700.5.1, with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the rain event, (2) applicable BMPs were observed to be breached, malfunctioning, or improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.

- Stormwater runoff from an area contaminated by historical usage of the site has been observed to combine with stormwater runoff from the site, and there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.

If stormwater sampling is unsafe because of dangerous weather conditions, such as flooding and electrical storms, then the stormwater sampler shall document the conditions for why an exception to performing the sampling was necessary. The documentation for sampling exception shall be filed in SWPPP 20.XX “Non-Visible Pollutant Sampling and Test Records.”

Sampling Locations

Sampling locations are based on proximity to planned non-visible pollutant storage, occurrence or use; accessibility for sampling, personnel safety; and other factors in accordance with the applicable requirements in the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010. Planned non-visible pollutant sampling locations are shown on the WPCDs and include the following:

If any of the following is not applicable, place cursor in a field and use the “Delete Line” option on the toolbar.

[Enter Number] sampling location(s) on the project site and the contractor’s yard have been identified for the collection of samples of runoff from planned material and waste storage areas and areas where non-visible pollutant producing construction activities are planned.

Sample location number(s) [Enter Number] is located [Enter Location].

[Enter number of locations] sampling locations have been identified for the collection of samples of runoff from drainage areas where soil amendments will be applied that have the potential to affect water quality.

If applicable Sample location number(s) [Enter Number] is located [Enter Location].

[Enter number of locations] sampling locations have been identified for the collection of samples of runoff from drainage areas contaminated by historical usage of the site.

If applicable Sample location number(s) [Enter Number] is located [Enter Location].

[Enter number of locations] sampling locations have been identified for the collection of samples of run-on to the Caltrans right-of-way with the potential to combine with discharges from the site being sampled for non-visible pollutants. These samples are intended to identify sources of potential non-visible pollutants that originate off the project site.

If applicable Sample location number(s) [Enter Number] is located [Enter Location].

[Enter Number] sampling location(s) has been identified for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants. This location(s) was selected such that the sample will not have come in contact with (1) operational or storage areas associated with the materials, wastes, and activities identified in Section 500.3.1; (2) potential non-visible pollutants due to historical use of the site

as identified in Section 500.3.2; (3) areas in which soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied; or (4) disturbed soils areas.

If applicable Sample location number(s) [Enter Number] is located [Enter Location].

If a stormwater visual monitoring site inspection conducted 24 hours prior to or during a storm event identifies the presence of a material storage, waste storage, or operations area with spills or the potential for the discharge of non-visible pollutants to surface waters or a storm drain system that is at a location not listed above and has not been identified on the WPCDs, sampling locations will be selected using the same rationale as that used to identify planned locations. Non-visible pollutant sampling locations shall be identified by the WPCM on the Rain Event Action Plan prior to a forecasted qualifying rain event.

700.2.3 Monitoring Preparation

<i>INSTRUCTIONS:</i>

- Training of water quality sampling personnel shall be in accordance with the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010.
- Identify whether samples will be collected by the contractor's personnel, or by a commercial laboratory, or by an environmental consultant.
- Identify training and experience of individuals responsible for collecting water samples.
- Identify the contractor's health and safety procedures for sampling personnel.
- Identify alternate sampling personnel in case of emergency, sick leave, and/or vacations during stormwater monitoring. Identify training of alternate sampling personnel.
- Identify the state-certified laboratory(ies) that will analyze the samples. For a list of California state-certified laboratories that are accepted by Caltrans, access the following web site: <http://www.dhs.ca.gov/ps/ls/elap/html/lablist.htm>.
- Include the appropriate required text to describe the strategy for ensuring that adequate sample collection supplies are available to the project in preparation for a sampling event.
- Describe the strategy for ensuring that appropriate field testing equipment is available to the project in preparation for a sampling event. If equipment is to be rented, contact a local environmental equipment rental company.

Samples will be collected by:

Contractor	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Consultant	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Laboratory	<input type="checkbox"/> Yes	<input type="checkbox"/> No

REQUIRED TEXT if contractor personnel will collect samples:

Samples on the project site will be collected by the following contractor sampling personnel:

Name/Telephone Number:

Alternate(s)/Telephone Number:

The stormwater sampler has received the following stormwater sampling training:

(LIST)

The stormwater sampler has the following stormwater sampling experience:

(LIST)

The alternate stormwater sampler has received the following stormwater sampling training:

(LIST)

The alternate stormwater sampler has the following stormwater sampling experience:

(LIST)

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAprP). Training records of designated contractor sampling personnel are provided in Attachment E.

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the project site will include, but are not limited to, surgical gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, ice, and Stormwater Sampling Information, Identification and Chain of Custody Record forms.

The contractor will obtain and maintain the field testing instruments, as identified in Section 700.5.6, for analyzing samples in the field by contractor sampling personnel.

Safety practices for sample collection will be in accordance with the [ENTER TITLE AND PUBLICATION DATE OF CONTRACTOR'S HEALTH AND SAFETY PLAN FOR THE PROJECT OR PROVIDE SPECIFIC REQUIREMENTS HEREIN].

REQUIRED TEXT if consultant or laboratory will collect samples:

Samples on the project site will be collected by the following [specify laboratory or environmental consultant]:

Company Name:

Address:

Telephone Number:

Point of Contact:

(LIST) will be the stormwater sampler for the site and has received the following stormwater sampling training:

(LIST)

The stormwater sampler has the following stormwater sampling experience:

(LIST)

(LIST) will be the alternate stormwater for the site and has received the following stormwater sampling training:

(LIST)

The alternate stormwater sampler has the following stormwater sampling experience:

(LIST)

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAprP). Training records of designated sampling personnel are provided in Attachment D.

WPCM will contact [specify name of laboratory or environmental consultant] 24 hours prior to a predicted rain event and if one of the triggering conditions is identified during an inspection before, during, or after a storm event to ensure that adequate sample collection personnel, supplies and field test equipment for monitoring non-visible pollutants are available and will be mobilized to collect samples on the project site in accordance with the sampling schedule.

[Specify name of laboratory or environmental consultant] will obtain and maintain the field testing instruments, as identified in Section 700.2.6, for analyzing samples in the field by their sampling and testing personnel.

700.2.4 Analytical Constituents

INSTRUCTIONS:

- Identify the specific non-visible pollutants on the project site and list the non-visible pollutants in Table 700-2-1, "Potential Non-Visible Pollutants and Water Quality Indicator Constituents" table.

- List the non-visible pollutant source, non-visible pollutant name, and water quality indicator.
- Refer to the “Pollutant Testing Guidance Table,” Attachment XX of the Construction Site Monitoring Program Guidance Manual, July 2010 for a partial list of some of the common non-visible pollutants and pollutant indicators.

Add lines to the table as needed.

- Do not include visible pollutants such as:
 - Petroleum products: gas, diesel, and lubricants;
 - Colored paints;
 - Sand, gravel or topsoil; and
 - Asphalt cold mix

EXAMPLE:

Identification of Non-Visible Pollutants

The following table lists the specific sources and types of potential non-visible pollutants on the project site and the applicable water quality indicator constituent(s) for that pollutant.

Table 700-2-1

Potential Non-Visible Pollutants and Water Quality Indicator Constituents

Pollutant Source	Pollutant	Water Quality Indicator Constituent

REQUIRED TEXT:

Identification of Non-Visible Pollutants

The following table lists the specific sources and types of potential non-visible pollutants on the project site and the applicable water quality indicator constituent(s) for that pollutant.

Table 700-2-1

Potential Non-Visible Pollutants and Water Quality Indicator Constituents

Pollutant Source	Pollutant	Water Quality Indicator Constituent

Table 700-2-1

Potential Non-Visible Pollutants and Water Quality Indicator Constituents

Pollutant Source	Pollutant	Water Quality Indicator Constituent

700.2.5 Sample Collection and Handling

INSTRUCTIONS:

- For sampling collection procedures, refer to the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010, for general guidance.
- For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136.
- For a list of California state-certified laboratories that are accepted by Caltrans, access the following web site: www.dhs.ca.gov/ps/ls/elap/html/lablist.htm.
- A Stormwater Sample Information, Identification and Chain of Custody Record form is required to be submitted to the laboratory with the samples to trace the possession and handling of samples from collection through analysis. Copies of completed Stormwater Sample Information, Identification and Chain of Custody Record will be placed in the SWPPP file category 20.13 "Non-visible Pollutant Sampling and Test Results".
- A Stormwater Sample Field Test Result form is to be completed for each sample or set of samples.
- A Stormwater Sampling and Testing Activity Log is required to document details of all sampling events and to record results for samples. A Sampling and Testing Activity Log is located in Appendix XX.
- Each sample bottle is required to have a proper and complete identification label.
- Run-on samples could be collected using the following collection procedures or other approved by the Resident Engineer:
 - Place several rows of sandbags in a half circle directly in the path of the run-on to pond water and wait for enough water to spill over. Then place a decontaminated or clean flexible hose along the top and cover with another sandbag so that ponded water will only pour through the flexible hose and into sample bottles. Do not reuse the same sandbags in future sampling events as they may cross-contaminate future samples.
 - Place a decontaminated or clean dustpan with open handle in the path of the run-on so that water will pour through the handle and into sample bottles.
 - If not using clean equipment, decontaminate by washing equipment in a TSP-soapy water wash, distilled water rinse, and final rinse with distilled water.
- Describe sample collection procedures to be used on the project site.
- Describe sample handling procedures.
- Describe decontamination waste disposal requirements (e.g., TSP soapy water shall not be discharged to the storm drainage system or receiving water)
- Describe sample collection documentation procedures.
- Describe procedures for recording and correcting sampling data.
- Fill in Table 700-2-2, Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants, in Section 700.2.6.

REQUIRED TEXT:

Sample Collection Procedures

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Samples of discharge shall be collected at the designated sampling locations shown on the WPCDs for observed breaches, malfunctions, leakages, spills, operational areas, soil amendment application areas, and historical site usage areas that triggered the sampling event. Samples shall be collected, maintained and shipped in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).

Grab samples shall be collected and preserved in accordance with the methods identified in Table 700-2-2, "Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants" table provided in Section 700.2.6. Only personnel trained in proper water quality sampling shall collect samples.

Samples shall be collected by placing a separate laboratory-provided sample container directly into a stream of water downgradient and within close proximity to the potential non-visible pollutant discharge location. This separate laboratory-provided sample container shall be used to collect water, which shall be transferred to sample bottles for laboratory analysis. The upgradient and uncontaminated background samples shall be collected first prior to collecting the downgradient to minimize cross-contamination. The sampling personnel shall collect the water upgradient of where they are standing. Once the separate laboratory-provided sample container is filled, the water sample shall be poured directly into sample bottles provided by the laboratory for the analyte(s) being monitored.

To maintain sample integrity and prevent cross-contamination, sampling collection personnel shall:

- Wear a clean pair of surgical gloves prior to the collection and handling of each sample at each location;
- Decontaminate sampling equipment prior to sample collection using a TSP-soapy water wash, distilled water rinse, and final rinse with distilled water. Dispose of decontamination water/soaps appropriately (i.e., not discharge to the storm drain system or receiving water).
- Not contaminate the inside of the sample bottle by not allowing it to come into contact with any material other than the water sample;
- Discard sample bottles or sample lids that have been dropped onto the ground prior to sample collection;
- Not leave the cooler lid open for an extended period of time once samples are placed inside;
- Not sample near a running vehicle where exhaust fumes may impact the sample;
- Not touch the exposed end of a sampling tube, if applicable;
- Avoid allowing rainwater to drip from rain gear or other surfaces into sample bottles;
- Not eat, smoke, or drink during sample collection;
- Not sneeze or cough in the direction of an open sample bottle; and
- Minimize the exposure of the samples to direct sunlight, as sunlight may cause biochemical transformation of the sample to take place.

Sample Handling Procedures

All or some of samples will be analyzed by (select one or both):

Laboratory Yes No

Contractor (Field Measurement) Yes No

REQUIRED TEXT only if a laboratory will analyze ALL OR SOME OF THE samples:

Immediately following collection, sample bottles for laboratory analytical testing shall be capped, labeled, documented on Stormwater Sampling Information, Identification, and Chain of Custody Record form, sealed in a re-sealable storage bag, placed in an ice-chilled cooler, at ± 4 degrees Celsius as practicable, and delivered within 24 hours to the following laboratory certified for such analyses by the State Department of Healthy Services:

Laboratory Name:

Address:

Telephone Number:

Point of Contact:

REQUIRED TEXT only if contractor will analyze SOME OR ALL samples:

Immediately following collection, samples for field analysis shall be tested in accordance with the field instrument manufacturer's instructions and results recorded on Stormwater Sample Field Testing Record and Stormwater Sampling and Testing Activity Log.

REQUIRED TEXT:

Sample Documentation Procedures

All original data documented on sample bottle identification labels, Stormwater Sampling Information, Identification and Record forms, and Stormwater Sampling and Testing Activity Logs shall be recorded using waterproof ink. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

The following forms for sample documentation are shown in the SWPPP appendices:

- Stormwater Sampling Information, Identification, and Chain of Custody Record Appendix XX

- Stormwater Sampling and Testing Activity Log Appendix XX

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the Stormwater Sampling and Testing Activity Log.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. At a minimum, the following information shall be recorded on the label, as appropriate:

Project name

Project number

Unique sample identification code as shown below:

SSSSSYMMDDHHmmTT

Where:

SSSSS = sampling point number (e.g., CCUP1, CCDN2)

YY = last two digits of the year (e.g. 06)

MM = month (01-12)

DD = day (01-31)

HH = hour sample collected (00-23)

mm = minute sample collected (00-59)

TT = Type or QA/QC Identifier (if applicable)

G = grab

FS = field duplicate

For example, the sample number for a grab sample collected at Station CCUP1 collected at 4:15PM on December 8, 2006 would be:

CCUP10612081615G

Collection date/time (No time applied to QA/QC samples)

Analysis constituent

Initials of person who collected the sample

Stormwater Sampling and Testing Activity Log: A log of sampling events and test results shall identify:

- Sampling date;
- Separate times for collected samples and QA/QC samples recorded to the nearest minute;
- Unique sample identification number and location;
- Analysis constituent;
- Names of sampling personnel;
- Weather conditions (including precipitation amount);
- Test results; and
- Other pertinent data.

Stormwater Sampling Information, Identification and Record Forms: All samples to be analyzed by a laboratory will be accompanied by a Stormwater Sampling Information, Identification and Record form. The samplers will sign the Stormwater Sampling Information, Identification and Chain of Custody Record form when a sample(s) is turned over to the testing laboratory. Chain of custody procedures will be strictly adhered to for QA/QC purposes.

Stormwater Site Inspection Report: When applicable, the contractor's Stormwater inspector will document on the Stormwater Site Inspection Report that samples for non-visible pollutants were taken during a rain event.

700.2.6 Sample Analysis

INSTRUCTIONS:

- Identify the test method and specifications to be used to monitor the non-visible pollutants included in the "Potential Non-Visible Pollutants and Water Quality Indicator Constituents" table in Section 700.2.4.
- Fill in Table 700-2-2, "Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants."
- There should be a test method identified for each Water Quality Indicator Constituent listed in the table in Section 700.2.4.
- Contact the selected laboratory for the appropriate test method(s)/specifications to be used for each constituent.
- Identify field test instruments to be used for analyzing samples in the field, if any.

REQUIRED TEXT:

Samples shall be analyzed for the applicable constituents using the analytical methods identified in Table 700-2-2, "Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants" table in this section.

INSTRUCTIONS:

Will samples be analyzed in the field?:

Yes No

REQUIRED TEXT only if samples will be analyzed in the field:

For samples collected for field analysis, collection, analysis and equipment calibration shall be in accordance with the field instrument manufacturer's specifications.

The following field instrument(s) will be used to analyze the following constituents:

**TABLE 700-2-3
Field Instruments**

Field Instrument	Constituent

The instrument(s) shall be maintained in accordance with manufacturer's instructions.

The instrument(s) shall be calibrated before each sampling and analysis event.

Maintenance and calibration records shall be maintained in SWPPP file category 20.19 Field Testing Equipment Maintenance and Calibration Records.

700.2.7 Quality Assurance/Quality Control

REQUIRED TEXT:

For an initial verification of laboratory or field analysis, duplicate samples shall be collected at a rate of 10 percent or 1 minimum duplicate per sampling event. The duplicate sample shall be collected, handled, and analyzed using the same protocols as primary samples. A duplicate sample shall be collected at each location immediately after the primary sample has been collected. Duplicates shall be collected where contamination is likely, not on the background sample. Duplicate samples shall not influence any evaluations or conclusions; however, they shall be used as a check on laboratory quality assurance.

700.2.8 Data Management and Reporting

INSTRUCTIONS:

- Sampling information and testing data results shall be provided to the Resident Engineer.

REQUIRED TEXT:

All original data form test analysis shall be documented on Stormwater Sample Field Test Results Report forms, Stormwater Sample Laboratory Test Results Report forms and Stormwater Sampling and Testing Activity Logs. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

A copy of all water quality analytical results and QA/QC data shall be submitted to the Resident Engineer within 48 hours of sampling for field analyzed samples and within 30 days for laboratory analyses. For field test the submitted information shall include a signed copy of the Stormwater Sampling Information, Identification and Chain of Custody Record form and Stormwater Field Sample Test Result Report form. Appendix XX contains the Stormwater Sample Field Test Result form, which must accompany the Stormwater Sampling Information, Identification and Chain of Custody Record form. The test results shall be recorded on the Stormwater Sampling and Testing Activity Log.

For laboratory test, if the Stormwater Sample Laboratory Test Result Report is not completed by the testing laboratory then the laboratory report used to complete the Stormwater Sample Laboratory Test Result Report form shall be attached to the completed Stormwater Sample Laboratory Test Result Report. For each testing report the Stormwater Sample Laboratory Test Result Report and Stormwater Sampling Information, Identification and Chain of Custody Record form shall be reviewed for consistency between lab methods, sample identifications, dates, and times for both primary samples and QA/QC samples. The test results shall be recorded on the Stormwater Sampling and Testing Activity Log.

All data, including Stormwater Sampling Information, Identification, and Chain of Custody Record forms, Stormwater Sample Laboratory Test Result Report forms, and Stormwater Sampling and Testing Activity Logs shall be kept in SWPPP file category 20.13 "Non-Visible Pollutant Sampling and Test Results". A copy of completed stormwater sampling record and testing report forms and an updated Stormwater Sampling and Testing Activity Log shall be submitted to the Resident Engineer

In addition to a paper copy of water quality test results, the test results shall be submitted electronic on diskette in Microsoft Excel (.xls) format, and shall include, at a minimum, the following information from the lab: Sample ID Number, Contract Number, Constituent, Reported Value, Lab Name, Method Reference, Method Number, Method Detection Limit, and Reported Detection Limit. Electronic copies of stormwater data shall be forwarded by email to [Resident Engineer Name] at [email address] for inclusion into a statewide database.

700.2.9 Data Evaluation

INSTRUCTIONS:

- The Construction General Permit requires that BMPs be implemented on the construction site to reduce non-visible pollutants in discharges of Stormwater from the construction site.
- The runoff/downgradient water quality sample analytical results shall be evaluated to determine if the runoff/downgradient sample(s) show significantly elevated concentrations of the tested analyte relative to the concentrations found in the uncontaminated background sample.
- The water quality sample analytical results shall be evaluated to determine if the runoff and run-on samples show significantly elevated levels of the tested constituent relative to the levels found in the background sample. The run-on sample analytical results shall be used as an aid in evaluating potential offsite influences on water quality results.

REQUIRED TEXT:

An evaluation of the water quality sample analytical results, including figures with sample locations, shall be submitted to the Resident Engineer with the water quality analytical results and the QA/QC data. Should the runoff/downgradient sample show an increased level of the tested analyte relative to the background sample, the BMPs, site conditions, and surrounding influences shall be assessed to determine the probable cause for the increase.

As determined by the site and data evaluation, appropriate BMPs shall be repaired or modified to mitigate discharges of non-visual pollutant concentrations. Any revisions to the BMPs shall be recorded as an amendment to the SWPPP.

Stormwater Sample Field Test Results Report form Stormwater Sample Field Test Results Report form 20.XX “Non-Visible Pollutant Sampling and Test Results.”

700.2.10 Change of Conditions

REQUIRED TEXT:

Whenever stormwater visual monitoring site inspections, indicates a change in site conditions that might affect the appropriateness of sampling locations or introduce additional non-visible pollutants of concern, sampling and testing protocols shall be revised accordingly. All such revisions shall be implemented as soon as feasible and the SWPPP amended.

700.3 SAMPLING AND ANALYSIS PLAN FOR SEDIMENT AND PH

INSTRUCTIONS:

- The Construction General Permit requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. Risk levels are established by determining two factors: first, calculate the site’s sediment risk; and second, receiving water risk during periods of soil exposure. Both factors are used to determine the site-specific risk level. The risk level determination for this project is shown in

Section 500.1 “Construction Site Risk Level Determination.” For Risk Level 2 and Risk Level 3 projects a SAP for turbidity and ph is required

- For Risk Level 1 projects Section 700.3.1 thru Section 700.3.9 are not required.A
- Note that if the cursor does not go to the next form field after answering a yes/no radio button question, then scroll down and click in the next applicable form field.

This project has a Risk Level determination of Risk Level 2 or Risk Level 3?

Yes No

Does this project have the potential to discharge collected stormwater by dewatering?

Yes No

REQUIRED TEXT FOR RISK LEVEL 1:

This project is Risk Level 1 and does require a Sampling and Analysis Plan(SAP) for sediment and pH because this project does not have the potential to discharge to a sediment-sensitive water body.

700.3.1 Scope of Monitoring Activities

INSTRUCTIONS:

Provide the name(s) of the sediment-sensitive water bodies that sediment-sensitive based on either: 303(d) listed water bodies impaired for sediment; has a USEPA-approved Total Maximum daily Load implementation plan for sediment; or has the beneficial uses of Cold and Spawn and Migratory.

Describe the location(s) of direct discharge from the project site to the sediment-sensitive water body and show the locations of direct discharge on the WPCDs.

Describe the location(s) of the stormwater dewatering discharge from the project site to the MS4 and/or sediment-sensitivewater body and show the locations of discharge on the WPCDs.

Include the appropriate required text to identify whether run-on to the Caltrans right-of-way may combine with stormwater and directly discharge to the sediment-sensitive water body. If the project does receive run-on, describe the locations of run-on and show the locations on the WPCDs.

REQUIRED TEXT:

Table 700-3-1 Stormwater Discharge Locations	
Location No.	Location

Table 700-3-2 Direct Stormwater Discharge Locations to Sediment Sensitive Waterbody	
Location No.	Location

INSTRUCTIONS:

Does the project receive run-on with the potential to combine with stormwater that discharges directly to the sediment-sensitive listed water body?

Yes No

REQUIRED TEXT for PROJECTs that RECEIVE RUN-ON:

The project receives run-on with the potential to combine with stormwater that discharges directly to the sediment-sensitive listed water body at the following locations, as shown on the WPCDs in Attachment BB:

- INSERT LOCATIONS

REQUIRED TEXT for Projects that Discharge Collected Stormwater by Dewatering

This project discharges accumulated stormwater into [specify water body or MS4]. This SAP has been prepared pursuant to the requirements of the *Caltrans Construction Site Monitoring Program Guidance Manual*, July 2010. The SAP describes the sampling and analysis strategy and schedule for monitoring turbidity in the water body and stormwater discharges from the project site.

The project will discharge to [specify water body or MS4] at the following location(s), as shown on the WPCDs in Attachment BB:

INSERT LOCATIONS

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.3.2 Monitoring Strategy

INSTRUCTIONS:

Describe the sampling schedule for monitoring the impacts of stormwater discharges to the sediment-sensitive or other water body.

Describe the sampling locations for monitoring the impacts of direct stormwater discharges from the project to the sediment-sensitive or other water body.

Describe the rationale for the selection of sampling locations.

Identify a location upstream of all direct discharge from the construction site that appears to represent the flow of the water body, to analyze the prevailing condition of the receiving water without any influence from the construction site. Describe exactly, either using GPS coordinates or post mile, where the sample will be collected. Note: Sampling too far upstream may not show prevailing conditions immediately upstream of the construction site.

Identify a location immediately downstream from the last point of direct discharge from the construction site that appears to represent the nature of the flow to analyze potential impacts to the sediment-sensitive listed water body from the project. Describe exactly where the sample will be collected. Downstream samples should represent the receiving water mixed with flow from the construction site. Note: Sampling too far downstream may detect pollutants from other discharges.

For projects that, in Section 700.3.1, identified locations of run-on to the Caltrans right-of-way include the required text to identify run-on sampling location(s) to determine potential impairments that originate off the project site. Describe exactly where the sample will be collected.

Show all sampling locations on the WPCDs.

- Locate sampling locations in areas that are safe, out of the path of heavy traffic, and reasonably accessible.

Describe surrounding areas such as agricultural fields, or other sites that may contribute run-on sediment to the site.

Do not locate sampling points at point sources or confluences to minimize backwater effects or poorly mixed flows.

REQUIRED TEXT:

Sampling Schedule

Discharge samples shall be collected for turbidity and pH for qualifying storm events that result in a discharge from the project site. If applicable, upstream, downstream, and run-on samples shall be collected for analysis of turbidity and pH. Sampling and testing for turbidity and pH will be done daily during all qualifying storm events. Samples shall be collected during working hours.

Stored or collected water from a qualifying storm event when discharged shall be tested for turbidity and pH.

A qualifying storm event is any storm event that produces precipitation of ½ inch or more. In conformance with the U.S. Environmental Protection Agency definition, a minimum of 72 hours of dry weather will be used to distinguish between separate qualifying storm events.

If stormwater sampling is unsafe because of dangerous weather conditions, such as flooding and electrical storms, then the stormwater sampler shall document the conditions for why an exception to performing the sampling was necessary. The documentation for sampling exception shall be filed in SWPPP 20.XX “Turbidity and pH Sampling and Test Records.”

REQUIRED TEXT:

Sampling Locations

Sampling locations are based on proximity to identified discharge or run-on location(s), accessibility for sampling, personnel safety, and other factors in accordance with the applicable requirements in the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010

Sampling locations were determined to characterize discharges associated with the construction activity from the entire project site. The sample locations were selected based on drainage areas that have the highest percentage of drainage area that is potential disturbed soil area. Representatives sampling for this project is based on sampling 20 percent of the project discharge locations per qualifying storm event.. If 20 percent results in only one location to be sampled then a minimum of 2 locations will be sampled per qualifying storm event. The selected sampling locations are listed in Table 700-3-3 “Stormwater Discharge Sampling Locations.” Discharge sampling locations are shown on the WPCDs in Attachment BB and the WPCM shall identify sampling locations on the Rain Event Action Plan.

Table 700-3-3 Stormwater Discharge Sampling Locations	
Location No.	Location

If construction activity has not started within the drainage area at a sampling location, there is no disturbed soil within a drainage area, sampling of that location is not required and another replacement sampling location must be selected. The WPCM shall select a replacement representative location to be sampled based on the drainage area with the highest percentage of disturbed soil area. The sampling locations shall be identified on the Rain Event Action Plan by the WPCM for every forecasted qualifying storm event.

If storm event test results from the selected locations exceed 200 NTU or pH test results are outside the range of 6.5-8.5 additional sampling locations will be added. The additional sampling locations will include 30 percent of the project discharge locations so that 50 percent of all discharge locations will be sampled and tested and the additional locations will be selected based on drainage areas with the highest percentage of disturbed soil area. The additional selected sampling locations are listed in Table 700-3-4 “Stormwater Additional Discharge Sampling Locations.” Discharge sampling locations are shown on the WPCDs in Attachment BB and the

WPCM shall identify sampling locations of the Rain Event action Plan for every forecasted qualifying rain event.

Table 700-3-4 Stormwater Additional Discharge Sampling Locations	
Location No.	Location

If construction activity has not started within the drainage area at an additional sampling location, sampling of that location is not required and another replacement sampling location must be selected. The WPCM shall select replacement representative locations to be sampled based on the drainage areas with the highest percentage of disturbed soil area so that at least 50 percent of the discharge locations are sampled. The sampling locations shall be identified on the Rain Event Action Plan by the WPCM for every forecasted qualifying storm event.

If the average of the storm event test results from the selected locations exceed 250 NTU or pH test results are outside the range of 6.5-8.5 all stormwater discharge locations will be sampled and tested during the next qualifying storm event. The discharge sampling locations are shown in Table 700-3-1 “Stormwater Discharge Locations.” Stormwater discharge locations are shown on the WPCDs in Attachment BB. The sampling locations shall be identified on the Rain Event Action Plan by the WPCM for every forecasted qualifying storm event.

REQUIRED TEXT only for PROJECTs that RECEIVE RUN-ON:

This project receives run-on from surrounding area that may contribute to exceedances of NALs or NELs. Sampling locations have been determined for both upstream and downstream of stormwater discharge location(s) into the receiving waterbody and/or locations where run-on enters the Caltrans right-of-way. The identified sampling locations are:

The upstream sampling location (designated number [Enter Number]) has been identified for the collection of samples that represent flow to the water body, to analyze the prevailing condition of the receiving water without any influence from the construction site. The sample point is located [Enter Location].

The downstream sampling location (designated number [Enter Number]) has been identified for the collection of samples that represent the nature of the flow to analyze potential impacts to the sediment-sensitive listed water body from the project. The sample point is located [Enter Location].

[Enter number of locations] sampling location(s) (designated number(s) [Enter Number]) have been identified for the collection of samples of run-on to the Caltrans right-of-way with the

potential to combine with discharges from the construction site in other than MS4 to the sediment-sensitive water body. These samples will identify potential turbidity and pH that originates off the project site and contributes to direct stormwater discharges from the construction site to the sediment-sensitive listed water body. The sample point(s) is located [Enter Location].

REQUIRED TEXT for Projects that Discharge Collected Stormwater by Dewatering

During dewatering activities, upstream, downstream, and discharge samples shall be collected for turbidity and pH during the discharge from the project site to the [specify water body or MS4]. Samples shall be collected at the commencement of dewatering and routinely during the dewatering activity.

700.3.3 Monitoring Preparation

INSTRUCTIONS:

- Training of water quality sampling personnel shall be in accordance with the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010. Identify whether samples will be collected by the contractor's personnel, by a commercial laboratory, or by an environmental consultant.
- Identify training and experience of individuals responsible for collecting water samples.
- Identify the health and safety procedures for sampling personnel.
- Identify alternate sampling personnel in case of emergency, sick leave, and/or vacations during stormwater monitoring. Identify training of alternate sampling personnel.
- Identify the state-certified laboratory(ies) that will analyze samples for suspended sediment concentrations. For a the list of California state-certified laboratories that are accepted by Caltrans, access the following web site:
www.dhs.ca.gov/ps/ls/elap/html/lablist.htm
- Include the appropriate required text to describe the strategy for ensuring that adequate sample collection supplies are available to the project in preparation for a sampling event.
- Describe the strategy for ensuring that appropriate field testing equipment is available to the project in preparation for a sampling event.

Samples will be collected by:

Contractor	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Consultant	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Laboratory	<input type="checkbox"/> Yes	<input type="checkbox"/> No

REQUIRED TEXT IF contractor personnel will collect samples:

Samples on the project site will be collected by the following contractor sampling personnel:

Name/Telephone Number:

Alternate(s)/Telephone Number:

The stormwater sampler has received the following stormwater sampling training:

(LIST)

The stormwater sampler has the following stormwater sampling experience:

(LIST)

The alternate stormwater sampler has received the following stormwater sampling training:

(LIST)

The alternate stormwater sampler has the following stormwater sampling experience:

(LIST)

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAprP). Training records of designated contractor sampling personnel are provided in Attachment E.

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the project site will include, but are not limited to, surgical gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, ice, and Stormwater Sampling Information, Identification and Chain of Custody Record forms.

The contractor will obtain and maintain the field testing instruments, as identified in Section 700.5.6, for analyzing samples in the field by contractor sampling personnel.

Safety practices for sample collection will be in accordance with the [ENTER TITLE AND PUBLICATION DATE OF CONTRACTOR'S HEALTH AND SAFETY PLAN FOR THE PROJECT OR PROVIDE SPECIFIC REQUIREMENTS HEREIN].

REQUIRED TEXT only If consultant or laboratory will collect samples:

Samples on the project site will be collected by the following [specify laboratory or environmental consultant]:

Company Name:

Address:

Telephone Number:

Point of Contact:

(LIST) will be the stormwater sampler for the site and has received the following stormwater sampling training:

(LIST)

The stormwater sampler has the following stormwater sampling experience:

(LIST)

(LIST) will be the alternate stormwater for the site and has received the following stormwater sampling training:

(LIST)

The alternate stormwater sampler has the following stormwater sampling experience:

(LIST)

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAprP). Training records of designated sampling personnel are provided in Attachment D.

WPCM will contact [specify name of laboratory or environmental consultant] 24 hours prior to a predicted rain event and if one of the triggering conditions is identified during an inspection before, during, or after a storm event to ensure that adequate sample collection personnel, supplies and field test equipment for monitoring non-visible pollutants are available and will be mobilized to collect samples on the project site in accordance with the sampling schedule.

[Specify name of laboratory or environmental consultant] will obtain and maintain the field testing instruments, as identified in Section 700.2.6, for analyzing samples in the field by their sampling and testing personnel.

700.3.4 Sample Collection and Handling

INSTRUCTIONS:

- Describe sample collection procedures to be used on the project. For sample collection procedures, refer to the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010 for general guidance.

- Run-on samples could be collected using the following collection procedures or others approved by the Resident Engineer:
 - Place several rows of sandbags in a half circle directly in the path of the run-on to pond water and wait for enough water to spill over. Then place a cleaned or decontaminated flexible hose along the top and cover with another sandbag so that ponded water will only pour through the flexible hose and into sample bottles. Do not reuse the same sandbags in future sampling events as they may cross-contaminate future samples.
 - Place a cleaned or decontaminated dustpan with open handle in the path of the run-on so that water will pour through the handle and into sample bottles.
- For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136.
- For the list of California state-certified laboratories that are accepted by Caltrans, access the following web site: www.dhs.ca.gov/ps/ls/elap/html/lablist.htm
- Describe sample handling procedures.
- Describe decontamination waste disposal requirements (e.g., trisodium phosphate (TSP) soapy water shall not be discharged to the storm drainage system or receiving water).
- Describe sample collection documentation procedures.
- Describe procedures for recording, checking, and correcting sampling data.
- Each sample bottle is required to have a proper and complete identification label.
- A Stormwater Sample Information, Identification, and Chain of Custody Record form is required to be submitted to the laboratory with the samples to trace the possession and handling of samples from collection through analysis. Copies of completed Stormwater Sample Information, Identification, and Chain of Custody Record will be placed in the SWPPP file category 20.13 "Non-visible Pollutant Sampling and Test Results".
- A Stormwater Sample Field Test Result Report form or Stormwater Sample Laboratory Test Result Report form is to be completed for each sample or set of samples.
- A Stormwater Sampling and Testing Activity Log is required to document details of all sampling events and to record test results for samples. A Stormwater Sampling and Testing Activity Log is located in Appendix XX.

REQUIRED TEXT:

Sample Collection Procedures

Grab samples shall be collected and preserved in accordance with the methods identified in Table 700-3-1, "Sample Collection, Preservation and Analysis for Monitoring Sedimentation/Siltation and/or Turbidity", provided in Section 700.3.5. Only personnel trained in proper water quality sampling shall collect samples.

Upstream samples shall be collected to represent the condition of the water body up gradient of the construction site. Downstream samples shall be collected to represent the water body mixed with direct flow from the construction site. Samples shall not be collected directly from ponded, sluggish, or stagnant water.

Upstream and downstream samples shall be collected using one of the following methods:

- Placing a sample bottle directly into the stream flow in or near the main current upstream of sampling personnel, and allowing the sample bottle to fill completely;

OR,

- Placing a decontaminated or ‘sterile’ bailer or other ‘sterile’ collection device in or near the main current to collect the sample, and then transferring the collected water to appropriate sample bottles, allowing the sample bottles to fill completely.

Run-on samples, if applicable, shall be collected to identify turbidity and pH that originates off the project site and contributes to direct discharges from the construction site to the sediment-sensitive water body. Run-on samples shall be collected down gradient and within close proximity of the point of run-on to the project by pooling or ponding water and allowing the ponded water to spill over into sample bottles directly in the stream of water.

•
Samples from dewatering discharge, if applicable, shall be collected to identify potential turbidity. Samples shall also be collected upstream and downstream of the discharge in the receiving water body.

To maintain sample integrity and prevent cross-contamination, sampling collection personnel shall:

- Wear a clean pair of nitrile gloves prior to the collection and handling of each sample at each location.
- Not contaminate the inside of the sample bottle by not allowing it to come into contact with any material other than the water sample.
- Decontaminate sampling equipment prior to sample collection using a TSP-soapy water wash, distilled water rinse, and final rinse with distilled water. Dispose of decontamination water/soaps appropriately (i.e., do not discharge to the storm drain system or receiving water).
- Discard sample bottles or sample lids that have been dropped onto the ground prior to sample collection.
- Not leave the cooler lid open for an extended period of time once samples are placed inside.
- Not touch the exposed end of a sampling tube, if applicable.
- Avoid allowing rainwater to drip from rain gear or other surfaces into sample bottles.
- Not eat, smoke, or drink during sample collection.
- Not sneeze or cough in the direction of an open sample bottle.
- Minimize the exposure of the samples to direct sunlight, as sunlight may cause biochemical transformation of the sample to take place.

INSTRUCTIONS:

All or some of samples will be analyzed by (select one or both):

Laboratory Yes No

Contractor (Field Analyze) Yes No

Sample Handling Procedures

REQUIRED TEXT only If laboratory will analyze ALL or SOME OF THE samples:

Immediately following collection, sample bottles for laboratory analytical testing shall be capped, labeled, documented on Stormwater Sampling Information, Identification, and Chain-of-Custody Record form, sealed in a re-sealable storage bag, placed in an ice-chilled cooler, at ± 4 degrees Celsius as practicable, and delivered within 24 hours to the following laboratory certified for such analyses by the State Department of Healthy Services:

Laboratory Name:

Address:

Telephone Number:

Point of Contact:

REQUIRED TEXT only If contractor will analyze ALL OR SOME OF THE samples:

Immediately following collection, samples for field analysis shall be tested in accordance with the field instrument manufacturer's instructions and results recorded on the Stormwater Sample Test Result form.

REQUIRED TEXT:

Sample Documentation Procedures

All original data documented on sample bottle identification labels, Stormwater Sampling Information, Identification and Chain of Custody Report forms, and Stormwater Sampling and Testing Activity Logs shall be recorded using waterproof ink. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated. Stormwater sampling shall be documented using the following:

Stormwater Sampling Information, Identification, and Chain of Custody record Appendix XX
Stormwater Sampling and Testing Activity Log Appendix XX

Sample documentation procedures:

- **Sample Bottle Identification Labels:** Sampling personnel shall attach an identification label to each sample bottle. At a minimum, the following information shall be recorded on the label, as appropriate:
 - Project name
 - Project number
 - Unique sample identification code as shown below:

SSSSYYMMDDHHmmTT

Where:

SSSSS = sampling point number (e.g., CCUP1, CCDN2)
YY = last two digits of the year (e.g., 06)
MM = month (01-12)
DD = day (01-31)
HH = hour sample collected (00-23)
mm = minute sample collected (00-59)
TT = Type or QA/QC Identifier (if applicable)
G = grab
FS = field duplicate

For example, the sample number for a grab sample collected at Station CCUP1 collected at 4:15PM on December 8, 2006 would be:

CCUP10612081615G

- Collection date/time
- Analysis constituent
- Initials of person who collected the sample
- **Stormwater Sampling and Testing Activity Log:** A log of sampling events and test results shall identify:
 - Sampling date
 - Separate times for sample collection of upstream, downstream, run-on, dewatering, and QA/QC samples recorded to the nearest minute
 - Unique sample identification number and location
 - Analysis constituent
 - Names of sampling personnel
 - Weather conditions (including precipitation amount)
 - Test results
 - Other pertinent data
- **Stormwater Sampling Information, Identification, and Chain of Custody Record:** All samples to be analyzed by a laboratory shall be accompanied by a Stormwater Sampling

Information, Identification, and Chain of Custody Record form. The sampler shall sign the Stormwater Sampling Information, Identification, and Chain of Custody Record form when a sample(s) is turned over to the laboratory. Chain of custody procedures shall be strictly adhered to for Quality Assurance and Quality Control (QA/QC) purposes.

- Stormwater Site Inspection Report: When applicable, the contractor’s stormwater inspector shall document on the Stormwater Site Inspection Report that samples for turbidity and pH were taken during a rain event.

700.3.5 Sample Analysis

INSTRUCTIONS:

- Tests to be used on the project are in Table 700-3-5, “Sample Collection, Preservation and Analysis for Monitoring Turbidity and pH.”
- For Risk Level 3, include table titled “Sample Collection, Preservation and Analysis for Monitoring Suspended Sediment Concentration (SSC).”

This project is Risk Level 3?

Yes No

REQUIRED TEXT:

Samples shall be analyzed for the constituents indicated in Table 700-3-5, “Sample Collection, Preservation and Analysis for Monitoring Turbidity and pH.”

**TABLE 700-3-5
Sample Collection, Preservation and Analysis for Monitoring Turbidity and pH**

Parameter	Test Method	Sample Preservation	Minimum Sample Volume ⁽¹⁾	Sample Bottle	Maximum Holding Time	Detection Limit (min)
Turbidity	Field test with calibrated portable instrument	Store at 4° C (39.2° F)	100 mL	Polypropylene or Glass	48 hours	1 NTU
pH	Field test with calibrated portable instrument	Store at 4° C (39.2° F)	100 mL	Polypropylene	48 hours	0.2

Parameter	Test Method	Sample Preservation	Minimum Sample Volume ⁽¹⁾	Sample Bottle	Maximum Holding Time	Detection Limit (min)
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Notes: ⁽¹⁾ **Minimum sample volume recommended. Specific volume requirements will vary by instrument; check instrument manufacturer instructions.**

- °C – Degrees Celsius
- °F – Degrees Fahrenheit
- L – Liter
- mL – Milliliters
- NTU – Nephelometric Turbidity Unit

REQUIRED TEXT:

For samples collected for field analysis, collection, analysis and equipment calibration shall be in accordance with the field instrument manufacturer’s specifications.

The following field instrument(s) will be used to analyze the following constituents:

**TABLE 700-3-6
Field Instruments**

Field Instrument	Constituent

- The instrument(s) shall be maintained in accordance with manufacturer’s instructions.
- The instrument(s) shall be calibrated before each sampling and analysis event.
- Maintenance and calibration records shall be maintained in SWPPP file category 20.19 Field Testing Equipment Maintenance and Calibration Records.

700.3.6 Quality Assurance/Quality Control

REQUIRED TEXT:

For an initial verification of laboratory or field analysis, duplicate samples shall be collected at a rate of 10 percent or 1 duplicate minimum per sampling event. The duplicate sample shall be collected, handled, and analyzed using the same protocols as primary samples, and shall be collected where contaminants are likely, and not on the upstream sample. A duplicate sample shall be collected immediately after the primary sample has been collected. Duplicate samples shall not influence any evaluations or conclusions; however, they shall be used as a check on laboratory quality assurance.

700.3.7 Data Management and Reporting

INSTRUCTIONS:

- Sampling information and test results shall be submitted to the Resident Engineer.

This project is Risk Level 3?

Yes No

REQUIRED TEXT:

All original data from test analysis shall be documented on Stormwater Sample Field Test Results Report forms, Stormwater Sample Laboratory Test Results Report forms and Stormwater Sampling and Testing Activity Logs. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

A copy of all water quality analytical results and QA/QC data shall be submitted to the Resident Engineer within 48 hours of sampling for field analyzed samples and within 30 days for laboratory analyses.

For field test the submitted information shall include a signed copy of the Stormwater Sampling Information, Identification and Chain of Custody Record form and Stormwater Field Sample Test Result Report form. Appendix XX contains the Stormwater Sample Field Test Result form, which must accompany the Stormwater Sampling Information, Identification and Chain of Custody Record form. The test results shall be recorded on the Stormwater Sampling and Testing Activity Log.

For laboratory test, if the Stormwater Sample Laboratory Test Result Report for SSC is not completed by the testing laboratory then the laboratory report used to complete the Stormwater Sample Laboratory Test Result Report form shall be attached to the completed Stormwater Sample Laboratory Test Result Report. For each testing report the Stormwater Sample Laboratory Test Result Report and Stormwater Sampling Information, Identification and Chain of Custody Record form shall be reviewed for consistency between lab methods, sample identifications, dates, and times for both primary samples and QA/QC samples. The test results shall be recorded on the Stormwater Sampling and Testing Activity Log.

All data, including Stormwater Sampling Information, Identification and Chain of Custody Record forms, Stormwater Sample Test Result Report forms, and Stormwater Sampling and Testing Activity Logs shall be kept in SWPPP file category 20.14 "Turbidity and pH Sampling and Test Results". A copy of completed stormwater sampling and testing forms and an updated Stormwater Sampling and Testing Activity Log shall be submitted to the Resident Engineer

In addition to a paper copy of water quality test results, the test results shall be submitted electronic on diskette in Microsoft Excel (.xls) format, and shall include, at a minimum, the

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following information from the lab: Sample ID Number, Contract Number, Constituent, Reported Value, Lab Name, Method Reference, Method Number, Method Detection Limit, and Reported Detection Limit. Electronic copies of stormwater data shall be forwarded by email to [Resident Engineer Name] at [email address] for inclusion into a statewide database.

Numeric Action Limit Exceedance Reporting

This project is subject to Numeric Action Levels (NALs) for pH and Turbidity as shown in the table below:

Parameter	Test Method	Detection Limit (Min)	Unit	Numeric Action Level
pH	Field test with calibrated portable instrument	0.2	pH units	Lower NAL = 6.5 Upper NAL = 8.5
Turbidity	Field test with calibrated portable instrument	1	NTU	250 NTU

If an NAL is exceeded a NAL Exceedance Report will be completed and submitted to the Resident Engineer within 48 hours of the storm event. The NAL Exceedance Report will include:

- Analytical methods, reporting units, and detection limits;
- Date, location, time of sampling, visual observation and measurements;
- Quantity of precipitation of the storm event;
- Description of BMP's; and
- Corrective actions taken to manage the NAL exceedance.

Appendix XX contains a NAL Exceedance Report form. NAL exceedance reports will be filed in SWPPP file category 20.15 "Numeric Action Limit (NAL) Exceedance Reports."

700.3.8 Data Evaluation

INSTRUCTIONS:

- The Construction General Permit requires that BMPs be implemented on the construction site to prevent a net increase of pH and sediment load in stormwater discharges relative to pre-construction levels. The upstream sample, while not representative of pre-construction levels, provides a basis for comparison with the sample collected downstream of the construction site.

- The downstream water quality sample analytical results shall be evaluated to determine if the downstream sample(s) show elevated levels of the tested constituent relative to the levels found in the upstream sample. The run-on sample analytical results shall be used as an aid in evaluating potential offsite influences on water quality results. If elevated levels of pollutants are identified, additional BMPs must be implemented in an iterative manner to prevent a net increase in pollutants to receiving waters.
- Sample results from dewatering discharges shall be evaluated to determine if the concentrations are less than or equal to the applicable water quality standard.

REQUIRED TEXT:

An evaluation of the water quality sample analytical results, including figures with sample locations, shall be submitted to the Resident Engineer with the water quality analytical results and the QA/QC data for every event that samples are collected. Should the downstream sample concentrations exceed the upstream sample concentrations or dewatering discharge concentrations exceed applicable water quality standards, then the WPCM or other personnel shall evaluate the BMPs, site conditions, surrounding influences (including run-on sample analysis), and other site factors to determine the probable cause for the increase.

As determined by the data and project evaluation, appropriate BMPs shall be repaired or modified to mitigate increases in sediment and/or turbidity concentrations in the water body. Any revisions to the BMPs shall be recorded as an amendment to the SWPPP.

Stormwater Sample Field Test Results Report form Stormwater Sample Field Test Results Report form 20.XX "Turbidity and pH Sampling and Test Results.

700.3.9 Change of Condition

REQUIRED TEXT:

Whenever a stormwater visual monitoring site inspection indicates a change in site conditions that might affect the appropriateness of sampling locations, sampling locations shall be revised accordingly. All such revisions shall be implemented as soon as feasible and the SWPPP amended.

700.4 SAMPLING AND ANALYSIS PLAN FOR MONITORING REQUIRED BY REGIONAL BOARD

INSTRUCTIONS:

- The Construction General Permit requires stormwater effluent monitoring for any additional parameters required by a Regional Water Board.

The Regional Water Board is requiring additional monitoring?

Yes No

- If there are no additional parameters shown in the contract special provisions then the Regional Water Board has not specified any additional parameters and Sections 700.4.1- 700.4.2 shall be deleted.

REQUIRED TEXT:

This project does not require a project specific Sampling and Analysis Plan (SAP) for parameters identified by the Regional Water Board.

700.4.1 Scope of Monitoring Activities

INSTRUCTIONS:

- Provide the name(s) of the water bodies that the Regional Water Board has based its requirements for additional parameter monitoring on.
- Describe the location(s) of direct discharge from the project site to the water body and show the locations of direct discharge on the WPCDs.
- Include the appropriate required text to identify whether run-on to the Caltrans right-of-way may combine with stormwater and directly discharge to the water body. If the project does receive run-on, describe the locations of run-on and show the locations on the WPCDs.

REQUIRED TEXT:

Table 700-4-1	
Stormwater Discharge Locations	
Location No.	Location

Table 700-4-2	
Direct Stormwater Discharge Locations to Waterbody	
Location No.	Location

INSTRUCTIONS:

Does the project receive run-on with the potential to combine with stormwater that discharges directly to the water body?

Yes No

REQUIRED TEXT for PROJECTs that RECEIVE RUN-ON:

The project receives run-on with the potential to combine with stormwater that discharges directly to at the following locations, as shown on the WPCDs in Attachment BB:

INSERT LOCATIONS

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.4.2 Monitoring Strategy

INSTRUCTIONS:

Describe the sampling schedule for monitoring the impacts of stormwater discharges to the water body.

Describe the sampling locations for monitoring the impacts of direct stormwater discharges from the project to the water body.

Describe the rationale for the selection of sampling locations.

Identify a location upstream of all direct discharge from the construction site that appears to represent the flow of the water body, to analyze the prevailing condition of the receiving water without any influence from the construction site. Describe exactly, either using GPS coordinates or post mile, where the sample will be collected. Note: Sampling too far upstream may not show prevailing conditions immediately upstream of the construction site.

Identify a location immediately downstream from the last point of direct discharge from the construction site that appears to represent the nature of the flow to analyze potential impacts to the esediment-sensitive listed water body from the project. Describe exactly where the sample will be collected. Downstream samples should represent the receiving water mixed with flow from the construction site. Note: Sampling too far downstream may detect pollutants from other discharges.

For projects that, in Section 700.3.1, identified locations of run-on to the Caltrans right-of-way include the required text to identify run-on sampling location(s) to determine potential impairments that originate off the project site. Describe exactly where the sample will be collected.

Show all sampling locations on the WPCDs.

- Locate sampling locations in areas that are safe, out of the path of heavy traffic, and reasonably accessible.

Describe surrounding areas such as agricultural fields, or other sites that may contribute run-on sediment to the site.

Do not locate sampling points at point sources or confluences to minimize backwater effects or poorly mixed flows.

REQUIRED TEXT:

Sampling Schedule

Upstream, downstream, discharge, and run-on samples, if applicable, shall be collected for for qualifying storm events that result in a discharge from the project site. Sampling and testing for will be done daily during all qualifying storm events Samples shall be collected during working hours.

A qualifying storm event is any storm event that produces precipitaion of ½ inch or more. In conformance with the U.S. Environmental Protection Agency definition, a minimum of 72 hours of dry weather will be used to distinguish between separate qualifying storm events.

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

Sampling Locations

Sampling locations are based on proximity to identified discharge or run-on location(s), accessibility for sampling, personnel safety, and other factors in accordance with the applicable requirements in the Caltrans *Construction Site Monitoring Program Guidance Manua*, July 2010

Sampling locations were determined to characterize discharges associated with the construction activity from the entire project site. The sample locations were selected based on Representatives sampling for this project is based on sampling percent of the project discharge locations per qualifying storm event.. If percent results in only one location to be sampled then a minimum of 2 locations will be sampled per qualifying storm event. The selected sampling locations are

Table 700-4-3	
Stormwater Discharge Sampling Locations	
Location	Location
No.	

. The sampling locations shall be identified on the Rain Event Action Plan by the WPCM for every forecated qualifying storm event.

Use when representative sampling of discharge locations is allowed and increased sampling is required when test results exceed parameter limits:

based on The additional selected sampling locations are

Table 700-4-4	
Stormwater Additional Discharge Sampling Locations	
Location No.	Location

that at least percent of the discharge locations are sampled. The sampling locations shall be identified on the Rain Event Action Plan by the WPCM for every forecated qualifying storm event.

REQUIRED TEXT:
 INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT
 OPTIONS" button to insert bullets)
***REQUIRED TEXT WHEN RECEIVING
 WATER SAMPLING IS REQUIRED:***

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The directly into the receiving waters. The receiving water sampling locations were determined based on the location providing a representative sample of the receiving water and being assessible.

A sample location (designated number [Enter Number]) is upstream of all direct discharge from the construction site for the collection of a control sample to be analyzed for the prevailing condition of the receiving water without any influence from the construction site. The control sample will be used to determine the background levels of water body upstream of the project, if any.

Sample location number [Enter Number] is located [Enter Location].

A sample location (designated number [Enter Number]) is immediately downstream from the last point of direct discharge from the construction site for the collection of a sample to be analyzed for potential increases in water body caused by storm water discharges from the project, if any.

Sample location number [Enter Number] is located [Enter Location].

Receiving water sampling locations shall be identified by the WPCM on Rain Event Action Plans prior to a forecasted qualifying storm event.

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

REQUIRED TEXT only for PROJECTs that RECEIVE RUN-ON:

This project receives run-on from surrounding area that may contribute to exceedances in stormwater discharges. Sampling locations have been determined for both upstream and downstream of the site discharge location(s) to the receiving water body and/or locations where run-on enters the Caltrans right-of-way. The identified sampling locations are:

The upstream sampling location (designated number [Enter Number]) has been identified for the collection of samples that represent flow to the water body, to analyze the prevailing condition of the receiving water without any influence from the construction site. The sample point is located [Enter Location].

The downstream sampling location (designated number [Enter Number]) has been identified for the collection of samples that represent the nature of the flow to analyze potential impacts to the sediment-sensitive listed water body from the project. The sample point is located [Enter Location].

[Enter number of locations] sampling location(s) (designated number(s) [Enter Number]) have been identified for the collection of samples of run-on to the Caltrans right-of-way with the potential to combine with discharges from the construction site in other than MS4 to the sediment-sensitive water body. These samples will identify potential turbidity and pH that originates off the project site and contributes to direct stormwater discharges from the

construction site to the sediment-sensitive listed water body. The sample point(s) is located [Enter Location].

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.4.3 Monitoring Preparation

INSTRUCTIONS:

- Training of water quality sampling personnel shall be in accordance with the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010. Identify whether samples will be collected by the contractor's personnel, by a commercial laboratory, or by an environmental consultant.

Identify training and experience of individuals responsible for collecting water samples.

Identify the health and safety procedures for sampling personnel.

Identify alternate sampling personnel in case of emergency, sick leave, and/or vacations during stormwater monitoring. Identify training of alternate sampling personnel.

Identify the state-certified laboratory(ies) that will analyze samples for suspended sediment concentrations. For a the list of California state-certified laboratories that are accepted by Caltrans, access the following web site: www.dhs.ca.gov/ps/ls/elap/html/lablist.htm

Include the appropriate required text to describe the strategy for ensuring that adequate sample collection supplies are available to the project in preparation for a sampling event.

Describe the strategy for ensuring that appropriate field testing equipment is available to the project in preparation for a sampling event.

Samples will be collected by (check one or more):

- | | | |
|--------------------------|------------------------------|-----------------------------|
| Contractor Personnel | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Commercial Laboratory | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Environmental Consultant | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

REQUIRED TEXT IF contractor personnel will collect samples:

Samples on the project site will be collected by the following contractor sampling personnel:

Name/Telephone Number:

Alternate(s)/Telephone Number:

The stormwater sampler has received the following stormwater sampling training:

(LIST)

The stormwater sampler has the following stormwater sampling experience:

(LIST)

The alternate stormwater sampler has received the following stormwater sampling training:

(LIST)

The alternate stormwater sampler has the following stormwater sampling experience:

(LIST)

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAprP). Training records of designated contractor sampling personnel are provided in Attachment E.

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the project site will include, but are not limited to, surgical gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, ice, and Stormwater Sampling Information, Identification and Chain of Custody Record forms.

The contractor will obtain and maintain the field testing instruments, as identified in Section 700.5.6, for analyzing samples in the field by contractor sampling personnel.

Safety practices for sample collection will be in accordance with the [ENTER TITLE AND PUBLICATION DATE OF CONTRACTOR'S HEALTH AND SAFETY PLAN FOR THE PROJECT OR PROVIDE SPECIFIC REQUIREMENTS HEREIN].

REQUIRED TEXT only if consultant or laboratory will collect samples:

Samples on the project site will be collected by the following [specify laboratory or environmental consultant]:

Company Name:

Address:

Telephone Number:

Point of Contact:

(LIST) will be the stormwater sampler for the site and has received the following stormwater sampling training:

(LIST)

The stormwater sampler has the following stormwater sampling experience:

(LIST)

(LIST) will be the alternate stormwater for the site and has received the following stormwater sampling training:

(LIST)

The alternate stormwater sampler has the following stormwater sampling experience:

(LIST)

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAprP). Training records of designated sampling personnel are provided in Attachment D.

WPCM will contact [specify name of laboratory or environmental consultant] 24 hours prior to a predicted rain event and if one of the triggering conditions is identified during an inspection before, during, or after a storm event to ensure that adequate sample collection personnel, supplies and field test equipment for monitoring non-visible pollutants are available and will be mobilized to collect samples on the project site in accordance with the sampling schedule.

[Specify name of laboratory or environmental consultant] will obtain and maintain the field testing instruments, as identified in Section 700.2.6, for analyzing samples in the field by their sampling and testing personnel.

700.4.4 Sample Collection and Handling

INSTRUCTIONS:

Describe sample collection procedures to be used on the project. For sample collection procedures, refer to the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010 for general guidance.

- For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136.
- For the list of California state-certified laboratories that are accepted by Caltrans, access the following web site: www.dhs.ca.gov/ps/ls/elap/html/lablist.htm

Describe sample handling procedures.

Describe decontamination waste disposal requirements (e.g., trisodium phosphate (TSP) soapy water shall not be discharged to the storm drainage system or receiving water).

Describe sample collection documentation procedures.

Describe procedures for recording, checking, and correcting sampling data.

Each sample bottle is required to have a proper and complete identification label.

A Stormwater Sample Information, Identification, and Chain of Custody Record form is required to be submitted to the laboratory with the samples to trace the possession and handling of samples from collection through analysis. Copies of completed Stormwater Sample Information, Identification, and Chain of Custody Record will be placed in the SWPPP file category 20.13 "Non-visible Pollutant Sampling and Test Results".

A Stormwater Sample Field Test Result Report form or Stormwater Sample Laboratory Test Result Report form is to be completed for each sample or set of samples.

A Stormwater Sampling and Testing Activity Log is required to document details of all sampling events and to record test results for samples. A Stormwater Sampling and Testing Activity Log is located in Appendix XX.

REQUIRED TEXT:

Sample Collection Procedures

Grab samples shall be collected and preserved in accordance with the methods identified in Table 700-4-5, "Sample Collection, Preservation and Analysis for Monitoring [Enter Location]", provided in Section 700.4.5. Only personnel trained in proper water quality sampling shall collect samples.

Upstream samples shall be collected to represent the condition of the water body up gradient of the construction site. Downstream samples shall be collected to represent the water body mixed with direct flow from the construction site. Samples shall not be collected directly from ponded, sluggish, or stagnant water.

Upstream and downstream samples shall be collected using one of the following methods:

- Placing a sample bottle directly into the stream flow in or near the main current upstream of sampling personnel, and allowing the sample bottle to fill completely;

OR,

- Placing a decontaminated or 'sterile' bailer or other 'sterile' collection device in or near the main current to collect the sample, and then transferring the collected water to appropriate sample bottles, allowing the sample bottles to fill completely.

Run-on samples, if applicable, shall be collected to identify [Enter Location] that originates off the project site and contributes to direct discharges from the construction site to the water body. Run-on samples shall be collected down gradient and within close proximity of the point of run-on to the project by pooling or ponding water and allowing the ponded water to spill over into sample bottles directly in the stream of water.

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

To maintain sample integrity and prevent cross-contamination, sampling collection personnel shall:

- Wear a clean pair of nitrile gloves prior to the collection and handling of each sample at each location.
- Not contaminate the inside of the sample bottle by not allowing it to come into contact with any material other than the water sample.
- Decontaminate sampling equipment prior to sample collection using a TSP-soapy water wash, distilled water rinse, and final rinse with distilled water. Dispose of decontamination water/soaps appropriately (i.e., do not discharge to the storm drain system or receiving water).
- Discard sample bottles or sample lids that have been dropped onto the ground prior to sample collection.
- Not leave the cooler lid open for an extended period of time once samples are placed inside.
- Not touch the exposed end of a sampling tube, if applicable.
- Avoid allowing rainwater to drip from rain gear or other surfaces into sample bottles.
- Not eat, smoke, or drink during sample collection.
- Not sneeze or cough in the direction of an open sample bottle.
- Minimize the exposure of the samples to direct sunlight, as sunlight may cause biochemical transformation of the sample to take place.

INSTRUCTIONS:

All or some of samples will be analyzed by (select one or both):

Laboratory	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Contractor (Field Analyze)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Sample Handling Procedures

REQUIRED TEXT only if laboratory will analyze ALL or SOME OF THE samples:

Immediately following collection, sample bottles for laboratory analytical testing shall be capped, labeled, documented on Stormwater Sampling Information, Identification, and Chain-of-Custody Record form, sealed in a re-sealable storage bag, placed in an ice-chilled cooler, at ± 4 degrees Celsius as practicable, and delivered within 24 hours to the following laboratory certified for such analyses by the State Department of Healthy Services:

mm = minute sample collected (00-59)
TT = Type or QA/QC Identifier (if applicable)
G = grab
FS = field duplicate

For example, the sample number for a grab sample collected at Station CCUP1 collected at 4:15PM on December 8, 2006 would be:

CCUP10612081615G

- Collection date/time
- Analysis constituent
- Initials of person who collected the sample
- Stormwater Sampling and Testing Activity Log: A log of sampling events and test results shall identify:
 - Sampling date
 - Separate times for sample collection of upstream, downstream, run-on, dewatering, and QA/QC samples recorded to the nearest minute
 - Unique sample identification number and location
 - Analysis constituent
 - Names of sampling personnel
 - Weather conditions (including precipitation amount)
 - Test results
 - Other pertinent data
- Stormwater Sampling Information, Identification, and Chain of Custody Record: All samples to be analyzed by a laboratory shall be accompanied by a Stormwater Sampling Information, Identification, and Chain of Custody Record form. The sampler shall sign the Stormwater Sampling Information, Identification, and Chain of Custody Record form when a sample(s) is turned over to the laboratory. Chain of custody procedures shall be strictly adhered to for Quality Assurance and Quality Control (QA/QC) purposes.
- Stormwater Site Inspection Report: When applicable, the contractor's stormwater inspector shall document on the Stormwater Site Inspection Report that samples for [Enter Location] were taken during a rain event.

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.4.5 Sample Analysis

INSTRUCTIONS:

Indicate tests to be used on the project in Table 700-4-1, "Sample Collection, Preservation and Analysis for Monitoring"

REQUIRED TEXT:

Samples shall be analyzed for the constituents indicated in Table 700-4-5, “Sample Collection, Preservation and Analysis for Monitoring [Enter Location].”

TABLE 700-4-5

Sample Collection, Preservation and Analysis for Monitoring [Enter Location]

Parameter	Test Method	Sample Preservation	Minimum Sample Volume ⁽¹⁾	Sample Bottle	Maximum Holding Time	Detection Limit (min)

Notes: ⁽¹⁾ Minimum sample volume recommended. Specific volume requirements will vary by instrument; check instrument manufacturer instructions.

- °C – Degrees Celsius
- °F – Degrees Fahrenheit
- L – Liter
- mL – Milliliters

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

REQUIRED TEXT:

For samples collected for field analysis, collection, analysis and equipment calibration shall be in accordance with the field instrument manufacturer’s specifications.

The following field instrument(s) will be used to analyze the following constituents:

TABLE 700-4-6

Field Instruments

Field Instrument	Constituent

The instrument(s) shall be maintained in accordance with manufacturer’s instructions.

The instrument(s) shall be calibrated before each sampling and analysis event.

Maintenance and calibration records shall be maintained in SWPPP file category 20.19 “Field Testing Equipment Maintenance and Calibration Records.”

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.4.6 Quality Assurance/Quality Control

REQUIRED TEXT:

For an initial verification of laboratory or field analysis, duplicate samples shall be collected at a rate of 10 percent or 1 duplicate minimum per sampling event. The duplicate sample shall be collected, handled, and analyzed using the same protocols as primary samples, and shall be collected where contaminants are likely, and not on the upstream sample. A duplicate sample shall be collected immediately after the primary sample has been collected. Duplicate samples shall not influence any evaluations or conclusions; however, they shall be used as a check on laboratory quality assurance.

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.4.7 Data Management and Reporting

INSTRUCTIONS:

Sampling information and test results shall be submitted to the Resident Engineer.

REQUIRED TEXT:

All original data form test analysis shall be documented on Stormwater Sample Field Test Results Report forms, Stormwater Sample Laboratory Test Results Report forms and Stormwater

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Sampling and Testing Activity Logs. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

A copy of all water quality analytical results and QA/QC data shall be submitted to the Resident Engineer within 48 hours of sampling for field analyzed samples and within 30 days for laboratory analyses.

For field tests the submitted information shall include a signed copy of the Stormwater Sampling Information, Identification and Chain of Custody Record form and Stormwater Field Sample Test Result Report form. Appendix XX contains the Stormwater Sample Field Test Result form, which must accompany the Stormwater Sampling Information, Identification and Chain of Custody Record form.

For tests performed by a laboratory, if the Stormwater Sample Laboratory Test Result Report for is not completed by the testing laboratory then the laboratory report used to complete the Stormwater Sample Laboratory Test Result Report form shall be attached to the completed Stormwater Sample Laboratory Test Result Report. For each laboratory test report the Stormwater Sample Laboratory Test Result Report and Stormwater Sampling Information, Identification and Chain of Custody Record form shall be reviewed for consistency between lab methods, sample identifications, dates, and times for both primary samples and QA/QC samples. The test results shall be recorded on the Stormwater Sampling and Testing Activity Log.

All data, including Stormwater Sampling Information, Identification and Chain of Custody Record forms, Stormwater Sample Test Result Report forms, and Stormwater Sampling and Testing Activity Logs shall be kept in SWPPP file category 20.17 "Required Regional Water Board Monitoring Test Results". A copy of completed stormwater sampling and testing forms and an updated Stormwater Sampling and Testing Activity Log shall be submitted to the Resident Engineer

In addition to a paper copy of water quality test results, the test results shall be submitted electronic on diskette in Microsoft Excel (.xls) format, and shall include, at a minimum, the following information from the lab: Sample ID Number, Contract Number, Constituent, Reported Value, Lab Name, Method Reference, Method Number, Method Detection Limit, and Reported Detection Limit. Electronic copies of stormwater data shall be forwarded by email to [Resident Engineer Name] at [email address] for inclusion into a statewide database.

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.4.8 Data Evaluation

INSTRUCTIONS:

- To evaluate the impact of stormwater discharges from the construction site the upstream sample, while not representative of pre-construction levels, provides a basis for comparison with the sample collected downstream of the construction site.
- The downstream water quality sample analytical results shall be evaluated to determine if the downstream sample(s) show elevated levels of the tested constituent relative to the levels found in the upstream sample. The run-on sample analytical results shall be used as an aid in evaluating potential offsite influences on water quality results. If elevated levels of pollutants are identified, additional BMPs must be implemented in an iterative manner to prevent a net increase in pollutants to receiving waters.

REQUIRED TEXT:

An evaluation of the water quality sample analytical results, including figures with sample locations, shall be submitted to the Resident Engineer with the water quality analytical results and the QA/QC data for every storm event that samples are collected. Should the downstream sample concentrations exceed the upstream sample concentrations, then the WPCM or other personnel shall evaluate the BMPs, site conditions, surrounding influences (including run-on sample analysis), and other site factors to determine the probable cause for the increase.

As determined by the data and project evaluation, appropriate BMPs shall be repaired or modified to mitigate increases in [Enter Location] concentrations in the water body. Any revisions to the BMPs shall be recorded as an amendment to the SWPPP.

Stormwater Sample Field Test Results Report formStormwater Sample Field Test Results Report form20.XX "Required Regional Water Board Monitoring Test Results."INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.4.9 Change of Conditions

REQUIRED TEXT:

Whenever a stormwater visual monitoring site inspection indicates a change in site conditions that might affect the appropriateness of sampling locations, sampling locations shall be revised accordingly. All such revisions shall be implemented as soon as feasible and the SWPPP amended.

700.5 SAMPLING AND ANALYSIS PLAN FOR MONITORING ACTIVE TREATMENT SYSTEM (ATS)

INSTRUCTIONS:

- The Construction General Permit requires stormwater effluent monitoring from the discharge pipe or another location representative of the nature of the discharge.

An ATS is to be deployed on the site?

Yes No

If no ATS will be deployed then Sections 700.5.1- 700.5.9 shall be deleted.

REQUIRED TEXT:

This project does not require a project specific Sampling and Analysis Plan (SAP) for an Active Treatment System (ATS) because deployment of an ATS is not planned.

REQUIRED TEXT WHEN AN Active Treatment System (ATS) WILL BE DEPLOYED ON THE SITE:

This Sampling and Analysis Plan (SAP) describes the sampling and analysis strategy and schedule for monitoring turbidity and pH in stormwater discharges from the Active Treatment System(s) located on the site in accordance with the requirements of the Construction General Permit and applicable requirements of the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010.

700.5.1 Scope of Monitoring Activities

INSTRUCTIONS:

Provide the name(s) of the sediment-sensitive water bodies that sediment-sensitive based on either: 303(d) listed water bodies impaired for sediment; has a USEPA-approved Total Maximum daily Load implementation plan for sediment; or has the beneficial uses of Cold and Spawn and Migratory.

Describe the location(s) of the stormwater Active Treatment System(s) discharge(s) from the project site to the MS4 and/or sediment-sensitivewater body and show the locations of discharge(s) on the WPCDs.

REQUIRED TEXT:

Table 700-5-1

ATS Stormwater Discharge Locations

Location	Location

No.	

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

700.5.2 Monitoring Strategy

INSTRUCTIONS:

Describe the sampling schedule for monitoring the impacts of stormwater discharges to the sediment-sensitive or other water body.

Describe the sampling locations for monitoring the impacts of ATS stormwater discharges from the project to the sediment-sensitive or other water body.

Describe the rationale for the selection of sampling locations.

Identify a location upstream of all direct discharge from the construction site that appears to represent the flow of the water body, to analyze the prevailing condition of the receiving water without any influence from the construction site. Describe exactly, either using GPS coordinates or post mile, where the sample will be collected. Note: Sampling too far upstream may not show prevailing conditions immediately upstream of the construction site.

Identify a location immediately downstream from the last point of direct discharge from the construction site that appears to represent the nature of the flow to analyze potential impacts to the sediment-sensitive listed water body from the project. Describe exactly where the sample will be collected. Downstream samples should represent the receiving water mixed with flow from the construction site. Note: Sampling too far downstream may detect pollutants from other discharges.

Show all sampling locations on the WPCDs.

REQUIRED TEXT:

Sampling Schedule

Discharge samples shall be collected for turbidity, pH and residual chemical/additive daily when ATS is discharging water from the project site. A minimum of three samples shall be collected daily during working hours.

INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)

If turbidity exceeds the Numeric Effluent Limitaion of 500 NTU samples will be taken for suspended sediment concentration (SSC).

REQUIRED TEXT:

Sampling Locations

Sampling location for ATS effluent are from the ATS discharge pipe unless another location is identified in this SWPPP that is representative of the nature of the discharge. INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets)Receiving waters sampling locations are based on ATS discharge location, accessibility for sampling, personnel safety, and other factors in accordance with the applicable requirements in the Caltrans *Construction Site Monitoring Program Guidance Manua*,July 2010

ATS sampling locations are

Table 700-5-2	
ATS Stormwater Discharge Sampling Locations	
Location No.	Location

700.5.3 Monitoring Preparation

INSTRUCTIONS:

- Training of water quality sampling personnel shall be in accordance with the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010. Identify whether samples will be collected by the contractor's personnel, by a commercial laboratory, or by an environmental consultant.

Identify training and experience of any additional individuals responsible for collecting water samples from ATS discharge.

Identify the state-certified laboratory(ies) that will analyze samples for suspended sediment concentrations and chemical/additive residual if different from Section 700.3.3. For a the list of California state-certified laboratories that are accepted by Caltrans, access the following web site: www.dhs.ca.gov/ps/ls/elap/html/lablist.htm

Samples will be collected by (check one or more):

Contractor Personnel Yes No

Commercial Laboratory Yes No

Environmental Consultant Yes No

REQUIRED TEXT IF SAMPLING PERSONNEL ARE THE SAME AS THOSE SHOWN IN SECTION 700.3.3:

ATS discharge samples shall be collected by sampling personnel shown in Section 700.3.3.

REQUIRED TEXT IF SAMPLING PERSONNEL ARE DIFFERENT THEN THOSE SHOWN IN SECTION 700.3.3:

ATS samples shall be collected by the following sampling personnel:

Name/Telephone Number: Name Phone Number

Alternate(s)/Telephone Number: Name Phone Number

(LIST) will be the sampler for ATS stormwater discharges and has received the following stormwater sampling training:

(LIST)

The stormwater sampler has the following stormwater sampling experience:

(LIST)

(LIST) will be the alternate sampler for ATS stormwater discharges and has received the following stormwater sampling training:

(LIST)

The alternate stormwater sampler has the following stormwater sampling experience:

(LIST)

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAprP). Training records of designated sampling personnel are provided in Attachment D.

700.5.4 Sampling Collection and Handling

INSTRUCTIONS:

Describe sample collection procedures to be used on the project. For sample collection procedures, refer to the Caltrans *Construction Site Monitoring Program Guidance Manual*, July 2010 for general guidance.

- For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136.
- For the list of California state-certified laboratories that are accepted by Caltrans, access the following web site: www.dhs.ca.gov/ps/ls/elap/html/lablist.htm

Describe sample handling procedures.

Describe decontamination waste disposal requirements (e.g., trisodium phosphate (TSP) soapy water shall not be discharged to the storm drainage system or receiving water).

Describe sample collection documentation procedures.

Describe procedures for recording, checking, and correcting sampling data.

Each sample bottle is required to have a proper and complete identification label.

A Stormwater Sample Information, Identification, and Chain of Custody Record form is required to be submitted to the laboratory with the samples to trace the possession and handling of samples from collection through analysis. Copies of completed Stormwater Sample Information, Identification, and Chain of Custody Record will be placed in the SWPPP file category 20.13 "Non-visible Pollutant Sampling and Test Results".

A Stormwater Sample Field Test Result Report form or Stormwater Sample Laboratory Test Result Report form is to be completed for each sample or set of samples.

A Stormwater Sampling and Testing Activity Log is required to document details of all sampling events and to record test results for samples. A Stormwater Sampling and Testing Activity Log is located in Appendix XX.

REQUIRED TEXT:

Sample Collection Procedures

Grab samples shall be collected and preserved in accordance with the methods identified in Table 700-5-4, "Sample Collection, Preservation and Analysis for ATS Monitoring", provided in Section 700.5.5. Only personnel trained in proper water quality sampling shall collect samples.

ATS grab samples shall be collected using one of the following methods:

Placing a sample bottle directly into the discharge flow and allowing the sample bottle to fill completely;

OR,

Placing a decontaminated or 'sterile' bailer or other 'sterile' collection device into the discharge flow to collect the sample, and then transferring the collected water to appropriate sample bottles, allowing the sample bottles to fill completely.

Upstream samples shall be collected to represent the condition of the water body up gradient of the construction site. Downstream samples shall be collected to represent the water body mixed with direct flow from the construction site. Samples shall not be collected directly from ponded, sluggish, or stagnant water.

Upstream and downstream samples shall be collected using one of the following methods:

Placing a sample bottle directly into the stream flow in or near the main current upstream of sampling personnel, and allowing the sample bottle to fill completely;

OR,

Placing a decontaminated or 'sterile' bailer or other 'sterile' collection device in or near the main current to collect the sample, and then transferring the collected water to appropriate sample bottles, allowing the sample bottles to fill completely.

Run-on samples, if applicable, shall be collected to identify turbidity and pH that originates off the project site and contributes to direct discharges from the ATS to the sediment-sensitive water body. Run-on samples shall be collected down gradient and within close proximity of the point of run-on to the project by pooling or ponding water and allowing the ponded water to spill over into sample bottles directly in the stream of water.

For sample integrity and to prevent cross-contamination requirements see Section 700.3.4.

INSTRUCTIONS:

All or some of samples will be analyzed by:

Laboratory

Yes

No

Sample Handling Procedures

REQUIRED TEXT only if laboratory will analyze ALL or SOME OF THE samples:

Immediately following collection, sample bottles for laboratory analytical testing shall be capped, labeled, documented on Stormwater Sampling Information, Identification, and Chain-of-Custody Record form, sealed in a re-sealable storage bag, placed in an ice-chilled cooler, at ± 4 degrees Celsius as practicable, and delivered within 24 hours to the following laboratory certified for such analyses by the State Department of Healthy Services:

Laboratory Name:

Address:

Telephone Number:

Point of Contact:

REQUIRED TEXT:

Immediately following collection, samples for field analysis shall be tested in accordance with the field instrument manufacturer's instructions and results recorded on the Stormwater Sample Field Test Result form.

REQUIRED TEXT:

Sample Documentation Procedures

For sample documentation procedure see Section 700.3.2.

700.5.5 Sample Analysis

INSTRUCTIONS:

Identify the specific chemical/additive used by the ATS on the project site and list the chemical/additive on Table 700-5-1, "ATS Chemical/Additive and Water Quality Indicator Constituents" table.

List the chemical/additive and water quality indicator.

Identify tests to be used on the project on Table 7-5-1, "Sample Collection, Preservation and Analysis for ATS Monitoring."

- Insert into Table 700-5-1 parameter to detect chemical/additive residual, test method, sample preservation, minimum sample volume, maximum holding time and detection limit.

Suspended Sediment Concentration testing required when Turbidity exceeds 500 NTU, include Table 700-3-2 "Sample Collection, Preservation and Analysis for Suspended Sediment Concentration (SSC)."

REQUIRED TEXT:

Table 700-5-3

Potential Non-Visible Pollutants and Water Quality Indicator Constituents

Chemical/Additive	Water Quality Indicator Constituent

Table 700-5-3

Potential Non-Visible Pollutants and Water Quality Indicator Constituents

Chemical/Additive	Water Quality Indicator Constituent

ATS samples shall be analyzed for turbidity, pH and chemical/additive residue. The chemical/additive residue can be detected based on the following INSERT ADDITIONAL BULLETS HERE OR DELETE THIS LINE (Use the "FORMAT OPTIONS" button to insert bullets).

Samples shall be analyzed for the constituents indicated in Table 700-5-4, "Sample Collection, Preservation and Analysis for ATS Monitoring."

TABLE 700-5-4

Sample Collection, Preservation and Analysis for ATS Monitoring

Parameter	Test Method	Sample Preservation	Minimum Sample Volume ⁽¹⁾	Sample Bottle	Maximum Holding Time	Detection Limit (min)
Turbidity	Field test with calibrated portable instrument	Store at 4° C (39.2° F)	100 mL	Polypropylene or Glass	48 hours	1 NTU
pH	Field test with calibrated portable instrument	Store at 4° C (39.2° F)	100 mL	Polypropylene	48 hours	0.2

Parameter	Test Method	Sample Preservation	Minimum Sample Volume ⁽¹⁾	Sample Bottle	Maximum Holding Time	Detection Limit (min)
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Notes: ⁽¹⁾ Minimum sample volume recommended. Specific volume requirements will vary by instrument; check instrument manufacturer instructions.

°C – Degrees Celsius

°F – Degrees Fahrenheit

L – Liter

mL – Milliliters

NTU – Nephelometric Turbidity Unit

If turbidity exceeds the Numeric Effluent Limitaion of 500 NTU samples shall be analyzed for the constituents indicated in Table 700-5-5, “Sample Collection, Preservation and Analysis for Monitoring Suspended Sediment Concentration.”

TABLE 700-5-5

Sample Collection, Preservation and Analysis for Monitoring Suspended Sediment Concentration (SSC)

Parameter	Test Method	Sample Preservation	Minimum Sample Volume ⁽¹⁾	Sample Bottle	Maximum Holding Time	Detection Limit (min)
Suspended Sediment Concentration (SSC)	ASTM D3977-97	Store at 4° C (39.2° F)	200 mL	Contact Laboratory	7 days	5 mg/L

**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
Contract No.04-172424**

Parameter	Test Method	Sample Preservation	Minimum Sample Volume ⁽¹⁾	Sample Bottle	Maximum Holding Time	Detection Limit (min)
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Notes: ⁽¹⁾ Minimum sample volume recommended. Specific volume requirements will vary by laboratory; check with laboratory when setting up bottle orders.

ASTM – American Society for Testing and Materials

°C – Degrees Celsius

°F – Degrees Fahrenheit

L – Liter

mg/L – Milligrams per liter

mL – Milliliters

For samples collected for field analysis, collection, analysis and equipment calibration shall be in accordance with the field instrument manufacturer’s specifications. See Table 700-3-3 for field instrument identification.

REQUIRED TEXT IF ADDITIONAL FIELD TESTING INSTRUMENTS ARE REQUIRED:

The following field instrument(s) will be used to analyze the following constituents:

TABLE 700-5-6

Field Instruments

Field Instrument	Constituent

The instrument(s) shall be maintained in accordance with manufacturer’s instructions.

The instrument(s) shall be calibrated before each sampling and analysis event.

Maintenance and calibration records shall be maintained in SWPPP file category 20.19 Field Testing Equipment Maintenance and Calibration Records.

700.5.6 Quality Assurance/Quality Control

REQUIRED TEXT:

For an initial verification of laboratory or field analysis, duplicate samples shall be collected at a rate of 10 percent or 1 duplicate minimum per sampling event. The duplicate sample shall be collected, handled, and analyzed using the same protocols as primary samples, and shall be collected where contaminants are likely, and not on the upstream sample. A duplicate sample shall be collected immediately after the primary sample has been collected. Duplicate samples shall not influence any evaluations or conclusions; however, they shall be used as a check on laboratory quality assurance.

700.5.7 Data Management and Reporting

INSTRUCTIONS:

Sampling information and test results shall be submitted to the Resident Engineer.

REQUIRED TEXT:

All original data form test analysis shall be documented on Stormwater Sample Field Test Results Report forms, Stormwater Sample Laboratory Test Results Report forms and Stormwater Sampling and Testing Activity Logs. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

A copy of all water quality analytical results and QA/QC data shall be submitted to the Resident Engineer within 48 hours of sampling for field analyzed samples and within 30 days for laboratory analyses.

For field test the submitted information shall include a signed copy of the Stormwater Sampling Information, Identification and Chain of Custody Record form and Stormwater Field Sample Test Result Report form. Appendix XX contains the Stormwater Sample Field Test Result form, which must accompany the Stormwater Sampling Information, Identification and Chain of Custody Record form. The test results shall be recorded on the Stormwater Sampling and Testing Activity Log.

For laboratory test, if the Stormwater Sample Laboratory Test Result Report is not completed by the testing laboratory then the laboratory report used to complete the Stormwater Sample Laboratory Test Result Report form shall be attached to the completed Stormwater Sample Laboratory Test Result Report. For each testing report the Stormwater Sample Laboratory Test Result Report and Stormwater Sampling Information, Identification and Chain of Custody Record form shall be reviewed for consistency between lab methods, sample identifications, dates, and times for both primary samples and QA/QC samples. The test results shall be recorded on the Stormwater Sampling and Testing Activity Log.

**Stormwater Pollution Prevention Plan (SWPPP)
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Contract No.04-172424**

All data, including Stormwater Sampling Information, Identification and Chain of Custody Record forms, Stormwater Sample Test Result Report forms, and Stormwater Sampling and Testing Activity Logs shall be kept in SWPPP file category 20.18 “ATS Monitoring Samples and Test Results”. A copy of completed stormwater sampling and testing forms and an updated Stormwater Sampling and Testing Activity Log shall be submitted to the Resident Engineer

In addition to a paper copy of water quality test results, the test results shall be submitted electronic on diskette in Microsoft Excel (.xls) format, and shall include, at a minimum, the following information from the lab: Sample ID Number, Contract Number, Constituent, Reported Value, Lab Name, Method Reference, Method Number, Method Detection Limit, and Reported Detection Limit. Electronic copies of stormwater data shall be forwarded by email to [Resident Engineer Name] at [email address] for inclusion into a statewide database.

REQUIRED TEXT NAL REPORTING:

Numeric Action Limit Reporting

This project is subject to Numeric Action Levels (NALs) for pH and Turbidity as shown in the table below:

Parameter	Test Method	Detection Limit (Min)	Unit	Numeric Action Level
pH	Field test with calibrated portable instrument	0.2	pH units	Lower NAL = 6.5 Upper NAL = 8.5
Turbidity	Field test with calibrated portable instrument	1	NTU	250 NTU

If an NAL is exceeded a NAL Exceedance Report will be completed and submitted to the Resident Engineer within 48 hours of the storm event. The NAL Exceedance Report will include:

- Analytical methods, reporting units, and detection limits;
- Date, location, time of sampling, visual observation and measurements;
- Quantity of precipitation of the storm event;
- Description of BMP’s; and
- Corrective actions taken to manage the NAL exceedance.

Appendix XX contains a NAL Exceedance Report form. NAL exceedance reports will be filed in SWPPP file category 20.15 “Numeric Action Limit (NAL) Exceedance Reports.”

700.5.8 Data Evaluation

INSTRUCTIONS:

- The Construction General Permit requirements for an ATS include Numeric Effluent Limitation of 10 NTU for Daily Flow Weighted Average and 20 NTU for Any Single sample.

REQUIRED TEXT:

An evaluation of the ATS water quality sample analytical results shall be submitted to the Resident Engineer with the water quality analytical results and the QA/QC data for every event that samples are collected. The ATS monitoring test results shall be compared to the daily recorded water quality test results for the ATS. If the monitoring test results are not verifying the ATS daily recorded test results, then the WPCM or other personnel shall evaluate the to determine the probable cause for the non-verification.

As determined by the data and evaluation appropriate actions shall be taken so that the ATS is operating effectively.

Stormwater Sample Field Test Results Report formStormwater Sample Field Test Results Report form20.XX “ATS Monitoring Samples and Test Results.”

SECTION 800 POST CONSTRUCTION CONTROL PRACTICES

800.1 POST-CONSTRUCTION CONTROL PRACTICES

INSTRUCTIONS:

- Post-Construction BMPs are permanent measures installed during construction, designed to reduce or eliminate pollutant discharges from the site after construction is completed. Caltrans may provide listings, descriptions, and special operations and maintenance requirements for post-construction BMPs in the Stormwater Information Handout, which includes the Storm Water Data Report.

Provide descriptions of the BMPs employed after all construction phases have been completed at the site (Post-Construction BMPs). Direct reference to the Storm Water Data Report may be made if one is available for the project. Examples of post-construction measures are:

- Infiltration basins;
- Detention basins;
- Biofiltration strips and/or swales;
- Permanent erosion control, seeding and planting;
- Outlet protection/velocity dissipation devices;
- Earth dikes, drainage swales, and lined ditches;
- Bridge slope protection;
- Rock slope protection; and
- Mulching.

EXAMPLE:

The following are the post-construction BMPs that are to be used at this construction site after all construction is complete:

- Outlet protection/velocity dissipation devices at all culvert outlets;
- Rock slope protection in slopes under and adjacent to all bridges;
- All other slopes will be seeded with Erosion Control Type D, planted and protected with wood mulch;
- Numerous biofiltration strips and swales; and
- An infiltration basin.

Refer to the Storm Water Data Report for a complete summary and description of post-construction BMPs.

REQUIRED TEXT:

The following are the post-construction BMPs that are to be used at this construction site after all construction is complete:

Erosion Control (Hydroseed)

Erosion Control (Compost Blanket)

Fiber Rolls

800.2 POST CONSTRUCTION OPERATION/MAINTENANCE

INSTRUCTIONS:

- Caltrans may provide specific language for any operations and maintenance requirements of post-construction control practices via the Stormwater Information Handout or the Resident Engineer. Any pertinent language provided by Caltrans shall be added by the Contractor to this section of the SWPPP. The Storm Water Data Report may be referenced if one has been prepared for the project.
- For Caltrans projects that are covered by their Storm Water Management Plan, post-construction storm water management measures must be installed and a long-term maintenance plan must be established to qualify for terminating permit coverage. A long-term maintenance plan will be designed for a minimum of five years, and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained. BMPs will be implemented to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site (Post-construction BMPs).

List the parties responsible for long-term operation and maintenance of permanent BMPs. One of three alternatives must be included: (1) Caltrans regional maintenance staff; (2) a local agency or municipality; or (3) Caltrans maintenance staff and local agency or municipality (if the project maintenance will be shared or a portion of the project is to be maintained by a local agency). This information may be provided by Caltrans.

Describe the short and long-term funding sources for operations and maintenance.

For a project site that is, or has a portion that is, not under the jurisdiction of the Caltrans Stormwater Management Plan (e.g., encroachment permit projects), the following additional requirements apply on and after September 2, 2012 unless modified by the RWQCB. This information may be provided by Caltrans or the local Agency or private entity administering this project (see Section 100.1 Approval and Certification for local Agency or private entity identification).

Include the map and worksheets submitted with the NOI that demonstrates compliance with the Post-Construction Standards of the CGP Section XIII. Describe the non-structural controls to be used or the structural controls used if it was demonstrated that non-structural controls were infeasible or that structural controls would produce greater reduction in water quality impacts. Describe the controls used that will replicate the pre-project water balance (defined as the volume of rainfall that ends up as runoff) for the

**Stormwater Pollution Prevention Plan (SWPPP)
Sweet Ranch Mitigation Project
Contract No.04-172424**

smallest storms up to the 85th percentile storm event (or the smallest storm event that generates runoff, whichever is larger).

Describe how the volume that cannot be addressed using nonstructural practices shall be captured in structural practices. Include documentation of approval by the RWQCB.

Summarize the infeasibility of using non-structural practices on the project site, or the documentation that there will be fewer water quality impacts through the use of structural practices.

For sites whose disturbed area exceeds two acres, describe how the pre-construction drainage density (miles of stream length per square mile of drainage area) for all drainage areas within the area serving a first order stream or larger stream are preserved and how the postproject time of runoff concentration is ensured to be equal or greater than pre-project time of concentration.

The Contractor must notify the RE at least 45 days prior to the use of any structural control used to replicate the pre-project water balance for this project.

EXAMPLE:

The post-construction BMPs that are described above will be funded and maintained as follows:

Short Term Funding: Caltrans District 7 Maintenance

Long Term Funding: Caltrans District 7 Maintenance

The responsible party for the post-construction BMPs is Caltrans District 7 Maintenance. Refer to the Storm Water Data Report.

REQUIRED TEXT:

The post-construction BMPs that are described above will be funded and maintained as follows:

Short Term Funding: Follow up project at the same location

Long Term Funding: Endowment for maintenance of easement

The responsible party for the long-term maintenance of post-construction BMPs is Caltrans District 4 Maintenance

SECTION 900 SWPPP REPORTING REQUIREMENTS

900.1 RECORD KEEPING

REQUIRED TEXT:

To manage the various documents required to by the SWPPP and to provide easy access to the documents the following SWPPP file categories will be used to file SWPPP compliance documents:

- File Category 20.01 Annual Certification Of Compliance
- File Category 20.05 Subcontractor Contact Information and Notification Letters
- File Category 20.06 Material Suppliers Contact Information and Notification Letters
- File Category 20.07 Contractor Personnel Stormwater Training Documentation
- File Category 20.08 Water Pollution Control Schedule Updates
- File Category 20.09 Contractor Site Inspection Reports
- File Category 20.10 Rain Event Action Plans
- File Category 20.11 Notice of Discharge Reports
- File Category 20.12 Site Visual Monitoring Inspection Reports
- File Category 20.13 Non-Visible Pollutant Sampling and Test Results
- File Category 20.14 Turbidity and pH Sampling and Test Results
- File Category 20.15 Numeric Action Limit Exceedance Reports
- File Category 20.16 Numeric Effluent Limitaion Violation Reports
- File Category 20.17 Required Regional Water Board Monitoring Sampling and Test Results
- File Category 20.18 ATS Monitoring Sampling and Test Results
- File Category 20.19 Field Testing Equipment Maintenance and Calibration Records

Records shall be retained for a minimum of three years for the following items:

- Approved SWPPP document and amendments;
- Stormwater Site Inspection Reports;
- Site Inspection Report Corrections Summary;
- Rain Event Action Plans
- Notice of Discharge reports;
- Numeric Action Limit (NAL) Exceedance Reports;
- Numeric Effluent Limitaion Violation Reports;
- Sampling records and analysis reports;
- Annual Compliance Certifications; and

- Copies of all applicable permits.

900.2 STORMWATER ANNUAL REPORT

REQUIRED TEXT:

A Stormwater Annual Report will be prepared for this project to document the stormwater monitoring information and training information.

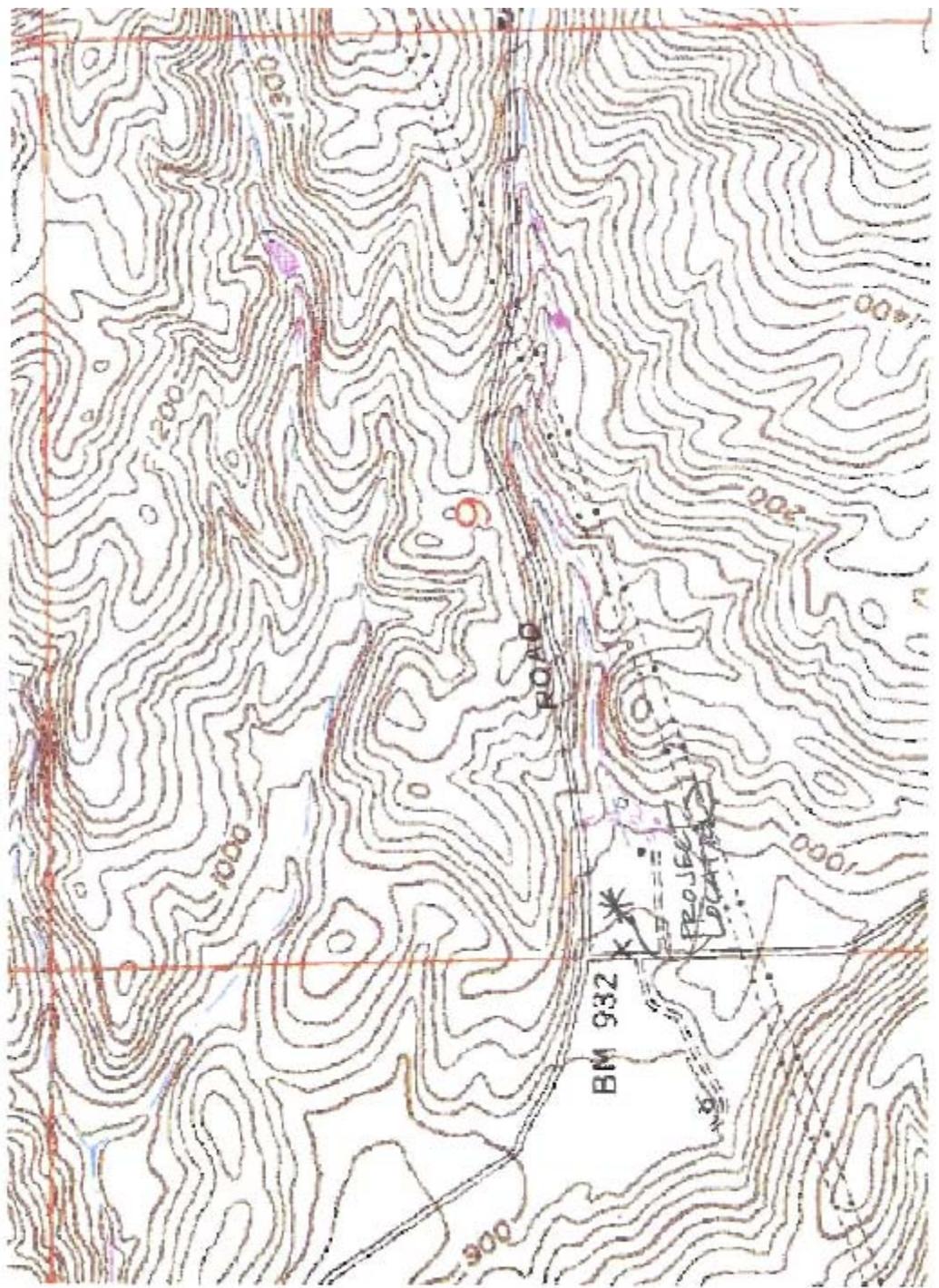
The stormwater motoring information to be included in the Stormwater Annual Report shall consist of:

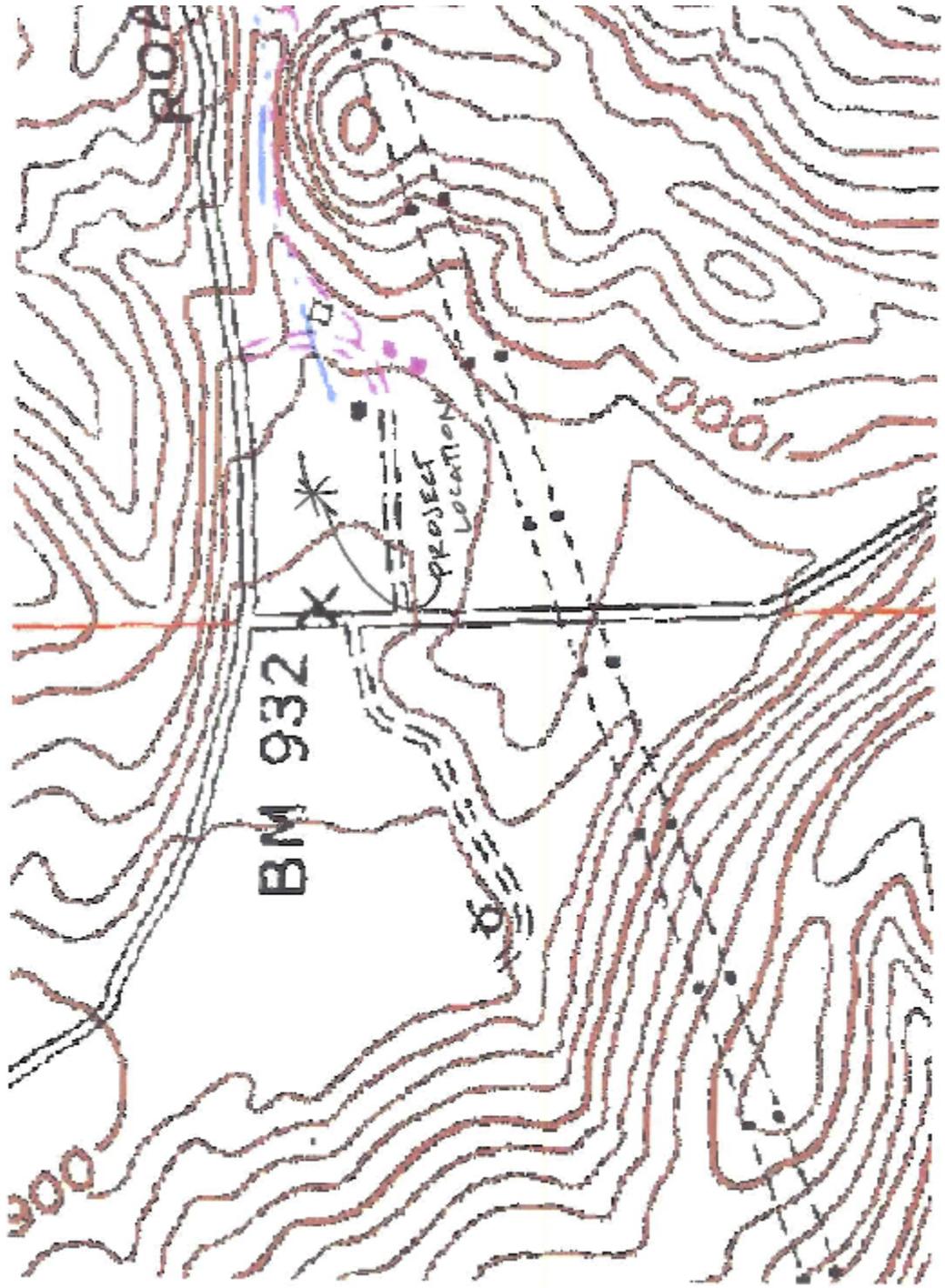
- A summary and evaluation of all sampling and analysis results, including copies of laboratory reports;
- The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter;
- A summary of all corrective actions taken during the compliance year;
- Identification of any compliance activities or corrective actions that were not implemented;
- A summary of all violations of the Construction General Permit;
- The names of individual(s) who performed site inspections, sampling, site visual monitoring inspections and/or measurements;
- The date, place, time of site inspections, sampling, site visual monitoring inspections, and/or measurements, including precipitation (rain gauge); and
- Any site visual monitoring inspection and sample collection exception records.

The stormwater training information to be included in the Stormwater Annual Report shall consist of:

- Documentation of all training for individuals responsible for all activities associated with compliance with the Construction General Permit;
- Documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
- Documentaion of all training for individuals responsible for overseeing, revising and amending the SWPPP.

Attachment C: Vicinity Map and Site Map





INDEX OF PLANS

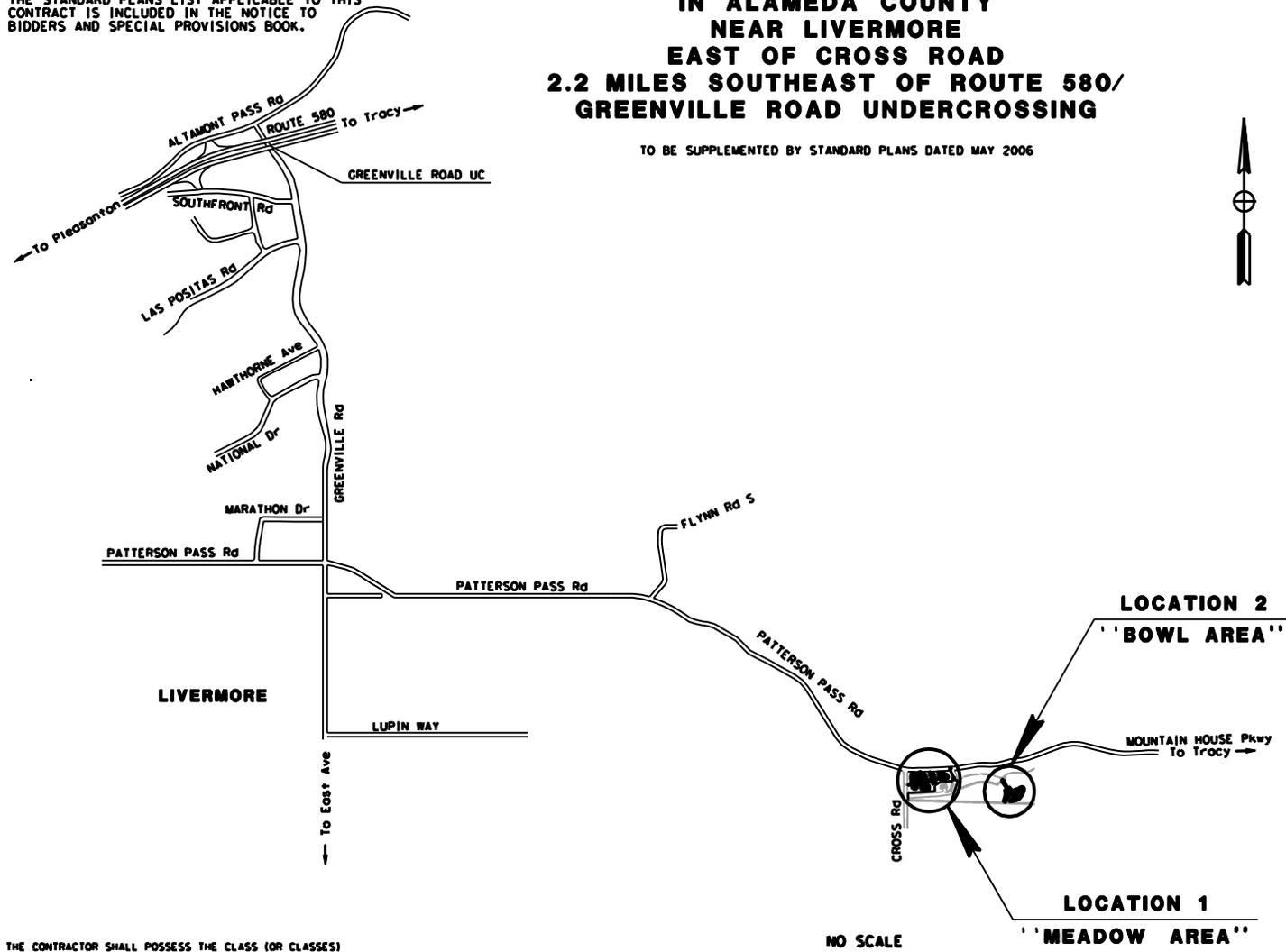
SHEET No.	DESCRIPTION
1	TITLE SHEET AND LOCATION MAP
2 & 3	LAYOUT
4 - 6	PROFILE
7 - 9	EROSION CONTROL PLAN, DETAILS
10 - 13	DRAINAGE PLAN, DETAILS AND QUANTITIES
14	SUMMARY OF QUANTITIES
15 - 19	REVISED & NEW STANDARD PLAN

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PROJECT PLANS FOR CONSTRUCTION NEAR
STATE HIGHWAY
IN ALAMEDA COUNTY
NEAR LIVERMORE
EAST OF CROSS ROAD
**2.2 MILES SOUTHEAST OF ROUTE 580/
 GREENVILLE ROAD UNDERCROSSING**

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Alc	580	R8.3	1	19



PROJECT MANAGER
 ROH NARAINA
 DESIGN ENGINEER
 HILLAL HANADAN

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

Hillal Hanadan 4-23-10
 PROJECT ENGINEER DATE
 REGISTERED CIVIL ENGINEER
 No. 67129
 May 10, 2010
 PLANS APPROVAL DATE
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



CONTRACT No. 04-172424



DATE PLOTTED => 6/14/2010
 TIME PLOTTED => 9:25:50 AM

Attachment E: Other Plans/Permits/Agreements

Link to new Construction General Permit:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

California Regional Water Quality Control Board San Francisco Bay Region



Dan Skopec
Acting Agency Secretary

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
<http://www.waterboards.ca.gov/sanfranciscobay>



Arnold Schwarzenegger
Governor

Date: **MAY 18 2006**
File No. 2199.9457 (BJT)
Site No. 02-01-C0884

Certified Mail No. 70033110000265559131

Mr. Ron Kiaaina
California Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, CA 94623

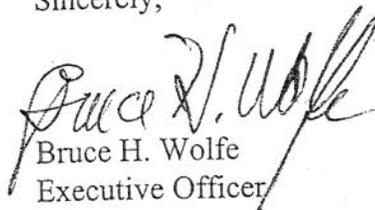
**Subject: Waste Discharge Requirements and Water Quality Certification for the Pigeon Pass
Route 84 Realignment Project**

Dear Mr. Kiaaina:

The San Francisco Bay Regional Water Quality Control Board adopted Order No. R2-2006-0033, Waste Discharge Requirements and Water Quality Certification for the Pigeon Pass Route 84 Realignment Project, on May 10, 2006. The adopted Order is attached.

If you have any questions, comments, or concerns, please contact Brendan Thompson of my staff at (510) 622-2506, or via e-mail to BThompson@waterboards.ca.gov.

Sincerely,


Bruce H. Wolfe
Executive Officer

cc: Mr. Oscar Balaguer, SWRCB-DWQ
Mr. Hal Durio, Regulatory Branch, USACE
Ms. Marcia Grefsrud, CDFG, Yountville
✓ Hardeep Takhar, Caltrans

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. R2-2006-0033

WASTE DISCHARGE REQUIREMENTS AND WATER QUALITY CERTIFICATION FOR:
CALIFORNIA DEPARTMENT OF TRANSPORTATION

PIGEON PASS STATE ROUTE 84 REALIGNMENT PROJECT, ALAMEDA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter Water Board, finds that:

1. The California Department of Transportation (hereinafter the Department) proposes to realign a 2.3-mile portion of State Route 84 (hereinafter SR 84), from Post Mile 20.7 to Post Mile 23.0, between the City of Livermore and Interstate 680, in an unincorporated area of Alameda County. The Project consists of the following elements:
 - a. Improvement of the existing SR 84 by realigning steep and winding portions, installing truck-climbing lanes, and widening to current Federal Highway standards;
 - b. Conversion of portions of the existing SR 84 alignment to frontage road; and
 - c. Obliteration of portions of the existing SR 84.
2. Project construction is expected to occur over a three-year period, beginning in March 2007, and ending in October 2010. Construction will be divided into three phases:
 - a. Construction of the westernmost two-thirds of the new frontage road and temporary detour road;
 - b. Construction of the majority of the realigned Route 84; and
 - c. Construction of the last one-third of the frontage road, removal of the temporary detour, and smoothing the transitions between the new and existing roadway.
3. There are approximately 4.66 acres of jurisdictional waters of the United States, including creeks and wetlands, on the Project site that are waters of the State and delineated waters of the United States. The site's waters are comprised of:
 - a. Approximately 5,318 linear feet (0.61 acres) of freshwater seasonal creeks; and
 - b. Approximately 4.05 acres freshwater seasonal wetlands.
4. The Project will result in the placement of approximately 654,000 cubic yards of cut and fill, with all cut being used on-site, and no import of fill material. 4,130 cubic yards of earth will permanently fill approximately 2.21 acres of jurisdictional waters of the United States, comprised of 1.87 acres of fresh seasonal wetlands and 2,775 linear feet (0.34 acres) of freshwater seasonal creeks, which includes mature oak woodland riparian forest. Project activities will temporarily disturb 0.42 acres of jurisdictional waters of the United States, comprised of 0.35 acres of freshwater seasonal wetlands, and 440 linear feet (0.07 acres) of freshwater seasonal creeks.

5. Portions of the waters on the Project site serve as habitat for the federally and state-listed threatened California red-legged frog (*Rana aurora draytonii*, hereinafter CRLF) and California tiger salamander (*Ambystoma californiense*, hereinafter CTS). The Project site also provides habitat for the federally-listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*, hereinafter VPFS).
6. **Mitigation Plan:** To mitigate for permanent and temporary fill of 2.21 and 0.42 acres of wetlands, respectively, a combination of on and off-site mitigation will be implemented, as described in the Department's Draft Revised Water Quality Certification Mitigation and Monitoring Report (hereinafter Draft Report), dated, "Revised Draft 2006," and received by the Water Board on March 13, 2006. The Draft Report does not propose mitigation sufficient to fully address the proposed Project impacts. This Order requires the Department to complete additional mitigation to fully address all impacts. The Draft Report's proposed mitigation consists of the following:
 - a. **On-site creation.** 0.92 acres of freshwater seasonal wetland and 791 linear feet (0.18 acres) of freshwater seasonal creeks will be created on-site. Existing freshwater seasonal wetlands will be expanded to create 0.43 acres of new wetlands. 0.49 acres of freshwater seasonal wetlands will be created on-site, at locations not historically wetlands, using excavated soil from permanently impacted wetland areas on-site. Approximately 791 feet (0.18 acres) of seasonal creek channel will be created adjacent to the existing tributary to Arroyo del Valle, which is proposed to be permanently impacted by the Project.
 - b. **On-site restoration.** To mitigate for a portion of the Project's 0.42 acres of temporary impacts to habitat, the Department is proposing to restore 0.42 acres of temporarily disturbed areas within the Project site. Temporarily disturbed areas will be restored on an ongoing basis throughout the life of the Project immediately following completion of construction in each section.
 - c. **On-site enhancement.** The Department also proposes to enhance approximately 1,510 linear feet (460 meters) of riparian oak woodland habitat along the ephemeral creek paralleling Highway 84 from Station 72+80 through 77+40, downstream from the relocated creek channel.
 - d. **On-site creek relocation.** An estimated 535 linear feet of the 2,775 feet of impacted channel are being relocated at the east end of the project from stations 80+35 to 81+05, and 81+50 to 82+40. Caltrans has not proposed taking credit for this channel relocation as mitigation to offset channel loss since a future project may result in impacts to the relocated channel. These relocated channel portions are anticipated to be in place at least until the completion of the Alameda 84 realignment project, in 2010, and at least 5 years prior to any future impacts, thus serving to offset temporal losses on the project.
 - e. **Off-site enhancement and creation.** The Department has proposed wetland creation and riparian enhancement mitigation on privately owned and actively grazed rangeland on the southern side of Patterson Pass Road, immediately east of Cross Rd.

in the city of Livermore (Sweet Property). The site contains hillside seeps and an unnamed tributary to the Arroyo Mocho. Proposed mitigation at the Sweet Property includes creation of 2.5 acres of freshwater seasonal wetlands, enhancement of 5,410 linear feet of degraded creek, preservation of 52 acres of contiguous upland grassland, a grazing management plan, and conservation easements over the mitigation areas.

The mitigation proposed in the Draft Report would not fully mitigate for the proposed creek impacts, in part because the Department has not yet been able to identify or does not yet have fully in place all mitigation locations, mitigation site functions and values, detailed mitigation designs, draft conservation easement agreements, a timeline identifying when mitigation would be completed, and appropriate compensation for permanent impacts to riparian waters. The Department will also be permanently impacting special-status species habitat and a significant length and area of mature oak riparian forest. Additionally, while the proposed mitigation would be in-kind, significant portions would be located off-site. Pursuant to the California Wetlands Conservation Policy and the Basin Plan, the Board shall generally require additional mitigation when the mitigation is implemented off-site. Therefore, this Order requires that jurisdictional wetlands and waters be mitigated by ensuring the successful restoration or creation of, at a minimum, a total of 5.6 acres of freshwater seasonal wetlands, and 11,900 linear feet of enhanced freshwater seasonal creeks, at one or more locations that are simultaneously within Alameda County and within the Alameda Creek Watershed. The remaining required mitigation after implementation of the 1,510 linear feet of proposed on-site creek enhancement and off-site mitigation comprised of creation of 2.5 acres of freshwater seasonal wetlands and enhancement of 5,400 linear feet of creek at the Sweet Property will be 2.1 acres of wetlands creation and 4,980 linear feet of creek enhancement.

The Water Board recognizes that some mitigation sites may also provide opportunities to complete preservation and enhancement of waters and wetlands. The Department may propose a creek and wetland mitigation package that substitutes preservation and enhancement for a portion of the required restoration and creation. Such substitution must be in all cases beyond the overall benefit provided by the wetland and creek restoration and creation required by this Order.

Mitigation will be provided on private lands as identified by the Alameda County Conservation Partnership (ACCP). The ACCP is a joint project of the Alameda County Resource Conservation District and the Natural Resources Conservation Service (NRCS) that has crafted a streamlined permit process and implementation plan for improving and preserving special-status wildlife habitat on private ranch lands. The ACCP has identified approximately 25 deteriorating agricultural stock ponds throughout Alameda County that are in need of immediate repair to prevent complete failure and loss of wildlife habitat. The Department will ensure the restoration and preservation in perpetuity of wetlands and waters on these private lands. Upon restoration, conservation easements will be placed on all mitigation areas.

Restoration work is proposed to commence in the fall of 2006. In the event that mitigation goals at the Sweet Property cannot be provided on or before January 31, 2008, the remaining required mitigation at the Sweet Property, plus an additional one-fifth of that remaining required mitigation, shall be constructed prior to January 31, 2009. For every year of delay thereafter, the required amount of remaining off-site mitigation shall be increased by one-fifth, on an areal basis for seasonal wetlands, and on a linear foot basis for riparian waters. Construction of all off-site mitigation requirements shall be provided on or before January 31, 2010.

7. On-site wetlands and waters will be created and enhanced in the following areas, as the highway runs from the southwest to the northeast (station numbers correspond to the proposed roadway, and are in meters):
 - a. 0.05 acres of freshwater seasonal wetlands will be created between stations 58+80 and 60+80, where 0.24 of 0.60 acres of an old livestock stock pond are to be permanently filled. A new berm will be installed at the uphill end of the existing wetland area to allow additional ponding to the east and north.
 - b. 0.37 acres of shallow, freshwater seasonal wetlands will be created on the northeastern side of the proposed roadway, between stations 62+80 and 63+60. To accommodate the new wetlands, culverts will be removed at the existing location and the site will be graded to promote ponding. The new wetlands will drain into ephemeral tributaries of San Antonio Reservoir.
 - c. 0.47 acres of 1.22 acres of existing wetlands will be expanded by 0.27 acres at its southern and northern portions, between stations 67+00 and 68+80. The 1.22 acres of wetlands provide breeding habitat for the CTS and VPFS, and has been found to contain CTS larva and VPFS cysts. 0.75-acres of the wetlands will be permanently impacted by the proposed Project.
 - d. On-site creation of waters consists of filling and relocating an ephemeral creek channel from its existing location to the toe of a new slope where the slope intersects the bank of the existing creek. The proposed channel will be broken into four segments totaling 791 linear feet (0.18 acres) between stations 69+65 and 72+80. 220 linear feet are proposed to be unvegetated, rock-lined channels, and 571 linear feet are proposed to have a combination of natural and rock-lined bottom. Rock weirs will be placed within the channel at locations to create two freshwater seasonal wetland areas, as mentioned below in e and f. The area of the in-stream created wetlands will not be calculated into the linear feet or acreage totals for created freshwater seasonal creeks, but rather, totaled into the acreage totals for created seasonal freshwater wetlands.
 - e. 0.07-acres of freshwater seasonal wetlands are planned to be created immediately adjacent to the western side of the proposed roadway, between stations 70+10 and 70+40. The wetlands would lie adjacent to the former location of 0.12 acres of freshwater seasonal wetlands, which is proposed to be permanently impacted by the Project. The wetlands will be created between two in-stream rock weirs.
 - f. 0.05 acres of freshwater seasonal wetlands are proposed for the western side of the roadway, between stations 71+50 and 71+80. The wetlands will be created between two in-stream rock weirs.

- g. Enhancement of 1,510 linear feet of existing creek channel from Station 72+80 through 77+40. Enhancement activities include planting approximately 1.01 acres (43,938 square feet) of oak woodland tree and shrub species along the currently grazed stream corridor, in areas currently devoid of vegetation. The creek corridor, varying from approximately 600 feet to 2,000 feet in width between the toe of new slope and the old highway, will also be removed from grazing activities, since it will be fully fenced off within the Caltrans right-of-way.
 - h. 0.10 acres of additional freshwater seasonal wetlands will be created on the northern side of the proposed roadway between stations 77+10 and 77+60, by expanding existing wetlands to the west. The created wetlands will receive water via a culvert draining from wetlands at the opposite side of the proposed roadway.
 - i. Recreation of approximately 535 linear feet of channel between Stations 80+40 and 82+40.
8. To mitigate for a portion of the temporal losses of wetlands and waters resulting from the time delay between commencement of wetland impacts and successful wetland restoration or creation, the Department will initiate the off-site creation, preservation, and restoration of wetlands prior to the onset of wetland habitat impacts. Additionally, the Department will restore wetlands and waters temporarily impacted by Project activities, immediately following that portion of Project construction. The Department will provide the Water Board with impact and restoration activity time schedules throughout the life of the Project. The time schedules will allow the Water Board to determine if temporary impacts are being restored in a timely manner, as proposed in the Final Mitigation Plan, as well as determine the compliance status of off-site mitigation activities as identified in Finding 6.e.
9. **Vernal Pool Fairy Shrimp:** The Department has been given terms and conditions by the USFWS, in the Project's Biological Opinion issued February 28, 2005, and the Amendment to the Biological Opinion, dated April 27, 2005, to ensure the implementation of Reasonable and Prudent Measures to minimize Project impacts to the VPFS. To mitigate for potential impacts to the VPFS, the Department will reserve \$216,300 to be used for in-lieu payments for 2.06-acres of VPFS habitat. The funds shall be released by the Department upon instruction from the USFWS. This Order requires the Department to ensure the purchase of at least 2.06 acres of VPFS habitat on or before October 1, 2010.
10. **California Tiger Salamander:** The proposed Project is within critical habitat proposed for the CTS by the USFWS. The Department has been given terms and conditions by the USFWS, in the Biological Opinion issued February 28, 2005, and the Amendment to the Biological Opinion, dated April 27, 2005, to ensure the implementation of Reasonable and Prudent Measures to minimize Project impacts to the CTS. To compensate for impacts to CTS habitat, the Department is proposing to purchase 80 credit acres for CTS habitat, as well as provide \$650,000 to be reserved in an internal account for future funding to be used to conserve habitat for the San Joaquin Kit Fox and the East Bay Unit of the CTS. The East Bay region generally includes the area from Alameda County south to Santa Benito and Santa Clara counties, and western Merced County. This Order requires the Department to ensure the purchase of 80 credit acres of CTS habitat on or before October 1, 2010.

To minimize impacts to the CTS, the Department will:

- Restrict construction around the CTS pond to a period when the pond is dry and there is not CTS breeding activity;
- Prohibit ground disturbance activities between October 31 and March 1 outside the limits of the established road bed; and,
- Work with the California Department of Fish and Game (CDFG) to find and relocate CTS one year prior to Project construction.

11. **California Red-Legged Frog:** The proposed Project is within critical habitat proposed for the CRLF by the USFWS. The Department has been given terms and conditions by the USFWS, in the Project's Biological Opinion issued February 28, 2005, and the Amendment to the Biological Opinion, dated April 27, 2005, to ensure the implementation of Reasonable and Prudent Measures to minimize Project impacts to the CRLF. To mitigate for the potential impacts to the CRLF, the Department has purchased 25 acres of CRLF habitat at the Ohlone Preservation Conservation Bank. A CRLF survey and relocation program will be completed on the Project site prior to the initiation of Project construction.
12. **Conservation Easement:** The Department shall submit a Final Mitigation and Monitoring Report (Final Mitigation Plan) that is acceptable to the Executive Officer, and that modifies the Draft Report. The Final Mitigation Plan will include how the mitigation lands are to be managed and preserved under the conservation easements. The long-term management of the mitigation sites will be provided using CDFG's model Conservation Easement (CE) as a template (see Attachment 1), and the management guidelines of the NRCS, acceptable to the Executive Officer. The CE shall identify the entities responsible for the long-term management of the mitigation sites. The accepted conservation easements shall be recorded not later than January 31, 2011, and within one year of the date of mitigation construction completion on any parcel with mitigation, whichever is earlier.
13. **Long-term Management:** This Order requires the Department to submit, prior to the start of Project construction, Property Analysis Records (PAR), or equivalent analyses estimating the endowment amounts necessary for the appropriate management, in perpetuity, of the mitigation areas. This Order requires these amounts be included as part of the Final Mitigation Plan.
14. **Post-construction stormwater management:** Operation of the reconfigured SR84 will impact beneficial uses through the discharge of stormwater containing automobile-related pollutants (e.g. oil, grease, heavy metals, etc.). To address the Project's post-construction impacts to beneficial uses, the Department proposed to install biofiltration strips along portions of the reconfigured SR 84. The strips would treat pollutants from approximately 12 acres, or 50% of the impervious surfaces within the Project limits.

Post-construction stormwater treatment controls (e.g., biofiltration strips) were not incorporated into the project design during the planning phase, but rather, the placement of treatment controls were evaluated for feasibility within the spatial limits of the final Project design. Consequently, the amount of impervious area that could be treated by stormwater

treatment controls is necessarily limited by the remaining available right-of-way within the Project area. Opportunities for treatment of roadway pollutants are further limited, given that portions of the proposed treatment controls are planned in areas subject to planned future roadway expansion. As such, to provide post-construction stormwater treatment to the maximum extent practicable, as required in State Water Resources Control Board Water Quality Order No. 99-06-DWQ, the NPDES Statewide Permit for Storm Water Discharges From the State of California Department of Transportation Properties, Facilities, and Activities (hereinafter Statewide Permit), the Department may collaborate with the City of Livermore (City) and the Alameda County Zone 7 Flood Control District (Zone 7) to provide for the treatment of dry weather urban runoff from approximately 1536 acres of existing residential and commercial areas discharging to the Arroyo Las Positas, nearby the Springtown Golf Course in the City of Livermore. The treatment would involve capture and filtration of dry-weather urban runoff through the use of a vegetated basin and swale(s). The Department would provide a water quality benefit equivalent to effectively treating 80 – 90% of average annual runoff from the SR84 Project site. Any additional treatment provided above that level of water quality benefit would be applied to future Department projects with stormwater requirements. Should this proposal prove infeasible, then the Department will provide alternate treatment, which may include treatment of stormwater runoff from the reconfigured SR84.

In the event that an arrangement cannot be reached between Zone 7 and the City, the Department shall provide the Water Board with alternate treatment that provides a water quality benefit equivalent to effectively treating 80 – 90% of average annual runoff from the Project.

15. **Hydromodification:** Project implementation will result in an increase of 14.2 acres of impervious surface. As a result, in comparison with the pre-Project conditions, stormwater runoff will be discharged from the Project site at greater volumes and over a shorter period of time following storm events. Consequently, operation of the Project will increase the potential for creek bed and bank erosion impacts downstream of the Project site.

The Department has submitted hydrologic data and analysis that represents changes in impervious surface and runoff coefficients for each watershed within the Project limits. Based upon an analysis of the data, the Department has concluded that changes in impervious surfaces will not result in significant hydromodification impacts downstream of the Project site. Based on a review of the submitted analyses and their underlying data, additional mitigation to address potential hydromodification impacts is not required in this Order.

16. On January 18, 2006, the Department submitted an initial application for Water Quality Certification and Waste Discharge Requirements for the Project. That application was subsequently completed by additional submittals.
17. The Water Board has determined to regulate the proposed discharge of fill materials into waters of the State by issuance of Waste Discharge Requirements (WDRs) pursuant to Section 13263 of the California Water Code (CWC) and 23 CCR §3857, in addition to issuing certification pursuant to 23 CCR §3859. The Water Board considers WDRs

necessary to adequately address impacts and mitigation to beneficial uses of waters of the State from this project, to meet the objectives of the California Wetlands Conservation Policy (Executive Order W-59-93), and to accommodate and require appropriate changes over the life of the project and its construction.

18. The Water Board, on June 21, 1995, adopted, in accordance with Section 13244 et seq. of the CWC, a revised Water Quality Control Plan, San Francisco Bay Basin (Basin Plan). This updated and consolidated revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in 23 CCR Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters. This Order is in compliance with the Basin Plan.

19. The subject wetlands, seasonal creeks, and other waters on the Project site are located in the South Bay Basin, and are tributaries to either Arroyo Valle, Vallecitos Creek, or San Antonio Reservoir. Vallecitos Creek is a tributary to Arroyo de la Laguna and Alameda Creek. The Basin Plan does not explicitly designate beneficial uses for waters on the Project site. However, the Basin Plan states that “[t]he beneficial uses of any specifically identified waterbody generally apply to all of its tributaries.” The following existing beneficial uses defined in the Basin Plan for identified waterbodies are:

- Agricultural supply (Alameda Creek);
- Cold freshwater habitat (Alameda Creek, Arroyo Valle, San Antonio Reservoir);
- Groundwater recharge (Alameda Creek, Arroyo de la Laguna, Arroyo Valle);
- Fish migration (Alameda Creek, Arroyo de la Laguna);
- Municipal and domestic water supply (Arroyo Valle, San Antonio Reservoir);
- Water contact recreation (Alameda Creek, Arroyo de la Laguna,);
- Non-contact water recreation (Alameda Creek, Arroyo de la Laguna, San Antonio Reservoir);
- Fish spawning (Alameda Creek, Arroyo de la Laguna, Arroyo Valle, San Antonio Reservoir);
- Warm freshwater habitat (Alameda Creek, San Antonio Reservoir); and,
- Wildlife habitat (Alameda Creek, Arroyo de la Laguna, Arroyo Valle, San Antonio Reservoir).

Additionally, waters on the Project site provide habitat for the preservation of protected species, including the federally and state-listed threatened CRLF and CTS. The Project site also provides habitat for the federally-listed threatened VPFS.

20. The Basin Plan Wetland Fill Policy (policy) establishes that there is to be no net loss of wetland acreage and no net loss of wetland value, when the project and any proposed mitigation are evaluated together, and that mitigation for wetland fill projects is to be located in the same area of the Region, whenever possible, as the project. The policy further establishes that wetland disturbance should be avoided whenever possible, and if not possible, should be minimized, and only after avoidance and minimization of impact should mitigation for lost wetlands be considered.

21. The goals of the California Wetlands Conservation Policy (Executive Order W-59-93, signed August 23, 1993,) include ensuring “no overall loss” and achieving a “...long-term net gain in the quantity, quality, and permanence of wetland acreage and values...” Senate Concurrent Resolution No. 28 states that “[i]t is the intent of the legislature to preserve, protect, restore, and enhance California’s wetlands and the multiple resources which depend upon them for benefit of the people of the State.” Section 13142.5 of the CWC requires that the “[h]ighest priority shall be given to improving or eliminating discharges that adversely affect...wetlands, estuaries, and other biologically sensitive areas.”
22. With the successful implementation of the mitigation measures described in these findings and the provisions, the Water Board finds that the Project will comply with the California Wetlands Conservation Policy and Basin Plan Wetland Fill Policy referenced in Findings 20 and 21.
23. This Order applies to the temporary and permanent fill and indirect impacts to waters of the State associated with the Project, which is comprised of the components listed in Finding 1.
24. The Department has submitted an Alternatives Analysis to show that appropriate effort was made to avoid and then to minimize wetland disturbance, as required by the Basin Plan. Water Board and federal agency staff held additional discussions with the Department regarding its Alternatives Analysis. The Water Board concurs with the conclusions of the Alternatives Analysis.
25. Discharges of stormwater associated with construction activity will occur. The Department is responsible for obtaining appropriate permits for these discharges, including complying with the rules and regulations of National Pollutant Discharge Elimination System (NPDES) permit requirements. This includes complying with the requirements of its Statewide Permit.
26. Because of the Project’s proximity to sensitive resources, including special status species habitat, and potential to discharge materials that could significantly impact those resources, this Order requires the Department to submit a Storm Water Pollution Prevention Plan (SWPPP) for the Project, prepared pursuant to the provisions of its Statewide Permit, at least 60 days prior to the beginning of construction for the Project.
27. Discharges of ground water or other non-storm water during construction may be required. This Order considers such discharges covered by the Statewide Permit, contingent on submittal of an acceptable discharge plan at least 30 days prior to such a discharge.
28. The California Environmental Quality Act (CEQA) requires all projects approved by State agencies to be in full compliance with CEQA, and requires a lead agency to prepare an appropriate environmental document (e.g., Environmental Impact Report or Negative Declaration) for such projects. The Water Board has reviewed the Project’s environmental documents, and finds that all environmental impacts have been identified for the project activities it is required to approve, and that with compliance with the conditions of this Order, that mitigation measures and/or alternatives have been incorporated to reduce those

impacts to a level of insignificance. On April 19, 2005, the Department issued a Negative Declaration indicating that the Project would not have a significant impact on the environment.

29. The Department has applied to the U.S. Army Corps of Engineers (Corps) for an Individual Permit for the Project under Section 404 of the Clean Water Act.
30. In February 2005, the United States Fish and Wildlife Service (USFWS) issued a Biological Opinion, and an amendment in April 2005, for the Project (USFWS File No. 1-1-04-F-0115), finding that it is not likely to jeopardize the existence of either the CRLF, CTS, or the VPFS.
31. Pursuant to 23 CCR Sections 3857 and 3859, the Board is issuing WDRs and Water Quality Certification for the Project as described herein.
32. The Water Board has notified the Corps, Alameda County, the City of Livermore, the City of Pleasanton, USFWS, CDFG, and other interested agencies and persons of its intent to prescribe WDRs and Water Quality Certification for this discharge.
33. The Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
34. Project files are maintained at the Water Board under file number 2199.9457 and site number 02-01-C0884.

IT IS HEREBY ORDERED that the Department, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, shall comply with the following, pursuant to authority under CWC Sections 13263 and 13267:

A. Discharge Prohibitions

1. The direct discharge of wastes, including rubbish, refuse, bark, sawdust, concrete, asphalt, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plains, is prohibited.
2. The discharge of floating oil or other floating materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.
3. The discharge of silt, sand, clay, or other earthen materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.
4. The wetland fill activities subject to these requirements shall not cause a nuisance as defined in CWC § 13050(m).

5. The discharge of decant water from active dredging or fill sites and dredged material/wet sediment stockpile or storage areas to surface waters or surface water drainage courses is prohibited, except as conditionally allowed following the submittal of a discharge plan or plans as described in the Provisions.
6. The groundwater in the vicinity of the Project shall not be degraded as a result of the Project activities or placement of fill for the Project.
7. The discharge of materials other than stormwater, which are not otherwise regulated by a separate NPDES permit or allowed by this Order, to waters of the State is prohibited.
8. The discharge of drilling muds to waters of the State, or where such muds could be discharged to waters of the State, is prohibited.

B. Receiving Water Limitations

1. The discharges shall not cause the following conditions to exist in waters of the State at any place:
 - a. Floating, suspended, or deposited macroscopic particulate matter or foam in concentrations that cause nuisance or adversely affect beneficial uses;
 - b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;
 - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
 - e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.
2. The discharges shall not cause nuisance, or adversely affect the beneficial uses of the receiving water.
3. The discharges shall not cause the following limits to be exceeded in waters of the State at any one place within one foot of the water surface:
 - a. Dissolved Oxygen: 5.0 mg/L, minimum

The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, then the discharges shall not cause further reduction in ambient dissolved oxygen concentrations.

- c. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH by more than 0.5 pH units.
- e. Nutrients: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

C. Provisions

1. The Department shall comply with all Prohibitions, Receiving Water Limitations, and Provisions of this Order immediately upon adoption of this Order or as provided below.
2. The Department shall submit copies of all necessary approvals and/or permits for the Project and mitigation projects from applicable government agencies, including, but not limited to, CDFG, USFWS, and the Corps, for each Project component applicable to that component, prior to the start of construction on that component.

Project Implementation Deadlines

3. Not later than 90 days following the adoption of the Order, the Department shall submit a Final Mitigation and Monitoring Plan that is acceptable to the Executive Officer, and that modifies the Draft Report and is consistent with the requirements of this Order, including dates and deadlines, and which provides for mitigation monitoring and maintenance until the regulatory agencies concur that the mitigation has been successfully completed. The Final Mitigation and Monitoring Plan shall not be deemed acceptable until the Department has received written notification of such acceptance from the Executive Officer. Similarly, the Department is responsible for monitoring and maintenance of Project mitigation until it has received a letter from the Executive Officer accepting the mitigation as complete. The Final Mitigation and Monitoring Plan must include a complete mitigation and monitoring plan for both the proposed on-site and off-site creek and seasonal wetland mitigation, including:
 - a. Planting plans and details for all on- and off-site mitigation, such as designs and construction drawings for in-stream structures, pond reconstructions, grading, planting, and irrigation plans, and all other information, as appropriate;
 - b. A minimum 5-year monitoring period for all wetland restoration activities, including creation and enhancement;

- c. A minimum 10-year monitoring period for all riparian restoration activities, including creation and enhancement;
- d. Performance standards and success criteria for mitigation;
- e. Specific locations and descriptions of reference sites to be used for evaluation of on-site and off-site mitigation success criteria;
- f. For the proposed mitigation locations, the proposed final conservation easements that identify, among other things, the entity or entities that will hold those easements after the monitoring period specified in 3.b and 3.c above;
- g. A finalized financial assurance proposal with all appropriate detail on financial assurances being provided to ensure the establishment and success, in perpetuity, of the proposed mitigation, and including appropriately detailed finalized estimates on the amount of the related financial assurances; and,
- h. A plan to ensure the restoration of temporarily disturbed areas on the Project site immediately following completion of construction in each section.

The Final Mitigation and Monitoring Plan may be amended subject to the review and approval of the Executive Officer. Project construction may not commence until the Final Mitigation and Monitoring Plan has been accepted in writing by the Executive Officer.

4. Not later than 90 days following the adoption of the Order, the Department shall provide, subject to the approval of the Executive Officer, a work plan identifying a timeline to implement the remaining mitigation requirements of this Order. The work plan should include dates for submission of all appropriate mitigation details.
5. The accepted conservation easements shall be recorded not later than January 31, 2011, and within one year of the date of mitigation construction completion on any parcel with mitigation, whichever is earlier.
6. To fully mitigate for proposed Project impacts, the Department shall ensure the successful creation and enhancement on-site of 791 and 1,510 linear feet, respectively, of freshwater seasonal creeks, and the creation of 0.92 acres of freshwater seasonal wetlands. Additionally, the Department shall ensure the successful restoration or creation of, at a minimum, 5.6 acres of freshwater seasonal wetlands, and the enhancement of 11,900 linear feet of freshwater seasonal creeks, to be completed no later than January 31, 2008. The 1,510 linear feet of on-site enhancement shall be applied towards the total required creek enhancement. If the Department cannot meet its off-site mitigation requirements on or before January 31, 2008, then additional mitigation requirements and implementation deadlines will apply, as described below in Provision 7. Additionally, the Water Board recognizes that some mitigation sites may also provide opportunities to complete preservation and enhancement of wetlands and waters. The Department may propose a creek and wetland mitigation package, acceptable to the Executive Officer, that substitutes preservation and enhancement for a portion of the required restoration and creation. Such substitution must be in all cases beyond the overall benefit provided by the wetland and creek restoration and creation required by this Order.

7. If all required off-site mitigation proposed in the Final Mitigation and Monitoring Plan as occurring in Fall 2006 through Fall 2007 (specifically, the creek enhancement, wetland creation, and related work on the Sweet property adjacent to Patterson Pass Road) is not constructed by January 31, 2008, the Department shall submit, subject to approval by the Executive Officer, a mitigation proposal to provide the balance of the remaining mitigation required on the Sweet property, plus an additional one-fifth of that remaining required mitigation, to be constructed prior to January 31, 2009. For every year of delay thereafter, the required amount of remaining off-site mitigation shall be increased by one-fifth, on an areal basis for seasonal wetlands, and on a linear foot basis for riparian waters.
8. Construction of all off-site mitigation shall be completed by January 31, 2010. Construction, not including monitoring and establishment, of all on-site mitigation requirements shall be completed within one year of Project construction completion. The Department shall notify the Executive Officer of the completed construction, by letter, not later than one week after construction has been completed.
9. Off-site mitigation shall be located within the Arroyo de la Laguna and Upper Alameda Creek sub-watersheds of the Alameda Creek Watershed, on sites that are also within Alameda County and within the boundaries of this Water Board.
10. Should the mitigation that the Department implements to satisfy the requirements of this Order result in a level of mitigation beyond what is required in this Order, in terms of quality, or in terms of implementation preceding the impacts they are mitigating for, the level of additional benefit may be applied as mitigation credit, subject to the approval of the Executive Officer, to this, or other Department projects impacting Waters of the State.
11. Not later than 90 days following adoption of the Order, the Department shall submit an updated alternate stormwater treatment proposal acceptable to the Executive Officer that includes all appropriate plans, calculations, narrative description of the proposal, design details, and related information. If a complete proposal cannot be submitted as identified above, then the Department shall submit a work plan for submitting all appropriate plans, calculations, narrative description of the proposal, design details, and related information, with deadlines for submittal of detailed plans and the completion of construction for the proposed stormwater controls. This proposal can be submitted as part of the Final Mitigation and Monitoring Plan, and shall include a level of treatment that has equivalent water quality benefit to effectively treating 80 – 90% of average annual runoff from the Project.
12. The Department shall fully implement any alternate stormwater treatment proposal prior to completion of the third stage of Project construction, as identified in Finding 2.
13. The Department shall submit annual mitigation monitoring reports acceptable to the Executive Officer no later than January 31 of each year until the mitigation sites have met their performance standards and final success criteria and the Executive Officer has accepted a notice of mitigation completion for each site, but for not less than a period of

five years and no less than a period of two years after any mitigation habitat irrigation systems have been terminated. If the mitigation and monitoring program indicates that establishment of the habitat is not progressing in a manner or rate consistent with the success criteria proposed and approved by the Executive Officer, the annual mitigation monitoring reports shall evaluate the probable cause(s) of any problems and propose appropriate corrective measures.

14. Not later than 60 days prior to commencement of each major phase of Project activities, as identified in Finding 2, the Department shall submit a schedule of Project implementation that includes the dates of impact, restoration, and/or creation as well as areas and lengths, of wetlands and waters to be temporarily and permanently impacted, restored, and/or created. The Department shall notify the Water Board immediately upon deviation from the submitted schedule of implementation.
15. Following the end of each construction season (April 1 – October 31), and no later than December 31, the Department shall provide an updated summary detailing the extent of impacts to wetlands and waters, with dates and waterbodies identified, as well as areas that have been restored during that year.
16. Not later than 60 days prior to the beginning of construction of any Project component, the Department shall submit, acceptable to the Executive Officer, a final SWPPP, prepared pursuant to its Statewide Permit, to address the Project's expected construction stage impacts.
17. As-built plans for the mitigation sites shall be prepared and submitted to the Water Board within 90 days of the completion of mitigation site construction.
18. The portion of the mitigation activities that will be scheduled to be completed prior to January 31, 2008 shall be identified in the Final Mitigation and Monitoring Plan. Identification of these activities shall include site location and detailed design plans, wetland acreage, linear feet of riparian restoration and preservation, and other appropriate details.
19. No construction shall occur within 150 feet of any Waters of the State, on any Project component, until off-site pond and riparian restoration mitigation activities identified in the approved Final Mitigation and Monitoring Plan as being planned prior to construction (specifically, the creek enhancement, wetland creation, and related work on the Sweet property adjacent to Patterson Pass Road) are in a stage of active construction.
20. The Department shall ensure the purchase of at least 2.06 acres of VPFS habitat, and 80 credit acres of CTS habitat, pending USFWS identification of appropriate habitat, prior to October 1, 2010, at a location or locations subject to the approval of the Executive Officer.

Other Provisions

21. Any substantive modifications to the Final Mitigation and Monitoring Plan or other documents referenced in the Provisions must be approved in writing by the Executive Officer, prior to implementation of the modification.
22. All Reports pursuant to these Provisions shall be prepared under the supervision of suitable professionals registered in the State of California, if such registration is required or offered in the profession of the subject field.
23. The Department shall immediately notify the Board staff by telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of the conditions of this Order, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. Pursuant to CWC §13267(b), a written notification of the adverse condition shall be submitted to the Water Board within two weeks of occurrence. The written notification shall identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to any modifications by the Water Board staff, for the remedial actions.
24. The Department shall at all times fully comply with the engineering plans, specifications, and technical reports submitted with its application for water quality certification and the completed report of waste discharge.
25. All discharges of ground water or other non-storm water during construction are covered under the Statewide Permit, contingent on submittal of an acceptable discharge plan at least 30 days prior to such a discharge.
26. The Department is considered to have full responsibility for correcting any and all problems that arise in the event of a failure that results in an unauthorized release of waste or wastewater.
27. Any hazardous, designated or non-hazardous waste as defined in Title 23, Division 3, Chapter 15 of the California Administrative Code, shall be disposed of in accordance with applicable state and federal regulations.
28. The Department shall clean up and abate any wastes that are discharged at any sites in violation of this Order.
29. In accordance with CWC §13260, the Discharger shall file with the Water Board a report of any material change or proposed change in the ownership, character, location, or quantity of this waste discharge. Any proposed material change in operation shall be reported to the Executive Officer at least 30 days in advance of the proposed implementation of any change. This shall include, but not be limited to, all significant new soil disturbances, all proposed expansion of development, or any change in drainage characteristics at the Project site. For the purpose of this Order, this includes any

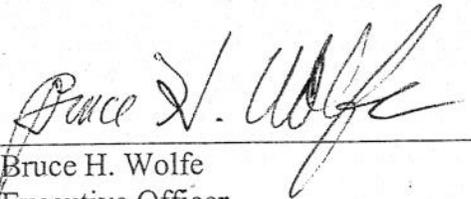
proposed change in the boundaries of the area of wetland/waters of the United States to be filled.

30. The following standard conditions apply to this Order:
 - a. Every certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to CWC §13330 and 23 CCR §3867.
 - b. Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and 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 §3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
 - c. Certification is conditioned upon total payment of any fee required pursuant to 23 CCR §3833 and owed by the Department.
31. An annual fee for Waste Discharge Requirements pursuant to Section 13260 of the California Water Code is required and shall be paid by the Department in a timely manner.
32. The Department shall maintain a copy of this Order at the Project site so as to be available at all times to site operating personnel and agencies.
33. The Department shall permit the Water Board or its authorized representative at all times, upon presentation of credentials:
 - a. Entry onto Project premises, including all areas on which wetland fill or wetland mitigation is located or in which records are kept.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this Order.
 - d. Sampling of any discharge or surface water covered by this Order.
34. This Order does not authorize commission of any act causing injury to the property of another or of the public; does not convey any property rights; does not remove liability under federal, state, or local laws, regulations or rules of other programs and agencies, nor does this Order authorize the discharge of wastes without appropriate permits from

other agencies or organizations.

35. The Water Board will consider rescission of this Order upon Project completion and the Executive Officer's acceptance of notices of completion of mitigation for all mitigation, creation, and enhancement projects required or otherwise permitted now or subsequently under this Order.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 10, 2006.



Bruce H. Wolfe
Executive Officer

DEPARTMENT OF THE ARMY PERMIT

PERMITTEE: California Department of Transportation

PERMIT NO.: 28771S

ISSUING OFFICE: San Francisco District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate District or Division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below:

PROJECT DESCRIPTION:

You are authorized to discharge into jurisdictional Waters of the U.S. including wetlands approximately 11 cubic yards of rock slope protection (RSP) and 4075 cubic yards of clean, granular fill material (from on-site sources). The above mentioned discharge material will fill 1.87 acres of wetlands and 0.34 acres of others waters of the U.S. that are associated with two unnamed drainages in the Vallecitos Hills adjacent to SR 84 southwest of Livermore. All jurisdictional sites where fill material will be discharged are illustrated on the maps shown in Appendix A of the *Pigeon Pass Realignment Project, Individual Permit Application*, dated January 2006.

The project will realign and widen a portion of State Route (SR) 84 through Pigeon Pass also known as the Vallecitos Hills, located southwest of Livermore in Alameda County, California. It begins near the intersection of Sabel Drive / Kalthoff Common with SR 84 and continues southwesterly to about 0.7 mile east of the SR 84 junction at Vallecitos Atomic Laboratory Road. The widening is being constructed to accommodate a passing lane for the uphill traffic in both the east and west bound direction. The project will also correct the existing vertical and horizontal alignment which in the existing highway is below standard and unsafe. This construction is needed for both safety and congestion relive purposes.

PROJECT LOCATION:

The project is located southwest of Livermore in Alameda County, California on SR 84 in the Vallecitos Hills. This section of highway is also known as Pigeon Pass.

PERMIT CONDITIONS:

GENERAL CONDITIONS:

1. The time limit for completing the work authorized ends **October 15, 2011**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should

you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. 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 of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity 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.

7. You understand and agree that, if future operations by the United States require the removal, relocation or other alteration of the structure or work authorized herein, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, you will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

SPECIAL CONDITIONS:

1. This Corps permit does not authorize you to take an endangered species. In order to legally take a listed species, you must have a separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit or a Biological Opinion (BO) under ESA Section 7 with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service (USFWS) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California* (BO), pages 63 – 74, dated February 25, 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 BO. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take authorized by the attached BO, whose terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take and it would also constitute non-compliance with this Corps permit. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

2. Caltrans shall adhere to the conditions of the RWQCB Clean Water Act 401 Certification dated May 18, 2006.

3. Caltrans will create on the project site at a ratio of 1:1, a minimal of 0.65 acres of seasonal wetland to offset impacts to .65 acres of impacts to seasonal wetlands. The on site wetlands will be created approximately as shown in Figures 2 – 7 in the *Pigeon Pass Realignment Project Addendum to Individual Permit Application*, dated February 2006 unless Caltrans gets an approved modification from the Corps.

4. Caltrans will create on the project site at a 1:1 ratio a minimal of 0.18 acres of ephemeral creek channel to offset impacts to 0.18 acres of ephemeral creek channel. The on site channels will be created approximately as shown in Figures 2 – 7 in the *Pigeon Pass Realignment Project Addendum to Individual Permit Application*, dated February 2006 unless Caltrans gets an approved modification from the Corps.

5. Caltrans will create 1.61 acres of new wetland on the Sweet Ranch site **before the start of construction on the Pigeon Pass Realignment Project.** These wetland areas will be created as described in the preliminary Sweet Ranch mitigation proposal or as modified with Corps approval to meet Corps requirements. This mitigation is described in a small document written by Caltrans entitled *Sweet Ranch Mitigation Site, Off Site Mitigation Proposal for Impacts at Pigeon Pass for Army Corps Jurisdictional Waters of the U.S. including wetlands*, dated May 19, 2006.

6. Appropriate best management practices (BMPs) shall be implemented throughout the project site to minimize erosion and reduce sedimentation into adjacent waterways. BMPs shall include, but not necessarily be limited to, placement of silt fencing and fiber rolls, or hay bales to all exposed slopes adjacent to waterways to intercept sediments and stabilize all exposed areas. Erosion control blankets and/or seeding with appropriate seed mixes will be used at project completion to control erosion on all disturbed sites.

7. The seasonal pond at the top of the saddle east of SR 84 by Station 68+00 called Wetland #1F shall not be filled as shown in figure 1 in the *Addendum to Individual Permit Application* dated February 2006 until the pond has dried up for the season or is at its low for the season.

8. The pond at Station 60+50 known as Wetland # 3B, shall not be filled as shown in figure 1 in the *Addendum to Individual Permit Application* dated February 2006 until it has dried up for the season or is at its low for the season.

9. Work in the all wetlands and waters within the project will occur after the sites are dry for the season and will be completed for the season by October 15th.

10. Before project implementation, Caltrans shall provide the Corps with project plans showing all Environmentally Sensitive Areas (ESA) that will be clearly marked on the ground during construction areas.

11. Caltrans shall provide the Corps with detailed **pre-construction maps** or aerial photos of all off site mitigation required by the Corps showing existing waters of the U.S. including wetlands. All jurisdictional waters of the U.S. including wetlands shall be delineated by the Corps.

12. Caltrans shall provide the Corps with detailed **post-construction maps** or aerial photos of all off site mitigation required by the Corps showing existing waters of the U.S. including wetlands. All jurisdictional waters of the U.S. including wetlands shall be re-delineated by the Corps to demonstrate the increases created for the mitigation.

13. Caltrans shall provide the Corps with a set of Landscape Erosion Control and Planting Plans for the project areas and mitigation sites when such plans become available.

14. Caltrans shall submit a Final Mitigation, Monitoring, and Maintenance Plan to the Corps. The plan should include planting plans and details of all on-site and off-site mitigation, such as designs and construction drawings for in-stream structures, pond reconstruction, grading, planting, irrigation plans, and all other information, as appropriate. The plan should also include approximate completion dates, performance standards and success criteria.

All mitigation sites shall be monitored at least once annually and monitoring shall continue for 5 years or longer until the Corps determines that the mitigation is successful. A yearly monitoring report shall be sent to the San Francisco Corps Office by December 31 each season. The reports should also include recommendations for remedial action as needed.

The Final Mitigation, Monitoring, and Maintenance Plan may be amended subject to a review and approval by the Corps.

15. Provide the Corps with the proposed mitigation locations, copies of the proposed final conservation easements, or other legal documents that identify, among other things, the entity or entities that will hold those easements after the monitoring period is completed and how the mitigation sites will be preserved in perpetuity.

FURTHER INFORMATION:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

- () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- (X) Section 404 of the Clean Water Act (33 U.S.C. Section 1344).
- () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization:

- a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability: In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

DEPARTMENT OF FISH AND GAME

CENTRAL COAST REGION

(707) 944-5520

Mailing address:

POST OFFICE BOX 47

YOUNTVILLE CALIFORNIA 94599

Street address:

7329 SILVERADO TRAIL

NAPA CALIFORNIA 94558



June 19, 2006

Notification Number: 1600-2006-0059-3

Ron Kiaaina / California Department of Transportation
Post Office Box 23660
Oakland, CA 95623-0660

1602 LAKE AND STREAMBED ALTERATION AGREEMENT

This agreement is issued by the Department of Fish and Game pursuant to Division 2, Chapter 6 of the California Fish and Game Code:

WHEREAS, the applicant Ron Kiaaina / California Department of Transportation, hereafter called the Operator, submitted a signed NOTIFICATION proposing to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed or lake of the following water: various streams, located near State Route 84, in the County of Alameda, State of California; and

WHEREAS, the Department has determined that such operations may substantially adversely affect existing fish and wildlife resources including water quality, hydrology, aquatic or terrestrial plant or animal species; and

WHEREAS, the project has undergone the appropriate review under the California Environmental Quality Act; and

WHEREAS, the Operator shall undertake the project as proposed in the signed PROJECT DESCRIPTION and PROJECT CONDITIONS (attached). If the Operator changes the project from that described in the PROJECT DESCRIPTION and does not include the PROJECT CONDITIONS, this agreement is no longer valid; and

WHEREAS, the agreement shall expire on December 31, 2010; with the work to occur between May 1 and October 31; and

WHEREAS, nothing in this agreement authorizes the Operator to trespass on any land or property, nor does it relieve the Operator of the responsibility for compliance with applicable Federal, State, or local laws or ordinances. Placement, or removal, of any material below the level of ordinary high water may come under the jurisdiction of the U. S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act;

THEREFORE, the Operator may proceed with the project as described in the PROJECT DESCRIPTION and PROJECT CONDITIONS. A copy of this agreement, with attached PROJECT DESCRIPTION and PROJECT CONDITIONS, shall be provided to contractors and subcontractors and shall be in their possession at the work site.

Failure to comply with all conditions of this agreement may result in legal action.

This agreement is approved by:

A handwritten signature in black ink, appearing to read "R. W. Floerke".

Robert W. Floerke
Regional Manager
Central Coast Region

cc: Warden Garrett
Lieutenant Christensen

DEPARTMENT OF FISH AND GAME

CENTRAL COAST REGION

(707) 944-5520

Mailing address:

POST OFFICE BOX 47

YOUNTVILLE, CALIFORNIA 94599

Street address:

7329 SILVERADO TRAIL

NAPA, CALIFORNIA 94558



Notification Number: **1600-2006-0059-3**
Pigeon Pass, Alameda County

Ron Kiaaina / California Department of Transportation
Post Office Box 23660
Oakland, CA 95623-0660

PROJECT DESCRIPTION and PROJECT CONDITIONS**Description**

The project is located southwest of Livermore on SR 84 in Alameda County beginning near the Ruby Hills Drive/Kalthoff and SR 84 intersection and continues west to Post Mile 23.0. The project is necessary to correct existing horizontal and vertical alignment deficiencies. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills/Pigeon Pass area. Below is a description of each project identified by and described by Caltrans.

Project 1 (Water 1A)

This project affects an unnamed ephemeral creek (labeled as Water 1A on the maps) which runs parallel to State Route 84 (SR 84) on the south side. This water is a tributary of Arroyo del Valle. The drainage in this area is shallow and characterized by indistinct banks vegetated with nonnative annual grasses typical for the area. See the attached habitat description for annual grassland. The area is devoid of a woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 63 square feet (0.001 ac; 10 linear ft) and associated temporary impacts totaling approximately 528 sq. ft (0.01 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland. No access roads within the streambed are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area.

Project 2 (Wetland 1A)

This project affects a seasonal wetland (labeled as Wetland 1A on the maps), which is tributary to the Arroyo del Valle. In the past, check dams made of rock were placed within the ephemeral creek (Water 1A) at this location. This has created a bottleneck, allowing wetland characteristics to evolve within the creek. The wetland is heavily vegetated with cattails. The area is devoid of woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 7,866 sq ft (0.18 ac) and associated temporary impacts totaling approximately 1,159 sq ft (0.03 ac). Three natural bottom ponds will be constructed at the toe of slope of the new alignment from approximately station number 80+40 to 82+40 (see maps) to direct the upstream flow. A ditch will connect the three ponds. The ditches will be lined with rock slope protection (RSP) at the outfalls of each pond to slow water velocity. Construction of the pond and ditch complex, as opposed to a straight channel, will reduce velocity through the area.

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area, as well as the newly created ponds.

Project 3 (Water 1B)

This ephemeral drainage (labeled as Water 1B on the map) is located upstream of the Wetland 1A along the southern edge of SR 84, and is tributary to Arroyo del Valle. It is a heavily incised, oak riparian stream corridor with steep banks leading to the channel bed at the toe of slope of SR 84. This drainage is connected to the adjacent, upstream wetland 1C by a culvert that passes under a residential driveway.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 4,081 sq ft (0.09 ac; 895 linear ft) and associated temporary impacts totaling approximately 982 sq ft (0.02 ac). The temporary impacts include the installation of a temporary culvert which will provide access between the east and west sides of the creek. Construction activities will also result in 0.36 acre of temporary impacts, and 1.46 acre of permanent impacts to oak riparian habitat.

Access to the location will be via the adjacent existing highway, driveways, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, the temporary culvert will be removed and the ground recontoured to its pre-project condition. Caltrans proposes to reseed the temporarily disturbed area and to replant the riparian corridor areas.

Project 4 (Wetland 1B)

This is a 0.01 acre seasonal wetland, labeled as Wetland 1B on the map, within the Water 1 system. It forms at the inlet of a culvert that passes under SR 84 and can best be described as a vegetated channel. The channel is devoid of woody riparian overstory.

Placement of fill or construction of the new alignment will result in permanent impacts totaling approximately 55 sq ft (0.001 ac) and associated temporary impacts totaling approximately 13 sq ft (0.0003 ac). Access to the location will be via the adjacent existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area.

Project 5 (Wetland 1C)

This is a 0.67 acre seasonal wetland (labeled as Wetland 1C on the map) south of SR 84. This wetland is a combination of flow from Water 1C and the nearby hills. It can best be described as a combination of swale and wet meadow. There is a small area of oak riparian habitat associated with the west end of this wetland. The riparian habitat is part of the riparian corridor that runs along Water 1C described below.

Placement of fill for the construction of the new alignment and installation of a 48-inch culvert and a 12-inch culvert to facilitate drainage under the new alignment will result in permanent impacts to wetlands totaling approximately 18,297 sq ft (0.42 ac) and associated temporary impacts totaling approximately 4,150 sq ft (0.10 ac). Construction activities will also result in 0.12 acre of temporary impacts to riparian habitat.

Access to the location will be via the adjacent existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed area.

Project 6 (Water 1C)

This heavily incised, ephemeral drainage (labeled as Water 1C on the map) receives flow from the bermed Wetland 1D via a spillway/culvert. This drainage, which has an associated dense oak

riparian corridor, discharges into the downstream Wetland 1C. It is a tributary of Arroyo del Valle.

There will be no impacts to the bed and bank of this drainage; however, there is the potential to temporarily impact 0.15 acre of the outer edge of the oak riparian habitat due to construction equipment and work activities associated with adjacent roadwork.

Access to the location will be through the adjacent upland areas. No access roads within the stream zone are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed riparian area.

Wetland 1D

This 0.35 acre seasonal wetland (labeled as Wetland 1D on the map) is south of SR 84. It is fed by Water 1D and drained by Water 1C. A wet meadow-type wetland has formed where Water 1D has braided out in this area behind a man-made berm. This area will be avoided during the construction therefore there will be no impacts.

Project 7 (Water 1D)

This ephemeral drainage (labeled as Water 1D) is located upstream of Wetland 1D and flows parallel to SR 84. This segment of the Water 1 system receives drainage from the upstream Wetland 1E, is moderately incised and has a dense oak/willow riparian habitat. It is a tributary of Arroyo del Valle.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,952 sq ft (0.14 ac; 917 linear feet) and associated temporary impacts totaling approximately 718 sq ft (0.02 ac). Work activities will also result in 0.24 acre of temporary impacts and 1.18 acre of permanent impacts to riparian habitat. The creek channel will be realigned from its existing location to the north toe of the new slope from approximately station numbers 69+65 to 72+80. This new channel will have a combination of natural bottom and some rock protection in areas where the additional erosion protection is needed, with rock weirs placed at appropriate locations along the new channel to create seasonally ponded wetland areas to mitigate impacts to Wetlands 1C, 1D, and 1E.

Access to the location will be via the adjacent existing highway or upland areas. There are no access roads within the stream zone planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed waters and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The recreated channel will, at minimum, be seeded with the wetland/waters species proposed in the submitted Revegetation Plan. If conditions are suitable to support riparian vegetation after construction, the area will also be augmented with riparian species proposed in the Revegetation Plan.

Project 8 (Wetland 1E)

This 0.12 acre seasonal wetland (labeled as Wetland 1E) is located above the origin of Water 1E in a low-lying area that slopes towards Water 1D. It receives water from sheet flow runoff from the adjacent hills and from a culvert under SR 84. Under heavy storm conditions, it has the potential to receive water from Wetland 1F. It is vegetated with wetland grasses and has no woody overstory.

This wetland will be completely filled by the construction project. Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,365 sq ft (0.12 ac).

Project 9 (Water 1E)

This drainage, labeled as Water 1E on the map, connects the headwaters Wetland 1F with all downstream jurisdictional features. It is a very shallow, indistinct drainage that has no associated riparian overstory and is vegetated only with nonnative annual grasses. It is a tributary of Arroyo del Valle.

This drainage will be completely filled by the construction project. Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 557 sq ft (0.01 ac; 277 linear ft). This drainage area will be recreated and vegetated as described in the Project 8, as the two projects are connected and will be similarly impacted.

Project 10 (Wetland 1F)

This large 1.2 acre seasonal wetland (labeled as Wetland 1F on the maps) forms in a low area immediately adjacent to the existing roadway on the east side of the Pigeon Pass saddle, and accepts roadway runoff and sheet flow from the surrounding uplands. Wet season observation, topography, and drainage patterns indicate that this system is not typically hydrologically connected to a jurisdictional water body, except possibly during heavy storm conditions, when it may overflow into Wetland 1E. The edges are populated with wetland plants such as *Eleocharis* sp., *Carex* sp., and *Juncus* sp. during the growing season with open water comprising the remaining inner portion. The area is devoid of a riparian overstory.

Placement of fill necessary to construct the new alignment will result in permanent impacts to wetlands totaling approximately 33,971 sq ft (0.78 ac) and associated temporary impacts totaling approximately 5,799 sq ft (0.13 ac).

Access to the location will be via the adjacent existing highway, driveway, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area.

Project 11 (Wetland 2)

This 0.07 acre wetland (labeled as Wetland 2 on the map) is the result of a spring at the beginning of a seasonal drainage, at the top of a hill. A small plateau at the spring creates an area for water to saturate the ground, and sometimes pool, before it overflows down the hill during the wet season. The wetland is vegetated with *Juncus* sp., *Eleocharis* sp., *Cyperus* sp., and *Rumex* sp. This wetland will be completely filled by the new alignment. Placement of fill necessary to construct the new alignment and installation of a 750 mm (29.5 inch) culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 3,162 sq ft (0.07 ac).

Project 12 (Wetland 3A)

This 0.06 acre seasonal wetland (labeled as Wetland 3A on the map) is partially within a creek bed and a backwater area of a creek (Water 2). It is sparsely vegetated with wetland plants such as *Rumex* sp., *Cyperus* sp., *Eleocharis* sp. and *Juncus* sp., but is devoid of a riparian overstory. This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill necessary to construct the new alignment and installation of a 28-inch culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 2,323 sq ft (0.05 ac) and associated temporary impacts to wetlands totaling approximately 88 sq ft (0.002 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project 13 (Wetland 3B)

This 0.60 acre seasonal wetland (labeled as Wetland 3B on the map) accepts both roadway runoff and sheet flow from the adjacent hills. It is a combination of a wet meadow, man-made stock pond, and vegetated channel. It drains into a natural, ephemeral drainage (Water 2), which then drains into Wetland 3A. This wetland has a woody willow riparian overstory around its eastern

edge.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for construction of the new alignment will result in permanent impacts to wetlands totaling approximately 10,071 sq ft (0.23 ac) and associated temporary impacts totaling approximately 1,595 sq ft (0.04 ac). Construction activities will also result in .04 acre of temporary and .19 acre of permanent impacts to riparian habitat. Access to the location will be by driving across the adjacent upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the submitted Revegetation Plan. The Revegetation Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project 14 (Water 2)

This water, labeled as Water 2 on the map, includes the heavily incised ephemeral drainage which flows from Wetland 3B into Wetland 3A. This drainage system eventually flows into the San Antonio Reservoir. It does not have an associated riparian corridor.

Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 447 sq ft (0.01 ac; 106 linear ft). This drainage will be completely filled by the project.

Project 15 (Water 3)

This water (labeled as Water 3 on the map) includes the ephemeral creek, which runs perpendicular to SR 84 and terminates in the San Antonio Reservoir. It is heavily incised and the associated oak riparian habitat includes approximately 4-5 oaks growing at the top of the banks. There are two impact areas along this drainage. Impact Area 1 involves the temporary placement of fill necessary to accommodate the relocation of a Pacific Gas & Electric pipeline. This relocation will result in temporary impacts totaling approximately 58 sq ft (0.001 ac). Impact Area 2 includes partially filling the drainage for the new alignment. This activity will result in permanent impacts totaling approximately 3,759 sq ft (0.09 ac; 570 linear ft) and associated temporary impacts totaling approximately 755 sq ft (0.02 ac). Construction activities will also result in 0.17 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland or along a farm road. Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed drainage areas.

Project 16 (Wetland 4)

This 0.16 acre seasonal wetland (labeled as Wetland 4 on the map) can best be described as a heavily incised, vegetated channel. It is located on both sides of SR 84. It receives water from the surrounding hills northwest of SR 84, travels under the highway through a culvert and transitions into Water 3. This wetland has an associated oak riparian corridor along the top of its banks.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for the construction of the new alignment will result in permanent impacts to wetlands totaling approximately 141 sq ft (0.003 ac) and associated temporary impacts totaling approximately 693 sq ft (0.01 ac). Construction activities will also result in .05 acre of temporary impacts to riparian habitat.

Access to the location will be by the existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed wetland and oak riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the submitted Revegetation Plan. The Revegetation Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project 17 (Wetlands 5A-5D)

These seasonal wetlands (0.20 ac, 0.30 ac, 0.01 ac, and 0.04 ac, respectively) are found along drainages that originate outside of the project area, north of SR 84 (5A and B), with 5C extending into the project area north of SR 84, then traveling under the highway through a culvert, and emerging again as 5D, outside the construction project area, south of SR 84. They are best described as a channel vegetated with wetland plants such as *Juncus* sp and *Carex* sp. They do not have an associated riparian corridor.

Portions of Wetland 5B will be temporarily disturbed during construction due to roadwork. The roadwork will temporarily impact 1,909 sq ft (0.04 ac).

Access to the location will be via the existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes. After construction Caltrans proposes to restore the temporarily disturbed wetland area.

Water 4

This ephemeral drainage, which runs parallel to SR 84 on the north side, connects two wetlands,

which are outside of the construction project area. This system eventually drains into the San Antonio Reservoir. This water will not be impacted by the project.

Wetlands 6A-6C

These seasonal wetlands (0.01 ac, 0.001 ac, and 0.03 ac, respectively) originate along a wetland drainage (6A) north of SR 84, and travel under the highway through a culvert, emerging again as Wetlands 6B and 6C, south of SR 84. This wetland drainage is tributary to the San Antonio Reservoir, located about 1 mile downstream. This system is described by Caltrans as a swale-like drainage. This area will not be impacted by the project.

Total Impacts

Total impacts related to the proposed project include 2.21 acres of waters of the State including 1.87 acres of fresh seasonal wetlands and 2,775 linear feet (0.34 acres) of freshwater seasonal creeks. Project activities will temporarily disturb 0.42 acres of jurisdictional waters of the U.S comprised of 0.35 acres of freshwater seasonal wetlands, and 440 linear feet (0.07 acres) of freshwater seasonal creeks. The project will also permanently impact 3.0 acres of permanent riparian habitat and 0.96 acres of temporary impacts.

Listed Species

Portions of the waters on the Project site serve as habitat for several special status species, the California red-legged frog (*Rana aurora draytonii*; CRLF), California tiger salamander (*Ambystoma californiense*; CTS) and vernal pool fairy shrimp (*Branchinecta lynchi*, hereinafter VPFS).

Conditions

1. Work within the stream/riparian corridor shall be confined to the period May 1 to October 31. Revegetation work is not confined to this time period.
2. If the Operator needs more time to complete the authorized activity, the work period may be extended on a day-to-day basis by Marcia Grefsrud at mgrefsrud@dfg.ca.gov, or the Yountville office at (707) 944-5520.
3. Work within the stream bed shall be restricted to periods of no stream flow and dry weather. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities shall cease and all reasonable erosion control measures shall be implemented prior to the onset of precipitation. Construction activities halted due to precipitation may resume when precipitation ceases and the 72-hour weather forecast from the National Weather Service indicates a 20% or less chance of precipitation, provided no work occurs in the stream bed if water is flowing.
4. If a construction phase may cause the introduction of sediments into the stream, no phase of the project shall be started in May or in October or any year, unless all work for that phase and all associated erosion control measures are completed prior to the onset of precipitation. If a construction phase may cause the introduction of sediments into the

stream, no phase of the project shall be started unless all equipment and materials are removed from the channel at least 12 hours prior to the onset of precipitation and all associated erosion control measures are in place prior to the onset of precipitation. After any storm event, the Operator shall inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sedimentation problems and take corrective action as needed. Seventy-two-hour weather forecasts from the National Weather Service shall be consulted prior to start up of any phase of the project that may result in sediment runoff to the stream, and construction plans made to meet this condition.

5. To protect and maintain riparian wetland systems and to ensure a "No Net Loss" in wildlife value or acreage of wetlands, the Operator shall submit to the Department a Mitigation Plan by December 31, 2006, which amounts to a 3:1 ratio for the acreage of bed and bank permanently impacted by the construction (0.34 x 3=1.02 acres), a 1:1 ratio for the acreage of bed and bank temporarily impacted by the construction (0.07), a 3:1 ratio for the acreage of wetlands permanently impacted (1.87x3=5.61 acres), a 1:1 ratio for the acreage of wetlands temporarily impacted (0.35 acres), and a 3:1 ratio for the acreage of riparian habitat permanently impacted (3x3=9 acres), and 1:1 ratio for the acreage of riparian habitat temporarily impacted by the project activities (0.96 acres). The mitigation can include a combination of on-site creation or restoration, off-site restoration or creation, or purchase and donation of wetlands/riparian land to an Alameda County non-profit organization along with funding and a restoration plan for the site to be protected in perpetuity. The Mitigation Plan and location of the mitigation must be approved in writing by the Department of Fish and Game prior to the start of construction. The mitigation area must be as close to the work site as is possible, preferably in the same drainage. Restoration of the stream bank and riparian zone shall include site preparation/earth movement, revegetation with native locally occurring riparian species. Work on the waterway shall not begin until the Department has approved the off-site mitigation location and Mitigation Plan or receipt of the donation has been provided.
6. The Final Mitigation Plan shall describe all both off site and on-site mitigation, design and construction plans, and survival performance criteria based on conditions #8-11.
7. Mitigation implementation shall be completed by January 31, 2008. On site temporary impacts shall be restored immediately following that portion of construction. If mitigation is not complete during the required time period, additional mitigation will be required for the additional temporal loss of habitat. The additional mitigation shall increase at a 1:5 ratio for each year the mitigation is not completed.
8. All trees and shrubs installed have an 80% survival performance criterion during the 3-year plant establishment period. In Year 5, two years after the completion of plant establishment, survival should not be lower than 70% or all failed plantings on the mitigation site should be replanted with live plantings and monitored an additional 3 years to achieve at least 80% total survival. In Year 5, species richness will be the same as the as-built condition. If a particular species suffers 100% mortality at any point in the

monitoring, it will be replaced in totality, unless a more appropriate substitution is recommended and approved by the Department based on specific environmental factors of the site conditions.

9. All disturbed slopes around and on the banks shall be seeded, mulched and fertilized with a blend of a minimum of three local grass species from the following list: California brome: 6# per acre, Purple needle grass (*Nasella pulchra*): 3# per acre, California wildflower mix or shrub seed: 5# per acre. If hydroseeding, extra tackifier and mulch shall be added. Erosion control seeding shall be at a rate of at least 25 pounds per acre, pure live seed. Monofilament shall not be used.
10. For erosion control cover there shall be a minimum of 80% cover with no bare areas larger than 3 feet x 3 feet.
11. If the survival and/or cover requirements are not meeting these goals, the Operator is responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for five years after planting. An annual status report on the mitigation shall be provided to the Department of Fish and Game by December 31 of each year. This report shall include the survival, percent cover, and height of both tree and shrub species. The number by species of plants replaced, an overview of the revegetation effort, and the method used to assess these parameters shall also be included. Photos from designated photo stations shall be included.
12. If construction, grading, or other project-related activities are scheduled during the nesting season of protected raptors and migratory birds (February 1 to July 31), a focused survey for active nest of such birds shall be conducted by a qualified biologist (as determined by a combination of academic training and professional experience in biological sciences and related resource management activities) within 15 days prior to the beginning to project-related activities. The results of the survey shall be faxed to (707)944-5595. Refer to Notification Number 1600-2006-0059-3 when submitting the survey to the Department. If nesting birds are found a 50-foot radius buffer should be established around the nest, a 300-foot radius buffer in the case of hawks and owls. The area should be fenced and avoided until the young have fledged, as determined by a qualified biologist. If a lapse in project-related work of 15 days or longer occurs, another focused survey and if required, consultation with the Department and United States Fish and Wildlife Service, will be required before project work can be reinitiated.
13. The project site has been identified as an area that is potentially inhabited by a listed species, the California red-legged frog, California tiger salamander, and San Joaquin kit fox and by a species of special concern, the Western burrowing owl. The Operator is required to comply with all applicable state and federal laws, including the California and Federal Endangered Species Acts. This agreement does not authorize the take of any state or federally listed species. Liability for any take or incidental take of such listed

species remains the responsibility of the Operator for the duration of the project. Any unauthorized take of such listed species may result in prosecution and nullification of the agreement.

14. Surveys and relocation shall be done in accordance with the Biological Opinion 1-1-04-F-0115 dated February 28, 2005.
15. The operator shall hire a biologist, with all necessary State and Federal permits, to relocate all fish/amphibians within the work site prior to dewatering. Captured fish/amphibians shall be moved to the nearest appropriate site on the stream. This condition does not allow for the take or disturbance of any state or federally listed species, or state listed species of special concern. A record shall be maintained of all fish/amphibians captured and moved, and the record shall be provided to the Department (c/o 1600 program, Post Office Box 47, Yountville, California 94599) with appropriate Streambed Alteration Notification number.
16. Qualified biological monitors shall be present on a continuous basis for all activities that could result in the take of a listed or protected species. The biological monitors shall ensure compliance with the measures provided in this Agreement. The biologists shall be given the authority to stop any work that may result in the take of listed or protected species. The Department shall be notified within 24 hours by email at mgregsrud@dfg.ca.gov if the biologist exercises this authority.
17. Work must be performed in isolation from the flowing stream. If there is any flow when the work is done, the operator shall construct coffer dams upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. The coffer dams may be constructed with clean river gravel or sand bags, and may be sealed with sheet plastic. Sand bags and any sheet plastic shall be removed from the stream upon project completion. Clean river gravel may be left in the stream, but the coffer dams must be breached to return the stream flow to its natural channel.
18. When any dam (any artificial obstruction) is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain fish life below the dam pursuant to Fish and Game Code Section 5937.
19. Flow diversions shall be done in a manner that shall prevent pollution and/or siltation and which shall provide flows to downstream reaches. Flows to downstream reaches shall be provided during all times that the natural flow would have supported aquatic life. Said flows shall be sufficient quality and quantity, and of appropriate temperature to support fish and other aquatic life both above and below the diversion. Normal flow shall be restored to the affected stream immediately upon completion of work at that location.
20. The temporary stream crossings shall be constructed using a temporary bridge with a gravel approach ramp or temporary culverts backfilled with clean round river cobble and

topped with a gravel road base.

21. Storm drains lines/culverts shall be adequately sized to carry peak storm flows for the drainage to one outfall structure. The storm drain lines/culverts and the outfall structure shall be properly aligned within the stream and otherwise engineered, installed and maintained, to assure resistance to washout, and erosion of the stream bed, stream banks and/or fill. Water velocity shall be dissipated at the outfall, to reduce erosion.
22. The bottom of permanent culverts shall be placed at or below stream grade.
23. Prior to removal of existing culverts they shall be inspected for wildlife. If any wildlife is encountered during the course of the maintenance, said wildlife shall be allowed to leave the maintenance area unharmed, and shall be flushed, hazed, or herded in a safe direction away from the project site. This condition does not allow for the take or disturbance of any state or federally listed species, or state listed species of special concern.
24. Streambank areas receiving rock slope protection (rip rap) shall be back-filled with appropriate topsoil. The topsoil fill should be placed to fill the voids in the rock slope protection and provide a substrate for revegetation efforts where appropriate.
25. Rip rap will be set below grade and keyed into the bank. Rip rap rock shall be of the proper size and weight to withstand high flows.
26. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of the stream channel and banks, avoiding areas of concentrated ground squirrel burrows suitable for use by CTS or burrowing owls. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream shall be positioned over drip-pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles must be moved away from the stream prior to refueling and lubrication.
27. The construction area shall be flagged to identify the limits of the agreed work area to prevent damage to adjacent habitat.
28. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations.
29. Silt control measures shall be utilized throughout all phases of the project where silt and/or earthen fill threaten to enter Waters of the State. Silt control structures shall be monitored for effectiveness and shall be repaired or replaced as needed. Build up of soil behind the fence shall be removed promptly and any breaches or undermined areas repaired at once.
30. A copy of this agreement must be provided to the contractor and all subcontractors who work within the stream zone and must be in their possession at the work site.

31. Building materials and/or construction equipment shall not be stockpiled or stored where they could be washed into the water or where they will cover aquatic or riparian vegetation.
32. Debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake, by Operator or any party working under contract, or with the permission of the Operator, shall be removed immediately.
33. The contractor shall not dump any litter or construction debris within the riparian/stream zone. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site.
34. Department personnel or its agents may inspect the work site at any time.
35. The Operator is liable for compliance with the terms of this Agreement, including violations committed by the contractors and/or subcontractors. The Department reserves the right to suspend construction activity described in this Agreement if the Department determines any of the following has occurred:
 - A). Failure to comply with any of the conditions of this Agreement
 - B). Information provided in support of the Agreement is determined by the Department to be inaccurate.
 - C). Information becomes available to the Department that was not known when preparing the original conditions of this Agreement (including, but not limited to, the occurrence of State or federally listed species in the area or risk to resources not previously observed)
 - D). The project as described in the Agreement has changed or conditions affecting fish and wildlife resources change.

Any violation of the terms of this Agreement may result in the project being stopped, a citation being issued, or charges being filed with the District Attorney. Contractors and subcontractors may also be liable for violating the conditions of this agreement.

Amendments and Extension to Expiration Date

The Operator shall notify the Department before any modifications are made in the project plans submitted to the Department. Project modifications may require an amendment or a new notification. To modify the project, a written request for an amendment must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599). An amendment requires a fee. The Fee Schedule can be obtained at www.dfg.ca.gov/1600 or by phone at (707) 944-5520. Amendments to the original Agreement are issued at the discretion of the Department.

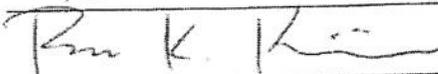
To renew the Agreement beyond the expiration date, a written request for an extension must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599) for consideration at least 30 days before the Agreement expiration date. An extension requires a fee. Extensions of the original Agreement are issued at the discretion of the Department.

This Agreement is transferable to subsequent owners of the project property by requesting an amendment.

Please note that you may not proceed with construction until your proposed project has undergone CEQA review and the Department signs the Agreement.

I, the undersigned, state that the above is the final description of the project I am submitting to the Department for CEQA review, leading to an Agreement, and agree to implement the conditions above required by the Department as part of that project. I will not proceed with this project until the Department signs the Agreement. I also understand that the CEQA review may result in the addition of measures to the project to avoid, minimize, or compensate for significant environmental impacts:

Operator's name (print): RON K. KIAAINA

Operator's signature: 

Signed the 13th day of JUNE, 2006

1600-2006 - For Department Use Only

Notification Number:	0059-3	Date Received	2/10/06	Date Completed	
Fee Enclosed?	<input checked="" type="checkbox"/> Yes \$ 4,000.00		<input type="checkbox"/> No		
Action Taken/Notes	# 082-893429 DEPT. OF TRANSPORTATION				

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

GRETS RUD
GARRETT
LT. CHRISTENSEN

Fish & Game

FEB 10 2006

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

All fields must be completed unless otherwise indicated.
(See enclosures for instructions.)

Yountville

Notification Type	
<input type="checkbox"/> Timber Harvesting Plan (No. _____)	<input type="checkbox"/> Water Application (No. _____)
<input type="checkbox"/> Commercial Gravel Extraction (No. _____)	<input checked="" type="checkbox"/> Other

Application Information			
	Name	Address	Telephone/FAX
Applicant:	California Department of Transportation (Caltrans)	See contact person	Business: See contact person Fax:
Operator:	Ron Kiaaina (Project Manager)	P.O. Box 23660 Oakland, Ca 95623-0660	Business: 510-286-4193 Fax: 510-286-5122
Contractor: (if known)	unknown		Business: Fax:
Contact Person: (if not applicant)	Shanna Zahner (Biologist)	703 B Street Marysville, Ca 95901	Business: 530-740-4815 Fax: 530-741-4457
Property Owner:	Multiple-see Attachment 2		Business: Fax:

Project Location				
Location Description:	Alameda County, State Route 84 southwest edge of the city of Livermore			
County		Assessor's Parcel Number		
Alameda		See Attachment 2		
USGS Map	Township	Range	Section	Latitude/Longitude
See Attachment 1				37° 38' 26" N/ 121° 47' 43" W
Name of River, Stream, or Lake:	Unnamed creeks			
Tributary To?	Arroyo Valle, San Antonio Reservoir			

Name of Applicant: Caltrans

Project Description							
Project Name:	Pigeon Pass (Alameda-84 Curve Realignment)						
Start Date:	2007	Completion Date:	2009	Project Cost:	\$25 million	Number of Stream Encroachments: (Timber Harvesting Plans Only)	NA
Describe project below: (Attach separate pages if necessary)							
See Attachment 1							
<input checked="" type="checkbox"/> Continued on separate page (s)							

Attachments/Enclosures		
Attach or enclose the required documents listed below and check the corresponding boxes.		
<input checked="" type="checkbox"/> Project Description	<input checked="" type="checkbox"/> Map showing project location, including distances and/or directions from nearest city or town	<input checked="" type="checkbox"/> Construction plans and drawings pertaining to the project
Completed CEQA documents:	<input type="checkbox"/> Notice of Exemption <input type="checkbox"/> Negative Declaration <input type="checkbox"/> Draft or Final Environmental Impact Report	<input type="checkbox"/> Mitigated Negative Declaration <input checked="" type="checkbox"/> Notice of Determination
Copies of applicable local, State, or federal permits, agreements, or other authorizations:	<input type="checkbox"/> Local. Describe:	
	<input checked="" type="checkbox"/> State. Describe: Army Corps of Engineers 404 permit; Regional Water Quality Control Board 401 Cert (all pending)	

I hereby certify that all information contained in this notification is true and correct and that I am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider this notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand that this notification is valid only for the project described herein and that I may be subject to civil or criminal prosecution for undertaking a project that differs from the one described herein, unless I have notified the Department of that project in accordance with Fish and Game Code Section 1602.

I understand that a Department representative may need to inspect the property where the project described herein will take place before issuing a Lake or Streambed Alteration Agreement pursuant to this notification. In the event the Department determines that a site inspection is necessary, I hereby authorize the Department to enter the property where the project described herein will take place to inspect the property at any reasonable time and certify that I am authorized to grant the Department permission to access the property.

I request the Department to first contact me at (insert telephone number) _____ to schedule a date and time to enter the property where the project described herein will take place and understand that this may delay the Department's evaluation of the project described herein.

Jean L Baker
Operator or Operator's Representative

Jan 12, 2006
Date

Attachment 1

Purpose and Need

The segment of SR 84 through the Vallecitos Hills / Pigeon Pass area has become functionally obsolete due to the combination of the existing features of the highway and increased volume of traffic. SR 84 has a winding alignment that generally follows the natural topography. Grades on SR 84 reach a maximum of 10 % and there are locations where stopping sight distance is limited by the curvature of the highway. Shoulder widths do not meet current design standards. There are no opportunities to pass slower vehicles. During peak hours, traffic is congested due to the winding alignment of the roadway through the Vallecitos Hills / Pigeon Pass area.

The project under consideration would correct existing horizontal and vertical alignment deficiencies on SR 84. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills / Pigeon Pass area. The average accident rate per million vehicle miles for a two-lane conventional highway is expected to be about 1.32 acc/mvm. The actual accident rate for SR 84 through the Vallecitos Hills / Pigeon Pass area is 1.42 acc/mvm. Improving the alignment and adding truck-climbing lanes to the roadway is expected to result in lower overall accident rates on SR 84.

Project Location and Description

The project is located southwest of Livermore on SR 84 in Alameda County. It begins near the Ruby Hills Drive/Kalthoff and SR 84 intersection and continues west to Post Mile 23.0. It can be found on the Livermore and La Costa Valley quadrangles, R 1E, and R 2E. Township and Sections are not available because the land was originally part of a Spanish Land Grant and has not been surveyed.

From I-580 take the 1st St/Springtown exit through Livermore. 1st St. will turn into Holmes, which turns into Vallecitos Rd (SR 84). Take Vallecitos Rd to the Ruby Hills/Kalthoff and Vallecitos intersection. From I-680 take the SR84/Vallecitos Rd exit. Follow to the Ruby Hills/Kalthoff and Vallecitos Rd. intersection.

Project Descriptions

Below is a description of each project (i.e. activity), as defined by the Department of Fish and Game, within the proposed Caltrans construction project known as Pigeon Pass.

Attached is a table that quantifies temporary and permanent impacts for each project.

Equipment to be used at each location will most likely include but is not limited to bulldozers, backhoes, excavators, compactors, and dump trucks.

Construction is expected to begin August 1, 2006 and end November 1, 2009.

Project 1 (Water 1A)

This project affects an unnamed ephemeral creek (labeled as Water 1A on the maps) which runs parallel to State Route 84 (SR 84) on the south side. This water is a tributary of Arroyo del Valle. The drainage in this area is shallow and characterized by indistinct banks vegetated with nonnative annual grasses typical for the area. See the attached habitat description for annual grassland. The area is devoid of a woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 63 ft² (0.001 ac; 10 linear ft) and associated temporary impacts totaling approximately 528 ft² (0.01 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland. No access roads within the streambed are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Cost of Project: \$50.00

Permit Fee: \$200.00

Project 2 (Wetland 1A)

This project affects a seasonal wetland (labeled as Wetland 1A on the maps), which is tributary to the Arroyo del Valle. In the past, check dams made of rock were placed within the ephemeral creek (Water 1A) at this location. This has created a bottleneck, allowing wetland characteristics to evolve within the creek. The wetland is heavily vegetated with cattails. The area is devoid of woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 7,866 ft² (0.18 ac) and associated temporary impacts totaling

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approximately 1, 159 ft² (0.03 ac). The streambed alterations at this location will require that a series of three natural bottom ponds be constructed at the toe of slope of the new alignment from approximately station number 80+40 to 82+40 (see maps) to direct the upstream flow. A ditch will connect the three ponds. The ditches will be lined with rock slope protection (RSP) at the outfalls of each pond to slow water velocity. Construction of the pond and ditch complex, as opposed to a straight channel, will reduce velocity through the area.

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area, as well as the newly created ponds. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Cost of Project: \$3,600.00

Permit Fee: \$200.00

Project 3 (Water 1B)

This ephemeral drainage (labeled as Water 1B on the map) is located upstream of the Wetland 1A along the southern edge of SR 84, and is tributary to Arroyo del Valle. It is a heavily incised, oak riparian stream corridor with steep banks leading to the channel bed at the toe of slope of SR 84. This drainage is connected to the adjacent, upstream wetland 1C by a culvert that passes under a residential driveway.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 4,081 ft² (0.09 ac; 895 linear ft) and associated temporary impacts totaling approximately 982 ft² (0.02 ac). The temporary impacts include the installation of a temporary culvert which will provide access between the east and west sides of the creek. Construction activities will also result in .36 acre of temporary, and 1.46 acre of permanent impacts to oak riparian habitat.

Access to the location will be via the adjacent existing highway, driveways, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, the temporary culvert will be removed and the ground recontoured to its pre-project condition. Caltrans proposes to reseed the temporarily disturbed area and to replant the riparian corridor areas. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters and riparian species to be used.

Project Cost: \$9,900.00

Permit Fee: \$250.00

Project 4 (Wetland 1B)

This is a 0.01 acre seasonal wetland, labeled as Wetland 1B on the map, within the Water 1 system. It forms at the inlet of a culvert that passes under SR 84 and can best be described as a vegetated channel. The channel is devoid of woody riparian overstory.

Placement of fill or construction of the new alignment will result in permanent impacts totaling approximately 55 ft² (0.001 ac) and associated temporary impacts totaling approximately 13 ft² (0.0003 ac).

Access to the location will be via the adjacent existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$80.00

Permit Fee: \$200.00

Project 5 (Wetland 1C)

This is a 0.67 acre seasonal wetland (labeled as Wetland 1C on the map) south of SR 84. This wetland is a combination of flow from Water 1C and the nearby hills. It can best be described as a combination of swale and wet meadow. There is a small area of oak riparian habitat associated with the west end of this wetland. The riparian habitat is part of the riparian corridor that runs along Water 1C described below.

Placement of fill for the construction of the new alignment and installation of a 48 inch (in) culvert and a 12 in culvert to facilitate drainage under the new alignment will result in permanent impacts to wetlands totaling approximately 18,297 ft² (0.42 ac) and associated temporary impacts totaling approximately 4,150 ft² (0.10 ac). Construction activities will also result in .12 acre of temporary impacts to riparian habitat.

Access to the location will be via the adjacent existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters and riparian species to be used.

Project Cost: \$28,000.00

Permit Fees: \$750.00

Project 6 (Water 1C)

This heavily incised, ephemeral drainage (labeled as Water 1C on the map) receives flow from the bermed Wetland 1D via a spillway/culvert. This drainage, which has an associated dense oak riparian corridor, discharges into the downstream Wetland 1C. It is a tributary of Arroyo del Valle.

There will be no impacts to the bed and bank of this drainage; however, there is the potential to temporarily impact .15 acre of the outer edge of the oak riparian habitat due to construction equipment and work activities associated with adjacent roadwork.

Access to the location will be through the adjacent upland areas. No access roads within the stream zone are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed riparian area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the riparian species to be used.

Project Cost: \$200.00

Permit Fee: \$200.00

Wetland 1D

This 0.35 acre seasonal wetland (labeled as Wetland 1D on the map) is south of SR 84. It is fed by Water 1D and drained by Water 1C. A wet meadow-type wetland has formed where Water 1D has braided out in this area behind a man-made berm. This area will be avoided during the construction therefore there will be no impacts.

Project 7 (Water 1D)

This ephemeral drainage (labeled as Water 1D) is located upstream of Wetland 1D and flows parallel to SR 84. This segment of the Water 1 system receives drainage from the upstream Wetland 1E, is moderately incised and has a dense oak/willow riparian habitat. It is a tributary of Arroyo del Valle.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,952 ft² (0.14 ac; 917 linear feet) and associated temporary impacts totaling approximately 718 ft² (0.02 ac). Work activities will also result in .24 acre of temporary, and 1.18 acre of permanent impacts to riparian habitat. The creek channel will be realigned from its existing location to the north toe of the new slope from approximately station numbers 69+65 to 72+80. This new channel will have a combination of natural bottom and some rock protection in areas where the additional erosion protection is needed, with rock weirs placed at appropriate locations along the new channel to create seasonally ponded wetland areas to mitigate impacts to Wetlands 1C, 1D, and 1E.

Access to the location will be via the adjacent existing highway or upland areas. There are no access roads within the stream zone planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed waters and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The recreated channel will, at minimum, be seeded with the wetland/waters species proposed in the previously submitted Revegetation Plan. If conditions are suitable to support riparian vegetation after construction, the area will also be augmented with riparian species proposed in the Revegetation Plan.

Project Cost: \$1,200

Permit Fee: \$200.00

Project 8 (Wetland 1E)

This 0.12 acre seasonal wetland (labeled as Wetland 1E) is located above the origin of Water 1E in a low-lying area that slopes towards Water 1D. It receives water from sheet flow runoff from the adjacent hills and from a culvert under SR 84. Under heavy storm

conditions, it has the potential to receive water from Wetland 1F. It is vegetated with wetland grasses and has no woody overstory.

This wetland will be completely filled by the construction project. Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,365 ft² (0.12 ac).

Project Cost: \$5,200

Permit Fee: \$250.00

Project 9 (Water 1E)

This drainage, labeled as Water 1E on the map, connects the headwaters Wetland 1F with all downstream jurisdictional features. It is a very shallow, indistinct drainage that has no associated riparian overstory and is vegetated only with nonnative annual grasses. It is a tributary of Arroyo del Valle.

This drainage will be completely filled by the construction project. Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 557 ft² (0.01 ac; 277 linear ft). This drainage area will be recreated and vegetated as described in the Project 8, as the two projects are connected and will be similarly impacted.

Project Cost: \$4,900.00

Permit Fee: \$200.00

Project 10 (Wetland 1F)

This large 1.2 acre seasonal wetland (labeled as Wetland 1F on the maps) forms in a low area immediately adjacent to the existing roadway on the east side of the Pigeon Pass saddle, and accepts roadway runoff and sheet flow from the surrounding uplands. Wet season observation, topography, and drainage patterns indicate that this system is not typically hydrologically connected to a jurisdictional water body, except possibly during heavy storm conditions, when it may overflow into Wetland 1E. The edges are populated with wetland plants such as *Eleocharis* sp., *Carex* sp., and *Juncus* sp. during the growing season with open water comprising the remaining inner portion. The area is devoid of a riparian overstory.

Placement of fill necessary to construct the new alignment will result in permanent impacts to wetlands totaling approximately 33,971 ft² (0.78 ac) and associated temporary impacts totaling approximately 5,799 ft² (0.13 ac).

Access to the location will be via the adjacent existing highway, driveway, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$180,000.00

Permit Fee: \$1,100.00

Project 11 (Wetland 2)

This 0.07 acre wetland (labeled as Wetland 2 on the map) is the result of a spring at the beginning of a seasonal drainage, at the top of a hill. A small plateau at the spring creates an area for water to saturate the ground, and sometimes pool, before it overflows down the hill during the wet season. The wetland is vegetated with *Juncus* sp., *Eleocharis* sp., *Cyperus* sp., and *Rumex* sp.

This wetland will be completely filled by the new alignment. Placement of fill necessary to construct the new alignment and installation of a 750 mm (29.5 in) culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 3,162 ft² (0.07 ac).

Project Cost: \$3,000.00

Permit Fee: \$200.00

Project 12 (Wetland 3A)

This 0.06 acre seasonal wetland (labeled as Wetland 3A on the map) is partially within a creek bed and a backwater area of a creek (Water 2). It is sparsely vegetated with wetland plants such as *Rumex* sp., *Cyperus* sp., *Eleocharis* sp. and *Juncus* sp., but is devoid of a riparian overstory.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill necessary to construct the new alignment and installation of a 28 in culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 2,323 ft² (0.05 ac) and associated temporary impacts to wetlands totaling approximately 88 ft² (0.002 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$3,000.00

Permit Fee: \$200.00

Project 13 (Wetland 3B)

This 0.60 acre seasonal wetland (labeled as Wetland 3B on the map) accepts both roadway runoff and sheet flow from the adjacent hills. It is a combination of a wet meadow, man-made stock pond, and vegetated channel. It drains into a natural, ephemeral drainage (Water 2), which then drains into Wetland 3A. This wetland has a woody willow riparian overstory around its eastern edge.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for construction of the new alignment will result in permanent impacts to wetlands totaling approximately 10,071 ft² (0.23 ac) and associated temporary impacts totaling approximately 1,595 ft² (0.04 ac). Construction activities will also result in .04 acre of temporary and .19 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project Cost: \$19,200.00

Permit Fee: \$500.00

Project 14 (Water 2)

This water, labeled as Water 2 on the map, includes the heavily incised ephemeral drainage which flows from Wetland 3B into Wetland 3A. This drainage system eventually flows into the San Antonio Reservoir. It does not have an associated riparian corridor.

Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 447 ft² (0.01 ac; 106 linear ft). This drainage will be completely filled by the project.

Project Cost: \$180.00

Permit Fee: \$200.00

Project 15 (Water 3)

This water (labeled as Water 3 on the map) includes the ephemeral creek, which runs perpendicular to SR 84 and terminates in the San Antonio Reservoir. It is heavily incised and the associated oak riparian habitat includes approximately 4-5 oaks growing at the top of the banks.

There are two impact areas along this drainage. Impact Area 1 involves the temporary placement of fill necessary to accommodate the relocation of a Pacific Gas & Electric pipeline. This relocation will result in temporary impacts totaling approximately 58 ft² (0.001 ac). Impact Area 2 includes partially filling the drainage for the new alignment. This activity will result in permanent impacts totaling approximately 3,759 ft² (0.09 ac; 570 linear ft) and associated temporary impacts totaling approximately 755 ft² (0.02 ac). Construction activities will also result in .17 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland or along a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed drainage areas. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost (Impact Area 1): \$700.00

Permit Fee: \$200.00

Project Cost (Impact Area 2): \$66,500.00

Permit Fee: \$750.00

Project 16 (Wetland 4)

This 0.16 acre seasonal wetland (labeled as Wetland 4 on the map) can best be described as a heavily incised, vegetated channel. It is located on both sides of SR 84. It receives water from the surrounding hills northwest of SR 84, travels under the highway through a culvert and transitions into Water 3. This wetland has an associated oak riparian corridor along the top of its banks.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for the construction of the new alignment will result in permanent impacts to wetlands totaling approximately 141 ft² (0.003 ac) and associated temporary impacts totaling approximately 693 ft² (0.01 ac). Construction activities will also result in .05 acre of temporary impacts to riparian habitat.

Access to the location will be by the existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed wetland and oak riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project Cost: \$16,000.00

Permit Fee: \$500.00

Project 17 (Wetlands 5A-5D)

These seasonal wetlands (0.20 ac, 0.30 ac, 0.01 ac, and 0.04 ac, respectively) are found along drainages that originate outside of the project area, north of SR 84 (5A and B), with 5C extending into the project area north of SR 84, then traveling under the highway through a culvert, and emerging again as 5D, outside the construction project area, south of SR 84. They are best described as a channel vegetated with wetland plants such as *Juncus* sp and *Carex* sp. They do not have an associated riparian corridor.

Portions of Wetland 5B will be temporarily disturbed during construction due to roadwork. The roadwork will temporarily impact 1,909 ft² (0.04 ac).

Access to the location will be via the existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$ 4,900.00

Permit Fee: \$200.00

Water 4

This ephemeral drainage, which runs parallel to SR 84 on the north side, connects two wetlands, which are outside of the construction project area. This system eventually drains into the San Antonio Reservoir. This water will not be impacted by the project.

Wetlands 6A-6C

These seasonal wetlands (0.01 ac, 0.001 ac, and 0.03 ac, respectively) originate along a wetland drainage (6A) north of SR 84, and travel under the highway through a culvert, emerging again as Wetlands 6B and 6C, south of SR 84. This wetland drainage is tributary to the San Antonio Reservoir, located about 1 mi downstream. This system can best be described as a swale-like drainage. This area will not be impacted by the project.

Habitat Type Descriptions

Oak Woodland, Riparian and Upland: The valley oak woodland plant community, which correspond with the CNPS's valley oak series, can be found along some of the ephemeral creeks and scattered in the upland nonnative grassland (URS 2002). It is dominated by valley oak (*Quercus lobata*) and includes coast live oak (*Quercus agrifolia*) and California buckeye (*Aesculus californica*) (URS 2002). The woodlands interspersed in the upland are lower in density than the riparian habitat and are typical of oak woodlands that have a nonnative grassland understory (URS 2002). The riparian areas also include western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), sandbar willow (*Salix exigua*), red willow (*Salix laevigata*), and arroyo willow (*Salix lasiolepis*) in the tree layer. The shrub layer consists of California rose (*Rosa californica*), Pacific blackberry (*Rubus ursinus*), blue elderberry (*Sambucus mexicana*), common snowberry (*Symphoricarpos albus* var. *laevigatus*), and poison oak (*Toxicodendron diversilobum*). A complete list of vegetation identified during botanical surveys is found in Appendix B.

Annual Grassland: Nonnative grassland is the dominant vegetation community within the LOD and surrounding area. Most of this grassland is completely open, with some scattered oaks. This plant community corresponds to the CNPS's California annual grassland series (URS 2002). The dominant species within the grassland include slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), perennial ryegrass (*Lolium multiflorum*), and Medusa-head (*Taeniatherum caput-medusae*) (URS 2002). Native and nonnative herbaceous species are also present, as well as patches of creeping wildrye (*Leymus triticoides*) (CNPS's creeping ryegrass series) and purple needlegrass (*Nassella pulchra*) (URS 2002). A complete list of all vegetation identified during botanical surveys is found in Appendix B.

Hydrophytic Vegetation: The seasonal wetlands located within the area support vegetation that is normally only found growing under anaerobic conditions characteristic of wetlands. Wetlands occur as narrow linear bands along channels, in pockets at culvert inlet and outlets, in natural swales and depressions and in man-made features where water collects. The wetland habitats in the project area are dominated by herbaceous vegetation that include tall flatsedge (*Cyperus eragrostis*), spikerush (*Eleocharis macrostachya*), fringed willow herb (*Epilobium ciliatum* ssp. *ciliatum*), spreading rush (*Juncus patens*), rabbit foot grass (*Polypogon monspeliensis*), low club rush (*Scirpus cernuus*), and mulefat (*Baccharis salicifolia*). Shrub and tree species, such as red willow (*Salix laevigata*), arroyo willow (*Salix lasiolpis*) and mulefat (*Baccharis salicifolia*) are present

within or along wetland edges at several locations. Grasses, such as Bermuda grass (*Cynodon dactylon*), Italian ryegrass (*Lolium multiflorum*), Dallis grass (*Paspalum dilatatum*), ditch grasses (*Polypogon* sp) and other nonnative annuals dominate many of these wetland areas. A complete list of vegetation identified during botanical surveys is found in Appendix B.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
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JENSEN
CALIF Young
3/14/05

In reply refer to:
1-1-04-F-0115

February 28, 2005

Mr. Gene Fong
Federal Highway Administration
Department of Transportation
650 Capital Mall, Suite 4-100
Sacramento, California 95814

Subject: Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California

Dear Mr. Fong:

This is in response to your February 17, 2004, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass) in Alameda County, California. Your request was received in this Field Office on February 18, 2004. This document represents the Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*); and conference opinion on the effects of the action on the proposed critical habitats for the California tiger salamander and the California red-legged frog. This document is issued pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

This biological opinion is based on: (1) a letter from the Federal Highway Administration to the Service dated February 17, 2004; (2) *Early Evaluation for the San Joaquin Kit Fox for the Pigeon Pass Curve Correction Project* dated August 22, 2002, that was prepared by the California Department of Transportation; (3) *Biological Assessment Pigeon Pass Curve Realignment, Alameda County State Route 84, southwest of Livermore, Ca 04-Ala-84-33.3-37.0 (20.6-23.0) 04-172400* (Biological Assessment) dated February 2004, that was received by the Service on February 18, 2004; (4) *Large Branchiopod Dry (2002) and Wet (2002-2003) Season Surveys Caltrans SR 84 Curve realignment Project* dated May 2003 that was prepared by URS; (5) a visit to the project site by Chris Nagano of the Service on November 8, 2004; (6) a meeting

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Mr. Gene Fong

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on November 9, 2004, between Cay Goude and Susan Moore of the Service, and Gary Winters, Susan Chang, and Jeff Jensen of the California Department of Transportation; (7) a telephone conference between Chris Nagano, and John Webb, Shanna Zahner, Jeanie Baker, and Chris Collision on November 18, 2004; (8) a letter from the California Department of Transportation to the Service dated November 18, 2004; a meeting between Chris Nagano, Cay Goude, Susan Moore, Catrina Martin, and Jim Browning of the Service and Jeff Jensen, Chuck Morton, and other staff of the California Department of Transportation; (9) a e-mail dated December 15, 2004, from Chris Collision of the California Department of Transportation to the Service; (10) a letter from the California Department of Transportation to the Service dated February 15, 2005; (11) e-mail and telephone conversations between the California Department of Transportation and the Service; and (12) other information available to the Service.

CONSULTATION HISTORY

- August 29, 2002: The Service received the *Early Evaluation for the San Joaquin Kit Fox for the Pigeon Pass Curve Correction Project*.
- September 19, 2002: Heather Bell and Adam Zerrenner of the Service met with Shanna Zahner of the California Department of Transportation to discuss the San Joaquin kit fox.
- February 18, 2004: A letter requesting initiation of formal consultation dated February 17, 2004, and the Biological Assessment from the Federal Highway Administration were received by the Service.
- August 11, 2004: Ann Bowers of the Service met with Shanna Zahner of the California Department of Transportation to discuss the San Joaquin kit fox, California tiger salamander, and California red-legged frog.
- October 4, 2004: Shanna Zahner advised the Service that nighttime construction may be necessary to complete the action within three construction seasons.
- November 8, 2004: Chris Nagano of the Service conducted a field visit at the proposed project site.
- November 9, 2004: Susan Moore and Cay Goude of the Service, and Gary Winters, Susan Chang and Jeff Jensen of the California Department of Transportation discussed the proposed project.
- November 18, 2004: Chris Nagano, and John Webb, Shanna Zahner, Jeanie Baker, and Chris Collision of the California Department of Transportation discussed the proposed project on the telephone.
- November 18, 2004: The California Department of Transportation sent a letter dated November 18, 2004, via e-mail to the Service that stated they will provide protection in perpetuity for habitat affected by the proposed project (3:1 for permanent loss; 1:1 for temporary loss; temporary impacts to California red-legged frog would be restored on-site).
- November 18, 2004: The Service sent an e-mail to the California Department of Transportation requesting habitat protection in perpetuity be provided for the loss of California red-legged frog habitat, and an assessment of effects to the habitat of this species in the southern portion of the proposed project.

- November 23, 2004: In response to a request from the Service, the California Department of Transportation sent an e-mail of a photo and plans for the driveway undercrossings of State Route 84.
- November 20, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the culvert undercrossings intended for wildlife at the proposed project.
- November 25, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the lighting that will be used at the proposed project due to the potential effect on the nocturnal activities of the fox, frog, and salamander.
- November 28, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the vernal pools that will be affected by the proposed project.
- December 5, 2004: The California Department of Transportation sent an e-mail containing portions of the information that the Service had requested in order to complete the analysis necessary for the formal consultation.
- December 8, 2004: Chris Nagano, Cay Goude, Susan Moore, Catrina Martin, and Jim Browning of the Service discussed the project with Jeff Jensen, Chuck Morton, and other members of the California Department of Transportation. The California Department of Transportation stated they would compensate for the adverse effects of the project on the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp.
- December 14, 2004: The California Department of Transportation sent an e-mail containing portions of the information that the Service had requested in order to complete the analysis necessary for the formal consultation.
- December 15, 2004: Chris Collision of the California Department of Transportation sent an e-mail to Chris Nagano of the Service stating that the Marysville office of the California Department of Transportation, not their Oakland office, was responsible for all negotiations and decisions on the formal consultation on the Pigeon Pass Project.
- December 20, 2004: The Service sent an e-mail to the California Department of Transportation requesting information on night lighting, vernal pools, and the California red-legged frog at the project site.
- January 7, 2005: Chris Nagano, Wayne White, Susan Moore, and Cay Goude discussed the proposed project with Susan Chang and Jeff Jensen of the California Department of Transportation.
- February 15, 2005: The Service received a letter from Susan Chang of the California Department of Transportation regarding the habitat for the California tiger salamander, California red-legged frog, San Joaquin kit fox, and the vernal pool fairy shrimp that will be protected as compensation for adverse effects resulting from the proposed project.

BIOLOGICAL OPINION

Description of Proposed Action

It is our understanding, the Pigeon Pass Project is intended to correct existing horizontal and vertical alignment deficiencies on State Route 84 south of Livermore in Alameda County, California. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills/Pigeon Pass area, thereby reducing the accident rate for this corridor.

The westbound truck-climbing lane would begin west of the signalized intersection at Ruby Hills Drive/State Route 84 and continue approximately 1600 feet west of the crest in the vertical profile of Pigeon Pass. The eastbound truck-climbing lane begins prior to the 6% uphill grade west of Pigeon Pass and continues over Pigeon Pass to the intersection of Ruby Hills Drive. There will be a 11.8 feet wide paved median, intended to function as a left turn and acceleration lane. The paved width of the new alignment will vary from 43.3 to 78.7 feet, and from Pigeon Pass to the west end it varies from 78.7 to 43.3 feet. The project requires the relocation of a 2 foot diameter natural gas transmission pipeline located approximately 1,792 feet west of Pigeon Pass. The earthwork is balanced, and therefore, a disposal site is not necessary. Approximately 17,655,367 cubic feet will be excavated and reused as fill within the cut and fill units.

Construction of the project is expected to begin in 2005 and be complete by 2007. It will most likely be constructed in three phases. The first phase will include construction of the westerly two-thirds of the frontage road (private landowner access) and temporary detour; the second phase will include constructing the last one-third of the frontage road, removal of temporary detour, and completing the conforms. The third phase will include constructing the last one-third of the frontage road, removal of temporary detour, and completing the conforms. At this time blasting and pile driving activities are not expected. Equipment used to perform the work could include, but is not limited to, scrapers, dozers, graders, and dump trucks. Nighttime construction of an unknown duration and extent will be conducted at the project site.

Avoidance and Protection Measures – Listed Species

According to the Biological Assessment, the February 15, 2005, letter from California to the Service, and other information available to the Service, the California Department of Transportation proposes to avoid, minimize, and compensate for effects to listed species through the following measures:

1. No ground disturbing activities will be conducted between October 31st and March 1st outside the limits of the established road bed. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads.
2. The potential for adverse effects caused by poor water quality will be avoided by implementing temporary and permanent Best Management Practices outlined in section 7-7.01G of the California Department of Transportation's Standard Specifications.

3. The contractor shall be required to submit a Storm Water Pollution Prevention Plan as required by the National Pollutant Discharge Elimination System permit.
4. Additional water quality protection measures required by other permits such as the California Department of Fish and Game's Lake and Streambed Alteration Agreement will be implemented.
5. Twelve drainage culverts and two driveway under crossings will be installed throughout the project area, which can provide a method of crossing under the new highway.
6. A qualified biologist shall be on-site or on-call during all activities that could result in the take of listed species. The qualification of the biologist(s) shall be presented to the Service for review and approval at least 60 calendar days prior to any groundbreaking at the project site. The biologist(s) shall be given the authority to stop any work that may result in the take of listed species. If the biologist(s) exercises this authority, the Service and the California Department of Fish and Game shall be notified by telephone and electronic mail within one (1) working day. The Service contact is the Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone 916/414-6600.
7. Environmentally sensitive areas (ESAs) will be established, and marked in the field with standard orange mesh ESA fencing, around known avoidable vernal pools, amphibian breeding and aestivation areas, and any active, or potentially active, kit fox dens. Under the direction of the California Department of Transportation Resident Engineer, with the aid of the Service approved biologist, the ESA fence will be erected around the ESAs to prevent areas from being disturbed during construction.
8. The limits of the construction area will be flagged, if not already marked by right of way, or other, fencing, and all activity will be confined within the marked area. All access to and from the project area will be clearly marked in the field with appropriate flagging and signs. Prior to commencing construction activities, the contractor will determine construction vehicle parking and all access.
9. Project-related vehicles shall observe a 20-mile per hour speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when California red-legged frogs, California tiger salamanders, and kit foxes are most active.
10. To the extent possible, nighttime construction should be minimized. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads.

11. An employee education program shall be conducted, consisting of a brief presentation by persons knowledgeable in vernal pool, California tiger salamander, red-legged frog, and kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and any other personnel involved in the project. The program should include the following: a description of the species and their habitat needs; a report of the occurrence of these species in the project area; an explanation of the status of these species and their protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the above-mentioned people and anyone else who may enter the project site. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.
12. For compensation for permanent and temporary loss of habitat listed below, where habitat is suitable for both the San Joaquin kit fox and the California tiger salamander, its preservation may be counted toward the preservation of both species.
13. The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander and providing payment for 52 acres into the Service's San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credits at the Ohlone Conservation Bank. The California Department of Transportation will pay \$650,000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

Avoidance and Protection Measures - San Joaquin Kit Fox

1. Preconstruction/pre-activity surveys shall be conducted by a Service approved biological monitor according to the *Standard Recommendation for the Protection of the San Joaquin kit fox Prior to or During Ground Disturbance* (Standard Recommendations) (U.S. Fish and Wildlife Service 1997) no less than 14 days and no more than 30 days prior to the beginning of project implementation. Surveys shall identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, and assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped in accordance with the survey protocol.
2. Written results of preconstruction/pre-activity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities. If a natal/pupping den is discovered within the project area or within (200-feet) of the project boundary, the Service shall be immediately notified. In accordance with the Standard Recommendations, after preconstruction surveys, dens which are determined by California Department of Transportation to be unavoidable

during construction may be destroyed by excavation, with the exception of natal/pupping dens.

3. Following preconstruction den searches and excavations of unavoidable dens but before construction begins, the Resident Engineer, with the assistance of the Service approved biologist, will establish Environmentally Sensitive Areas around those kit fox dens which are determined by the California Department of Transportation to be reasonably avoidable. ESA radii will be: potential den = (50 feet); known den = (100 feet); natal or pupping den = to be determined on a case-by-case basis in coordination with the Service and the California Department of Fish and Game.
4. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than (2 feet) deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals.
5. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of (4-inches) or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes prior to commencing construction activities for the day, or, at the latest, before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. If necessary, and under the direct supervision of the Service approved biological monitor, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped.
6. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.
7. California Department of Transportation employees, contractors, and contractors' employees shall not have firearms on the project site. This shall not apply to authorized security personnel, or local, State, or Federal law enforcement officials.
8. The California Department of Transportation Resident Engineer is the point of contact in the event that any employee or contractor might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The Resident Engineer will be identified in the employee education program. The Resident Engineer's name and phone number will be provided to the Service.

9. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. shall be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game, and revegetation experts.

Avoidance and Protection Measures - California Tiger Salamander

1. To minimize direct mortality to breeding adults and juveniles using the pool that will be filled, construction at the pool will be restricted to a period after the pool has completely dried (normally by mid-July).

Avoidance and Protection Measures - California Red-Legged Frog

1. A survey and relocation program for California red-legged frogs will be implemented no less than 14 days and no more than 30 days prior to the onset of construction. All red-legged frog habitat previously identified in the Biological Assessment will be surveyed for red-legged frogs by a Service approved biologist. If frogs are found they will be relocated to Ruby Hills/Vineyard Estates mitigation site, pending final written approval from the site managers. If final approval can not be obtained for the Ruby Hills/Vineyard Estates mitigation site, the California Department of Transportation will submit a new location for consideration. No relocation activities will begin until the California Department of Transportation has received written approval of the alternate relocation site from the Service. All biologists involved with the surveying/handling of the red-legged frogs will employ sterilization techniques appropriate to avoid the transmission of chytrid fungus to or from the site.
2. All fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 60 feet from any riparian habitat or water body. The California Department of Transportation shall ensure contamination of habitat does not occur during such operations. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
3. Areas of red-legged frog habitat that are avoidable will be fenced with standard orange mesh Environmentally Sensitive Area fencing.
4. The California Department of Transportation will purchase 25 acres of California red-legged frog habitat. The Service has agreed that 25 acres of the 80 credit acres that will be purchased at the Ohlone Conservation Bank also will be credited towards the listed frog.

Avoidance and Protection Measures - Vernal Pool Fairy Shrimp

1. The California Department of Transportation will purchase 2.06 acres or 2.06 acre credits of habitat for the vernal pool fairy shrimp. The California Department of Transportation will ensure the Service approves of the means of compensation that will be used for this listed crustacean prior to construction.

STATUS OF SPECIES/ENVIRONMENTAL BASELINE

San Joaquin Kit Fox

The San Joaquin kit fox was listed as an endangered species on March 11, 1967 (U.S. Fish and Wildlife Service 1967) and it was listed by the State of California as a threatened species on June 27, 1971. The *Recovery Plan for Upland Species of the San Joaquin Valley, California* includes this listed canine (U.S. Fish and Wildlife Service 1998).

In the San Joaquin Valley before 1930, the range of the San Joaquin kit fox extended from southern Kern County north to Tracy in San Joaquin County, on the west side, and near La Grange in Stanislaus County, on the east side (Grinnell *et al.* 1937; U.S. Fish and Wildlife Service 1998). 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 Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by man. 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 (U.S. Fish and Wildlife Service 1998). There are a limited number of observations of San Joaquin kit foxes foraging in trees in urban areas (Murdoch *et al.* 2005). 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).

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; U.S. Fish and Wildlife Service 1998). 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 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 5 miles (Scrivner *et al.* 1987a), dispersal distances of up to 76.3 miles have been documented for the San Joaquin kit fox (Scrivner *et al.* 1993; U.S. Fish and Wildlife Service 1998). 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.

San Joaquin 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 1983). 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 (U.S. Fish and Wildlife Service 1998). 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 1983), with the average slope at den sites ranging from 0 to 22 degrees (California Department of Fish and Game 1980; O'Farrell 1983; 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 1983; Spiegel *et al.* 1996a).

Natal and pupping dens of the San Joaquin kit fox 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 1983). Active natal dens are generally 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 1983). 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 San Joaquin 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.* 2001). 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 320 to 482 acres (Morrell 1972). An average den density of one den per 69 to 92 acres was reported by O'Farrell (1984) in the southern San Joaquin Valley.

Dens are used by San Joaquin 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. 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 (*Ammospermophilus nelsoni*), black-tailed hares (*Lepus californicus*), and chukar (*Alectoris chukar*) (Jensen 1972; Archon 1992). 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 San Joaquin 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 Reserve (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 (White and Ralls 1993, Spiegel 1996; White and Garrott 1997). 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). Ralls *et al.* (2001) found that foxes sometimes share dens with foxes from other groups; many of these cases involved unpaired individuals and appeared to be unsuccessful attempts at pair formation. 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. 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 3.11 per square mile in optimal habitats in good years (U.S. Fish and Wildlife Service 1998). 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 (U.S. Fish and Wildlife Service 1998). Kit fox home ranges vary in size from approximately 1 to 12 square miles (Spiegel *et al.* 1996b; U.S. Fish and Wildlife Service 1998). Knapp (1978) estimated that a home range in agricultural areas is approximately 1 square mile. Individual home ranges overlap considerably, at least outside the core activity areas (Morrell 1972; Spiegel *et al.* 1996b).

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 sections.

Loss of Habitat

Less than 20 percent of the habitat within the historical range of the kit fox remained when the animal 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 (U.S. Fish and Wildlife 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 (U.S. Fish and Wildlife Service 1995a). 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; U.S. Fish and Wildlife Service 1980). Data from the California Department of Fish and Game (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, Service file 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. 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 (U.S. Fish and Wildlife Service 1998).

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 (U.S. Fish and Wildlife 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 (Paul Kelly, Endangered Species Recovery Program, Fresno, California, personal communication to P. White, U.S. Fish and Wildlife Service, Sacramento, California 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 rabbits (*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, and golden eagles (*Aquila chrysaetos*) will kill kit foxes. Badgers, coyotes, and red foxes also may compete for den sites (U.S. Fish and Wildlife Service 1998). 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 non-native red foxes into areas inhabited by the San Joaquin kit fox. Historically, the geographic range of the red fox did not overlap with that of the 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 (Paul Kelly, pers. comm. to P.J. White, 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 the closely-related swift fox (*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 (U.S. Fish and Wildlife 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 (U.S. Fish and Wildlife 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 kit 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 (U.S. Fish and Wildlife Service 1998). This lack of information is problematic because Williams (in litt., 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 litt., 1989) documented another case of pesticide use near Raisin City in 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, Service file 1-1-00-F-0056, February 29, 2000).

A September 22, 1993, biological opinion issued by the U.S. Fish and Wildlife 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 (U.S. Fish and Wildlife 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)(U.S. Fish and Wildlife 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 habitat occupied by the San Joaquin kit fox 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" 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 parties. Incidental take is defined as take that is "...incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." If no permit is obtained for the incidental take of listed species, the individuals or entities responsible for these actions could be liable under 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.

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 (U.S. Fish and Wildlife Service 1998). 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. J. White, 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 (U.S. Fish and Wildlife Service 1998). 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, Montana, pers. comm. to P.J. White, March 23, 2000). 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 already may 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, pers. Comm. to P. J. White, March 23, 2000). 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 for Upland Species of the San Joaquin Valley, California* (U.S. Fish and Wildlife 1998) 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 including the Millerton Lake area of Fresno County, around the bottom of the Valley, and cross-valley corridors in Kern, Fresno, and Merced counties.

From 1991 to 2000, the Service authorized incidental take for thirteen projects in Alameda, Contra Costa, San Joaquin, and Stanislaus Counties that have resulted in the loss or degradation of approximately 2,644 acres of San Joaquin kit fox habitat (U.S. Fish and Wildlife Service 2001). Compensation measures for these projects protected or will protect 3,016 acres of kit fox habitat within this area. However, much of these conservation measures are in the form of conservation easements, and for the most part, the lands are not actively managed for kit fox.

The Service also recently issued an incidental permit for projects occurring in San Joaquin County as identified in the San Joaquin Multi-species Open Space and Conservation Plan. Since the issuance of this section 10(a)(1)(B) permit in July of 2001, three projects within the kit fox corridor have been or are in the process of being permitted. These projects will impact approximately 204 acres of kit fox habitat. The San Joaquin County Council of Governments will purchase lands at a ratio of 3:1 for natural lands and 1:1 for disturbed lands to mitigate for these impacts. In 2002, the McDonald Kit Fox Preserve was acquired in southwest San Joaquin County, to compensate for impacts of current and future actions that will affect the kit fox (San Joaquin County 2003).

Although there have been sightings of kit fox in the northern range through the years by qualified biologists, population studies in this area have been limited. In 1982 and 1983, a family of kit foxes was radio collared and monitored near Bethany Reservoir (Hall 1983). From 1985 to 1989, kit fox surveys in the Kellogg Creek watershed found a total of 114 potential and possibly active dens, most of which were associated with ground squirrel colonies (Jones & Stokes Associates 1989).

The small size of the population and its isolation from other established populations make this northern most population vulnerable to extinction owing to predation and competition from coyotes and red foxes, inbreeding, catastrophic events, and disease epidemics (White *et al.* 2000). Genetic studies conducted by Schwartz *et al.* (2000) found that individuals in the Los Banos population near San Luis Reservoir only breed with animals in the northern population in Alameda and Contra Costa counties. Thus, projects in Alameda and Contra Costa County that significantly reduce travel corridors and population size could potentially impact the Los Banos kit fox population. The long term viability of both populations depends, at least in part, on periodic immigration and gene flow from between the populations.

Habitat in the northern range is highly fragmented by highways, canals, and development. Interstate 580 runs southeast to northwest as it splits from Interstate 5, and turns west through the Altamont Pass area; thus it impedes both north-south and west-east movement of San Joaquin kit foxes. Although the canal system facilitates north-south migration along its length, it also impedes lateral east-west kit fox travel. Recent development proposals, including those described above, will further impede the movement of kit fox and isolate the northern population from more southern populations. These and other developments are slowly diminishing the last remaining kit fox habitat, and development pressures are expected to increase in the future (see *Cumulative Effects* section of this biological opinion). The protection of the remaining travel corridor, including grasslands west of Interstate 580, and lands between the California aqueduct and the Delta Mendota Canal, is vital to the survival of this population.

Suitable kit fox habitat in the form of grasslands is abundant in the action area, and contiguous within a 10-mile radius of the project (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted

at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest kit fox sighting to the proposed project is approximately 5 miles from the project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the project, as well as the nearby observations of this listed species.

California Tiger Salamander

The final rule listing the California tiger salamander as a threatened species was published on August 4, 2004 (U.S. Fish and Wildlife 2004).

The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998; Stebbins 2003). California tiger salamanders exhibit sexual dimorphism; males tend to be larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. As adults, California tiger salamanders tend to have the creamy yellow to white spotting on the sides with much less on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the top of the animals.

Historically, the California tiger salamander inhabited low elevation grassland and oak savanna plant communities of the Central Valley, and adjacent foothills, and the inner coast ranges in California (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species occurs from near sea level up to approximately 3900 feet in the coast ranges and up to about 1600 feet in the Sierra Nevada foothills (Shaffer *et al.* 2004). Along the coast ranges, the species occurred from the Santa Rosa area of Sonoma County south to the vicinity of Buellton in Santa Barbara County. In the Central Valley and surrounding foothills, the species occurred from northern Yolo County southward to northwestern Kern County and northern Tulare County.

The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae salamanders develop in the vernal pools and ponds in which they were born, they are otherwise terrestrial salamanders that spend most of their postmetamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Subadult and adult California tiger salamanders spend the dry summer and fall months of the year in the burrows of small mammals, such as California ground squirrels and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredó and Van Vuren 1996; Petranka 1998; Trenham 1998a). Camel crickets and other invertebrates within these burrows likely are prey for California tiger salamanders, as well as protection from the sun and wind associated with the dry California climate that can cause desiccation (drying out) of amphibian skin. Although California tiger salamanders are members of a family known as "burrowing salamanders," California tiger

salamanders are not known to create their own burrows in the wild, perhaps due to the hardness of soils in the California ecosystems in which they are found. Because they live underground in the burrows of mammals, they are rarely encountered by humans even where they are abundant. The burrows may be active or inactive, but because they collapse within approximately 18 months if not maintained, an active population of burrowing mammals is necessary to sustain

sufficient underground refugia for the species (Loredo *et al.* 1996). California tiger salamanders also may utilize leaf litter or desiccation cracks in the soil.

The upland burrows inhabited by California tiger salamanders have often been referred to as "estivation" sites, which implies a state of inactivity, however, recent studies show that the animals move, feed, and remain active in their burrows (Trenham 2001; Van Hattem 2004). Researchers have long inferred that they are feeding while underground because the animals arrive at breeding ponds in good condition and are heavier when entering a pond than when leaving. Thus, upland habitat is a more accurate description of the terrestrial areas used by California tiger salamanders.

Once fall or winter rains begin, the salamanders emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993). Adult salamanders mate in the breeding ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Historically, the California tiger salamander utilized vernal pools, but the animals also currently breed in livestock stockpools. Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). In ponds with no or limited vegetation, they may be attached to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). After breeding, adults leave the pool and return to the small mammal burrows (Loredo *et al.* 1996; Trenham 1998a), although they may continue to come out nightly for approximately the next two weeks to feed (Shaffer *et al.* 1993). In drought years, the seasonal pools may not fill and the adults can not breed (Barry and Shaffer 1994).

Salamander eggs hatch in ten to 14 days with newly hatched larvae salamanders ranging from 0.45 to 0.56 inch in total length (Petranka 1998). The larvae are aquatic. They are yellowish gray in color and have broad flat heads, possess large, feathery external gills, and broad dorsal fins that extend well onto their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume smaller tadpoles of Pacific treefrogs (*Pseudacris regilla*) and California red-legged frogs (*Rana aurora*) (J. Anderson 1968; P. Anderson 1968). The larvae are among the top aquatic predators in the seasonal pool ecosystems. They often rest on the bottom in shallow water, but also may be found at different layers in the water column in deeper water. The young salamanders are wary and when approached by potential predators, will dart into vegetation on the bottom of the pool (Storer 1925).

The larval stage of the California tiger salamander usually last three to six months, as most seasonal ponds and pools dry up during the summer (Petranka 1998). Amphibian larvae must

grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left the breeding pools 60 to 94 days after the eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. The longer the ponding duration, the larger the larvae and metamorphosed juveniles are able to grow, and the more likely they are to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). The larvae will perish if a site dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1988) found a strong positive correlation with ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 pools sampled supported larval California tiger salamanders, and 5 of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only six (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998). In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave them and enter upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Unlike during their winter migration, the wet conditions that California tiger salamanders prefer do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find temporary upland sites for the dry summer months, waiting until the next winter's rains to move further into suitable upland refugia. Once juvenile California tiger salamanders leave their birth ponds for upland refugia, they typically do not return to ponds to breed for an average of 4 to 5 years. However, they remain active in the uplands, coming to the surface during rainfall events to disperse or forage (Trenham and Shaffer, unpublished manuscript).

Lifetime reproductive success for California and other tiger salamanders is low. Trenham *et al.* (2000) found the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in roughly 11 metamorphic offspring over the lifetime of a female. Two reasons for the low reproductive success are the preliminary data suggest that most individuals of the California tiger salamanders require two years to become sexually mature, but some individuals may be slower to mature (Shaffer *et al.* 1993); and some animals do not breed until they are four to six years old. While individuals may survive for more than ten years, many breed only once, and in some populations, less than 5 percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as from human caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

Dispersal and migration movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where

they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). Following breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before breeding again (Trenham *et al.* 2000).

California tiger salamanders are known to travel large distances from breeding ponds into upland habitats. Maximum distances moved are generally difficult to establish for any species, but California tiger salamanders in Santa Barbara County have been recorded to disperse 1.3 miles from breeding ponds (Sweet 1998). California tiger salamanders are known to travel between breeding ponds; one study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during migration to or dispersal from ponds, California tiger salamanders may reside in burrows that are far from ponds. At one site in Contra Costa County, hundreds of California tiger salamanders have been captured three years in a row in upland habitat approximately 0.75 mile from the nearest breeding pond (Orloff 2003).

Although the observations above show that California tiger salamanders can travel far, typically they stay closer to breeding ponds. Evidence suggests that juvenile California tiger salamanders disperse further into upland habitats than adult California tiger salamanders. A trapping study conducted in Solano County during winter of 2002/2003 found that juveniles used upland habitats further from breeding ponds than adults (Trenham and Shaffer in press). More juvenile salamanders were captured at distances of 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Large numbers, approximately 20 percent of total captures, were found 1,312 feet from a breeding pond. Fitting a distribution curve to the data revealed that 95 percent of juvenile salamanders could be found within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-04 trapping efforts detected juvenile California tiger salamanders at even further distances, with a large proportion of the total salamanders caught at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2100 feet, were still moving away from ponds (Ben Fitzpatrick, University of California at Davis, pers. comm. 2004). In Santa Barbara County, juvenile California tiger salamanders have been trapped approximately 1,200 feet away while dispersing from their natal pond (Science Applications International Corporation, unpublished data). These data show that many California tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration, radio-equipped adult California tiger salamanders were tracked to burrows 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders having depleted physical reserves post-breeding, or also due to the drier weather conditions that can occur during the period when adults leave the ponds.

In addition, rather than staying in a single burrow, most individuals used several successive burrows at increasing distances from the pond. Although the studies discussed above provide an approximation of the distances that California tiger salamanders regularly move from their breeding ponds, upland habitat features will drive the details of movements in a particular

landscape. Trenham (2001) found that radio-tracked adults favored grasslands with scattered large oaks, over more densely wooded areas. A drift-fence survey at a Santa Barbara County pond that is bordered by a strawberry field found that many emigrating juveniles moved towards the strawberry field; however, no adults were captured entering the pond from this direction. Most of the California tiger salamanders entered the pond from extensive, overgrazed grassy flats rather than sandhill or eucalyptus habitats in other quadrants (Steve Sykes, University of California at Santa Barbara, unpublished data 2003). Based on radio-tracked adults, there is no indication that certain habitat types are favored as corridors for terrestrial movements (Trenham 2001). In addition, at two ponds completely encircled by drift fences and pitfall traps, captures of arriving adults and dispersing new metamorphs were distributed roughly evenly around the ponds. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Several species prey have either been documented or likely prey upon the California tiger salamander including coyotes (*Canis latrans*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), egrets (*Egretta* species), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), bullfrogs (*Rana catesbeiana*), mosquito fish (*Gambusia affinis*), and crayfish (*Procambarus* species). Domestic dogs (*Canis familiaris*) have been observed eating California tiger salamanders at Lake Lagunitas at Stanford University (Sean Barry, ENTRIX, pers. comm. to C. Nagano July 2004).

The California tiger salamander is imperiled throughout its range by a variety of human activities (U.S. Fish and Wildlife Service 2004). Current factors associated with declining populations of the salamander include continued degradation and loss of habitat due to agriculture and urbanization, hybridization with non-native eastern tiger salamanders (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003), and introduced predators. Fragmentation of existing habitat and the continued colonization of existing habitat by non-native tiger salamanders (*Ambystoma tigrinum* and other species) may represent the most significant current threats to California tiger salamanders, although populations are likely threatened by more than one factor. Isolation and fragmentation of habitats within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). Other threats are predation and competition from introduced exotic species; possible commercial overutilization; disease; various chemical contaminants; road-crossing mortality; and certain unrestrictive mosquito and rodent control operations. The various primary and secondary threats are not currently being offset by existing Federal, State, or local regulatory mechanisms. The California tiger salamander also is vulnerable to chance environmental or demographic events, to which small populations are particularly vulnerable.

Thirty-one percent (221 of 711 records and occurrences) of all Central California tiger salamander records and occurrences are in Alameda, Santa Clara, San Benito (excluding the extreme western end of the County), southwestern San Joaquin, western Stanislaus, western Merced, and southeastern San Mateo counties, most of them are in eastern Alameda and Santa Clara counties (Buckingham in litt. 2003; California Department of Fish and Game 2003; U.S.

Fish and Wildlife Service 2004). Thirteen of these records in the Bay Area region are considered extirpated or likely to be extirpated by the California Department of Fish and Game (2003).

The East Bay and Livermore Valley areas have undergone intensive urban development in recent years (California Department of Conservation 1996, 1998, 2000, 2002). The total human population of the counties in the Bay Area Region increased by approximately 17 percent between 1990 and 2000 (4.5 million people to 5.3 million people) (California Department of Forestry 1998). Most of the California tiger salamander natural historic habitat (vernal pool grasslands) available in this region has been lost due to urbanization and conversion to intensive agriculture (Keeler-Wolf *et al.* 1998). California tiger salamanders are now primarily restricted to artificial breeding ponds, such as bermed ponds or stock ponds which are typically located at higher elevations (California Department of Fish and Game 2003).

Of 140 California tiger salamander localities where wetland type was identified, only 7 percent were located in vernal pools (California Department of Fish and Game 2003). The Bay Area region occurs within the Central Coast and Livermore vernal pool regions (Keeler-Wolf *et al.* 1998). Vernal pools within the Coast Range are more sporadically distributed than vernal pools in the Central Valley (Holland 2003). In San Benito and Santa Clara counties, Central Coast vernal pools have been destroyed and degraded due to agriculture. The vernal pools at Stanford in Santa Clara County have been destroyed and degraded due to recreation and development (Keeler-Wolf *et al.* 1998). The annual loss of vernal pools from 1994 to 2000 in Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura counties was 2 to 3 percent; this rate of loss suggests that vernal pools in these counties are disappearing faster than previously reported (Holland 2003). Most of the vernal pools in the Livermore Region in Alameda County have been destroyed or degraded by urban development, agriculture, water diversions, and poor water quality, and long-term overgrazing (Keeler-Wolf *et al.* 1998). During the 1980s and 1990s, vernal pools were lost at a 1.1 percent annual rate in Alameda County (Holland 1998).

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many California tiger salamander breeding sites consist of artificial water bodies. Overall, 89 percent (124) of the records for which the water body was identified are in stock, farm, or berm ponds used by cattle grazing and as a temporary source of water for small farm irrigation (California Department of Fish and Game 2003), possibly placing California tiger salamanders at great risk of hybridization with non-native tiger salamanders especially in Santa Clara and San Benito counties. Without long-term maintenance the longevity of these artificial breeding habitats is also much shorter than their natural breeding habitat, which are vernal pools (Shaffer *in litt.* 2003).

Shaffer *et al.* (1993) found that the East Bay counties of Alameda and Contra Costa supported the greatest concentrations of California tiger salamander. California tiger salamander populations in the Livermore Valley are severely threatened by the ongoing conversion of grazing land to subdivisions and vineyards (Stebbins 1989; East Bay Regional Park District 1999). One project within Alameda County in the Bay Area region that may affect California tiger salamander totals 700 acres (East Bay Regional Parks District 2003). Projects that are likely to threaten California tiger salamanders in the Bay Area region include one in Alameda

County totaling 310 acres, two in San Joaquin County totaling 12,427 acres and one in Santa Clara County totaling 19 acres.

Larvae California tiger salamander were observed in the large pool designated as Site 1 in the fairy shrimp survey (URS 2003), and there are numerous recent sightings in this area recorded in the California Natural Diversity Data Base (California Department of Fish and Game 2004). Suitable salamander breeding habitat also exists in a 60-acre mitigation site for the California red-legged frog and the California tiger salamander at the east end of the project area and north of State Route 84. The site was established to mitigate for impacts resulting from the Ruby Hills and Vineyard Estates subdivision. Juvenile salamanders were observed during fairy shrimp surveys in seasonal pools within the action area. Suitable California tiger salamander habitat in the form of grasslands is abundant in the action area (Nagano pers. obs. November 2004; California Department of Transportation 2002). There is an abundance of ground squirrels, whose burrows provide underground upland habitat for the amphibian (Nagano pers. obs. November 2004; California Department of Transportation 2004). Therefore, the Service has determined it is reasonable to conclude the California tiger salamander inhabits the action area, based on the biology and ecology of the species, the presence of suitable habitat, as well as the recent observations of this animal.

California Tiger Salamander Proposed Critical Habitat

Critical habitat for the California tiger salamander was proposed on August 10, 2004 (U.S. Fish and Wildlife Service 2004). The Service divided the current range of the Central population into four regions: (1) Central Valley; (2) Southern San Joaquin Valley; (3) East Bay; and (4) Central Coast. The project area is located in the East Bay region.

The Service determined that conserving the California tiger salamander over the long-term requires a five-pronged approach: (1) Maintaining the current genetic structure across the species range; (2) maintaining the current geographical, elevational, and ecological distribution; (3) protecting the hydrology and water quality of breeding pools and ponds; (4) retaining or providing for connectivity between locations for genetic exchange and recolonization; (5) protecting sufficient barrier-free upland habitat around each breeding location to allow for sufficient survival and recruitment to maintain a breeding population over the long-term (U.S. Fish and Wildlife Service 2004).

The Service believes that areas proposed for critical habitat may require certain management considerations or protections due to the following threats: (1) Activities that introduce or promote the occurrence of bullfrogs and fish; (2) Activities that could disturb aquatic habitats during the breeding season; (3) Activities that impair the water quality of aquatic breeding habitats; (4) Activities that would reduce small mammal populations to the point that there is insufficient underground Central population refugia used for foraging, protection from predators, and shelter from the elements; (5) Activities that create barriers impassible for salamanders or road crossings that increase mortality in upland habitat between extant occurrences in breeding habitat; (6) Activities on adjacent uplands that disrupt vernal pool complexes' ability to support California tiger salamander breeding function; (7) Activities that introduce non-native tiger

salamanders in areas where the California tiger salamander is threatened with hybridization (U.S. Fish and Wildlife Service 2004).

In determining which areas to designate as critical habitat, the Service considers those physical and biological features (primary constituent elements) that are essential to the conservation of the species, and that may require special management considerations and protection (50 CFR § 424.14). The Service lists the known primary constituent elements together with the proposed critical habitat description. Such physical and biological features include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements for the California tiger salamander are aquatic and upland areas, including vernal pool complexes, where suitable breeding and non-breeding habitats are interspersed throughout the landscape, and are interconnected by continuous dispersal habitat. All areas proposed as critical habitat for the central population contain one or more of the primary constituent elements (U.S. Fish and Wildlife Service 2004).

Breeding Habitat. Standing bodies of fresh water, including natural and man-made (e.g. stock) ponds, vernal pools, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a sufficient length of time necessary for the species to complete its life cycle (U.S. Fish and Wildlife Service 2004).

Breeding California tiger salamander are found in vernal pools, vernal pool complexes, and seasonal ponds in associated annual grasslands, oak savannah, and coastal bay scrub plant communities of the Bay Area (Santa Clara Valley), Central Coast, Central Valley, and Southern San Joaquin Valley. The California tiger salamander also have adapted to using artificial water bodies, such as stock ponds during their aquatic phase. However, stockponds are often not optimum breeding habitat because the hydroperiod is so short there is not sufficient time for larvae to metamorphose, or it is so long that predatory fish and bullfrogs can colonize the pond. Permanent wetlands can support breeding California tiger salamander if fish are not present, but extirpation of the salamander is likely to occur if fish are introduced. Periodic maintenance to remove silt from stockponds and other artificial waterbodies may also cause a temporary loss of functioning aquatic habitat. Regardless of vernal pool, pond, or seasonal wetland type, successful breeding ponds for California tiger salamander need to be inundated for a minimum of 21 weeks to allow for successful metamorphosis (U. S. Fish and Wildlife Service 2004).

Non-Breeding Habitat. California tiger salamanders spend the majority of their lives in barrier-free upland habitats adjacent to breeding ponds. Within these upland habitats, adult California tiger salamander spend part of their lives in the underground burrows of mammals, especially the burrows of the California ground squirrel and valley pocket gopher, with depths ranging from 20 centimeters to 1 meter beneath the ground surface. Small mammals are essential in creating the underground habitat that adult California tiger salamander depend on for food, shelter, and

protection from the elements and from predation. Although California tiger salamanders are members of a family of burrowing tiger salamanders, California tiger salamanders are not known to create their own burrows in the wild and require small mammal burrows for survival. The upland component of the Central population habitat typically consists of vernal pool grassland or grassland savannah with scattered oak trees. However, some occupied California tiger salamander breeding ponds exist within mixed grassland and woodland habitats, in woodlands, scrub, or chaparral habitats (U.S. Fish and Wildlife Service 2004).

Dispersal and Migration. Movements made by California tiger salamanders can be grouped into two main categories: (1) Breeding migration, and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years (on average, four years). Upon reaching sexual maturity, most individuals return to their natal (birth) pond to breed, while 20 percent disperse to other ponds (U. S. Fish and Wildlife Service 2004).

Essential dispersal habitats generally consist of upland areas adjacent to essential aquatic habitats which are not isolated from other essential aquatic habitats by barriers that California tiger salamanders cannot cross. Essential dispersal habitats provide connectivity among California tiger salamander suitable aquatic and upland habitats. While California tiger salamanders can bypass many obstacles, and do not require a particular type of habitat for dispersal, the habitats connecting essential aquatic and upland habitats need to be free of barriers (e.g. a physical or biological feature that prevents salamanders from dispersing beyond the feature) to function effectively (U. S. Fish and Wildlife Service 2004).

The Service proposed critical habitat that allowed for dispersal between extant occurrences within 0.7 mile of each other. This distance was selected because it provides for 99 percent of the chances that individual salamanders can move and breed between extant occurrences, and, thereby, provides for genetic exchange between individuals within the region (U.S. Fish and Wildlife Service 2004).

The proposed Pigeon Pass Project is located in Unit 3 of critical habitat proposed by the Service (U.S. Fish and Wildlife Service 2004b). The project area is relatively undeveloped, with the highway corridor, the Ruby Hills and Vineyard Estates developments, and several ranches in the project vicinity. The surrounding habitat includes several vegetation communities, including valley oak woodland, annual non-native grassland, seasonally wetted areas with associated vegetation, and ponds. A 60-acre California red-legged frog/California tiger salamander mitigation site for the Ruby Hills/Vineyard Estates consists of a series of artificial ponds connected by drainages, and the surrounding upland habitat. As described in the Biological Assessment, essentially all undeveloped lands on and adjacent to the action area contain the constituent elements of proposed California tiger salamander critical habitat, including aquatic habitat, associated uplands, and dispersal habitat.

California Red-Legged Frog

The California red-legged frog was listed as a threatened species on May 23, 1996, (U.S. Fish and Wildlife Service 1996). Please refer to the final rule and the *Recovery Plan for the California Red-Legged Frog (Rana aurora draytonii)* (U.S. Fish and Wildlife Service 2002) for additional information on this species.

This species is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 1985). The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 1985), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). California red-legged frogs breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). Individuals occurring in coastal drainages are active year-round (Jennings et al. 1992), whereas those found in interior sites are normally less active during the cold season.

The historic range of the red-legged frog extended coastally from the vicinity of Point Reyes National Seashore, Marin County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985; Hayes and Krempels 1986). The California Red-legged frog was historically documented with 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (U.S. Fish and Wildlife Service 2002). Red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (California Department of Fish and Game 2002).

California red-legged frogs have been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, California red-legged frogs have been documented in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

Adult California red-legged frogs prefer dense, shrubby or emergent riparian vegetation closely associated with deep (>2.3 feet), still, or slow-moving water (Hayes and Jennings 1988).

However, frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of California red-legged frogs currently are associated with deep pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). California red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat. Sheltering habitat for California red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay ricks may also be used. Incised stream channels with portions narrower than 46 centimeters (18 inches) and depths greater than 46 cm (18 in) may also provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival. During winter rain events, juvenile and adult California red-legged frogs are known to disperse up to 0.54-1.08 miles (Rathbun and Holland, unpublished data, cited in Rathbun *et al.* 1997). Dispersing frogs in northern Santa Cruz County traveled distances from 0.25 mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger, unpublished data).

Egg masses contain about 2,000 to 5,000 moderate sized (0.08 to 0.11 inches in diameter), dark reddish brown eggs and are typically attached to vertical emergent vegetation, such as bulrushes (*Scirpus* spp.) or cattails (Jennings *et al.* 1992). California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992); eggs exposed to salinity levels greater than 4.5 parts per thousand result in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1990). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925; Jennings and Hayes 1985). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations of California red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful (e.g., drought).

The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. Vertebrates, such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). Tadpoles likely eat algae (Jennings *et al.* 1992).

Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (*Rana catesbeiana*) (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculus*), and several species of warm water fish including sunfish (*Lepomis* spp.), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range.

Several researchers in central California have noted the decline and eventual disappearance of California red-legged frog populations once bullfrogs became established at the same site (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs (*Rana aurora aurora*), and suggested that bullfrogs could prey on subadult northern red-legged frogs as well. In addition to predation, bullfrogs may have a competitive advantage over California red-legged frogs; bullfrogs are larger, possess more generalized food habits (Bury and Whelan 1984), have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977), and larvae are unpalatable to predatory fish (Kruse and Francis 1977). In addition to competition, bullfrogs also interfere with California red-legged frog reproduction. Both California and northern red-legged frogs have been observed in amplexus with (mounted on) both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; M. Jennings, in litt. 1993; R. Stebbins in litt. 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat. The urbanization of land within and adjacent to California red-legged frog habitat has also impacted California red-legged frogs. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks California red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs. This report further identifies the conversion and isolation of perennial pool habitats resulting from urbanization as an ongoing impact to California red-legged frogs.

The recovery plan for the California red-legged frog identifies eight recovery units. Each recovery unit reflects areas with similar conservation needs. The strategy for recovery of California red-legged frogs includes promoting and protecting populations that are geographically distributed in a manner that allows for the continued existence of viable metapopulations. The California red-legged frog has been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, California red-legged frogs have been documented in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

This project is located within the East San Francisco Bay Recovery Unit, which extends from the northernmost portion of Contra Costa County, includes a portion of San Joaquin County south to

Santa Clara County, includes the eastern portion of San Mateo County, and all of San Francisco County (U. S. Fish and Wildlife Service 2002). Contra Costa and Alameda counties contain the majority of known California red-legged frog localities within the eastern San Francisco Bay area. Within this recovery unit, the listed amphibian seem to have been nearly eliminated from the western lowland areas near urbanization, they still occur in isolated populations in the East Bay Foothills (between Interstate 580 and Interstate 680), and are abundant in several areas in the eastern portions of Alameda and Contra Costa counties. This recovery unit is essential to the survival and recovery of California red-legged frogs, as it contains the largest number of occupied drainages in the northern portion of its range. The eastern and western edges of this area are heavily urbanized and the northern and southern edges are bounded by major highways. However, there are numerous small drainages flowing underneath both Interstate 580 and Highway 84 that California red-legged frogs could disperse through. Therefore, this area is connected to other populations of red-legged frogs in the foothills of central Alameda and Contra Costa Counties and the populations found in eastern Alameda County. Within this area, the species historically bred in several ponds and drainages within the proposed project area, Garin/Dry Creek Regional Park, Pleasanton Ridge Regional Park, and Sinbad Creek.

There are several recent sightings of the California red-legged frog in the action area and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds. Areas containing aquatic and upland habitat exist within and adjacent to the action area (Nagano pers. obs. November 2004). The action area contains components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

California Red-Legged Frog Proposed Critical Habitat

On March 13, 2001, the final rule determining critical habitat for red-legged frogs was published in the Federal Register (U.S. Fish and Wildlife Service 2001). This rule established 31 critical habitat units based on three primary constituent elements: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat. In November 2002, the U.S. District Court for the District of Columbia vacated most of the 2001 designation and ordered the Service to publish a new critical habitat proposal. On April 13, 2004, the Service re-proposed 4.1 million acres in 28 California counties as critical habitat for the frog (U.S. Fish and Wildlife Service 2004). This proposed rule basically re-proposes the same areas designated critical habitat in the 2001 final rule.

The Service is required to list the known primary constituent elements together with the critical habitat description. Such physical and biological features include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species (U. S. Fish and Wildlife Service 2004).

Due to the complex life history and dispersal capabilities of the California red-legged frog, and the dynamic nature of the environments in which they are found, the primary constituent elements described below are found throughout the watersheds that are proposed as critical habitat. Special management, such as habitat rehabilitation efforts (e.g., removal of nonnative predators), may be necessary in the area designated. The proposed critical habitat for the California red-legged frog provides for breeding and non-breeding habitats and for dispersal between these habitats, as well as allowing for expansion of frog populations vital to the recovery of the subspecies. The proposed critical habitat includes: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat.

Aquatic habitat is essential for providing space, food, and cover, necessary to sustain all life stages of red-legged frogs. It consists of virtually all low-gradient fresh water bodies, including natural and man-made (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds, except deep lacustrine water habitat (e.g., deep lakes and reservoirs 50 acres or larger in size) inhabited by nonnative predators. The subspecies requires a permanent water source to ensure that aquatic habitat is available year-round. Permanent water sources can include, but are not limited to, ponds, perennial creeks, permanent plunge pools within intermittent creeks, seeps, and springs. Aquatic habitat used for breeding usually has a minimum deep water depth of 20 inches, and maintains water during the entire tadpole rearing season (at least March through July). During periods of drought, or less-than-average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but because they support breeding in wetter years these sites would still be considered essential breeding habitat. Ponds that support a small population of red-legged frogs, but are not surrounded by suitable upland habitat, or are cut off from other breeding ponds or permanent water sources by impassable dispersal barriers, do not have the primary constituent elements for proposed California red-legged frog critical habitat.

To be a primary constituent element for California red-legged frog proposed critical habitat, the aquatic components within the designated boundaries must include two or more breeding sites (as defined above) located within 1.25 miles of each other; at least one of the breeding sites must also be a permanent water source; or, the aquatic component can consist of two or more seasonal breeding sites with a permanent non-breeding water source located within 1.25 miles of each breeding site. California red-legged frogs have been documented to travel 2.25 miles in a virtual straight line migration from non-breeding to breeding habitats (U.S. Fish and Wildlife Service 2001a). In addition, breeding sites must be connected by dispersal habitat connecting essential aquatic habitat, described below.

Associated upland and riparian habitat is essential to maintain California red-legged frog populations associated with essential aquatic habitat. The associated uplands and riparian habitat provide food and shelter sites for California red-legged frogs, and assist in maintaining the integrity of aquatic sites by protecting them from disturbance and supporting the normal functions of the aquatic habitat. Key conditions include the timing, duration, and extent of water moving within the system, filtering capacity, and maintaining the habitat to favor red-legged frogs and discourage the colonization of nonnative species such as bullfrogs. Essential upland habitat consists of all upland areas within 300 feet, or no further than the watershed boundary, of the edge of the ordinary high-water mark of essential aquatic habitat (U.S. Fish and Wildlife Service 2001a).

Essential dispersal habitat provides connectivity among California red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to California red-legged frog dispersal.

Dispersal habitat connecting essential aquatic habitat. Essential dispersal habitat provides connectivity among red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to red-legged frog dispersal.

The Pigeon Pass Project occurs within the East Bay-Diablo Range unit (Unit 15), which consists of watersheds within Contra Costa, Alameda, San Joaquin, Santa Clara, Stanislaus, San Benito, Merced, and Fresno counties. The boundary of Unit 15 encompasses approximately 1.05 million acres, of which approximately 87 percent is privately owned. The remaining 13 percent is managed, in part, by various Federal, State, and local land and water management agencies. Because essential aquatic habitat, associated uplands, and essential dispersal habitat has not been widely mapped in the unit, the Service can not accurately estimate the area within the unit that supports primary constituent elements. However, due to the presence of high use roads and

developed areas as well as substantial areas without permanent water, we anticipate that the effective area of Unit 15 will be considerably less than 1.05 million acres.

Unit 15 has been affected by activities that destroy essential aquatic and upland habitats, and dispersal habitats providing connectivity between subpopulations. Degradation and loss of these habitats have occurred through urbanization, mining, inappropriate management of grazing, recreation, invasion of nonnative plants, impoundments, water diversions, degraded water quality, and introduced predators.

The action area is relatively undeveloped, and it contains State Route 84, Ruby Hills and Vineyard Estates developments, and several ranches. The surrounding habitat includes several vegetation communities, including valley oak woodland, annual non-native grassland, seasonally wetted areas with associated vegetation, and ponds. A 60-acre California red-legged frog/California tiger salamander mitigation site for the Ruby Hills/Vineyard Estates consists of a series of artificial ponds connected by drainages, and the surrounding upland habitat. As described in the Biological Assessment, essentially all undeveloped lands on and adjacent to the project site contain the constituent elements of proposed California red-legged frog critical habitat, including essential aquatic habitat, associated uplands, and essential dispersal habitat.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp was listed as threatened on September 19, 1994 (U.S. Fish and Wildlife Service 1994). Simovich *et al.* (1992) and Ericksen and Belk (1999) provide further details about the life history and ecology of this species.

The vernal pool fairy shrimp has a delicate elongate body, large stalked compound eyes, no carapace, and 11 pairs of swimming legs. It swims or glides gracefully upside down by means of complex beating movements of the legs that pass in a wave-like anterior to posterior direction. Fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus. The females carry the eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The "resting" or "summer" eggs are capable of withstanding heat, cold, and prolonged desiccation. When the pools fill in the same or subsequent seasons, some, but not all, of the eggs may hatch. The egg bank in the soil may consist of eggs from several years of breeding (Donald 1983). The eggs hatch when the vernal pools fill with rainwater. The early stages of the vernal pool fairy shrimp develop rapidly into adults. These non-dormant populations often disappear early in the season long before the vernal pools dry up.

The vernal pool fairy shrimp inhabits vernal pools with clear to tea-colored water, most commonly in grass or mud-bottomed swales, or basalt flow depression pools in unplowed grasslands. The vernal pool fairy shrimp has been collected from early December to early May. It can mature quickly, allowing populations to persist in short-lived shallow pools (Simovich *et al.* 1992). Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools (Eng *et al.* 1990; Helm 1998; California Department of Fish and Game 2001). The pool types where the

species has been found include Northern Hardpan, Northern Claypan, Northern Volcanic Mud Flow, and Northern Basalt Flow vernal pools formed on a variety of geologic formations and soil types. Although vernal pool fairy shrimp have been collected from large vernal pools, including one exceeding 25 acres in area (Eriksen and Belk 1999), it is most frequently found in pools measuring fewer than 0.05 acre in area (Helm 1998; Gallagher 1996). The species occurs at elevations from 33 feet to 4,003 feet (Eng *et al.* 1990), and is typically found in pools with low to moderate amounts of salinity or total dissolved solids (Keeley 1984; Syrdahl 1993). Vernal pools are mostly rain fed, resulting in low nutrient levels and dramatic daily fluctuations in pH, dissolved oxygen, and carbon dioxide (Keeley and Zedler 1998). Although there are many observations of the environmental conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species.

The hydrology that maintains the pattern of inundation and drying characteristic of vernal pool habitats is complex. Vernal pool habitats form in depressions above an impervious soil layer (duripan) or rock substrate. After winter rains begin, this impervious layer prevents the downward percolation of water and creates a perched water table causing the depression (or pool) to fill. Due to local topography and geology, the depressions are generally part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages (Nikiforoff 1941; Holland and Jain 1978). These features form an interconnected hydrological unit known as a vernal pool complex. Although vernal pool hydrology is driven by the input of precipitation, water input to vernal pool basins also occurs from surface and subsurface flow from the swale and upland portions of the complex (Zedler 1987, Hanes *et al.* 1990, Hanes and Stromberg 1998). Surface flow through the swale portion of the complex allows vernal pool species to move directly from one vernal pool to another. Upland areas are a critical component of vernal pool hydrology because they directly influence the rate of vernal pool filling, the length of the inundation period, and the rate of vernal pool drying (Zedler 1987; Hanes and Stromberg 1998).

The vernal pool fairy shrimp has evolved unique physical adaptations to survive in vernal pools. Vernal pool environments are characterized by a short inundation phase during the winter, a drying phase during the spring, and a dry phase during the summer (Holland and Jain 1978). The timing and duration of these phases can vary significantly from year to year, and in some years vernal pools may not inundate at all. In order to take advantage of the short inundation phase, vernal pool crustaceans have evolved short reproduction times and high reproductive rates. The listed crustaceans generally hatch within a few days after their habitats fill with water, and can start reproducing within a few weeks (Eng *et al.* 1990; Helm 1998; Eriksen and Belk 1999). Vernal pool crustaceans can complete their entire life cycle in a single season, and some species may complete several life cycles. Vernal pool crustaceans can also produce numerous offspring when environmental conditions are favorable. Some species may produce thousands of cysts during their life spans.

To survive the prolonged heat and desiccation of the vernal pool dry phase, vernal pool crustaceans have developed a dormant stage. After vernal pool crustacean eggs are fertilized in the female's brood sac, the embryos develop a thick, usually multi-layered shell. When embryonic development reaches a late stage, further maturation stops, metabolism is drastically

slowed, and the egg, now referred to as a cyst, enters a dormant state called diapause. The cyst is then either dropped to the pool bottom or remains in the brood sac until the female dies and sinks. Once the cyst is desiccated, it can withstand temperatures near boiling (Carlisle 1968), fire (Wells *et al.* 1997), freezing, and anoxic conditions without damage to the embryo. The cyst wall cannot be affected by digestive enzymes, and can be transported in the digestive tracts of animals without harm (Horne 1967). Most fairy shrimp cysts can remain viable in the soil for a decade or longer (Belk 1998).

Although the exact signals that cause crustacean cysts to hatch are unknown, factors such as soil moisture, temperature, light, oxygen, and osmotic pressure may trigger the embryo's emergence from the cyst (Brendonck 1996). Because the cyst contains a well developed embryo, the animal can quickly develop into a fully mature adult. This allows vernal pool crustaceans to reproduce before the vernal pool enters the dry phase, sometimes within only a few weeks (Helm 1998, Eriksen and Belk 1999). In some species, cysts may hatch immediately without going through a dormant stage, if they are deposited while the vernal pool still contains water. These cysts are referred to as quiescent, and allow the vernal pool crustacean to produce multiple generations in a single wet season as long as their habitat remains inundated.

Another important adaptation of vernal pool crustaceans to the unpredictable conditions of vernal pools is the fact that not all of the dormant cysts hatch in every season. Hathaway and Simovich (1996) found that only 6 percent of endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) cysts hatched after initial hydration, and only 0.18 percent of Riverside fairy shrimp cysts hatched. The cysts that don't hatch remain dormant and viable in the soil. These cysts may hatch in a subsequent year, and form a cyst bank much like the seed bank of annual plants. The cyst bank may be comprised of cysts from several years of breeding, and large cyst banks of viable resting eggs in the soil of vernal pools containing fairy shrimp have been well documented (Belk 1998). Based on a review of other studies (e.g. Belk 1977; Gallagher 1996, Brendonck 1996), Hathaway and Simovich (1996) concluded that species inhabiting more unpredictable environments, such as smaller or shorter lived pools, are more likely to have a smaller percent of their cysts hatch after their vernal pool habitats fill with water. This strategy reduces the probability of complete reproductive failure if a vernal pool dries up prematurely. This kind of "bet-hedging strategy" has been suggested as a mechanism by which rare species may persist in unpredictable environments (Chesson and Huntly 1989; Ellner and Hairston 1994).

Upland areas associated with vernal pools are also an important source of nutrients to vernal pool organisms (Wetzel 1975). Vernal pool habitats derive most of their nutrients from detritus which is washed into the pool from adjacent uplands, and these nutrients provide the foundation for vernal pool aquatic communities food chain. Detritus is a primary food source for the vernal pool crustaceans (Eriksen and Belk 1999).

Vernal pool fairy shrimp generally will not hatch until water temperatures drop to below 50°F (Gallagher 1996; Helm 1998). This species is capable of hatching multiple times within a single wet season if conditions are appropriate. Helm (1998) observed 6 separate hatches of vernal pool

fairy shrimp within a single wet season, and Gallagher (1996) observed 3 separate hatches in vernal pools in Butte County.

Helm (1998) observed vernal pool fairy shrimp living for as long as 147 days. The species can reproduce in as few as 18 days at optimal conditions of 68°F and can complete its life cycle in as little as 9 weeks (Gallagher 1996; Helm 1998). However, maturation and reproduction rates of vernal pool crustaceans are controlled by water temperature and can vary greatly (Eriksen and Brown 1980; Helm 1998). Helm (1998) observed that vernal pool fairy shrimp did not reach maturity until 41 days at water temperatures of 59°F. Vernal pool fairy shrimp has been collected at water temperatures as low as 40°F (Eriksen and Belk 1999), however, the species has not been found in water temperatures above about 73°F (Helm 1998; Eriksen and Belk 1999).

The vernal pool fairy shrimp is known from 32 populations extending from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County (Eng et al. 1990; Fugate 1992; Sugnet and Associates 1993) and a disjunct population on the Agate Desert in Oregon. Five additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County; one in the mountain grasslands of northern Santa Barbara County; one on the Santa Rosa Plateau in Riverside County, one near Rancho California in Riverside County and one on the Agate Desert near Medford, Oregon. Three of these isolated populations each contain only a single pool known to be occupied by the vernal pool fairy shrimp. The genetic characteristics of these species, as well as ecological conditions, such as watershed continuity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools (Fugate 1992). Therefore, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes. Individual vernal pools occupied by these species are most appropriately referred to as subpopulations.

The primary historic dispersal method for the vernal pool fairy shrimp likely was large scale flooding resulting from winter and spring rains which allowed the animals to colonize different individual vernal pools and other vernal pool complexes. This dispersal currently is non-functional due to the construction of dams, levees, and other flood control measures, and widespread urbanization within significant portions of the range of this species. Waterfowl and shorebirds likely are now the primary dispersal agents for vernal pool tadpole shrimp and vernal pool fairy shrimp (Brusca in litt.; 1992, King in litt., 1992; Simovich in litt., 1992). The eggs of these crustaceans are either ingested (Krapu 1974; Swanson *et al.* 1974; Driver 1981; Ahl 1991) and/or adhere to the legs and feathers where they are transported to new habitats.

Vernal pool crustaceans are often dispersed from one pool to another through surface swales that connect one vernal pool to another. These dispersal events allow for genetic exchange between pools and create a population of animals that extends beyond the boundaries of a single pool. Instead, populations of vernal pool crustaceans are defined by the entire vernal pool complex in which they occur (Simovich *et al.* 1992, King 1996). These dispersal events also allow vernal pool crustaceans to move into pools with a range of sizes and depths. In dry years, animals may only emerge in the largest and deepest pools. In wet years, animals may be present in all pools,

or in only the smallest pools. The movement of vernal pool crustaceans into vernal pools of different sizes and depths allows these species to survive the environmental variability that is characteristic of their habitats.

Vernal pool crustaceans are an important food source for a number of aquatic and terrestrial species. Aquatic predators include insects such as backswimmers (Woodward and Kiesecker 1994), predaceous diving beetles and their larvae, and dragonflies and damselfly larvae. Vernal pool tadpole shrimp are another significant predator of fairy shrimp. Vernal pools provide important habitat for resident and migratory birds, particularly waterfowl and shorebirds. Birds are particularly attracted to the pools because they offer foraging habitat at a time of year when resources are limited (Silveira 1998), and vernal pools help link aquatic resources in the California portion of the Pacific Flyway. Vernal pool crustaceans provide important proteins and calcium vital to the energetic needs of migratory bird migration and reproduction (Proctor *et al.* 1967; Silveira 1998). Vernal pool crustaceans are a major food source for a number of terrestrial vertebrate predators including water fowl, wading birds, toads, frogs, and salamanders (Proctor *et al.* 1967; Krapu 1974; Swanson 1974; Morin 1987; Simovich *et al.* 1991; Silveira 1998). Vernal pool crustaceans depend on the absence of water during the summer months to discourage aquatic predator species such as bullfrogs, garter snakes, and fish (Eriksen and Belk 1999).

The vernal pool fairy shrimp is imperiled by a variety of human-caused activities, primarily urban development, water supply/flood control projects, and land conversion for agricultural use. Habitat loss occurs from direct destruction and modification of pools due to filling, grading, discing, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use. The main threat to listed vernal pool crustaceans is the loss of habitat associated with human activities, including urban/suburban development, water supply/flood control development, and conversion of natural lands to intensively farmed agricultural uses. According to the 1997 National Resources Inventory, released by the Natural Resources Conservation Service (1999), California ranked sixth in the nation in number of acres of private land developed between 1992 and 1997, at nearly 695,000 acres. Habitat loss occurs from direct destruction and modification of pools due to filling, grading, discing, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use, alterations of vernal pool hydrology, fertilizer and pesticide contamination, activity, invasions of aggressive non-native plants, gravel mining, and contaminated stormwater runoff. State and local laws and regulations do not protect listed vernal pool crustaceans, while other laws and regulations, including the Clean Water Act, have not effectively maintained habitat necessary to conserve and recover these species. Although developmental pressures continue, only a small fraction of vernal pool habitat is protected from the threat of destruction.

Holland (1978) estimated that between 67 and 88 percent of the area within the Central Valley of California which once supported vernal pools had been destroyed by 1973. However, an analysis of this report by the Service revealed apparent arithmetic errors which resulted in a determination

that a historic loss between 60 and 85 percent may be more accurate. Regardless, in the ensuing years, threats to this habitat type have continued and resulted in a substantial amount of vernal pool habitat being converted for human uses in spite of Federal regulations implemented to protect wetlands. For example, the Corps' Sacramento District has authorized the filling of 467 acres of wetlands between 1987 and 1992 pursuant to Nationwide Permit 26 (U.S. Fish and Wildlife Service 1992). The Service estimates that a majority of these wetland losses within the Central Valley involved vernal pools, the habitat of the vernal pool tadpole shrimp and vernal pool fairy shrimp. Current rapid urbanization and agricultural conversion throughout the ranges of these two species continue to pose the most severe threats to the continued existence of the vernal pool tadpole shrimp and vernal pool fairy shrimp. The Corps' Sacramento District has several thousand vernal pools under its jurisdiction (Coe 1988), which includes most of the known populations of these listed species. It is estimated that within 20 years 60 to 70 percent of these pools will be destroyed by human activities (Coe 1988).

In addition to direct habitat loss, the vernal pool habitat for the vernal pool tadpole shrimp and vernal pool fairy shrimp has been and continues to be highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated vernal pool tadpole shrimp and vernal pool fairy shrimp populations. Ecological theory predicts that such populations will be highly susceptible to extirpation due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986; Goodman 1987a, 1987b). If an extirpation event occurs in a population that has been fragmented, the opportunities for recolonization would be greatly reduced due to physical (geographical) isolation from other (source) populations.

In addition to direct habitat loss, the vernal pool habitat for this listed vernal pool crustacean is also highly fragmented throughout their ranges due to the nature of vernal pool landscapes and the conversion of natural habitat by human activities. Such fragmentation results in small, isolated populations of listed crustaceans which may be more susceptible to extinction due to random demographic, genetic, and environmental events. Should an extirpation event occur in a population that has been fragmented, the opportunities for recolonization would be greatly reduced due to physical (geographical) isolation from other (source) populations.

Vernal pools and ephemeral wetlands are found at seven sites in the action area of the Pigeon Pass Project (California Department of Transportation 2004). Service-approved protocols for sampling for the listed crustacean were not followed at the proposed project. Two of the seven sites were not sampled for vernal pool crustaceans because they were located more than 250 feet from the construction area. Back-to-back dry and wet season surveys were conducted at the remaining five sites (California Department of Transportation 2004). Cysts of fairy shrimp of the genus *Branchinecta* were found at one of the pools; however, the specific identity was not determined. This vernal pool is in the right-of-way and cut-and-fill limits for the Pigeon Pass Project, and will be partially filled as a result of the proposed action. Surveys were discontinued at one of the sites when California red-legged frog egg masses were discovered, however, that site is over 250 feet from the zone of disturbance. The vernal pool fairy shrimp has been recorded within 7 miles of the proposed project (California Department of Fish and Game 2004) and suitable habitat for this listed animal is found in the action area of the project. Therefore, the

Service has determined it is reasonable to conclude the vernal pool fairy shrimp occurs in the action area because of the biology and ecology of the species, the presence of suitable habitat, as well as the nearby observations of this listed crustacean.

Effects of the Proposed Action

The proposed Pigeon Pass Project likely will result in a number of adverse effects to the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp. There is a likelihood the animals may be affected by being crushed, entombed in their burrows, their cysts buried or crushed, hit and injured or killed by vehicle strikes, being shot, chased and injured or killed by domestic pet dogs, poisoned by chemical agents, trapped in erosion control netting, or harassed by noise and vibration. The San Joaquin kit fox, California red-legged frog, and California tiger salamander may be adversely affected by the proposed project blocking travel corridors, or by evening construction disturbing night time foraging, mating, movement, or subjecting them to predation that otherwise would not occur. These four listed animals inhabit the project site and surrounding vicinity (for purposes of this biological opinion the surrounding vicinity is described as 1000 feet outside and adjacent to the project footprint) are likely to be subject to indirect effects including loss of habitat, pesticide or chemical poisoning, exotic predators, competitors, and non-native plants, disease, and a reduction in natural food sources as a result of habitat disturbance and loss.

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within two seasons. Ground disturbance resulting from the proposed Pigeon Pass Project includes substantial grading, excavating, and fill. The California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than two seasons after the construction of the project is completed. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

The proposed Pigeon Pass Project includes two oversized culverts that that will allow adjacent landowners to access their properties, and also twelve drainage culverts. The California Department of Transportation has stated these undercrossing and culverts will function as wildlife movement corridors but adequate information was not made available to the Service on

such factors as the sizes or other data that would have allowed an adequate evaluation of the effectiveness of this proposed conservation measure.

Construction equipment that has been used in different areas and with different species of amphibians including the California tiger salamander and the California red-legged frog may transmit diseases by introducing contaminated soil and other material on the equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytrid fungus may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch *et al.* 2000).

This conference opinion on the proposed critical habitats for the California tiger salamander and the California red-legged frog does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR § 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to the proposed critical habitats.

San Joaquin Kit Fox

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species

Construction related activities are likely to cause disruption of foraging, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Because these animals are nocturnal, when construction is performed at night, associated lighting likely would increase all of the above effects. Lighting associated with night construction will also increase the likelihood of predation on San Joaquin kit foxes by removing the cover of darkness. The animals that avoid construction activities may become displaced into adjacent areas. Nocturnally active mammalian predators may be vulnerable to increased predation, exposure, starvation, or stress through disorientation, loss of shelter, and intraspecific and interspecific aggression (Grigione 2002).

Range-wide habitat loss, fragmentation, and degradation from multiple factors is the primary threat to the San Joaquin kit fox (U.S. Fish and Wildlife Service 1998). Approximately 95% of native habitat for kit fox habitat in the San Joaquin Valley has been destroyed by agricultural, industrial, and urban development (U.S. Fish and Wildlife Service 1998). Loss of natural lands continues to occur further reducing the habitat available for the animal. The amount of historical

and current habitat loss directly attributable to road has not been calculated. Estimates of the area occupied by roads under the jurisdiction of California Department of Transportation includes 591 acres for Kings County, 431 hectares (1065 acres) for Merced County, 2019 acres for Fresno County, and 3669 acres for Kern County (Cypher 2000). These estimates are based on a standard lane width of 11.8 feet, and not all of this area is in kit fox habitat. However, the estimates do not include road shoulders, medians, or associated developments (e.g. Interchanges, signs), and also do not include the area occupied by county and city roads.

The effect of habitat fragmentation on the San Joaquin kit fox is potentially significant and likely will: (1) reduce access to habitat as well as habitat suitability, and (2) disrupt movement, dispersal, and gene flow. The construction of roads through San Joaquin kit fox habitat may restrict or block access to adjacent and formerly contiguous habitat patches. The likelihood of this effect increases with larger road size, higher traffic volume, and the presence of fences or median barriers. 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 2 occasions were animals located on the opposite side of the highway from their primary area of use. Interstate 5 has an effect on kit fox use patterns and restricts movements by the San Joaquin kit fox between habitat blocks.

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 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. Whether or not the patch can be used as part of a San Joaquin kit fox home range will depend upon the nature of the factors causing the fragmentation.

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 also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. Bobcats (*Felis rufus*) in Wisconsin readily crossed dirt roads, but were reluctant to cross paved roads (Lovallo and Anderson 1996). Lynx also exhibit a

reluctance to cross roads (Barnum 1999) as do mountain lions (*Felis concolor*) (Van Dyke *et al.* 1986). In a study in North Carolina, the number of road crossings by black bears (*Ursus americanus*) was inversely related to traffic volume, and bears almost never crossed an interstate highway (Brody and Pelton 1989). Endangered Sonoran pronghorn (*Antilocarpa americana*) in Mexico are reluctant to cross a 2-lane highway, and the planned expansion of the road could further restrict movements (Castillo-Sanchez 1999). Many rodents are reluctant to cross roads (Oxley *et al.* 1974).

The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glareolus*) populations separated by a 50-meter (164 foot) wide highway in Germany (Gerlach and Musolf 2000). In California, local extirpations of mountain lions has occurred when roads and other developments fragmented habitat in small patches and blocked movement corridors thereby isolating the patches and preventing recolonization (Beier 1993). Adequately sized culverts or undercrossings with suitable habitat at each side of the passage significantly increases the ability of mammals to cross highways (Ng *et al.* 2003).

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 San Joaquin kit fox. Thus, vehicle strikes are a direct source of mortality for this listed canine. If vehicle strikes are sufficiently frequent in a given locality, they could result in reduced San Joaquin kit fox abundance. The death of animals 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 Reserve 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. Predators, primarily coyotes and bobcats, were the primary source of mortality at the Naval Petroleum Reserves. In addition, 70 kit foxes, both radio collared and non-collared, were found dead on roads in and around the Naval Petroleum Reserve during 1980-1991 (U.S. Department of Energy 1993). Of these, 34 were hit by vehicles on the approximately

1,600 kilometers (990 miles) of roads at the Reserve, and 36 were struck on the approximately 80 kilometers (50 miles) of State and County roads (e.g., State Route 119, Elk Hills Road), where traffic volumes and average vehicle speeds were higher.

In other 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, 6 non-collared kit foxes were killed by vehicles on the access road. Predators, primarily coyotes, bobcats, and feral dogs were responsible for most deaths in this study. 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%) were attributed to a vehicle strike. At the Camp Roberts National Guard Training Facility 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 western Merced County, 28 San Joaquin kit foxes were radio-collared during 1985-1987 (Briden *et al.* 1992). Seventeen were found dead and 2 (12%) of these deaths were attributed to 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 (123 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.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. However, the precise effect of vehicle strikes on the San Joaquin kit fox has not been adequately investigated. According to Morrell (1970), "The automobile is by far the major cause of reported San Joaquin kit fox deaths - 128 of 152 deaths reported were caused by automobiles." Morrell acknowledged that the numbers were based on non-radio-collared kit foxes and therefore were biased because road-killed foxes are conspicuous and easily observed compared to animals dying from other causes. Predators such as coyotes, bobcats, non-native red foxes, and domestic dogs likely constitute a higher source of mortality than vehicle strikes (U.S. Fish and Wildlife Service 1998; Cypher 2000).

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 the animals 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 this endangered mammal, but for which little data is 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.

Based on a study of another kit fox subspecies, Egoscue (1962) reported that 8 tagged foxes (*Vulpes macrotis nevadensis*) in Utah were killed by vehicles, and 5 of these were pups. Pups appeared to be more vulnerable to vehicle strikes. Many of the foxes killed were residents that were using dens located near roads. O'Neal *et al* (1987) examined 23 dead kit foxes in western Utah in 1983. None were killed by vehicles, possibly due to the remoteness of the study site.

Swift foxes (*Vulpes velox*) are closely related to the San Joaquin kit fox, and are listed as an endangered in Canada. They show numerous ecological similarities with the San Joaquin kit fox. Hines (1980) reported that roads were a major source of swift fox mortality in Nebraska. In Alberta, where the swift fox was extirpated and recently reintroduced, vehicles were responsible for 5 of 89 (6%) of the foxes found dead (Cabyn *et al* 1994). Pups appeared to be especially vulnerable, particularly if the natal dens were located near roads (Cabyn 1998). In western Kansas, 41 adults and 24 juvenile swift foxes were radio collared and monitored during 1996-97 on 2 study sites (Sovada *et al* 1998). Among the adults, 18 were found dead, but none were killed by vehicles. Among the juveniles, 14 were found dead and 4 (29%) of these had been struck by vehicles. All 7 of the juveniles killed by vehicles were found on the same study site. This study site had 90% more roads compared to the other study site where no foxes were killed by vehicles (78 miles vs. 41 miles). At a remote site in Colorado with few roads and restricted public access, swift foxes were rarely struck by vehicles (Covell 1992; Kitchen *et al.* 1999).

Vehicle-related mortality has significantly affected other listed or rare species. Vehicles caused 49% of the mortality documented among endangered Florida panthers (*Felis concolor coryi*) (Maehr *et al.* 1991). With a small remaining population, the loss of any individuals to vehicles could constitute a significant population effect. Similarly, at least 15% of the remaining 250-300 key deer (*Odocoileus virginianus clavium*) are killed annually by vehicles (Tubak 1999), and this mortality is considered to be a limiting factor for this endangered species (U.S. Fish and Wildlife Service 1985). Mortality from vehicles was the primary source of mortality for endangered ocelots (*Felis pardalis*) in Texas (Tubak 1999), and also contributed to the failure of a lynx (*Lynx lynx*) reintroduction project in New York (Aubrey *et al.* 1999). Rudolph *et al.* (1999) estimated that road-associated mortality may have depressed populations of Louisiana pine snakes (*Pituophis ruthveni*) and timber rattlesnakes (*Crotalus horridus*) by over 50% in eastern Texas, and this mortality may be a primary factor in local extirpations of timber rattlesnakes (Rudolph *et al.* 1998). Mortality from vehicles also is contributing to the reduction in the status of the prairie garter snake (*Thamnophis radix radix*) in Ohio (Dalrymple and Reichenbach 1984), and was a limiting factor in the recovery of the endangered American crocodile (*Crocodylus acutus*) in Florida (Kushland 1998). In Florida, threatened Florida scrub-jays (*Aphelocoma coerulescens*) suffered higher mortality in territories near roads, as well as reduced productivity due to vehicle strikes of both breeding adults and young (Mumme *et al.* 1999).

Construction, maintenance, and operational activities associated with roads may result in a disturbance effect on nearby San Joaquin kit foxes. Disturbance can result from noise, vibration, odors, or human activity. 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 increase energetic requirements, decrease reproductive output, decrease 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). Hearing loss was greater in male than in female humans; however, this may be caused by environmental factors (NIH 1990). Also, 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*) (Comman 2001). Increased reproductive failure in laboratory mice (*Mus musculus*) was found to occur after a level of 82-85 dBA for one week (Comman 2001). However, measurable loss of hearing was found to occur in chinchillas (*Chinchilla laniger*) at a sustained level of 70 dBA (Peters 1965). 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 (Comman 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*) (MacArthur 1976; Workman *et al.* 1992 both cited in U.S. National Park Service 1994).

Hearing loss is correlated with distance from the source of the noise. At a level of 110 dBA, guinea pigs (*Cavia porcellus*) suffered long-term hearing loss at distances of 75 and 150 feet, temporary loss at a distance of 100 meters, and no measurable loss at 4500 feet (Gonzales *et al.* 1970). Over water, noise is reduced at a rate of 5 dBA for each doubling of the distance to the

source (Komanoff & Shaw 2000). For instance, a noise that measured 20 dBA at 60 feet registers 10 dBA at 40 meters.

Harassment from long-term noise may cause San Joaquin kit foxes to eventually vacate the project site and adjacent areas. Endangered California condors (*Gymnogyps californianus*) have been shown to abandon nesting sites in response to vehicle noise (Shaw 1970). 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 (Chadwick 1973; McCourt *et al.* 1974; Ballard 1975; Krausman and Hervert 1983; Gunn *et al.* 1985; Bleich 1990; all cited in U.S. National Park Service 1994).

Project effects on San Joaquin kit foxes are expected to be greater during the den selection, pregnancy, and early pup dependency periods of the breeding cycle (December through July) than at other times of the year. San Joaquin kit foxes may exhibit increased sensitivity to disturbance during this period and therefore, ideally, surface-disturbing activities should occur between August and November. Habitat compensation measures are anticipated to minimize habitat effects that result from implementation of the project.

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 (e.. 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. Other animals, some of which were prey species for the kit fox, were found drowned in crude oil at the Naval Petroleum Reserve (U.S. Department of Energy 1993). Such spills potentially can cause local reductions in the abundance of kit foxes and their prey. Construction of 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. These exotic species can spread along roadsides and then into adjacent habitat. Non-native animals may use modified habitats adjacent to road to disperse into kit fox habitat. They could compete with kit foxes for resources such as food or dens, or directly injure or kill San Joaquin kit foxes. Non-native plants and animals may reduce habitat quality for the listed canine or their prey, and reduce the productivity or the local carrying capacity for the endangered species. Introductions of non-native species could cause San Joaquin 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, compete with native plants for resources, does not appear to be used by San Joaquin kit fox prey, dense growth, and may be difficult for the listed canine to move through due its large size (up to 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 San Joaquin 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; U.S. Fish and Wildlife Service 1998), and likely compete with kit foxes for food and dens. Red foxes are considered a threat to the swift fox in Canada (Carbyn 1999). 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. Non-native red foxes and feral cats (*Felis catus*) are reported to use roads as movement corridors in Australia (Bennett 1991).

Negative 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 (1998) described the area affected as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet 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 mile from the road. Rudolph *et al* (1999) detected reduced snake abundance up to 2790 feet from roads in Texas. They estimated snake abundance out to 2790 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 the Lone Star State is within 1640 feet of a road. The "road-zone" effects can be subtle. Van der Zandt *et al.* (1980) reported that lapwings (*Vanellus vanellus*) and black-tailed godwits (*Limosa limosa*) feeding at 1575-6560 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 Frossell (2000) described another type of "road-zone" effect. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, by elevated levels of metals in both soil and plants were detected at ≥ 660 feet) of roads. The "road-zone" apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1000 feet in woodlands, 1197 feet in grasslands, and 2657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The "road zone" and the San Joaquin kit fox has not been adequately investigated; however, it is possible it exists given the effects of roads on the animal.

California Tiger Salamander

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart *et al.* 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their

movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

Construction related activities are likely to cause disruption of surface movement, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Because these animals are nocturnal, if construction is performed at night, associated lighting likely would increase all of the above effects. Wise and Buchanan (2002) reviewed the adverse effects that may result from night time illumination on salamander species. Artificial lighting used during night time construction may increase predation of the California tiger salamanders, if it occurs during periods of fall, winter, or spring rains, because the amphibians will lose the cover of darkness for movement. Nocturnal foraging by salamander species may be affected by artificial lighting. Wise and Buchanan (2002) reported that in one species of salamander, individuals emerged from refugia to forage within one hour after light levels dropped to dramatically following sunset. During such foraging bouts, visual information was used for locating prey. Greater light levels delay emergence, resulting in less foraging time, but could have increased the ability of the salamanders to capture prey; however, they also could make the amphibians more vulnerable to predation. Many salamanders, such as the California tiger salamander, are terrestrial as adults but migrate to ponds to breed and lay eggs. The orientation of some of these terrestrial species away from and toward these ponds is influenced by the spectral characteristics of light (Wise and Buchanan 2002). Artificial lights that emit unusual spectra may disrupt these migration patterns.

The loss of ground squirrel burrows will reduce the amount of available upland habitat within the action area. The loss of the breeding pond will result in significantly reduced breeding opportunities for the California tiger salamander. The addition of impermeable surfaces resulting from the widened realignment will be accompanied by an increase in chemical runoff, which would include gasoline and oil, as well as silt runoff, which will reduce water quality in the project site. A wider highway to cross during dispersal and migration likely will result in increased injury and mortality of California tiger salamanders, and increased fragmentation of their habitat in the action area.

The effect of habitat fragmentation on the California tiger salamander is potentially significant. Fragmentation can have two effects: (1) reduction in access to habitat as well as habitat suitability, and (2) disruption of movements, dispersal, and gene flow. The construction of roads through salamander habitat may restrict or block movement between breeding ponds and upland habitat. The likelihood of this effect will increase with larger road size, higher traffic volume, and the presence of fences or median barriers. In addition to limiting access to breeding ponds or upland habitat, roads also may reduce the suitability of habitat for the California tiger salamander by fragmentation into patches too small for effective use by the animals. As a habitat patch decreases in size, the number of California tiger salamanders the patch can support also decreases. This increases the probability that the animals will be extirpated from each habitat

patch. The possibility for recolonization will depend upon the nature of the factors, e.g., roads, canals, development, etc., that are causing the fragmentation.

Fragmentation factors that effectively isolate patches and limit access also constitute barriers to California tiger salamander dispersal, and gene flow. Movements and dispersal corridors between breeding ponds and upland habitat are critical to this animal's population dynamics, particularly because the animals currently persist as metapopulations with multiple disjunct population centers. Movement and dispersal corridors likely are important for alleviating overcrowding during years when California tiger salamander abundance is high, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glareolus*) populations separated by a 50-meter (164 foot) wide highway in Germany (Gerlach and Musolf 2000).

California tiger salamander mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes occur on rainy nights when the animals are moving to their breeding ponds. Thus, vehicle strikes are a direct source of mortality for the California tiger salamander. If vehicle strikes are sufficiently frequent in a given locality, this could result in reduced abundance of this animal. Especially problematic is the death of females prior to the laying of their eggs because this could result in the loss of an entire cohort, and therefore, reduced recruitment of new individuals into the population.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. Although no systematic, range-wide studies have been conducted, it is known that significant numbers of California tiger salamanders are killed by vehicular traffic while crossing roads (Hansen and Tremper 1993; S. Sweet, *in litt.* 1993; Joe Medeiros, Sierra College, pers. comm. 1993). For example, during a 1-hour period on a road bordering Lake Lagunita on the Stanford University campus, 45 California tiger salamanders were collected, 28 of which had been killed by cars (Twitty 1941). More recently, during one 15-day period in 2001 at a Sonoma County location, 26 road-killed California tiger salamanders were found (D. Cook, pers. comm. 2002). Overall breeding population losses of California tiger salamanders due to road kills have been estimated to be between 25 and 72 percent (Twitty 1941; S. Sweet *in litt.* 1993; Launer and Fee *in litt.* 1996). Mortality may be increased by associated roadway curbs and berms as low as 3.5 to 5 inches, which allow California tiger salamanders access to roadways but prevent their exit from them (Launer and Fee 1996; S. Sweet *in litt.* 1998).

In a recent study along a 0.7 mile high-vehicular-use (21,450 vehicles per day) section of the Trans-Canadian Highway in Alberta, Canada, Clevenger *et al.* (2001) recorded 183 road-killed eastern tiger salamanders in 30 days and concluded it was likely that very little of the local population had survived. In California, vehicular-use levels along various State, interstate, and secondary roads commonly far exceed the level of use reported in the Alberta study. Vehicular usage on California roads is also increasing rapidly and directly with human population and urban expansion. During November 2002, California's estimated total vehicular travel on State highway system roads alone was 14.27 billion miles (this figure and subsequent vehicular-use data from California Department of Transportation's Internet website which was accessed on January 2, 2003). From 1972 to 2001, State highway system total vehicular usage rose steadily from 67.11 to 167.81 billion miles annually. For the 23 California counties in which the California tiger salamander may occur, State highway system total annual vehicular usage in 1999, 2000, and 2001 was 53.27, 55.85, and 57.21 billion miles, respectively. The steady increase of vehicular use is thus continuing. We believe such figures illustrate (1) the general increase in vehicular usage that has been, and is still, occurring in many parts of the California tiger salamander's range, and (2) that additional increments of road-kill losses, which are already a potentially serious problem for the species, are likely occurring.

Vehicle-related mortality has significantly affected other listed or rare species. Rudolph *et al.* (1999) estimated that road-associated mortality may have depressed populations of Louisiana pine snakes (*Pituophis ruthveni*) and timber rattlesnakes (*Crotalus horridus*) by over 50% in eastern Texas, and this mortality may be a primary factor in local extirpations of this species of rattlesnake (Rudolph *et al.* 1998). Mortality from vehicles also is contributing to the reduction in the status of the prairie garter snake (*Thamnophis radix radix*) in Ohio (Dalrymple and Reichenbach 1984), and was a limiting factor in the recovery of the endangered American crocodile (*Crocodylus acutus*) in Florida (Kushland 1998).

Similar to the endangered San Joaquin kit fox California red-legged frog, the presence of roads could introduce chemical agents that contaminate and adversely affect the California tiger salamander and its prey; introduce or improve habitat for non-native species that compete or prey upon this listed amphibian; and also the "road zone" effect may adversely affect this listed animal.

California Tiger Salamander Proposed Critical Habitat

The proposed action is not expected to appreciably diminish the value of the proposed critical habitat for the California tiger salamander, or prevent the proposed critical habitat from sustaining its role in the conservation and recovery of the species. The California Department of Transportation is proposing to implement measures to restore the areas subject to a significant amount of cut and fill to pre-project conditions. There is currently an existing highway within the action area, and, due to the proposed restoration activities, realigning a section of that highway will not significantly interfere with the current capability of the proposed critical habitat to satisfy essential requirements of the species. Constituent elements for the California tiger salamander will remain intact during and after project completion, or will be restored, and will continue to provide suitable habitat.

California Red-legged Frog

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

Changes in light level may disrupt orientation in nocturnal animals. The range of anatomical adaptations to allow night vision is broad (Park 1940), and rapid increases in light can blind animals. For frogs, a quick increase in illumination causes a reduction in visual capability from which the recovery time may be minutes to hours (Buchanan 1993). After becoming adjusted to a light, frogs may be attracted to it as well (Jaeger and Hailman 1973). Laboratory experiments have demonstrated that dark-adapted frog species exposed to rapid increases in illumination may be temporarily "blinded" and unable to gather visual information on prey, predators, or conspecifics until their eyes adapt to the new illumination. Foraging may be facilitated in frog species that hunt around lights because the ambient illumination is increased to a level that allows the frogs to see prey or because lights attract abnormally large numbers of insects and other invertebrate prey. Experiments and anecdotal evidence indicates that both temporary and permanent changes to the night time illumination of an area may affect the reproduction, foraging, predator avoidance, and social interactions of frog species (Buchanan 2002). Reproductive behaviors may be altered by artificial lighting; it may be inhibited in frog species that normally reproduce only at very low illuminations. Female frogs of the species *Physalaemus pustulosus* are less selective about mate choice when light levels are increased, evidently preferring to mate quickly and avoid the increased predation risk of mating activity (Rand *et al.* 1997). Longcore and Rich (2002) reported that frogs in an experimental enclosure stopped mating activity during night football games, when lights from a nearby stadium increased sky glow. Mating choruses only resumes when the enclosure was covered to shield the frogs from light. Increased illumination may allow predators to see frogs that may not normally be visible to them. Circadian rhythms, activity patterns, and intraspecific visual communication also may be affected by increased illuminations.

Breeding habitat, identified as Site 1, will be eliminated by the proposed project. Individual frogs occupying the affected habitat run the risk of being crushed or buried by earth moving activities. Those that do survive will suffer permanent and temporary loss of habitat, and harassment from increased human activity. Construction of an unspecified duration and location will occur at night and the associated lighting may increase predation because frogs will lose the cover of darkness. In addition to the elimination of the breeding pond identified as Site 1, at certain times during construction the movement of frogs from breeding ponds north of State Route 84 to summer habitat south of State Route 84, and visa versa, likely will be impeded by construction activities. Temporary loss of dispersal habitat for the project duration increases

intra-and interspecific competition for food and living space for red-legged frogs in the action area.

The proposed action is likely to result in indirect effects to the red-legged frog that will last beyond the completion of the proposed action. The action would (1) result in permanent and temporal loss of aestivation habitat; (2) reduce water quality in the action area; (3) result in higher mortality of red-legged frogs in the action area; and (4) increase fragmentation of remaining red-legged frog habitat over the longer term.

Similar to the endangered San Joaquin kit fox and the California tiger salamander, the presence of roads could introduce chemical agents that contaminate and adversely affect the California red-legged frog and its prey; introduce or improve habitat for non-native species that compete or prey upon this listed amphibian; and also the "road zone" effect may adversely affect this listed animal.

The addition of impermeable surfaces resulting from the widened realignment will be accompanied by an increase in chemical runoff, which would include gasoline and oil, as well as silt runoff, which will reduce water quality in the project site. The widening of State Route 84 will likely result in higher mortality due to the increased distance that red-legged frogs have to travel over the highway to cross it. Removal of vegetation will likely increase exposure to introduced non-native and/or urban-adapted predators due to the permanent and temporary loss of cover to dispersing red-legged frogs.

California Red-Legged Frog Proposed Critical Habitat

The proposed action is not expected to appreciably diminish the value of the proposed critical habitat for the red-legged frog, or prevent proposed critical habitat from sustaining its role in the conservation and recovery of the species. The California Department of Transportation is proposing to implement measures to restore the areas subject to a significant amount of cut and fill to pre-project conditions. There is currently an existing highway within the action area, and, due to the proposed restoration activities, realigning a section of that highway will not significantly interfere with the current capability of the proposed critical habitat to satisfy essential requirements of the species. Constituent elements for the red-legged frog will remain intact during and after project completion, or will be restored, and will continue to provide suitable habitat.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

The potential adverse effects of the proposed Pigeon Pass Project include habitat fragmentation; altered hydrology; non-point source pollution; dust emissions; erosion; sedimentation; hazardous material spills; human disturbance; and establishment of invasive nonnative plants. The project could potentially result in habitat fragmentation. The results of fragmentation are inhibition of genetic exchange between populations and impediments to recolonization of habitats from which populations have been extirpated. Small, isolated populations are substantially more vulnerable to stochastic events (e.g., aberrant weather patterns, fluctuations in availability of food) and may exhibit reduced adaptability to environmental (natural or anthropogenic) changes.

The Service considers all vernal pool branchiopods and their habitat not considered to be directly affected but within 250 feet of proposed construction activities to be indirectly affected by project implementation. Habitat indirectly affected includes all habitat supported by future destroyed areas and swales, and all habitat otherwise damaged by loss of watershed, human intrusion, introduced species, and pollution that will be caused by the proposed project. The proposed project will directly affect 0.61 acre and 0.2 acre of vernal pool will be indirectly affected by the proposed project. The new alignment will affect the vernal pool fairy shrimp through construction activities and long-term effects occurring within 250 feet of it. Individual branchiopods and their cysts, which may inhabit this seasonal wetland, may be injured or killed by any of the following indirect effects:

Erosion - The ground disturbing activities in the watershed of vernal pools associated with the proposed project action area are expected to result in siltation when pools fill during the wet season following construction. Siltation in pools supporting vernal pool fairy shrimp may result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages, thereby reducing the number of mature adults in future wet seasons. The proposed project construction activities could result in increased sedimentation transport into vernal pool branchiopod habitats during periods of heavy rains.

Changes in hydrology - The biota of vernal pools and swales can change when the hydrologic regime is altered (Bauder 1986, 1987). Survival of aquatic organisms like the vernal pool fairy shrimp are directly linked to the water regime of their habitat (Zedler 1987). Therefore, construction near vernal pool areas will, at times, result in the decline of local sub-populations of vernal pool organisms, including fairy shrimp.

Introduction of non-natives - There is an increased risk of introducing weedy, non-native plants into the vernal pools both during and after project construction due to the soil disturbance from clearing and grubbing operations, and general vegetation disturbance associated with the use of heavy equipment.

Chemical contamination - The runoff from chemical contamination can kill listed species by poisoning. Oils and other hazardous materials associated with construction equipment could be conveyed into the habitat of the vernal pool fairy shrimp by overland runoff during the rainy season, thereby adversely affected water quality. Many of these chemical compounds are thought to have adverse effects on this species. Individuals may be killed directly or suffer reduced

fitness through physiological stress or a reduction in their food base due to the presence of these chemicals.

In addition to the adverse effects detailed above, the proposed project will contribute to a local and range-wide trend of habitat loss and degradation, the principal reasons that the vernal pool fairy shrimp have declined. The proposed project will contribute to the fragmentation and reduction of the acreage of the remaining listed vernal pool branchiopod habitat located in western Alameda and throughout the range of this listed vernal pool branchiopod.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions 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.

From 1995 to 2020, the human population is projected to increase by 18 percent for the San Francisco Bay hydrologic region, while at the same time agricultural crop land use in the region is projected to remain around 65,000 acres (California Department of Water Resources 998). According the California Department of Forestry, from 2000 to 2020, the human population within counties in the Bay Area region is expected to grow by 29 percent (5.3 million people to 6.8 million people), and by 60 percent from 2000 to 2040 (5.3 million people to 8.4 million people) (California Department of Forestry 1998). There will likely be many other development projects that occur during this timeframe due to increases in human population growth that will continue to imperil the California tiger salamander, San Joaquin kit fox, California red-legged frog, and the vernal pool fairy shrimp.

The California Department of Parks and Recreation's Carnegie State Park is operated for use by off-highway vehicles. This State Park unit is located approximately 10 miles east of the Pigeon Pass Project along Corral Hollow Creek. Ongoing habitat degradation by off road vehicle use will continue to marginalize the available upland and riparian habitat along Corral Hollow Creek. Presently, there are plans to expand Carnegie State Park; any expansion of this Park could exacerbate the degradation of habitat in this area.

Within this region of Alameda County, there is a continued demand for new housing. Considering this, the remaining open space adjacent to the Pigeon Pass Project is likely threatened by development. Two developments, Ruby Hills and Vineyard Estates have already been constructed adjacent to the project site. The development of adjacent wildlife habitat will continue to result in the loss of not only breeding, resting, and foraging habitat, but the loss of dispersal corridors between breeding populations, thereby further isolating and fragmenting wildlife populations. Additionally, development of small reservoirs or water bodies, such as golf course hazards, and water diversions may occur which may pose further threats such as disruption of dispersal corridors for terrestrial species, and competition or predation from with non-native species such as bullfrogs for aquatic species.

CONCLUSION

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed. The Service reached the conclusion on the effects on the proposed critical habitat of the California red-legged frog and the California tiger salamander because the effects of the project will be offset by the conservation measures in the project description, including the successful restoration of areas subject to the temporary effects of cut and fill to pre-project conditions.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, 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 California Department of Transportation so they become binding conditions of project authorization for the exemption under 7(o)(2) to apply. The California Department of Transportation has a continuing duty to regulate the activity that is covered by this incidental take statement. If the California Department of Transportation (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of 7(o)(2) may lapse.

Amount or Extent of Take

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity,

it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often is extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size, Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the San Joaquin kit fox, California red-legged frog, California tiger salamander. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore will not be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed based on the proposed restoration of the areas subject to temporary disturbance.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the Pigeon Pass Project on the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp:

1. The California Department of Transportation shall implement conservation measures for the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp to minimize (1) the effects of the loss of habitat that will occur as a result of the project; (2) the potential for harassment, harm, injury, and mortality to these four listed species; and (3) the potential for inadvertent capture or entrapment of federally listed wildlife species during construction activities.
2. The California Department of Transportation shall ensure their compliance with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Highway Administration shall ensure the California Department of Transportation complies with the

following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

- A. The following Term and Conditions will implement Reasonable and Prudent Measure number one (1):
1. The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, and appearing in the *Project Description* of this biological opinion.
 2. The California Department of Transportation shall include Special Provisions that include the avoidance and minimization measures of this biological opinion in the solicitation for bid information. In addition, the California Department of Transportation will educate and inform contractors involved in the project as to the requirements of the biological opinion.
 3. As described in the February 15, 2005, letter from the California Department of Transportation to the Service, the 52 acres that will be purchased for the San Joaquin kit fox and the California tiger salamander via the Service's San Joaquin Kit Fox Fund shall be acquired within the geographic area inhabited by the same population segment of the California tiger salamander known as the East Bay Unit that is being adversely affected by the Pigeon Pass Project.
 4. As described in the February 15, 2005, letter from the California Department of Transportation to the Service, prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for preservation credits that are equivalent of 1.45 acres of suitable vernal pool habitat for this listed species. Prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for creation credits that are equivalent of 0.61 acre of suitable vernal pool habitat for this listed species.
 5. The California Department of Transportation biologist shall have oversight over implementation of all the Terms and Conditions in this biological opinion, and shall have the authority to stop project activities, through communication with the California Department of Transportation Resident Engineer, if any of the requirements associated with these Terms and Conditions are not being fulfilled.

- If biologist/construction liaison has requested a stop work due to take of any of the listed species the Service and Fish and Game will be notified within one (1) working day via email or telephone
6. Permanent and temporary construction disturbances and other types of project-related disturbance to San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp habitat shall be minimized to the maximum extent practicable. To minimize temporary disturbances, all project-related vehicle traffic shall be restricted to established roads, construction areas, and other designated areas. These areas also should be included in preconstruction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects.
 7. Project employees shall be directed to exercise caution when commuting within the habitats of the California tiger salamander, California red-legged frog, and the San Joaquin kit fox. A 20-mile per hour speed limit will be strongly encouraged on unpaved roads within listed species habitats.
 8. Cross-country travel by vehicles shall be prohibited, unless authorized by the Service.
 9. Project employees shall be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.
 10. Prior to initiation of ground breaking, the California Department of Transportation or Service-approved biologist will conduct an education and training session for all construction personnel. All individuals who will be involved in the site preparation or construction shall be present, including the project representative(s) responsible for reporting take to the Service and the California Department of Fish and Game. Training sessions shall be repeated for all new employees before they access the project site. Sign up sheets identifying attendees and the contractor/company they represent shall be provided to the Service with the post-construction compliance report. At a minimum, the training shall include a description of the natural history of the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp affected by the Pigeon Pass Project and include information on these four listed species and their habitats, as appropriate. The training shall 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) of the project. To ensure that employees and contractors understand their roles and responsibilities, training shall be conducted in languages other than English, as appropriate.

11. A litter control program shall be instituted at the entire Pigeon Pass Project. All workers 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.
12. No canine or feline pets or firearms (except for Federal, State, or local law enforcement officers and security personnel) shall be permitted at the Pigeon Pass Project to avoid harassment or killing or injuring of the San Joaquin kit fox, California red-legged frog, and the California tiger salamander.
13. All construction activity shall be confined within the Pigeon Pass Project site, which may include temporary access roads, haul roads, and staging areas specifically designated and marked for these purposes, as described in Conservation Condition 18 below. At no time shall equipment or personnel be allowed to adversely affect areas outside the project site without authorization from the Service.
14. The Resident Engineer or their designee shall be responsible for implementing these conservation measures and shall be the point of contact for the Pigeon Pass Project.
15. 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.
16. The California Department of Transportation shall submit to the Service their draft proposal for the restoration of temporarily affected listed species habitat and proposed critical habitat to pre-project conditions at least sixty (60) calendar days prior to initial ground breaking at the Pigeon Pass Project; the final plan shall be submitted for approval by the Service prior to ground breaking at the proposed project. The plan shall include restoration and revegetation work associated with temporary effects using native California plant species 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 practicable (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 listed animal species. The draft and final plan shall contain specific quantifiable criteria to evaluate the success of the restoration.
17. The Pigeon Pass Project construction area shall be delineated with high visibility temporary fencing at least four (4) 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 the site. Actions within the project area shall be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.
18. Prior to any ground disturbance, pre-construction surveys shall be conducted for San Joaquin kit fox, California tiger salamander, and the California red-legged frog. These surveys shall consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species (i.e., kit fox dens and related sign).
 19. Only California Department of Transportation biologist(s) who are familiar with the biology and ecology of the San Joaquin kit fox, California tiger salamander, or the California red-legged frog, or a Service-approved biologist holding valid permit issued pursuant to section 10(a)(1)(A) of the Act will be allowed to capture listed species.
 20. Because dusk and dawn are often the times when San Joaquin kit fox, California red-legged frog, and the California tiger salamander are most actively foraging and dispersing, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Except when necessary for necessary construction, driver or pedestrian safety, lighting of the Pigeon Pass Project site by artificial lighting during night time hours should be minimized to the maximum extent practicable.
 21. Maintenance and construction excavations greater than two (2) feet deep either shall be covered or filled in at the end of each working day. Wooden ramps or other structures of suitable surface that provide adequate footing for the San Joaquin kit fox shall be placed in the trench or pit no greater than 200 feet apart to allow for unaided escape. The trench or pit shall be surveyed in the morning and late afternoon hours to ascertain whether the San Joaquin kit fox, California red-legged frog, and the California tiger salamander have fallen into the trench or pit. If at anytime, a trapped San Joaquin kit fox is discovered, the California Department of Transportation biologist shall immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service and/or the California Department of Fish and Game contacted for further guidance. If a California red-legged frog or California tiger salamander is discovered trapped in a trench or pit, the animal shall be carefully captured by the California Department of Transportation biologist and released at a secure location, such as the entrance to a ground squirrel burrow, within walking distance and is outside of the construction area. The Service shall be notified by telephone and electronic mail within one (1) working day of the incident.

22. Tightly woven fiber netting or similar material shall be used for erosion control or other purposes at the Pigeon Pass Project site to ensure that the California red-legged frog and the/or the California tiger salamander do not get trapped. This limitation will be communicated to the contractor through use of Special Provisions included in the bid solicitation package.
23. Use of rodenticides and herbicides at the Pigeon Pass Project site shall be utilized in such a manner to prevent primary or secondary poisoning of listed species, and the depletion of prey populations on which they depend. 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.
24. The following Term and Condition shall be implemented for borrow sites associated with the Pigeon Pass Project:
 - a. The California Department of Transportation 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.
 - b. The California Department of Transportation 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 Resident Engineer any one of the following:
 - i. a letter from the Service stating use of the borrow pit area will not result in the incidental take of listed species;
 - ii. an incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;
 - iii. 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;
 - iv. letter from the Service concurring with the "no effect" determination for contractor-related activities; or
 - v. Contractor submittal of information to the California Department of Transportation Resident Engineer indicating compliance with the State Mining and Reclamation Act (SMARA) and provide the County land use permits and California Quality Act (CEQA) clearance.

- c. If a borrow site that is in compliance with the Act is not available, the California Department of Transportation shall either:
 - i. identify/select a site that the Service has concurred with the “no effect” determination, or;
 - ii. request reinitiation of formal consultation on the action considered herein based on new information.
25. The California Department of Transportation shall implement the following six general conservation measures for the San Joaquin kit fox:
- a. The presence/absence of San Joaquin kit fox dens (natural or in pipes and culverts) shall be determined.
 - i. Pre-construction surveys within the project area shall be conducted no more than thirty (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.
 - ii. Surveys for dens shall be conducted by qualified biologists with demonstrated experience in identifying San Joaquin kit fox dens.
 - iii. Pipes and culverts shall be searched for kit foxes prior to being moved or sealed to ensure that a San Joaquin kit fox has not been trapped.
 - b. All San Joaquin kit fox dens shall be protected to the maximum extent practicable as determined by the on-site biologist in consultation with the Service.
 - c. The type of den (natal or non-natal) and its status (occupied or unoccupied) shall be identified based on the most current Service guidance (U.S. Fish and Wildlife Service 1999):
 - i. Known den: any existing natural den or human-made structure for which conclusive evidence or circumstantial evidence can show that the den is used or has been used at any time in the past by the San Joaquin kit fox.
 - ii. Potential den: any natural den or burrow within the range of the species that has entrances of appropriate dimensions (4 to 12 inches in diameter) to accommodate San Joaquin kit foxes. The California Department of Transportation shall survey and investigate using photo-detection equipment, track plate, or other

- methods to determine species utilization. If no information is collected that would indicate use by other species, the den shall be treated as a potential kit fox den.
- iii. Pupping den: any known San Joaquin kit fox den (as defined) used by kit foxes to whelp and/or rear their pups.
 - iv. Atypical den: any known San Joaquin kit fox den that has been established in, or in association with, a human-made structure.
- d. The California Department of Transportation shall identify and execute appropriate action(s) regarding notification, buffers, excavation and fill, or seal-off of burrows of this listed species:
- i. Occupied natal den: if an occupied natal den is visible or encountered within the project limits, or other accessible land, or on accessible land within 1000 feet of the project construction area, the Service shall be contacted immediately, before any project action occurs, and the project construction should take place between August 1 and November 30.
 - ii. An adequate buffer or exclusion zone shall be established to protect the physical den and surrounding habitat of unoccupied natal dens and all non-natal dens that can be avoided:
- e. Unoccupied natal dens should be surrounded with a 200 feet buffer and the Service shall be contacted. Occupied and unoccupied non-natal dens should be surrounded with a minimum 100-foot buffer zone.
- f. When occupied dens have been found on or near the project site, ground disturbing activities should be restricted during the period from August 1 and November 30. During this time period, project activities within 0.3 mile of occupied natal dens should be prohibited. Buffer zones shall be delineated with a temporary fence or other suitable barrier that does not prevent movement and dispersal of the San Joaquin fox. Alternately, the project construction area can be delineated with temporary fence, flagging, or other barrier.
- g. Prior to their use, pipes or culverts with a diameter greater than 4 inches at the project site shall be examined by the California Department of Transportation biologist to ascertain if any San Joaquin kit foxes are present in them. Any San Joaquin kit fox found in a pipe or culvert shall be allowed to escape unimpeded.

- h. If an unoccupied natural San Joaquin kit fox den cannot be avoided and must be destroyed, the following actions shall be followed:
 - i. Prior to the destruction of any den, the den shall be monitored for at least three (3) consecutive days to determine its current status. Activity at the den shall be monitored by placing tracking medium at the entrance and by standard spotlighting detection techniques. If no San Joaquin kit fox activity is observed during this period, the den shall be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed at the den during this period, the den shall be monitored for at least five (5) consecutive days from the time of observation to allow any resident animal to move to another den during its normal activities. Use of the den can be discouraged during this period by partially plugging the entrance(s) with soil in such a manner that any resident animal can escape easily. Destruction of the den may begin when, in the judgment of a Service or Service-approved biologist, the animal has moved to a different den. The biologist shall be trained and familiar with San Joaquin kit fox biology. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may be excavated when, in the judgment of the Service-approved biologist, it is temporarily vacant, for example during the animal's normal foraging activities.
 - ii. All San Joaquin kit dens shall be excavated by hand, by or under the supervision of, a Service-approved biologist.
 - iii. The den shall be fully excavated and then filled with dirt and compacted to ensure that San Joaquin kit foxes cannot reenter or use the den during the construction period. If, at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den shall be resumed. Destruction of the den may be resumed, when in the judgment of the Service-approved biologist, the animal has escaped from the partially destroyed den.
 - iv. Non-natal San Joaquin kit dens may be excavated at any time of the year; natal dens shall be excavated only between August 15 and November 1.

B. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

1. If requested, during or upon completion of construction activities, the on-site biologist, and/or a representative from California Department of Transportation shall accompany Service or California Department of Fish and Game personnel on

an on-site inspection of the site to review project effects to the San Joaquin kit fox, California red-legged frog, California tiger salamander, vernal pool fairy shrimp, and their habitats.

2. The Federal Highway Administration shall ensure California Department of Transportation complies with the *Reporting Requirements* of this biological opinion.

Reporting Requirements

Injured San Joaquin kit foxes, California red-legged frogs, and/or California tiger salamanders must be cared for by a licensed veterinarian or other qualified person; dead individuals of any of these three listed species and the vernal pool fairy shrimp should be preserved according to standard museum techniques and held in a secure location. The Service and the California Department of Fish and Game must be notified within one (1) working day of the discovery of death or injury to a San Joaquin kit fox, California red-legged frog, California tiger salamander, and/or vernal pool fairy shrimp that occurs due to project related activities or is observed at the project site. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are Chris Nagano, Chief of the Endangered Species Division (Central Valley) at the Sacramento Fish and Wildlife Office (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 Mr. Ron Schlorff at 1416 9th Street, Sacramento, California 95814, (916) 654-4262.

The California Department of Transportation shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp, if any; (v) occurrences of incidental take of any of these four listed species, if any; and (vi) other pertinent information

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 to implement recovery actions, to help implement recovery plans, to develop information, or otherwise further the purposes of the Act.

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. We propose the following conservation recommendations:

1. The California Department of Transportation should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California red-legged Frog* (U.S. Fish and Wildlife Service 2002).
2. The California Department of Transportation should assist the Service in developing and implementing recovery actions identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (U.S. Fish and Wildlife Service 1998).
3. The California Department of Transportation should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by California tiger salamanders, California red-legged frogs, San Joaquin kit foxes, other listed animals, and wildlife. The California Department of Transportation should include photographs, plans, and other information in their biological assessments if they incorporate "wildlife friendly" crossings into their projects.
4. The Federal Highway Administration and the California Department of Transportation should consider participating in the planning for a regional habitat conservation plan for the San Joaquin kit fox, California tiger salamander, other listed species, and sensitive species.
5. The California Department of Transportation should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California tiger salamander, San Joaquin kit fox, listed crustacean species, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate.
6. Sightings of any listed or sensitive animal species should be reported to the California Natural Diversity Database of the California Department of Fish and Game. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.
7. The California Department of Transportation should provide habitat for bats, including surfaces for bat roosts on the underside of bridges and other structures whenever possible.

REINITIATION - CLOSING STATEMENT

This concludes the conference for effects of the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass Project) in Alameda County, California, on the critical habitats for the California red-legged frog and California tiger salamander. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if either of these critical habitats are designated. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in

the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

This concludes formal consultation on the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass Project) in Alameda County, California. 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 Pigeon Pass Project, please contact the Chief of our Endangered Species Division (Central Valley) at the letterhead address or at telephone 916/414-6600.

Sincerely,



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Cay C. Goude
Acting Field Supervisor

cc:

Susan Chang, Jeff Jensen, California Department of Transportation, Oakland, California
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Dee Warenycia, California Department of Fish and Game, Sacramento, California
Dan Gifford, California Department of Fish and Game, Lodi, California
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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:
1-1-05-F-0116

APR 27 2005

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

RY -
Review - File
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Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0115)

Dear Mr. Fong:

This letter is an amendment to the biological opinion and conference opinion issued for the proposed Pigeon Pass Curve Realignment Project located in Alameda County, California. At issue are the effects of the project on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and proposed critical habitats for the California red-legged frog and the California tiger salamander. This amended biological and conference opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California (1-1-04-F-0115)* dated February 28, 2005, that was prepared by the U.S. Fish and Wildlife Service (Service); (2) a request for an amendment to the Biological Opinion from the Federal Highway Administration, dated March 28, 2005; (3) an April 1, 2005, phone discussion with Chris Collison of Caltrans concerning the distribution of vernal pool fairy shrimp mitigation funds; (4) an additional request for an amendment to the Biological Opinion from the Federal Highway Administration, dated April 15, 2005; and (5) other information available to the Service.

The following changes are made to the February 28, 2005, biological and conference opinion:

1. Change Avoidance and Protection Measures - Listed Species on page 6 from:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander, by purchasing 80

credit acres for the California tiger salamander and providing payment for 52 acres into the Service's San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credit at the Ohlone Conservation Bank. The California Department of Transportation will pay \$650,000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

To:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander, by purchasing 80 credit acres for the California tiger salamander. For the remaining 52 acres, Caltrans will set aside \$650,000.00 (52 acres x \$12,500/acre), which will be held until a Service-approved conservation bank becomes available. At that time, the California Department of Transportation will expend the \$650,000 to purchase credits at the bank.

2. Change Term and Condition A1 page 64 from

The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, and appearing in the *Project Description* of this Biological Opinion.

To:

The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, the letter from the Federal Highway Administration dated March 28, 2005, the letter from the Federal Highway Administration dated April 15, 2005, and appearing in the *Project Description* of this Biological Opinion.

3. Change Term and Condition A3 page 64 from

As described in the February 15, 2005, letter from the California Department of Transportation to the Service, the 52 acres that will be purchased for the San Joaquin kit fox and the California tiger salamander via the Service's San Joaquin Kit Fox Fund shall be acquired within the geographic area inhabited by the same population segment of the California tiger salamander known as the East Bay Unit that is being adversely affected by the Pigeon Pass Project.

To:

As described in the March 28, 2005, letter from FHWA to the Service, the California Department of Transportation will reserve \$650,000 in an internal account for future funding to be used to conserve habitat for both the San Joaquin kit fox and the East Bay Unit of the California tiger salamander. The funds shall be released by Caltrans upon written instructions from the Sacramento Fish and Wildlife Office.

4. Change Term and Condition A4 page 64 from

As described in the February 15, 2005, letter from the California Department of Transportation to the Service, prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for preservation credits that are equivalent of 1.45 acres of suitable vernal pool habitat for this species. Prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for creation credits that are equivalent of 0.61 acre of suitable vernal pool habitat for this species.

To:

As described in the April 15, 2005, letter from FHWA to the Service, the California Department of Transportation will reserve \$216,300.00 (2.06 acres x \$105,000.00/acre) in the Pigeon Pass Project account to be used for in-lieu payments for 2.06 acres of vernal pool fairy shrimp habitat. The funds shall be released by Caltrans upon written instruction from the Sacramento Fish and Wildlife Office.

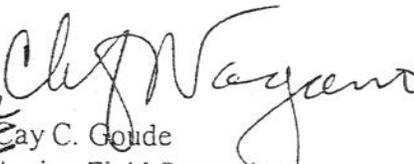
The remainder of the February 28, 2005, biological and conference opinion are unchanged. This concludes formal consultation on the Pigeon Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation of formal consultation is required where discretionary 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 re-initiation.

Mr. Gene Fong

4

If you have any questions regarding this amendment to the biological opinion on the Pigeon Pass Curve Realignment Project, please contact Chris Nagano, Chief of our Endangered Species Division, at the letterhead address or at (916) 414-6648.

Sincerely,


For
Cay C. Goude
Acting Field Supervisor

cc:

Larry Vinzant, Federal Highway Administration, Sacramento, California
Jeannie Baker, Christel Little, Shanna Zahner, California Department of Transportation,
Marysville, California
Chris Collison, California Department of Transportation, Sacramento, California
Susan Chang, Jeff Jensen, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
Janice Gan, Carl Wilcox, Scott Wilson, Warden Nicole Kozicki, California Department of Fish
and Game, Yountville, California
Scott Heard, Law Enforcement, FWS, Sacramento, California



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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In Reply Refer To
1-1-07-F-0268

July 20, 2007

Mr. Gene Fong
Federal Highway Administration
Department of Transportation
650 Capital Mall, Suite 4-100
Sacramento, California 95814

Subject: Amendment to the Biological Opinion on the Proposed Pigeon Pass Curve
Realignment, Southwest of Livermore, Alameda County, California (1-1-04-F-
0115)

Dear Mr. Fong:

This is an amendment to the biological opinion on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California. At issue are the adverse effects on the threatened California tiger salamander (*Ambystoma californiense*) and the threatened California red-legged frog (*Rana aurora draytonii*). The Service issued the biological opinion (1-1-04-F-1115) for this Federal action on February 28, 2005. This document is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*)(Act).

On June 27, 2007, the Service visited the Pigeon Pass project site per Term and Condition B.1. of the February 28, 2005, biological opinion. We met with the project engineer and the biological monitor. It was our conclusion that construction-related Conservation Measures and Terms and Conditions are being implemented at the project.

This amended biological opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California*, dated February 13, 2005, that was prepared by the U.S. Fish and Wildlife Service (Service); (2) a telephone discussion between the Service and the California Department of Transportation on July 20, 2007; (3) the June 27, 2007, site visit to the project by the Service; (4) several electronic mail messages between the Service and the California Department of Transportation during the month of July 2007.

TAKE PRIDE
IN AMERICA 

1. The following additions are made to the Conservation Measures on page 6 of the February 28, 2005, biological opinion:

14. All California red-legged frogs and California tiger salamanders encountered in the action area will be relocated to a Service-approved location to the maximum extent possible. The written authorization of the Service shall be obtained by the California Department of Transportation prior to transporting California tiger salamanders and/or California red-legged frogs to a location other than the approved translocation site (i.e., individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service).

15. The Service-approved biologist(s) will use nets or their bare hands to capture California red-legged frogs and California tiger salamanders at the project site. The Service-approved biologist(s) will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two (2) hours before and during periods when they are capturing and relocating either of these two listed species

2. The following addition is made to the Amount or Extent of Take on page 62 second paragraph of the February 28, 2005, biological opinion:

Change:

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

To:

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur

on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, pursue, capture, collect, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

3. The following addition is made to the Amount or Extent of Take on page 62 third paragraph of the February 28, 2005, biological opinion:

Change:

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

To:

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their

breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, pursue, capture, collect, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

4. The following addition is made to the terms and Conditions on page 71 of the February 28, 2005, biological opinion:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, and/or California red-legged frog. The number of Service-approved biologists who are on-site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.

5. The following addition is made to the terms and Conditions on page 71 of the February 28, 2005, biological opinion:

27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders and California red-legged frog shall be done with hand tools whenever possible. The depth to which these two amphibians are found depend on the burrow-specific conditions. Excavation should extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found should be recorded whenever possible and the information should be provided to the Service and the California Department of Fish and Game.

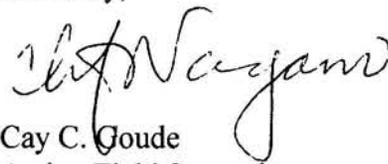
- a. Upon capture, individual California tiger salamanders and California red-legged frogs should be placed in a clear plastic container (ie., Tupperware®) of suitable size (e.g. enough room so the animal is not unnecessarily inhibited in its movements). The container should be kept moist with damp paper towels, ¼ inch or ½ inch soft foam rubber, or natural or plastic sponges. The lids of the containers should have small air holes for ventilation. If possible, only one frog or salamander should be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container, however, the two listed species shall not be mixed in order to avoid injury due to jumping by the frogs. Individuals should never be so crowded that they are touching another individual. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.

- b. Individual plastic containers containing salamanders or frogs should be held in an ice chest. Ice packs should be placed on top of the containers to maintain a cool temperature comparable to a refrigerator. The ice chests shall be kept in a cool, dark, quiet secure room
- c. California tiger salamanders and California red-legged frogs should be released as soon as possible but can be held in this manner for 2 to 3 days prior to release.
- d. California tiger salamanders and California red-legged frogs shall be released at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal should be released per burrow. A maximum of three California tiger salamanders or California red-legged frogs may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Frogs and salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals or the two listed species should be released one at a time rather than en masse.

The remainder of the February 28, 2005, biological opinion is unchanged. This concludes formal consultation on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California. 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 Federal Highway Administration 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 amendment to the biological opinion for the biological opinion and conference opinion on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California, please contact Chris Nagano or John Cleckler at the letterhead address or at 916/414-6600.

Sincerely,


Cay C. Goude
Acting Field Supervisor

Mr. Gene Fong

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cc:

Todd Ellwood, CH2M Hill, Oakland, California

Craig Lawrence, CH2M Hill, Oakland, California

Dan Weinberg, CH2M Hill, Oakland, California

Scott Wilson, California Department of Fish and Game, Yountville, California

Janice Gan, California Department of Fish and Game, Yountville, California

Eric Brown, Livermore Community Development Department, Livermore, California

Bill Gray, Gray and Bowen, Walnut Creek, California

Jean Hart, Alameda County Congestion Management Agency, Oakland, California



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:
81420-2008-F-0214

NOV 5 2007

Mr. James B. Richards
Attn: Margaret Gabil
California Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to the Biological Opinion for the Effects of the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0115) on the Endangered San Joaquin Kit Fox, the Threatened California Red-Legged Frog, the Threatened California Tiger Salamander, and Vernal Pool Fairy Shrimp for the Inclusion of the Proposed Sweet Ranch Mitigation Site

Dear Mr. Richards:

This document amends the U. S. Fish and Wildlife Service's (Service) February 28, 2005, *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California (Service File Number: 1-1-04-F-0115)* for the effects of roadway improvement project located on State Route 84 on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), the threatened California red-legged frog (*Rana aurora draytonii*), the threatened California tiger salamander (*Ambystoma californiense*), and the threatened vernal pool fairy shrimp (*Branchinecta lynchi*) to included the proposed enhancement activities at the proposed Sweet Ranch mitigation site. Your request was received in our office on October 12, 2007. This amendment is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). The biological opinion was previously amended on April 21, 2005 (Service File: 1-1-04-F-0116) and again on May 2, 2007 (Service File: 1-1-07-F-0159).

The applicant wishes to amend the project description described in the biological opinion to include the habitat creation and enhancement activities at the proposed Sweet Ranch mitigation site. Caltrans proposes to use the proposed Sweet Ranch mitigation site as compensation for adverse effects to the San Joaquin kit fox, California red-legged frog, and California tiger salamander resulting from the and Pigeon Pass Curve Realignment Project. Therefore, the Sweet Ranch activities are considered as a component of the Pigeon Pass Curve Realignment Project. The Sweet Ranch will be considered for compensation by the Service when Caltrans has satisfied

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the requirements for a conservation easement, management plan, endowment, and presence of the target species within the proposed mitigation area.

This amended biological opinion is based on: (1) the *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California* (Service File Number: 1-1-04-F-0115) dated February 28, 2005, that was prepared by the U. S. Fish and Wildlife Service's (Service); (2) the *Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116), dated April 21, 2005, that was prepared by the Service; (3) the *Amendment to the Formal Section 7 Consultation for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File: 1-1-07-F-0159), dated May 2, 2007, that was prepared by the Service; (3) a letter from the California Department of Transportation (Caltrans) dated October 12, 2007, and received on October 12, 2007, requesting an amendment to the biological opinion; (4) the *Initial Habitat Assessment for the Sweet Ranch Mitigation Area in Alameda County, CA* dated May 4, 2006 and received by the Service on May 8 2006; (5) additional project description information provided via electronic mail message by USDA Natural Resources Conservation Service on October 10, 2007, and by Caltrans on October 24, 2007; and (6) other information available to the Service.

The following changes are made to the February 28, 2005, biological opinion:

1. Add to the Consultation History:

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| May 1, 2006 | The Service visited the proposed Sweet Ranch site. |
| May 8, 2006 | The Service received the <i>Initial Habitat Assessment for the Sweet Ranch Mitigation Area in Alameda County, California</i> . |
| October 10, 2007 | The USDA Natural Resources Conservation Service provided the project description for the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |
| October 12, 2007 | The Service received a request for an amendment to the biological opinion to include activities associated with the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |
| October 24, 2007 | Caltrans provided additional project description information for the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |

2. Add the following to the Description of the Proposed Action:

Sweet Ranch Conservation Site Habitat Restoration, Creation, and Enhancement

Caltrans proposes to use 97.7 acres of the approximately 100 acre Sweet Ranch property off of Patterson Pass Road as a conservation site to compensate for adverse effects to the San Joaquin kit fox, California red-legged frog, and California tiger salamander resulting from Caltrans' projects in Alameda County, including the Pigeon Pass Curve Realignment Project. The Sweet Ranch will be considered for compensation by the Service when Caltrans has satisfied the requirements for an acceptable conservation easement, management plan, endowment, and presence of the target species within the proposed conservation area. Caltrans proposes to implement habitat restoration and creation activities within 97.7 acres of the Sweet Ranch site to enhance its value for the California red-legged frog and California tiger salamander.

The proposed Sweet Ranch site is located approximately 6 miles east of downtown Livermore and 2 miles east of the University of California's Lawrence Livermore Laboratory, in the Altamont Hills region of eastern Alameda County. The site is bordered by Patterson Pass Road to the north and Cross Road to the west. The southern and eastern portions of the proposed mitigation site are bordered by private property primarily used for grazing.

The Sweet Ranch site historically was used for dry-land farming of grains and is now occupied by rolling grassland used for cattle grazing. An approximately 1 linear mile intermittent creek runs east to west and parallel to Patterson Pass Road along the northern border of the mitigation site. The riparian cover along the creek is patchy and includes willow (*salix* species), northern California black walnut (*Juglans californica* var. *hindsii*), blue elderberry (*Sambucus Mexicana*), poison oak (*Toxicodendron diversilobium*), *Eucalyptus* species, and Himalayan blackberry (*Rubus discolor*). The site also has two existing seeps and associated wetlands located along the southern edge of the creek. Caltrans refers to these two seeps as Seep East and Seep West. There is a residence on the ranch that includes a house, barn, and garage. Pacific Gas & Electric (PG&E) maintain a utility easement through the ranch site for an overhead transmission line. The area occupied by the structures and utility easement is not included in the proposed mitigation area.

General Scope of Work

The key elements of the proposed Sweet Ranch conservation site habitat restoration, enhancement, and creation activities will be completed in two phases. The activities associated with the first phase are summarized as follows:

1. Excavation of a shallow seep wetland to create a deeper water wetland/pond suitable for breeding by the California tiger salamander and the California red-legged frog.
2. Eucalyptus tree removal.

The activities included in the second phase are not included in this amendment but will be included in a future request for an amendment to the biological assessment and are summarized as follows:

1. Creation of additional seasonal wetlands in the upland Bowl Area and the Wet Meadow/Meandering Channel Wetland Creation Area.
2. Stream restoration/wet meadow creation in the lowest stream reach near the intersection of Patterson Pass and Cross Roads.
3. Restoration and enhancement of the upper reaches within the existing riparian corridor (debris removal and exotic species removal and control).
4. Boulder weir installation at along the creek to slow head-cutting and potentially expand existing in-stream wetlands.
5. Riparian planting in the lower reaches, where little riparian vegetation exists.
6. Removal and replacement of one large culvert (at the existing driveway).
7. Culvert extension and gully repair at improperly outletted existing culvert along Patterson Pass Road.
8. Construction of approximately 1-mile of boundary and pasture fencing (5-strand barbed wire) to exclude grazing of created wetlands, springs and new plantings.
9. Reconstruction of the one access road to create a finished grade with a 2 % outslope and armour the surface with drain rock to a finished compacted thickness of 6" to reduce erosion and allow vehicle access for monitoring and making repairs in wet weather.

10. Installation of one corral from portable fencing panels and a chute for working livestock.
11. Reconstruction of two high capacity springs and outfencing.
12. Establishing a domestic water supply well on the caretaker residence parcel (outside of the easement) and modifying the current water supply system to service only the wetlands and riparian plantings.

Construction Activities

Western Seep/Spring Pond Creation Area

Activity at this location will include the creation of a pond/wetland that will be fed by an existing seep to create breeding habitat for the California tiger salamander and the California red-legged frog. The existing seep/spring in this area drains through a slightly depressed wetland area towards a bare ground area that is currently occupied by livestock watering troughs. The area around the troughs is heavily impacted by cattle. According to the property owner, this seep/spring is perennial and was once used to supply water to the residence on-site. Caltrans plans to excavate a deep-water pond below Seep West, in an area of bare ground lying south of the Bowl Area creation site. The seep wetland disappears in this area with the water infiltrating below the surface towards the creek. Caltrans' goal is to bring that water to the surface through excavation, allowing flow through to the creek. The maximum pond depth will be three feet, the footprint will be less than 4,000 square feet (0.09 acres), and the net amount of excavated soil will be approximately 200 cubic yards. The pond will be over-excavated approximately one foot and clayey soil re-compacted to form a dense liner. The excavated soil will be stockpiled for use during phase 2 activities at a location away from the creek and outside the path of any surface water flow. The pond creation will not include the construction of a dam, therefore the water should not concentrate in any particular area if the pond overflows. The area where the pond will be constructed is almost flat and there is no existing evidence of concentrated flow. Downhill from the pond there is a grassed path by which surface water drains to the creek; the pond will be graded so that the overflow pattern is not altered, and any overflow would be expected to continue down the grassed swale to the creek. This pond creation would also include a wetland fringe and, potentially, riparian plantings. In phase 1, the western seep/spring would be out-fenced with permanent fencing to exclude livestock. The newly created pond will be out-fenced with permanent fencing in phase 2.

Equipment used would include a bulldozer and/or a small excavator. Work will take place in the timeframe of October 22 to November 1, 2007. The work will take approximately 1 to 2 days to complete. After excavation, a five-foot-wide fringe around the pond will be seeded with a mixture of mugwort (*Artemisia douglasiana*), meadow barley (*Hordeum brachyantherum*), creeping wildrye (*Leymus triticoides*), and blue-eyed

grass (*Sisyrinchium bellum*). Plugs of appropriate wetland species may be planted in the Fall/Winter 2008 to create transitional vegetation around the pond.

Eucalyptus Tree Removal

Caltrans plans to remove four mature Eucalyptus trees from the eastern section of the riparian corridor on the Sweet Ranch site. The Eucalyptus trees will be removed with a crane or excavator, working from either Patterson Pass Road or the Sweet Ranch side of the creek. The trees will be cut, removed, and the stumps directly treated with glyphosphate. Work will take place in the timeframe of October 22 to November 1, 2007. The work will take approximately 1 to 2 days. If necessary, on-going maintenance may include follow-up glyphosphate treatments to the stumps. Replanting with appropriate native trees will occur during Fall 2008 and will be included in a subsequent amendment to the Pigeon Pass Biological Opinion.

Permanent vs. Temporary Effects

For the Sweet Ranch activities, Caltrans describes the permanent effects on listed species habitat as those areas where the character and function is changed or enhanced as a result of the proposed activities. As a result of the proposed activities, habitat characters and values will change but there will be no loss of listed species habitat. These are areas that might be subject to vegetation removal and extensive soil disturbance due to excavation, grading or placement of dirt fill, or to lesser degrees of disturbance due to creation of temporary access roads, use of staging areas with storage of construction materials and parking heavy equipment. Areas subject to temporary disturbance will be restored so that they once again support vegetation and provide wildlife habitat.

Construction Site Restoration

Caltrans plans to restore areas of temporary ground disturbances, including storage and staging areas, and temporary roads. These areas will be re-contoured, if appropriate, and revegetated with seeds and/or cuttings of appropriate plant species to promote restoration of the area to pre-project conditions. Caltrans will be developing a restoration plan that will be submitted to the Service for approval prior to initial ground breaking. According to Caltrans, to the maximum extent practicable (i.e., presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of listed animal species.

Proposed Conservation Measures

Caltrans proposes to avoid and minimize effects to listed species during the Sweet Ranch activities by implementing the measures prescribed for the Pigeon Pass Curve Realignment project and included in the original biological opinion.

Maintenance and Monitoring

Maintenance and monitoring of the Sweet Ranch Conservation Site will be performed by the Alameda County Resource Conservation District. Maintenance activities are expected to include repeat hand removal or herbicide treatment of Eucalyptus, fence maintenance, watering of plantings, and removal of any exotic plant species that may invade the pond. Monitoring will include qualitative and quantitative measures of plant establishment and invasive species reduction, pond water level assessment, and surveys in the pond and surrounding grassland for the California tiger salamander and California red-legged frog.

Reporting

Reporting will be done by the Alameda County Resource Conservation District. Construction and monitoring activities will be documented and monitoring reports will be forwarded to the Service annually for up to 5 years. The first monitoring report will be due no later than December 31st, one year after completion of phase 1, and annually every December 31st for each consecutive monitoring season. An annual report describing construction activities and maintenance and monitoring operations will be submitted to the Service for up to 5 years.

3. Change the first paragraph on page 23 under the Status and Environmental Baseline section for the San Joaquin kit fox from:

Suitable kit fox habitat in the form of grasslands is abundant in the action area, and contiguous within a 10-mile radius of the project (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest kit fox sighting to the proposed project is approximately 5 miles from the project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the project, as well as the nearby observations of this listed species.

TO:

Suitable kit fox habitat in the form of grasslands is abundant in the action areas for the road project and Sweet Ranch enhancement project, and contiguous within a 10-mile

radius of the projects (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest documented kit fox sighting is approximately 5 miles from the road project site and 1 mile from the Sweet Ranch project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius from either project location. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area of the road project and Sweet Ranch because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the projects, as well as the nearby observations of this listed species.

4. Add the following after the last paragraph under the Status and Environmental Baseline section for the California tiger salamander on page 29:

The proposed Sweet Ranch mitigation site is primarily characterized by rolling annual grassland habitat actively grazed by cattle. The site includes numerous active ground squirrel and other small mammal burrows appropriate for tiger salamander occupation. The Sweet Ranch is private property surrounded by extensive and contiguous rangeland with little disturbance or development.

The California Natural Diversity Database includes a California tiger salamander record approximately 1 mile west of the proposed Sweet Ranch mitigation site and a second breeding pond occupied by the species approximately 1,000 feet from the northern boundary of the proposed mitigation site. Although there are currently no potential breeding ponds on the proposed mitigation site, the site does provide likely upland habitat for California tiger salamanders and creation of a suitable and sustainable breeding pond on the site would likely enhance the local habitat value. The Service has determined it is reasonable to conclude the California tiger salamander inhabits the Sweet Ranch project area, based on the biology and ecology of the species, the presence of suitable habitat, as well as nearby observations of this animal.

5. Change the last paragraph under the Status and Environmental Baseline section for the California red-legged frog on page 35 from:

There are several recent sightings of the California red-legged frog in the action area and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy

shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds. Areas containing aquatic and upland habitat exist within and adjacent to the action area (Nagano pers. obs. November 2004). The action area contains components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

TO:

There are several recent sightings of the California red-legged frog in the action area for the road project and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds.

The proposed Sweet Ranch includes California red-legged frog habitat in the unnamed intermittent creek dominated by dense riparian vegetation and along the lower terraces. The riparian habitat and surrounding grasslands offer dispersal, foraging, and aestivation habitat. The frog species has been recorded less than 1 mile away from the Sweet Ranch project area and a likely breeding pond supporting the California tiger salamander occurs within 1,000 feet of the north boundary of the property.

Areas containing aquatic and upland habitat exist within and adjacent to the action area for both projects (Nagano pers. obs. November 2004; Cleckler pers. obs. May 2006). The action area for both projects contain components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area for the road project and the Sweet Ranch project because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

6. Change the second paragraph under the Effects of the Proposed Action section from:

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within two seasons. Ground disturbance resulting from the proposed Pigeon Pass Project includes substantial grading, excavating, and fill. The California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than two seasons after the construction of the project is completed. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

TO:

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within one year of initial disturbance. Ground disturbance resulting from the proposed Pigeon Pass Road Construction Project includes substantial grading, excavating, and fill. Ground disturbance resulting from the proposed phase 1 habitat enhancement activities at the Sweet Ranch property includes equipment access, excavation, and fill stockpiling.

For the road construction project, the California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than one year after the initial ground disturbance. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and

revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland.

7. Change the first paragraph under the San Joaquin kit fox section of the Effects of the Proposed Action section on page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The proposed phase 1 activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and result in possible construction-related harassment of an unknown number of San Joaquin kit foxes.

8. Change the first paragraph under the California tiger salamander section of the Effects of the Proposed Action section on page 54 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities.

Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California tiger salamander. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders.

9. Change the first paragraph under the California red-legged frog section of the Effects of the Proposed Action section on page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. Activities may result in construction related harassment and the death of an unknown number of red-legged frogs.

10. Change the first paragraph under the vernal pool fairy shrimp section of the Effects of the Proposed Action section on page 59 from:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

TO:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed road project would directly

eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County. The proposed phase 1 activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp.

11. Change the Amount or Extent of Take section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is

unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often is extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size, Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all San Joaquin kit foxes inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all California tiger salamanders inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take during the enhancement activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. In addition, all California red-legged frogs inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take during the enhancement activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or napulai are difficult to located in the vernal pools and seasonal wetlands; and the finding

of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

This concludes the reinitiation of the formal consultation on the Pigeon Pass Curve Realignment Project. 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.

If you have any questions regarding this amendment to the biological opinion for the Pigeon Pass Curve Realignment Project, please contact John Cleckler, Ryan Olah, or Chris Nagano of my staff at (916) 414-6625.

Sincerely,



Cay C. Goude
Acting Field Supervisor

cc:

Jeff Jensen, California Department of Transportation, Oakland, California
Margaret Gabil, California Department of Transportation, Oakland, California
Cheryl Davis, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
Dan Gifford, California Department of Fish and Game, Lodi, California

Janice Gan, California Department of Fish and Game, Yountville, California
Carl Wilcox, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Warden Nicole Kozicki, California Department of Fish and Game, Yountville, California



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:
81420-2008-F-0214-2

APR 17 2008

Mr. Jim Richards
Attn: Alison Graff
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California.

Dear Mr. Richards:

This letter is an amendment to the Biological Opinion and Conference Opinion issued for the Pigeon Pass Curve Realignment Project located in Alameda County, California. At issue are the effects of the project on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and proposed critical habitats for the California red-legged frog and the California tiger salamander. This amended biological and conference opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California* (1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0268) dated July 20, 2007; (4) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated April 1, 2008; (5) correspondence between Alison Graff (Caltrans), Margaret Gabil (Caltrans), Derek Jansen (URS Corporation), and Jerry Roe (Service) between March 27, 2008 and April 16, 2008 concerning the installation of 6,593 feet of underground phone line to restore phone service to the Mullenex residence located at 2980 Vallecitos Road; and (6) other information available to the Service.

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The following changes are made to the February 28, 2005 Biological Opinion and Conference Opinion:

1. Add the following to the **Consultation History**:

- | | |
|-------------------------------------|--|
| March 27, 2008 to
April 16, 2008 | Email correspondence between the Service and Caltrans discussing restoration of phone service to Mullenex, residence. |
| April 4, 2008 | Jerry Roe (Service) visited the proposed project site with biological monitor Derek Jansen (URS Corporation) to evaluate the action area and determine the extent of impacts to listed species and critical habitat. |

2. Add the following to the **Description of Proposed Action**:

Installation of an Underground Phone Line to a Single-Family Residence Located at 2980 Vallecitos Road, Livermore, California

General Scope of Work

During construction at the Pigeon Pass Curve Realignment Project in 2007, Caltrans inadvertently disrupted phone service to the Tiffin Mullenex residence located at 2980 Vallecitos Road, Livermore, California. Caltrans proposes to reconnect phone service by installing a new underground phone line to the residence. The phone line will be constructed from station 79+40 southwest to the Mullenex driveway and will run along the west side of State Route 84 (SR 84). It will pass under SR 84 and the new alignment currently under construction, and will continue along the northern side of the driveway to the residence.

Construction Activities

Approximately 6,593 feet of 2-inch c-pc (Schedule 40) conduit and fifteen 30 x 48 x 34 inch pull boxes with traffic covers will be installed. The conduit will be placed at the bottom of a trench 24 inches deep and 6 to 12 inches wide, with the midline of the trench placed 30 inches off the edge of pavement. The pull boxes will be placed such that the side furthest from the road will lay 40 inches from the edge of pavement. Where the line crosses the existing SR 84 to the Mullenex property, the conduit will be placed in a trench as previously described, or through a 130-foot bore hole. The trench will be excavated with a trencher or excavator and backfilled with the excavated earth as the phone line is laid down; no part of the trench will be left unfilled during the construction period. After the trench is backfilled, the fill soil will be compacted with a hand-held compactor (jumping jack) or small roller. All work will be performed either by the Contractor for the road project or a subcontractor. Installation of the line is expected to begin in early April 2008 and will take two weeks to complete. Work will be done during the daytime and no work will take place in the rain or when the soil is excessively moist.

A total length of 1,181 feet of trench will be located inside the cut and fill area described in the Biological Opinion and Conference Opinion dated February 28, 2005 for the Pigeon Pass Curve Realignment Project, and 5,412 feet will be located outside of the cut and fill area. Of the 5,412 feet located outside of the cut and fill area, 2,000 feet will be located along the driveway on the Mullenex property and 3,412 feet will be located within the existing SR 84 right-of-way. Three pull boxes will be located inside the cut and fill and 12 will be located outside the cut and fill area on the SR 84 right-of-way and the Mullenex property.

Permanent and Temporary Effects

Installation of the conduit and pull boxes will disturb approximately 6,734 square feet (0.15-acre) of ruderal and grassland habitat. The Contractor will restore all excavated surfaces over the trench to original or better condition. Trenching and conduit installation will account for 6,593 square feet (0.15-acre) of temporary disturbance. The pull boxes will account for 150 square feet (0.003-acre) of permanent disturbance, since they will replace earthen areas with impermeable surfaces. The area of ground disturbance inside and outside of the project cut and fill lines is shown in Table 1.

Table 1. Area of Ground Disturbance from Phone Line Installation.

Type of Affect	Inside Existing Cut and Fill	Outside Existing Cut and Fill	Total
Trench (Temporary Affect)	1,181 ft ² (0.03 ac)	5,412 ft ² (0.12 ac)	6,593 ft ² (0.15 ac)
Pull Boxes (Permanent Affect)	30 ft ² (0.0007 ac)	120 ft ² (0.003 ac)	150 ft ² (0.003 ac)
Total	1,211 ft² (0.03 ac)	5,532 ft² (0.12 ac)	6,743 ft² (0.15 ac)

Where the trench parallels the Mullenex driveway and turns north towards the residence, it will be excavated in ruderal annual grassland that forms the upland associated with the Mullenex pond. This pond currently supports a breeding population of California tiger salamanders (*Ambystoma californiense*). Approximately, 2,000 feet of the trench and four pull boxes will be located within this upland area, resulting in 2,000 feet of temporary impacts and 40 square feet of permanent impacts outside of the project cut and fill. Where the trench parallels SR 84, it will be located on the shoulder or toe of the slope in highly disturbed ruderal habitat. The toe of slope along this stretch of highway is characterized by tire ruts, gravel, trash, areas of steep banks, and non-native invasive plant species. No small mammal burrowing activity was observed. Along the highway shoulder 1,584 feet to be trenched borders the Ruby Hills mitigation area within disturbed ruderal roadside habitat, 180 feet of which lies within the cut and fill for the Pigeon Pass Curve Realignment Project.

Proposed Conservation Measures

There is the potential that animals may be disturbed or harmed during the installation of the phone line. To avoid this possibility, Caltrans will observe all of the avoidance and minimization measures set forth in the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, including the presence of a biological monitor during all excavation and fill activities. Because all trenches will be backfilled immediately following excavation, Caltrans is proposing to work without erecting Environmentally Sensitive Area (ESA) fencing in the areas outside of the cut and fill for the project. If a burrow is encountered during trenching, the monitor will excavate it by hand to determine whether California tiger salamanders are present. If an animal is found, it will be relocated to the Ruby Hills mitigation area, as per the Biological Opinion. Upon completion of the project, the Contractor will restore all excavated surfaces over the trench to original or better condition.

3. The following additions are made to the **Avoidance and Protection Measures -- Listed Species** on page 6:
 14. All California red-legged frogs and California tiger salamanders encountered in the action area will be relocated to Ruby Hills or a Service-approved location. The written authorization of the Service shall be obtained by the California Department of Transportation prior to transporting California tiger salamanders and/or California red-legged frogs to a location other than the approved translocation site (*i.e.*, individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service).
 15. The Service-approved biologist(s) will use nets or their bare hands to capture California red-legged frogs and California tiger salamanders at the project site. The Service-approved biologist(s) will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two (2) hours before and during periods when they are capturing and relocating either of these two listed species.
 16. Prior to trenching, vegetation along the trench line shall be mowed to a width not to exceed 60 inches measured from edge of pavement to facilitate locating burrows, California tiger salamanders, and California red-legged frogs that may be present within the action area. The biological monitor shall perform clearance surveys within the area to be cleared immediately prior to mowing and shall be onsite during all activities that could result in take.
 17. Trenching and installation of conduit and pull boxes shall be constructed in a manner not to exceed the length that can be trenched, conduit installed, and backfilled in a single day. All trenches shall be backfilled by the end of work each day; no trenches shall be left open overnight.
 18. No work shall occur during or following 24 hours of rain events.
 19. The biological monitor shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying what species, including general wildlife species, were encountered, including the time and location when such species were found; (3) the time the specimen was identified

and by whom and its condition; and (4) a description of any actions taken. The biological monitor shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service upon request. All monitoring records shall be provided to the Service upon completion of the monitoring work.

20. Following completion of the work, erosion control measures shall be implemented for all disturbed areas, which may include reseeding using a noxious weed free native seed mix, hydroseeding, jute matting, or tackifying agents to stabilize soils, control dust and prevent erosion.

4. The following addition is made to the **Terms and Conditions** on page 71:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, and/or California red-legged frog. The number of Service-approved biologists who are on site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.
27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders and California red-legged frogs shall be done with hand tools whenever possible. The depth to which these two amphibians are found depend on the burrow-specific conditions. Excavation should extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found should be recorded whenever possible and the information should be provided to the Service and the California Department of Fish and Game.
 - a. Upon capture, individual California tiger salamanders and California red-legged frogs should be placed in a clear plastic container (*i.e.*, Tupperware® or Rubbermaid®) of suitable size (*e.g.*, enough room so the animal is not unnecessarily inhibited in its movements). The container should be kept moist with damp paper towels, ¼-inch or ½-inch soft foam rubber, or soap-free natural or synthetic sponges. The lids of the containers should have small air holes for ventilation. If possible, only one frog or salamander should be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container; however, the two listed species or the same species of significantly different sizes or life history stages shall not be mixed in order to avoid injury or depredation. Individuals should never be so crowded that they are touching one another. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.
 - b. Individual plastic containers containing salamanders or frogs should be held in an ice chest. Ice packs should be placed on top of the containers to maintain a cool temperature comparable to a refrigerator. The ice chests shall be kept in a cool, dark, quiet, secure place.

- c. California tiger salamanders and California red-legged frogs should be released as soon as possible, but can be held in this manner for 2 to 3 days prior to release.
- d. California tiger salamanders and California red-legged frogs shall be released at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal should be released per burrow. A maximum of three California tiger salamanders and California red-legged frogs may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Frogs and salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals or the two listed species should be released one at a time rather than en masse.

5. Change the **Conclusions** on page 61 from:

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed. The Service reached the conclusion on the effects on the proposed critical habitat of the California red-legged frog and the California tiger salamander because the effects of the project will be offset by the conservation measures in the project description, including the successful restoration of areas subject to the temporary effects of cut and fill to pre-project conditions.

To:

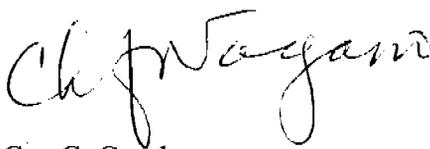
After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated on February 10, 2006 (Federal Register 71: 7117-7167); however none is located in the action area, and therefore none will be affected by the proposed project. On August 23, 2005, the Service issues the final rule for the critical habitat of the Central California population of the California tiger salamander (Federal Register 70: 49379-49458) and critical habitat for the California red-legged frog on April 13, 2006 (Federal Register 71: 19243-19346). Proposed Unit ALA-1C for the California red-legged frog, and Proposed Critical Habitat Unit 4 for the California tiger salamander was not included in the final

critical habitat designations for these two listed species. Therefore, the Pigeon Pass Curve Realignment Project will not result in effects to any proposed or designated critical habitat.

The remainder of the February 28, 2005 Biological Opinion and Conference Opinion is unchanged. This concludes formal consultation on the State Route 84 Pigeon Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation 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 re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe, Endangered Species Biologist, (Jerry_Roe@fws.gov) or (Chris_Nagano@fws.gov) at the letterhead address or at telephone (916) 414-6600 if you have any questions.

Sincerely,


 Cay C. Goude
Acting Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Marcia Grefsrud, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Liam Davis, California Department of Fish and Game, Yountville, California
Melissa Escaron, California Department of Fish and Game, Yountville, California



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:
81420-2008-F-0214-3

OCT 29 2008

Mr. Jim Richards
ATTN: Alison Graff
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for Compensation Activities at Sycamore Grove Regional Park, Livermore, Alameda County, California.

Dear Mr. Richards:

This is in response to your August 18, 2008, request for reinitiation of formal consultation to amend the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No. 1-1-04-F-0115) issued on February 28, 2005. This amendment addresses riparian habitat restoration compensation activities at Sycamore Grove Regional Park located in the City of Livermore, Alameda County, California. This document represents the amended Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and critical habitats for the California red-legged frog and California tiger salamander. This amended biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*) (Act). The biological opinion was previously amended on April 21, 2005 (1-1-04-F-0116), May 2, 2007 (1-1-07-F-0159), July 20, 2007 (1-1-07-F-0268), November 5, 2007 (81420-2008-F-0214), and April 17, 2008 (81420-2008-F-0214-2).

This amended biological and conference opinion is based on: (1) Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California (Service File No. 1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) Amendment to the Biological

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Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-07-F-0159) dated May 2, 2007; (4) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-07-F-0268) dated July 20, 2007; (5) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 81420-2008-F-0214) dated November 5, 2007; (6) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California (Service File No. 81420-2008-F-0214-2) dated April 17, 2008; (7) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated August 18, 2008; (8) Proposal for Riparian Vegetation Establishment at Sycamore Grove "Drainage E" revision dated July 03, 2007; (9) correspondence between Alison Graff (Caltrans), and Jerry Roe (Service) between July 31, 2008 and August 19, 2008; (10) site visit conducted with the Natural Resources Conservation Service, Caltrans, Livermore Area Recreation and Park District (LARPD), and the Service on August 7, 2008; (11) request to include additional conservation measures for Alameda whipsnakes; and (12) other information available to the Service.

The following changes are made to the February 28, 2005 Biological Opinion and Conference Opinion:

1. Add the following to the **Consultation History**:

July 31, 2008 to October 9, 2008	Email correspondence between the Jerry Roe of the Service, and Alison Graff of Caltrans, regarding the proposed compensation activities at Sycamore Grove Regional Park.
August 7, 2008	Jerry Roe of the Service visited the proposed riparian compensation area at Sycamore Grove Regional Park with Jackie Charbonneau of NRCS, Pete Van Hoorn of ACRCDD, Michael Nicholson of LARPD, Alison Graff of Caltrans.
August 18, 2008	The Service received a request from Caltrans to amend the biological opinion via electronic correspondence.
September 3, 2008	The Service received a request from Caltrans to add Conservation Measures for Alameda whipsnake into the Sycamore Grove project description.
September 29, 2008	The Service sent the draft amendment to the biological opinion to Caltrans for review.
October 8, 2008	The Service received comments from Caltrans for the draft amendment to the biological opinion.

2. Add the following to the **Description of Proposed Action**:

Project Summary

The California Department of Transportation (Caltrans) proposes to restore riparian habitat along an unnamed drainage at Sycamore Grove Regional Park as partial compensation for effects to riparian habitat for the Pigeon Pass Curve Realignment Project, pursuant to the requirements of permits from the California Department of Fish and Game (DFG) and the California Regional Water Quality Control Board (RWQCB). Sycamore Grove Regional Park is owned and managed by the Livermore Area Regional Parks District (LARPD). The design and implementation of the proposed compensation activities will be undertaken by the Alameda County Resource Conservation District (ACRCD), in cooperation with the Natural Resources Conservation Service (NRCS).

The area to be planted, Drainage E, consists of 3 acres inside and along a 2,660-foot (ft) grass-lined drainage with ephemeral water flow. Based on the seasonally arid conditions at the site, the ACRCD proposes to revegetate the drainage with a suite of drought tolerant riparian tree and shrub species, primarily valley oaks (*Quercus lobata*) and mulefat (*Baccharis salicifolia*), as well as many species characteristic of a riparian and upland ecotone. The planting plan will consist of both individual design plantings of trees and shrubs and clustered plantings of shrubs and herbaceous species. Long-term, the desired outcome is a naturalistic-looking corridor of valley and coast live oaks, other trees and shrubs, and a persisting and diverse native component in the understory. Work began in February 2008 with the planting of 270 acorns in 90 clusters. A total of approximately 1,400 plants will be installed over the life of the project in hand-dug holes 10 to 18 inches deep and 2 to 4 inches in diameter.

The project will include an irrigation system for plant establishment that will consist of a buried pipeline running from an existing developed spring to a holding tank and from the holding tank to the planting area. Above-ground lines will deliver water from the buried pipe to the plantings. Trenching for the buried lines will be approximately 18 inches deep, 6 inches wide, and 3,660 ft long and will follow existing maintenance roads except for a short portion running down a hillside from the proposed holding tank. The buried pipe will have a maximum diameter of 3 inches. The tank will be installed close to the ridgeline of a low hill, next to an existing road, and will require a 10 foot x 10 foot gravel or concrete pad.

Environmental Setting

The project site is dominated by California non-native annual grassland. It was historically dry-farmed up to the edge of each bank and much of the soil in the drainage appears to be unconsolidated material that was pushed in when the surrounding fields were tilled. Perhaps due to this, the channel is head-cutting and slumping in several places. There is a high level of ground squirrel activity.

Project Schedule

Irrigation system installation is scheduled to occur between May 1 and October 15, 2009. The remaining plantings are scheduled for installation in the fall and early winter of 2008-2009 or 2009-2010, contingent upon the execution of the Cooperative Agreement.

Equipment Used

A bobcat, dump truck, mower, trencher, and hand labor will be required for the installation of the irrigation system. All plantings will be installed using hand labor. A small four-wheel drive utility vehicle will be used for maintenance activities.

Locations of Staging Areas/Access Roads

The staging area for installing the irrigation system will be located in a flat area adjacent to an existing gravel road. This area currently supports California annual grassland. Access to all planting areas will be made via an existing grassy maintenance road.

Construction Site Restoration

All temporary ground disturbances will be restored to pre-project conditions.

Permanent Erosion Control Measures

To control erosion, any trenched area along a slope will be re-seeded using a site-appropriate erosion control seed mix consisting of native grass species and sterile straw will be applied.

Proposed Avoidance and Minimization Measures

The tank pad and trenching locations will be mowed prior to groundbreaking. Prior to mowing and again prior to groundbreaking, an on-site biologist permitted to handle California tiger salamander and California red-legged frog will clear the area. The on-site biologist will be present during all ground-disturbing activities. He/she will inspect trenches before they are filled. Trenches will be filled as the pipe is laid, with no trenches left open overnight.

3. The following additions are made to the **Avoidance and Protection Measures – Listed Species** on page 6:
 14. If California red-legged frogs or California tiger salamanders are encountered in the action area, work within the immediate vicinity should cease immediately and the Service-approved biologist shall be notified. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the California red-legged frog(s) or California tiger salamander(s), the individual(s) shall be left at the location of discovery and monitored by the Service-approved biologist. All project personnel shall be notified of the finding and at no time shall work occur within the vicinity of the listed species without a biological monitor present. If it is determined by the Service-approved biologist that relocating the California red-legged frog(s) or California tiger salamander(s) is necessary, the individual(s) shall be relocated to the nearest suitable habitat within Sycamore Grove Regional Park approved by the Service. Prior to transporting California tiger salamanders or California red-legged frogs to a location other than this approved site (*i.e.*, individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service), written authorization of the Service shall be obtained by the California

Department of Transportation, the Alameda County Resource Conservation District, or the Natural Resources Conservation Service.

15. If California red-legged frogs or California tiger salamanders are encountered in the work area, the Service-approved biologist(s) shall capture California red-legged frogs and California tiger salamanders at the project site by hand, dipnet or other Service-approved methodology. Prior to handling, the Service-approved biologist(s) shall thoroughly wash their hands with soapy water. Oils, creams, lotions, repellents, or solvents of any sort shall not be used within two (2) hours before and during periods when capturing and relocating will occur. Handling of California red-legged frogs and California tiger salamanders shall be minimized to the maximum extent practicable. Immediately following handling, California red-legged frogs and California tiger salamanders shall be placed in a holding container, rinsed with freshwater, transported, and released as soon as practicable the same day of capture.
16. Prior to trenching, vegetation along the trench line shall be mowed to the width necessary to accommodate the trenching equipment and a walking buffer to facilitate locating and avoiding burrows, California tiger salamanders, and California red-legged frogs that may be present within the action area. The biological monitor shall perform clearance surveys within the area to be cleared immediately prior to mowing and shall be onsite during all irrigation installation activities that could result in take, *i.e.* mowing, trenching, vehicular access, *etc.* The biological monitor does not have to be present on site during hand digging of holes or plant installation, but shall be available by phone if a listed species is observed on site.
17. Trenching and installation of irrigation conduit shall be constructed in a manner not to exceed the length that can be trenched, irrigation conduit installed, and backfilled in a single day. All trenches shall be backfilled by the end of work each day; no trenches shall be left open overnight.
18. No work shall occur during or 24 hours following rain events.
19. The biological monitor shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying what species, including general wildlife species, were encountered, including the time and location when such species were found; (3) the time the specimen was identified and by whom and its condition; and (4) a description of any actions taken. The biological monitor shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service upon request. All monitoring records shall be provided to the Service upon completion of the monitoring work.
20. Following completion of the work, erosion control measures shall be implemented for all disturbed areas, which may include reseeding using a noxious weed free native seed mix, hydroseeding, jute matting, or tackifying agents to stabilize soils, control dust and prevent erosion.

4. The following additions are made to the **Avoidance and Protection Measures – Listed Species** on page 6:

Avoidance and Protection Measures – Alameda whipsnake

1. A biological monitor will be present during the construction of the water tank pad and all trenching and backfilling activities and will have oversight over implementation of these measures. The biological monitor will have the authority to stop project activities, through communication with the Alameda County Resource Conservation District and the Operator, if any of these measures are not being fulfilled and if the Alameda whipsnake or any other listed species are encountered. If the biologist has requested work to stop due to observation or take of any of the listed species, the Service and the California Department of Fish and Game will be notified within one (1) working day via email or telephone for instructions.
2. A pre-construction survey will be conducted by a biological monitor within the immediate area of construction and where equipment and construction activities will be located. Any work will be delayed and the Service will be contacted if an Alameda whipsnake is encountered.
3. Prior to construction, a biologist will educate construction workers about the Alameda whipsnake and how to avoid them. If a snake is detected during construction, work will halt and the onsite biological monitor will be notified to identify the snake. If the biologist determines that the animal may be an Alameda whipsnake, a Service-approved specialist will be called in to verify the species' identity. If the animal is determined to be an Alameda whipsnake, the snake will be allowed to leave the site passively and the Service will be contacted prior to any additional work.
4. Snake exclusionary fencing shall be erected around the boundaries of the water tank pad construction area and shall be installed prior to the initiation of construction and shall remain in place until all construction equipment is removed from the site. No project activities will occur outside the exclusionary fencing. Exclusionary fencing shall be installed in the following manner:
 - Exclusion fencing shall be a minimum of 36 inches in height and buried to a minimum depth of 4 inches, backfilled, and compacted to prevent snake from passing under the fence in any areas;
 - Fence stakes shall be placed on construction side of the fence (opposite the normal requirement for sediment control);
 - The fencing shall be erected along the work boundaries adjacent to suitable habitat as determined by the Service and DFG. The fence shall be installed with loop-arounds at the ends and at any access openings needed in the fencing in order to redirect the snakes away from the area. Loop-arounds shall be created by installing the last 10 feet of the fence in the shape of a narrow "u" so that parallels to the main fence and forms a space separated by no more than 12-18 inches;

- Fences must be inspected regularly to ensure the integrity of the fence is maintained. Repairs shall be made immediately following discovery.
 - These fences must be maintained through out the Alameda whipsnake's entire active period (March 1 – November 1) or until all construction and landscaping activities have been completed, whichever occurs first. If the project continues into more seasons, fencing must be maintained during the snake's active season until project completion;
 - Additional sediment control fencing may be required as part of other agency permit conditions.
5. Prior to construction of the water tank pad and excavation of the trench, the construction area will be mowed. A qualified biologist will walk ahead of the mower to clear the area prior to mowing.
 6. A qualified biologist will perform a clearance survey before pad construction and trenching commence.
 7. To prevent inadvertent entrapment of Alameda whipsnakes during construction, the trench will be backfilled as the water pipe is installed. No trenches will be left open overnight.
5. The following additions are made to the **Status of Species/Environmental Baseline** after the first paragraph under **San Joaquin Kit Fox** on page 23:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the San Joaquin kit fox and provides suitable habitat for this species. San Joaquin kit fox have the potential to use habitat within the action area for denning, foraging, or dispersal.

6. The following additions are made to the **Status of Species/Environmental Baseline** after the second paragraph under **California Tiger Salamander** on page 29:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the California tiger salamander and provides suitable habitat for this species. There are known occurrences of California tiger salamanders in livestock ponds located on LARPD property within 0.5-mile of the compensation site. This species may use the action area for aestivation, foraging, and dispersal. California tiger salamanders may be present in rodent burrows or deep cracks in the soil, given that ground disturbance will occur within dispersal distance of the nearby ponds.

7. The following additions are made to the **Status of Species/Environmental Baseline** after the second paragraph under **California Red-Legged Frog** on page 35:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the California red-legged frog and provides suitable habitat for this species. There are known occurrences of California red-legged frog in livestock ponds located on LARPD property within 0.5-mile of the compensation site. This species may use the compensation area for foraging and dispersal. California red-legged frogs are not expected to be present in the action area during the dry season when the irrigation system will be installed.

8. The following additions are made to the **Status of Species/Environmental Baseline** after the first paragraph on page 44:

STATUS OF THE SPECIES

Alameda Whipsnake

The Alameda whipsnake was federally listed as threatened on December 5, 1997, (Service 1997). The animal was listed as threatened by the State of California in 1971. Approximately 406,598 acres of critical habitat was designated for the Alameda whipsnake within Contra Costa, Alameda, Santa Clara, and San Joaquin counties on October 3, 2000 (Service 2000). The critical habitat was vacated and remanded on May 9, 2003; proposed again on October 18, 2005; and designated on October 2, 2006 (Service 2006). A draft Alameda whipsnake recovery plan was included in the *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California*, issued in November 2002 (Service 2002).

Description: The Alameda whipsnake is a slender, fast-moving, diurnal snake with a narrow neck and a relatively broad head with large eyes. The snake's dorsal surface is sooty black with distinct yellow-orange stripes along each side. The coloration of the snake's ventral surface varies along its length: the anterior portion is orange-rufous; the midsection is cream colored; and the posterior and tail are pinkish. Adults range in length from 3 to 4 feet (Service 1997).

The Alameda whipsnake is one of two subspecies of California whipsnake (*Masticophis lateralis*). The Alameda whipsnake (*M. l. euryxanthus*) is distinguished from the other subspecies, the chaparral whipsnake (*M. l. lateralis*), by its sooty black dorsum; wider lateral yellow-orange stripes; the lack of a dark line across the rostral; an uninterrupted light stripe between the rostral and eye; and the virtual absence of spotting on the venter of the head and neck.

Distribution: The Alameda whipsnake inhabits the inner Coast Ranges in western and central Contra Costa and Alameda counties (Jennings 1983; McGinnis 1992; Swaim 1994) where it is found in a variety of vegetation communities including chamise-redshank chaparral, mixed chaparral, coastal scrub, annual grassland, blue oak-foothill pine, blue oak woodland, coastal oak woodland, valley oak woodland, eucalyptus, redwood, and riparian (CDFG 2008).

Habitat Requirements: Scrub and chaparral communities are the primary habitat types essential for providing space, food, and cover necessary to sustain all life stages of the Alameda whipsnake. Associated scrub habitat typically consists of Diablan sage scrub, coyote bush scrub, and chamise chaparral (Swaim 1994), and is also classified as coastal scrub, mixed chaparral, and chamise-redshank chaparral (CDFG 2008). Swaim (1994) found that core scrub habitat areas (areas of concentrated use by Alameda whipsnakes, based on telemetry and trapping data) tended to occur on east, southeast, south or southwest facing slopes and were within 500 feet of open or partially-open canopy or grassland habitat. Alameda whipsnakes have also been found in open chaparral stands with a northern exposure (K. Swaim, Swaim Biological Consulting, personal communication with the Service 2004). As a result of incidental observations and trapping surveys, Alameda whipsnakes have been discovered greater than 600 feet and as much as 21,600 feet from primary scrub and chaparral habitat (K. Swaim, Swaim Biological Consulting, personal communication with the Service 2004).

Alameda whipsnakes are also known to use other habitat types adjacent to their primary scrub and chaparral habitat. McGinnis (1992) has documented Alameda whipsnakes using oak woodland/grassland habitat as a corridor between stands of northern coastal scrub. Grassland habitats appear to be used extensively by male Alameda whipsnakes during the spring mating season (Swaim 1994). Females appear to use these grassland areas more extensively after mating (Swaim 1994), possibly looking for suitable egg-laying sites or for dispersing to other scrub habitat (K. Swaim, Swaim Biological Consulting, personal communication with the Service, 2002). Alvarez et al. (2005) indicated that Alameda whipsnakes use a broader association of habitats including annual grassland, oak woodland, riparian and other non-native and disturbed open habitats at distances averaging 1,041 m (0.6-mile) and exceeding 7,300 m (4.54 miles) from chaparral/scrub plant communities based on occurrence data analyzed from 1948 to 2004. Egg-laying sites have been found close to scrub communities in grasslands with scattered shrubs (Swaim 1994) and in true scrub communities (K. Swaim, Swaim Biological Consulting, personal communication with the Service, 2002). These other habitat areas may be important in the early life history stages of hatchling whipsnakes (Swaim 1994). Rock outcrops, talus, and burrows (mating habitats) need to be within dispersal range of scrub and grassland habitat (egg-laying habitats). Swaim (1994) also observed Alameda whipsnakes mating in rock outcrops.

Alameda whipsnakes require plant canopy covers that supply a suitable range of temperatures, corridors of plant cover and retreats (including rock outcrops) sufficient to provide dispersal pathways between areas of habitat, and plant community patches of sufficient size to prevent the deleterious effects of isolation, such as inbreeding or the loss of a subpopulation due to a catastrophic event. Specific habitat features used by Alameda whipsnakes include, but are not limited to, small mammal burrows, rock outcrops, talus, soil crevices, debris piles, and other forms of cover to provide temperature regulation, shelter from predators, egg-laying sites, and winter hibernacula (Swaim 1994). Adequate insect populations are also necessary to sustain their primary lizard prey populations.

Life History: Survey data suggests that the Alameda whipsnake exhibits a bimodal season activity pattern with peak activity in the spring and late summer/early fall (Swaim 1994). Male Alameda whipsnakes appear to be more active than females in the spring,

which is likely attributed to breeding season behavior (Swaim 1994). The breeding season is thought to be between March and June, and mating appears to typically occur near the female's hibernacula (Swaim 1994). During the mating season, females likely remain near their retreat sites while males disperse throughout their home ranges. In one study, Swaim (1994) estimated a mean individual home range size for four males was 13.6 acres, and 8.4 acres for two females. Gravid female Alameda whipsnakes likely lay eggs between May and July (Stebbins 2003). Clutch sizes are typically between 6 to 11 eggs and the young hatch and emerge in the late-summer to early-fall (Swaim 1994). Male and female snakes appear to exhibit similar movement and activity patterns following the breeding season (Swaim 1994). Increases in late summer/early fall activity may be attributed to emergence of hatchling whipsnakes and the increased availability of hatchling lizard prey (Swaim 1994). Alameda whipsnakes typically retreat into winter hibernacula in November and emerge in March.

Alameda whipsnake above-ground activity cycles appear to be highly temperature dependent. Alameda whipsnakes have the highest documented mean active body temperature (92.1 degrees Fahrenheit) and degree of body temperature stability (stenothermy) than other snake species under natural conditions (Swaim 1994). Maintenance of such a high body temperature likely enables the snake to capture its characteristically fast-moving prey (Swaim 1994). Open and partially open and/or low growing shrub communities provide a mosaic of sunny and shady areas that apparently allow the snake to effectively maintain sufficient body temperature while providing cover from potential predators (Swaim 1994).

The Alameda whipsnake is an active diurnal predator and hunts by holding its head high off the ground to peer over vegetation or rocks for potential prey. This foraging strategy corresponds with the open habitat with which this species is typically associated with (Swaim 1994). Its diet includes lizards, skinks, frogs, small mammals, snakes, nesting birds, and insects. Features such as small mammal burrows, rock outcrops, and talus provide important habitat components such as shelter from predators, egg-laying sites, over-night retreats, and winter hibernacula (Swaim 1994). Their lizard prey is often abundant in these areas as well. Lizards, especially the western fence lizard, appear to be the Alameda whipsnake's primary prey item (Stebbins 2003; Swaim 1994).

Threats: Urban development has fragmented the once contiguous range of the Alameda whipsnake into the following five population centers: (1) the Tilden-Briones population (Sobrante Ridge, Tilden/Wildcat Regional Parks to the Briones Hills, in Contra Costa County); (2) the Oakland-Las Trampas population (Oakland Hills, Anthony Chabot area to Las Trampas Ridge, in Contra Costa County); (3) the Hayward-Pleasanton Ridge population (Hayward Hills, Palomares area to Pleasanton Ridge, in Alameda County); (4) the Mount Diablo-Black Hills population (Mount Diablo vicinity and the Black Hills, in Contra Costa County); and (5) the Sunol-Cedar Mountain population, (Wauhab Ridge, Del Valle area to the Cedar Mountain Ridge) (Service 1997).

Habitat fragmentation appears to have resulted in little to no gene flow or interchange between the five populations. Interchange between the Tilden-Briones, Oakland-Las Trampas, and Hayward-Pleasanton Ridge populations appears to depend on dispersal over the Caldecott Tunnel in Contra Costa County; under State Route 580 in Alameda

County (at the Eden Canyon interchange); under the Dublin Boulevard undercrossing; or where San Lorenzo Creek passes under the highway (Service 1997). Interchange between the Hayward-Pleasanton Ridge and Sunol-Cedar Mountain populations depends on dispersal along Alameda Creek in Alameda County; crossing under I-680 (where the creek passes under the highway); or crossing under the highway at Scott's Corner along Vallecitos Creek, or where two unnamed tributaries to Arroyo de la Laguna cross under I-680 north of Scott's Corner (Service 1997). The Mount Diablo-Black Hills population appears to be completely isolated from the other populations (Service 1997).

Habitat fragmentation makes some Alameda whipsnake populations more vulnerable to extinction. Habitat patches with high edge to interior ratios are known to provide less value for some species than round or square patches (Jimerson and Hoover 1991; Saunders *et al.* 1991). In general, the species most prone to extinction in fragmented habitats are those that depend on native vegetation; require combinations of different habitat types; require large territories; and exist at low densities (Saunders *et al.* 1991). Alameda whipsnakes have been associated with a variety of habitats for different natural history functions. They are primarily associated with native Diablan sage scrub, but are known to forage in adjacent grasslands, and migrate along riparian corridors. Consistent low trap success and high recapture rates suggests Alameda whipsnakes may be sparse, even in suitable habitat (Swaim 1994). The combination of these factors may cause the Alameda whipsnake to be more vulnerable to extinction in small habitat patches resulting from habitat fragmentation.

Small populations with limited breeding partners are prone to inbreeding which often results in problems associated with the lack of genetic diversity (Frankham and Ralls 1998). Populations with less genetic variability or more deleterious genetic material are typically less able to successfully respond to environmental stresses or adapt to even relatively minor changes in environmental conditions. These factors influence the survivability of smaller, genetically isolated populations.

The Alameda whipsnake has a variety of potential native and exotic predators including California kingsnake (*Lampropeltis getula californiae*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginianus*), coyote (*Canis latrans*), gray fox (*Vulpes cinereoargenteus*), red fox (*V. vulpes*), and red-tailed hawk (*Buteo jamaicensis*). Urbanization often facilitates the introduction or spread of non-native predators (Goodrich and Buskirk 1995). Increased predatory pressure may become excessive in situations where Alameda whipsnake habitat is fragmented, isolated, and otherwise degraded by human activities. This may be especially true where alien species, such as rats, feral pigs (*Sus scrofa*), and feral and domestic cats (*Felis domesticus*) and dogs (*Canis familiaris*) are present. These additional threats become particularly acute where urban development immediately adjacent to Alameda whipsnake habitat. A growing movement to maintain feral cats in parklands, such as those managed by East Bay Regional Park District, is a potential threat to a variety of wildlife species (Coleman *et al.* in litt. 1997; Roberto 1995; DeVecchio 1997). Little is known about the predation of Alameda whipsnakes, but feral cats are known to prey on reptiles, including the yellow racer (*Coluber mormon*), a fast, diurnal snake similar to the Alameda whipsnake (Hubbs 1951; Stebbins 2003). The threat of predation and harassment from domestic and feral cats and other non-native species increases as human disturbance from recreational use on

regional and state parks, and urban development encroaches into the current open space buffers between existing developments and Alameda whipsnake habitat on public lands (Coleman *et al.* in litt. 1997).

McGinnis (1992) has suggested that grazing has impacted Alameda whipsnake habitat in many areas east of the Coast Range. Livestock grazing that significantly reduces or eliminates shrub and grass cover can be detrimental to this snake. Many snake species, including the Alameda whipsnake, likely avoid such open areas due to increased danger from predators and lack of prey (McGinnis 1992). Removed native vegetation is often replaced by non-native plant species that significantly degrade habitat values or even replace entire plant communities such that it no longer provides appropriate habitat for the Alameda whipsnake. For instance, radio telemetry data indicates that Alameda whipsnakes tend to avoid dense stands of eucalyptus (Swaim 1994).

The Alameda whipsnake is directly and indirectly threatened by the effects of fire suppression. Fire suppression results in a buildup of fuel (underbrush, thatch, and woody debris). This exacerbates the effects of wildfires by creating conditions for hot, slow-moving fires. The development of a closed scrub canopy also results in a buildup of flammable fuels over time (Parker 1987; Rundel *et al.* 1987). Fire suppression can also result in the spread and proliferation of non-native vegetation, further increasing flammable fuel loads in and around Alameda whipsnake habitat. The threat of wildfire is typically highest in the summer and early fall when accumulated fuel is abundant and dry. This "fire season" coincides with the primary above-ground activity period for hatchling and adult Alameda whipsnakes (Swaim 1994). Therefore, populations are likely to sustain heavy losses from fires during this period.

Changes in the vegetation structure typically results in changes to the micro-climate temperature regime important in maintaining the Alameda whipsnake's high optimal body temperature. For instance, fire suppression may result in increased canopy closure and shading (Parker 1987) from plant species such as poison oak (*Toxicodendron diversilobum*) and coyote brush (*Baccharis pilularis*). Increased vegetative cover can result in ground temperatures that are less than optimal for the Alameda whipsnake. Survey data suggests that Alameda whipsnakes are less likely to be found in areas of scrub habitat with a closed canopy (Swaim 1994).

Encroaching urban development has lead to the implementation of rigorous fire suppression practices in and around adjacent suitable Alameda whipsnake habitat. Frequent fire events are important in maintaining the scrub habitat associated with the Alameda whipsnake. Many native coastal scrub and chaparral plant species require periodic fires to stimulate new sprouting, seedling recruitment, and seed dispersal (Parker 1987; Keeley 1987; Keeley 1992). The optimal frequency of fire events is often disputed but likely ranges from every 10 to 30 years (Keeley 1987; Rundel *et al.* 1987). Depending on the rate of fuel accumulation, any prescribed burn program should take place every 10 to 30 years (J. Ferreira, California Department of Parks and Recreation, personal communication with the Service 1996).

All five remaining populations of the Alameda whipsnake are threatened by a variety of factors. Each of these populations consists of several to numerous subpopulations with

varying degrees of connectivity between them. In the western portion of the species' range, the Tilden-Briones population is threatened by a high potential for catastrophic wildfire and urban development. However, the remaining habitat, regional parklands, and municipal watersheds within this area overlap to the extent that a regional preserve may be possible. The Oakland-Las Trampas population is threatened by a high potential for catastrophic wildfire and the negative effects associated with habitat fragmentation and urban development. The Hayward-Pleasanton Ridge population may be the most susceptible to extirpation. This population is scattered in distribution and is, therefore, more vulnerable to the effects of development and subsequent habitat fragmentation. The Mount Diablo-Black Hills population, in the eastern portion of the species' range, is threatened by a high potential for catastrophic wildfire, development and its associated impacts, and inappropriate grazing practices. If threats associated with urbanization can be controlled, this population is a good candidate for recovery, due to the inclusion of public lands and the potential for improved fire and grazing management on parklands. The Sunol-Cedar Mountain population is threatened by development and inappropriate grazing practices. Overall, the Oakland-Las Trampas and Hayward-Pleasanton Ridge populations are the most immediately imperiled with habitat fragmentation becoming prevalent enough to compromise its long-term viability.

Recovery: Seven recovery units have been identified for the Alameda whipsnake (Service 2002). The proposed compensation site at Sycamore Grove Regional Park is located within the Sunol-Cedar Mountain Recovery Unit (Unit 5). This is the southernmost unit and comprises an area of interface between Alameda whipsnake and San Joaquin whipsnake. Much of this area consists of East Bay Regional Park District, San Francisco Water District, California Department of Parks and Recreation, U.S. Department of Energy (Lawrence Livermore National Laboratory), and private properties. The recovery plan recommends that landowners within Unit 6 implement plans to address health of chaparral/scrub, fire management, recreation, unauthorized collection, and incompatible land uses. The recovery plan also specifies the importance of habitat restoration, including return of fire as a natural disturbance regime, removal of nonnatives or vegetation that overtops chaparral/scrub, and providing rock outcrops or other forms of retreat or hibernacula as being a priority within this unit.

ENVIRONMENTAL BASELINE

Alameda Whipsnake

The California Natural Diversity Database (California Department of Fish and Game 2008) includes two records of Alameda whipsnake observations within 1 mile and three within 3 miles of the action area. The closest of the three observations is an unconfirmed sighting in the orchard immediately adjacent to the subject drainage from a former Sycamore Grove Regional Park employee (K. Swaim pers. comm. on August 20, 2008). The second occurrence is located approximately 0.9-mile to the southeast on the north side of Del Valle Canyon downstream of the Del Valle Reservoir. The third occurrence is located on the east shoreline of Del Valle Reservoir dating back to 1975. Based on the habitat located within and adjacent to the action area, the biology and ecology of the Alameda whipsnake, including its dispersal behavior, and the nearby records of the listed

species, the Service has concluded it is likely this listed animal utilizes the action area for foraging, resting, mating, and other essential behaviors.

9. ADD the following text after the second paragraph of the **Effects of the Proposed Action** on Page 45:

Sycamore Grove Regional Park

The proposed riparian compensation activities consisting of equipment access, trenching, staging, and installation of an irrigation infrastructure at Sycamore Grove Regional Park may result in adverse effects to the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake. There is a likelihood the proposed activities may directly affect individuals of these listed species by causing mortality or injury resulting from being crushed by rocks or equipment, or entombed in dens or in trenches, or harassment from construction noise, vibration or light. These species may be indirectly affected by construction activities temporarily altering foraging, movement patterns or refugia habitat, or subjecting them to predation that otherwise would not occur. The proposed action will result in the temporary loss and degradation of 0.04-acres and the permanent loss of 0.002-acre of the habitat of the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake comprising entirely of non-native annual grassland.

10. Change the first paragraph under *San Joaquin Kit Fox* of the **Effects of the Proposed Action** on Page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species.

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The Phase I activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and possible construction-related harassment

of an unknown number of San Joaquin kit foxes. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of grassland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of grassland habitat resulting from the construction of a holding take. Activities may result in construction related harassment and harm of an unknown number of San Joaquin kit foxes. The riparian compensation activities will have a net beneficial effect to the San Joaquin kit fox by providing greater habitat diversity, increasing prey base of small rodents and insects, increasing protective cover, and stabilizing erosion within the drainage.*

11. Change the first paragraph under *California Tiger Salamander* of the **Effects of the Proposed Action** on Page 53 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as raccoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during nighttime construction. Edible trash left during or after repair activities could attract predators, such as raccoons, skunks, opossums, crows and ravens, that could subsequently prey on the listed amphibian.

Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of upland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of upland habitat for the California tiger salamander. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders. The riparian compensation activities will have a net beneficial effect to the California tiger salamander by increasing protective cover and stabilizing erosion within the drainage.*

12. Change the first paragraph under *California Red-legged Frog* of the **Effects of the Proposed Action** on Page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County. Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of upland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of upland habitat*

for the California red-legged frogs. Activities may result in construction related harassment and the death of an unknown number of California red-legged frogs. The riparian compensation activities will have a net beneficial effect to the California red-legged frog by increasing the prey base, increasing protective cover, and stabilizing erosion within the drainage.

13. ADD the following text at the end of the **Effects of the Proposed Action** on Page 60:

Alameda Whipsnake

Individual Alameda whipsnakes may be directly injured or killed by activities that disturb feeding, sheltering, and dispersal habitat. The proposed action would result in adverse effects to Alameda whipsnake that may be dispersing, foraging, and/or aestivating in the action area, and would result in the temporary loss and degradation of 0.04-acres and the permanent loss of 0.002-acre of the habitat for this listed species. The effects will likely (1) result in the injury and death of an unknown number of Alameda whipsnakes by entombment in burrows; (2) result in construction-related harassment to Alameda whipsnakes in the area; (3) temporarily impede the dispersal or daily movement of Alameda whipsnakes through the area while the action is in progress; and/or (4) increase the likelihood of predation on Alameda whipsnakes.

Construction related activities may cause disruption of foraging, harassment from increased human activity, and permanent and temporary loss of shelter. Because Alameda whipsnakes are diurnal, they will be active while construction is performed. Individuals that avoid construction activities may become displaced into adjacent areas where they may be vulnerable to increased predation, exposure, starvation, or stress through disorientation, loss of shelter, and intraspecific and inter-specific aggression (Grigione 2002). The conservation measures that will be implemented at the proposed project will likely reduce mortality, injury, harassment, or harm to the Alameda whipsnake.

The proposed compensation activities at Sycamore Grove Regional Park would likely improve the habitat quality within the action area by enhancing a sparsely vegetated riparian corridor, thereby increasing refugia, hibernacula, escape cover, and foraging habitat.

14. Change the **Amount or Extent of Take** section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass

Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or napulai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit,

will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, may range over a large territory, is primarily active at night, highly intelligent, and often extremely shy around humans; making finding an injured or dead individual unlikely. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. *In addition, San Joaquin kit foxes inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect, because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels and other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. *In addition, California tiger salamanders inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their

cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. *In addition, California red-legged frogs inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp and will not result in incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service expects that incidental take of the Alameda whipsnake will be difficult to detect or quantify because this animal may range over a large territory and the finding of an injured or dead individual is unlikely because of their relatively small body size and conspicuous coloration. Therefore, the Service is estimating that all of the Alameda whipsnakes inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the Alameda whipsnake caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

15. The following addition is made to the **Terms and Conditions** on page 71:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake. The number of Service-approved biologists who are on site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.
27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders shall be done with hand tools whenever possible. The depth to which this amphibian is found depend on the burrow-specific conditions. Excavation shall extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found shall be recorded whenever possible and the information shall be provided to the Service and the California Department of Fish and Game.
 - a. Prior to handling, the Service-approved biologist(s) shall thoroughly wash their hands with soapy water. Oils, creams, lotions, repellents, or solvents of any sort shall not be used within two (2) hours before and during periods when capturing and relocating will occur. To minimize transmission of infectious agents among amphibians, vinyl gloves shall be worn while handling California tiger salamanders, and changed between individuals. Prior to handling, vinyl gloves shall be rinsed in freshwater to remove any residual surface chemicals used during the production process. Handling of juvenile and adult California tiger salamanders shall be minimized to the maximum extent practicable; handling of larvae shall not exceed 90 seconds. Immediately following handling, California tiger salamanders shall be placed in a holding container, rinsed with freshwater, and observed for a period of 30 minutes prior to release for signs of impairment, tissue necrosis, or mechanical damage associated with contact with gloves, equipment, or improper handling. Note that recent studies by Cashins et al. (2008) indicate that latex or nitrile gloves can be lethal to tadpoles; therefore, such gloves shall not be used to handle amphibians of any life stage of any species. The holding container shall be kept in a cool location with moist with damp paper towels or a saturated soap-free sponge. If possible, only one frog or salamander shall be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container; however, the two listed species or the same species of significantly different sizes or life history stages shall not be mixed in order to avoid injury or depredation. Individuals shall never be so crowded that they are touching one another. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.
 - c. California tiger salamanders shall be released as soon as possible within the same day they are captured. If circumstances dictate that the individual(s) cannot be released the same day the Service shall be contacted immediately for further guidance.

- d. California tiger salamanders shall be released at the nearest location that is outside of the construction area and shall be placed at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal shall be released per burrow. A maximum of three California tiger salamanders may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals shall be released one at a time rather than en masse. The Service-approved biologist shall monitor the released individuals to ensure they retreat to safety and do not return to the construction area.

16. Add the following reference to the **Literature Cited** on page 75:

- Alvarez, J.A. 2006. *Masticophis lateralis eurryanthus* (Alameda whipsnake) habitat. Herpetological Review 37(2): 233.
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- Jennings, M.R. 1983. *Masticophis lateralis*. Catalogue of American Amphibians and Reptiles: 343.1-343.2.
- Jimerson, T. and L. Hoover. 1991. Old-growth forest fragmentation: Changes in amount, patch size and edge as a result of logging. Pages 168-174 in: Proceedings of the symposium on biodiversity of northwestern California. October 28-30, 1991, Santa Rosa, California.
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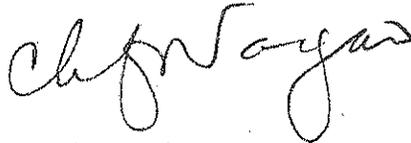
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- Parker, V.P. 1987. Can native flora survive prescribed burns? *Fremontia* 14(4): 3-6.
- Roberto, P. 1995. The cat rescue movement vs. wildlife defenders: whose right to live. *California Coast and Ocean* 11:31-40.
- Rundel, P. W., G. A. Baker, D. J. Parsons, and T. J. Stohlgren. 1987. Postfire demography of resprouting and seedling establishment by *Adenostoma fasciculatum* in the California chaparral. Pp. 575-595. In J. D. Tenhunen, F. M. Catarino, P. L. Lange, and W. C. Oechel, W.C. (editors), *Plant response to stress*. Springer-Verlag, Berlin.
- Saunders, D.A., R.J. Hobbs, and C.R. Margules. 1991. Biological consequences of ecosystem fragmentation: a review. *Conservation Biology* 5:18-32.
- Stebbins, R. C. 2003. *A Field Guide to Western Reptiles and Amphibians*. 3rd Edition. Houghton Mifflin Company. New York, New York. 533 pp.
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The remainder of the February 28, 2005 Biological Opinion and Conference Opinion is unchanged. This concludes reinitiation of the formal consultation on the State Route 84 Pigeon

Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation 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 re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe, Endangered Species Biologist, (Jerry.Roe@fws.gov) or (Chris.Nagano@fws.gov) at the letterhead address or at telephone (916) 414-6600 if you have any questions.

Sincerely,



Cay C. Goude
Acting Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Melissa Escaron, California Department of Fish and Game, Yountville, California
Marcia Grefsrud, California Department of Fish and Game, Yountville, California
Liam Davis, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Brendan Thompson, Regional Water Quality Control Board, Oakland, California
Keith Lichten, Regional Water Quality Control Board, Oakland, California
Jackie Charbonneau, Natural Resources Conservation Service, Livermore, California



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:
81420-2008-F-0214-3

APR 27 2010

Mr. Jim Richards
Attn: Laura Ivey
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Reinitiation of Consultation of the Biological Opinion for the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for the Inclusion of Phase II of Mitigation Activities at Sweet Ranch, Livermore, California

Dear Mr. Richards:

This is in response to your April 22, 2008 request for reinitiation of formal consultation to amend the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No.: 1-1-04-F-0115) issued on February 28, 2005. This amendment addresses Phase II activities at the Sweet Ranch property located approximately 6 miles east of downtown Livermore, Alameda County, California. On November 5, 2007 the Service issued an amendment to the Pigeon Pass Biological Opinion (Service File No.: 81420-2008-F-0214) for the first phase of the mitigation activities on the Sweet Ranch property. The activities associated with the first phase (Phase I) of work (*e.g.*, creation of a seasonal pond and exotic species removal) was completed in December 2007. This document represents the Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), and threatened California tiger salamander (Central Valley Distinct Population Segment) (*Ambystoma californiense*). This amended biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

The California Department of Transportation (Caltrans) proposes to use the 97.7 acre Sweet Ranch as compensation for 52 acres for effects to the San Joaquin kit fox and riparian and seasonal wetland habitat resulting from the project. The Sweet Ranch will be considered as compensation for the San Joaquin kit fox by the Service when Caltrans has satisfied the requirements for a conservation easement, habitat management plan, and management



endowment. In addition, Caltrans would like to consider the remaining easement acreage as future mitigation for San Joaquin kit fox, California tiger salamander and/or California red-legged frog. This proposal was outlined and deemed appropriate in a letter from the Service dated March 21, 2007 (Service File No.: 1-1-07-TA-0780).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California* (Service File No. 1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0159) dated May 2, 2007; (4) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0268) dated July 20, 2007; (5) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 81420-2008-F-0214) dated November 5, 2007; (6) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California* (Service File No. 81420-2008-F-0214-2) dated April 17, 2008; (7) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated April 22, 2008; (8) Sweet Ranch Memorandum from Caltrans dated April 22, 2008 and supporting documentation; (9) correspondence between Alison Graff (Caltrans), and Jerry Roe (Service) on April 22, 2008; (10) site visit conducted with the Natural Resources Conservation Service and Caltrans on May 15, 2008; and (11) other information available to the Service.

The following changes are made to the February 28, 2005 Biological Opinion:

1. Add the following to the **Consultation History**:

April 22, 2008	Email correspondence between the Service and Caltrans regarding the Phase II of mitigation activities on the Sweet Ranch.
April 24, 2008	The Service received a request to amend the February 28, 2005 Biological Opinion and Conference Opinion to include Phase II of the mitigation activities on the Sweet Ranch.
May 15, 2008	The Service attended a site visit to the Sweet Ranch with Caltrans and the Natural Resources Conservation Service to discuss Phase II of the mitigation activities.
June 10, 2008	The Service issued a draft amendment to Caltrans for review and comments with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch.

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|---------------|--|
| June 24, 2008 | The Service received comments from Caltrans with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch. |
| April 1, 2010 | The Service received final comments from Caltrans with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch. |

2. Add the following to the **Description of Proposed Action**:

Caltrans proposes to restore 4,810 linear feet of creek corridor at the Sweet Ranch, a private property located approximately 6 miles east of downtown Livermore. Along this stretch of creek, 4.7 acres of mixed riparian habitat will be restored/enhanced, 2.4 acres of bed and bank will be improved and 4.0 acres of seasonal wetlands will be created.

An in-perpetuity conservation easement, management endowment and a long-term conservation practices management plan are conditions of the easement. In October 2009, the State and the property owner executed a conservation easement on the Ranch. The State will hold the easement until a successor entity acceptable to the property owner and resource agencies is found to hold the easement and endowment. The conservation easement was reviewed and approved by the Service and the Regional Water Quality Control Board. The Service is a third party signatory to the conservation easement.

Project Summary

The key elements of the proposed Sweet Ranch conservation site habitat restoration, enhancement, and creation activities were divided into two phases. The activities associated with the first phase were completed in December 2007. These activities were included in the November 5, 2007 amendment to the Biological Opinion for the Effects of the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County (Service File No.: 81420-2008-F-0214).

Activities executed during Phase 1 included:

1. Seasonal Pond Creation: Excavation of a seasonal pond suitable for breeding by the California tiger salamander and potentially the California red-legged frog.
2. Exotics Removal: Eucalyptus (*Eucalyptus globulus*) tree removal in the riparian corridor. A total of two trees were removed.

The activities proposed for Phase 2 include:

1. Wetland Creation
 - a. The Bowl Areas: Creation of seasonal wetlands in the two upland bowl areas.
 - b. Wet Meadow: Wet meadow creation in the westernmost reach of the existing riparian corridor.
 - c. Pond/Spring Enhancement: Enhancement of the newly created seasonal pond and existing spring.

2. Riparian Restoration
 - a. Debris and Exotic Species Removal: Removal and control of non-native, invasive plant species and removal of existing debris along the western reach of the existing riparian corridor.
 - b. Riparian Planting: Planting of native riparian vegetation in the eastern reaches of the existing riparian corridor, where little riparian vegetation currently exists.
3. Grade Stabilization
 - a. Boulder Weirs: Installation of rock weirs along the creek to slow head-cutting and potentially expand existing in-stream wetlands.
4. Culvert Improvements
 - a. Culvert Replacement: Removal and replacement of one large culvert (at the existing driveway road behind the house).
 - b. Culvert Extension: Extension of an existing culvert to improve the outfall or placement of rock slope protection to prevent further erosion.
5. Ranch Infrastructure
 - a. Fence: Installation of a temporary livestock exclusion fence around the riparian corridor and wetland creation areas.
 - b. Access Road: Improvement of existing access road.
 - c. Corral: Installation of one corral made from portable fence panels and a chute for working livestock.
 - d. Water Supply: Installation of a livestock water and irrigation system.

Project Scope

Wetland Creation

Bowl Areas

The design for the creation of seasonal wetlands in these two areas includes a series of shallow depressions lined with a bentonite clay liner to allow short-term retention of runoff water. Because of the degree of change in elevation from one end of the basin to the other, a stepped/terraced design will be used in these locations. Wetland areas will be seeded and planted with the appropriate native plants. A total of approximately 1.0-acre of seasonal wetland will be created at these locations.

Wet Meadow

A wet meadow will be created in the gently sloping field at the westernmost reach of the intermittent stream immediately upstream of Cross Road. This will be accomplished by re-grading the field and existing channel and constructing a series of ponded terraces separated by earthen berms. Rock-lined drop structures will be installed as spillway structures between the ponded areas. Wetland areas will be seeded and planted with the appropriate native plants. Approximately 3.0 acres of seasonal wetland will be created at this location.

Pond/Spring Enhancement

The seasonal pond that was constructed during Phase 1 of the project will be tested for bulk density and recompact as necessary to achieve its full water holding potential. The existing western spring originates at the toe slope of the hill, above the newly constructed pond location. Water from the spring flows towards the newly constructed pond for a short distance and then infiltrates into the soils before it reaches the pond. The spring is perennial and was once used to supply water to the on-site residence. The spring will be excavated to bring water to the surface, allowing flow to the new pond, or redeveloped with a new spring box and pipe. Wetland areas will be seeded and planted with the appropriate native plants.

Riparian Restoration

Debris and Exotic Species Removal

Approximately 2,000 linear feet of the eastern reach of the riparian corridor will be enhanced through exotic species and debris removal. This area has an understory dominated by German ivy (*Delawarea odorata*), periwinkle (*Vinca major*), and similarly undesirable invasive exotic species. Two eucalyptus trees were removed during Phase 1 and another dozen will be removed during Phase 2, provided an agreement can be reached with the adjacent landowner (trees are outside of the easement area).

Exotics removal will be accomplished with a combination of mechanical and manual removal techniques and application of the herbicide Rodeo (glyphosate). The herbicide is needed to accomplish habitat enhancement at Sweet Ranch due to the extensive cover of German ivy and periwinkle in the riparian corridor and a net benefit to California red-legged frogs is expected. California red-legged frogs have not been documented at Sweet Ranch; however, individuals have been reported from a livestock pond at least one-half mile from the project site. Herbicides will be applied in the dry season only to treat German ivy and periwinkle between May 1 and October 15 outside of the breeding season, and will not be applied within 72 hours of forecasted precipitation. All exotic vegetation removed manually will be taken off site and disposed of at an approved green waste facility.

Debris (*e.g.* wire rolls, old tires, appliances, old farm equipment, *etc.*) will be removed from the channel. All debris will be taken off site and disposed of at an appropriate waste/recycling facility.

Riparian Plantings

Approximately 4,810 linear feet of riparian corridor will be replanted. Portions of the stream and stream banks currently lacking riparian vegetation will be planted with locally occurring riparian species, *e.g.* arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), blue elderberry (*Sambucus mexicana*), California buckeye (*Aesculus californica*), and valley oak (*Quercus lobata*). Willows and valley oaks will be used along the lower portions of the banks. Transitional species, such as California buckeye and blue elderberry, will be planted along the upper banks. A planting plan is being developed that details species mix and planting locations. An irrigation system will be installed to provide supplemental irrigation as needed during the first 3 years post installation or until establishment. A fence with gates will be installed along both sides of the riparian corridor to exclude livestock until plants

become sufficiently established to withstand grazing and to allow controlled grazing thereafter.

Grade Stabilization

Boulder Weirs

Seven low boulder weirs (½ to 1-ton rock) are proposed within the stream to prevent further head cutting. The rock will be sized and placed to interlock and will cover approximately 400 square feet of channel. The weirs will be placed in the channel at locations that exhibit head cutting and where the immediate upstream channel is fairly level in profile. The boulder structures will allow some water to back up, potentially increasing the area of stream channel saturation directly upstream, while still allowing water to flow through the structure.

Culverts

Culvert Replacement

A culvert that currently crosses under the unpaved driveway behind the existing house will be replaced with twin 36 inch diameter culverts to accommodate a 100-year storm event. The current culvert is undersized and as a result has failed to function properly, causing much of the erosion in this area of the creek. Replacing it with an adequately sized culverts will minimize erosion and improve the health of the creek.

Culvert Extension

An existing roadside culvert along Patterson Pass Road is causing erosion on the north bank of the creek. The culvert will be extended approximately 150 linear feet and placed through an existing gully. The culvert extension will outlet to a rock plunge pool dissipater adjacent to the streambed.

Ranch Infrastructure

Fencing

Approximately 1-mile of boundary and pasture fencing (5-strand barbed wire) will be installed to temporarily exclude livestock from created wetlands, springs, and new plantings.

Access Road

The existing ranch access road will be graded and improved with drainrock to reduce erosion and allow vehicle access for monitoring and making repairs in wet weather.

Corral

The Sweet Ranch conservation property will use cattle grazing as one method of range management as identified by the Sweet Ranch Conservation Practices Management Plan. New corrals made from portable fence panels and a chute for working livestock will be installed near the staging area where a dilapidated barn was recently removed.

Water Supply System

An existing spring is located at the eastern end of the project site. The spring is fenced and currently provides water for livestock. A pipeline will be added to the existing developed spring to supply water for the irrigation system that will service the restoration plantings. Additional troughs will also be added to the system. Location of new livestock water facilities will be determined with the acceptance of the Sweet Ranch Conservation Practices Management Plan. The pipeline will follow the existing access road.

Project Schedule

Wetland creation, debris and exotic species removal, grade stabilization, irrigation system installation, and culvert work, will begin August 2010. All plantings and seeding will occur between October 15 and December 31, 2011. Ranch infrastructure improvement will be ongoing and may occur between July 15 and December 31, 2010, or at a later date.

Equipment Used

Types of equipment used for project implementation will include a bulldozer, excavator, bobcat, backhoe, trencher, dump truck, and hand labor.

Locations of Staging Areas/Access Roads

The project staging area is a heavily impacted area located near the home site at the ranch entrance. All equipment will travel from the staging area on an existing ranch road that runs parallel to the drainage on the property. Equipment will be operated only within the project footprint area.

Temporary Erosion Control Measures

Temporary erosion control measures will follow Caltrans standards and specifications and will include measures to prevent loss of soil from runoff and erosion. Measures include the use of rice straw, straw bales, straw wattles, or similar means provided they do not entangle or block escape and dispersal routes of listed animal species. All disturbed areas will be seeded with an appropriate erosion control mixture.

Construction Site Restoration

All temporary ground disturbances, including storage and staging areas and temporary roads. These areas will be re-contoured, if appropriate, and revegetated with seeds and/or cuttings of appropriate native plant species to promote restoration of the area to pre-project conditions. To the maximum extent practicable (*i.e.*, presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented using the temporary erosion control measures listed above.

Permanent and Temporary Effects to Habitat for Phases I and II

Permanent Effects

Mitigation activities at Sweet Ranch will result in permanent effects to 0.06-acre of aquatic (stream) habitat and 4.02 acres of upland habitat (*i.e.*, 0.02-acres of streambank/riparian

habitat and 4.0 acres of California annual grassland habitat). Approximately 0.06-acre of streambed will be permanently altered by placement of the seven boulder weirs, reconfiguration of the stream channel in the wet meadow wetland creation area, and culvert replacement. In addition, 0.02-acre of eroded stream bank will be repaired. All of the above permanent effects will result in a net improvement to California tiger salamander and California red-legged frog habitat features on Sweet Ranch.

Temporary Effects

Mitigation activities at Sweet Ranch will result in temporary effects to 0.3-acre of aquatic (stream) habitat and 5.7 acres of upland habitat (i.e., one-acre of California annual grassland habitat and 4.7-acres of streambank/riparian habitat). These habitats will be enhanced and will result in a net improvement in habitat quantity and quality when fully restored.

Table 1. Permanent and Temporary Effects to Habitat for Phases I and II

Habitat	Permanent	Temporary
Aquatic (streambed)	0.06 ac	0.30 ac
Upland (streambank/riparian corridor)	0.02 ac	4.70 ac
Upland (California annual grassland)	4.00 ac	1.00 ac
Total:	4.08 ac	6.00 ac

Proposed Conservation Measures

The Avoidance and Protection Measures in the Biological Opinion and Conference Opinion issued on February 28, 2005 for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No. 1-1-04-F-0115) and all amendments to the biological opinion (Service File No. 1-1-04-F-0116, 1-1-07-F-0159, 1-1-07-F-0268, 81420-2008-F-0214, and 81420-2008-F-0214-2) will be implemented during the proposed work. The boundaries of the Environmentally Sensitive Area will be delineated using flagging.

Maintenance/Monitoring/Reporting

Maintenance, monitoring, and reporting will be the responsibility of Caltrans. Monitoring activities will be documented and monitoring reports will be forwarded to the Service annually for 5 to 10 years, as per the Sweet Ranch Conservation Practices Management Plan. The first monitoring report will be due no later than December 31, one year after completion of Phase II and annually every December 31 for each consecutive monitoring season thereafter.

3. Change the third paragraph of **Avoidance and Protection Measure** on Page 6 from:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander and providing payment for 52 acres into the Service’s San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credits at the Ohlone Conservation Bank.

The California Department of Transportation will pay \$650, 000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

TO:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander at Ohlone Conservation Bank and reserving 52 acres of the 97.7 acre Sweet Ranch Conservation Easement for San Joaquin kit fox.

4. Add the following paragraph after the first paragraph under the **Effects of the Proposed Action** on Page 44:

Phase I and II activities at the Sweet Ranch property will result in 6 acres of temporary impacts to aquatic (0.3-acre) and 5.7 acres of upland habitat (i.e., 4.7 acres of streambank/riparian habitat and 1.0-acre of California annual grassland habitat), and permanent effects to 0.06-acre of aquatic (stream) habitat and 4.02 acres of upland habitat (i.e., 0.02-acre of streambank/riparian habitat and 4.0-acre of California annual grassland habitat). Phase II activities at the Sweet Ranch property includes equipment access/staging, debris/exotic species removal, excavation, culvert replacement/extension, infrastructure construction, and fill stockpiling. The proposed restoration and enhancement activities may result in the harm or harassment of individual California red-legged frogs and California tiger salamanders during the construction activities. However, the overall habitat quality will be enhanced for all life history stages for both species by improving upland habitat and creating potential breeding habitat.

5. Change the first paragraph under *San Joaquin Kit Fox* of the **Effects of the Proposed Action** on Page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species.

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through

the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The Phase I activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and possible construction-related harassment of an unknown number of San Joaquin kit foxes. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the San Joaquin kit fox to wetland habitat, and the permanent loss of 0.02-acre of riparian habitat as a result of the construction of boulder weirs and the culvert extension. Activities may result in construction related harassment of individual San Joaquin kit fox.

6. Change the first paragraph under *California Tiger Salamander* of the **Effects of the Proposed Action** on Page 53 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as raccoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during nighttime construction. Edible trash left during or after repair activities could attract predators, such as raccoons, skunks, opossums, crows and ravens, that could subsequently prey on the listed amphibian.

Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander. Phase I activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California tiger salamander. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the California tiger salamander to seasonal wetland habitat intended to function as suitable breeding habitat. A total of 0.08-acre of riparian habitat will be permanently impacted as a result of the construction of boulder weirs and the culvert extension and a total of 6.0 acres of upland habitat will be temporarily impacted. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders.

7. Change the first paragraph under *California Red-legged Frog* of the **Effects of the Proposed Action** on Page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County. Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the California red-legged frog to

seasonal wetland habitat. A total of 0.02-acre of riparian habitat will be permanently impacted as a result of the construction of boulder weirs and the culvert extension and a total of 6.0 acres of upland habitat will be temporarily impacted. Activities may result in construction related harassment and the death of an unknown number of California red-legged frogs.

8. Change the first paragraph under *Vernal Pool Fairy Shrimp* of the **Effects of the Proposed Action** on Page 58 from:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

TO:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed road project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp.

9. Change the **Amount or Extent of Take** section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17.3 acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal

fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, may range over a large territory, is primarily

active at night, and is highly intelligent and often extremely shy around humans, making finding an injured or dead individual unlikely. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17.3 acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all San Joaquin kit foxes inhabiting the proposed 97.7 acre Sweet Ranch compensation site will be subject to incidental take during the enhancement activities. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat; therefore, the Service is authorizing take incidental to the proposed action as the harm and harassment of all San Joaquin kit fox within the Sweet Ranch action area. No injury or mortality of San Joaquin kit fox are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect, because when this amphibian is not in breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels and other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as the capture, harm and harassment of all California tiger salamanders within the Sweet Ranch action area. No injury or mortality of California tiger salamanders are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their

cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as the capture, harm and harassment of all California red-legged frogs within the Sweet Ranch action area. No injury or mortality of California red-legged frogs are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to locate in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp and will not result in incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The remainder of the February 28, 2005 Biological and Conference Opinion is unchanged. This concludes reinitiation of the formal consultation on the State Route 84 Pigeon Pass Curve Realignment Project in Alameda County, California. 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 re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe or Ryan Olah at (916) 414-6600.

Sincerely,



for
Susan K. Moore
Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Melissa Escaron, California Department of Fish and Game, Yountville, California

**Attachment AA: Water Pollution Control Best Management
Practices List:**

**Street Sweeping
Construction Site Management**

Locations of the following are on plans in Attachment BB:

Temporary Construction Entrance

Temporary Fiber Roll

Temporary Cover

Temporary Hydraulic Mulch (Bonded Fiber Matrix)

Temporary Silt Fence

Erosion Control (Hydroseed)

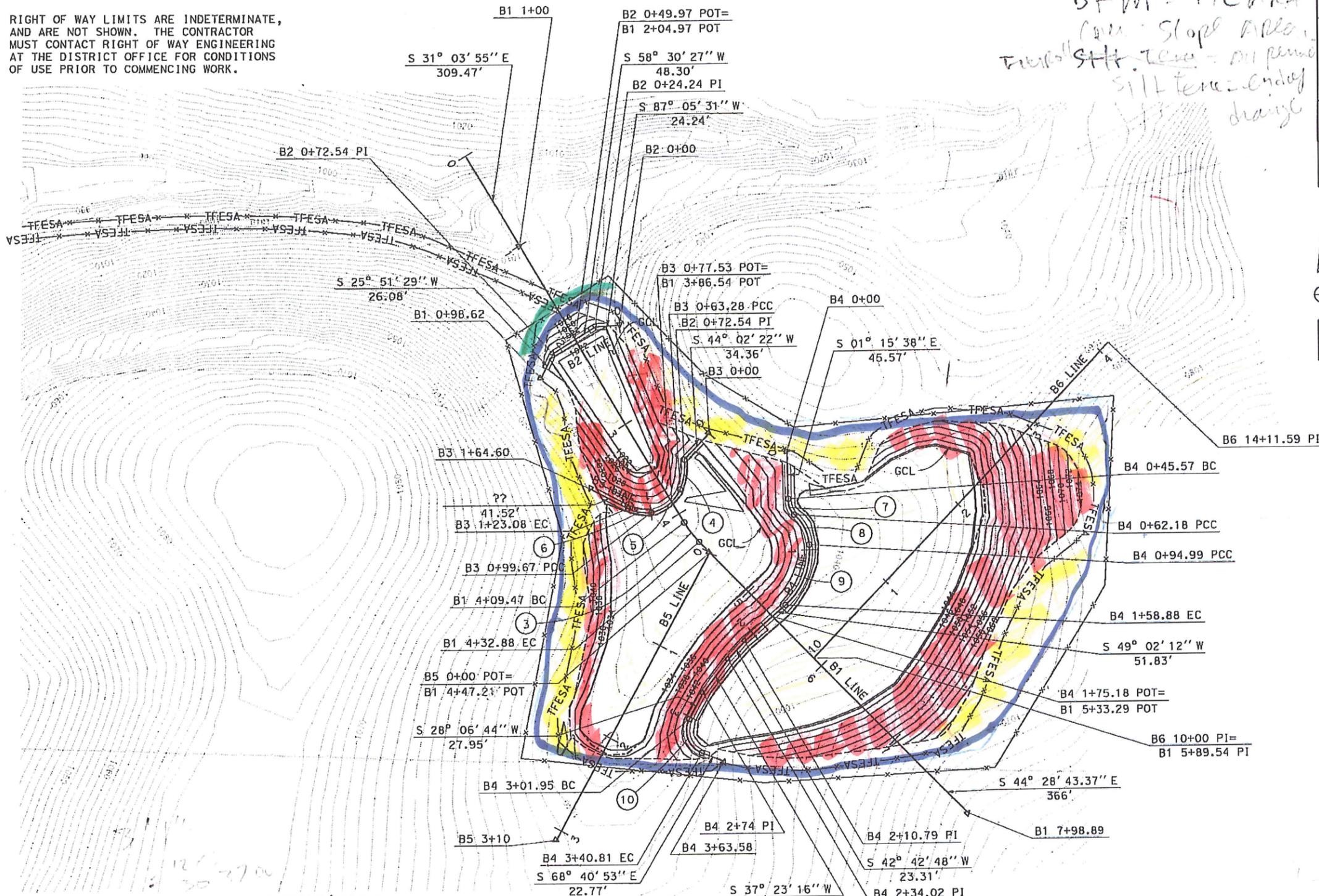
Fiber Rolls

Erosion Control (Compost Blanket)

Attachment BB: Water Pollution Control Drawings

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 CONSULTANT FUNCTIONAL SUPERVISOR: DAVID YAM
 CHECKED BY: HILLAL HAMDAN
 DESIGNED BY: HAN-BIN LIANG
 REVISIONS: HL 2/25/10
 DATE REVISED: 2/25/10

RIGHT OF WAY LIMITS ARE INDETERMINATE, AND ARE NOT SHOWN. THE CONTRACTOR MUST CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE FOR CONDITIONS OF USE PRIOR TO COMMENCING WORK.



*BFM = T/C ARA
 Com. Slope Allo.
 Trenches - on plan
 Sill term - end of
 drainage*

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Alameda	580	RB.3	3	16

REGISTERED CIVIL ENGINEER DATE: 2/19/10
DRAT
 HAN-BIN LIANG
 No. 48404
 Exp. 6/30/10
 CIVIL ENGINEER
 STATE OF CALIFORNIA

PLANS APPROVAL DATE: _____

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

WRECO
 1814 FRANKLIN STREET
 SUITE 608
 OAKLAND, CA 94612

CALTRANS
 111 GRAND AVENUE
 OAKLAND, CA 94612

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
3	100'	13° 24' 48.09"	11.76'	23.41'	2073887.34	6227916.64
4	58.13'	28° 30' 11.20"	14.77'	28.92'	2073951.04	6227852.96
5	35.37'	58° 57' 49.13"	19.99'	36.39'	2073942.32	6227873.99
6	38.35'	34° 58' 22.11"	12.08'	23.41'	2073945.34	6227874.02
7	18.84'	50° 31' 16.95"	8.89'	16.61'	2073916.99	6228029.35

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
8	40.17'	46° 47' 29.90"	17.38'	32.81'	2073872.68	6227990.44
9	67.57'	54° 10' 19.63"	34.56'	63.89'	2073869.02	6227963.23
10	23'	96° 47' 37.26"	25.90'	38.86'	2073699.62	6227935.42

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
 SCALE: 1" = 50'

L-2

Attachment CC: Water Pollution Control Schedule:

**October, 2010 Contract Awarded
Construction Begins**

**October 15, 2010- April 30, 2011: Seasonal Restrictions
Construction Site BMPs in place**

May 1, 2011 Construction Resumes

June 30, 2011 Construction Ends

Attachment EE: Risk Level Determination

	A	B	C
1	Sediment Risk Factor Worksheet		Entry
2	A) R Factor		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	R Factor Value		10.36
6	B) K Factor (weighted average, by area, for all site soils)		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	K Factor Value		0.19
10	C) LS Factor (weighted average, by area, for all slopes)		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	LS Factor Value		0.09
14			
15	Watershed Erosion Estimate (=RxKxLS) in tons/acre		0.177156
16	Site Sediment Risk Factor		Low
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Combined Risk Level Matrix

		<u>Sediment Risk</u>		
		Low	Medium	High
<u>Receiving Water Risk</u>	Low	Level 1	Level 2	
	High	Level 2		Level 3

Project Sediment Risk: **Low**

Project RW Risk: **Low**

Project Combined Risk: **Level 1**

Attachment FF: Soils Report

June 29, 2006

Terry Huff
USDA – Natural Resources Conservation Service
Livermore, California

Subject: Soils Report for Proposed Constructed Wetlands at Sweet Ranch

On June 28, 2006 I visited the Sweet Ranch to log soils at the proposed constructed wetlands. The site is about 2.0 miles east of the Lawrence Livermore Lab, southeast of the intersection of Patterson Pass Road and Cross Road, Livermore, Alameda County, California. See the Site Map for details. The soil data points are shown on the Site Map.

Summary of Findings.

The soil at each data point has sufficient clay content and low enough permeability from the surface to a depth of 24 to 48 inches to pond water when the soil is wet. These soil layers are in Group Design for Liner III or IV (See the Soil Log Report for references and details). These soils crack when dry and water may infiltrate the soil down these cracks during the first storms in the fall and early winter. However, the cracks swell shut once the soil is wetted. Cracks are usually closed by January.

The surface 18 to 24 inches of soil are suitable for use as embankments. The surfaces of all soils are in Behavior Group VI. Layers in group VII (fat clays) may be used for cores of embankments, but not for blankets.

Constructing a shallow meandering channel to distribute water across the fan may imitate the pre-existing natural condition. Data points 1 through 5 are on this fan. Fine stratification in the loamy sand at data point 3 suggests this layer was laid down by water. Since it is discontinuous across this landform, it may be an abandoned channel meander.

Details of Findings. I logged soils at 9 points to a depth of 24 to 56 inches. The data is shown in the attached table called Soil Log Report. This includes the Unified Soil Classification, Group for Design of Liner, and Behavior Group for “Working Classification of Soils for Use as Fill Materials for Rolled Earth Dams”. See the following website for details on pond liners: <ftp://ftp.wcc.nrcs.usda.gov/downloads/wastemgmt/AWMFH/awmfh-chap10-app10d.pdf>. See the following website for Tables 4-14 and 4-15 from the USDA-SCS Engineering Field Manual for details on fill materials for rolled earth dams: <http://www.info.usda.gov/CED/ftp/CED/EFH-Ch04.pdf>.

Resistance to Seepage. The soils are in Group III, and Group IV for design of a liner.

Group III has very low permeability, good structural features, and only low to moderate shrink-swell behavior. It may not need a liner if the layer is sufficiently thick, and it may be used as liner material.

Group IV soils have very low permeability, but have high shrink-swell potential. They may experience high seepage through cracks when dry.

Embankment. See “Working Classification of Soils for Use as Fill Materials for Rolled Earth Dams” in the Soil Log Report for suitability of this material.

The layers in Group I are resistant to shearing. Permeability is high and compressibility is very slight. Compaction is good with a crawler tractor or steel-wheeled roller.

The layers in Group II are slightly susceptible to shearing, piping and cracking. Permeability is low and compressibility is slight. Compaction is fair with a sheepsfoot roller or rubber-tired roller.

The layers in Group III are resistant to shearing and cracking, but susceptible to piping. Permeability is medium and compressibility is slight. Compaction is good with a rubber-tired or sheepsfoot roller.

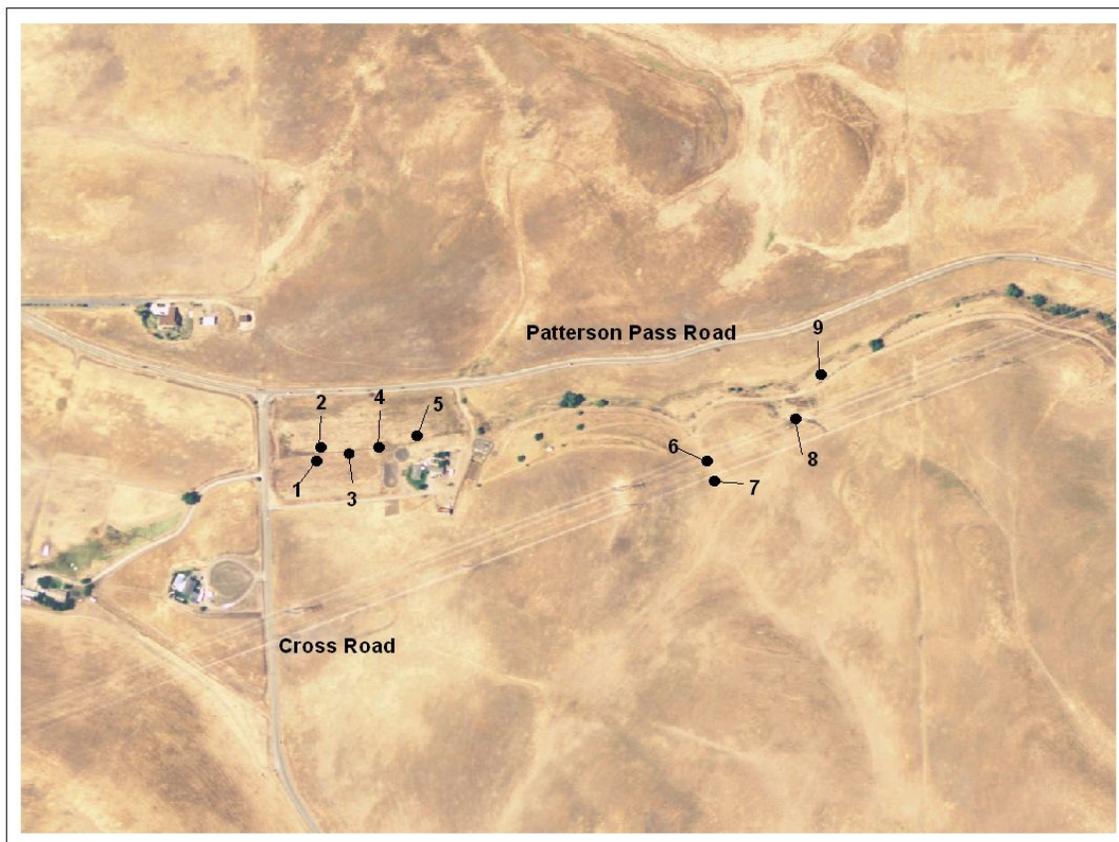
The layers in Group VI are resistant to shearing, and moderately resistant to piping, and cracking. Permeability is low and compressibility is medium to high. Compaction is good to fair with a sheepsfoot or rubber-tired roller.

The layers in Group VII are susceptible to shearing. Permeability is low and compressibility is high. Compaction is fair to poor with a sheepsfoot roller. This soil may crack upon drying and be susceptible to piping. This soil may be used for the core, but not for the blanket of levees or embankments.

Ken Oster
Area Resource Soil Scientist

Site Map
Sweet Ranch
Alameda County, California

USDA - Natural Resources Conservation Service
June 28, 2006



0 2000 Feet



Soil Data Points
● Waypoint

Soil Log Report (Unified Soil Classification System)

Date: 6-28-06		Logged by: Ken Oster													
Client: D. Sweet															
Site Name: Sweet Ranch															
Project: Constructed Wetlands															
Location: About 2.0 miles east of the Lawrence Livermore Lab, south east of the intersection of Patterson Pass Road and Cross Road, Livermore, Alameda															
Data Point	Top Depth	Bottom Depth	Thickness	Unified Symbol (Field Estimate)	Group Name	Color (moist)/carbonates	% Gravel > 1/4"	USDA Soil Texture	% Clay	% Passing No. 200 Sieve (Field Estimate)	Plasticity Index (Field Estimate)	Proctor Compaction (Estimated) (U.S. Bureau of Reclamation, Design of Small Dams, 1973, p. 137)		Group for Design of Liner (Agricultural Waste Management Field Handbook, USDA-NRCS 1997, Table 10D-1)	Behavior Group from Working Classification of Soils for Use as Fill Materials for Rolled Earth Dams (USDA-SCS, Engineering Field Manual, Table 4-14)
	(inches)	(inches)	(inches)									Maximum Dry Density (lbs/ft ³)	Optimum water content, %		
1	0.0	6.4	6.4	CL	Lean Clay	very dark grayish brown	0	clay loam	34	75	25	108+/-1	17.3+/-0.3	III	VI
	6.4	26.0	19.6	CL	Lean Clay	very dark grayish brown	0	clay loam	34	75	25	108+/-1	17.3+/-0.3	III	VI
	26.0	43.6	17.6	SC	Clayey Sand	very dark grayish brown	0	sandy clay loam	20	45	15	115+/-1	14.7+/-0.4	II	II
	43.6	52.0	8.4	CL	Lean Clay	very dark grayish brown with secondary carbonates	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
2	0.0	8.0	8.0	CL	Lean Clay		0	clay loam	30	75	22	108+/-1	17.3+/-0.3	III	VI
	8.0	18.0	10.0	CL	Lean Clay		0	clay loam	30	75	22	108+/-1	17.3+/-0.3	III	VI
	18.0	36.0	18.0	SC	Clayey Sand		0	sandy clay loam	25	45	19	115+/-1	14.7+/-0.4	III	II
	36.0	48.0	12.0	CL	Lean Clay	with secondary carbonates	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
3	0.0	10.0	10.0	CL	Lean Clay	very dark grayish brown	0	clay loam	33	75	24	108+/-1	17.3+/-0.3	III	VI
	10.0	24.0	14.0	CL	Lean Clay	very dark grayish brown	0	clay loam	33	75	24	108+/-1	17.3+/-0.3	III	VI
	24.0	30.0	6.0	SC	Clayey Sand	very dark grayish brown	0	sandy clay loam	25	45	19	115+/-1	14.7+/-0.4	III	II
	30.0	36.0	6.0	SP	Poorly Graded Sand	grayish brown	0	loamy sand	5	25	5	110+/-2	12.4+/-1.0	II	I
	36.0	56.0	20.0	CH	Fat Clay	black	0	clay	50	85	36	94+/-2	25.5+/-1.2	IV	VII
4	0.0	6.0	6.0	CL	Lean Clay	very dark grayish brown	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
	6.0	18.0	12.0	CH	Fat Clay	very dark gray	0	clay	45	85	33	94+/-2	25.5+/-1.2	IV	VII
	18.0	40.0	22.0	CH	Fat Clay	very dark gray	0	clay	45	85	33	94+/-2	25.5+/-1.2	IV	VII



Data Point	Top Depth	Bottom Depth	Thickness	Unified Symbol (Field Estimate)	Group Name	Color (moist)/carbonates	% Gravel > 1/4"	USDA Soil Texture	% Clay	% Passing No. 200 Sieve (Field Estimate)	Plasticity Index (Field Estimate)	Proctor Compaction (Estimated) (U.S. Bureau of Reclamation, <u>Design of Small Dams</u> , 1973, p. 137)		Group for Design of Liner (Agricultural Waste Management Field Handbook, USDA-NRCS 1997, Table 10D-1)	Behavior Group from Working Classification of Soils for Use as Fill Materials for Rolled Earth Dams (USDA-SCS, Engineering Field Manual, Table 4-14)
	(inches)							(Field Estimate)				Maximum Dry Density (lbs/ft ³)	Optimum water content, %		
5	0.0	6.4	6.4	CL	Lean Clay	very dark gray	0	clay loam	33	75	24	108+/-1	17.3+/-0.3	III	VI
	6.4	26.0	19.6	CL	Lean Clay	very dark grayish brown	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
	26.0		14.0	CL	Lean Clay	very dark gray with secondary carbonates	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
6	0.0	10.8	10.8	CL	Lean Clay	very dark grayish brown	0	clay loam	33	75	24	108+/-1	17.3+/-0.3	III	VI
	10.8	35.2	24.4	CL	Lean Clay	very dark grayish brown	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
7	0.0	40.0	40.0	CL	Lean Clay	very dark grayish brown	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
8	0.0	0.8	0.8	CL	Lean Clay		0	clay loam	30	75	22	108+/-1	17.3+/-0.3	III	VI
	0.8	24.0	23.2	CL	Lean Clay		0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
9	0.0	6.4	6.4	CL	Lean Clay	very dark gray	0	clay loam	33	75	24	108+/-1	17.3+/-0.3	III	VI
	6.4	23.2	16.8	CL	Lean Clay	very dark gray	0	clay loam	37	75	27	108+/-1	17.3+/-0.3	III	VI
	23.2	32.0	8.8	CL	Lean Clay	very dark grayish brown	0	clay loam	33	75	24	108+/-1	17.3+/-0.3	III	VI

**Attachment GG: Applicable Contract Plans, Standard
Special Provisions, Standard Plans, and Standard
Specifications**

Applicable Standard Plans:

T51

T53

RSP T56

T58

T65

RNSP H51

NSP H53

Applicable Standard Specifications:

Section 10

Section 18

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION, AND LIQUIDATED DAMAGES

Complete the work within 60 calendar days starting on the 5th day after contract approval or on the day you start work at the job site, whichever occurs first.

The first paragraph and second paragraph, item number 2, of Section 8-1.03 "Beginning of Work" will not apply. Submit a written notice 24 hours before beginning work.

A Conceptual Storm Water Pollution Prevention Plan (CSWPPP) has been prepared for this Contract as described in "Supplemental Project Information," of these special provisions. The Contractor shall adhere to the CSWPPP for all construction activities during the course of construction. Within the first 5 days after contract approval, the Contractor shall either sign the "Initial SWPPP Certification", included within the CSWPPP and submit it to the Engineer or submit an amended SWPPP to include pollution control measures for staging areas used for this project and for any other planned pollution control work. The subsequent Contractor's amended SWPPP shall supersede the initial SWPPP upon Engineer's approval.

5-1. SUPPLEMENTAL PROJECT INFORMATION

The Department makes the following supplemental project information available:

Supplemental Project Information

Means	Description
Included in the Information Handout	1. 1602 Lake and Streambed Alteration Agreement 2. Department of the Army 404 Permit 3. Biological Opinion 4. Waste Discharge Requirements and Water Quality Certification RWQCB 401 5. Environmental Compliance Information 6. Conceptual Storm Water Pollution Prevention Plan (CSWPPP)
Available at: http://www.dot.ca.gov/hq/esc/oe/weekly_ads/index.php	Cross sections

5-1. RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

This project lies within the boundaries of the San Francisco Bay Regional Water Quality Control Board (RWQCB).

The State Water Resources Control Board (SWRCB) has issued to the Department a permit that governs storm water and non-storm water discharges from the Department's properties, facilities, and activities. The Department's permit is entitled "Order No. 99 - 06 - DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)." Copies of the Department's permit are available for review from the SWRCB, Storm Water Permit Unit, 1001 "I" Street, P.O. Box 1977, Sacramento, California 95812-1977, Telephone: (916) 341-5254, and may also be obtained at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/

The Department's permit references and incorporates by reference the current statewide general permit issued by the SWRCB entitled "Order No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity" that regulates discharges of storm water and non-storm water from construction activities disturbing one acre or more of soil in a common plan of development. Sampling and analysis requirements as specified in SWRCB Resolution No. 2001-46 are added to the statewide general permit. Copies of the statewide permit and modifications thereto are available for review from the SWRCB, Storm Water Permit Unit, 1001 "I" Street, P.O. Box 1977, Sacramento, California 95812-1977, Telephone: (916) 341-5254 and may also be obtained at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/

The [San Francisco Bay](#) RWQCB has issued a permit which governs storm water and non-storm water discharges resulting from construction activities in the project area. The RWQCB permit is entitled "[Waste Discharge Requirements and Water Quality Certification for California Department of Transportation Pigeon Pass State Route 84 Realignment Project, Alameda County](#)", Order No. [R2-2006-0033](#)." Copies of the RWQCB permit are available for review from [the Informational Handout as listed in the "Supplemental Project Information" of these special provisions](#).

The NPDES permits that regulate this project, as referenced above, are collectively referred to in this section as the "permits."

This project shall conform to the permits and modifications thereto. The Contractor shall maintain copies of the permits at the project site and shall make them available during construction.

The Contractor shall know and comply with provisions of Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from the project site and areas of disturbance outside the project limits during construction. Attention is directed to Sections 7-1.01, "Laws to be Observed," 5-1.18, "Property and Facility Preservation," 7-1.12, "Indemnification and Insurance," and 9-1.07E(5), "Penalty Withholds," of the Standard Specifications.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the Department shall provide copies of correspondence, notices of violation, enforcement actions, or proposed fines by regulatory agencies to the requesting regulatory agency.

5-1. ENVIRONMENTALLY SENSITIVE AREA

An ESA exists on this project.

Before start of work, protect the ESA by installing [temporary fence \(Type ESA\)](#).

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

Prior to performing any work all Contractor and State field personnel shall complete a 1 hour minimum U.S. Fish and Wildlife Service Biological Opinion Permit training that communicates the details of the permit requirements and the project area wildlife species information.

The first order of work is to notify the Engineer and Caltrans supplied biologist 5 days prior to start of construction to implement the Biological Resources Information Program.

No ground disturbing activities shall occur within the project limits from October 16 to April 30, except for work required for compliance as specified in "Water Pollution Control" elsewhere in these special provisions. The Contractor will coordinate the work such that the Biological Monitor is present for any work outside the limits of the established roadbed between October 16 and April 30.

Attention is directed to "Water Pollution Control" of these special provisions regarding the submittal and approval of the Storm Water Pollution Prevention Plan prior to performing work having potential to cause water pollution.

Work within the riparian zone, including (but not limited to) culvert replacement and channel grading upstream of culvert, will be confined to the period between May 1 through October 15.

No more than five days following the approval of the contract, furnish the Engineer a statement from the vendor that the order for the Geosynthetic Clay Liner required for this contract has been received and accepted by the vendor. The statement from the vendor must include the quantity of Geosynthetic Clay Liner ordered and the anticipated date of delivery.

Attention is directed to "Environmentally Sensitive Area" and "Temporary Fence (Type ESA)" of these special provisions. Prior to beginning work, the boundaries of the Environmentally Sensitive Areas (ESA) shall be clearly delineated in the field. The boundaries shall be delineated by the installation of temporary fence (Type ESA).

At least 20 days before applying seeds, furnish the Engineer a statement from the vendor that the order for the seed required for this contract has been received and accepted by the vendor. The statement from the vendor must include the names and quantity of seed ordered and the anticipated date of delivery.

10-1. WATER POLLUTION CONTROL

GENERAL

Summary

Discharges of storm water from the project must comply with NPDES General Permit for "Storm Water Discharges Associated with Construction and Land Disturbance Activities" (Order No. 2009-009-DWQ, NPDES No. CAS000002). Manage work activities to reduce the discharge of pollutants to surface waters, groundwater, or municipal separate storm sewer systems including work items shown in the verified Bid Item List for:

1. Prepare Storm Water Pollution Prevention Plan. SWPPP preparation includes obtaining SWPPP acceptance, amending the SWPPP, preparing a CSMP and a SAP, and monitoring and inspecting WPC practices at the job site.

2. Storm Water Sampling and Analysis Day. Storm Water Sampling and Analysis Day includes reporting of storm water quality per qualifying rain event. If specified for the risk level, the work includes preparation, collection, analysis, and reporting of storm water samples for turbidity, pH, and other constituents.
3. Storm Water Annual Report. Storm Water Annual Report preparation includes certifications, monitoring and inspection results, and obtaining Storm Water Annual Report acceptance.
4. Rain Event Action Plan. If specified for the project risk level, REAP preparation includes preparing and submitting REAP forms and monitoring weather forecasts.

Do not start work until:

1. [CSWPPP is signed and certified or](#) SWPPP is accepted
2. WDID is issued
3. SWPPP has been reviewed by the RWQCB. If the RWQCB requires time for SWPPP review, allow enough time for the RWQCB to review the SWPPP as specified under "Submittals" of these special provisions.

This job is Risk Level [1](#).

Definitions and Abbreviations

active and inactive areas: (1) Active areas have soil disturbing work activities occurring at least once within 14 days, and (2) Inactive areas are areas that have not been disturbed for at least 15 days.

BMPs: Best Management Practices are water pollution control practices.

construction phase: Construction phases are (1) Highway Construction including work activities for building roads and structures, (2) Plant Establishment including maintenance on vegetation installed for final stabilization, and (3) Suspension where work activities are suspended and areas are inactive.

CSMP: Construction Site Monitoring Program.

NAL: Numeric Action Level

NEL: Numeric Effluent Limit

NPDES: National Pollutant Discharge Elimination System

NOI: Notice of Intent

normal working hours: The hours you normally work on this project

Preparation Manual: The Department's "Storm Water Pollution Prevention Plan and Water Pollution Control Program Preparation Manual."

QSD: Qualified SWPPP Developer

QSP: Qualified SWPPP Practitioner

REAP: Rain Event Action Plan.

RWQCB: Regional Water Quality Control Board.

SAP: Sampling and Analysis Plan

SSC: Suspended Sediment Concentration

SWRCB: State Water Resources Control Board

SWPPP: Storm Water Pollution Prevention Plan

WDID: Waste Discharge Identification Number

WPC: Water Pollution Control

WPC Manager: Water Pollution Control Manager. The WPC Manager implements water pollution control work described in the SWPPP and oversees revisions and amendments to the SWPPP.

Submittals

Within 5 days after contract approval, the Contractor shall sign and certify the CSWPPP or submit a separate SWPPP for Engineer approval. If the Contractor elects to submit a separate SWPPP, then within 5 days after contract approval, follow this process for SWPPP approval:

1. Submit 3 copies of the SWPPP and allow 10 days for the Engineer's review. If revisions are required, the Engineer provides comments and specifies the date that the review stopped
2. Change and resubmit the SWPPP within 5 days of receipt of the Engineer's comments. The Engineer's review resumes when the complete SWPPP is resubmitted.
3. When the Engineer approves the SWPPP, submit 4 copies of the approved SWPPP. After approval, the Engineer submits one copy of the approved SWPPP to the San Francisco Bay RWQCB for their review and comment.
4. If the San Francisco Bay RWQCB provides comments to the SWPPP, the contractor shall incorporate these comments within 5 days of the receipt. The contractor shall submit four (4) copies of the final SWPPP upon notification of final approval.

The Contractor is responsible for any delays in submittal and approval of a separate SWPPP.

Submit:

1. Storm water training records including training dates and subjects for employees and subcontractors. Include dates and subjects for ongoing training, including tailgate meetings.
2. Employee training records:
 - 2.1. Within 5 days of SWPPP acceptance for existing employees
 - 2.2. Within 5 days of training for new employees
 - 2.3. At least 5 days before subcontractors start work for subcontractor's employees

Prepare a Storm Water Annual Report for the reporting period from July 1st to June 30th:

1. If construction occurs from July 1st through June 30th, submit the report no later than July 15th for the prior reporting period

2. If construction ends before June 30th, submit the report within 15 days after contract acceptance

Submit the Storm Water Annual Report as follows:

1. Submit 2 copies of the Storm Water Annual Report and allow 10 days for the Engineer's review. If revisions are required, the Engineer provides comments and specifies the date that the review stopped.
2. Change and resubmit the Storm Water Annual Report within 5 days of receipt of the Engineer's comments. The Engineer's review resumes when the complete Storm Water Annual Report is resubmitted.
3. When the Engineer accepts the Storm Water Annual Report, insert the WPC Manager's signed certification and the Engineer's signed certification.

Submit one electronic copy and 2 printed copies of the accepted Storm Water Annual Report.

Submit as required:

1. NAL Exceedance Reports
2. NEL Exceedance Reports
3. Visual Monitoring Reports
4. Inspection Reports
5. BMP Status Report

At least 5 days before operating any construction support facility:

1. Submit a plan showing the location and quantity of WPC practices associated with the construction support facility
2. If you will be operating a batch plant or a crushing plant under the General Industrial Permit, submit a copy of the NOI approved by the RWQCB and the SWPPP approved by the RWQCB

Quality Control and Assurance

Training

Provide storm water training for:

1. Project managers
2. Supervisory personnel
3. Employees involved with WPC work

Train all employees, including subcontractor's employees, in the following subjects:

1. WPC rules and regulations
2. Implementation and maintenance for:

- 2.1. Temporary Soil Stabilization

- 2.2. Temporary Sediment Control
- 2.3. Tracking Control
- 2.4. Wind Erosion Control
- 2.5. Material pollution prevention and control
- 2.6. Waste management
- 2.7. Non-storm water management
- 2.8. Identifying and handling hazardous substances
- 2.9. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances

Employees must receive initial WPC training before working on the job.

Conduct weekly training meetings covering:

1. WPC BMP deficiencies and corrective actions
2. BMPs that are required for work activities during the week
3. Spill prevention and control
4. Material delivery, storage, use, and disposal
5. Waste management
6. Non-storm water management procedures

Training for personnel to collect water quality samples must include:

1. SAP review
2. Health and safety review
3. Sampling simulations

A [Conceptual Storm Water Pollution Prevention Plan \(CSWPPP\)](#) has been prepared for this contract and is available as described in "Supplemental Project Information" of these special provisions.

If you operate construction support facilities, protect storm water systems or receiving waters from the discharge of potential pollutants by using WPC practices.

Construction support facilities include:

1. Staging areas
2. Storage yards for equipment and materials
3. Mobile operations
4. Batch plants for PCC and HMA
5. Crushing plants for rock and aggregate
6. Other facilities installed for your convenience such as haul roads

If you operate a batch plant to manufacture PCC, HMA, or other material; or a crushing plant to produce rock or aggregate; obtain coverage under the General Industrial General Permit. You must be covered under the General Industrial Permit for batch plants and crushing plants located:

1. Outside of the job site

2. Within the job site that serve one or more contracts

Discharges from manufacturing facilities such as batch plants must comply with the general waste discharge requirements for Order No. 97-03-DWQ, NPDES General Permit No. CAS000001, issued by the SWRCB for "Discharge of Stormwater Associated with Industrial Activities Excluding Construction Activities." The General Industrial Permit is available at:

<http://www.waterboards.ca.gov/>

You may obtain copies of the Preparation Manual from the Publication Distribution Unit. The mailing address for the Publication Distribution Unit is:

State of California
Department of Transportation
Publication Distribution Unit
1900 Royal Oaks Drive
Sacramento, California 95815
Telephone: (916) 445-3520

For the Preparation Manual and other WPC references, go to the Department's "Construction Storm Water and Water Pollution Control" Web site at:

<http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm>

Water Pollution Control Manager

Assign one WPC Manager to implement the SWPPP. The WPC Manager must comply with the Permit (Order No. 2009-009-DWQ, NPDES No. CAS000002) qualifications for a QSP and a QSD. You may assign a different QSD to prepare the SWPPP.

The QSD must have the following qualifications:

1. Department approved storm water management training described in the Department's "Construction Storm Water and Water Pollution Control" web site
2. Registration or certification described in the Permit (Order No. 2009-009-DWQ, NPDES No. CAS000002)

The QSP must meet the qualifications of the QSD or have the following certifications:

1. Department approved storm water management training described in the Department's "Construction Storm Water and Water Pollution Control" web site
2. Certification described in the Permit

At the job site, the WPC Manager must:

1. Be responsible for WPC work
2. Be the primary contact for WPC work
3. Oversee the maintenance of WPC practices
4. Oversee and enforce hazardous waste management practices
5. Have the authority to mobilize crews to make immediate repairs to WPC practices
6. Ensure that all employees have current water pollution control training
7. Implement the accepted SWPPP and amend the SWPPP when required

WPC Manager must oversee:

1. Inspections of WPC practices identified in the SWPPP
2. Inspections and reports for visual monitoring
3. Preparation and implementation of REAPs
4. Sampling and analysis
5. NAL exceedance reports
6. NEL exceedance reports
7. SWPPP annual certification
8. Annual reports
9. BMP status reports

STORM WATER POLLUTION PREVENTION PLAN

This work includes preparing a SWPPP including a CSMP, obtaining SWPPP acceptance, amending the SWPPP, inspecting and reporting on WPC practices at the job site. If specified by the risk level, the work includes preparing REAPs. The SWPPP must comply with the Preparation Manual and the Permit. The SWPPP must be submitted in place of the water pollution control program under Section 7-1.01G, "Water Pollution," of the Standard Specifications.

You may request, or the Engineer may order, changes to the WPC work. Changes may include the addition of new WPC practices. Additional WPC work will be paid for as extra work under Section 4-1.03D, "Extra Work," of the Standard Specifications.

The SWPPP must include sections as specified for the project risk level as follows:

1. For risk level 1:
 - 1.1. Schedule
 - 1.2. CSMP
2. For risk level 2:
 - 2.1. Schedule
 - 2.2. CSMP
 - 2.3. Adherence to Effluent Standards for NALs
 - 2.4. REAP
3. For risk level 3:

- 3.1. Schedule
- 3.2. CSMP
- 3.3. Adherence to Effluent Standards for NALs and NELs
- 3.4. REAP

The SWPPP must include WPC practices:

1. For storm water and non-stormwater from areas outside of the job site related to project work activities such as:
 - 1.1. Staging areas
 - 1.2. Storage yards
 - 1.3. Access roads
2. For activities or mobile operations related to contractor obtained NPDES permits
3. Construction support facilities

The SWPPP must include a copy of permits obtained by the Department such as Fish & Game permits, US Army Corps of Engineers permits, RWQCB 401 Certifications, and RWQCB Waste Discharge Requirements for Aerially Deposited Lead Reuse.

Amend the SWPPP annually and resubmit it by July 15th.

Amend the SWPPP if:

1. Changes in work activities could affect the discharge of pollutants
2. WPC practices are added by change order work
3. WPC practices are added at your discretion
4. Changes in the amount of disturbed soil are substantial
5. Objectives for reducing or eliminating pollutants in storm water discharges have not been achieved
6. There is a Permit violation

Whenever you amend the SWPPP, follow the same process specified for SWPPP acceptance.

Retain a printed copy of the accepted SWPPP at the job site.

SWPPP Schedule

The SWPPP schedule must:

1. Describe when work activities will be performed that could cause the discharge of pollutants into storm water
2. Describe WPC practices associated with each construction phase
3. Identify soil stabilization and sediment control practices for disturbed soil areas

Construction Site Monitoring Program (CSMP)

The QSD must prepare a CSMP as part of the SWPPP. The CSMP must be developed before starting work and be revised to reflect current construction activities as necessary.

The CSMP must include sections for the project risk level as follows:

1. For risk level 1:

- 1.1. Visual Monitoring
- 1.2. SAP for Non-Visible Pollutants

2. For risk level 2:

- 2.1. Visual Monitoring
- 2.2. SAP for Non-Visible Pollutants
- 2.3. SAP for sediment and turbidity
- 2.4. SAP for pH

3. For risk level 3:

- 3.1. Visual Monitoring
- 3.2. SAP for Non-Visible Pollutants
- 3.3. SAP for sediment and turbidity
- 3.4. SAP for pH
- 3.5. Receiving Water Sampling
- 3.6. SAP for temporary active treatment systems

Visual Monitoring

The WPC Manager must oversee the performance of visual inspections for qualifying rain events. A qualified rain event is a storm that produces at least 0.5 inches of precipitation with a 48 hour or greater period between storms.

For each qualifying rain event, perform visual inspections and record observations during normal working hours as follows:

- 1. Record the time, date, and rain gauge reading
- 2. Observe:

2.1. Within 2 days before the storm:

- 2.1.1. Drainage areas for spills, leaks, or uncontrolled pollutants
- 2.1.2. Proper implementation of WPC practices
- 2.1.3. Storm water storage areas for leaks and adequate freeboard

2.2. Every 24 hours during the storm:

- 2.2.1. WPC practices for effective operation

2.2.2. WPC practices needing maintenance and repair

2.3. Within 2 days after the storm event:

2.3.1. Discharge locations

2.3.2. WPC practices to evaluate the design, implementation, and effectiveness

2.3.3. To identify where additional WPC practices may be needed

Perform non-stormwater discharge visual inspections as follows:

1. At least once during each of the following periods:

1.1. January through March

1.2. April through June

1.3. July through September

1.4. October through December

2. Observe flowing and contained storm water for the presence of floating and suspended materials, sheen on the surface, discoloration, turbidity, odors, and sources of observed pollutants

3. Observe the job site for the presence of authorized and unauthorized non-stormwater discharges and their sources

The WPC Manager must prepare visual inspection reports that include the following:

1. Name of personnel performing the inspection, inspection date, and date inspection report completed

2. Storm and weather conditions

3. Locations and observations

4. Corrective actions taken

Maintain visual inspections reports at the job site as part of the SWPPP.

Sampling and Analysis

General

Include a SAP in the CSMP to monitor the effectiveness of WPC practices.

The SAP must comply with the Preparation Manual.

Assign trained personnel to collect water quality samples. Document their training in the SAP.

Describe the following water quality sampling procedures in the SAP:

1. Sampling equipment

2. Sample preparation

3. Collection

4. Field measurement methods

5. Analytical methods
6. Quality assurance and quality control
7. Sample preservation and labeling
8. Collection documentation
9. Sample shipping
10. Chain of custody
11. Data management and reporting
12. Precautions from the construction site health and safety plan
13. Laboratory selection and certifications

Whenever assigned field personnel take samples, comply with the equipment manufacturer's recommendation for collection, analysis methods, and equipment calibration.

Samples taken for laboratory analysis must follow water quality sampling procedures and be analyzed by a State-certified laboratory under 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants."

The SAP must identify the State-certified laboratory, sample containers, preservation requirements, holding times, and analysis method. For a list of State-certified laboratories go to:

<http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx>

Obtain, install, and maintain a rain gauge at the job site. Observe and record daily precipitation.

Document sample collection during precipitation.

You are not required to physically collect samples under the following conditions:

1. During dangerous weather conditions such as flooding or electrical storms
2. Outside of normal working hours

Retain water quality sampling documentation and analytical results with the SWPPP at the job site.

Show pollutant sampling locations on SWPPP drawings.

If discharges or sampling locations change because of changed work activities or knowledge of site conditions, amend the SAP.

If the job is risk level 2 or risk level 3, collect and analyze at least 3 samples for each day of each qualifying rain event. Collect effluent samples at all locations where the storm water is discharged off-site.

Analytical Results and Evaluation

Submit an electronic copy (in file format .xls, .txt, .csv, .dbs, or .mdb) and a printed copy of water quality analytical results, and quality assurance and quality control within 48 hours of field analysis sampling, and within 30 days for laboratory analysis. Also provide an evaluation of whether the downstream samples show levels of the tested parameter that are higher than the control sample.

Electronic water quality analysis results must have the following information:

1. Sample identification number
2. Contract number
3. Constituent
4. Reported value
5. Analytical method
6. Method detection limit
7. Reported limit

If downstream samples show increased levels, assess WPC practices, site conditions, and surrounding influences to determine the probable cause for the increase.

SAP for Non-Visible Pollutants

The SAP must include a description of the sampling and analysis strategy for monitoring non-visible pollutants.

The SAP must identify potential non-visible pollutants present at the job site associated with any of the following:

1. Construction materials and waste
2. Existing contamination due to historical site usage
3. Application of soil amendments, including soil stabilization materials, with the potential to change pH or contribute toxic pollutants to storm water

SWPPP drawings must show the locations planned for storage and use of potential non-visible pollutants.

The SAP must include sampling procedures for the following conditions when observed during a storm water visual inspection. For each of the following, collect at least one sample for each qualifying storm event:

1. Materials or waste containing potential non-visible pollutants that are not stored under watertight conditions
2. Materials or waste containing potential non-visible pollutants that are stored under watertight conditions, but a breach, leakage, malfunction, or spill is observed; the leak or spill has not been cleaned up before precipitation; and material or waste could discharge non-visible pollutants to surface waters or drainage system
3. Chemical applications, including fertilizer, pesticide, herbicide, methyl methacrylate concrete sealant, or non-pigmented curing compound used during precipitation or within 24 hours preceding precipitation, and could discharge pollutants to surface waters or drainage system
4. Applied soil amendments, including soil stabilization materials that could change pH levels or contribute toxic pollutants to storm water runoff and discharge pollutants to surface waters or drainage system, unless available independent test data indicates acceptable concentrations of non-visible pollutants in the soil amendment
5. Storm water runoff from an area contaminated by historical usage of the site that could discharge pollutants to surface waters or drainage systems

The SAP must provide sampling procedures and schedule for:

1. Sample collection during the first 2 hours of each rain event that generate runoff
2. Sample collection during normal working hours
3. Each non-visible pollutant source
4. Uncontaminated control sample

The SAP must identify locations for sampling downstream and control samples, and reasons for selecting those locations. Select control sample locations where the sample will not come in contact with materials, waste, or areas associated with potential non-visible pollutants or disturbed soil areas.

SAP for Sediment and Turbidity

If the job is risk level 2 or risk level 3, sample and analyze for turbidity:

Parameter	Test Method	Detection Limit (Min)	Unit
Turbidity	Field test with calibrated portable instrument	1	NTU

If the job is risk level 3 and the turbidity NEL has been exceeded, sample and analyze for SSC:

Parameter	Test Method	Detection Limit (Min)	Unit
SSC	ASTM Method D3977-97	5	Mg/L

SAP for pH

If the job is risk level 2 or risk level 3, sample and analyze for pH:

Parameter	Test Method	Detection Limit (Min)	Unit
pH	Field test with calibrated portable instrument	0.2	pH units

Receiving Water Sampling

If the job is risk level 3, obtain samples from representative and accessible locations:

1. Upstream of the discharge point
2. Downstream of the discharge point

Show receiving water sampling locations on SWPPP drawings.

If there are several discharge points, obtain samples from a single upstream and a single downstream location.

Rain Event Action Plan (REAP)

The WPC Manager must submit a REAP to protect the job site at least 48 hours before a predicted rain event.

Prepare a REAP when National Weather Service is predicting at least a 50 percent probability of precipitation within 72 hours.

For the REAP, use approved forms and include:

1. Site location
2. Risk level
3. Contact information including 24-hour emergency phone numbers for:
 - 3.1. WPC Manager
 - 3.2. Erosion and sediment control providers or subcontractors
 - 3.3. Storm water sampling providers or subcontractors
4. Storm Information
5. Construction phase information for:
 - 5.1. Highway Construction including active and inactive areas for work activities for building roads and structures
 - 5.2. Plant Establishment including maintenance on vegetation installed for final stabilization where areas are inactive
 - 5.3. Suspension where work activities are suspended and areas are inactive
6. Construction phase information including:
 - 6.1. Construction activities
 - 6.2. Subcontractors and trades on the job site
 - 6.3. Pre-storm activities including:
 - 6.3.1. Responsibilities of the WPC Manager
 - 6.3.2. Responsibilities of the crew and crew size
 - 6.3.3. Stabilization for active and inactive disturbed soil areas
 - 6.3.4. Stockpile management
 - 6.3.5. Corrective actions taken for deficiencies identified during pre-storm visual inspection
 - 6.4. Activities to be performed during storm events including:
 - 6.4.1. Responsibilities of the WPC Manager
 - 6.4.2. Responsibilities of the crew and crew size
 - 6.4.3. BMP maintenance and repair
 - 6.5. Description of flood contingency measures

You must have the REAP onsite at least 24 hours before a predicted rain event. A printed copy of each REAP must be at the job site as part of the SWPPP.

Implement the REAP including mobilizing crews to complete activities no later than 24 hours before precipitation occurs.

IMPLEMENTATION REQUIREMENTS

Monitor the National Weather Service Forecast Office on a daily basis. For forecasts, go to:

<http://www.srh.noaa.gov/forecast>

Whenever you or the Engineer identifies a deficiency in the implementation of the accepted SWPPP:

1. Correct the deficiency immediately, unless the Engineer authorizes an agreed date for correction
2. Correct the deficiency before precipitation occurs

If you fail to correct the deficiency by the agreed date or before the onset of precipitation, the Department may correct the deficiency and deduct the cost of correcting the deficiency from payment.

Continue SWPPP implementation during any temporary suspension of work activities.

Install WPC practices within 15 days or before predicted precipitation, whichever occurs first.

Numeric Action Levels (NALs)

If the job is risk level 2 or risk level 3, then it is subject to NALs:

Parameter	Test Method	Detection Limit (Min)	Unit	Numeric Action Level
pH	Field test with calibrated portable instrument	0.2	pH units	Lower NAL = 6.5 Upper NAL = 8.5
Turbidity	Field test with calibrated portable instrument	1	NTU	250 NTU

Numeric Effluent Limits (NELs)

If the job is risk level 3, then it is subject to NELs:

Parameter	Test Method	Detection Limit (Min)	Unit	Numeric Effluent Limit
pH	Field test with calibrated portable instrument	0.2	pH units	Lower NEL = 6.0 Upper NEL = 9.0
Turbidity	Field test with calibrated portable instrument	1	NTU	500 NTU

The storm event daily average for storms up to the 5-year, 24-hour storm, must not exceed the NEL for turbidity.

The daily average sampling results must not exceed the NEL for pH.

Inspection

The WPC Manager must oversee inspections for WPC practices identified in the SWPPP:

1. Before a forecasted storm
2. After precipitation that causes site runoff
3. At 24-hour intervals during extended precipitation
4. On a predetermined schedule, a minimum of once a week

The WPC Manager must oversee daily inspections of:

1. Storage areas for hazardous materials and waste
2. Hazardous waste disposal and transporting activities
3. Hazardous material delivery and storage activities
4. WPC practices specified under "Construction Site Management" of these special provisions

The WPC Manager must use the Storm Water Site Inspection Report provided in the Preparation Manual.

The WPC Manager must prepare BMP status reports that include the following:

1. Location and quantity of installed WPC practices
2. Location and quantity of disturbed soil for the active or inactive areas

Within 24 hours of finishing the weekly inspection, the WPC Manager must submit:

1. Copy of the completed site inspection report
2. Copy of the BMP status report

REPORTING REQUIREMENTS

Storm Water Annual Report

The WPC Manager must prepare a Storm Water Annual Report. The report must:

1. Use an approved report format
2. Include project information including description and location
3. Include storm water monitoring information including:
 - 3.1. Summary and evaluation of sampling and analysis results including laboratory reports
 - 3.2. Analytical methods, reporting units, detections limits for analytical parameters
 - 3.3. Summary of corrective actions

- 3.4. Identification of corrective actions or compliance activities that were not implemented
 - 3.5. Summary of violations
 - 3.6. Names of individuals performing storm water inspections and sampling
 - 3.7. Logistical information for inspections and sampling including location, date, time, and precipitation
 - 3.8. Visual observations and sample collection records
4. Include documentation on training for:
 - 4.1. Individuals responsible for NPDES permit compliance
 - 4.2. Individuals responsible for BMP installation, inspection, maintenance, and repair
 - 4.3. Individuals responsible for preparing, revising, and amending the SWPPP

NAL Exceedance Report

If the job is risk level 2 or risk level 3 and an effluent sample exceeds a NAL, notify the Engineer and submit a NAL Exceedance Report no later than 48 hours after the conclusion of the storm event. The report must:

1. Include the following field sampling results and inspections:
 - 1.1. Analytical methods, reporting units, and detection limits
 - 1.2. Date, location, time of sampling, visual observation and measurements
 - 1.3. Quantity of precipitation of the storm event
2. Description of BMPs and corrective actions taken to manage NAL exceedance

NEL Violation Report

If the job is risk level 3 and an NEL is exceeded, notify the Engineer and submit a NEL Violation Report within 6 hours. The report must:

1. Include the following field sampling results and inspections:
 - 1.1. Analytical methods, reporting units, and detection limits
 - 1.2. Date, location, time of sampling, visual observations and measurements
 - 1.3. Quantity of precipitation of the storm event
2. Description of BMPs and corrective actions taken to manage NEL exceedance

If the job is risk level 2 or risk level 3, submit all sampling results to the Engineer no later than 48 hours after the conclusion of a storm event.

PAYMENT

The contract lump sum price paid for prepare storm water pollution prevention plan includes full compensation for furnishing all labor, materials, tools, equipment, and

incidentals and for doing all the work involved in preparing, obtaining acceptance of, and amending the SWPPP and CSMP, inspecting water pollution control practices, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

For projects with 60 working days or less, payments for SWPPP are made as follows:

1. After the Engineer accepts the SWPPP, the Department includes up to 75 percent of the bid item price in the monthly progress estimate
2. After contract acceptance, the Department pays for the remaining percentage of the bid item price

For projects with more than 60 working days, payments for SWPPP are made as follows:

1. After the Engineer accepts the SWPPP, the Department includes up to 50 percent of the bid item price in the monthly progress estimate
2. The Department pays 40 percent of the bid item price over the life of the contract
3. After contract acceptance, the Department pays for the remaining 10 percent of the bid item

The Department pays \$500 for each Rain Event Action Plan submitted. The contract unit price paid for Rain Event Action Plan includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparation and submittal of REAP forms, and monitoring weather forecasts as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The Department does not adjust payment for an increase or decrease in the quantity of rain event action plans submitted. Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications does not apply.

The Department pays \$2,000 for each Storm Water Annual Report submitted. The contract unit price paid for Storm Water Annual Report includes full compensation for doing all the work involved in submitting the completed Storm Water Annual Report.

The Department does not adjust payment for an increase or decrease in the quantity of storm water annual reports submitted. Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications does not apply.

The work to complete the final Storm Water Annual Report contract item is excluded from Section 7-1.17, "Acceptance of Contract," of the Standard Specifications.

The contract unit price paid for storm water sampling and analysis day includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparation, collection, analysis, and reporting of storm water samples per qualifying rain event as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The Department does not adjust payment for an increase or decrease in the quantity of storm water sampling and analysis. Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications does not apply.

You may request or the Engineer may order laboratory analysis of storm water samples. Laboratory analysis of storm water samples will be paid for as extra work under Section 4-1.03D, "Extra Work," of the Standard Specifications.

The Department does not pay for the preparation, collection, laboratory analysis, and reporting of storm water samples for non-visible pollutants if WPC practices are not implemented before precipitation or if a failure of a WPC practice is not corrected before precipitation.

The Department does not pay for implementation of WPC practices in areas outside the highway right-of-way not specifically provided for in the drawings or in the special provisions.

The Department does not pay for WPC practices installed at your construction support facilities.

WPC practices for which there are separate bid items of work are measured and paid for as those bid items of work.

For each failure to submit a completed Storm Water Annual Report, the Department withholds \$10,000. This withhold is in addition to other withholds under Section 9-1.07E(3) "Performance Failure Withholds," of the Standard Specifications.

Each failure to comply with any part of these special provisions and each failure to implement water pollution control practices are considered separate performance failures.

10-1. CONSTRUCTION SITE MANAGEMENT

GENERAL

Summary

This work includes controlling potential sources of water pollution before they come in contact with storm water systems or watercourses.

Control material pollution and manage waste and non-storm water at the job site by implementing effective handling, storage, use, and disposal practices.

For information on documents under these special provisions, refer to the Department's Preparation Manual, Dewatering Guide, and BMP Manual.

Preparation Manual, Dewatering Guide, and BMP Manual are available from the Department's Construction Storm Water and Water Pollution Control web site at:

<http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm>

Definitions

BMP Manual: The Department's Construction Site Best Management Practices (BMP) Manual.

Dewatering Guide: The Department's Field Guide to Construction Site Dewatering.

Minor spills: Small quantities of oil, gasoline, paint, or other material that are small enough to be controlled by a first responder upon discovery of the spill.

Preparation Manual: The Department's Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual.

Semi-significant spills: Spills that can be controlled by a first responder with help from other personnel.

Significant or hazardous spills: Spills that cannot be controlled by construction personnel.

Submittals

Submit the following:

1. Material Safety Data Sheet (MSDS) at least 5 days before material is used or stored
2. Monthly inventory records for material used or stored
3. Stormwater training:
 - 3.1. Include training dates and subject for employees and subcontractors with SWPPP or WPCP. Include dates and subject for ongoing training, including tailgate meetings.
 - 3.2. Employee training records:
 - 3.2.1. Within 5 days of SWPPP or WPCP approval for existing employees
 - 3.2.2. Within 5 days of training for new employees
 - 3.2.3. At least 5 days before subcontractors begin work for subcontractor's employees
4. Manifest forms for hazardous waste disposal within 5 days of transport and disposal
5. Copy of written approval to discharge into a sanitary sewer system at least 5 days before beginning discharge activities

Quality Control and Assurance

Train all employees and subcontractors in these subjects:

1. Material pollution prevention and control
2. Waste management
3. Non-storm water management
4. Identifying and handling hazardous substances
5. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances

Training must take place before starting work on this job. New employees must receive the complete training before starting work on this job. Conduct weekly meetings to discuss and reinforce spill prevention and control; material delivery, storage, use, and disposal; waste management; and non-storm water management procedures.

MATERIALS

Not used.

CONSTRUCTION

Spill Prevention and Control

Implement spill and leak prevention procedures for chemicals and hazardous substances stored on the job site.

As soon as it is safe, contain and clean up spills of petroleum products, sanitary and septic waste substances listed under CFR Title 40, Parts 110, 117, and 302.

Minor Spills: Clean up minor spills using these procedures:

1. Contain spread of the spill
2. Recover spilled material using absorption
3. Clean contaminated area
4. Dispose of contaminated material promptly and properly

Semi-significant Spills: Clean up semi-significant spills immediately using these procedures:

1. Contain spread of the spill
2. Recover spilled material using absorption where the spill occurs on paved or an impermeable surface
3. Contain the spill with an earthen dike and dig up contaminated soil for disposal where the spill occurs on soil
4. When the spill occurs during precipitation, cover the spill with plastic or other material to prevent contaminated runoff
5. Dispose of contaminated material promptly and properly

Significant or Hazardous Spills: Immediately notify qualified personnel of significant or hazardous spills. Take these steps:

1. Construction personnel must not attempt to cleanup the spill until qualified staff have arrived
2. Notify the Engineer and follow up with a written report
3. Obtain the services of a spills contractor or hazardous material team immediately
4. Notify the local emergency response team by dialing 911 and county officials at the emergency phone numbers kept on the job site
5. Notify the Governor's Office of Emergency Services Warning Center at (805) 852-7550
6. Notify the National Response Center at (800) 424-8802 regarding spills of Federal reportable quantities under CFR Title 40, Parts 110, 119, and 302
7. Notify other agencies as appropriate, including:
 - 7.1. Fire Department
 - 7.2. Public Works Department
 - 7.3. Coast Guard
 - 7.4. Highway Patrol
 - 7.5. City Police or County Sheriff Department
 - 7.6. Department of Toxic Substances

- 7.7. California Division of Oil and Gas
- 7.8. Cal OSHA
- 7.9. Regional Water Resources Control Board

Report minor, semi-significant, and significant spills to the WPC (Water Pollution Control) manager. WPC manager must notify the Engineer immediately. WPC manger must oversee and enforce proper spill prevention and control measures.

Prevent spills from entering storm water runoff before and during cleanup. Spills must not be buried or washed with water.

Keep material or waste storage areas clean, well organized, and equipped with enough cleanup supplies for the material being stored.

Material Management

General

Material must be delivered, used, and stored for this job in a way that minimizes or eliminates discharge of material into the air, storm drain systems, or watercourses.

Implement the practices described in this section while taking delivery of, using, or storing these materials:

1. Hazardous chemicals including:
 - 1.1. Acids
 - 1.2. Lime
 - 1.3. Glues
 - 1.4. Adhesives
 - 1.5. Paints
 - 1.6. Solvents
 - 1.7. Curing compounds
2. Soil stabilizers and binders
3. Fertilizers
4. Detergents
5. Plaster
6. Petroleum products including:
 - 6.1. Fuel
 - 6.2. Oil
 - 6.3. Grease
7. Asphalt components and concrete components
8. Pesticides and herbicides

Employees trained in emergency spill cleanup procedures must be present during unloading of hazardous materials or chemicals.

If practical, use less hazardous products.

Material Storage

Use these storage procedures:

1. Store liquids, petroleum products, and substances listed in CFR Title 40, Parts 110, 117, and 302 in containers or drums approved by the United States Environmental Protection Agency, and place them in secondary containment facilities.
2. Secondary containment facilities must be impervious to the materials stored there for a minimum contact time of 72 hours.
3. Throughout the rainy season, cover secondary containment facilities during non-working days and when precipitation is predicted. Secondary containment facilities must be adequately ventilated.
4. Keep secondary containment facility free of accumulated rainwater or spills. After precipitation, or in the event of spills or leaks, collect accumulated liquid and place into drums within 24 hours. Handle these liquids as hazardous waste under "Hazardous Waste" unless testing determines them to be nonhazardous.
5. Do not store incompatible materials, such as chlorine and ammonia, in the same secondary containment facility.
6. Store materials in the original containers with the original product labels maintained in legible condition. Replace damaged or illegible labels immediately.
7. Secondary containment facility must have the capacity to contain precipitation from a 24-hour-long, 25-year storm; and 10 percent of the aggregate volume of all containers, or entire volume of the largest container within the facility, whichever is greater.
8. Store bagged or boxed material on pallets. Throughout the rainy season, protect bagged or boxed material from wind and rain during non-working days and while precipitation is predicted.
9. Provide sufficient separation between stored containers to allow for spill cleanup or emergency response access. Storage areas must be kept clean, well organized, and equipped with cleanup supplies appropriate for the materials being stored.
10. Repair or replace perimeter controls, containment structures, covers, and liners as necessary. Inspect storage areas before and after precipitation, and at least weekly during other times.

Stockpile Management

Implement practices described in this section for managing stockpiles:

1. During the rainy season
2. During the non-rainy season when the National Weather Service predicts precipitation with a probability of at least 30 percent

Use these stockpile management procedures:

1. Reduce or eliminate potential air and water pollution from stockpiled material including soil, paving material, or pressure treated wood.
2. Locate stockpiles:

- 2.1. If within the floodplain, at least 100 feet from concentrated flows of storm water, drainage courses, or inlets unless approved
- 2.2. If outside the floodplain, at least 50 feet from concentrated flows of storm water, drainage courses, or inlets unless approved

Active and inactive soil stockpiles must be:

1. Covered with soil stabilization measures, plastic sheeting, or geosynthetic fabric
2. Surrounded with a linear sediment barrier

Portland cement concrete rubble, AC, HMA, AC and HMA rubble, aggregate base or aggregate sub-base stockpiles must be:

1. Covered with plastic sheeting, or geosynthetic fabric
2. Surrounded with a linear sediment barrier

Pressure treated wood stockpiles must be:

1. Placed on pallets
2. Covered with impermeable material

Cold mix asphalt concrete stockpiles must be:

1. Placed on impervious surface
2. Covered with impermeable material
3. Protected from run-on and runoff

If you discontinue adding or removing material for up to 21 days the stockpile is considered still active during that period.

Control wind erosion during the non-rainy season and dry weather under Section 10, "Dust Control".

Repair or replace linear sediment barriers and covers as needed to keep them functioning properly. If sediment accumulates to 1/3 of the linear sediment barrier height, remove sediment.

Waste Management

Solid Waste

Do not allow litter or debris to accumulate anywhere on the job site, including storm drain grates, trash racks, and ditch lines. Pick up and remove trash and debris from the job site at least once a week. WPC manager must monitor solid waste storage and disposal procedures on the job site.

If practicable, recycle nonhazardous job site waste and excess material. If recycling is not practicable, disposal must comply with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way."

Furnish enough closed-lid dumpsters of sufficient size to contain the solid waste generated by work activities. When refuse reaches the fill line, empty dumpsters. Dumpsters must be watertight. Do not wash out dumpsters at the job site. Furnish additional containers and more frequent pickup during the demolition phase of construction.

Solid waste includes:

1. Brick
2. Mortar
3. Timber
4. Metal scraps
5. Sawdust
6. Pipe
7. Electrical cuttings
8. Non-hazardous equipment parts
9. Styrofoam and other packaging materials
10. Vegetative material and plant containers from highway planting
11. Litter and smoking material, including litter generated randomly by the public
12. Other trash and debris

Furnish and use trash receptacles in the job site yard, field trailers, and locations where workers gather for lunch and breaks.

Hazardous Waste

Use hazardous waste management practices if waste is generated on the job site from these substances:

1. Petroleum products
2. Asphalt products
3. Concrete curing compound
4. Pesticides
5. Acids
6. Paints
7. Stains
8. Solvents
9. Wood preservatives
10. Roofing tar
11. Road flares
12. Lime
13. Glues and adhesives
14. Materials classified as hazardous by California Code of Regulations, Title 22, Division 4.5; or listed in CFR Title 40, Parts 110, 117, 261, or 302

WPC manager must oversee and enforce hazardous waste management practices. Minimize the production of hazardous materials and hazardous waste at the job site. If damaged, repair or replace perimeter controls, containment structures, and covers.

If hazardous material levels are unknown, use a laboratory certified by the Environmental Laboratory Accreditation Program (ELAP) under the California Department of Public Health (CDPH) to sample and test waste to determine safe methods for storage and disposal.

Separate potentially hazardous waste from nonhazardous waste at the job site. Hazardous waste must be handled, stored, and disposed of under California Code of Regulations, Title 22, Division 4.5, Section 66262.34; and in CFR Title 49, Parts 261, 262, and 263.

Store hazardous waste in sealed containers constructed and labeled with the contents and date accumulated under California Code of Regulations, Title 22, Division 4.5; and in CFR Title 49, Parts 172, 173, 178, and 179. Keep hazardous waste containers in temporary containment facilities under "Material Storage" of these special provisions.

Furnish containers with adequate storage volume at convenient locations for hazardous waste collection. Do not overfill hazardous waste containers. Do not mix hazardous wastes. Do not allow potentially hazardous waste to accumulate on the ground. Store containers of dry waste that are not watertight on pallets. Store hazardous waste away from storm drains, watercourses, moving vehicles, and equipment.

Clean water based or oil based paint from brushes or equipment within a contained area and in a way that does not contaminate soil, watercourses, or storm drain systems. Handle and dispose of these as hazardous waste: paints, thinners, solvents, residues, and sludges that cannot be recycled or reused. When thoroughly dry, dispose of these as solid waste: dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths.

Dispose of hazardous waste within 90 days of being generated. Use a licensed hazardous waste transporter to take hazardous waste to a Class I Disposal Site. Submit a copy of uniform hazardous waste manifest forms within 24 hours of transporting hazardous waste.

WPC manager must inspect these daily:

1. Storage areas for hazardous materials and wastes
2. Hazardous waste disposal and transporting activities
3. Hazardous material delivery and storage activities

Contaminated Soil

Identify contaminated soil from spills or leaks by noticing discoloration, odors, or differences in soil properties. Soil with evidence of contamination must be sampled and tested by a laboratory certified by ELAP.

If levels of contamination are found to be hazardous, handle and dispose of the soil as hazardous waste.

Prevent the flow of water, including ground water, from mixing with contaminated soil by using one or a combination of these measures:

1. Berms
2. Cofferdams
3. Grout curtains
4. Freeze walls

5. Concrete seal course

If water mixes with contaminated soil and becomes contaminated, sample and test the water using a laboratory certified by ELAP. If levels of contamination are found to be hazardous, handle and dispose of the water as hazardous waste.

Concrete Waste

Use practices to prevent the discharge of portland cement concrete, AC, or HMA waste into storm drain systems or watercourses.

Collect and dispose of portland cement concrete, AC, or HMA waste at locations where:

1. Concrete material, including grout, is used
2. Concrete dust and debris result from demolition
3. Sawcutting, coring, grinding, grooving, or hydro-concrete demolition of portland cement concrete, AC, or HMA creates a residue or slurry
4. Concrete truck or other concrete-coated equipment is cleaned at the job site

Sanitary and Septic Waste

Do not bury or discharge wastewater from sanitary or septic systems within Department right of way. WPC manager must inspect sanitary or septic waste storage and monitor disposal procedures at least weekly. Sanitary facilities that discharge to the sanitary sewer system must be properly connected and free from leaks. Place sanitary facilities at least 50 feet away from storm drains, watercourse, and flow lines.

Obtain written approval from local health agency, city, county, and sewer district before discharging from a sanitary or septic system directly into a sanitary sewer system, and submit a copy to the Engineer. Comply with local health agency provisions while using an on-site disposal system.

Liquid Waste

Use practices to prevent job site liquid waste from entering storm drain systems or watercourses. Liquid wastes include the following:

1. Drilling slurries or fluids
2. Grease-free or oil-free wastewater or rinse water
3. Dredgings, including liquid waste from drainage system cleaning
4. Liquid waste running off a surface including wash or rinse water
5. Other non-storm water liquids not covered by separate permits

Hold liquid waste in structurally sound, leak proof containers such as:

1. Roll-off bins
2. Portable tanks

Liquid waste containers must be of sufficient quantity and volume to prevent overflow, spills and leaks.

Store containers:

1. At least 50 feet from moving vehicles and equipment
2. If within the floodplain, at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved
3. If outside the floodplain, at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved

Remove and dispose of deposited solids from sediment traps under "Solid Waste" unless the Engineer authorizes another method.

Liquid waste may require testing to determine hazardous material content before disposal.

Drilling fluids and residue must be disposed of outside the highway right of way.

If an approved location is available within the job site, fluids and residue exempt under California Code of Regulations, Title 23, Section 2511(g) may be dried by evaporation in a leak proof container. Dispose of remaining solid waste under "Solid Waste" of these special provisions.

Non-Storm Water Management

Water Control and Conservation

Manage water used for work activities to prevent erosion or discharge of pollutants into storm drain systems or watercourses. Obtain approval before washing anything on the job site with water that could discharge into a storm drain system or watercourse. Report discharges immediately.

If water is used at the job site, implement water conservation practices . Inspect irrigation areas. Adjust watering schedules to prevent erosion, excess watering, or runoff. Shut off water source to broken lines, sprinklers, or valves, and repair breaks within 24 hours. If possible, reuse water from waterline flushing for landscape irrigation. Sweep and vacuum paved areas: do not wash with water.

Direct job site water runoff, including water from water line repair, to areas where it can infiltrate into the ground and not enter storm drain systems or watercourses. Do not allow spilled water to escape water truck filling areas. If possible, direct water from off-site sources around the job site. Minimize the contact of off-site water with job site water.

Illegal Connection and Discharge Detection and Reporting

Inspect the job site and the site perimeter before starting work for evidence of illegal connections, discharges, or dumping. After starting work, inspect the job site and perimeter on a daily schedule.

When illegal connections, discharges, or dumping are discovered, notify the Engineer immediately. Take no further action unless ordered by the Engineer. Assume unlabeled or unidentifiable material is hazardous.

Look for the following evidence of illegal connections, discharges, or dumping:

1. Debris or trash piles
2. Staining or discoloration on pavement or soils

3. Pungent odors coming from drainage systems
4. Discoloration or oily sheen on water
5. Stains or residue in ditches, channels or drain boxes
6. Abnormal water flow during dry weather
7. Excessive sediment deposits
8. Nonstandard drainage junction structures
9. Broken concrete or other disturbances near junction structures

Vehicle and Equipment Cleaning

Limit vehicle and equipment cleaning or washing at the job site except what is necessary to control vehicle tracking or hazardous waste. Notify the Engineer before cleaning vehicles and equipment at the job site with soap, solvents, or steam. Contain and recycle or dispose of resulting waste under "Liquid Waste" or "Hazardous Waste" of these special provisions, whichever is applicable. Do not use diesel to clean vehicles or equipment, and minimize the use of solvents.

Clean or wash vehicles and equipment in a structure equipped with disposal facilities. If using a structure is not possible, vehicles and equipment must be cleaned or washed in an outside area:

1. Paved with AC, HMA, or portland cement concrete
2. Surrounded by a containment berm
3. Equipped with a sump to collect and dispose of wash water
4. If within the floodplain, located at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved
5. If outside the floodplain, located at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved

When washing vehicles or equipment with water, use as little water as possible. Hoses must be equipped with a positive shutoff valve.

Discharge liquid from wash racks to a recycle system or to another approved system. Remove liquids and sediment as necessary.

WPC manger must inspect vehicle and equipment cleaning facilities:

1. Daily when vehicle and equipment cleaning occurs daily
2. Weekly when vehicle and equipment cleaning does not occur daily

Vehicle and Equipment Fueling and Maintenance

If practicable, perform maintenance on vehicles and equipment off the job site.

If fueling or maintenance must be done at the job site, designate a site, or sites, and obtain approval before using. Minimize mobile fueling or maintenance.

If vehicle and equipment fueling and maintenance must be done on the job site, areas for these activities must be:

1. On level ground
2. Protected from stormwater run-on

3. If within the floodplain, located at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved
4. If outside the floodplain, located at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved

Use containment berms or dikes around the fueling and maintenance area. Keep adequate quantities of absorbent spill cleanup material and spill kits in the fueling and maintenance area and on fueling trucks. Dispose of spill cleanup material and kits immediately after use. Use drip pans or absorbent pads during fueling or maintenance.

Fueling or maintenance activities must not be left unattended. Fueling nozzles must be equipped with an automatic shutoff control. Vapor recovery fueling nozzles must be used where required by the Air Quality Management District. When not in use, nozzles must be secured upright. Do not top-off fuel tanks.

Recycle or properly dispose of used batteries and tires.

WPC manager must inspect vehicle and equipment maintenance and fueling areas:

1. Daily when vehicle and equipment maintenance and fueling occurs daily
2. Weekly when vehicle and equipment maintenance and fueling does not occur daily

WPC manager must inspect vehicles and equipment at the job site for leaks and spills on a daily schedule. Operators must inspect vehicles and equipment each day of use.

If leaks cannot be repaired immediately, remove the vehicle or equipment from the job site.

Material and Equipment Used Over Water

Place drip pans and absorbent pads under vehicles or equipment used over water. Keep an adequate supply of spill cleanup material with the vehicle or equipment. If the vehicle or equipment will be idle for more than one hour, place drip pans or plastic sheeting under vehicles or equipment on docks, barges, or other surfaces over water.

Furnish watertight curbs or toe boards on barges, platforms, docks, or other surfaces over water to contain material, debris, and tools. Secure material to prevent spills or discharge into water due to wind.

Structure Removal Over or Adjacent to Water

Do not allow demolished material to enter storm water systems or watercourses. Use approved covers and platforms to collect debris. Use attachments on equipment to catch debris on small demolition activities. Empty debris catching devices daily and handle debris under "Waste Management" of these special provisions.

WPC manager must inspect demolition sites within 50 feet of storm water systems or watercourses daily.

Paving, Sealing, Sawcutting, and Grinding Activities

Prevent these materials from entering storm drain systems or water courses:

1. Cementitious material

2. Asphaltic material
3. Aggregate or screenings
4. Grinding or sawcutting residue
5. Pavement chunks
6. Shoulder backing
7. Methacrylate

Cover drainage inlets and use linear sediment barriers to protect downhill watercourses until paving, sealing, sawcutting, or grinding activities are completed and excess material has been removed. Cover drainage inlets and manholes during the application of seal coat, tack coat, slurry seal, or fog seal.

During the rainy season or when precipitation is predicted, limit paving, sawcutting, and grinding to places where runoff can be captured.

Do not start seal coat, tack coat, slurry seal, or fog seal activities when precipitation is predicted during application or curing period. Do not excavate material from existing roadways during precipitation.

Use a vacuum to remove slurry from sawcutting activities immediately after slurry is produced. Do not allow slurry to run onto lanes open to public traffic or off the pavement.

Collect residue from portland cement concrete grinding activities with a vacuum attachment on the grinding machine. Do not leave residue on pavement or allow residue to flow across pavement.

If approved, material excavated from existing roadways may be stockpiled under "Stockpile Management" of these special provisions.

Do not coat asphalt trucks and equipment with substances that contain soap, foaming agents, or toxic chemicals.

When paving equipment is not in use, park over drip pans or plastic sheeting with absorbent material to catch drips.

Thermoplastic Striping and Pavement Markers

Thermoplastic striping and preheating equipment shutoff valves must work properly at all times. Do not preheat, transfer, or load thermoplastic within 50 feet of drainage inlets or watercourses. Do not fill preheating container above a level that is 6 inches below the top. Truck beds must be cleaned daily of scraps or melted thermoplastic.

Do not unload, transfer, or load bituminous material for pavement markers within 50 feet of drainage inlets or watercourses. Release all pressure from melting tanks before removing the lid to fill or service. Do not fill melting tanks above a level that is 6 inches below the top.

Collect bituminous material from the roadway after marker removal.

Pile Driving

Keep spill kits and cleanup material at pile driving locations. Pile driving equipment must be parked over drip pans, absorbent pads, or plastic sheeting with absorbent material. When precipitation is predicted, protect pile driving equipment by parking on plywood and covering with plastic.

When not in use, store pile driving equipment:

1. On level ground
2. Protected from stormwater run-on
3. If within the floodplain, at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved
4. If outside the floodplain, at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, or storm drain inlets unless approved

If practicable, use vegetable oil instead of hydraulic fluid.

WPC manager must inspect pile driving area for leaks and spills:

1. Daily when pile driving occurs daily
2. Weekly when pile driving does not occur daily

Concrete Curing

Do not overspray chemical curing compound. Minimize drift by spraying as close to the concrete as possible. Cover drainage inlets before applying curing compound.

Minimize the use and discharge of water by using wet blankets or similar methods to maintain moisture while curing concrete.

Concrete Finishing

Collect and dispose of water and solid waste from high-pressure water blasting. Cover drainage inlets within 50 feet before sandblasting. Minimize drift of dust and blast material by keeping the nozzle close to the surface of the concrete. Blast residue may contain hazardous material.

Inspect containment structures for concrete finishing activities for damage before each day of use and before predicted precipitation. Remove liquid and solid waste from the containment structure after each work shift.

Sweeping

Sweeping must be done using hand or mechanical methods such as vacuuming.

Sweeping must be done:

1. At the end of each work shift
2. When the National Weather Service predicts precipitation with a probability of at least 30 percent
3. On paved roads at job site entrance and exit locations
4. On paved areas within the job site that flow to storm drains or water bodies

You may stockpile collected material at the job site. Dispose of collected material at least once per week. Remove collected material including sediment from paved shoulders, drain inlets, curbs and dikes, and other drainage areas.

Sediment collected from the roadway during sweeping may be disposed of within the job site. Protect disposal areas against erosion.

Remove and dispose of trash collected during sweeping under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way".

Dewatering

Dewatering consists of discharging accumulated storm water, ground water, or surface water from excavations or temporary containment facilities.

If dewatering and discharging activities are specified under another work item such as "Temporary Active Treatment System" or "Dewatering and Discharge", then perform dewatering work as specified in those sections.

If dewatering and discharging activities are not specified under another work item, then:

1. At least 10 days before starting dewatering, submit a Dewatering and Discharge Plan under Section 5-1.02, "Plans and Working Drawings," and "Water Pollution Control" of the Standard Specifications. Dewatering and Discharge Plan must include:
 - 1.1. Title sheet and table of contents
 - 1.2. Description of dewatering and discharge activities detailing locations, quantity of water, equipment, and discharge point
 - 1.3. Estimated schedule for dewatering and discharge (start and end dates, intermittent or continuous)
 - 1.4. Discharge alternatives such as dust control or percolation
 - 1.5. Visual monitoring procedures with inspection log
2. Conduct dewatering activities under the Field Guide for Construction Dewatering.
3. Ensure that dewatering discharge does not cause erosion, scour, or sedimentary deposits that impact natural bedding materials.
4. Discharge water within project limits. If water cannot be discharged within project limits due to site constraints, dispose of it in the same way specified for material in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way".
5. Do not discharge storm water or non-storm water that has an odor, discoloration other than sediment, an oily sheen, or foam on the surface. Notify the Engineer immediately upon discovering any of those conditions.
6. WPC manager must inspect dewatering activities:
 - 6.1. Daily when dewatering work occurs daily
 - 6.2. Weekly when dewatering work does not occur daily

PAYMENT

The contract lump sum price paid for construction site management includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in spill prevention and control, material management, waste management, non-storm water management, and dewatering and identifying, sampling, testing, handling, and disposing of hazardous waste, as specified in the Standard Specifications and these special provisions, and as ordered by the Engineer.

10-1. __ STREET SWEEPING

GENERAL

Summary

This work includes street sweeping.

The SWPPP must describe and include the use of street sweeping as a water pollution control practice for sediment control and tracking control.

Submittals

At least 5 business days before starting clearing and grubbing, earthwork, or other activities with the potential for tracking sediment or debris, submit:

1. Number of sweepers described in the SWPPP
2. Type of sweeper technology

Quality Control and Assurance

Retain and submit records of street sweeping including:

1. Quantity of sweeping waste disposal
2. Sweeping times and locations

CONSTRUCTION

Street Sweepers

Sweepers must use one of these technologies:

1. Mechanical sweeper followed by a vacuum-assisted sweeper
2. Vacuum-assisted dry (waterless) sweeper
3. Regenerative-air sweeper

Operation

Street sweeping must be done at:

1. Paved roads at job site entrance and exit locations
2. Paved areas within the job site that flow to storm drains or water bodies

Street sweeping must be done:

1. During clearing and grubbing activities
2. During earthwork activities
3. During trenching activities
4. During roadway structural section activities
5. When vehicles are entering and leaving the job site
6. After soil disturbing activities
7. After observing offsite tracking of material

Monitor paved areas and roadway within the jobsite. Street sweeping must be done:

1. Within 1 hour, if sediment or debris is observed during activities that require sweeping
2. Within 24 hours, if sediment or debris is observed during activities that do not require sweeping

At least 1 sweeper must be on the job site at all times when sweeping work is required. The sweeper must be in good working order.

Perform street sweeping to minimize dust. If dust generation is excessive or sediment pickup is ineffective, use water or a vacuum.

You may stockpile collected material on the jobsite according to the approved SWPPP. Dispose of collected material at least once per week.

Material collected during street sweeping must be removed and disposed of under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Your WPCM must inspect paved roads at job site access points:

1. Daily if earthwork and other sediment or debris generating activities occur daily
2. Weekly if earthwork and other sediment or debris generating activities do not occur daily
3. When the National Weather Service predicts precipitation with a probability of at least 30 percent

MEASUREMENT AND PAYMENT

The contract lump sum price paid for street sweeping includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as shown on the plans, as specified in the Standard Specifications, these special provisions, and as directed by the Engineer.

10-1. TEMPORARY HYDRAULIC MULCH (BONDED FIBER MATRIX)

GENERAL

Summary

This work includes applying, maintaining, and removing temporary hydraulic mulch (bonded fiber matrix). Hydraulic mulch uses a mixture of fiber, tackifier, and water to stabilize active and nonactive disturbed soil areas.

The SWPPP must describe and include the use of temporary hydraulic mulch (bonded fiber matrix) as a water pollution control practice for soil stabilization.

Submittals

At least 5 business days before applying hydraulic mulch, submit:

1. Material Safety Data Sheet for the tackifier.
2. Product label describing the tackifier as an erosion control product.

3. List of pollutant indicators and potential pollutants for the use of temporary hydraulic mulch. Pollutant indicators are described under "Sampling and Analysis Plan for Non-Visible Pollutants" in the Preparation Manual.
4. Determination of acute and chronic toxicity for aquatic organisms conforming to EPA methods for the tackifier.
5. Composition of ingredients including chemical formulation.

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for:

1. Tackifier
2. Fiber

Quality Control and Assurance

Retain and submit records of temporary hydraulic mulch applications including:

1. Compliance with specified rates
2. Application area
3. Application time
4. Quantity

MATERIALS

Tackifier

The tackifier must be:

1. Nonflammable
2. Nontoxic to aquatic organisms
3. Free from growth or germination inhibiting factors
4. Bonded to the fiber or prepackaged with the fiber by the manufacturer
5. At least 10 percent of the weight of the dry fiber and include the weight of the activating agents and additives
6. Organic, high viscosity colloidal polysaccharide with activating agents, or a blended hydrocolloid-based binder

Fiber

Fiber must be:

1. Long strand, whole wood fibers, thermo-mechanically processed from clean, whole wood chips
2. Not made from sawdust, cardboard, paper, or paper byproducts
3. At least 25 percent of fibers 3/8 inch long
4. At least 50 percent held on a No. 25 sieve
5. Free from lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, or chlorine bleach
6. Free from synthetic or plastic materials
7. At most 7 percent ash

Coloring Agent

Use a biodegradable nontoxic coloring agent free from copper, mercury, and arsenic to ensure the hydraulic mulch contrasts with the application area.

CONSTRUCTION

Application

Dilute hydraulic mulch with water to spread the mulch evenly.

Use hydroseeding equipment to apply hydraulic mulch.

Apply hydraulic mulch:

1. In the proportions indicated in the table below. Successive applications or passes may be needed to achieve the required proportion rate:

Material	Application Rate lbs/acre
Bonded Fiber (includes fiber and tackifier material)	4500

2. To form a continuous mat with no gaps between the mat and the soil surface.
3. From 2 or more directions to achieve a continuous mat.
4. In layers to avoid slumping and to aid drying.
5. During dry weather or at least 24 hours before predicted rain.

Do not apply hydraulic mulch if:

1. Water is standing on or moving across the soil surface
2. Soil is frozen
3. Air temperature is below 40 °F during the tackifier curing period unless allowed by the tackifier manufacturer and approved by the Engineer

Do not over-spray hydraulic mulch onto the traveled way, sidewalks, lined drainage channels, or existing vegetation.

Maintenance

Reapply hydraulic mulch within 24 hours of discovering visible erosion unless the Engineer approves a longer period.

Removal

Remove hydraulic mulch by mechanically blending it into the soil with track laying equipment, disking, or other approved method.

Temporary hydraulic mulch disturbed or displaced by your vehicles, equipment, or operations must be reapplied at your expense.

Cleanup, repair, removal, disposal, or replacement due to improper installation or your negligence are not included in the cost for performing maintenance.

MEASUREMENT AND PAYMENT

Temporary hydraulic mulch (bonded fiber matrix) is measured by the square yard from measurements along the slope of the areas covered by the hydraulic mulch.

The contract price paid per square yard for temporary hydraulic mulch (bonded fiber matrix) includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying temporary hydraulic mulch, complete in place, including removal of hydraulic mulch, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The State and you share the cost of maintaining the temporary hydraulic mulch. The State determines the maintenance cost under Section 9-1.03, "Force Account Payment," of the Standard Specifications and pays you one-half of that cost.

10-1. TEMPORARY COVER

GENERAL

Summary

This work includes constructing, maintaining, and removing temporary cover.

The SWPPP must describe and include the use of temporary cover as a water pollution control practice for soil stabilization and stockpile management.

Submittals

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for:

1. Gravel-filled bag fabric
2. Temporary cover fabric

If you substitute a material in the following list, submit a sample of the alternative material for approval at least 5 business days before installation:

1. Alternative restrainer
2. Alternative linear sediment barrier

MATERIALS

Geosynthetic Fabrics

Geosynthetic fabrics must consist of one of the following:

1. Polyester
2. Polypropylene
3. Combined polyester and polypropylene

Sample under ASTM D 4354, Procedure C.

Test under ASTM D 4759. All properties are based on Minimum Average Roll Value (MARV).

Identify, store, and handle under ASTM D 4873.

Protect geosynthetics from moisture, sunlight and damage during shipping and storage. Label each unit with the manufacturer's name, identifying information and product identification.

Gravel-filled bag fabric must comply with:

Specification	Requirements
Grab breaking load 1-inch grip, lb, min. in each direction	205
Apparent elongation percent, min., in each direction	50
Water Flow Rate max. average roll value, gallons per minute/square foot	80-150
Permittivity 1/sec., min	1.2
Apparent opening size max. average roll value, U.S. Standard sieve size	40-80
Ultraviolet Degradation percent of original unexposed grab breaking load 500 hr, minimum	70

The temporary cover fabric must be geosynthetic cover fabric, plastic sheeting, or a combination of both.

Temporary cover fabric must be either:

1. Plastic sheeting consisting of a single-ply geomembrane material, 10 mils thick, that complies with ASTM D 5199
2. Geosynthetic cover fabric that complies with the following properties:

Specification	Requirements
Grab breaking load 1-inch grip, lb, min. in each direction	200
Apparent elongation percent, min., in each direction	50
Water Flow Rate max. average roll value, gallons per minute/square foot	75-120
Permittivity 1/sec., min	0.08
Apparent opening size max. average roll value, U.S. Standard sieve size	100
Ultraviolet Degradation percent of original unexposed grab breaking load 500 hr, minimum	70

Gravel

Gravel for gravel-filled bags must be:

1. From 3/8 to 3/4 inch in diameter
2. Clean and free from clay balls, organic matter, and other deleterious materials

Gravel-filled Bags

Gravel-filled bags must:

1. Be made from gravel-filled bag fabric.
2. Have inside dimensions from 24 to 32 inches in length, and from 16 to 20 inches in width.
3. Have the opening bound to retain the gravel. The opening must be sewn with yarn, bound with wire, or secured with a closure device.
4. Weigh from 30 to 50 pounds when filled with gravel.

Restrainers

Restrainers must be used to secure the cover fabric or plastic sheeting to the surface of the slope or stockpile.

Restrainers must be one of the following:

1. Made of gravel-filled bags that are roped together and spaced no more than a 6 feet apart
2. Made of wooden lath and anchor restrainers as shown on the plans and the following:
 - 2.1 Wooden lath must be 2" x 4" x 8', made from fir or pine, and comply with Section 88-2.12, "Lumber," of the Standard Specifications
 - 2.2 Anchor restrainers must be made from steel reinforcing bars and spaced no more than 4 feet apart along the wooden lath
3. An approved alternate method

Rope

Rope must be at least 3/8 inch in diameter.

Rope must be one of the following:

1. Biodegradable, such as sisal or manila
2. Nondegradable, such as polypropelene or nylon

Linear Sediment Barrier

Linear sediment barriers consist of one or more of the following:

1. Gravel bag berm
2. Earthen berm
3. Approved alternate method

CONSTRUCTION

Temporary Cover Fabric

Install temporary cover fabric by:

1. Placing the temporary cover fabric loosely on the slope or stockpile with the longitudinal edges perpendicular to the slope contours
2. Placing the temporary cover fabric on the upper portion of the slope to overlap cover fabric on the lower portion of the slope
3. Placing the temporary cover fabric on the side of the prevailing wind to overlap the cover fabric on the downwind side of the slope
4. Anchoring the perimeter edge of the temporary cover fabric in key trenches
5. Overlapping edges of the temporary cover fabric by at least 2 feet
6. Placing restrainers at the overlap area and along the toe of the slope. Between overlaps, the restrainers must be spaced a maximum of 8 feet on center.
7. Ensuring that, if anchor restraints are used, the leg of the steel reinforcing bar pierces the temporary cover fabric and holds the wooden lath firmly against the surface of the slope or stockpile.

Linear Sediment Barrier

Protect excavation and embankment slopes with linear sediment barrier by:

1. Preventing run-on and concentrated flows from damaging the slopes
2. Placing the barrier approximately parallel to the slope contour at the toe of the slope
4. Angling the last 6 feet of the barrier up-slope

Protect stockpiles with linear sediment barrier by:

1. Preventing run-on and concentrated flows from touching the stockpiled material
2. Surrounding the stockpile with a linear sediment barrier
3. Adding more linear sediment barrier within 24 hours of adding more material to the stockpile

If earthen berms are used as a linear sediment barrier, they must be:

1. At least 8 inches high and 36 inches wide
2. Compacted by hand or mechanical method

If gravel bag berms are used as a linear sediment barrier:

1. Place gravel bags as a single layer
2. Place gravel bags end-to-end to eliminate gaps

If you need to increase the height of the gravel bag berm:

1. Increase height by adding rows of gravel-filled bags
2. Stack bags in a way that the bags in the top row overlap the joints in the lower row
3. Stabilize berm by adding rows at the bottom

If you remove the temporary cover to do other work, replace and secure temporary cover within one hour.

MAINTENANCE

Maintain temporary cover to minimize exposure of the slopes or stockpile and prevent movement of the material beyond the linear sediment barrier.

Maintain temporary cover by:

1. Relocating and securing restrainers to keep the erosion control blankets in place. Temporary cover fabric that breaks free must be immediately secured.
2. Repairing or replacing the temporary cover fabric when the area covered by temporary cover becomes exposed or exhibits visible erosion.
3. Repairing or replacing the linear sediment barrier when washouts occur between joints or beneath the linear sediment barrier.
4. Repairing or replacing the temporary cover fabric when it becomes detached, torn, or unraveled.

Repair temporary cover within 24 hours of discovering damage unless the Engineer approves a longer period.

If your vehicles, equipment, or activities disturb or displace temporary cover, repair temporary cover at your expense.

REMOVAL

When the Engineer determines that temporary cover is not required, it must be removed and disposed of under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary cover must be backfilled and repaired under Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Temporary cover is measured by the square yard of the actual area covered excluding overlaps.

The contract price paid per square yard for temporary cover includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary cover, complete in place, including restrainers and removal of temporary cover, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1. TEMPORARY FIBER ROLL

GENERAL

Summary

This work includes constructing, maintaining, and removing temporary fiber roll.

The SWPPP must describe and include the use of temporary fiber roll as a water pollution control practice for sediment control.

Submittals

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for fiber roll.

MATERIALS

Fiber Roll

Fiber roll must:

1. Last for at least one year after installation
2. Be Type 1 or Type 2

If specified, Type 1 fiber roll must be:

1. Made from an erosion control blanket:
 - 1.1. Classified by the Erosion Control Technology Council (ECTC) as ECTC 2D
 - 1.2. With a Universal Soil Loss Equation (USLE) C-Factor of not more than 0.20 at a 2:1 (horizontal:vertical) slope
 - 1.3. Capable to withstand a maximum shear stress of 1.75 pounds per square foot under ASTM D 6460
 - 1.4. With a minimum tensile strength of 75 pounds per foot under ASTM D 5035
 - 1.5. With top and bottom surfaces covered with lightweight non-synthetic netting
 - 1.6. That complies with one of the following:
 - 1.6.1. Double net straw and coconut blanket with 70 percent straw and 30 percent coconut fiber
 - 1.6.2. Double net excelsior blanket with 80 percent of the wood excelsior fibers being 6 inches or longer
2. Rolled along the width
3. Secured with natural fiber twine every 6 feet and 6 inches from each end
4. Finished to be either:
 - 4.1. From 8 to 10 inches in diameter, from 10 to 20 feet long, and at least 0.5 pounds per linear foot
 - 4.2. From 10 to 12 inches in diameter, at least 10 feet long, and at least 2 pounds per linear foot

If specified, Type 2 fiber roll must:

1. Be filled with rice or wheat straw, wood excelsior, or coconut fiber

2. Be covered with a biodegradable jute, sisal, or coir fiber netting
3. Have the netting secured tightly at each end
4. Be finished to be either:
 - 4.1. From 8 to 10 inches in diameter, from 10 to 20 feet long, and at least 1.1 pounds per linear foot
 - 4.2. From 10 to 12 inches in diameter, at least 10 feet long, and at least 3 pounds per linear foot

Wood Stakes

Wood stakes must be:

1. Untreated fir, redwood, cedar, or pine and cut from sound timber
2. Straight and free of loose or unsound knots and other defects which would render the stakes unfit for use
3. Pointed on the end to be driven into the ground

For fiber roll, wood stakes must be at least:

1. 1" x 1" x 24" in size for Type 1 installation
2. 1" x 2" x 24" in size for Type 2 installation

Rope

For Type 2 installation, rope must:

1. Be biodegradable, such as sisal or manila
2. Have a minimum diameter of 1/4 inch

CONSTRUCTION

Before placing fiber roll, remove obstructions including rocks, clods, and debris greater than one inch in diameter from the ground.

If fiber roll is to be placed in the same area as erosion control blanket, install the blanket before placing the fiber roll. For other soil stabilization practices such as hydraulic mulch or compost, place the fiber roll and then apply the soil stabilization practice.

Place fiber roll on slopes at the following spacing unless the plans show a different spacing:

1. 10 feet apart for slopes steeper than 2:1 (horizontal:vertical)
2. 15 feet apart for slopes from 2:1 to 4:1 (horizontal:vertical)
3. 20 feet apart for slopes from 4:1 to 10:1 (horizontal:vertical)
4. 50 feet apart for slopes flatter than 10:1 (horizontal:vertical)

Place fiber roll approximately parallel to the slope contour. For any 20 foot section of fiber roll, do not allow the fiber roll to vary more than 5 percent from level.

Type 1 and Type 2 fiber roll may be installed using installation method Type 1, Type 2, or a combination:

For installation method Type 1, install fiber roll by:

1. Placing in a furrow that is from 2 to 4 inches deep
2. Securing with wood stakes every 4 feet along the length of the fiber roll
3. Securing the ends of the fiber roll by placing a stake 6 inches from the end of the roll
4. Driving the stakes into the soil so that the top of the stake is less than 2 inches above the top of the fiber roll

For installation method Type 2, install fiber roll by:

1. Securing with rope and notched wood stakes.
2. Driving stakes into the soil until the notch is even with the top of the fiber roll.
3. Lacing the rope between stakes and over the fiber roll. Knot the rope at each stake.
4. Tightening the fiber roll to the surface of the slope by driving the stakes further into the soil.

MAINTENANCE

Maintain temporary fiber roll to provide sediment holding capacity and to reduce runoff velocities.

Remove sediment deposits, trash, and debris from temporary fiber roll as needed or when directed by the Engineer. If removed sediment is deposited within project limits, it must be stabilized and not subject to erosion by wind or water. Trash and debris must be removed and disposed of as specified in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Maintain temporary fiber roll by:

1. Removing sediment from behind the fiber roll when sediment is 1/3 the height of the fiber roll above ground
2. Repairing or adjusting the fiber roll when rills and other evidence of concentrated runoff occur beneath the fiber roll.
3. Repairing or replacing the fiber roll when they become split, torn, or unraveled
4. Adding stakes when the fiber roll slump or sag
5. Replacing broken or split wood stakes

Repair temporary fiber roll within 24 hours of discovering damage unless the Engineer approves a longer period.

If your vehicles, equipment, or activities disturb or displace temporary fiber roll, repair temporary fiber roll at your expense.

The Department does not pay maintenance costs for cleanup, repair, removal, disposal, or replacement due to improper installation or your negligence.

REMOVAL

When the Engineer determines that temporary fiber roll is not required, they must be removed and disposed of under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary fiber roll must be backfilled and repaired under Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Temporary fiber roll is measured by the linear foot along the centerline of the installed roll. Where temporary fiber roll is joined and overlapped, the overlap is measured as a single installed roll.

The contract price paid per linear foot for temporary fiber roll includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the temporary fiber roll, complete in place, including removal of materials, cleanup and disposal of retained sediment and debris, and backfilling and repairing holes, depressions and other ground disturbance, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The State and you share the cost of maintaining the temporary fiber roll. The State determines the maintenance cost under Section 9-1.03, "Force Account Payment," of the Standard Specifications and pays you one-half of that cost.

10-1. TEMPORARY SILT FENCE

GENERAL

Summary

This work includes installing, maintaining, and removing temporary silt fence.

The SWPPP must describe and include the use of temporary silt fence as a water pollution control practice for sediment control.

Submittals

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for silt fence fabric.

MATERIALS

Silt Fence Fabric

Geosynthetic fabric for temporary silt fence must consist of one of the following:

1. Polyester
2. Polypropylene
3. Combined polyester and polypropylene

Sample under ASTM D 4354, Procedure C.

Test under ASTM D 4759. All properties must be based on Minimum Average Roll Value (MARV).

Identify, store, and handle under ASTM D 4873.

Protect geosynthetics from moisture, sunlight, and damage during shipping and storage. Label each unit with the manufacturer's name, identifying information, and product identification.

Silt fence fabric must comply with:

Property	ASTM Designation	Specification	
		Woven	Non-woven
Grab breaking load 1-inch grip, lb, min. in each direction	D 4632	120	120
Apparent elongation percent, min., in each direction	D 4632	15	50
Water Flow Rate max. average roll value, gallons per minute/square foot	D 4491	10-50	100-150
Permittivity 1/sec., min.	D 4491	0.05	0.05
Apparent opening size max. average roll value, U.S. Standard sieve size	D 4751	30	30
Ultraviolet Degradation percent of original unexposed grab breaking load 500 hr, minimum	D 4595	70	

Posts

Posts must be wood or metal.

Wood posts must be:

1. Untreated fir, redwood, cedar, or pine and cut from sound timber
2. Straight and free of loose or unsound knots and other defects that would render the stakes unfit for use
3. Pointed on the end to be driven into the ground
4. At least 2" x 2" in size, and 4 feet long

Metal posts must:

1. Be made of steel.
2. Have a "U," "T," "L," or other cross sectional shape that can resist failure from lateral loads.
3. Be pointed on the end to be driven into the ground.
4. Weigh at least 0.75-pound per foot.
5. Be at least 4 feet long.
6. Have a safety cap attached to the exposed end. The safety cap must be orange or red plastic and fit snugly to the metal post.

CONSTRUCTION

Silt fence must be:

1. Constructed with silt fence fabric, posts, and fasteners
2. Prefabricated or assembled at the job site

Silt fence fabric must be attached to posts using these methods:

1. If prefabricated silt fence is used, posts must be inserted into sewn pockets
2. If assembled on the job site:
 - 2.1. If wood posts are used, fasteners must be staples or nails
 - 2.2. If steel posts are used, fasteners must be tie wires or locking plastic fasteners
 - 2.3. Spacing of the fasteners must be no more than 8 inches apart

Place silt fence approximately parallel to the slope contour. For any 50 foot section of silt fence, do not allow the elevation at the base of the fence to vary more than 1/3 of the fence height.

Install silt fence by:

1. Placing the bottom of the fabric in a trench that is 6 inches deep
2. Securing with posts placed on the downhill side of the fabric
3. Backfilling the trench with soil and hand or mechanically tamping to secure the fabric in the trench

If you reinforce the silt fence fabric with wire or plastic mesh, you may increase the post spacing to a maximum of 10 feet. The field-assembled reinforced silt fence must be able to retain saturated sediment without collapsing.

Connect silt fence sections by:

1. Joining separate sections of silt fence to form reaches that are no more than 500 feet long
2. Securing the end posts of each section by wrapping the tops of the posts with at least two wraps of 16-gage diameter tie wire
3. Ensuring that each reach is a continuous run of silt fence from end to end or from an end to an opening, including joined panels

If you mechanically push the silt fence fabric vertically through the soil, you must demonstrate that the silt fence fabric will not be damaged and will not slip out of the soil, resulting in sediment passing under the silt fence fabric.

MAINTENANCE

Maintain temporary silt fence to provide sediment holding capacity and to reduce runoff velocities.

Remove sediment deposits, trash, and debris from temporary silt fence as needed or when directed by the Engineer. If removed sediment is deposited within project limits, it must be stabilized and not subject to erosion by wind or water. Trash and debris must be removed and disposed of as specified in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Maintain temporary silt fence by:

1. Removing sediment from behind the silt fence when sediment is 1/3 the height of the silt fence above ground
2. Repairing or adjusting the silt fence when rills and other evidence of concentrated runoff occur beneath the silt fence fabric
3. Repairing or replacing the silt fence fabric when it become split, torn, or unraveled

Repair temporary silt fence within 24 hours of discovering damage unless the Engineer approves a longer period.

If your vehicles, equipment, or activities disturb or displace temporary silt fence, repair temporary silt fence at your expense.

The Department does not pay maintenance costs for cleanup, repair, removal, disposal, or replacement due to improper installation or your negligence.

REMOVAL

When the Engineer determines that temporary silt fence is not required, remove and dispose of fence under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary silt fence must be backfilled and repaired under Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Temporary silt fence is measured by the linear foot along the centerline of the installed fence.

The contract price paid per linear foot for temporary silt fence includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the temporary silt fence, complete in place, including removal of materials, cleanup and disposal of retained sediment and debris, and backfilling and repairing holes, depressions and other ground disturbance, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The State and you share the cost of maintaining the temporary silt fence. The State determines the maintenance cost under Section 9-1.03, "Force Account Payment," of the Standard Specifications and pays you one-half of that cost.

10-1. TEMPORARY FENCE (TYPE ESA)

GENERAL

Summary

This work includes constructing, maintaining, and removing temporary fence (Type ESA). Temporary fence (Type ESA) provides a visible boundary adjacent to protected areas such as an environmentally sensitive area.

Signs are not required for temporary fence (Type ESA).

Submittals

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for:

1. High visibility fabric
2. Safety cap for metal posts

MATERIALS

High Visibility Fabric

High visibility fabric for temporary fence (Type ESA) must consist of one of the following:

1. Polyethylene
2. Polypropylene
3. Combined polyethylene and polypropylene

Sample under ASTM D 4354, Procedure C.

Test under ASTM D 4759. All properties must be based on Minimum Average Roll Value.

Identify, store, and handle under ASTM D 4873.

High visibility fabric must:

1. Contain ultraviolet inhibitors
2. Comply with the following:

Property	Specifications	Requirements
Width, inches, Min	Measured	48
Opening size inches	Measured	1" x 1" (Min) 2" x 2" (Max)
Color	Observed	Orange
Grab breaking load 1-inch grip, lb, Min. in each direction	ASTM D4632	260
Apparent elongation percent, Min., in each direction	ASTM D4632	5
Ultraviolet Degradation percent of original unexposed grab breaking load 500 hr, minimum	ASTM D4355	70

Posts

Posts must be wood or steel.

Wood posts must be:

1. Untreated fir, redwood, cedar, or pine and cut from sound timber
2. Straight and free of loose or unsound knots and other defects that would render the stakes unfit for use

3. Pointed on the end to be driven into the ground
4. At least 2" x 2" in size and 6 feet long

Steel posts must:

1. Have a "U," "T," "L," or other cross sectional shape that can resist failure from lateral loads.
2. Be pointed on the end to be driven into the ground.
3. Weigh at least 0.75-pound per foot.
4. Be at least 6 feet long.
5. Have a safety cap attached to the exposed end. The safety cap must be yellow, orange or red plastic and fit snugly to the metal post.

Signs

If specified, signs must be:

1. Weatherproof and fade-proof and may include plastic laminated printed paper affixed to an inflexible weatherproof backer board
2. Attached to the high visibility fabric with tie wire or locking plastic fasteners

CONSTRUCTION

General

Install temporary fence (Type ESA):

1. With high visibility fabric, posts, and fasteners as follows:
 - 1.1. If wood posts are used, fasteners must be staples or nails
 - 1.2. If steel posts are used, fasteners must be tie wires or locking plastic fasteners
 - 1.3. Spacing of the fasteners must be no more than 8 inches apart
2. Before clearing and grubbing activities
3. From outside of the protected area
4. With posts spaced 8 feet apart and embedded at least 16 inches in the soil

If specified, signs must be:

1. Attached with the top of the sign panel flush with the top of the high visibility fabric
2. Placed 100 feet apart along the length and at each end of the fence

If trees and other plants need protection, install fence to:

1. Enclose the foliage canopy (drip line) of protected plants
2. Protect visible roots from encroachment

Maintenance

Maintain temporary fence (Type ESA) by:

1. Keeping posts in a vertical position
2. Reattaching fabric to posts
3. Replacing damaged sections of fabric
4. Replacing and securing signs

Removal

When the Engineer determines that temporary fence (Type ESA) is no longer required, remove and dispose of it under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Backfill and repair ground disturbance caused by the installation and removal of temporary fence (Type ESA), including holes and depressions, under Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Temporary fence (Type ESA) is measured and paid for by the linear foot in the same manner specified for fence (Type BW or WM) in Section 80, "Fences," of the Standard Specifications.

The contract price paid per linear foot for temporary fence (Type ESA) includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the temporary fence (Type ESA), complete in place, including maintenance, removal of materials, and backfilling and repairing holes, depressions and other ground disturbance, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as ordered by the Engineer.

10-1. TEMPORARY CONSTRUCTION ENTRANCE

GENERAL

Summary

This work includes constructing, maintaining, and removing temporary construction entrance to provide temporary access.

The SWPPP must describe and include the use of temporary construction entrance as a water pollution control practice for tracking control.

Temporary construction entrance must be Type 1, Type 2, or a combination.

Submittals

Submit a Certificate of Compliance under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for:

1. Temporary entrance fabric
2. Rock

Submit details for alternatives at least 5 business days before installation. You may propose alternatives for the following items:

1. Alternative sump
2. Alternative corrugated steel panels

If the Engineer approves, you may eliminate the sump.

MATERIALS

Temporary Entrance Fabric

Temporary entrance fabric must comply with Section 88-1.04, "Rock Slope Protection Fabric," of the Standard Specifications and be woven Type B or non-woven Type B.

Rock

Rock must be Type A or Type B.

Rock (Type A) must comply with:

1. Requirements under Section 72-2.02, "Materials," of the Standard Specifications
2. Following sizes:

Square Screen Size (inch)	Percentage Passing	Percentage Retained
6	100	0
3	0	100

Rock (Type B) must be Railway Ballast Number 25. Do not use blast furnace slag. Railway Ballast Number 25 must comply with:

1. Description in AREMA Manual for Railway Engineering.
2. Following sizes:

Nominal Size Square Opening	Percentage Passing								
	3"	2-1/2"	2"	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4
2-1/2"-3/8"	100	80-100	60-85	50-70	25-50	-	5-20	0-10	0-3

3. Following properties:

Specification	Requirements
Percent material passing No. 200 sieve, max. ASTM: C 117	1.0
Bulk specific gravity, min. ASTM: C 127	2.60
Absorption, percent min. ASTM: C 127	1.0
Clay lumps and friable particles, percent max. ASTM: C 142	0.5
Degradation, percent max. ASTM: C 535	30
Soundness (Sodium Sulfate), percent max. ASTM: C 88	5.0
Flat, elongated particles, or both, percent max. ASTM: D 4791	5.0

Corrugated Steel Panels

Corrugated steel panels must:

1. Be made of steel.
2. Be pressed or shop welded
3. Have a slot or hook for connecting panels together

CONSTRUCTION

Prepare location for temporary construction entrance by:

1. Removing vegetation to ground level and clear away debris
2. Grading ground to uniform plane
3. Grading ground surface to drain
4. Removing sharp objects that may damage fabric
5. Compacting the top 1.5 feet of soil to at least 90 percent relative compaction

If temporary entrance (Type 1) is specified, use rock (Type A).

If temporary construction entrance (Type 2) is specified, use Rock (Type B) under corrugated steel panels. Use at least 6 corrugated steel panels for each entrance. Couple panels together.

Install temporary construction entrance by:

1. Positioning fabric along the length of the entrance
2. Overlapping sides and ends of fabric by at least 12 inches
3. Spreading rock over fabric in the direction of traffic
4. Covering fabric with rock within 24 hours
5. Keeping a 6 inch layer of rock over fabric to prevent damage to fabric by spreading equipment

Do not drive on fabric until rock is spread.

Unless the Engineer eliminates the sump, install a sump within 20 feet of each temporary construction entrance.

Repair fabric damaged during rock spreading by placing a new fabric over the damaged area. New fabric must be large enough to cover damaged area and provide at least 18-inch overlap on all edges.

Maintenance

Maintain temporary construction entrance to minimize generation of dust and tracking of soil and sediment onto public roads. If dust or sediment tracking increases, place additional rock unless the Engineer approves another method.

Repair temporary construction entrance if:

1. Fabric is exposed
2. Depressions in the entrance surface develop
3. Rock is displaced

Repair temporary construction entrance within 24 hours of discovering damage unless the Engineer approves a longer period.

During use of temporary construction entrance, do not allow soil, sediment, or other debris tracked onto pavement to enter storm drains, open drainage facilities, or watercourses. When material is tracked onto pavement, remove it within 24 hours unless the Engineer approves a longer period.

If your vehicles, equipment, or activities disturb or displace the temporary construction entrance, repair it at your expense.

The Department does not pay maintenance costs for cleanup, repair, removal, disposal, or replacement due to improper installation or your negligence.

Removal

When the Engineer determines that temporary construction entrance is not required, remove and dispose of it under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Backfill and repair ground disturbance, including holes and depressions, caused by installation and removal of temporary construction entrance under Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Temporary construction entrance is determined from actual count in place. Temporary construction entrance is measured one time only and no additional measurement will be recognized.

The contract price paid for temporary construction entrance includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing temporary construction entrance, complete in place, including removal of temporary construction entrance, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No additional compensation will be made if the temporary construction entrance is relocated during the course of construction.

The State and you share the cost of maintaining temporary construction entrance. The State determines the maintenance cost under Section 9-1.03, "Force Account Payment," of the Standard Specifications and pays you one-half of that cost.

10-1. EROSION CONTROL (SEQUENCING)

Place erosion control treatments in the following sequence for each erosion control type identified:

Erosion Control (Type 1)

Erosion Control (Compost Blanket)
Fiber Rolls
Erosion Control (Hydroseed) ([Seed Type 1](#))

Erosion Control (Type 2)

[Erosion Control \(Compost Blanket\)](#)
[Fiber Rolls](#)
[Erosion Control \(Hydroseed\)\(Seed Type 2\)](#)

10-1. MOVE-IN/MOVE-OUT (EROSION CONTROL)

Move-in/move-out (Erosion Control) shall include moving onto the project when an area is ready to receive erosion control as determined by the Engineer, setting up all required personnel and equipment for the application of erosion control materials and moving out all personnel and equipment when erosion control in that area is completed.

When areas are ready to receive applications of erosion control (Hydroseed), as determined by the Engineer, the Contractor shall begin erosion control work in that area within 5 working days of the Engineer's notification to perform the erosion control work.

Quantities of move-in/move-out (Erosion Control) will be determined as units from actual count as determined by the Engineer. For measurement purposes, a move-in followed by a move-out will be considered as one unit.

The contract unit price paid for move-in/move-out (Erosion Control) shall include full compensation for furnishing all labor, materials (excluding erosion control materials), tools, equipment, and incidentals and for doing all the work involved in moving in and removing from the project all personnel and equipment necessary for application of erosion control (Hydroseed), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No adjustment of compensation will be made for any increase or decrease in the quantities of move-in/move-out (Erosion Control) required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to the item of move-in/move-out (Erosion Control).

10-1. __ EROSION CONTROL (HYDROSEED)

GENERAL

Summary

This work includes removing and disposing of weeds, applying erosion control materials, seed, fiber, organic fertilizer, straw, and tackifier to erosion control (Hydroseed) areas shown on the plans.

Comply with Section 20-3, "Erosion Control," of the Standard Specifications.

If the slope on which the erosion control to be placed is finished during the rainy season as specified under "Water Pollution Control" of these special provisions, apply erosion control to the slope immediately.

The Engineer will designate the ground location of all erosion control (Hydroseed) areas in increments of one acre or smaller by directing the placing of stakes or other suitable markers. Furnish all tools, labor, materials, and transportation required to adequately indicate the various erosion control (Hydroseed) locations.

MATERIALS

Seed

Seed not required to be labeled under the California Food and Agricultural Code must be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts or by a seed technologist certified by the Society of Commercial Seed Technologists. Measure and mix individual seed species in the presence of the Engineer.

Seed must contain at most 1.0 percent total weed seed by weight.

Deliver seed to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag attached are not accepted. The Engineer takes a sample of approximately one ounce or 0.25 cup of seed for each seed lot greater than 2 pounds.

Seed must comply with the following:

Seed (Type 1)

Botanical Name (Common Name)	Percent Germination (Minimum)	Pounds Pure Live Seed Per Acre (Slope Measurement)
Bromus carinatus ¹ (California Brome)	40	8.0
Eschscholzia californica (California poppy)	35	2.0
Festuca rubra 'Molate' (Molate Red Fescue)	40	6.0
Hordeum californicum (California barley)	40	8.0
Leymus triticoides ¹ (Creeping Wildrye)	35	6.0
Lupinus bicolor (Pygmy Lupine)	40	6.0
Nassella cernua (Nodding Needlegrass)	35	8.0
Nassella pulchra (Purple Needlegrass)	35	10.0
Trifolium hirtum (Rose Clover)	50	4.0
Vulpia microstachys (Three Week Fescue)	45	6.0
	Total	64.0

Seed (Type 2)

Botanical Name (Common Name)	Percent Germination (Minimum)	Pounds Pure Live Seed Per Acre (Slope Measurement)
Artemisia douglasiana (Mugwort)	10	0.3
Deschampsia caespitosa (Tufted hairgrass)	35	6.0
Elymus X Triticum (Hybrid Sterile Wheatgrass)	50	15.0
Elymus trachycaulus (Slender Wheatgrass)	40	6.0
Hordeum californicum ¹ (California barley)	40	6.0
Hordeum vulgare var. UC603 (Barley) (UC603)	50	15.0
Leymus triticoides ¹ (Creeping wildrye)	35	6.0
Mimulus guttatus (Seep monkeyflower)	30	0.2
Sisyrinchium bellum (Blue-eyed grass)	35	3.0
	Total	57.5

Applicable when numbers below are shown after a Botanical Name/(Common Name) above:

¹Seed produced in California only.

Seed Sampling Supplies

At the time of seed sampling, provide the Engineer a glassine lined bag and custody seal tag for each seed lot sample.

Organic Fertilizer

Must be a pelleted or granular form and must be one of the following:

Organic Fertilizer

Products	Guaranteed Chemical Analysis (N-P-K) (%)	Company
Biosol Mix® - Granular	7-2-3	Rocky Mountains Bioproducts Edwards, CO
Fertil-Fibers™	6-4-1	Quattro Environmental Coronado, CA
Sustane®	5-2-4	Natural Fertilizer of America Cannon Falls, MN
Approved Equal ¹	(N) 5 to 7 (P) 1 to 5 (K) 2 to 10	

¹ Approved equal must be within the ranges shown for N-P-K. The cumulative (N) release rate must be no more than 70 percent the first 70 days after incubation (86° F) with 100 percent at 350 days or more.

Straw

Straw must be:

1. Rice

Straw must be free of plastic, glass, metal, rocks, and refuse or other deleterious material.

Tackifier

Tackifier must be:

1. Guar (Plant Based)
2. Psyllium (Plant Based)
3. Starch (Plant Based)
4. Polymeric Emulsion Blend

Tackifier must comply with the following:

1. Nonflammable
2. Nontoxic to aquatic organisms
3. Free from growth or germination inhibiting factors
4. Either a plant-based product or a polymeric-emulsion blend

Tackifier classified as a plant based product must comply with the following:

1. A natural high molecular weight polysaccharide
2. A high viscosity hydrocolloid that is miscible in water
3. Functional for at least 180 days
4. Labeled as either guar, psyllium, or starch

Guar:

1. A guar gum based product derived from the ground endosperm of the guar plant, *Cyamopsis tetragonolobus*
2. Treated with dispersant agents for easy mixing
3. Able to be diluted at the rate of 1 to 5 pounds per 100 gallons of water

Psyllium:

1. Made of the finely ground muciloid coating of *plantago ovata* or *plantago ispaghula* seeds
2. Able to dry and form a firm but rewettable membrane

Starch:

1. A non-ionic, water-soluble granular material derived from corn, potato, or other plant-based source.

Tackifier classified as polymeric emulsion blend must comply with the following:

1. A liquid or dry powder formulation
2. **Anionic with a residual monomer content that is at most 0.05 percent by weight**
3. Functional for at least 180 days
4. A prepackaged product labeled as containing one of the following as the primary active ingredient of the polymeric emulsion blend:
 - 4.1 Acrylic copolymers and polymers
 - 4.2 Polymers of methacrylates and acrylates
 - 4.3 Copolymers of sodium acrylates and acrylamides
 - 4.4 Polyacrylamide (PAM) and copolymer of acrylamide
 - 4.5 Hydrocolloid polymers

Fiber

Fiber must be:

1. Wood

Fiber must comply with the following:

1. Free from lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, or chlorine bleach
2. Free from synthetic or plastic materials
3. At most 7 percent ash

Wood Fiber must comply with the following:

1. Long strand, whole wood fibers, thermo-mechanically processed from clean, whole wood chips
2. Not made from sawdust, cardboard, paper, or paper byproducts
3. At least 25 percent of fibers 3/8 inch long
4. At least 40 percent held on a No. 25 sieve

Coloring Agent

Use a biodegradable, nontoxic coloring agent free from copper, mercury, and arsenic.

CONSTRUCTION

Site Preparation

Immediately prior to applying seed to erosion control (Hydroseed) areas, trash and debris and weeds must be removed.

Removed weeds must be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Application

Apply erosion control (Hydroseed) materials in separate applications in the following sequence:

1. Apply the following mixture with hydroseeding equipment at the rates indicated within 60 minutes after the seed has been added to the mixture:

Seed (Type 1)

Material	Pounds Per Acre (Slope Measurement)
Seed	64
Fiber	400
Organic Fertilizer	1,200

Seed (Type 2)

Material	Pounds Per Acre (Slope Measurement)
Seed	57.5
Fiber	400
Organic Fertilizer	1,200

2. Apply straw at the rate of 2.0 tons per acre based on slope measurements. Incorporation of straw will not be required. Distribute straw evenly without clumping or piling.
3. Apply the following mixture with hydro-seeding equipment at the corresponding rates:

Both Seed Types

Material	Pounds Per Acre (Slope Measurement)
Fiber	400
Tackifier	250

The ratio of total water to total tackifier in the mixture must be as recommended by the manufacturer.

Hydraulic application of erosion control (Hydroseed) materials for rolled erosion control product (Netting) areas must be applied by hose, from the ground. Erosion control (Hydroseed) materials must be applied onto the slope face such that the materials are well integrated into the rolled erosion control product (Netting) and in contact with ground surface. Application must be perpendicular to the slope face such that rolled erosion control product (Netting) materials are not damaged or displaced. Once straw work is started in an area, complete tackifier applications in that area on the same working day.

The Engineer may change the rates of erosion control (Hydroseed) materials to meet field conditions.

For any area where erosion control (Hydroseed) materials are to be applied, the application of all erosion control (Hydroseed) materials to be applied to that area must be completed within 72 hours from when the first materials were applied.

MEASUREMENT AND PAYMENT

Erosion control (Hydroseed) will be measured by the square foot or by the acre, whichever is designated in the Engineer's Estimate. The area will be calculated on the basis of actual or computed slope measurements.

The contract price paid per square foot or acre for erosion control (Hydroseed) includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in erosion control (Hydroseed) complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1. __ EROSION CONTROL (COMPOST BLANKET)

GENERAL

Summary

This work includes removing and disposing of weeds, applying erosion control materials seed and compost to erosion control (Compost Blanket) areas shown on the plans.

Comply with Section 20-3, "Erosion Control," of the Standard Specifications.

The Engineer will designate the ground location of all erosion control (Compost Blanket) areas in increments of one acre or smaller by directing the placing of stakes or other suitable markers. Furnish all tools, labor, materials, and transportation required to adequately indicate the various erosion control (Compost Blanket) locations.

MATERIALS

Compost

The compost producer must be fully permitted as specified under the California Integrated Waste Management Board, Local Enforcement Agencies and any other State and Local Agencies that regulate Solid Waste Facilities. If exempt from State permitting requirements, the composting facility must certify that it follows guidelines and procedures for production of compost meeting the environmental health standards of Title 14, California Code of Regulations, Division 7, Chapter 3.1, Article 7.

The compost producer must be a participant in United States Composting Council's Seal of Testing Assurance program.

Compost may be derived from any single, or mixture of the following feedstock materials:

1. Green material consisting of chipped, shredded, or ground vegetation, or clean processed recycled wood products
2. Biosolids
3. Manure
4. Mixed food waste

Compost feedstock materials to reduce weed seeds, pathogens and deleterious materials as specified under Title 14, California Code of Regulations, Division 7, Chapter 3.1, Article 7, Section 17868.3.

Compost must not be derived from mixed municipal solid waste and must be reasonably free of visible contaminants. Compost must not contain paint, petroleum products, pesticides or any other chemical residues harmful to animal life or plant growth. Compost must not possess objectionable odors.

Metal concentrations in compost must not exceed the maximum metal concentrations listed under Title 14, California Code of Regulations, Division 7, Chapter 3.1, Section 17868.2.

Compost must comply with the following:

Physical/Chemical Requirements

Property	Test Method	Requirement
pH	*TMECC 04.11-A Elastometric pH 1:5 Slurry Method pH Units	6.0–8.0
Soluble Salts	TMECC 04.10-A Electrical Conductivity 1:5 Slurry Method dS/m (mmhos/cm)	0-10.0
Moisture Content	TMECC 03.09-A Total Solids & Moisture at 70+/- 5 deg C % Wet Weight Basis	30-60
Organic Matter Content	TMECC 05.07-A Loss-On-Ignition Organic Matter Method (LOI) % Dry Weight Basis	30–65
Maturity	TMECC 05.05-A Germination and Vigor Seed Emergence Seedling Vigor % Relative to Positive Control	80 or Above 80 or Above
Stability	TMECC 05.08-B Carbon Dioxide Evolution Rate mg CO ₂ -C/g OM per day	8 or below
Particle Size	TMECC 02.02-B Sample Sieving for Aggregate Size Classification % Dry Weight Basis	100% Passing, 3 inch 90-100% Passing, 1 inch 65-100% Passing, 3/4 inch 0 - 75% Passing, 1/4 inch Maximum length 6 inches
Pathogen	TMECC 07.01-B Fecal Coliform Bacteria < 1000 MPN/gram dry wt.	Pass
Pathogen	TMECC 07.01-B Salmonella < 3 MPN/4 grams dry wt.	Pass
Physical Contaminants	TMECC 02.02-C Man Made Inert Removal and Classification: Plastic, Glass and Metal % > 4mm fraction	Combined Total: < 1.0
Physical Contaminants	TMECC 02.02-C Man Made Inert Removal and Classification: Sharps (Sewing needles, straight pins and hypodermic needles) % > 4mm fraction	None Detected

*TMECC refers to "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the United States Compost Council (USCC).

Before compost application, provide the Engineer with a copy of the compost producer's compost technical data sheet and a copy of the compost producer's Seal of Testing Assurance certification.

The compost technical data sheet must include:

1. Laboratory analytical test results
2. List of product ingredients

Before compost application, provide the Engineer with a Certificate of Compliance under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

CONSTRUCTION

Site Preparation

Immediately prior to applying compost to erosion control (Compost Blanket) areas remove trash, debris and weeds.

Removed weeds must be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Application

Apply compost to a uniform thickness.

Erosion control (Compost Blanket) must extend to the edge of retaining sidewalks, walls, curbs, dikes, paving, and to within 4 feet from the flow line of paved and unpaved drainage ditches.

MEASUREMENT AND PAYMENT

Erosion Control (Compost Blanket) will be measured by the cubic yard of compost in the vehicle at the point of delivery in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

The contract price paid per cubic yard for erosion control (Compost Blanket) includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in erosion control (Compost Blanket), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1. FIBER ROLLS

GENERAL

Summary

This work includes installing fiber rolls.

At the option of the Contractor, fiber rolls shall be Type 1 or Type 2.

MATERIALS

Fiber Roll

Fiber roll shall be either:

1. Constructed with a premanufactured blanket consisting of wood excelsior, rice or wheat straw, or coconut fibers or a combination of these materials. The blanket shall be between 6 feet and 8 feet in width and between 65 feet and 95 feet in length. Wood excelsior shall be individual fibers, of which 80 percent shall be 6 inches or longer in length. The blanket shall have a biodegradable jute, sisal, or coir fiber netting. The blanket shall be rolled along the width and secured with jute twine spaced 6 feet apart along the full length of the roll and placed 6 inches

- from the ends of each roll. The finished roll shall be between 8 inches and 10 inches in diameter, a minimum of 20 feet in length, and shall weigh a minimum of 0.5 pound per linear foot. More than one blanket may be required to achieve the finished roll diameter. When more than one blanket is required, blankets shall be jointed longitudinally with an overlap of 6 inches along the length of the blanket.
2. A premanufactured roll of rice or wheat straw, wood excelsior, or coconut fiber encapsulated within a biodegradable jute, sisal, or coir fiber netting. The netting shall have a minimum durability of one year after installation. The netting shall be secured tightly at each end of the roll. Rolls shall be between 8 inches and 12 inches in diameter. Rolls between 8 inches and 10 inches in diameter shall have a minimum weight of 1 pound per linear foot and a minimum length of 20 feet. Rolls between 10 inches and 12 inches in diameter shall have a minimum weight of 3 pounds per linear foot and a minimum length of 10 feet.

Stakes

Wood stakes shall be a minimum of 1" x 1" x 24" in size for Type 1 installation, or a minimum of 1" x 2" x 24" in size for Type 2 installation. Wood stakes shall be untreated fir, redwood, cedar, or pine and cut from sound timber. They shall be straight and free of loose or unsound knots and other defects which would render them unfit for the purpose intended. Metal stakes shall not be used.

Rope

Rope shall be biodegradable, such as sisal or manila, with a minimum diameter of 1/4 inch.

CONSTRUCTION

Installation

Fiber rolls shall be installed as follows:

1. Fiber rolls (Type 1): Furrows shall be constructed to a depth between 2 inches and 4 inches, and to a sufficient width to hold the fiber roll. Stakes shall be installed 24 inches apart along the length of the fiber rolls and stopped at 12 inches from each end of the rolls. Stakes shall be driven to a maximum of 2 inches above, or flush with the top of the roll.
2. Fiber rolls (Type 2): Rope and notched stakes shall be used to restrain the fiber rolls against the slope. Stakes shall be driven into the slope until the notch is even with the top of the fiber roll. Rope shall be knotted at each stake and laced between stakes. After installation of the rope, stakes shall be driven into the slope such that the rope will hold the fiber roll tightly to the slope. Furrows will not be required.
3. Fiber rolls shall be placed [as shown on the plans](#).
4. The bedding area for the fiber rolls shall be cleared of obstructions including rocks, clods, and debris greater than one inch in diameter before installation.
5. Fiber rolls shall be installed approximately parallel to the slope contour.

If the intended function of the fiber rolls to disperse concentrated water runoff and to reduce runoff velocities is impaired, the Contractor shall take action to repair or replace the fiber rolls. Split, torn, or unraveling rolls shall be repaired or replaced. Broken or split stakes shall be replaced. Sagging or slumping fiber rolls shall be repaired with additional stakes or replaced. Locations where rills and other evidence of concentrated runoff have occurred beneath the rolls shall be corrected. Fiber rolls shall be repaired or replaced within 24 hours of identifying the deficiency.

MEASUREMENT AND PAYMENT

Quantities of fiber rolls to be paid for will be determined by the linear foot measured along the centerline of the installed roll. Where fiber rolls are joined and overlapped, the overlap will be measured as a single installed roll.

The contract price paid per linear foot for fiber roll shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing fiber rolls, complete in place, including furrow excavation and backfill, repairing or replacing fiber rolls as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**Attachment HH: Runoff Coefficients and Run-on
Discharge Calculations**

Attachment HH

Computation Sheet for Determining Runoff Coefficients

$$\text{Total Site Area} = \underline{\quad 5 \quad} \quad (\text{A})$$

Existing Site Conditions

$$\text{Impervious Site Area}^1 = \underline{\quad 0.25 \quad} \quad (\text{B})$$

$$\text{Impervious Site Area Runoff Coefficient}^{2,4} = \underline{\quad 0.95 \quad} \quad (\text{C})$$

$$\text{Pervious Site Area}^3 = \underline{\quad 4.75 \quad} \quad (\text{D})$$

$$\text{Pervious Site Area Runoff Coefficient}^4 = \underline{\quad 0.5 \quad} \quad (\text{E})$$

$$\text{Existing Site Area Runoff Coefficient} \frac{(\text{B} \times \text{C}) + (\text{D} \times \text{E})}{(\text{A})} = \underline{\quad 0.52 \quad} \quad (\text{F})$$

Proposed Site Conditions (after construction)

$$\text{Impervious Site Area}^1 = \underline{\quad 0.25 \quad} \quad (\text{G})$$

$$\text{Impervious Site Area Runoff Coefficient}^{2,4} = \underline{\quad 0.95 \quad} \quad (\text{H})$$

$$\text{Pervious Site Area}^3 = \underline{\quad 4.75 \quad} \quad (\text{I})$$

$$\text{Pervious Site Area Runoff Coefficient}^4 = \underline{\quad .54 \quad} \quad (\text{J})$$

$$\text{Proposed Site Area Runoff Coefficient} \frac{(\text{G} \times \text{H}) + (\text{I} \times \text{J})}{(\text{A})} = \underline{\quad .56 \quad} \quad (\text{K})$$

1. Includes paved areas, areas covered by buildings, and other impervious surfaces.
2. Use 0.95 unless lower or higher runoff coefficient can be verified.
3. Includes areas of vegetation, most unpaved or uncovered soil surfaces, and other pervious areas.
4. See the table on the following page for typical C values.

Attachment HH

Computation Sheet for Determining Run-on Discharges

Existing Site Conditions

Area Runoff Coefficient	=	<u>0.52</u>	(A)
Area Rainfall Intensity	=	<u>1.6 in/hr</u>	(B)
Drainage Area	=	<u>5 acres</u>	(C)
Site Area Run-on Discharge	(A) x (B) x (C)	=	<u>4.2 cfs</u> (D)

