APPLICATION FOR CERTIFICATION

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-6

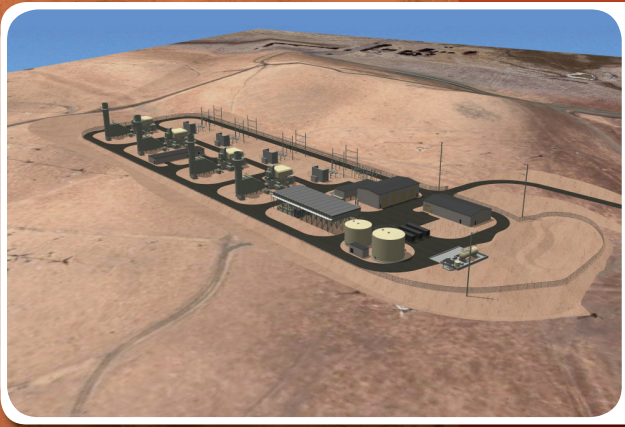
SUBMITTED TO THE

California Energy Commission

FOR THE

Mariposa Energy Project

(09-AFC-03C)



SUBMITTED BY

Mariposa Energy, LLC

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Biological Resources Mitigation Implementation and Monitoring Plan for the Mariposa Energy Project (09-AFC-3C)

Prepared for

Mariposa Energy, LLC

June 2011

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Contents

Section **Page**

Acronyms and Abbreviations ..... **vii**

Preface ..... **ix**

1. Purpose and Background of the BRMIMP **1-1**

2. Project Description and Schedule **2-1**
- 2.1 Project Description 2-1
- 2.2 Project Schedule 2-2

3. Summary of Biological Resources **3-1**
- 3.1 Existing Vegetation, Wildlife, and Habitats 3-1
  - 3.1.1 Power Plant and Offsite Facilities 3-1
- 3.2 Jurisdictional Waters of the United States 3-2
  - 3.2.1 Surveys 3-2
  - 3.2.2 Wetlands and Other Waters 3-3
  - 3.2.3 Impacts on Jurisdictional Waters 3-5
- 3.3 Special-status Species 3-6
  - 3.3.1 Special-status Wildlife 3-6
  - 3.3.2 Special-Status Plants 3-7

4. Authority and Lines of Communication **4-1**
- 4.1 Definitions of Participants 4-1
- 4.2 Responsibilities of the Participants 4-3
  - 4.2.1 Designated Biologist Selection 4-3
  - 4.2.2 Designated Biologist Duties 4-4
  - 4.2.3 Biological Monitor Selection (BIO-3) 4-5
  - 4.2.4 Agency Responsibilities 4-5
- 4.3 Authority and Lines of Communication 4-6
  - 4.3.1 Regulatory Agencies 4-6
  - 4.3.2 Roles and Authority of the Designated Biologist and Biological Monitors 4-6
  - 4.3.3 Roles and Authority of the Project Owner/PG&E/BBID Construction Personnel 4-7

5. Worker Environmental Awareness Program (BIO-5) **5-1**
- 5.1 Program Overview 5-1
- 5.2 Documentation of Training 5-1
- 5.3 USFWS BO Minimization Measure 5 5-2

6. Preconstruction Surveys and Reporting **6-1**
- 6.1 Preconstruction Surveys (USFWS BO Minimization Measure 2) 6-1
- 6.2 Nesting Birds (BIO-8) 6-1

6.3 California Tiger Salamander and California Red-legged Frog 6-1
6.3.1 Condition of Certification BIO-10 6-1
6.3.2 USFWS BO Minimization Measure 4 6-2
6.4 Western Pond Turtle (BIO-11) 6-2
6.5 Burrowing Owl (BIO-12) 6-2
6.6 American Badger (BIO-13) 6-3
6.7 San Joaquin Kit Fox 6-3
6.7.1 Condition of Certification BIO-14 6-3
6.7.2 USFWS BO Minimization Measure 3 6-4
6.8 Swainson's Hawk (BIO-15) 6-4

7. Impact Avoidance and Minimization Measures 7-1
7.1 General Measures 7-1
7.1.1 Condition of Certification BIO-7 7-1
7.1.2 USFWS BO Minimization Measures 8 and 21 7-2
7.2 Best Management Practices for Wetlands and Waters 7-3
7.2.1 Condition of Certification BIO-7 7-3
7.2.2 USFWS BO Minimization Measures 9, 14, 15, 17, 20, and 26 7-5
7.3 Staking and Flagging of Exclusion Zones 7-6
7.4 Construction Work Windows 7-7
7.5 Construction and Operational Lighting 7-7
7.5.1 USFWS BO Minimization Measures 22 and 23 7-7
7.6 Construction and Operational Noise 7-8
7.7 Species-specific Measures 7-8
7.7.1 Avoid Harassment or Harm to California Tiger Salamander and California Red-legged Frog 7-8
7.7.2 Avoid Harassment or Harm to San Joaquin Kit Foxes 7-12
7.7.3 Bird Nest Monitoring 7-16
7.7.4 Burrowing Owl Impact Avoidance and Minimization Measures (BIO-12) 7-17
7.7.5 Western Pond Turtle Measures Impact Avoidance and Minimization Measures (BIO-11) 7-18
7.7.6 Fairy Shrimp Surveys or Avoidance and Compensatory Mitigation (BIO-9) 7-18
7.8 Revegetation and Restoration 7-19
7.8.1 Condition of Certification BIO-18 7-19
7.8.2 USFWS BO Minimization Measure 13 7-19
7.9 Compliance with USACE Section 404 and RWQCB Section 401 7-20
7.9.1 USACE Section 404 Permit Conditions 7-21
7.9.2 CVRWQCB Section 401 Permit Conditions 7-23

8. Compensation for Habitat and Species Impacts 8-1
8.1 Condition of Certification BIO-16 8-1
8.2 USFWS BO Mitigation Measure 27 8-2

9. Construction Monitoring and Reporting Responsibilities 9-1
9.1 Scope of Monitoring 9-1
9.1.1 USFWS BO Minimization Measure 10 9-3

9.2 Conflict Resolution 9-3
9.3 Summary of Reporting Responsibilities of Construction Monitoring 9-3
9.3.1 USFWS BO Minimization Measure 11 9-4
9.4 Reporting of Injured Wildlife 9-4
9.5 Spill Response Emergency Procedures 9-5

10. Post-construction Monitoring and Reporting Responsibilities 10-1

11. Implementation Monitoring/Verification Program 11-1

12. Facility Closure 12-1

13. Modifications to the BRMIMP 13-1

14. References 14-1

Appendixes

A CEC Biological Conditions of Certification, Agency Agreements/Permits
B Sensitive Biological Resource Maps
C Satellite Imagery Showing Preconstruction Conditions
D Resumes of Designated Biologist and Biological Monitors
E Wildlife Observation Form
F Noncompliance Resolution Report
G California Red-legged Frog and California Tiger Salamander Management Plan
H San Joaquin Kit Fox Monitoring and Management Plan
I Bird Nest Monitoring Plan
J Burrowing Owl Mitigation and Monitoring Plan

Tables

2-1 Project Milestone Schedule
3-1 Potential Jurisdictional and Non-jurisdictional Wetland and Waters Identified in the Project Study Area
4-1 Mariposa Energy Project Personnel and Agency Contacts
4-2 Laws, Ordinances, Regulations, and Standards Applicable to the Mariposa Energy Project
7-1 Exclusion Zones
8-1 Compensation Acreages for Construction and Operation
11-1 Monitoring Tasks and Criteria that Determine Successful Implementation of Mitigation Measures

Figures

2-1 Project Vicinity Map
2-2 Project Design Features
3-1 Special-Status Species Recorded in the Project Area

Acronyms and Abbreviations

AFC	Application for Certification
APLIC	Avian Power Line Interaction Committee
BBID	Byron Bethany Irrigation District
BMP	best management practice
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
CBOC	California Burrowing Owl Consortium
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
cogen	cogeneration
CPM	Compliance Project Manager
CVRWQCB	Central Valley Regional Water Quality Control Board
ESA	Endangered Species Act
kV	kilovolt
LORS	laws, ordinances, regulations, and standards
MBTA	Migratory Bird Treaty Act
MEP	Mariposa Energy Project
MW	megawatt
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas and Electric Company
Project	Mariposa Energy Project
Project Owner	Mariposa Energy, LLC
SAA	Streambed Alteration Agreement
Service	U.S. Fish and Wildlife Service (see also USFWS)
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USC	United States Code

USFWS	U.S. Fish and Wildlife Service (see also Service)
USGS	U.S. Geological Survey
WEAP	Worker Environmental Awareness Program

Preface

This report presents the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) for Mariposa Energy, LLC's (the Project Owner) Mariposa Energy Project (MEP or Project) in Alameda County. It is being submitted to comply with Condition of Certification BIO-6 as set forth in the California Energy Commission's (CEC) Supplemental Staff Assessment for the MEP dated December 2010. It is anticipated that the CEC will approve the Project and issue a license for the construction and operation of MEP in early 2011.

The purpose of the BRMIMP is to identify all mitigation, monitoring, and compliance measures related to biological resources that will be implemented during facility construction and operation. This BRMIMP addresses all components of the Project and will be amended if necessary to account for new information or changing conditions. Laws, ordinances, regulations, and standards (LORS) applicable to the Project are provided in Table 4-2. A description of the Worker Environmental Awareness Program (WEAP), required by BIO-5, is also addressed in this document. Also included in this BRMIMP are the California red-legged frog and California tiger salamander management plan (see Section 7.7.1 and Appendix G), as required by BIO-10; the San Joaquin kit fox management plan (see Section 7.7.2 and Appendix H), as required by BIO-14; the bird nest monitoring plan (see Section 7.7.3 and Appendix I), as required by BIO-8; and the burrowing owl management plan (see Section 7.7.4 and Appendix J), as required by BIO-12.

This BRMIMP incorporates the terms and conditions of the following license, permits, opinions, and agreements, each provided in Appendix A:

- CEC – Biological Resource Findings, Conclusions, and Conditions of Certification from the Commission Decision in Docket No. 09-AFC-03 (see Appendix A)
- U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 Nationwide Permit work authorization including a U.S. Fish and Wildlife Service (USFWS) Biological Opinion (pursuant to Section 7 of the federal Endangered Species Act [ESA]).
- Central Valley Regional Water Quality Control Board (CVRWQCB) Clean Water Act Section 401 Water Quality Certification

SECTION 1

Purpose and Background of the BRMIMP

This BRMIMP summarizes the sensitive biological resources that potentially will be affected by the Project and the measures required to avoid, minimize, or compensate for impacts on these resources. The biological resources mitigation and monitoring procedures discussed in this plan were outlined in the MEP AFC filed with the CEC on June 15, 2009 (Mariposa Energy, 2009) and in the Supplemental Staff Assessment (CEC, 2010), which contains the CEC staff's independent analysis and recommendations on the MEP.

This BRMIMP describes the measures that will be implemented by the Project Owner and its employees and contractors during the construction, operation, and closure of the Project. This BRMIMP addresses all features of the Project, including construction of the MEP power plant site and associated linear facilities (electric transmission line, natural gas supply pipeline, and water supply pipeline). The BRMIMP is being implemented to ensure that the Project is completed in a manner that minimizes and/or avoids impacts on the natural environment by appropriate compliance with terms and conditions of various permits and approvals.

Consistent with the requirements of BIO-6, the BRMIMP includes the following primary components:

- A summary of the MEP project description
- Responsibilities of participants, qualifications of the Designated Biologist and Biological Monitor, and lines of communication
- An overview of the WEAP
- An overview of sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure
- Preconstruction survey and reporting responsibilities, including a description of timing and location of surveys
- All biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the Project Owner
- All biological resource CEC Conditions of Certification, applicant proposed measures, and the terms and conditions of applicable local, state, and federal permits
- All biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements
- A description of impact avoidance, minimization, and mitigation measures for sensitive biological resources, noise, fugitive dust, and lighting impacts

- All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction (see Appendix B)
- Duration and frequency of construction monitoring and reporting responsibilities to ensure proper implementation of mitigation measures and protection of sensitive resources
- Post-construction monitoring and reporting responsibilities, including details on post-construction cleanup and reclamation techniques
- Aerial photographs before and after construction (see Appendix C), or other verifiable means to document all areas to be disturbed during project construction activities
- Wildlife rehabilitation procedures
- Performance standards to be used to help decide whether and when proposed mitigation is or is not successful and remedial measures (for example, increased monitoring, changes to the construction schedule, work stoppages) to be implemented if performance standards are not met
- A process for proposing plan modification to the Compliance Project Manager (CPM) and appropriate agencies for review and approval
- A preliminary discussion of biological resources-related facility closure measures
- References
- Contact list and copies of biological resource-related permits

The CPM will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits will be submitted to the CPM within 5 days of their receipt, and the BRMIMP will be revised or supplemented to reflect the permit condition within 10 days of their receipt by the Project Owner. Ten days prior to site and related facilities mobilization, the revised BRMIMP will be resubmitted to the CPM.

SECTION 2

Project Description and Schedule

2.1 Project Description

MEP will be a nominal 200-megawatt (MW) simple-cycle generating facility consisting of four General Electric Energy LM6000 PC-SPRINT natural gas-fired combustion turbine generators and associated equipment. The facility will be located in northeastern Alameda County, California, on an approximately 10 acres of a 158-acre parcel that consists of non-irrigated grazing land, a former wind-turbine development, and an existing cogeneration (cogen) power plant (Figure 2-1). The MEP site is approximately 7 miles northwest of Tracy, 7 miles east of Livermore, 6 miles south of Byron, and approximately 2.5 miles west of the community of Mountain House.

Temporary construction facilities will include a 9.2-acre worker parking and laydown area immediately east of the MEP site and a 1-acre water supply pipeline parking and laydown area located at the Byron Bethany Irrigation District (BBID) headquarters facility on Bruns Road. Equipment staging for the construction of the transmission line and gas line will take place in the 9.2-acre laydown area. The main laydown area will be in use for approximately 14 months, including during the wet season. Because heavy machinery will be used at the site, portions of the 9.2-acre laydown area will require gravel or road base with an underlayment of geotextile fabric for stabilization. Topsoil stripped from the laydown will be stockpiled onsite inside the laydown area. During project completion, ripping will be performed to a depth no less than 2 feet to reduce compaction of underlying native soils. The resulting roughed soil surface will be smoothed and covered with salvaged topsoil removed from the laydown area during initial ground-breaking activities. The base rock and fabric underlayment will be removed before ripping and replacing the topsoil. This procedure will facilitate post-construction restoration. The temporary laydown area for the water supply pipeline will be located within an existing maintenance yard at BBID's headquarters.

The existing gravel road from Bruns Road provides access to the Byron Cogen Power Plant. A portion of this gravel road will be improved and used during construction and operation of MEP. Improvements resulting in a permanent loss of grassland habitat include widening the road from approximately 10 feet to about 20 feet, and adding an asphalt layer. Temporary overland access routes to the transmission line corridor and gas line corridor will originate from this main road, and all access to the offsite facilities work areas will occur in upland grassland areas only. All nearby seasonal wetlands, such as vernal pools, will be avoided during overland access. Access to the water supply pipeline corridor will be from existing roads including Bruns Road, a portion of the onsite main access road, and a BBID agricultural dirt road.

In addition to the new power plant and associated equipment, the Project includes the following offsite facilities, also as shown in Figure 2-2:

- A new 580-foot-long 8-inch natural gas pipeline connection with Pacific Gas & Electric's (PG&E) existing high-pressure gas line;
- A new 1.8-mile-long 10-inch water supply pipeline connection with BBID's Canal 45; and
- An approximately 0.7-mile-long single-circuit, three-phase, 230-kilovolt (kV) transmission line interconnection.

The gas pipeline will run generally to the east from the project site, staying on the 158-acre project parcel and will be installed in a relatively shallow trench. The water supply pipeline will be placed in or along Bruns Road and run from Canal 45 south to the power plant site. The water supply pipeline will cross seven culverts using either underground tunneling (pipe ramming) or open-cut trenching. From Bruns Road, the water supply pipeline will follow the existing access road to the power plant site. The 230-kV line will run generally north from the project site, staying east of the Byron Power Cogen Plant, crossing Kelso Road, and staying east of the PG&E Bethany Compressor Station. It will turn west just north of the Kelso Substation, then turn south to the final interconnect point at PG&E's Kelso Substation.

2.2 Project Schedule

A project milestone schedule showing construction activities, along with surveys and monitoring designed to protect biological resources, is presented in Table 2-1. A complete discussion of preconstruction surveys is included in Section 6 of this plan. A list of the key construction events is also provided in Table 2-1, along with protection measures and construction limitations identified for biological resources.

Construction of the generating facility, from site preparation and grading to commercial operation, is expected to take place from May 2011 to July 2012, lasting no more than 14 months. The construction activity scheduled has been optimized to avoid or minimize disturbance to special-status species in coordination with the USFWS and CDFG.

TABLE 2-1
Project Milestone Schedule
Mariposa Energy Project

Event Description	Expected Dates	Essential Biological Resource Protection Measures
Date of expected certification by CEC	Second Quarter 2011	None applicable
Start of rainy season	October 15 (Typical)	Typical end date of permitted water crossings. Project site and linears will have Stormwater Pollution Prevention Plan (SWPPP) protection measures implemented prior to the start of the rainy season. Full-time onsite biological monitoring is required by USFWS, CDFG, and CEC until end of rainy season.
End of rainy season	April 15 (Typical)	Typical start date of permitted water crossings.

TABLE 2-1
Project Milestone Schedule
Mariposa Energy Project

Event Description	Expected Dates	Essential Biological Resource Protection Measures
Construction of the Project boundaries, clearing and grubbing, and sediment/wildlife fence installation.	Second Quarter 2011	Biological Monitor required to conduct preconstruction surveys for wildlife prior to any ground disturbance on the Project. No work to be performed in or adjacent to sensitive habitat areas marked by the biologist.
Construction of laydown, parking, and construction offices	Second Quarter 2011	Biological Monitor required to clear/survey area for wildlife prior to any ground disturbance on the Project and when construction inactivity exceeds three weeks in any given area.
Power plant construction	Second Quarter 2011	Biological Monitor required to clear/survey area for wildlife prior to any ground disturbance on the Project and perform daily checks to make sure no wildlife in pathway of work, under equipment, in trenches, etc. Monitor will be present during work outside of fences. Perform daily/weekly site inspections to ensure that Conditions of Certification and other agency permit conditions are being followed.
Transmission line construction	Second Quarter 2011	Biological Monitor required to clear/survey area for wildlife prior to any ground disturbance on the Project and perform daily checks to make sure no wildlife in pathway of work, under equipment, in trenches, etc. Monitor will be present during work outside of fences. Perform daily site inspections to ensure that Conditions of Certification and other agency permit conditions are being followed.
Natural gas line construction	Second Quarter 2011	Biological Monitor required to clear/survey area for wildlife prior to any ground disturbance on the Project. Perform daily/weekly site inspections to ensure that Conditions of Certification and other agency permit conditions are being followed.
Water supply pipeline construction	First Quarter 2011	Biological Monitor required to clear/survey area for wildlife prior to any ground disturbance on the Project and perform daily checks to make sure no wildlife in pathway of work, under equipment, in trenches, etc. Monitor will be present during work outside of fences. Perform daily site inspections to ensure that Conditions of Certification and other agency permit conditions are being followed.
Startup and test	First Quarter 2012	Not applicable

TABLE 2-1
Project Milestone Schedule
Mariposa Energy Project

Event Description	Expected Dates	Essential Biological Resource Protection Measures
Biological resources post-construction report	Due 30 days after construction is complete (expected to be third quarter 2012)	Designated biologist to conduct a post-construction site visit to determine whether habitats are restored per restoration success criteria. Also pre- and post-construction conditions will be verified by aerial photography, GPS foot survey or other verifiable means.
Commercial Operation	Third Quarter 2012	Not applicable

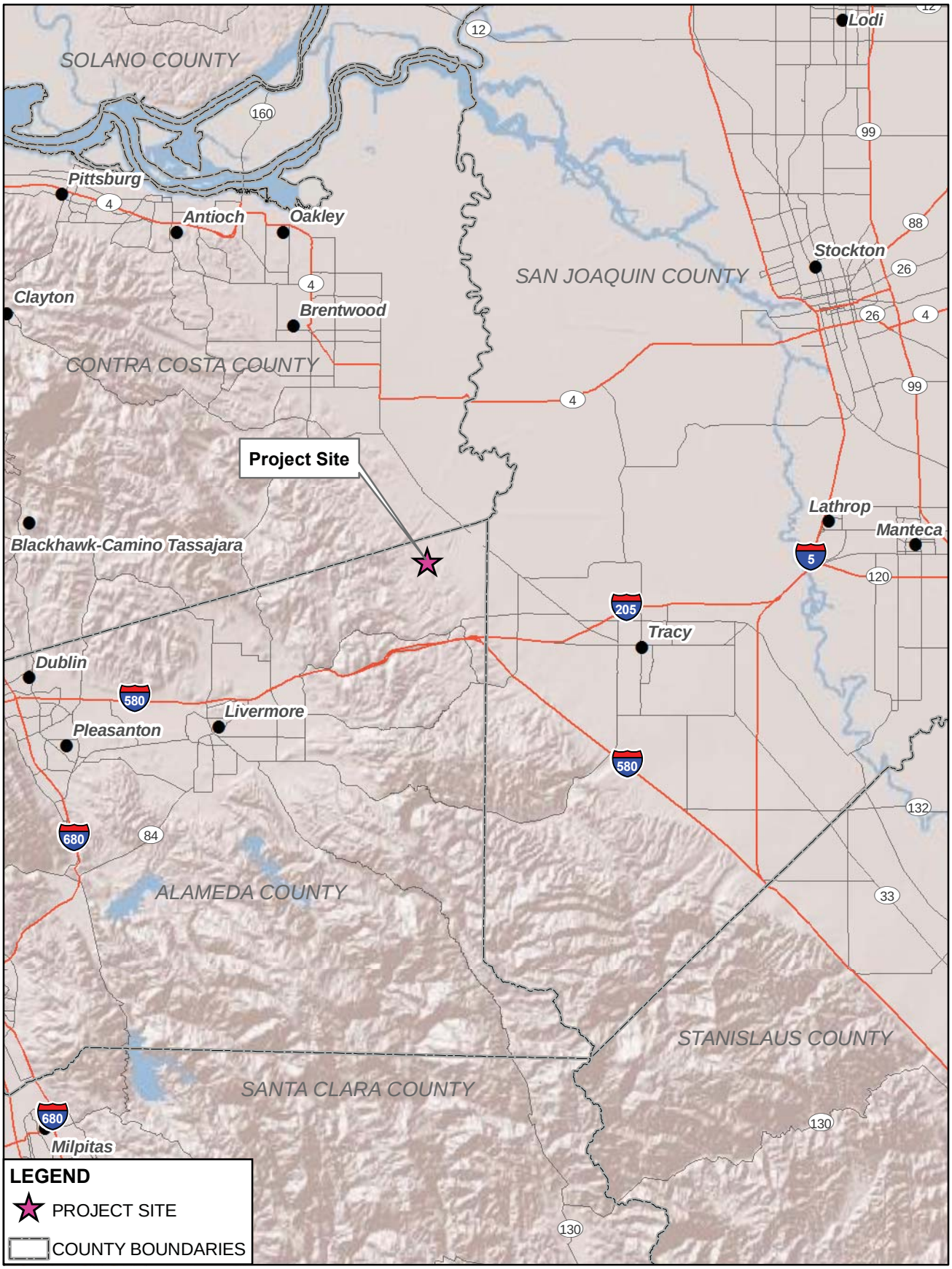

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FIGURE 2-1
PROJECT VICINITY
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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LEGEND

- POWER POLE LOCATION
- PUMP STATION/TURNOUT STRUCTURE
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

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FIGURE 2-2
PROJECT DESIGN FEATURES
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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SECTION 3

Summary of Biological Resources

3.1 Existing Vegetation, Wildlife, and Habitats

3.1.1 Power Plant and Offsite Facilities

MEP will be located just above the Central Valley floor in a region of low-lying foothills below the Altamont Hills. Non-native annual grassland characterizes the MEP site and laydown area, gas pipeline corridor, and transmission line corridor. Currently, the 158-acre project parcel is actively managed for cattle grazing. At the MEP site, California ground squirrel (*Spermophilus beecheyi*) burrows are abundant. Small mammal burrows such as these provide potential refuge sites for California red-legged frog and California tiger salamander, and potential breeding habitat for western burrowing owl (*Athene cunicularia*), San Joaquin kit fox (*Vulpes macrotis mutica*), and American badger (*Taxidea taxus*). Although the MEP site is treeless, riparian habitat and landscaping trees found on adjacent properties within 1 mile provide nesting opportunities for a variety of avian species. A known Swainson's hawk (*Buteo swainsoni*) nest site is located in a large eucalyptus tree approximately 0.5 mile west of the facility site.

Potentially jurisdictional waters of the United States (including wetlands) occur in the project area, including seasonal, intermittent, and perennial water bodies. Cattle stock ponds, ephemeral and intermittent drainages, vernal pools, and other seasonal wetlands, and seasonal swales within and adjacent to the project area provide breeding opportunities for the special-status aquatic species known to occur in the project area. California red-legged frog and California tiger salamander are known from area ponds. Western pond turtle (*Actinemys marmorata*) could occur in the perennial ponds as well. During site surveys, vernal pool branchiopods were observed onsite in a seasonal wetland area and offsite in a seasonal alkali wetland.

Four well-defined intermittent and ephemeral drainages intersect the water supply pipeline route along Bruns Road, either through concrete box culverts or corrugated metal pipe culverts. Each drainage is shown as a blue line on a U.S. Geological Survey (USGS) topographic map, indicating a waterway. All four features converge into a single channelized ditch outside the project area and flow northerly into Italian Slough, a delta waterway. CDFG's Byron Conservation Bank is located along Bruns Road, upstream of the D-3 and D-4 Bruns Road crossings. A stream restoration effort at Byron Conservation Bank resulted in occupied breeding habitat for California red-legged frog. No aspect of MEP will impact the Byron Conservation Bank.

A seasonal alkali wetland exists east of the proposed gas pipeline route on the Project parcel. The northern portion of this wetland supports playa pool conditions; it is largely unvegetated, has salt encrustations, and is fringed by halophytes including salt grass (*Distichlis spicata*). The wetland is hydrologically connected to an offsite ephemeral drainage and cattle stock pond. Similar playa conditions exist in an alkali meadow found just north of PG&E's Kelso Substation. All alkali wetland areas were recognized early in the design

process as potentially sensitive habitat, and Mariposa Energy has specifically designed the transmission line and gas pipeline to avoid them.

Cattle grazing is the dominant land use in the project area. Typically these managed grasslands are characterized by introduced Mediterranean grasses such as brome (*Bromus diandrus, B. hordeaceous),* wild oat (*Avena fatua),* and barley (*Hordeum murinum*). Dominant forbs also tend to be introduced species such as storksbill (*Erodium cicutarium*), wild radish (*Raphanus sativa*), and mustard (*Brassica nigra*). Other species identified during the December 2008 reconnaissance survey include Italian thistle (*Carduus pycnocephalus*), yellow star-thistle (*Centaurea solstitialis*), Great valley gumweed (*Grindelia camporum*), black mustard (*Brassica nigra*), filarees (*Erodium botrys, E. cicutarium*), horehound (*Marrubium vulgare*), soft chess (*Bromus hordeaceus*), and foxtail barley (*Hordeum murinum* ssp. *leporinum*).

The power plant site and most of the proposed linear facility alignments provide foraging, cover, and some nesting habitat for a variety of common species. Mammals detected during numerous site surveys include California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), and coyote (*Canis latrans*). The project site lacks shrubs and trees, but could provide nesting habitat for ground-nesting birds or birds that nest in bulrush or cattail, which are present along the water supply pipeline route. The project area provides foraging or roosting habitat for a variety of bird species; some of the species observed in the project area include mallard (*Anas platyrhynchos*), black-necked stilt (*Himantopus mexicanus*), long-billed curlew (*Numenius americanus*), marsh wren (*Cistothorus palustris*), loggerhead shrike (*Lanius ludovicianus*), red-winged blackbird (*Agelaius phoeniceus*), and lark sparrow (*Chondestes grammacus*). Raptors detected foraging or roosting at the site include burrowing owl (*Athene cunicularia*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), and northern harrier (*Circus cyaneus*).

3.2 Jurisdictional Waters of the United States

3.2.1 Surveys

Surveys were conducted for potential waters of the United States, including wetlands, by CH2M HILL biologists Russell Huddleston and Todd Ellwood on December 29, 2008, and February 19, April 8, April 15, and June 4, 2009 (CH2M HILL, 2009). The approximately 69-acre study area included 41-acre area in which the power plant facility, laydown area, and natural gas pipeline will be located, as well as 100-foot-wide survey corridors along the transmission line and water supply pipeline alignments.

The wetland field surveys were conducted following the survey methodology described in the 1987 Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (USACE, 2008). Results of the survey are summarized below. The wetland delineation was submitted to the USACE for verification in September 2009. Jurisdictional and non-jurisdictional wetlands and waters were identified in nearly all project areas.

3.2.2 Wetlands and Other Waters

Based on the observations made during the field surveys, 0.251 acre of potential USACE jurisdictional drainage wetlands, 0.166 acre of alkali sink wetland, and 0.075 acre of potential jurisdictional waters of the United States occur within the approximately 69-acre study area. Table 3-1 below presents the acreage and a brief description of each feature delineated inside the study area. An additional 0.228 acre of potentially non-jurisdictional areas, including isolated seasonal wetlands and swales, three erosional channels and a small section of Canal 45, were also identified in the study area. The following sections provide descriptions of the wetlands, waters, and other features that were identified and mapped in the study area.

TABLE 3-1
Potential Jurisdictional and Non-jurisdictional Wetland and Waters Identified in the Study Area
Mariposa Energy Project

Feature	Acreage	Description
Potential Jurisdictional Waters of the United States		
Drainage Wetland (D-1)	0.021	Defined drainage channel characterized by saltgrass within the channel; blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Drainage Wetland (D1a)	0.006	Weakly expressed drainage swale characterized by saltgrass, Mediterranean barley, soft chess and foxtail barley, blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Drainage Wetland (D-2)	0.032	Small swale like feature characterized by saltgrass, Italian ryegrass and meadow barley with some scouring evident along the channel; blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Drainage Wetland (D-3)	0.138	Shallow well defined drainage channel characterized by cosmopolitan bulrush with scattered rabbitsfoot grass, curly dock and cattail. Palustrine Emergent Permanently Flooded wetland on the National Wetland Inventory Maps and is a blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Drainage Wetland (D-4)	0.053	Shallow, well defined channel characterized by dense cattails growing in the center of the channel with dense saltgrass growing around the outer edges; Palustrine Emergent Semi-Permanently Flooded wetland on the National Wetland Inventory Maps and is a blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Waters of the United States (D-1b)	0.023	Defined channel with steep cut banks, largely devoid of vegetation, continuation of Drainage 1 on the north side of Kelso Road, blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Waters of the United States (D-2a and Ditch 1)	0.052	Small, well defined channel with defined bed and bank, channel is a continuation of Drainage 2, portion of the original channel has been realigned through the PG&E facility to the west; blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough

TABLE 3-1
Potential Jurisdictional and Non-jurisdictional Wetland and Waters Identified in the Study Area
Mariposa Energy Project

Feature	Acreage	Description
Alkali Sink Wetland (ASW-1)	0.166	Wetland area is characterized by saltgrass and common rusty molly with scattered sand spurry, alkali heath and common spikeweed; strongly alkaline soils; shown as a Palustrine Unconsolidated Shore Seasonally Flooded wetland on the National Wetland Inventory Map
Total	**0.491**	
Potential Non-Jurisdictional Waters of the United States		
Seasonal Wetland (SWL-1)	0.018	Two shallow, well defined basins along access road to the Byron Power Cogen Plant connected by a corrugated metal pipe culvert; slender popcorn flower and other vernal pool plants scattered within the basin; no hydrologic connection or significant nexus with any other drainage or water features
Seasonal Wetland (SWL-2)	0.007	Shallow weakly expressed topographic low area with scattered coyote thistle and Italian ryegrass, adjacent to transmission line laydown area; no hydrologic connection or significant nexus with any other drainage or water features
Swale (SW-1)	0.063	Low topographic swale characterized by Mediterranean barley; appears to convey low volume, short duration flows in response to storm events but lacks evidence of prolonged inundation; water flows west and ponds in low areas around the Byron Power Cogen Plant; no hydrologic connection or significant nexus with any other drainage or water features
Swale (SW-2)	0.045	Low topographic swale characterized by Mediterranean barley; appears to convey low volume, short duration flows in response to storm events but lacks evidence of prolonged inundation; water flows west and ponds in low areas around the Byron Power Cogen Plant; no hydrologic connection or significant nexus with any other drainage or water features
Swale (SW-3)	0.012	Small weakly expressed swale from 12-inch diameter culvert under Kelso Road; characterized by soft chess, Italian ryegrass and saltgrass; appears to convey very low volume flow for very short durations only in response to heavy rainfall
Erosional Channel (E-1)	0.002	Small weakly expressed erosional rill resulting from direct runoff from the PG&E Kelso substation
Erosional Channel (E-2)	0.013	Erosional channel resulting from direct runoff from the PG&E Kelso substation
Erosional Channel (E-3)	0.022	Large deeply scoured erosional channel resulting from direct runoff from the PG&E Kelso substation
Canal 45	0.046	Constructed and routinely maintained irrigation canal
Total	**0.228**	

3.2.3 Impacts on Jurisdictional Waters

Four aquatic features will be impacted during construction of the Project, including SWL-1, D-2, ASW-1, and Canal 45. The Project Owner requested a preliminary jurisdictional determination from the USACE on September 29, 2009, which ultimately resulted in all wetlands and waters listed in Table 3-1 being USACE jurisdictional. It was assumed during other permitting efforts that all of these features were also jurisdictional by the State Water Resources Control Board (SWRCB) and only D-1, D-2, D-3, D-4, and Canal 45 by CDFG.

The entire SWL-1 north of the proposed power plant site will be permanently removed during installation of the MEP stormwater detention basin and as a result of access route disturbance around the north side of the MEP site. Open-cut trenching will affect D-2 and ASW-1, and excavation for and installation of a new concrete intake structure will affect Canal 45. The trench width is expected to be approximately 2 feet and depth is approximately 4 feet. The new pipe at the D-2 and ASW-1 drainage crossings will be encased with approximately 6 inches of concrete for scour protection, backfilled to original grade with native or import material. The other jurisdictional features along the water line (e.g., D-1, D-3, SW-3 and D-4) will be avoided. Their avoidance entails pipe ramming the new pipeline beneath the culverts at D-1, D-3, SW-3 and D-4 within the road bed. Pipe ramming is a process where two access pits will be excavated approximately 10 feet from either side of the culvert within the roadbed. A metal casing is then pneumatically driven (repeated percussive blows) horizontally from one pit to the other a minimum of 6 inches beneath the culvert, followed by insertion of new water line pipe into the sleeve. Backfilling includes concrete slurry around the metal casing and fill dirt in the access pits. In general, pipe ramming is necessary where installation of the pipe within the drainage area would be very difficult due to space constraints, especially on the box culverts where wing walls extend past the end of culverts. Any dewatering required during pipeline construction will occur in accordance with the RWQCB NPDES stormwater permit requirements.

Stormwater collected in power plant process areas will drain into the general plant drain system to be recycled. Stormwater runoff that is outside the process areas will be captured in the site stormwater drainage system and conveyed to the onsite extended detention basin located at the north end of the MEP site. The extended detention basin is designed to release site stormwater runoff from the design storm capture volume over a 48-hour period. It is not designed to hold water for longer periods. The multi-stage discharge structure will discharge to one of two swales routing upgradient stormwater around the site. All surfaces within the site perimeter (including the surface of the perimeter road) will drain to the extended detention basin, with the exception of the segregated process area drainage described previously. Two grass-lined swales will convey upgradient stormwater drainage around the MEP site; site runoff will not drain directly to these swales. Stormwater will be released from the swales back to the natural drainage course through rip-rap energy dissipaters.

3.3 Special-status Species

Several databases were reviewed to identify special-status species that may be affected by MEP. Special-status species that could occur in the project area were identified by regional lists provided by the USFWS (USFWS, 2009), by CDFG's California Natural Diversity Database (CNDDB) (CDFG, 2009), and by the California Native Plant Society (CNPS) (CNPS, 2009) (Figure 3-1). The special-status species database searches included the Clifton Court Forebay, Brentwood, Woodward Island, Holt, Union Island, Tracy, Midway, Altamont, and Byron Hot Springs USGS 7.5-minute topographic quadrangles.

The designation of special-status species includes all federal- and state-listed species, candidate species, and species proposed for listing under the federal and California ESAs; state species of special concern; and plant species designated as Rare, Threatened, or Endangered (List 1B or List 2) by CNPS.

Special-status species include those listed as threatened or endangered under the federal or state ESAs, species proposed for listing, California Species of Special Concern, and other species that have been identified by CNPS, USFWS, or CDFG or other agencies as unique or rare.

3.3.1 Special-status Wildlife

The site provides habitat for several special-status wildlife species. The evidence that supports this conclusion includes numerous CNDDB occurrences, several site surveys conducted by CH2M HILL biologists confirming presence of suitable habitats, direct observation of species by CH2M HILL biologists during surveys (species listed below with an asterisk were observed during site surveys), and personal communication with USFWS and CDFG biologists. Special-status species known, presumed, or highly likely to use the project site for foraging, breeding, cover, or dispersal include:

- **Western pond turtle (*Emys marmorata*)**, a California Species of Concern (aquatic and upland habitats, including area stock ponds and portions of D-4 along the water supply pipeline alignment)
- **California tiger salamander (*Ambystoma californiense*)**, federally and state listed as threatened (aquatic and surrounding open grasslands and/or oak savannah habitats, including potential aestivation habitat throughout the project area)
- **California red-legged frog (*Rana draytonii*)**, a California Species of Concern and federally listed as threatened (aquatic and surrounding riparian and open grassland habitats, including potential dispersal and aestivation habitat throughout the project area)
- **American badger (*Taxidea taxus*)**, a California Species of Concern (open grassland habitats, including potential denning or forage habitat throughout the project area)
- **San Joaquin kit fox (*Vulpes macrotis mutica*)**, state listed as threatened and federally listed as endangered (valley and foothill grassland or mixed shrub/grassland habitats including potential denning and foraging habitat throughout the project area)

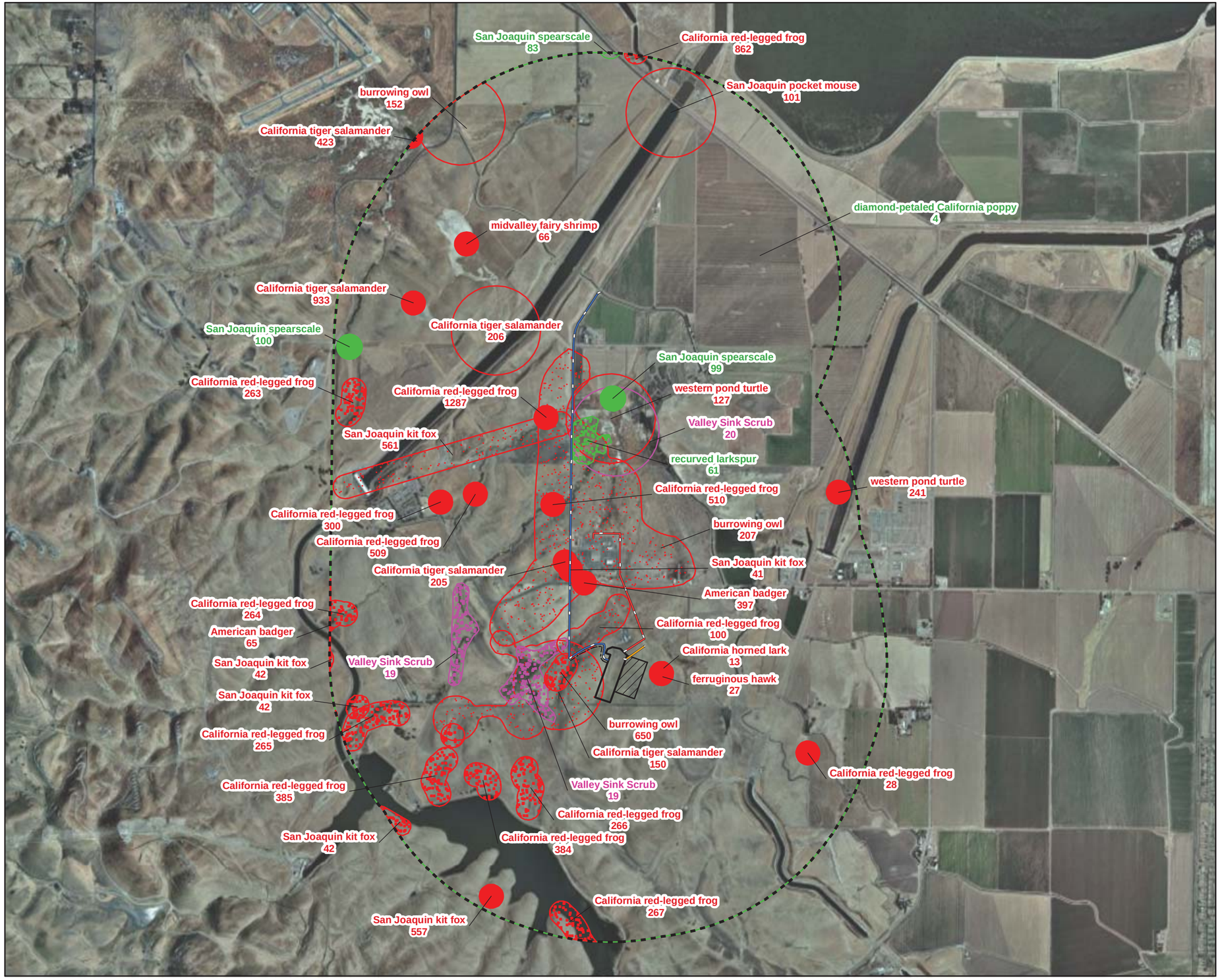
- **Burrowing owl (*Athene cunicularia*)***, a California Species of Concern (may use ground squirrel burrows found throughout the project area)
- **Swainson's hawk (*Buteo swainsoni*)***, state listed as threatened (forage and potential nesting within the project area and along the natural gas pipeline alignment)
- **Northern harrier (*Circus cyaneus*)***, a California Species of Concern (foraging and potential nesting habitat in and/or adjacent to the project area)
- **Loggerhead shrike (*Lanius ludovicianus*)***, a California Species of Concern (lowland, open habitat types, including foraging and potential nesting habitat in and/or adjacent to the project area)
- Migratory birds and birds protected under the federal Migratory Bird Treaty Act (MBTA) (all habitats and project areas)
- **Vernal pool fairy shrimp (*Branchinecta lynchi*)**, federally listed as threatened (vernal pools and seasonal wetland habitats)
- **Longhorn fairy shrimp (*Branchinecta longiantenna*)**, federally listed as endangered (vernal pools and seasonal wetland habitats)

Designated critical habitat unit CCS-2b of the California red-legged frog encompasses almost the entire project site (not including the water supply pipeline in Contra Costa County). Rather than conduct protocol-level surveys for California red-legged frog, California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and longhorn fairy shrimp, the Project Owner inferred for their presence for the purposes of formal consultation with the USFWS and CDFG under the federal and state ESAs, respectively. Because of the proximity of a known nest on the Mountain House Conservation Bank property, the project site was presumed Swainson's hawk foraging habitat.

For a detailed description of special-status species that may be disturbed by the Project and a description of potential impacts on these species, please refer to the 2009 MEP AFC (Mariposa Energy, 2009). Biological impacts have been minimized to the extent feasible by locating facilities away from sensitive resources and by the proposed protection and mitigation measures presented in this document.

3.3.2 Special-Status Plants

CH2M HILL biologists Russell Huddleston and Todd Ellwood conducted protocol-level special-status plant surveys April 7 and 15, May 20, and August 18, 2009. No special-status plant species were observed within the project disturbance area; however, heartscale (*Atriplex cordulata*) and little mousetail (*Myosurus minimus* ssp. *apus*), were found within the project vicinity near the new transmission line corridor. Figure 3-1 shows the locations of these observations. Heartscale is a CNPS 1B species, meaning it is rare, threatened, or endangered in California and elsewhere. Little mousetail is a CNPS 2 species meaning it is rare, threatened, or endangered in California but more common elsewhere. Neither species is listed as threatened or endangered by the USFWS or CDFG.



LEGEND

- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 1-mile BUffer of Project Features

AVLCODE

- PLANTS (80m)
- PLANTS (SPCEIFIC)
- PLANTS (NON-SPCEIFIC)
- PLANTS (CIRCULAR)
- ANIMAL (80m)
- ANIMAL (SPECIFIC)
- ANIMAL (NON-SPECIFIC)
- ANIMAL (SPECIFIC)
- TERRESTRIAL COMMUNITY (80m)
- TERRESTRIAL COMMUNITY (SPECIFIC)
- TERRESTRIAL COMMUNITY (NON-SPECIFIC)
- TERRESTRIALCOMMUNITY (CIRCULAR)

Note:
1. Source - California Dept. of Fish and Game, Califorina Natural Diversity Database (CNDDB) January, 2011.
2. The number next to each occurrence name corresponds to the CNDDB online datasheet.

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

N

0 1,000 2,000
Feet

FIGURE 3-1
SPECIAL-STATUS SPECIES RECORDED IN THE PROJECT AREA
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

SAC \\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\MARIPOSA_COMPLIANCE\FIGURE3-1_CNDDB_SPECIESSPECIFIC.MXD SSCOPES 1/12/2011 10:18:19 AM

SECTION 4

Authority and Lines of Communication

The first part of this section describes the responsibilities of three groups of participants: regulatory agencies; a third-party biologist (Designated Biologist); and the Project Owner, its employees, contractors, and construction crews. The qualifications that the Designated Biologist will satisfy are also described in this section.

The second part of this section describes the lines of communication and chain of command and identifies which persons have the authority to stop or temporarily suspend surface-disturbing activities during construction, operation, and maintenance.

4.1 Definitions of Participants

The CEC has designated a staff member to serve as its CPM. The CPM oversees compliance with the CEC Conditions of Certification for the Project. The CEC CPM is also responsible for processing post-certification changes, documenting and tracking compliance filings, and ensuring that compliance files are maintained and accessible.

The Designated Biologist, Environmental Compliance Manager, and Biological Monitors report to the Energy Commission and assist the Project Owner with biological resources compliance implementation and reporting responsibilities. These responsibilities and relationships are described later in this section.

Mariposa Energy's construction personnel will be referred to as contractors and include the construction project manager, construction inspector, plant manager, contractor supervisor, resident engineer, and the crew foreman and crew.

Regulatory agencies involved include USFWS, USACE, CDFG, CEC, and the CVRWQCB. Table 4-1 lists the Project personnel and agency contacts for the MEP. Permits from each of these agencies include terms and conditions imposed to mitigate impacts to biological resources. Agency agreements and/or permits will be provided when they become available and will be provided as Appendix A.

TABLE 4-1
Mariposa Energy Project Personnel and Agency Contacts
Mariposa Energy Project

Applicant – Environmental Compliance Manager Mariposa Energy, LLC 333. S. Grand Avenue Los Angeles, CA 90071	Chris Curry, Senior Manager – Development Phone: (213) 346-2134 Mobile: (213) 435-3301 Email: c.curry@dgc-us.com
Applicant – Onsite Construction Manager Mariposa Energy, LLC 333. S. Grand Avenue Los Angeles, CA 90071	James Spicer, Assistant Director – Eng. & Const. Phone: (213) 346-2135 Mobile: (213) 505-4902 Email: j.spicer@dgc-us.com

TABLE 4-1
Mariposa Energy Project Personnel and Agency Contacts
Mariposa Energy Project

Designated Biologist CH2M HILL 155 Grand Avenue, Suite 800 Oakland, CA 94612	Todd Ellwood, CH2M HILL Direct/Mobile: (408) 839-2402 Email: todd.ellwood@ch2m.com
Biological Monitor	John Hale Direct/Mobile: (530) 864-5049 Email: botany@comcast.net
Biological Monitor	Daniel Weinberg Direct: (510) 587-7648 Mobile: (510) 316-3951 Email: daniel.weinberg@ch2m.com
Biological Monitor	Dan Williams Direct: (916) 286-0229 Mobile: (916) 943-8247 Email: daniel.williams@ch2m.com
Biological Monitor	Thomas Davis Direct: (510) 587-7713 Mobile: (707) 280-4020 Email: tom.davis@ch2m.com
Biological Monitor	Richard Crowe Direct: (916) 920-0212 x 416 Mobile: (916) 296-5525 Email: richard.crowe@ch2m.com
Biological Monitor	Victor Leighton Direct: (916) 920-0212 x415 Mobile: (916) 425-7862 Email: victor.leightonIII@ch2m.com
CEC CPM 1516 Ninth Street, MS 15 Sacramento, CA 95814	Craig Hoffman Direct: (916) 654-4781 Email: choffman@energy.state.ca.us
USFWS 2800 Cottage Way Room W-2605 Sacramento, CA 95825	Kim Squires, Senior Fish and Wildlife Biologist Direct: (916) 414-6654 Fax: (916) 414-6713 Email: kim_squires@fws.gov
CDFG 7329 Silverado Trail Napa, CA 94558	Marcia Grefsrud, Environmental Scientist Direct (main office line): (707) 944-5559 Email: mgrefsrud@dfg.ca.gov
USACE Regulatory Branch 1325 J Street Room 1480 Sacramento, CA 95814-2922	Marc Fugler, Project Manager Direct: (916) 557-5255 Fax: (916) 557-6877 Email: marc.a.fugler@usace.army.mil
CVRWQCB 11020 Sun Center Drive, #200 Rancho Cordova, CA 95670-6114	Skyler Anderson, Environmental Scientist Direct: (916) 464-4849 Email: sanderson@waterboards.ca.gov

4.2 Responsibilities of the Participants

Although responsibilities are divided, ultimately the Project Owner's construction team and the Designated Biologist collectively have the responsibility to reach a consensus when conflicts arise among construction, environmental, and landowner concerns. From time to time, it is possible that one or more of the regulatory agencies may be consulted as part of conflict resolution.

4.2.1 Designated Biologist Selection

4.2.1.1 Condition of Certification BIO-1

The Project Owner has assigned Todd Ellwood of CH2M HILL as the Designated Biologist for the Project. The CEC CPM has approved Mr. Ellwood to serve as the Designated Biologist. As required, Mr. Ellwood has the following minimum qualifications:

- A bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field
- Three years of experience in field biology or current certification of a nationally recognized biological society such as the Ecological Society of America or The Wildlife Society
- Demonstrated field experience in the identification and life history of California tiger salamander, California red-legged frog, and San Joaquin kit fox, and demonstrated field experience identifying burrowing owl burrows and other burrowing owl sign, and demonstrated experience in identifying Swainson's hawks
- Is in possession of required state and federal permits and/or approvals from CDFG and USFWS

The Project Owner will submit the above information at least 60 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities, including preconstruction debris removal, will commence until an approved Designated Biologist is available to be onsite.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the Project Owner will immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

4.2.1.2 USFWS BO Minimization Measure 1

At least 15 days prior to any ground disturbing activities, the applicant will submit to the Service for review the qualifications of the proposed biological monitor(s).

4.2.2 Designated Biologist Duties

4.2.2.1 Condition of Certification BIO-2

The Project Owner will ensure that the Designated Biologist performs the following duties during any site (or related facilities) preconstruction debris removal, mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist will be assisted by the approved Biological Monitor(s), but remains the contact for the Project Owner and CPM. The Designated Biologist's duties include:

1. Advise the Project Owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification.
2. Consult on the preparation of the BRMIMP, to be submitted by the Project Owner.
3. Supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat.
4. Clearly mark sensitive biological resource areas, if present, and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions.
5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way.
6. Notify the Project Owner and the CPM of any non-compliance with any biological resources Conditions of Certification.
7. Respond directly to inquiries of the CPM regarding biological resource issues.
8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records will be submitted in the Monthly Compliance Report and the Annual Report.
9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, WEAP training, and all permits.

The Designated Biologist will submit in the Monthly Construction Compliance Report to the CPM copies of all written reports and summaries that document biological resources activities. If actions may affect biological resources during operation, a Designated Biologist will be available for monitoring and reporting. During project operation, the Designated Biologist will submit record summaries in the Annual Compliance Report unless their duties are determined to be unnecessary by the CPM.

4.2.2.2 USFWS BO Minimization Measure 1 (continued)

Upon Service approval, the biologist(s) will be given the authority to stop any work that may result in the take of listed species. If the on-site biologist(s) exercises this authority, the Service will be notified by telephone and electronic mail within one (1) working day. The on-site biologist will be the contact for any employee or contractor who might inadvertently

kill or injure a California red-legged frog, San Joaquin kit fox or California tiger salamander, or anyone who finds a dead, injured, or entrapped individual of these species. The on-site biologist will possess a working cellular telephone whose number will be provided to the Service. Should take occur of a California red-legged frog, San Joaquin kit fox or California tiger salamander individual, the Service-approved biologist will contact the Service and CDFG within 24 hours of the discovered occurrence.

4.2.3 Biological Monitor Selection (BIO-3)

The Project Owner's CPM-approved Designated Biologist will submit the resume, including at least three references and contact information, of the proposed Biological Monitors to the CPM for approval, in consultation with CDFG and USFWS. Enough Biological Monitors will be onsite during preconstruction debris removal, water supply pipeline, natural gas pipeline, and transmission line construction and prior to fencing the power plant site to collectively meet the minimum qualifications:

1. Demonstrated field experience in the identification and life history of:

    a. California tiger salamander
    b. California red-legged frog
    c. San Joaquin kit fox

2. Demonstrated field experience identifying burrowing owls burrows and other burrowing owl sign.

    Additionally, all Biological Monitors onsite during preconstruction debris removal, water supply pipeline, natural gas pipeline, and transmission line construction and prior to fencing the power plant site must meet the following minimum qualification:

3. Be in possession of required state and federal permits and/or approvals from CDFG and USFWS.

4.2.4 Agency Responsibilities

Regulatory agency personnel are responsible for enforcing state and federal laws protecting sensitive species and natural resources. Staff from these agencies generally have broad authority to monitor and evaluate projects implemented under permits authorized by the agencies and can take enforcement actions if violations occur. The following agencies have authority associated with biological and water resources at the MEP site:

- CEC through the CPM verifies compliance with Conditions of Certification, approves changes in implementation methodology, and is responsible for incidental take authorized under the Commission Decision Conditions of Certification.
- USFWS is responsible for protecting federally listed endangered and threatened species and for taking actions pursuant to an ESA Section 7, Incidental Take authorization. This would include measures in the project description or mitigation intended to avoid, minimize, or compensate for adverse impacts to federally listed or candidate species and critical habitat. The USFWS contact will be notified immediately if a listed wildlife species is involved in an injury or fatality.

- CDFG is responsible for protecting species under California ESA. The CDFG contact will be notified immediately if a listed species is involved in an injury or fatality.
- USACE is responsible for regulating the discharge of dredged or fill materials into waters of the United States under the Clean Water Act, Section 404.
- CVRWQCB is responsible for protecting beneficial uses of waters of the State under the Clean Water Act, Section 401 permit for water quality protection.

The agencies and the CPM will receive copies of the relevant monitoring reports that detail compliance with the permits and authorizations issued for the Project. These agencies may also conduct unannounced site visits to ensure compliance with project conditions.

4.3 Authority and Lines of Communication

The regulatory agencies and the Designated Biologist identified above have different responsibilities regarding implementing mitigation measures to protect biological resources. This section of the BRMIMP describes how they will interact on the Project.

4.3.1 Regulatory Agencies

If compliance problems arise during any phase of the Project, agency representatives would discuss the issue with the CPM, Designated Biologist, Mariposa Energy, PG&E (if the issue is related to the gas pipeline), BBID (if the issue is related to the water supply pipeline), and PG&E's and BBID's contractors. If violations occur, work can be stopped on the whole Project or on portions of the Project by the revocation of permits. However, before work is stopped, the aforementioned parties will undertake a good-faith effort to resolve any violations.

4.3.2 Roles and Authority of the Designated Biologist and Biological Monitors

4.3.2.1 Roles of the Designated Biologist and Biological Monitors

The Designated Biologist and Biological Monitor(s), although contracted to the Project Owner, are responsible for independently ensuring that the requirements described in the BRMIMP are carried out completely and in a timely manner. The following individuals have been named as the Designated Biologist and Biological Resources Monitors for the MEP (resumes are included in Appendix D):

- Designated Biologist: Todd Ellwood, CH2M HILL
- Biological Resources Monitor(s): John Hale, Daniel Weinberg, Daniel Williams, Thomas Davis, Richard Crowe, Victor Leighton

4.3.2.2 Authority of the Designated Biologist and Biological Monitor (BIO-4)

The Project Owner's Construction/Operation Manager will act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification. If required by the Designated Biologist and Biological Monitor(s), the Project Owner's Construction/Operation Manager will halt all site mobilization, preconstruction debris removal, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist will:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact on biological resources if the activities continued
2. Inform the Project Owner and the Construction/Operation Manager when to resume activities
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor will act on behalf of the Designated Biologist. The Project Owner will ensure that the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, preconstruction debris removal, ground disturbance, grading, construction, and operation activities. The Project Owner will notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the Project Owner, a determination of success or failure will be made by the CPM within 5 working days after receipt of notice that corrective action is completed, or the Project Owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

Forms that the Designated Biologist or Biological Monitor and contractors will use to report observations of wildlife within the project site are provided in Appendix E. Noncompliance Resolution Report forms will be used to document noncompliance with CEC Conditions of Certification or agency permit terms and conditions and are included in Appendix F.

4.3.3 Roles and Authority of the Project Owner/PG&E/BBID Construction Personnel

The Project Owner, PG&E (for the gas pipeline), and BBID (for the water supply line) are committed to fully implementing the Conditions of Certification and mitigation measures described in this BRMIMP. Construction contractors, by signing the contract documents when the job is awarded, will also commit to comply with the relevant mitigation measures and to cooperate with the Designated Biologist and Biological Monitor(s). The bid package will clearly identify the need to comply with environmental protection regulations, including requirements for the WEAP and cooperation with the Designated Biologist and Biological Monitors. Any new owners of the Project will agree to the commitments made by the Mariposa Energy under previous ownership and will agree to abide by the terms and conditions of all permit conditions.

The Resident Engineer is obligated to cooperate with the Designated Biologist and Biological Monitors by (1) assisting with formulating solutions to problems and potential problems related to the protection of biological resources, and (2) requiring all crews to follow the directions of the Designated Biologist and Biological Monitors. Table 4-2 summarizes the applicable LORS.

TABLE 4-2
Laws, Ordinances, Regulations, and Standards Applicable to the Mariposa Energy Project
Mariposa Energy Project

Federal	
Section 404 of the Clean Water Act of 1977 (33 United States Code (USC) 1344)	Prohibits the discharge of dredged or fill material into the waters of the United States without a permit. The administering agency is the USACE.
Section 401 of the Clean Water Act of 1977 (33 USC 1341)	Requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State in which the discharge originates or would originate, that the discharge will comply with the applicable effluent limitations and water quality standards. A certification obtained for the construction of any facility must also pertain to the subsequent operation of the facility.
Endangered Species Act of 1973	Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for the protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is the USFWS.
Eagle Act (Title 50, Code of Federal Regulations, section 22.26)	Authorizes limited take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) under the Eagle Act, where the taking is associated with, but not the purpose of activity, and cannot practicably be avoided.
Eagle Act (Title 50, Code of Federal Regulations, section 22.27)	Provides for the intentional take of eagle nests where necessary to alleviate a safety hazard to people or eagles; necessary to ensure public health and safety; the nest prevents the use of a human–engineered structure, or; the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests would be allowed to be taken except in the case of safety emergencies.
Bald and Golden Eagle Protection Act (Title 16, United States Code section 668)	This law provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
Migratory Bird Treaty Act	Title 16, USC, sections 703 through 712, prohibit the take of migratory birds, including nests with viable eggs. The administering agency is the USFWS.
Executive Order 11312	Prevent and control invasive species.
State	
California Endangered Species Act of 1984	Fish and Game Code sections 2050 through 2098 protect California's rare, threatened, and endangered species. The administering agency is the CDFG.
California Code of Regulations	California Code of Regulations Title 14, Division 1, Subdivision 3, Chapter 3, sections 670.2 and 670.5 list plants and animals of California that are designated as rare, threatened, or endangered. The administering agency is the CDFG.
Fully Protected Species	Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibit the take of animals that are classified as fully protected in California. The administering agency is the CDFG.

TABLE 4-2
Laws, Ordinances, Regulations, and Standards Applicable to the Mariposa Energy Project
Mariposa Energy Project

Native Plant Protection Act (Fish and Game Code, section 1900 et seq.)	Designates rare, threatened, and endangered plants in California and prohibits the taking of listed plants. The administering agency is CDFG.
Nest or Eggs – Take, Possess, or Destroy	Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. The administering agency is the CDFG.
Birds of Prey – Take, Possess, or Destroy	Fish and Game Code section 3503.5 specifically protects California's birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds of prey or to take, possess, or destroy the nest or eggs of any such bird. The administering agency is the CDFG.
Migratory Nongame Birds – Take or Possession	Fish and Game Code section 3513 protects California's migratory nongame birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird. The administering agency is the CDFG.
Nongame mammals (Fish and Game Code section 4150)	Makes it unlawful to take or possess any nongame mammal or parts thereof except as provided in the Fish and Game Code or in accordance with regulations adopted by the commission.
Streambed Alteration Notification (Fish and Game Code sections 1600 et seq.)	Requires notification to CDFG for activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California. Impacts on vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated. The administering agency is CDFG.
Public Resources Code, sections 25500 and 25527	Prohibits siting of facilities in certain areas of critical concern for biological resource, such as ecological preserves, refuges, etc. The administering agency is the CEC (with comment from CDFG).
Significant Natural Areas	Fish and Game Code Sections 1930 et seq. designate certain areas in California such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
Regional Water Quality Control Board	By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request state certification that the proposed activity will not violate state and federal water quality standards. The administering agency is the CVRWQCB.
California Environmental Quality Act (CEQA) (Public Resources Code Section 15380)	CEQA requires that the effects of a project on environmental resources must be analyzed and assessed using criteria determined by the lead agency.
Warren Alquist Act (Public Resources Code Section 25000 et seq.)	Warren-Alquist Act is a CEQA-equivalent process implemented by the CEC.

TABLE 4-2
Laws, Ordinances, Regulations, and Standards Applicable to the Mariposa Energy Project
Mariposa Energy Project

Local	
Alameda County General Plan (East County Area Plan)	Under the East County Area Plan of the Alameda County General Plan, the goal for biological resources is to preserve a variety of plant communities and wildlife habitat. Several policies related to goal are included in the plan, including Policy 126 (no net loss of riparian and seasonal wetlands).
Contra Costa General Plan	The Contra Costa County General Plan presents the broad goals and policies, and specific implementation measures, which will guide decisions on future growth, development, and the conservation of resources through the year 2020. Overall conservation goals under the plan are to preserve and protect the ecological resources of the County; to conserve the natural resources of the County through control of the direction, extent, and timing of urban growth, and; to achieve a balance of uses of the County's natural and developed resources to meet the social and economic needs of the County's residents.

SECTION 5

Worker Environmental Awareness Program (BIO-5)

The Project Owner will develop and implement a CPM-approved WEAP in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, preconstruction debris removal, ground disturbance, grading, construction, operation, and closure, are informed about sensitive biological resources associated with the Project.

5.1 Program Overview

Consistent with the CEC's requirements set forth in BIO-5, the WEAP will include the following:

- An onsite or training center presentation, developed by or in consultation with the Designated Biologist, in which supporting written material and electronic media are made available to all participants
- Locations and types of sensitive biological resources (shown in Appendix B) on the project site and adjacent areas
- Reasons for protecting sensitive biological resources
- Meaning of various temporary and permanent habitat protection measures
- Penalties for violation of applicable LORS (see Table 4-2)
- A list of people to contact regarding further comments and questions about the material discussed in the program
- A training acknowledgment form to be signed by each worker indicating that they received training and will abide by the guidelines
- Confirmation that the WEAP is administered by a competent individual acceptable to the Designated Biologist

5.2 Documentation of Training

No less than 30 days prior to the start of any site (or related facilities) mobilization, the Project Owner will provide to the CPM the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The Project Owner will provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who

have completed the training to date. No less than 10 days prior to site and related facilities mobilization, the Project Owner will submit two copies of the CPM-approved materials.

Training acknowledgement forms signed during construction will be kept on file by the Project Owner for a period of at least 6 months after the start of commercial operation. During project operation, signed statements for operational personnel will be kept on file for 6 months following the termination of an individual's employment.

5.3 USFWS BO Minimization Measure 5

Prior to the start of groundbreaking activities, all construction personnel will receive worker education training on listed species and their habitats by a Service-approved biologist or a video recording of this biologist. The importance of these species and their habitat will be described to all employees as well as the minimization and avoidance measures that are to be implemented as part of the Project. An educational brochure containing color photographs of all listed species in the work area(s) will be distributed to all employees working within the project site(s). Workers will also be informed of appropriate measures to take should a toxic materials spill occur. A list of employees who attend the training sessions will be maintained by the applicant to be made available for review by the Service and the CDFG upon request. Contractor training will be incorporated into construction contracts and will be a component of weekly project meetings.

SECTION 6

Preconstruction Surveys and Reporting

6.1 Preconstruction Surveys (USFWS BO Minimization Measure 2)

Preconstruction surveys for the California red-legged frog, San Joaquin kit fox, and the California tiger salamander will be performed immediately prior to groundbreaking activities. Surveys will be conducted by Service-approved biologists. If at any point, activities associated with the establishment of the MEP cease for more than 15 consecutive days, additional preconstruction surveys will be conducted prior to the resumption of these actions.

6.2 Nesting Birds (BIO-8)

Preconstruction nest surveys will be conducted if construction activities will occur from February 1 through August 31. The Designated Biologist or Biological Monitor will perform surveys by covering all potential nesting habitat in the project site and within 500 feet of the boundaries of the power plant site and linear facilities (except for Swainson's Hawk, see BIO-15). At least two preconstruction surveys will be conducted, separated by a minimum 10-day interval. One of the surveys will be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation.

No less than 2 days prior to the start of any ground-disturbing activities or construction equipment staging, the Project Owner will provide the CPM a letter report describing the findings of the preconstruction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report will include a map or aerial photo identifying the location of the nest and will depict the boundaries of the no-disturbance buffer zone around the nest, and a monitoring plan will be submitted to the CDFG and USFWS Migratory Bird Office for review and comment and the CPM for approval. Approval of the plan is required before construction may commence.

6.3 California Tiger Salamander and California Red-legged Frog

6.3.1 Condition of Certification BIO-10

Clearance surveys within the exclusionary fence will be conducted by a qualified biologist 48 hours to 1 week prior to ground disturbance. In addition, after the first major rain event (as agreed upon with the CPM, in consultation with CDFG and USFWS), clearance surveys

must be conducted within the exclusionary fence before construction can commence. If California red-legged frog or California tiger salamander are discovered during preconstruction surveys, individuals will be relocated to a CPM- (in consultation with CDFG) and USFWS-approved site. Only biologists with the appropriate permits or those approved by the CPM, USFWS, and CDFG for the Project will capture and relocate these species.

Prior to ground disturbance, linear routes will be mapped, marked in the field, and surveyed for burrows. Burrows will be avoided to the extent possible as described above. Burrows within a vehicle access route that cannot be avoided will be temporarily reinforced with PVC pipe or by other measures as deemed effective by the Biological Monitor, and approved by the CPM (in consultation with CDFG and USFWS), (dry season only) prior to allowing vehicle access, and removed immediately after access is completed. A Biological Monitor will be present during all linear route construction.

Before disturbance to aquatic habitat, the Designated Biologist or Biological Monitor will check for California red-legged frog and California tiger salamander within the aquatic habitat or surrounding area.

6.3.2 USFWS BO Minimization Measure 4

Any California tiger salamanders or California red-legged frogs observed during preconstruction surveys will be monitored by the approved biologist and allowed to passively leave the site or, if determined necessary by the Service-approved biologist, removed from the work area(s) and relocated to an appropriate location.

6.4 Western Pond Turtle (BIO-11)

To avoid direct impacts on western pond turtles, preconstruction surveys will be conducted concurrently with the California red-legged frog and California tiger salamander preconstruction surveys. Western pond turtles will be avoided to the extent possible. Avoidance areas will be delineated by exclusionary fencing. If western pond turtles are found within the project disturbance area that cannot be avoided, the western pond turtles will be relocated to the CPM-approved (in consultation with CDFG) relocation site.

The Project Owner will submit a report to the CPM and CDFG no less than 10 days prior to the start of any ground-disturbing activities or construction equipment staging that describes when surveys were completed, observations, and proposed impact minimization measures. Within 30 days after completion of construction of the Project linears, the Project Owner will provide to the CDFG and CPM a written construction termination report identifying how impact minimization measures have been completed.

6.5 Burrowing Owl (BIO-12)

The Designated Biologist or Biological Monitor will conduct preconstruction surveys for burrowing owls in accordance with CDFG guidelines (California Burrowing Owl Consortium, 1993). The survey area will include the project disturbance area and surrounding 500 foot survey buffer. If ground-disturbing activities are delayed or

suspended for more than 30 days after the preconstruction survey, the site will be resurveyed. The Designated Biologist will provide to the CPM and CDFG preconstruction survey results within 10 days of the completion of the survey.

If preconstruction surveys detect burrowing owls within 500 feet of proposed construction activities, the Designated Biologist will provide to the CPM and CDFG documentation indicating that non-disturbance buffer fencing has been installed no less than 10 days prior to the start of any project-related site disturbance activities. The documentation will include both a figure and photographs showing the location of the fencing.

If preconstruction surveys detect burrowing owls or active burrowing owl burrows within the project disturbance area, the Project Owner will provide to the CPM and CDFG a final Burrowing Owl Mitigation Plan no less than 10 days prior to the start of construction. The measures described in the plan will be incorporated into the BRMIMP no less than 10 days of completion of the plan, and implemented.

6.6 American Badger (BIO-13)

Preconstruction surveys will be conducted concurrently with the San Joaquin kit fox (BIO-14) and burrowing owl preconstruction surveys (BIO-12). The Designated Biologist will perform preconstruction surveys for badger dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads. If dens are detected each den will be classified as inactive, potentially active, or definitely active. Den avoidance, monitoring, and destruction methods will adhere to those prescribed for San Joaquin kit fox avoidance and minimization in BIO-14.

The Project Owner will submit a report to the CPM and CDFG no less than 10 days prior to the start of any ground-disturbing activities or construction equipment staging that describes when surveys were completed, observations, and proposed impact minimization measures. Within 30 days after completion of construction of the Project, the Project Owner will provide to the CDFG and CPM a written construction termination report identifying how impact minimization measures have been completed.

6.7 San Joaquin Kit Fox

6.7.1 Condition of Certification BIO-14

Before project construction begins, a USFWS- and CPM-approved (in consultation with CDFG) biologist will conduct a preconstruction survey for San Joaquin kit fox dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads. If dens are detected each den will be classified as a known, potential, atypical, or natal/pupping den. Den avoidance, monitoring, and destruction methods are described in Section 7.7.2.

The Project Owner will submit a report to the CPM and CDFG at least 10 days prior to the start of any ground-disturbing activities or construction equipment staging that describes when surveys were completed, observations, and proposed minimization measures.

6.7.2 USFWS BO Minimization Measure 3

Preconstruction surveys for San Joaquin kit fox dens will be conducted within a minimum of 200 feet of the MEP area. Any natal dens encountered will be avoided by a minimum of 100 feet for known dens and a minimum of 50 feet for potential dens. Non-natal dens will be monitored for a minimum of three days to determine their current use. If no San Joaquin kit fox activity is observed during this period, the den will be destroyed to prevent future use by San Joaquin kit fox. If San Joaquin kit fox activity is observed at the den during this period, the den will be monitored for at least five (5) consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den will be discouraged during this period by partially plugging its entrance(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied will it be excavated under the direction of the biologist. If the animal is still present after 5 or more consecutive days of plugging and monitoring, the den will be excavated when, as determined by the biologist, it is temporarily vacant (for example, during the San Joaquin kit fox's normal foraging activity). Potential dens will be temporarily marked for avoidance by a minimum of 50 feet and further studied by the qualified biologist. Destruction of potential dens will occur only after the biologist determines that no San Joaquin kit fox are inside. To determine the presence of San Joaquin kit fox, the potential den will be fully excavated to the end by either hand or machinery. Once determined empty, the den will be filled with dirt and compacted to ensure that San Joaquin kit fox cannot enter or use the den during the construction period. If any potential den is determined to be currently or previously used by San Joaquin kit fox, the measures described above for natal and non-natal dens (as applicable) will be followed.

6.8 Swainson's Hawk (BIO-15)

If construction is proposed during the Swainson's hawk breeding season (March-August), a preconstruction nest survey will be conducted within 30 days prior to the beginning of construction activities by a qualified biologist in order to identify active nests in the project site vicinity. Surveys will be conducted according to the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000).

The Project Owner will submit a report to the CPM and CDFG no less than 10 days prior to the start of any ground-disturbing activities or construction equipment staging that describes when Swainson's hawk surveys were completed, identification and qualifications of the biologist conducting the surveys, observations, and, if required, updates to the BRMIMP based upon findings. If project-related work is required within a Swainson's hawk nest buffer, the Project Owner will submit the name and qualification of the proposed monitor to the CDFG for comment and the CPM for approval no less than 30 days prior to disturbance within the nest buffer.

SECTION 7

Impact Avoidance and Minimization Measures

7.1 General Measures

7.1.1 Condition of Certification BIO-7

The project design will incorporate all feasible measures that avoid or minimize impacts on the local biological resources, including the following:

1. Design, install, and maintain natural gas supply pipelines, water supply pipelines, transmission lines, access roads, and laydown and parking areas to avoid or minimize impacts on identified sensitive resources.
2. Design, install, and maintain the transmission lines and all other electrical components in accordance with the Avian Power Line Interaction Committee (APLIC, 2006), *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* to reduce the likelihood of electrocutions of large birds.
3. Eliminate from landscaping plans any List A California exotic pest plants of concern as defined by the California Exotic Pest Plant Council.
4. Prescribe a road sealant that is non-toxic to wildlife and plants.
5. Design, install, and maintain construction and facility lighting to minimize the amount of light off-site, including directing and shielding lights to prevent side casting of light toward wildlife habitat, and using the minimum wattage required for safety.
6. Prepare pre- and post-construction photo-documentation of all habitats to be made part of the Project report.
7. Survey for the special-status species prior to ground-disturbing activities including preconstruction debris removal or construction equipment staging, and:
    a. If special-status wildlife species are found within the construction area, species-specific contingencies described in BIO-8, 9, 10, 11, 12, 13, 14, and 15 will be followed. If the species is not covered under these conditions, the CPM and the CDFG and/or USFWS will be contacted for further guidance.
    b. If special-status plant species are found within the construction area, they will be avoided and the CPM and the CDFG and/or USFWS will be contacted for further guidance.
    c. Once it has been sufficiently determined that there are no special-status wildlife species present, the power plant site, laydown, and access road construction areas will be fenced with USFWS- and CDFG-approved exclusion fencing to ensure that no special-status wildlife species enter the site.

8. Clearly demarcate construction exclusion zones around biologically sensitive areas and any nests or other sensitive resources identified during surveys.
9. Have onsite the Designated Biologist (or approved designee) during any construction activity near sensitive habitat and to ensure implementation of, and compliance with, mitigation measures. The Designated Biologist (or approved designee) has the authority to stop work and determine alternative work practices in consultation with construction personnel if construction activities are likely to impact sensitive biological resources.
10. Confine vehicles to established roadways and pre-approved overland access routes. Limit access routes and the number and size of staging areas and work areas to the minimum necessary to achieve the Project goals. Prior to initiating project construction, clearly mark routes and boundaries of work areas.
11. Construction along the Project linears will be constrained within a designated temporary construction corridor.
12. Trash dumping, firearms, open fires (such as barbecues), hunting, and pets will be prohibited in the project area.
13. To avoid attracting predators of the target species of concern, the project site will be kept as clean of debris as possible. All food-related trash items will be enclosed in sealed containers and regularly removed from the site(s). Feeding of wildlife by staff and subcontractors will be prohibited.
14. Road-killed animals or other carcasses detected by personnel on roads associated with the project area will be reported immediately to a Biological Monitor or Designated Biologist, who will remove the road-kill promptly. For special-status species road-kill, the Biological Monitor will contact CDFG and USFWS within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information will be noted and reported in the Monthly Compliance Reports. Injured animals will be reported to CDFG or USFWS and the Project Owner will follow instructions that are provided by CDFG or USFWS.

All mitigation measures and their implementation methods will be included in the BRMIMP. Implementation of the measures will be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the Project Owner will provide to the CPM for review and approval a written construction termination report identifying how impact avoidance measures were completed.

7.1.2 USFWS BO Minimization Measures 8 and 21

Measure 8. All work areas and designated temporary travel corridors will be clearly delineated via flagging, signage or other similar methods to minimize construction disturbances beyond the work area. Vehicles will only enter temporary travel corridors when dry soil conditions exist to avoid the creation of tire ruts or other impacts to the ground surface.

Measure 21. All trash and debris within the work area will be placed in containers with secure lids before the end of each work day in order reduce the likelihood of predators

being attracted to the site by discarded food rappers and other rubbish that may be left on-site. Containers will be emptied as necessary to prevent trash overflow onto the site and all rubbish will be disposed of at an appropriate off-site location.

7.2 Best Management Practices for Wetlands and Waters

7.2.1 Condition of Certification BIO-7

The following practices will be adhered to throughout construction:

1. Waters, wetlands, and drainage or channels will be avoided to the maximum extent possible.
2. For all wetlands and waters to be avoided, a buffer zone will be established to protect the resource and the immediate watershed. The buffer zone will be delineated with temporary protective fencing.
3. A SWPPP will be developed that describes sediment and hazardous materials control, fueling and equipment management practices, and other factors deemed necessary for the Project.
4. If bentonite is required to install pipeline under a drainage, an Emergency Spill Response Plan, "Frac out" Monitoring Plan, and a Biological Monitoring Plan will be developed for approval by the CPM in consultation with the CDFG. A Designated Biologist will be onsite during the installation.
5. Erosion control measures will be monitored on a regularly scheduled basis, particularly during times of heavy rainfall. Corrective measures will be implemented in the event erosion control strategies are inadequate. Sediment/erosion control measures will be continued at the project site until such time as the revegetation efforts are successful at soil stabilization.
6. All equipment will be maintained so that there will be no leaks of automotive fluids such as fuels, solvents, or oils. Hazardous materials such as these will be stored in sealable containers in a designated location that is at least 250 feet from aquatic habitats. All refueling and maintenance of vehicles and other construction equipment and staging areas will occur at least 250 feet from any aquatic habitat.
7. No discharge of sediment-laden water from project-related work will be allowed into storm drains, wetlands, or watercourses.
8. Erodible fill material will not be deposited into watercourses. Brush, loose soils, or other similar debris material will not be stockpiled in the drainage channel or on its banks.
9. Equipment and personnel will not be allowed to enter aquatic habitats or be on the banks unless otherwise authorized by the resource agencies.
10. Erosion and sedimentation control devices (such as silt fences and fiber rolls) will be implemented as necessary during the wet season and before forecasted rain events.

11. Dust control will be implemented in accordance with a fugitive dust plan, including the use of water trucks to control dust in disturbed areas, rocking of temporary access road entrances and exits, street sweeping, and placement of geotextile mats and rock on access road areas to be used in the wet season.

12. All construction activities will be performed in accordance with the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities Water Quality Order 2009-0009-DWQ (SWRCB, 2009) requiring the implementation of best management practices (BMPs) to control sediment and other pollutants mobilized from construction activities.

13. Contractor encroachment into environmentally sensitive areas will be restricted (including the staging/operation of heavy equipment or casting of excavation materials). The Designated Biologist will assist the construction personnel in placement of protection measures.

14. Where working areas encroach on flowing or dry streams, canals, or wetlands, appropriate physical barriers adequate to prevent the flow or discharge of sediment into these systems will be constructed and maintained between working areas and water features. Erosion control and sediment detention devices (e.g., well-anchored sandbag cofferdams, straw bales, or silt fences) may be incorporated into the project design and implemented at the time of construction, as necessary. These devices will be in place during construction activities—and after, if necessary—for the purposes of minimizing sediment impact on the wetlands and input to waters of the United States. These devices will be placed at all locations where the likelihood of sediment input exists. A supply of erosion control materials will be kept on hand to cover small sites that may become susceptible to erosion.

15. Public roadways adjacent to the project site that are used by construction and worker vehicles will be swept daily or as needed to eliminate tracking and sedimentation.

16. All trucks hauling dirt, sand, soil, or other loose materials will be covered and will maintain a minimum of 6 inches of freeboard between the top of the load and the top of the trailer.

17. Following completion of construction, rock material will be removed from the temporary laydown area where topsoil has been removed and crushed rock (gravel) has been placed for construction. Disturbed areas to be restored will be made to reasonably match preconstruction conditions.

No less than 10 days prior to ground disturbance, the Project Owner will provide the CPM, CDFG, and USFWS with a report identifying the location of any protective fencing, including a figure and photographs that show the fencing.

If bentonite will be used, an Emergency Spill Response Plan, “Frac out” Monitoring Plan, and a Biological Monitoring Plan will be submitted to the CDFG for review and comment and to the CPM for approval no less than 30 days prior to the start of project ground-disturbing activities involving bentonite. Plan approval will be required before construction using bentonite may commence.

The Project Owner will report monthly to the CPM, CDFG and USFWS for the duration of construction on the implementation avoidance and minimization measures. Within 30 days

after completion of construction the Project Owner will provide to the USFWS, CDFG and CPM a written construction termination report identifying how mitigation measures have been completed.

7.2.2 USFWS BO Minimization Measures 9, 14, 15, 17, 20, and 26

Measure 9. A 25-foot minimum no-work buffer will be established around all inundated seasonal wetlands near the overland designated temporary access routes associated with the gas pipeline, transmission line or their associated work corridors. This buffer will be clearly demarcated with orange snow fencing to avoid construction access into potential branchiopod habitat. This fencing will be established prior to the start of ground breaking activities and will be checked weekly, at a minimum, by Service-approved biological monitors throughout the course of activities within these areas. Dry seasonal drainage features located along the transmission line will be crossed via temporary metal plates that will span the entire width of these features and will be installed prior to construction activities. All metal plates will be removed upon completion of MEP construction.

Measure 14. To the maximum extent practicable, the water pipeline will be established in existing disturbed areas. Intermittent features will be crossed by pipe ramming under the current culverts associated with Bruns Road. Water pipeline activities that do require additional disturbance to ephemeral drainage and wetland features will only occur during the dry season once these features no longer hold water. An onsite biological monitor will be present to advise all workers to stay inside approved work areas at all times.

Measure 15. Potential effects to water quality from contaminated runoff or airborne dust will be avoided by the implementation of standard erosion and/or sedimentation control devices, fugitive dust management, avoidance, and other best management practices (BMPs) prescribed by the MEP's approved Stormwater Pollution Prevention Plan (SWPPP) and Fugitive Dust Mitigation Plan. As-needed dust control measures (e.g., wetting dry ground) will minimize airborne transmission of soil particles into aquatic habitats. Erosion and sediment control devices (such as silt fences and fiber rolls) will be implemented as necessary during the wet season and before forecasted rain events to minimize impacts to water quality and effects to branchiopods. Equipment fueling, maintenance. and repairs as well as storage of hazardous materials such as fuels and lubricants will be limited to areas 250 feet or greater from any wetlands or drainage areas. Other hazardous material BMPs, including but not limited to secondary containment and not topping off fuel tanks will be enforced to prevent soil contamination. Prior to the start of construction activities, an emergency spill plan will be developed as part of SWPPP requirements and will be readily available to all employees throughout the duration of work activities. This plan will include appropriate prevention and cleanup measures for both upland and aquatic areas.

Measure 17. Construction of the MEP will include the establishment of secondary emergency containment reservoirs for both ammonia and oil storage tanks associated with the long-term operation and maintenance of the power generation facility. This will minimize the potential leak or seepage of these materials into onsite habitats during long-term MEP operation.

Measure 20. No discharge of pollutants from vehicle and equipment cleaning, maintenance, or repair will be allowed into storm drains, wetlands, or water courses. No discharge

of sediment-laden water from project-related activities will be allowed into storm drains, wetlands, or water courses.

Measure 26. Upon completion of construction activities, all debris and materials associated with MEP construction will be removed and areas not needed for the long-term operation of the site will be recontoured to match adjoining grades. Post construction BMPs (as prescribed in the SWPPP) will be implemented, including reseeding all areas as necessary to facilitate timely vegetative restoration.

7.3 Staking and Flagging of Exclusion Zones

As determined necessary by the Designated Biologist, exclusion zones will be identified by signs reading "KEEP OUT – Sensitive Resource Area." The signs will be attached to wooden or metal stakes connected by rope, flagging, or other fencing approved by USFWS and CDFG for any sensitive habitat or for the following:

- Occurrences of known and potentially suitable fairy shrimp habitat
- Nests and buffer zones of any raptors, including Swainson's hawk and burrowing owl, and other migratory birds
- Suitable habitat for special-status species including the California red-legged frog, California tiger salamander, Western pond turtle, American badger, and San Joaquin kit fox

Each exclusion zone will be sized according to the distances listed in Table 7-1. The zones will be maintained until construction activities have been completed and will then be removed. No work activities will be conducted within the designated exclusion zones as identified by the Designated Biologist.

TABLE 7-1
Exclusion Zones
Mariposa Energy Project

Biological Resource	Exclusion Zones
Fairy shrimp habitat	Limits of immediate watershed or 250 feet, whichever is greater; also, smaller buffer to be determined in consultation with USFWS (BIO-10).
Western pond turtle	100 feet from occupied aquatic habitats determined by Designated Biologist during preconstruction surveys
California tiger salamander and California red-legged frog	Minimum of 25 feet from identified aquatic habitats and minimize and/or avoid upland burrows in all project areas to the greatest extent feasible
Nesting burrowing owl burrow (February 1–August 31)*	160 feet (Sept 1 – Jan 31) 250 feet (Feb 1 – Aug 31)
Nests of sensitive raptors including but not limited to northern harrier and loggerhead shrike*	Size to be determined by Designated Biologist in consultation with CDFG, but not expected to exceed 250 feet (Feb 1 – Aug 31)
Swainson's hawk*	Initial exclusion zone of 0.5 mile from any active nest. Work may proceed within the exclusion zone only as determined by experienced raptor biologist in consultation with the CPM and CDFG.

TABLE 7-1
Exclusion Zones
Mariposa Energy Project

Biological Resource	Exclusion Zones
Nests of birds protected by the MBTA*	Size to be determined by Designated Biologist in consultation with CDFG and USFWS Migratory Bird Office, but not expected to exceed 50 feet (Feb 1 – Aug 31)
American badger and San Joaquin kit fox*	Minimum exclusion zones are: 100 feet from known dens; 50 feet from potential dens; 50 feet from atypical dens; and 100 feet followed by immediate consultation with the CPM, USFWS, and/or CDFG for natal/pupping dens for further direction on proper avoidance measures, which may include lengthening the exclusion zone distance.

*The exclusion zone would be circular in shape with the radius measured outward from the center of the species' habitat, burrow entrances, or the edge of the plant populations.

7.4 Construction Work Windows

All ground-disturbing activities will be restricted to the periods listed in Table 2-1 and to the boundaries listed in Table 7-1 to protect special-status species.

7.5 Construction and Operational Lighting

Project construction activities are planned to occur between approximately 7:00 a.m. and 3:30 p.m. from Monday through Friday with weekends and later hours as needed. To the extent feasible and consistent with worker safety codes, lighting required for night construction activities will be directed toward the center of the construction site and will be shielded to prevent light from straying offsite as much as possible. Task-specific construction lighting will be used to the extent practical while complying with worker safety regulations.

The power plant could be operated 24 hours per day, 7 days per week and will require night lighting for safety and security. The lights will provide illumination for operation under normal conditions, for safety under emergency conditions, and for manual operations during a power outage. Some night lighting is already visible from the project site because of the existing power infrastructure in the vicinity.

To reduce offsite lighting impacts, lighting at MEP will be restricted to areas where lighting is required for safety and operation. Exterior lights will be hooded and will be directed onsite to minimize significant light or glare. Low-pressure sodium lamps and non-glare fixtures will be specified. High-illumination areas not occupied on a regular basis will be provided with switches or motion detectors to light these areas only when occupied.

7.5.1 USFWS BO Minimization Measures 22 and 23

Measure 22. To the maximum extent practicable, construction will only occur between 7 a.m. and 7 p.m. to limit the need for night lighting which could attract California tiger salamanders or California red-legged frogs into the construction area and/or provide additional light for night time predators, increasing mortality of these animals. If night time

work is required during certain periods, no nocturnal construction activities will occur outside of wildlife exclusion fences associated with the access road, power generation facility, laydown area, and gas pipeline corridor for the duration of the wet season.

Measure 23. All exterior lights associated with construction and long-term operation will be hooded, and directed onsite so that significant light or glare into the surrounding habitats is minimized. Low-pressure sodium lamps and other low glare fixtures will also be utilized. For areas where lighting is not required for normal operation, safety, or security, switched lighting circuits will be established, allowing these areas to remain dark to minimize attracting California tiger salamanders, California red-legged frogs, or other animals to the site.

7.6 Construction and Operational Noise

MEP construction is expected to be typical of other power plants in terms of schedule, equipment used, and other types of activities. The noise level will vary during the construction period, depending on the construction phase. Noise and construction activities at the power plant site and/or along the offsite linear facilities could temporarily displace wildlife from foraging and nesting in the project area and vicinity. However, any special-status species found nesting during preconstruction surveys will be protected by implementation of the measures listed in this plan. Noise from long-term operations of the power plant is not expected to adversely impact wildlife, as they usually become accustomed to routine background noise.

7.7 Species-specific Measures

7.7.1 Avoid Harassment or Harm to California Tiger Salamander and California Red-legged Frog

7.7.1.1 Condition of Certification BIO-10

The Project Owner, in consultation with the Designated Biologist, will implement a California Tiger Salamander and California Red-legged Frog Management Plan. These measures will be included this Plan:

1. Minimize Construction Impacts:

    a. Avoidance: During project implementation, concentrations of small mammal burrows and other refugia that may support California red-legged frog or California tiger salamander will be avoided to the extent feasible.

    b. Install Exclusionary Fencing: Prior to any site work, including debris removal, a solid barrier fence will be installed around the power plant site, and laydown area, and will remain in place for the duration of the Project. The Biological Monitor will survey and delineate the fence route, and will be present during fence installation. Ramps or other means of escape (e.g., exit funnels) for California tiger salamander and California red-legged frog will be provided. This exclusionary fence will be routinely inspected for good repair for the duration of MEP construction; any damage, such as holes or gaps, will be repaired immediately.

c. Clearance Surveys (see Section 6.2 for more information)

d. California Tiger Salamander and California Red-legged Frog Relocation: California red-legged frog and California tiger salamander found in or near the construction site and along Bruns Road during road monitoring (see item "j" below) will be captured and relocated by the biological monitor following the procedures outlined in the relocation plan (Appendix G).

e. Linear Routes (see Section 6.2 for more information)

   i. Before disturbance to aquatic habitat, the Designated Biologist or Biological Monitor will check for California red-legged frog and California tiger salamander within the aquatic habitat or surrounding area.

   ii. Before the start of linear work each morning, the Designated Biologist or Biological Monitor will check for California red-legged frog and California tiger salamander under any equipment such as vehicles and stored pipes. The Biological Monitor will check all excavated steep-walled holes or trenches greater than 6 inches each morning before sunrise for any California red-legged frog and California tiger salamander. California red-legged frog and California tiger salamander will be removed by the Designated Biologist or Biological Monitor and relocated to the USFWS and CPM-approved relocation site (Appendix G). All excavated holes or trenches located outside the MEP site will be ramped at the end of the work day, or escape boards will be placed in the trench to allow the animals to escape.

f. Timing: Construction outside fenced areas will be scheduled to occur during the dry summer months between June 15 and October 15. Work will not take place outside of fenced areas during the wet season, unless approved by the CPM (in consultation with CDFG) and USFWS.

g. Off-road access: Prior to off-road vehicle access for construction or maintenance, the vehicle route will be mapped and marked. Burrows within the route will be avoided to the extent possible. Burrows that cannot be avoided will be reinforced with PVC pipe (dry season only) to prevent collapse.

h. Environmentally Sensitive Areas: An environmentally sensitive area fence will be installed along linear routes to protect potential breeding sites. Construction personnel will not enter the environmentally sensitive areas.

i. Speed limit: A 10-mile-per-hour speed limit will be enforced at all construction sites, except on roads with a posted speed limit. On roads with posted speed limits, construction traffic will go the minimum safe speed.

j. Bruns Road and Access Road Monitoring

   i. During wet-season construction (approximately mid-November through mid-June, though earlier or later if conditions are wet and California tiger salamander are observed) if there will be large volumes of construction traffic (25 vehicles or more) scheduled to arrive or depart after dusk or before dawn. California tiger

salamander moving between breeding sites and burrows will be protected by one of these methods:

(1) Biological monitors will walk (or slowly drive if deemed necessary for personnel safety) along Bruns Road from Canal 45 to the project site access road, and along the access road, to detect and move any California tiger salamander (or California red-legged frog) (see Appendix G for the management plan). This will be completed prior to the expected construction traffic arrival time before dawn, and prior to departure after dusk. If the survey is done by driving, the vehicle will avoid pulling off the road unless the shoulder or pull-out is clear of California tiger salamander and California red-legged frog.

(a) Any California tiger salamander or California red-legged frog that are detected will be moved by the biologist only if, in the biologist's judgment, the animal would be in danger from vehicles.

(b) The Project Owner will contact the CPM to indicate when the construction traffic threshold is anticipated to be met, and therefore when surveys are anticipated.

(2) During wet-season construction, construction worker traffic may be directed away from Bruns Road north of Kelso Road, and be directed to use Kelso Road and Mountain House Road east of the project site. If this option is selected, surveys will only be done along the access road and Bruns Road to Kelso Road.

(3) Alterations to the protective measure described in (1) and (2) above may be made if they will provide for more efficient or greater protection of California tiger salamander and California red-legged frog, and if the alteration is approved by the CPM (in consultation with CDFG) and USFWS. An alternative means of protection (such as protective barriers) may also be implemented in lieu of or in conjunction with either (1) or (2) with approval from the CPM (in consultation with CDFG) and USFWS.

ii. Throughout wet-season construction (including when surveys have not been conducted) as soon as practicable after the work crew arrives or departs, the biologist will drive slowly along the survey route to determine if any California tiger salamander or California red-legged frog have been affected. Any dead or injured California tiger salamander or California red-legged frog will be reported as described in BIO-7, #14. In the event that dead or injured California tiger salamander or California red-legged frog are found, the biologist will consult with the CPM, CDFG, and USFWS to determine which, if any, adaptive management measures will be implemented. These measures may include more frequent surveys (lower traffic threshold), more intensive surveys, or controlled arrival and departures for construction-crew traffic.

k. Best Management Practices (BMPs): BMPs listed in the SWPPP (BIO-17) will be implemented during project construction to protect against adverse affects on sensitive aquatic areas. Dust control measures will be implemented during

construction in the dry season. Work areas and dirt access roads will be watered regularly to minimize airborne dust and soil particles generated by construction.

2. Minimize Operation Impacts:

   a. A barrier on the permanent fence sufficient to block access to the power plant site by California red-legged frog and California tiger salamander will be installed.

Prior to the start of any ground-disturbing activities or construction equipment staging, the Project Owner will provide the CPM a letter report describing the findings of the preconstruction surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed, number of California tiger salamander and California red-legged frog observed and moved, and location to which they were moved. The Project Owner will report monthly to the CPM, CDFG, and USFWS for the duration of construction on the implementation of California tiger salamander and California red-legged frog avoidance and minimization measures. Within 30 days after completion of construction the Project Owner will provide to the CDFG and CPM a written construction termination report identifying how mitigation measures described in the plan have been completed.

Within 60 days of completion of the permanent power plant site fence, the Project Owner shall submit a figure and photographs to the CPM, CDFG, and USFWS of the California tiger salamander and California red-legged frog barrier fence.

7.7.1.2 USFWS BO Minimization Measures 6, 7, 12, 16, 24, and 25

Measure 6. Wildlife exclusion fencing will be established around the perimeter of the MEP power generation facility, 9.2-acre laydown area, MEP main access road, and gas line work corridor. Approximately 1,000 feet of the water line, located on the Lee Property, will be included with the gas line exclusion fence, as water line and access road occur in tandem with each other. A partial wildlife exclusion fence will also be established along the eastern right-of-way of the water supply pipeline corridor to deter California tiger salamander and/or California red-legged frog from entering the disturbance area from adjacent aquatic drainages. All fencing will be, at minimum, buried six (6) inches into the ground and extend 36 inches above ground level to discourage listed animals from entering the site. Exclusion fencing will remain around the specified work areas for the duration of ground disturbing activities.

Measure 7. The monitoring biologist will be onsite at all times during initial ground-breaking activities until wildlife exclusion fencing is installed around the power generation facility, access road, laydown yard, and gas line. Upon completion of these activities, the monitoring biologist will inspect all wildlife and wetland exclusion fencing as well as construction zone fencing or flagging associated with the specified areas each week, at minimum, for the duration of MEP construction to ensure fencing integrity. During the wet season, a biological monitor will remain on site each day to record any migrating California tiger salamander or California red-legged frog individuals and to ensure appropriate avoidance and minimization measures are being implemented for these animals. During this period, the Service-approved monitor will also survey wildlife exclusion and construction perimeter fencing on a daily basis to look for tears and to ensure no California

tiger salamander or California red-legged frog have become trapped along the fence line. The applicant will maintain and/or replace these barriers immediately if necessary.

Measure 12. To the maximum extent practicable, fossorial mammal burrows that may provide refugia habitat for California tiger salamander and California red-legged frog will be avoided during the construction and long-term operation of the MEP. Exclusion fence and/or plywood will be placed around areas with high concentrations of burrows during the course of construction activities to avoid the destruction of these features.

Measure 16. Plastic mono-filament netting or similar material will not be used for erosion control matting at the project site to avoid the entanglement or entrapment of California tiger salamander or California red-legged frog individuals. Acceptable substitutes include coconut coir matting, tackified hydroseeding compounds, or other similar materials

Measure 24. All vehicles entering the work area(s) will be confined to existing roads or approved temporary routes. Speed limits within the work area(s) will be limited to 15 miles per hour [Note: CEC Condition of Certification BIO-10 requires a speed limit of 10 mph]. Trash dumping, firearms, and pets will be prohibited in the project area(s).

Measure 25. Construction of the power generation facility will include the installation of a permanent barrier to discourage movement of California tiger salamanders or California red-legged frogs onto the site. This barrier will be installed and maintained around the perimeter of the facility for the operational life of the Project and will be comprised of tightly woven metal fencing, concrete curbing or other similar exclusionary materials. At minimum, the barrier will be buried 6 inches into the ground and extend for three vertical feet above the ground surface.

7.7.2 Avoid Harassment or Harm to San Joaquin Kit Foxes

The Project Owner will prepare and implement a San Joaquin kit fox Management Plan, including the management measures listed below.

7.7.2.1 Condition of Certification BIO-14

The following avoidance and minimization measures will be implemented.

1. Preconstruction surveys (see Section 6.6 for more information)
2. Exclusion zones. The configuration of exclusion zones around the San Joaquin kit fox dens will have a radius measured outward from the entrance or cluster of entrances. The radii listed in Table 7-1 are minimums; if they cannot be followed, the CPM, USFWS, and CDFG must be contacted.
    a. Known den: To ensure protection, the exclusion zone will be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by San Joaquin kit foxes. Exclusion zone fencing will be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing will be removed to avoid attracting subsequent attention to the dens.
    b. Potential and Atypical dens: Placement of 4 to 5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; although fencing will not be required, the exclusion zone will be observed.

c. Construction and other project activities will be prohibited or greatly restricted within these exclusion zones. Only essential vehicle operation on existing roads and foot traffic will be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity will be prohibited within the exclusion zones.

3. Destruction of Dens. Disturbance to all San Joaquin kit fox dens will be avoided to the maximum extent possible. Protection provided by San Joaquin kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Limited destruction of San Joaquin kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. Potential, known, and/or occupied San Joaquin kit fox dens will not be destroyed unless the Project Owner has prior approval from the USFWS. The following measures will be implemented for any natal/pupping dens, active dens (non natal), and potential dens observed during preconstruction project surveys:

   a. Natal/pupping dens will be avoided and USFWS contacted for further guidance. Natal/pupping dens will not be disturbed by the proposed Project.

   b. Known dens occurring within the footprint of the activity will be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no San Joaquin kit fox activity is observed during this period, the den will be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed at the den during this period, the den will be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied will the den be excavated under the direction of the Designated Biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den will have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. Energy Commission staff, USFWS, and CDFG encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.

   c. Destruction of the den will be accomplished by careful excavation until it is certain that no San Joaquin kit foxes are inside. The den will be fully excavated, 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 San Joaquin kit fox is discovered inside the den, the excavation activity will cease and the CPM, USFWS, and CDFG will be notified immediately before monitoring of the den as described above will be resumed. Destruction of the den may be completed when, in the judgment of the Designated Biologist (in consultation with the CPM, USFWS, and CDFG), the animal has escaped from the partially destroyed den.

4. Construction and Operational Requirements. Habitat subject to permanent and temporary construction disturbances and other types of project-related disturbance will be minimized. Project designs will limit or cluster permanent project features to the

smallest area possible while still permitting project goals to be achieved. To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas will also be included in preconstruction surveys and, to the extent possible, will be established in locations disturbed by previous activities to prevent further impacts. The following measures also will be implemented:

a. Procedure for San Joaquin kit fox discovery onsite. If construction personnel encounter a San Joaquin kit fox or any animal that construction personnel believe may be San Joaquin kit fox, the following protocol will be followed:

    i. All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.

    ii. The construction manager will be immediately notified.

    iii. The construction manager will notify the Designated Biologist and Biological Monitor.

    iv. The animal will be allowed to leave the site on its own.

b. Before any ground is disturbed, the boundaries of the construction zone will be clearly delineated with orange colored plastic construction fencing or solid barriers (for example, a wildlife exclusion fence) to discourage workers or equipment from inadvertently straying from the project area.

c. Project-related vehicles will observe a 10-mph speed limit in all project areas, except on county roads and state and federal highways; this is particularly important at night when San Joaquin kit foxes are most active. To the extent possible, night-time construction will be minimized. Off-road traffic outside of designated project areas will be prohibited.

d. To prevent inadvertent entrapment of San Joaquin kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 6 inches deep will 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 will be thoroughly inspected for trapped animals. If at any time a trapped or injured San Joaquin kit fox is discovered, the procedures under item “m” below will be followed.

e. San Joaquin 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 will be thoroughly inspected for San Joaquin kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until the CPM, USFWS, and CDFG have been consulted. If necessary, and under the direct supervision of the Designated Biologist, the pipe may be moved once to remove it from the path of construction activity, until the San Joaquin kit fox has escaped.

f. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a week from a construction or project site.

g. No firearms will be allowed on the project site.

h. To prevent harassment, mortality of San Joaquin kit foxes, or destruction of dens by dogs or cats, no pets will be permitted on project sites.

i. A representative (e.g., Environmental Compliance Manager) will be appointed by the Project Owner who will be the contact source for any employee or contractor who might inadvertently kill or injure a San Joaquin kit fox or who finds a dead, injured or entrapped individual, including animals struck by project vehicles. The representative will be identified during the employee education program. The representative's name and telephone number will be provided to the CPM, CDFG, and USFWS.

j. An employee education program will be conducted for the MEP that addresses the expected impacts on San Joaquin kit fox or other endangered species. The program will consist of a presentation by the Designated Biologist on San Joaquin kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and agency personnel involved in the Project. The program will include the following: a description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of San Joaquin kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Acts; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information will be prepared for distribution to the above-mentioned people and anyone else who may enter the project site.

k. Upon completion of the Project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline and transmission line corridors, etc. will 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 project construction, but that after completion of project construction will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas will be determined on a site-specific basis in consultation with the CPM, USFWS, CDFG, and revegetation experts.

l. In the case of trapped animals, escape ramps or structures will be installed immediately to allow the animal(s) to escape, or the USFWS, CPM, and CDFG will be contacted for advice.

m. The CPM, USFWS, and CDFG will be notified immediately within 3 working days of the accidental death or injury to a San Joaquin kit fox during project-related activities. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825, (916) 414-6600. The CDFG contact for

immediate assistance is State Dispatch at (831) 649-2817. They will contact the local warden or biologist. Also contact Ms. Marcia Grefsrud at PO Box 47, Yountville, California, 94599, (707) 644-2812.

The Project Owner will submit the resume and qualifications of the proposed biologist(s) to the CDFG and USFWS for review and comment and the CPM for approval no less than 30 days prior to the start of preconstruction surveys.

No less than 30 days after completion of construction of the Project linears, the Project Owner will provide to the USFWS, CDFG, and CPM a written construction termination report identifying how impact minimization measures in the plan have been completed.

7.7.2.2 USFWS BO Minimization Measures 18 and 19

Measure 18. To prevent the accidental entrapment of listed species during construction, all excavated holes or trenches deeper than six inches will be covered at the end of each work day with plywood or similar materials. Foundation trenches or larger excavations that cannot easily be covered will be ramped at the end of the work day to allow trapped animals an escape method. Prior to the filling of such holes, these areas will be thoroughly inspected for listed species by Service-approved biologists. In the event of a trapped animal is observed, construction will cease until the individual has been relocated to an appropriate location.

Measure 19. All construction pipes, culverts, or similar structures greater than 4 inches in diameter that are stored at the MEP overnight will be securely capped before storage or will be thoroughly inspected for San Joaquin kit fox and other sensitive species prior to pipe installation or capping to avoid entrapment or injury of this animal. If a San Joaquin kit fox or other sensitive species is discovered inside a pipe, that section of pipe will not be moved until the Service and CDFG have been contacted by the Service-approved biologist to determine the appropriate course of action.

7.7.3 Bird Nest Monitoring

7.7.3.1 Swainson's Hawk (BIO-15)

If active nests are found within 0.5mile of the project disturbance area, an initial temporary nest disturbance buffer will be established. If project-related activities within the temporary nest disturbance buffer are determined to be necessary during the nesting season (approximately March 1 and September 1), then a biologist experienced with raptor behavior will be retained by the Project Owner to monitor the nest and will, along with the Project Owner, consult with the CPM and CDFG to determine the best course of action necessary to avoid nest abandonment or take of individuals. Work may be allowed to proceed within the temporary nest disturbance buffer if raptors are not exhibiting agitated behavior such as defensive flights at intruders, getting up from a brooding position, or flying off the nest. The Biological Monitor or Designated Biologist approved for raptor monitoring will be onsite daily while construction-related activities are taking place and will have the authority to stop work if raptors are exhibiting agitated behavior. In consultation with the CPM and CDFG and depending on the behavior of the raptors, over time it may be determined that the onsite biologist/monitor may no longer be necessary due to the raptors' acclimation to construction-related activities.

The Designated Biologist will contact the CPM and CDFG within 2 days of a work stoppage because of disturbance of the nesting Swainson's hawks. No less than 30 days after completion of construction within the nest buffer, the Project Owner will provide to the CDFG and CPM a written construction termination report identifying the results of monitoring during disturbance within the nest buffer.

7.7.3.2 Other Bird Nesting including Raptors and MBTA Species (BIO-8)

If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG and USFWS Migratory Bird Office; also see Table 7-1 for more information) and monitoring plan will be developed. The monitoring plan will include avoidance measures and remedial actions if the avoidance measures are not successful. Nest locations will be mapped using GPS technology and submitted, along with a weekly report stating the survey results, to the CPM.

The Designated Biologist will monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might, in the opinion of the Designated Biologist, disturb nesting activities will be prohibited within the buffer zone until such a determination is made.

7.7.4 Burrowing Owl Impact Avoidance and Minimization Measures (BIO-12)

The Project Owner will implement the following measures to manage the construction site, and related facilities, in a manner to avoid or minimize impacts on breeding and foraging burrowing owls.

1. Preconstruction Surveys (see Section 6.4 for more information)
2. Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet of the project disturbance area, the following avoidance and minimization measures will be implemented:
    a. Establish Non-Disturbance Buffer. Fencing will be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1 through January 31). Sensitive resource signs will be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.
    b. Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31), the Designated Biologist or Biological Monitor will monitor to determine if these activities have potential to adversely affect nesting efforts and will implement measures to minimize or avoid such disturbance.
3. Implement Burrowing Owl Mitigation Plan. If preconstruction surveys indicate the presence of burrowing owls or active burrowing owl burrows within the project disturbance area, the Project Owner shall prepare and implement a Burrowing Owl Mitigation Plan, in addition to the avoidance measures described above. The final

Burrowing Owl Mitigation Plan shall be approved by the CPM, in consultation with CDFG, and shall:

a. Identify and describe suitable relocation sites within 1 mile of the project disturbance area, and describe measures to ensure that burrow installation or improvements would not affect sensitive species' habitat or existing burrowing owl colonies in the relocation area;

b. Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG, 1995) and shall be approved by the CPM in consultation with CDFG;

c. Provide detailed methods and guidance for passive relocation of burrowing owls occurring within the project disturbance area (including burrow destruction); and

d. Describe monitoring and management of the relocated burrowing owl site, and provide a reporting plan.

The Project Owner shall report monthly to the CPM and CDFG for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction the Project Owner will provide to the CDFG and CPM a written construction termination report identifying how mitigation measures, including those measures described in the plan if a plan was required, have been completed.

7.7.5 Western Pond Turtle Measures Impact Avoidance and Minimization Measures (BIO-11)

Western pond turtles will be avoided to the extent possible. Avoidance areas will be delineated by exclusionary fencing. If western pond turtles are found within the project disturbance area that cannot be avoided, the western pond turtles will be relocated to the CPM-approved (in consultation with CDFG) relocation site.

The Project Owner will submit a report to the CPM and CDFG no less than 10 days prior to the start of any ground-disturbing activities or construction equipment staging that describes when surveys were completed, observations, and proposed impact minimization measures. Within 30 days after completion of construction of the Project linears, the Project Owner will provide to the CDFG and CPM a written construction termination report identifying how impact minimization measures have been completed.

7.7.6 Fairy Shrimp Surveys or Avoidance and Compensatory Mitigation (BIO-9)

The Project Owner will implement the following measures to manage the construction site, and related facilities, in a manner to avoid or minimize impacts on listed fairy shrimp or tadpole shrimp species and habitat.

1. A buffer zone of 250 feet or the limit of the immediate watershed supporting the seasonal wetland (whichever is larger) will be established around all known and potentially occupied branchiopod habitat. The buffer zone will be delineated with

temporary fencing. The fencing will be kept in good repair and remain installed for the duration of MEP construction. If this buffer zone is not feasible for any potential habitat, a buffer zone will be delineated in consultation with CDFG and USFWS.

2. A Biological Monitor will be onsite during all ground-disturbing work within 250 feet of potential branchiopod habitat and will oversee all off-road vehicle access for the Project.
3. To the extent possible, construction of the linear projects will occur during the dry summer season to minimize the potential for indirect effects on nearby branchiopod habitat.

No less than 10 days prior to ground disturbance, the Project Owner will provide a report detailing the locations of buffer zone fencing, and that includes both a figure and photographs showing the location of the fencing. The Project Owner will report monthly to the CPM, CDFG, and USFWS for the duration of construction on the implementation of listed branchiopod habitat avoidance and minimization measures. Within 30 days after completion of construction the Project Owner will provide to the CDFG, USFWS, and CPM a written construction termination report identifying how impact minimization measures have been completed.

7.8 Revegetation and Restoration

7.8.1 Condition of Certification BIO-18

All temporarily affected areas will be restored to pre-project conditions. Topsoil stripped from the project site will be stockpiled onsite for later use during restoration of the temporary impact areas. In areas subject to compaction, ripping will be performed to a depth no less than 2 feet to facilitate restoration. Affected areas will be reseeded with species typical of annual grassland, and temporary erosion control BMPs, including silt fences, erosion control blankets, and fiber rolls, will be installed as necessary to prevent any observed erosion until revegetation measures are fully implemented. Within 30 days after completion of restoration, the Project Owner will provide to the USFWS, CDFG and CPM a written report identifying how revegetation has been completed.

7.8.2 USFWS BO Minimization Measure 13

Topsoil removed from the 9.2-acre temporary laydown area, access road widening, cut-and-fill area, and gas pipeline trenching locations will be stockpiled and reserved for the duration of construction activities. Upon completion of these actions, temporarily disturbed areas will be graded and restored with reserved topsoil to facilitate the re-establishment of fossoral mammal populations and upland listed species habitats. Any surplus topsoil will be hauled off site and disposed of at an appropriate facility.

7.9 Compliance with USACE Section 404 and RWQCB Section 401

The following measures will be implemented:

1. Include in the final BRMIMP any conditions of the 404 and 401 not currently included in this plan that are requirements of USACE and RWQCB, respectively.

2. Allow the CPM, USACE, RWQCB, or CDFG to enter the project site at any time to ensure compliance with the conditions for right of access and review for compliance monitoring. The Project Owner herein grants to the CPM and to USACE, RWQCB, and/or CDFG employees and/or their representatives the right to enter the project site at any time to ensure compliance with the terms and conditions and/or to determine the impacts of storm events, maintenance activities, or other actions that might affect the jurisdictional waters. The CPM, USACE, RWQCB, or CDFG may, at their discretion, review relevant documents maintained by the operator, interview the operator's employees and agents, inspect the work site, and take other actions to assess compliance with or effectiveness of mitigation measures.

3. The Project Owner will notify the CPM, USACE, RWQCB, and CDFG of any change of conditions to the Project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the site change in a manner that changes risk to biological resources that may be substantially adversely affected. The notifying report will be provided to the CPM, USACE, RWQCB, and CDFG no later than 7 days after the change of conditions is identified. As used here, "change of condition" refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the Project as defined below. A copy of the notifying change of conditions report will be included in the annual reports.

    a. Biological Conditions: A change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened as defined in section 15380 of Title 14 of the California Code of Regulations.

    b. Physical Conditions: A change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage; or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

    c. Legal Conditions: A change in legal conditions includes, but is not limited to, a change in regulations, statutory law, a judicial or court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened as defined in section 15380 of Title 14 of the California Code of Regulations.

4. The Project Owner will provide a copy of the each agency's respective work authorization permit to all contractors, subcontractors, and project supervisors. Copies will be readily available at work sites at all times during periods of active work and will be presented to any agency personnel or CEC personnel upon demand. Copies of the 404 and 401 permits are provided in Appendix A.

5. The Project Owner will also comply with the requirements of the aforementioned permits, presented in the following sections.

7.9.1 USACE Section 404 Permit Conditions

1. This Corps permit does not authorize you to take an endangered species, in particular California red-legged frog (*Rana aurora draytonii*), San Joaquin kit fox (*Vulpes macrotis mutica*), California tiger salamander (*Ambystoma californiense*), vernal pool fairy shrimp (*Branchinecta lynchi*), longhorn fairy shrimp (*Branchinecta longiantenna*) or designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed Fish and Wildlife Service Biological Opinion (Number 84120-2009-F-1306-2, dated May 17, 2011), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with "incidental take" of the attached Biological Opinion, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological Opinion, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The U. S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its Biological Opinion, and with the Endangered Species Act. You must comply with all conditions of this Biological Opinion, including those ascribed to the Corps.

2. To mitigate for the loss of 0.018 acre of waters of the United States you shall purchase 0.02 credits of seasonal wetland habitat at Cosumnes Floodplain Mitigation Bank. The selected mitigation bank shall include the area of the permitted project within its service area. Evidence of this purchase shall be provided to this office prior to the` commencement of any activity authorized by this permit.

3. Within 15 days prior to construction activities, you shall submit to the Corps preconstruction site and aerial photographs of the project site, which have been taken no more than 30 days prior to initiation of construction activities. Within 30 days following construction activities, you shall submit post-construction site and aerial photographs of the project site, showing the work conducted, to this office. The camera positions and view angles of post-construction photographs shall be identified on a map, aerial photo, or project drawing. Construction locations shall include all major project features and waters of the U.S., including mitigation areas.

4. You and your authorized contractor must allow representatives from this office to inspect the authorized activity and all mitigation, preservation, and avoidance areas at any time deemed necessary to ensure that work is being or has been accomplished in accordance with the terms and conditions of this verification.

5. You are responsible for all work authorized herein and ensuring that all contractors and workers are made aware and adhere to the terms and conditions of this permit authorization. You shall ensure that a copy of the permit authorization and associated drawings are available for quick reference at the project site until all construction activities are completed.

6. All terms and conditions of the May 26, 2011 Section 401 Water Quality Certification are expressly incorporated as conditions of this permit.

7. You shall employ a wetland scientist or environmental engineer to continuously monitor construction activities in the vicinity of waters of the U.S. to ensure against unauthorized activity during construction. The monitor shall be on-site during all construction activities within 50 feet of preserved and/or avoided waters of the U.S.

8. The buried utility lines shall be accomplished to meet the following requirements:

    a. Within 30-days following completion of construction activities, you shall restore the trench area and any temporary stockpiling area in accordance with Special Condition 9 below.

    b. During construction, the top 12-18 inches of topsoil shall be removed and stockpiled separately. Following installation, the stockpiled topsoil shall be replaced on top and seeded with native vegetation that has been approved by the Corps.

    c. Utility lines shall not adversely alter existing hydrology, including the draining of wetlands. In wetland areas, structures such as cut-off walls shall be used within utility trenches to ensure that the trench through which the utility line is installed does not drain waters of the U.S. Clay blocks, bentonite or other suitable material shall be used to seal the trench to prevent the utility line from draining waters of the U.S., including wetlands.

9. All temporary impacts to waters of the U.S. and adjacent upland areas within 50 feet of waters of the U.S. shall be restored to their original contour and condition within 30 days after completion of construction activities. In order to ensure compliance with this condition, you shall:

    a. Submit to the Corps, for review and approval, a plan for the restoration of temporary impact areas prior to initiation of any construction activities. This plan shall include the following information: (1) A description of and drawings showing the existing contours (elevation) and existing vegetation of the temporary impact areas. This information shall include site photographs taken of the temporary impact area. For linear projects, these photographs shall be taken from the alignment, in both directions and taken every 50-feet for the length of the temporary impact area.; (2) The methods used to restore the site to the original contour and conditions, as well as a plan for the revegetation of the site following construction activities; (3) The proposed schedule for the restoration activities; (4) A mitigation and monitoring plan, to be approved by the

Corps, for the temporary impact area to ensure success of the restoration. Monitoring shall be conducted for a minimum of 3 growing seasons after completion of restoration activities. The plan shall be presented in the format of the Sacramento District's Habitat Mitigation and Monitoring Proposal Guidelines, dated December 30, 2004.

b. Within 30 days after completion of restoration activities, submit to the Corps a report describing the restoration activities and including photographs of the restored area. The camera positions and view angles of post-construction photographs shall be identical to preconstruction photographs.

c. Submit to the Corps a Monitoring Report by December 1 for each year of required monitoring. This report shall be submitted in the format shown on the enclosed Regulatory Guidance Letter 08-03, dated 10 October 2008, or subsequent guidance as appropriate. Reports may be submitted in hard copy or electronically.

10. The project permit limits shall be clearly identified in the field with highly visible markers such as construction fencing or silt barriers prior to initiating construction work to ensure avoidance of impacts beyond permit limits. Such identification shall be properly maintained until construction is completed. Equipment, materials, or any other substances or activity that impacts waters of the U.S. outside the permit limits (as shown on the May 26, 2011, Figure 3 Exclusion Fence Plan) is prohibited.

11. Prior to initiation any activities otherwise authorized in this permit, you shall employ construction best management practices (BMPs) onsite to prevent degradation to on-site and off-site waters of the U.S. Methods shall include the use of appropriate measures to intercept and capture sediment prior to entering waters of the U.S., as well as erosion control measures along the perimeter of all work areas to prevent the displacement of fill material. All BMP's shall be in place prior to initiation of any construction activities and shall remain until construction activities are completed. Erosion control methods shall remain in place until all on-site soils are stabilized. You shall submit a description of and photo-documentation of your BMPs to our office within 15 days of commencement of construction. Photos may be submitted electronically to regulatory-info@usace.army.mil.

7.9.2 CVRWQCB Section 401 Permit Conditions

The following conditions within the Clean Water Act Section 401 Water Quality Certification and Waste Discharge Requirements (WDID#5B01CR00012) will be implemented.

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This Order serves as a Water Quality Certification (Certification) action that is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license

unless the pertinent Certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3. The validity of any non-denial Certification action shall be conditioned upon total payment of the full fee required under 23. CCR §3833 unless otherwise stated in writing by the certifying agency.

4. This Certification is valid for the duration of the described project. This Certification is no longer valid if the project (as currently described) is modified, or coverage under Section 404 of the Clean Water Act has expired.

5. All reports, notices, or other documents required by this Certification or requested by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) shall be signed by a person described below or by a duly authorized representative of that person.

   a. For a corporation: by a responsible corporate officer such as (1) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; (2) any other person who performs similar policy or decision-making functions for the corporation; or (3) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

   b. For a partnership or sole proprietorship: by a general partner or the proprietor.

   c. For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official.

6. Any person signing a document under Standard Condition number 5 shall make the following certification, whether written or implied:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated 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, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

ADDITIONAL TECHNICALLY CONDITIONED CERTIFICATION CONDITIONS:

In addition to the above standard conditions, Diamond Generating Corporation shall satisfy the following:

1. Diamond Generating Corporation shall notify the Central Valley Water Board in writing 7 days in advance of the start of any work within waters of the United States or State. The notification should include the name of the project and the WDID number, and should be sent to the Central Valley Water Board contact person shown on page six of this Certification.

2. Except for activities permitted by the U.S. Army Corps under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.
3. All areas disturbed by project activities shall be protected from washout or erosion.
4. Diamond Generating Corporation shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed project shall be adequately informed and trained regarding the conditions of this Certification.
5. All temporarily affected areas will be restored to preconstruction contours and conditions upon completion of construction activities.
6. Diamond Generating Corporation shall perform surface water sampling: 1) When performing any in-water work; 2) In the event that project activities result in any materials reaching surface waters or; 3) When any activities result in the creation of a visible plume in surface waters. The following monitoring shall be conducted immediately upstream out of the influence of the project and within 300 feet downstream of the active work area. Sampling results shall be submitted to this office within two weeks of initiation of sampling and every two weeks thereafter. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board.

Parameter	Unit	Type of Sample	Frequency of Sample
Turbidity	NTU	Grab	Every 4 hours during in water work
Settleable Material	mill	Grab	Same as above
Visible construction related pollutants	Observations	Visual Inspections	Continuous throughout the construction period

7. Activities shall not cause turbidity increases in surface water to exceed:
   a. where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTU;
   b. where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
   c. where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
   d. where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs;
   e. where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTU over background turbidity as measured in surface waters within 300 feet downstream of the working area. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be assessed by prior permission of the Central Valley Water Board.

8. Activities shall not cause settleable matter to exceed 0.1 mill in surface waters as measured in surface waters within 300 feet downstream of the project.

9. The discharge of petroleum products or other excavated materials to surface water is prohibited. Activities shall not cause visible oil, grease, or foam in the work area or downstream. Diamond Generating Corporation shall notify the Central Valley Water Board immediately of any spill of petroleum products or other organic or earthen materials.

10. Diamond Generating Corporation shall notify the Central Valley Water Board immediately if the above criteria for turbidity, settleable matter, oil/grease, or foam are exceeded.

11. Diamond Generating Corporation shall comply with all California Department of Fish and Game requirements for the project.

12. The use of netting material (e.g., monofilament-based erosion blankets) that could trap aquatic dependent wildlife is prohibited within the Project Area.

13. Diamond Generating Corporation must obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board for any project disturbing an area of 1 acre or greater.

14. The Conditions in this Certification are based on the information in the attached "Project Information." if the information in the attached Project Information Sheet is modified or the project changes, this Certification is no longer valid until amended by the Central Valley Water Board.

15. In the event of any violation or threatened violation of the conditions of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under State and Federal law. The applicability of any State law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with this Certification.

    a. If Diamond Generating Corporation or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Certification, or falsifies any information provided in the monitoring reports, the applicant is subject to civil, for each day of violation, or criminal liability.

    b. In response to a suspected violation of any condition of this Certification, the Central Valley Water Board may require Diamond Generating Corporation to

furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

c. Diamond Generating Corporation shall allow the staff(s) of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this Certification and determining the ecological success of the project.

16. Diamond Generating Corporation shall provide a Notice of Completion (NOC) no later than 30 days after the project completion. The NOC shall demonstrate that the project has been carried out in accordance with the project's description (and any amendments approved). The NOC shall include a map of the project location(s), including final boundaries of any in situ restoration area(s), if appropriate, and representative pre and post construction photographs. Each photograph shall include a descriptive title, date taken, photographic site, and photographic orientation.

17. Diamond Generating Corporation shall provide evidence of mitigation credits purchased in association with the compensatory mitigation requirements of this project to the Central Valley Water Board prior to proceeding with the activity authorized by this Certification.

ADDITIONAL STORM WATER QUALITY CONDITIONS:

Diamond Generating Corporation shall also satisfy the following additional storm water quality conditions:

1. During the construction phase, Diamond Generating Corporation must employ strategies to minimize erosion and the introduction of pollutants into storm water runoff. These strategies must include the following:

   a. The Storm Water Pollution Prevention Plan (SWPPP) must be prepared during the project planning and design phases and implemented, as appropriate, before construction;

   b. An effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working prior to the rainy season and during all phases of construction.

2. Diamond Generating Corporation must minimize the short and long-term impacts on receiving water quality from the Mariposa Energy Project (MEP) by implementing the following post-construction storm water management practices and as required by the local agency permitting the project, as appropriate:

   a. Provide treatment BMPs to reduce pollutants in runoff;

   b. Ensure existing waters of the State (e.g., wetlands, vernal pools, or creeks) are not used as pollutant source controls and/or treatment controls;

c. Preserve and, where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones;

d. Limit disturbances of natural water bodies and natural drainage systems caused by development (including development of roads, highways, and bridges);

e. Identify and avoid development in areas that are particularly susceptible to erosion and sediment loss, or establish development guidance that protects areas from erosion/ sediment loss.

SECTION 8

Compensation for Habitat and Species Impacts

8.1 Condition of Certification BIO-16

To mitigate for impacts on wetlands and habitat loss and potential take of listed branchiopods, San Joaquin kit fox, California red-legged frog, California tiger salamander, western burrowing owl, Swainson's hawk, and wetlands, the Project Owner will provide compensatory mitigation for permanent, long-term temporary, and short-term temporary impacts. Compensation for these losses will be accomplished either by establishment of a conservation easement preserving suitable habitat for the aforementioned species in perpetuity or through the purchase of credits from an agency-approved mitigation bank such as the proposed Mountain House Conservation Bank. Wetlands impacts will be mitigated separately as required by USACE and RWQCB by purchasing wetland creation credits from the Cosumnes Floodplain Mitigation Bank. The compensation acreages for MEP are shown in Table 8-1 below.

TABLE 8-1
Compensation Acreages for Construction and Operation
Mariposa Energy Project

Species/Habitat	Compensation (Acres)
Waters of the United States (including wetlands)	0.018
Listed Branchiopods	0.054
California tiger salamander (upland habitat)	79.9
California red-legged frog (upland habitat)	79.9
San Joaquin kit fox	79.9
Burrowing owl (foraging habitat)	44.2
Swainson's hawk (foraging habitat)	19.3

Note: The acreages shown are based on a combination of temporary and permanent impact ratios, ranging from 1:1 to 3:1.

If the mitigation actions required by BIO-16 are not completed prior to the start of ground-disturbing activities, the Project Owner will provide the CPM with an approved security (financial assurance) in accordance with BIO-16, no less than 30 days prior to beginning project ground-disturbing activities. The Project Owner's intention is to provide the compensation by purchasing credits from the proposed Mountain House Conservation Bank and Cosumnes Flood Plain Mitigation Bank. Under this scenario, the Project Owner will complete and provide written verification to the CPM, CDFG, and USFWS of the credit purchase within 18 months of the start of project ground-disturbing activities, or prior to commercial operation, whichever occurs first. The verification will be a letter from the conservation bank, or other method approved by the CPM and CDFG, in consultation with

the USFWS, and will include the name of the conservation bank, number of credits purchased, and the species covered under the purchase.

8.2 USFWS BO Mitigation Measure 27

Potential effects to listed species resulting from MEP activities will be compensated for by the preservation of 79.9 acres of upland California tiger salamanders, California red-legged frogs and San Joaquin kit fox habitats at the proposed Mountain House Mitigation Bank or other alternative Service, CDFG and CEC -approved conservation property and 0.57-acre of preservation habitat at the Fitzgerald Ranch Conservation Bank or other alternative Service and CEC-approved conservation property for vernal pool fairy shrimp. Any conservation property utilized to offset MEP effects to listed species will be accompanied by a long-term management plan with an associated endowment, and will be placed under a permanent conservation easement. All documentation for the selected conservation property will be reviewed and approved by the Service, CDFG and CEC. Mariposa Energy, LLC will provide written verification to the Service, CDFG and CEC of the credit purchase or conservation easement within 18 months from the start of construction activities or prior to commercial operation of the power generation facility, whichever comes first. Prior to the start of construction, Mariposa Energy, LLC will provide a letter of credit to CDFG with sufficient funding to cover the higher of either the purchase of 79.9 upland acres at the Mountain House Mitigation Bank and 0.57-acre worth of preservation credits at the Fitzgerald Ranch Conservation Bank or the development and implementation of these acres at the alternative Service, CDFG, and CEC -approved conservation property.

SECTION 9

Construction Monitoring and Reporting Responsibilities

9.1 Scope of Monitoring

The intensity and frequency of monitoring depends on the biological resources in and near the work area and the kinds of activity under way. When trenches and holes are open, large volumes of supplies are deployed for installation, construction traffic is very heavy, work is occurring outside excluded areas (for example, during construction of the offsite facilities) and/or sensitive resources are common in the area, full-time environmental compliance monitoring will be necessary. During such periods, daily or more frequent inspections will include the following:

- Evaluate the fencing and staking of exclusion zones protecting special-status species. No work activities will be conducted within the designated exclusion zones.
- Ensure that straw wattles or silt fences are in place where appropriate.
- Ensure that all ground-disturbing activities are restricted to the periods listed in Table 2-1 to protect special-status species.
- Monitor special-status species as specified in Section 7.
- Monitor to determine that disturbance or removal of vegetation within the agreed work area will not exceed the minimum necessary to complete operations. Precautions will be taken to avoid other damage to vegetation by people or equipment. Where possible, grassland removal will occur during periods when no nesting birds are present.
- Ensure that vehicles will not be operated in surface water. Except within agreed (fenced or flagged) work areas, vehicles will not be operated where riparian or aquatic species of plants are present.
- Ensure that fill will be limited to the minimum amount necessary to accomplish the agreed activities. Excess fill will be moved offsite at project completion.
- Confirm with the Project Owner that sediment-laden water will not be discharged into waters of the United States (including wetlands). The ability to minimize sedimentation will be the subject of preconstruction planning and feature implementation. Precautions to minimize sedimentation may require that the work site be isolated so that sediment or other deleterious materials are not allowed to pass to downstream reaches.
- Confirm with the Project Owner that raw cement, concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to fish or wildlife resulting from project-related activities will be prevented from contaminating the soil or entering the waters of the U.S. (including wetlands).

- Confirm with the Project Owner that all project-generated debris, building materials, and rubbish will be removed from areas where such materials could be washed into waters of the United States (including wetlands).
- Verify with the Project Owner that any equipment or vehicles driven and/or operated adjacent to the wetlands and waters, and staging/storage and refueling areas for equipment and materials will be located outside the waterways.
- Verify with the Project Owner that all excess project materials are removed from the project site.
- Confirm with the Project Owner that transmission lines and towers will be designed with suitable spacing between conductor wires to minimize risk of electrocution for birds.
- Confirm with the Project Owner whether all construction and operation workers in the project area have completed an employee orientation and WEAP. Training will be required at the start of work. Specific details of the program are included in MEP's WEAP.
- Evaluate compliance with installation of escape ramps or covers to prevent entrapment of wildlife.
- Confirm with the Project Owner that construction personnel have inspected all trenches for entrapped wildlife each morning prior to onset of construction before such holes or trenches are filled. Any animals so discovered will be allowed to escape voluntarily, without harassment, before construction activities resume, or will be removed from the trench or hole by the Designated Biologist or Biological Monitor and allowed to escape unimpeded. All handling of endangered species will be done by biologists in possession of a valid 10(a)(1)(A) permit for that species as required, and/or as approved by USFWS and/or CDFG.
- Confirm with the Project Owner that ground-disturbing activities on transmission lines and pipelines will be limited to daylight hours, unless otherwise authorized.
- Verify that any employee who inadvertently kills or injures a listed species or who finds any such animal dead, injured, or entrapped, reports the incident immediately to the Designated Biologist/Biological Monitor. In the case of entrapped listed animals, escape ramps or structures will be installed immediately if possible to allow the subject animal(s) to escape unimpeded.
- Contact USFWS and/or CDFG following the resolution of any sensitive species emergency regarding appropriate protection measures for listed species and their habitat that is implemented during cleanup activities. The Designated Biologist will contact USFWS and/or CDFG.

Although the inspections listed below may be done whenever a monitor is in the construction area, inspections will be conducted at least once a week to confirm that the following are being performed:

- Exclusion zone flagging and fencing is in place where needed and has been removed in areas where construction is completed. Exclusion fencing will be inspected for effectiveness.

- Construction area boundaries are clearly delineated by fencing or staking and flagging and/or rope or cord.
- Equipment storage and parking are confined to the designated areas.
- All food-related trash items are being disposed of in closed containers and are being removed at least once a week from the site.
- Deliberate feeding of wildlife is not occurring.
- No firearms, except for those carried by security personnel, are on the project site.
- No pets are on the project site.
- Use of rodenticides or herbicides in project areas is minimized, and there is no use of chemicals and pesticides known to cause harm to amphibians. All users of approved rodenticides and herbicides are observing label requirements and other restrictions per federal and state legislation.

9.1.1 USFWS BO Minimization Measure 10

The Service-approved biologist will monitor the construction of the water supply pipeline and transmission line on a daily basis for the duration of these activities, regardless of the season.

9.2 Conflict Resolution

Remediation of noncompliance issues will require the cooperation of the Designated Biologist, Environmental Compliance Manager, Resident Engineer, Construction Inspector, Contractor Supervisor, and Crew Foreman. Through this cooperative effort, all involved parties will become aware of the issues, remediation measures, and reasons for future avoidance of similar and related noncompliance issues. However, to ensure that these issues are given the priority that they deserve, all incidences of noncompliance as well as other problems that may become noncompliance issues will be discussed at the weekly project status meeting. Furthermore, the Designated Biologist will take every opportunity to discuss sensitive species biology and protection with contracting personnel.

9.3 Summary of Reporting Responsibilities of Construction Monitoring

Monthly monitoring reports and weekly reporting (for example, nesting bird reporting) where required will be prepared by the Designated Biologist and will be submitted to the Project Owner's Environmental Compliance Manager for transmittal to the CEC CPM. In addition, the CPM will be notified immediately, in writing, if monitoring reveals that any of the protective measures were not implemented during the period indicated in this program, or if it appears that measures will not be implemented within the time period specified. The CPM also will be notified if any of the protective measures are not providing a level of protection that is appropriate for the impact that is occurring. The CPM will be notified of recommendations, if any, for alternative protective measures.

The first monthly report will be prepared within 1 month of the beginning of surface disturbing activities. Subsequent reports will be prepared for any month during which the biological monitoring is necessary for the protection of sensitive biological resources. Each monthly compliance report will include the following information:

- Areas and activities monitored during the reporting month
- Summary of the BRMIMP measures that were implemented
- Incident reports and resolution of each reported situation
- Species relocated, killed, or injured during project construction; the dates, times, and locations of capture, mortality, or injury; and descriptions of relocation sites
- Construction and monitoring activities planned for the following month, along with anticipated problems
- Methods used to resolve noncompliance issues, including agency and MEP personnel contacted

9.3.1 USFWS BO Minimization Measure 11

The Service-approved biological monitor and construction manager will be notified immediately if a California tiger salamander, California red-legged frog, or San Joaquin kit fox are observed anywhere within the property. If the observed animal is a California tiger salamander or California red-legged frog, the Service-approved biologist will monitor these animals and determine if they are in danger of take from construction activities, predators, or entrapment. If they are, all construction in the immediate area will cease until the animal is allowed to passively leave the site. If this is not possible, the Service-approved biological monitor will remove the California tiger salamander or California red-legged frog from the property in a cool, moist container and relocate these individuals to either the adjacent Bryon Conservation Bank or the proposed Mountain House Conservation Bank site. Upon release of these animals, the Service-approved biologist will monitor the individual until it is determined that it is in no imminent danger. If a San Joaquin kit fox is observed on the site, construction activities that will directly affect the individual will cease until the animal passively leaves the site. Field survey forms will be completed for all California tiger salamander, California red-legged frog, or San Joaquin kit fox observations. These forms will be submitted to the California Natural Diversity Data Base (CNDDB) prior to completion of construction activities.

9.4 Reporting of Injured Wildlife

Any employee who inadvertently kills or injures a wildlife species, or who finds any animal either dead, injured, or entrapped, is required to report the incident immediately to the Designated Biologist. Injured special-status animals will be reported to CDFG and USFWS. The Project Owner will follow instructions that are provided by CDFG and USFWS for special-status species. The Designated Biologist has identified the Lindsay Wildlife Museum (located at 1931 1st Avenue, Walnut Creek, CA 94597, telephone: [925] 935-1978) as the on-call wildlife rehabilitation center and/or veterinarian who can be contacted in the event that an injured animal needs care.

In the case of entrapped listed animals, escape ramps or structures will be installed immediately, if possible, to allow the subject animal(s) to escape unimpeded.

In the event that an animal is found dead on the project site and the species of animal is classified as threatened or endangered, the Designated Biologist will immediately (within 24 hours) notify USFWS (contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825, [916] 414-6600) and CDFG (contact for immediate assistance is State Dispatch at [831] 649-2817 and Ms. Marcia Grefsrud at P.O. Box 47, Yountville, California, 94599, [707] 644-2812) by phone or in person and will document initial notification in writing within 2 working days of the finding of any such animal(s). Notification will include the date, time, location, species, and circumstances of the incident.

Any listed species found dead or injured will be delivered to the USFWS, CDFG, or designated veterinarian immediately for care, analysis, or disposition.

9.5 Spill Response Emergency Procedures

In the event that a spill or accident occurs adjacent to or in a sensitive habitat and the Designated Biologist or Biological Monitor is not onsite, the following will occur:

- Construction activities in the immediate vicinity will halt
- The site or area foreman will be notified of the incident
- The Designated Biologist or Biological Monitor will be contacted immediately

The Designated Biologist will assess impacts on the site-specific sensitive resources, determine whether damage is significant, develop the necessary mitigation measures, and if the Designated Biologist deems necessary, contact the CPM and appropriate agencies responsible for consultation. The CPM will be notified every time a spill or accident occurs in or adjacent to a sensitive habitat.

SECTION 10

Post-construction Monitoring and Reporting Responsibilities

According to Condition of Certification BIO-6, within 30 days after completion of project construction, the Project Owner will provide to the CPM for review and approval a written construction closure report identifying which items of the BRMIMP have been completed; a summary of all modifications to mitigation measures made during the Project's site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding. The Designated Biologist will conduct a post-construction site visit once all restoration activities are complete to determine whether all implemented protection measures related to biological resources were successful. The results of the inspection will be included in the post-construction report (BIO-6).

Upon completion of construction, all temporarily disturbed areas will be subject to post-construction cleanup and restoration (BIO-18) by the contractors. Cleanup will consist of removal of gravel, stakes, lathes, temporary erosion control devices, flagging, barrels, cans, drums, accidental spills, and any other refuse generated by construction. Reclamation will consist of recontouring soil surfaces to natural lines and grades. All areas subject to temporary ground disturbances will be re-contoured to natural lines and original grade without disruption to adjacent undisturbed habitat.

Although the construction area will be kept cleared of trash, food-related items, construction debris, and other litter during the entire construction period, a post-construction inspection and cleanup will be conducted. The Designated Biologist will accomplish the inspection within 15 days of completion of construction in each construction area. All construction debris, unneeded signs, and other trash and litter will be removed within 15 days of the inspection. The Designated Biologist will be responsible for removing all stakes, lathes, flagging, and signs associated with protected areas; the construction contractor will be responsible to remove all other debris. Disposal of all debris will be at an approved waste facility.

SECTION 11

Implementation Monitoring/Verification Program

Verification of mitigation will be documented on daily monitoring logs, in Monthly Compliance Reports, and in the final Construction Closure Report Measures for MEP that will be submitted to the CEC within 30 days after completion of construction.

Compliance of each mitigation measure will be monitored by the Designated Biologist according to the schedule in Table 11-1 and will be documented on compliance verification forms or daily logs for each site visit. The daily forms will record where, when, and how construction activities are performed and whether compliance was met. Monthly Compliance Reports will summarize the activities for each month. The summaries will include a discussion of whether the mitigation measures were successful, compared with the success criteria where applicable. The summaries will also include all plan modifications and remedial measures taken if the success criteria were not met during the mitigation monitoring process. Table 11-1 outlines the performance standards or success criteria for each mitigation measure.

TABLE 11-1
Monitoring Tasks and Criteria that Determine Successful Implementation of Mitigation Measures
Mariposa Energy Project

Mitigation Measure	Monitoring Type	Monitoring Duration	Monitoring Frequency	Success Criteria
Preconstruction surveys	Direct observation	Throughout construction	As needed, dependent on season, targeted species, and survey protocol	Identified special-status species are protected with species-specific avoidance/minimization measures. Effectiveness of mitigation measures reported in monthly compliance reports.
Construction zone limits	Direct observation	Throughout construction	Daily/weekly site inspections	No adverse effects on surrounding habitats
Worker Environmental Awareness Training	Direct observation of attendance	Throughout construction for new employees	For each new site worker at start of project construction	Signed affidavits, to be included with monthly compliance reports
Special-status species protection	Direct observation	Throughout construction	As needed, dependent on season and targeted species at power plant site; fulltime at offsite linear facilities	No adverse effects on special-status species. Success of avoidance/minimization measures reported in monthly compliance reports.

TABLE 11-1
Monitoring Tasks and Criteria that Determine Successful Implementation of Mitigation Measures
Mariposa Energy Project

Mitigation Measure	Monitoring Type	Monitoring Duration	Monitoring Frequency	Success Criteria
Post-construction restoration of temporarily affected work areas	Direct observation	Throughout construction	As work is completed	Disturbance areas are adequately restored to pre-project conditions

SECTION 12

Facility Closure

Permanent and unexpected permanent and temporary closure scenarios are addressed in this section. Permanent closure will occur at the end of the facility's operational phase, but unexpected permanent or temporary closures may be necessary in the event of disastrous events or unfavorable economic conditions.

As required by the BIO-6, a permanent closure plan will be prepared prior to closure activities. It will include special-status species take avoidance and mitigation requirements applicable to the sensitive biological resources in the area at that time. The plan will also include reclamation of areas where facilities will be removed. Measures similar to those contained in Sections 6, 7, 9, 10, and 11, along with other appropriate measures, will be included in the closure plan. The permanent closure plan will be subject to approval by the responsible agencies.

In the case of unexpected permanent or temporary closure, measures to protect biological resources will be needed only if surface disturbances or releases of harmful materials occurred during a disaster. If such an event occurs, Mariposa Energy will consult with responsible agencies to plan cleanup and mitigation of impacts on biological resources.

SECTION 13

Modifications to the BRMIMP

Mariposa Energy will notify the CEC CPM no less than 5 working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP also will be approved by the CPM and will be submitted to the USFWS and CDFG to ensure that no conflicts exist. The following items are required when modifications to the BRMIMP and CPM approval are necessary:

1. Identify changes considered necessary:
    a. Describe the proposed change.
    b. Describe the reasons for the change.
    c. Describe how the change will be implemented.
2. Determine whether CEC Condition of Certification/project amendment (requires approval of full Commission) is required:
    a. Contact CPM.
    b. Notify other permitting agencies and interested parties.

SECTION 14

References

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Appendix A
CEC Biological Conditions of Certification, Agency Agreements/Permits

California Energy Commission Final Decision
Conditions of Certification

MARIPOSA ENERGY PROJECT

Commission Decision

CALIFORNIA
ENERGY COMMISSION
Edmund G. Brown, Jr., Governor

MAY 2011
CEC 800-2011-001-CMF

DOCKET NUMBER 09-AFC-3

CALIFORNIA
ENERGY COMMISSION
1516 Ninth Street
Sacramento, CA 95814

http://www.energy.ca.gov/sitingcases/mariposa/index.html

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DISCLAIMER

This report was prepared by the California Energy Commission Mariposa Project AFC Committee as part of the Mariposa Project, Docket No. 09-AFC-3. The views and recommendations contained in this document are not official policy of the Energy Commission until the report is adopted at an Energy Commission Business Meeting.

CONCLUSIONS OF LAW

1. We therefore conclude that with implementation of the Conditions of Certification set forth below, construction and operation of the MEP will not create any significant direct, indirect, or cumulative impacts to biological resources.

2. Further, implementation of the Conditions of Certification, below, will ensure the MEP conforms to all applicable laws, ordinances, regulations, and standards relating to biological resources as identified in the pertinent portions of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign a Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least 3 references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval, in consultation with CDFG and USFWS. The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field; and
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and
3. Demonstrated field experience in the identification and life history of California tiger salamander, California red-legged frog, and San Joaquin kit fox, and demonstrated field experience identifying burrowing owl burrows and other burrowing owl sign, and demonstrated experience in identifying Swainson's hawks, and;
4. Be in possession of required state and federal permits and/or approvals from CDFG and USFWS.

In lieu of the above requirements (excepting the permit requirements), the resume shall demonstrate to the satisfaction of the CPM, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities, including pre-construction debris removal, shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least ten (10) working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the following duties during any site (or related facilities) pre-construction debris removal, mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by the approved Biological Monitor(s), but remains the contact for the project owner and CPM.

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification;
2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), to be submitted by the project owner;
3. Supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;
4. Clearly mark sensitive biological resource areas, if present, and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e. parking lots) for animals in harm’s way;
6. Notify the project owner and the CPM of any non-compliance with any biological resources conditions of certification;
7. Respond directly to inquiries of the CPM regarding biological resource issues;
8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Report; and

9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training and all permits.

Verification: The Designated Biologist shall submit in the Monthly Construction Compliance Report to the CPM copies of all written reports and summaries that document biological resources activities. If actions may affect biological resources during operation, a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties are determined to be unnecessary by the CPM.

BIOLOGICAL MONITOR QUALIFICATIONS

BIO-3 The project owner's CPM-approved Designated Biologist shall submit the resume, including at least 3 references and contact information, of the proposed Biological Monitors to the CPM for approval, in consultation with CDFG and USFWS.

Enough biological monitors must be on site during pre-construction debris removal, before and during, water supply pipeline, natural gas pipeline, and transmission line construction and prior to fencing the power plant site to collectively meet the minimum qualifications:

Demonstrated field experience in the identification and life history of:

California tiger salamander;

California red-legged frog;

San Joaquin kit fox; and

Demonstrated field experience identifying burrowing owls burrows and other burrowing owl sign.

All biological monitors on site during pre-construction debris removal, before and during, water supply pipeline, natural gas pipeline, and transmission line construction and prior to fencing the power plant site must meet the following minimum qualification:

Be in possession of required state and federal permits and/or approvals from CDFG and USFWS.

Verification: The project owner shall submit the specified information to the CDFG and USFWS for review and comment and the CPM for approval no less than 30 days prior to the start of any site (or related facilities) mobilization. The Designated Biologist shall submit a written statement to the CPM confirming that the individual Biological Monitor(s) have been trained including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to the CDFG and USFWS for review and comment and the CPM for approval no less than 14 days prior to their first day of monitoring activities.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist and Biological Monitor(s) the project owner's Construction/Operation Manager shall halt all site mobilization, pre-construction debris removal, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage.
4. If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, pre-construction debris removal, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within 5 working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a CPM-approved Worker Environmental Awareness Program (WEAP) in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, pre-construction debris removal, ground disturbance, grading, construction, operation, and closure are informed about sensitive biological resources associated with the project.

The WEAP must:

- Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media is made available to all participants;
- Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
- Present the reasons for protecting these resources;
- Present the meaning of various temporary and permanent habitat protection measures as necessary;
- Discuss penalties for violation of applicable LORS (e.g., federal and state endangered species acts);
- Identify whom to contact if there are further comments and questions about the material discussed in the program; and
- Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: No less than 30 days prior to the start of any site (or related facilities) mobilization, the project owner shall provide to the CPM the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. No less than 10 days prior to site and related facilities mobilization submit two copies of the CPM-approved materials.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for a period of at least 6 months after the start of commercial operation.

During project operation, signed statements for operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)

BIO-6 The project owner shall develop a BRMIMP and submit two copies of the proposed BRMIMP to the CDFG and USFWS for review and

comment and the CPM for approval and shall implement the measures identified in the approved BRMIMP.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall identify:

a. All biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

b. All biological resource conditions of certification in the Commission Decision;

c. All biological resource mitigation, monitoring and compliance measures required in other state agency terms and conditions, such as those provided in the CWA 404 permits and the USFWS Biological Opinion;

d. All biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements;

e. A list all sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;

f. All required mitigation measures for each sensitive biological resource;

g. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

h. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;

i. Aerial photographs (at an approved scale), a GPS foot survey, or other verifiable means (as approved by the CPM) to document all areas to be disturbed during project construction activities — one set prior to any site (and related facilities) mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography or other method and a description of why times were chosen;

j. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

k. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

l. All performance standards and remedial measures to be implemented if performance standards are not met;

m. A preliminary discussion of biological resources-related facility closure measures; and

n. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: The project owner shall provide the specified draft document at least 60 days prior to start of any site (or related facilities) mobilization.

The CPM will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM within 5 days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. 10 days prior to site and related facilities mobilization the revised BRMIMP shall be resubmitted to the CPM.

The project owner shall notify the CPM no less than 5 working days before implementing any modifications to the approved BRMIMP to obtain CPM approval.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with other appropriate agencies to ensure no conflicts exist.

Implementation of BRMIMP measures will be reported in the Monthly Compliance Reports by the Designated Biologist (i.e., survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction closure report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

GENERAL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-7 The following measures shall be implemented to avoid and minimize impacts to biological resources from the proposed project during site mobilization, pre-construction debris removal, ground disturbance, grading, construction, operation, maintenance, and closure.

1. Design, install, and maintain natural gas supply pipelines, water supply pipelines, transmission lines, access roads, and laydown and parking areas to avoid or minimize impacts to identified sensitive resources;
2. Design, install, and maintain the transmission lines and all other electrical components in accordance with the Avian Power Line Interaction Committee (APLIC), Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 to reduce the likelihood of electrocutions of large birds;

3. Eliminate from landscaping plans any List A California exotic pest plants of concern as defined by the California Exotic Pest Plant Council;
4. Prescribe a road sealant that is non-toxic to wildlife and plants;
5. Design, install, and maintain construction and facility lighting to minimize the amount of light off-site, including directing and shielding lights to prevent side casting of light towards wildlife habitat, and using the minimum wattage required for safety;
6. Pre- and post-construction photo-documentation of all habitats shall be prepared and made part of the project report;
7. The project site shall be surveyed for the special-status species prior to ground disturbing activities including pre-construction debris removal or construction equipment staging.
    a. If special-status wildlife species are found within the construction area, species-specific contingencies described in **BIO-8, 9, 10, 11, 12, 13, 14,** and **15** shall be followed. If the species is not covered under these conditions, the CPM and the CDFG and/or USFWS shall be contacted for further guidance.
    b. If special-status plant species are found within the construction area, they shall be avoided and the CPM and the CDFG and/or USFWS shall be contacted for further guidance.
    c. Once it has been sufficiently determined that there are no special-status wildlife species present, the power plant site, laydown, and access road construction areas shall be fenced with USFWS- and CDFG-approved exclusion fencing to ensure that no special-status wildlife species enter the site.
8. Clearly demarcate construction exclusion zones around biologically sensitive areas and any nests or other sensitive resources identified during surveys;
9. The Designated Biologist (or approved designee) shall be onsite during any construction activity near sensitive habitat and shall ensure implementation of, and compliance with, mitigation measures. The Designated Biologist (or approved designee) has the authority to stop work and determine alternative work practices in consultation with construction personnel if construction activities are likely to impact sensitive biological resources.
10. Vehicles shall be confined to established roadways and pre-approved overland access routes. Limit access routes and the number and size of staging areas and work areas to the minimum

necessary to achieve the project goals. Routes and boundaries of work areas, including access roads, shall be clearly marked prior to initiating project construction.

11. Construction along the project linears shall be constrained within a designated temporary construction corridor.
12. Trash dumping, firearms, open fires (such as barbecues), hunting, and pets shall be prohibited in the project area.
13. To avoid attracting predators of the target species of concern, the project site shall be kept as clean of debris as possible. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site(s).
14. Road-killed animals or other carcasses detected by personnel on roads associated with the project area will be reported immediately to a Biological Monitor or Designated Biologists, who will remove the road-kill promptly. For special-status species road-kill, the Biological Monitor shall contact CDFG and USFWS within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information shall be noted and reported in the Monthly Compliance Reports. Injured animals shall be reported to CDFG or USFWS and the project owner shall follow instructions that are provided by CDFG or USFWS;

Verification: No less than 10 days prior to the start of any ground disturbing activities or construction equipment staging, the project owner shall provide the CPM a letter-report describing the findings of the pre-construction surveys; e-mails or letter reports may be used to document the findings of the pre-construction surveys conducted 1 day and immediately prior to construction. The letter shall describe survey personnel, dates, and conditions; specific area surveyed (with figure); species included in the survey, and; results of the survey.

All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-8 Pre-construction nest surveys shall be conducted if construction activities will occur from February 1 through August 31. The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat in the project site and within 500 feet of the boundaries of the power plant site and linear facilities (except for Swainson's Hawk, see **BIO-15**);
2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys needs to be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;
3. If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG and USFWS Migratory Bird Office) and monitoring plan shall be developed. The monitoring plan shall include avoidance measures and remedial actions if the avoidance measures are not successful. Nest locations shall be mapped using GPS technology and submitted, along with a weekly report stating the survey results, to the CPM; and
4. The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might, in the opinion of the Designated Biologist, disturb nesting activities, shall be prohibited within the buffer zone until such a determination is made.

Verification: No less than 2 days prior to the start of any ground disturbing activities or construction equipment staging, the project owner shall provide the CPM a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed.

If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest, and a monitoring plan shall be submitted to the CDFG and USFWS Migratory Bird Office for review and comment and the CPM for approval. Approval of the plan is required before construction may commence.

SPECIAL-STATUS INVERTEBRATE IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-9 The project owner shall implement the following measures to manage their construction site, and related facilities, in a manner to avoid or minimize impacts to listed fairy shrimp or tadpole shrimp species and habitat.

1. Avoidance and Minimization:

a. A buffer zone of 250 feet or the limit of the immediate watershed supporting the seasonal wetland (whichever is larger) shall be established around all known and potentially occupied branchiopod habitat. The buffer zone shall be delineated with temporary fencing. The fencing shall be kept in good repair and remain installed for the duration of MEP construction. If this buffer zone is not feasible for any potential habitat, a buffer zone shall be delineated in consultation with CDFG and USFWS.

b. A biological monitor will be onsite during all ground disturbing work within 250 feet of potential branchiopod habitat, and will oversee all off-road vehicle access for the project.

c. To the extent possible, construction of the linear projects will occur during the dry summer season to minimize the potential for indirect effects on nearby branchiopod habitat.

Verification: No less than 10 days prior to ground disturbance, the project owner shall provide a report detailing the locations of buffer zone fencing, and that includes both a figure and photographs showing the location of the fencing. The project owner shall report monthly to the CPM, CDFG, and USFWS for the duration of construction on the implementation of listed branchiopod habitat avoidance and minimization measures. Within 30 days after completion of construction the project owner shall provide to the CDFG, USFWS, and CPM a written construction termination report identifying how impact minimization measures have been completed.

CALIFORNIA TIGER SALAMANDER AND CALIFORNIA RED-LEGGED FROG IMPACT AVOIDANCE AND MINIMIZATION MEASURES AND MANAGEMENT PLAN

BIO-10 The project owner, in consultation with the Designated Biologist, shall prepare and implement a California Tiger Salamander and California Red-legged Frog Management Plan that presents measures to manage the construction site, and related facilities, in a manner to avoid and minimize impacts to California red-legged frogs (CRLF) and California tiger salamanders (CTS). The measures should be developed in coordination with the CDFG and USFWS, shall be approved by the CPM (in consultation with the USFWS and CDFG), and shall include, at a minimum, the following:

1. Minimize Construction Impacts.

   a. Avoidance: During project implementation, concentrations of small mammal burrows and other refugia that may support CRLF or CTS shall be avoided to the extent feasible.

   b. Install Exclusionary Fencing: Prior to any site work, including debris removal, a solid barrier fence will be installed around the power plant site, and laydown area, and shall remain in place

for the duration of the project. The biological monitor shall survey and delineate the fence route, and shall be present during fence installation. Ramps or other means of escape for CTS and CRLF shall be provided. This exclusionary fence shall be routinely inspected for good repair for the duration of MEP construction; any damage, such as holes or gaps, shall be repaired immediately.

c. Clearance surveys. Clearance surveys within the exclusionary fence shall be conducted by a qualified biologist 48 hours to 1 week prior to ground disturbance. In addition, after the first major rain event (as agreed upon with the CPM, in consultation with the CDFG and USFWS), clearance surveys must be conducted within the exclusionary fence before construction can commence. If CRLF or CTS are discovered during pre-construction surveys, individuals shall be relocated to a CPM-(in consultation with CDFG) and USFWS-approved site. Only biologists with the appropriate permits or those approved by the CPM, USFWS, and CDFG for the project shall capture and relocate these species.

d. Linear Routes:

   i. Prior to ground disturbance, linear routes will be mapped, marked in the field, and surveyed for burrows. Burrows will be avoided to the extent possible as described above. Burrows within a vehicle access route that cannot be avoided will be temporarily reinforced with pvc pipe or by other measures as deemed effective by the biological monitor, and approved by the CPM (in consultation with CDFG and USFWS), (dry season only) prior to allowing vehicle access, and removed immediately after access is completed. A biological monitor shall be present during all linear route construction.

   ii. Before disturbance to aquatic habitat, the Designated Biologist or biological monitor shall check for CRLF and CTS within the aquatic habitat or surrounding area.

   iii. Before the start of linear work each morning, the designated biologist or biological monitor shall check for CRLF and CTS under any equipment such as vehicles and stored pipes. The biological monitor shall check all excavated steep-walled holes or trenches greater than 6 inches each morning before sunrise for any CRLF and CTS. CRLF and CTS shall be removed by the Designated Biologist or Biological Monitor and relocated to the USFWS and CDFG-approved relocation site. All excavated holes or trenches located outside the MEP site

shall be ramped at the end of the work day, or escape boards will be placed in the trench to allow the animals to escape.

e. Timing: Construction outside of fenced areas shall be scheduled to occur during the dry summer months between June 15 and October 15. Work shall not take place outside of fenced areas during the wet season, unless approved by the CPM (in consultation with CDFG) and USFWS.

f. Off-road access: Prior to off-road vehicle access for construction or maintenance, the vehicle route shall be mapped and marked. Burrows within the route will be avoided to the extent possible. Burrows that cannot be avoided shall be reinforced with pvc pipe (dry season only) to prevent collapse.

g. Environmentally Sensitive Areas: An environmentally sensitive area fence shall be installed along linear routes to protect potential breeding sites. Construction personnel shall not enter the environmentally sensitive areas.

h. Speed limit: A 10-mile-per-hour speed limit shall be enforced at all construction sites, except on roads with a posted speed limit. On roads with posted speed limits, construction traffic shall go the minimum safe speed.

i. Bruns Road and Access Road Monitoring:

   i. During wet-season construction (October through April, though earlier or later if conditions are wet and CTS are observed) if there will be large volumes of construction traffic (25 vehicles or more) scheduled to arrive or depart after dusk or before dawn. CTS moving between breeding sites and burrows shall be protected by one of these methods:

      1) Biological monitors shall walk (or slowly drive if deemed necessary for personnel safety) along Bruns Road from Canal 45 to the project site access road, and along the access road, to detect and move any CTS (or CRLF). This shall be completed prior to the expected construction traffic arrival time before dawn, and prior to departure after dusk. If the survey is done by driving, the vehicle must avoid pulling off the road unless the shoulder or pull-out is clear of CTS and CRLF.

         a. Any CTS or CRLF that are detected will be moved by the biologist only if, in the

biologist's judgment, the animal would be in danger from vehicles.

b. The project owner shall contact the CPM to indicate when the construction traffic threshold is anticipated to be met, and therefore when surveys are anticipated.

2. During wet-season construction, construction worker traffic may be directed away from Bruns Road north of Kelso Road, and be directed to use Kelso Road and Mountain House Road east of the project site. If this option is selected, surveys need only be done along the access road and Bruns Road to Kelso Road.

3. Alterations to the protective measure described in (1) and (2) above may be made if they will provide for more efficient or greater protection of CTS and CRLF, and if the alteration is approved by the CPM (in consultation with CDFG) and USFWS. An alternative means of protection (such as protective barriers) may also be implemented in lieu of or in conjunction with either (1) or (2) with approval from the CPM (in consultation with CDFG) and USFWS.

ii. Throughout wet-season construction (including when surveys have not been conducted) as soon as practicable after the work crew arrives or departs, the biologist shall drive slowly along the survey route to determine if any CTS or CRLF have been affected. Any dead or injured CTS or CRLF shall be reported as described in **BIO-7, #14**. In the event that dead or injured CTS or CRLF are found, the biologist shall consult with the CPM, CDFG, and USFWS to determine which, if any, adaptive management measures shall be implemented. These measures may include more frequent surveys (lower traffic threshold), more intensive surveys, or controlled arrival and departures for construction-crew traffic.

j. Best Management Practices: Best Management Practices (BMPs) listed in the Stormwater Pollution Prevention Plan (**BIO-17**) shall be implemented during project construction to protect against adverse affects on sensitive aquatic areas. Dust control measures shall be implemented during construction in the dry season. Work areas and dirt access roads shall be watered regularly to minimize airborne dust and soil particles generated by construction.

2) Minimize Operation Impacts:

a. Include a barrier on the permanent fence sufficient to block access to the power plant site by CRLF and CTS.

Verification: No less than 30 days prior to the start of any project-related ground disturbance, the project owner shall provide a final Management Plan to the CPM, CDFG, and USFWS. The final, approved Management Plan shall be incorporated into the BRMIMP within 10 days of completion of the plan, and implemented. Prior to the start of any ground disturbing activities or construction equipment staging, the project owner shall provide the CPM a letter-report describing the findings of the pre-construction surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed, number of CTS and CRLF observed and moved, and location to which they were moved. The project owner shall report monthly to the CPM, CDFG and USFWS for the duration of construction on the implementation of CTS and CRLF avoidance and minimization measures. Within 30 days after completion of construction the project owner shall provide to the CDFG and CPM a written construction termination report identifying how mitigation measures described in the plan have been completed.

Within 60 days of completion of the permanent power plant site fence, the project owner shall submit a figure and photographs to the CPM, CDFG, and USFWS of the CTS and CRLF barrier fence.

WESTERN POND TURTLE IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-11 To avoid direct impacts to western pond turtles, pre-construction surveys shall be conducted concurrent with the California red-legged frog and California tiger salamander pre-construction surveys. Western pond turtles shall be avoided to the extent possible. Avoidance areas shall be delineated by exclusionary fencing. If western pond turtles are found within the project Disturbance area that cannot be avoided, the western pond turtles shall be relocated to the CPM (in consultation with CDFG)-approved relocation site.

Verification: The project owner shall submit a report to the CPM and CDFG no less than 10 days prior to the start of any ground disturbing activities or construction equipment staging that describes when surveys were completed, observations, and proposed impact minimization measures. Within 30 days after completion of construction of the project linears, the project owner shall provide to the CDFG and CPM a written construction termination report identifying how impact minimization measures have been completed.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES AND MANAGEMENT PLAN

BIO-12 The project owner shall implement the following measures to manage their construction site, and related facilities, in a manner to avoid or minimize impacts to breeding and foraging burrowing owls.

1. Pre-Construction Surveys. The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls in accordance with CDFG guidelines (California Burrowing Owl Consortium 1993). The survey area shall include the project disturbance area and surrounding 500 foot survey buffer. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the site will be resurveyed.

2. Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet from the project disturbance area the following avoidance and minimization measures shall be implemented:

   a. Establish Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

   b. Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st), the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.

3. Implement Burrowing Owl Mitigation Plan. If pre-construction surveys indicate the presence of burrowing owls or active burrowing owl burrows within the project disturbance area, the project owner shall prepare and implement a Burrowing Owl Mitigation Plan, in addition to the avoidance measures described above. The final Burrowing Owl Mitigation Plan shall be approved by the CPM, in consultation with CDFG, and shall:

   a. Identify and describe suitable relocation sites within 1 mile of the project disturbance area, and describe measures to ensure that burrow installation or improvements would not affect sensitive species habitat or existing burrowing owl colonies in the relocation area;

b. Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG;

c. Provide detailed methods and guidance for passive relocation of burrowing owls occurring within the project disturbance area (including burrow destruction); and

d. Describe monitoring and management of the relocated burrowing owl site, and provide a reporting plan.

Verification: The Designated Biologist shall provide to the CPM and CDFG pre-construction survey results within 10 days of the completion of the survey.

If pre-construction surveys detect burrowing owls within 500 feet of proposed construction activities, the Designated Biologist shall provide to the CPM and CDFG documentation indicating that non-disturbance buffer fencing has been installed no less than 10 days prior to the start of any project-related site disturbance activities. The documentation shall include both a figure and photographs showing the location of the fencing.

If pre-construction surveys detect burrowing owls or active burrowing owl burrows within the project disturbance area, the project owner shall provide to the CPM and CDFG a final Burrowing Owl Mitigation Plan no less than 10 days prior to the start of construction. The measures described in the plan shall be incorporated into the BRMIMP no less than 10 days of completion of the plan, and implemented.

The project owner shall report monthly to the CPM and CDFG for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction the project owner shall provide to the CDFG and CPM a written construction termination report identifying how mitigation measures, including those measures described in the plan if a plan was required, have been completed.

AMERICAN BADGER IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-13 To avoid direct impacts to American badgers, pre-construction surveys shall be conducted concurrent with the San Joaquin kit fox and burrowing owl pre-construction surveys. Surveys shall be conducted as described below:

The Designated Biologist shall perform pre-construction surveys for badger dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads. If dens are

detected each den shall be classified as inactive, potentially active, or definitely active. Den avoidance, monitoring, and destruction methods shall adhere to those prescribed for San Joaquin kit fox avoidance and minimization in Condition of Certification **BIO-14**.

Verification: The project owner shall submit a report to the CPM and CDFG no less than 10 days prior to the start of any ground disturbing activities or construction equipment staging that describes when surveys were completed, observations, and proposed impact minimization measures. Within 30 days after completion of construction of the project, the project owner shall provide to the CDFG and CPM a written construction termination report identifying how impact minimization measures have been completed.

SAN JOAQUIN KIT FOX IMPACT AVOIDANCE AND MINIMIZATION MEASURES AND MANAGEMENT PLAN

BIO-14 The project owner shall prepare and implement a San Joaquin kit fox Management Plan that includes the following measures, developed in cooperation with USFWS and CDFG.

1. Pre-construction Surveys. Before project construction begins, a USFWS- and CPM-(in consultation with CDFG)approved biologist will conduct a pre-construction survey for San Joaquin kit fox dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads. If dens are detected each den shall be classified as a known, potential, atypical, or natal/pupping den. Den avoidance, monitoring, and destruction methods are described below.

2. Exclusion Zones. The configuration of exclusion zones around the San Joaquin kit fox dens should have a radius measured outward from the entrance or cluster of entrances. The following radii are minimums, and if they cannot be followed the CPM, USFWS, and CDFG must be contacted:

   - Known den: 100 feet
   - Potential den: 50 feet
   - Atypical den: 50 feet
   - Natal/pupping den (occupied and unoccupied): the CPM, USFWS, and CDFG must be contacted

   a. Known den: To ensure protection, the exclusion zone should be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by San Joaquin kit foxes. Exclusion zone fencing should be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing shall be removed to avoid attracting subsequent attention to the dens.

b. Potential and Atypical dens: Placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.

c. Construction and other project activities should be prohibited or greatly restricted within these exclusion zones. Only essential vehicle operation on existing roads and foot traffic should be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity should be prohibited within the exclusion zones.

3. Destruction of Dens. Disturbance to all San Joaquin kit fox dens should be avoided to the maximum extent possible. Protection provided by San Joaquin kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Limited destruction of San Joaquin kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. Potential, Known, and/or occupied San Joaquin kit fox dens shall not be destroyed unless the project owner has an Incidental Take Statement from the USFWS. The following measures will be implemented for any natal/pupping dens, active dens (non natal), and potential dens observed during pre-construction project surveys:

   a. Natal/pupping dens will be avoided and USFWS contacted for further guidance. Natal/pupping dens will not be disturbed by the proposed project.

   b. Known dens occurring within the footprint of the activity must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no San Joaquin kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed at the den during this period, the den should be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. Energy Commission staff, USFWS, and CDFG encourage hand excavation, but realize that soil conditions may

necessitate the use of excavating equipment. However, extreme caution must be exercised.

c. Destruction of the den should be accomplished by careful excavation until it is certain that no San Joaquin kit foxes are inside. The den should be fully excavated, 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 San Joaquin kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgment of the biologist, the animal has escaped from the partially destroyed den.

d. If any den was considered unoccupied, but upon commencement of den destruction determined to be occupied, then destruction shall cease and the CPM, USFWS, and CDFG shall be notified immediately.

4. Construction and Operational Requirements. Habitat subject to permanent and temporary construction disturbances and other types of project-related disturbance should be minimized. Project designs should limit or cluster permanent project features to the smallest area possible while still permitting project goals to be achieved. To minimize temporary disturbances, all project-related vehicle traffic should be restricted to established roads, construction areas, and other designated areas. These areas should also be included in pre-construction surveys and, to the extent possible, should be established in locations disturbed by previous activities to prevent further impacts. The following measures shall also be implemented:

Procedure for San Joaquin Kit Fox Discovery Onsite. If construction personnel encounter a San Joaquin kit fox or any animal that construction personnel believe may be San Joaquin kit fox, the following protocol shall be followed:

i. All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.

ii. The construction manager will be immediately notified.

iii. The construction manager will notify the approved onsite biologist.

iv. The animal will be allowed to leave the site on its own.

a. Before any ground is disturbed, the boundaries of the construction zone will be clearly delineated with orange colored plastic construction fencing or solid barriers (for example, a

wildlife exclusion fence) to discourage workers or equipment from inadvertently straying from the project area.

b. Project-related vehicles should observe a 10-mph speed limit in all project areas, except on county roads and state and federal highways; this is particularly important at night when San Joaquin kit foxes are most active. To the extent possible, night-time construction should be minimized. Off-road traffic outside of designated project areas should be prohibited.

c. To prevent inadvertent entrapment of San Joaquin 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. If at any time a trapped or injured San Joaquin kit fox is discovered, the procedures under item “m” below must be followed.

d. San Joaquin 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 San Joaquin kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe should not be moved until the CPM, USFWS, and CDFG have been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity, until the San Joaquin kit fox has escaped.

e. 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.

f. No firearms shall be allowed on the project site.

g. To prevent harassment, mortality of San Joaquin kit foxes, or destruction of dens by dogs or cats, no pets shall be permitted on project sites.

h. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a San Joaquin kit fox or who finds a dead, injured or entrapped individual, including

animals struck by project vehicles. The representative will be identified during the employee education program. The representative's name and telephone number shall be provided to the CPM, CDFG, and USFWS.

i. An employee education program should be conducted for any project that has expected impacts to San Joaquin kit fox or other endangered species. The program should consist of a brief presentation by persons knowledgeable in San Joaquin kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and agency personnel involved in the project. The program should include the following: a description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of San Joaquin kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Acts; 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.

j. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. should 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 project construction, but that after completion of project construction 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 CPM, USFWS, CDFG, and revegetation experts.

k. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the USFWS, CPM, and CDFG should be contacted for advice.

l. The CPM, USFWS, and CDFG will be notified immediately within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825, (916) 414-6600. The CDFG contact for immediate assistance is State Dispatch at (831) 649-2817.

They will contact the local warden or biologist. Also contact Ms. Marcia Grefsrud at PO Box 47, Yountville, California, 94599, (707) 644-2812.

Verification: The project owner shall submit to the CPM, CDFG, and USFWS the final San Joaquin Kit Fox Management Plan no less than 30 days prior to the start of ground disturbing activities or construction equipment staging. The mitigation measures in the plan shall be incorporated into the BRMIMP within 10 days of completion of the plan, and implemented.

The project owner shall submit the resume and qualifications of the proposed biologist(s) to the CDFG and USFWS for review and comment and the CPM for approval no less than 30 days prior to the start of preconstruction surveys.

The project owner shall submit a report to the CPM and CDFG at least 10 days prior to the start of any ground disturbing activities or construction equipment staging that describes when surveys were completed, observations, and proposed minimization measures. No less than 30 days after completion of construction of the project linears, the project owner shall provide to the USFWS, CDFG, and CPM a written construction termination report identifying how impact minimization measures in the plan have been completed.

SWAINSON'S HAWK IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-15 If construction is proposed during the Swainson's hawk breeding season (March-August), a pre-construction nest survey shall be conducted within 30 days prior to the beginning of construction activities by a qualified biologist in order to identify active nests in the project site vicinity.

Surveys shall be conducted according to the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000).

If active nests are found within 1/2 mile of the project disturbance area, an initial temporary nest disturbance buffer shall be established. If project related activities within the temporary nest disturbance buffer are determined to be necessary during the nesting season (approximately March 1 and September 1), then a biologist experienced with raptor behavior shall be retained by the project owner to monitor the nest, and shall along with the project owner, consult with the CPM and CDFG to determine the best course of action necessary to avoid nest abandonment or take of individuals. Work may be allowed to proceed within the temporary nest disturbance buffer if raptors are not exhibiting agitated behavior such as defensive flights at intruders, getting up from a brooding position, or flying off the nest. The biological monitor or designated biologist approved for raptor

monitoring shall be on-site daily while construction related activities are taking place and shall have the authority to stop work if raptors are exhibiting agitated behavior. In consultation with the CPM and CDFG and depending on the behavior of the raptors, over time it may be determined that the on-site biologist/monitor may no longer be necessary due to the raptors' acclimation to construction related activities.

Verification: The project owner shall submit a report to the CPM and CDFG no less than 10 days prior to the start of any ground disturbing activities or construction equipment staging, that describes when Swainson's hawk surveys were completed, identification and qualifications of the biologist conducting the surveys, observations, and, if required, updates to the BRMIMP based upon findings. If project-related work is required within a Swainson's hawk nest buffer, the project owner shall submit the name and qualification of the proposed monitor to the CDFG for comment and the CPM for approval no less than 30 days prior to disturbance within the nest buffer. The designated biologist shall contact the CPM and CDFG within 2 days of a work stoppage due to disturbance to the nesting Swainson's hawks. No less than 30 days after completion of construction within the nest buffer, the project owner shall provide to the CDFG and CPM a written construction termination report identifying the results of monitoring during disturbance within the nest buffer.

COMPENSATORY MITIGATION FOR IMPACTS TO SPECIAL-STATUS WILDLIFE SPECIES AND WETLANDS

BIO-16 To mitigate for impacts to wetlands and habitat loss and potential take of listed branchiopods, San Joaquin kit fox, California red-legged frog, California tiger salamander, western burrowing owl, Swainson's hawk, and wetlands, the project owner shall provide compensatory mitigation for permanent, long-term temporary, and short-term temporary impacts at the following ratios:

BIO-16 Table 1

Species	Mitigation Ratios for Impacts		
	Permanent	Long-term Temporary	Short-term Temporary
Wetlands	1:1	--	--
Branchiopod	3:1	3:1	--
California tiger salamander	3:1	3:1	1.1:1
California red-legged frog	3:1	3:1	1.1:1
San Joaquin kit fox	3:1	3:1	1.1:1
Western burrowing owl	2:1	2:1	--
Swainson's hawk	1:1	1:1	--

The project owner shall provide Security as described in **Section A** below. The project owner shall acquire, initially improve, endow, and transfer to CDFG (or a qualified non-profit organization), as described in **Section A** below, the acreages listed below (final costs will be adjusted to reflect final project footprint).

BIO-16 Table 2

Species	Compensation (Acres)
Wetland	0.018
Branchiopod	0.054
California tiger salamander	79.9
California red-legged frog	79.9
San Joaquin kit fox	79.9
Western burrowing owl	44.2
Swainson's hawk	19.3

In lieu of acquiring lands itself, the project owner may purchase credits in an approved conservation bank, as described in **Section B**, below.

A. The acquisition and management of compensation lands shall include the following elements:

1. General Selection Criteria for Compensation Lands. Compensation lands may be purchased to cover acquisition requirements for more than one species only if all criteria for each species included in the acquisition are met. Compensation lands must be approved by the CPM, CDFG, and USFWS. Compensation lands shall:

    a. provide comparable or better value habitat than that of the affected area, and with capacity to improve in quality and value for the species;

    b. be adjacent to, or in close proximity to, larger blocks of lands that are already protected such that there is connectivity between the acquired lands and the protected lands;

    c. be as close to the impact site as feasible, and within the geographical range approved by the CPM, CDFG, and USFWS;

    d. not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible;

    e. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

    f. not be encumbered by easements or uses that would preclude fencing of the site or preclude or unacceptably constrain management of the site for the primary benefit of

the species and their habitat for which compensation mitigation lands were secured, and;

g. not contain hazardous wastes.

2. Specific Selection Criteria for Compensation Lands.

   a. *San Joaquin kit fox*: In addition to the measures described above, compensation lands selected for acquisition shall:

   b. Compensation lands should be occupied by, or be connected to lands currently occupied by the San Joaquin kit fox, however, due to the scarcity of known occurrences in this region, compensation lands with historical occurrences, or connected to lands with a historical occurrence, or other lands approved by the CPM, CDFG, and USFWS, are acceptable. Connection must be free of barriers, and have features of suitable dispersal habitat for this species.

   c. *California red-legged frog*: In addition to the measures described above, compensation lands selected for acquisition shall:

      - Be within California red-legged frog Critical Habitat Unit CCS-2B.
      - Contain known California red-legged frog breeding habitat or, with approval from the CPM and USFWS, contain potential California red-legged frog breeding habitat and be within 1 mile (with a barrier-free connection qualifying as dispersal habitat) of known California red-legged frog breeding habitat.
      - Contain suitable California red-legged frog upland habitat

   d. *California tiger salamander*: In addition to the measures described above, compensation lands selected for acquisition shall:

      - Contain known California tiger salamander breeding habitat or, with approval of the CPM, CDFG, and USFWS,, contain potential California tiger salamander breeding habitat and be within 1 mile (with a barrier-free connection qualifying as dispersal habitat) of known protected California tiger salamander breeding sites, and;
      - Contain suitable upland habitat.

   e. *Western burrowing owl*: In addition to the measures described above, compensation lands selected for acquisition shall:

- Currently supports burrowing owls at twice the number of owls displaced by the project site. This requirement will be presumed to be met if compensation is through a conservation bank.
- If no owls displaced by the project, the compensatory lands must currently support burrowing owls or be within 1-mile of an active burrowing owl colony, or as approved by the CPM and CDFG.

f. *Swainson's hawk*: In addition to the measures described above, compensation lands selected for acquisition shall:

- Either currently support a nesting site or be within 5 miles of a documented Swainson's hawk nest.

g. *Branchiopods:* In addition to the measures described above, compensation lands selected for acquisition shall**:**

- Currently support either vernal pool fairy shrimp and/or longhorn fairy shrimp, based upon agency approval.

3. Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for the target species in relation to the criteria listed above. Approval from the CPM, CDFG, and USFWS, shall be required for acquisition of all parcels comprising the compensation lands.

4. Compensation Lands Acquisition Requirements. The project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, CDFG, and, USFWS, has approved the proposed compensation lands:

   a. Preliminary Report. The project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, draft conservation easement and other necessary or requested documents for the proposed compensation land to the CPM, CDFG, and USFWS. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM, CDFG, and USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

   b. Title/Conveyance. The project owner shall transfer fee title to the compensation lands, a conservation easement over the

lands, or both fee title and conservation easement as required by the CPM, CDFG, and USFWS. Any transfer of a conservation easement or fee title must be to CDFG or a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965) and must be approved by CDFG. If an approved non-profit organization holds title to the compensation lands, the conservation easement shall be recorded in favor of CDFG, or a non-profit approved by the CDFG and CPM, in a form approved by CDFG. If an approved non-profit holds the conservation easement, CDFG shall be named a third party beneficiary.

c. Initial Habitat Improvement Fund. The project owner shall fund the initial protection and habitat improvement of the compensation lands by an irrevocable letter of credit or other mechanism approved by the CPM and CDFG. Alternatively, a non-profit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965) and if it meets the approval of the CPM, CDFG, and USFWS. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

d. Property Analysis Record. Upon identification of the compensation lands, the project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands.

e. Long-term Maintenance and Management Fund. The project owner shall provide to CDFG, or approved non-profit organization, a fee for maintenance and management, in perpetuity, of the compensation lands in the amount determined through the PAR or PAR-like analysis conducted for the compensation lands. Long-term maintenance and management fees will be determined through a PAR or PAR-like analysis that will be based upon an approved Management Plan. The project owner must cover the full amount of the fee for this long-term maintenance and management. If the fee is less than the Security described in **BIO-16 Table 3**, the excess money shall be returned to the project owner. The CPM, CDFG, and USFWS, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFG takes fee title to the compensation lands, CDFG shall

determine whether it will hold the long-term management endowment fee in the special deposit fund or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

f. Interest and Principal. The project owner, with approval from the CPM, CDFG, and USFWS, shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

   i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the operation, management, and protection, in perpetuity, of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by the CPM, CDFG, and USFWS, designed to protect or improve the habitat values of the compensation lands.

   ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFG or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates another entity to manage the long-term maintenance and management fee for CDFG.

g. Other expenses. In addition to the costs listed above, the project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to title and document review costs, expenses incurred from other state agency reviews, and overhead related to providing compensation lands to CDFG or an approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures. An estimate of this cost is included in the Security, **BIO-16 Table 3**. The project owner shall be responsible for the full cost of other expenses; if the other expenses are less than the Security

described in **BIO-16 Table 3**, the excess money shall be returned to the project owner.

h. Mitigation Security. The project owner shall provide financial assurances to the CPM with copies of the document(s) to CDFG and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition. These funds shall be used solely for implementation of the measures associated with the project in the event the project owner fails to comply with the requirements specified in this condition, or shall be returned to the project owner upon successful compliance with the requirements in **Section A**. The CPM's use of the Security to implement measures in this condition may not fully satisfy the project owner's obligations under this condition. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit or another form of security ("Security") approved by the CPM. Prior to submitting the Security to the CPM, the project owner shall obtain approval from the CPM, CDFG, and USFWS, of the form of the Security. Security shall be provided in the amount as follows:

BIO-16 Table 3

Security for:	Cost
Acquisition ($10,000/acre)	$799,000
Initial protection and improvement activities	$100,000
Long-term management ($22,000/year at 3% interest)	$733,333
Other fees	$44,000
Total Security:	**$1,676,333**

Source: CDFG (CEC 2010v); estimate for acquisition, enhancement, and long-term management endowment of 79.9 acres.
1 – Other fees include conservation easement fee, accounting, copying, tracking, documents fee, fee for PAR review, grantee orientation, initiation of management, etc.

The amount of Security shall be adjusted for any change in the project footprint.

i. The project owner may elect to fund the acquisition and initial improvement of compensation lands through an approved third party. Approval is by written agreement from the CPM. Such delegation shall be subject to approval by the CPM, CDFG, and USFWS, prior to land acquisition, enhancement or management activities.

Initial deposits for this purpose must be made in the same amounts as the acquisition, initial protection and improvement, and other expenses Securities required in **BIO-16 Table 3**, above, and may be provided in lieu of these Securities. If this option is used for the acquisition and initial improvement, the project owner must cover the actual acquisition costs and administrative costs and fees

of the compensation land proposed for purchase once land is identified and the actual costs are known. If the total actual costs for and fees are less than the Security described in **BIO-16 Table 3**, the excess money shall be returned to the project owner.

B. In lieu of the requirements of **Section A**, the project owner may purchase compensatory mitigation credits in an approved conservation bank.

1. Credits must be purchased in the amounts equivalent to the compensatory mitigation acreage requirements included in **BIO-16 Table 2.**
2. The conservation bank must be approved by the CPM, CDFG, and USFWS.
3. Multiple conservation banks, if necessary, may be used to fulfill compensatory mitigation requirements.

Verification: If the mitigation actions required under **Section A** or **Section B** of this condition are not completed prior to the start of ground-disturbing activities, the project owner shall provide the CPM with an approved Security in accordance with this condition of certification, no less than 30 days prior to beginning project ground-disturbing activities.

*If the project owner chooses to mitigate under **Section A** of this Condition:*

Agreements to delegate land acquisition to an approved third party shall be implemented within 6 months of the start of project ground-disturbing activities. If the project owner elects to delegate land acquisition prior to project construction, the project owner shall provide to the CPM, CDFG, and USFWS a delegation proposal that identifies the third party and includes their qualifications to complete land acquisition and initial protection and improvement, and shall obtain approval from the CPM, CDFG, and USFWS, prior to delegation or transfer of funds. The project owner shall remain responsible for demonstrating compliance with the timelines and requirements described below.

No less than 90 days prior to acquisition of the property, the project owner shall submit a formal acquisition proposal to the CPM, CDFG, USFWS, describing the parcels intended for purchase and shall obtain approval from the CPM, CDFG, and USFWS prior to the acquisition.

The project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, and USFWS of the compensation lands acquisition and transfer within 18 months of the start of project ground-disturbing activities, or prior to commercial operation, whichever occurs first.

The project owner, or an approved third party, shall provide the CPM, CDFG, and USFWS with a Compensation Lands Management Plan, for approval, within 180

days of the land or easement purchase, as determined by the date on the title. If additional long-term management fees are required, these fees shall be paid by the project owner no more than 90 days from approval of the Management Plan.

*If the project owner chooses to mitigate under **Section B** of this Condition:*

No less than 90 days prior to purchase of credits, the project owner shall submit to the CPM and CDFG for review and approval, and the USFWS for review and comment, the proposed conservation bank(s), species to be mitigated at the bank, and evidence that credits are available for purchase.

The project owner shall complete and provide written verification to the CPM, CDFG, and USFWS of the credit purchase within 18 months of the start of project ground-disturbing activities, or prior to commercial operation, whichever occurs first. The verification shall be a letter from the conservation bank, or other method approved by the CPM and CDFG, in consultation with the USFWS, and shall include the name of the conservation bank, number of credits purchased, and the species covered under the purchase.

Under either Section A or B of this Condition:

Within 90 days after completion of all project related ground disturbance, the project owner shall provide to the CPM, CDFG, and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during project construction. This shall be the basis for the final number of acres required to be acquired.

WATERS AND WETLANDS IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-17 To avoid and minimize impacts to wetlands and waters, the project owner shall implement the following measures:

1. Waters, wetlands, and drainage or channel shall be avoided to the maximum extent possible.
2. For all wetlands and waters to be avoided, a buffer zone shall be established to protect the resource and the immediate watershed. The buffer zone shall be delineated with temporary protective fencing.
3. A Stormwater Pollution Prevention Plan (SWPPP) shall be developed that describes sediment and hazardous materials control, fueling and equipment management practices, and other factors deemed necessary for the project.
4. If bentonite is required to install pipeline under a drainage, an Emergency Spill Response Plan, “Frac out” Monitoring Plan, and a Biological Monitoring Plan shall be developed for approval by the CPM in

consultation with the CDFG. A designated biologist must be onsite during the installation.

5. Erosion control measures shall be monitored on a regularly scheduled basis, particularly during times of heavy rainfall. Corrective measures shall be implemented in the event erosion control strategies are inadequate. Sediment/erosion control measures shall be continued at the project site until such time as the revegetation efforts are successful at soil stabilization.
6. All equipment will be maintained so that there will be no leaks of automotive fluids such as fuels, solvents, or oils. Hazardous materials such as these will be stored in sealable containers in a designated location that is at least 250 feet from aquatic habitats. All refueling and maintenance of vehicles and other construction equipment and staging areas shall occur at least 250 feet from any aquatic habitat.
7. No discharge of sediment-laden water from project-related work will be allowed into storm drains, wetlands, or water courses.
8. Erodible fill material shall not be deposited into water courses. Brush, loose soils, or other similar debris material will not be stockpiled in the drainage channel or on its banks.
9. Equipment and personnel will not be allowed to enter aquatic habitats or be on the banks unless otherwise authorized by the resource agencies.
10. Erosion and sedimentation control devices (such as silt fences and fiber rolls) shall be implemented as necessary during the wet season and before forecasted rain events.
11. Dust control shall be implemented, including the use of water trucks to control dust in disturbed areas, rocking of temporary access road entrances and exits, and placement of geotextile mats and rock on access road areas to be used in the wet season.

Verification: No less than 10 days prior to ground disturbance, the project owner shall provide the CPM, CDFG, and USFWS with a report identifying the location of any protective fencing, including a figure and photographs that show the fencing.

If bentonite will be used, an Emergency Spill Response Plan, “Frac out” Monitoring Plan, and a Biological Monitoring Plan shall be submitted to the CDFG for review and comment and to the CPM for approval no less than 30 days prior to the start of project ground-disturbing activities involving bentonite. Plan approval shall be required before construction using bentonite may commence.

The project owner shall report monthly to the CPM, CDFG and USFWS for the duration of construction on the implementation avoidance and minimization measures. Within 30 days after completion of construction the project owner shall

provide to the USFWS, CDFG and CPM a written construction termination report identifying how mitigation measures have been completed.

REVEGETATION AND RESTORATION

BIO-18 The project owner shall revegetate all temporarily affected areas:

a. Topsoil stripped from the project site shall be stockpiled onsite for later use during restoration of the temporary impact areas.

b. In areas subject to compaction, ripping will be performed to facilitate restoration. Ripping will be to a depth no less than 2 feet.

c. Affected areas will be reseeded with species typical of annual grassland.

d. Temporary erosion control measures including silt fences, erosion control blankets, and fiber rolls will be installed as necessary to prevent any observed erosion until revegetation measures are fully implemented.

Verification: Within 30 days after completion of restoration the project owner shall provide to the USFWS, CDFG and CPM a written report identifying revegetation has been completed.

U.S. Army Corps of Engineers 404 Permit

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

REPLY TO
ATTENTION OF

June 2, 2011

Regulatory Division (SPK-2009-01261)

Bo Buchynsky
Diamond Generating Corporation
333 S. Grand Avenue, Suite 1570
Los Angeles, California 90071

Dear Mr. Buchynsky:

We are responding to your request for a Department of the Army permit for the Mariposa Energy Project. This approximately 35.5-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to construct a construct an electrical generating plant. The project is located in Section 1, Township 2 South, Range 3 East, Mount Diablo Meridian, Latitude 37.79023°, Longitude -121.60233°, Alameda County, California.

Based on the information you provided, the proposed activity, resulting in the permanent loss of approximately 0.018 acre of seasonal wetlands and temporary impacts to approximately 0.0012 acres of other waters, is authorized by Nationwide Permit Numbers 12 and 14. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets and the following special conditions:

Special Conditions

1. This Corps permit does not authorize you to take an endangered species, in particular California red-legged frog *(Rana aurora draytonii)*, San Joaquin kit fox *(Vulpes macrotis mutica)*, California tiger salamander *(Ambystoma californiense)*, vernal pool fairy shrimp *(Branchinecta lynchi)*, longhorn fairy shrimp *(Branchinecta longiantenna)* or designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed Fish and Wildlife Service Biological Opinion (Number 84120-2009-F-1306-2, dated May 17, 2011), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with "incidental take" of the attached Biological Opinion, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological Opinion, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The U. S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its Biological Opinion, and with the Endangered Species Act. You must comply with all conditions of this Biological Opinion, including those ascribed to the Corps.

2. To mitigate for the loss of 0.018 acre of waters of the United States you shall purchase 0.02 credit of seasonal wetland habitat at Cosumnes Floodplain Mitigation Bank. The selected mitigation bank shall include the area of the permitted project within its service area. Evidence of this purchase shall be provided to this office prior to the commencement of any activity authorized by this permit.

3. Within 15 days prior to construction activities, you shall submit to the Corps pre-construction site and aerial photographs of the project site, which have been taken no more than 30 days prior to initiation of construction activities. Within 30 days following construction activities, you shall submit post-construction site and aerial photographs of the project site, showing the work conducted, to this office. The camera positions and view angles of post-construction photographs shall be identified on a map, aerial photo, or project drawing. Construction locations shall include all major project features and waters of the U.S., including mitigation areas.

4. You and your authorized contractor must allow representatives from this office to inspect the authorized activity and all mitigation, preservation, and avoidance areas at any time deemed necessary to ensure that work is being or has been accomplished in accordance with the terms and conditions of this verification.

5. You are responsible for all work authorized herein and ensuring that all contractors and workers are made aware and adhere to the terms and conditions of this permit authorization. You shall ensure that a copy of the permit authorization and associated drawings are available for quick reference at the project site until all construction activities are completed.

6. All terms and conditions of the May 26, 2011, Section 401 Water Quality Certification are expressly incorporated as conditions of this permit.

7. You shall employ a wetland scientist or environmental engineer to continuously monitor construction activities in the vicinity of waters of the U.S. to ensure against unauthorized activity during construction. The monitor shall be on-site during all construction activities within 50 feet of preserved and/or avoided waters of the U.S.

8. The buried utility lines shall be accomplished to meet the following requirements:

a. Within 30-days following completion of construction activities, you shall restore the trench area and any temporary stockpiling area in accordance with Special Condition 9 below.

b. During construction, the top 12-18 inches of topsoil shall be removed and stockpiled separately. Following installation, the stockpiled topsoil shall be replaced on top and seeded with native vegetation that has been approved by the Corps.

c. Utility lines shall not adversely alter existing hydrology, including the draining of wetlands. In wetland areas, structures such as cut-off walls shall be used within utility trenches to ensure that the trench through which the utility line is installed does not drain waters of the U.S. Clay blocks, bentonite or other suitable material shall be used to seal the trench to prevent the utility line from draining waters of the U.S., including wetlands.

9. All temporary impacts to waters of the U.S. and adjacent upland areas within 50 feet of waters of the U.S. shall be restored to their original contour and condition within 30 days after completion of construction activities. In order to ensure compliance with this condition, you shall:

a. Submit to the Corps, for review and approval, a plan for the restoration of temporary impact areas prior to initiation of any construction activities. This plan shall include the following information: (1) A description of and drawings showing the existing contours (elevation) and existing vegetation of the temporary impact areas. This information shall include site photographs taken of the temporary impact area. For linear projects, these photographs shall be taken from the alignment, in both directions and taken every 50-feet for the length of the temporary impact area.; (2) The methods used to restore the site to the original contour and conditions, as well as a plan for the revegetation of the site following construction activities; (3) The proposed schedule for the restoration activities; (4) A mitigation and monitoring plan, to be approved by the Corps, for the temporary impact area to ensure success of the restoration. Monitoring shall be conducted for a minimum of 3 growing seasons after completion of restoration activities. The plan shall be presented in the format of the Sacramento District's *Habitat Mitigation and Monitoring Proposal Guidelines*, dated December 30, 2004.

b. Within 30 days after completion of restoration activities, submit to the Corps a report describing the restoration activities and including photographs of the restored area. The camera positions and view angles of post-construction photographs shall be identical to pre-construction photographs.

c. Submit to the Corps a Monitoring Report by December 1 for each year of required monitoring. This report shall be submitted in the format shown on the enclosed Regulatory Guidance Letter 08-03, dated 10 October 2008, or subsequent guidance as appropriate. Reports may be submitted in hard copy or electronically.

10. The project permit limits shall be clearly identified in the field with highly visible markers such as construction fencing or silt barriers prior to initiating construction work to ensure avoidance of impacts beyond permit limits. Such identification shall be properly maintained until construction is completed. Equipment, materials, or any other substances or activity that impacts waters of the U.S. outside the permit limits (as shown on the May 26, 2011, Figure 3 Exclusion Fence Plan) is prohibited.

11. Prior to initiation any activities otherwise authorized in this permit, you shall employ construction best management practices (BMPs) onsite to prevent degradation to on-site and off-site waters of the U.S. Methods shall include the use of appropriate measures to intercept and capture sediment prior to entering waters of the U.S., as well as erosion control measures along the perimeter of all work areas to prevent the displacement of fill material. All BMP's shall be in place prior to initiation of any construction activities and shall remain until construction activities are completed. Erosion control methods shall remain in place until all on-site soils are stabilized. You shall submit a description of and photo-documentation of your BMPs to our office within 15 days of commencement of construction. Photos may be submitted electronically to regulatory-info@usace.army.mil.

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

This verification is valid until March 18, 2012, when the existing Nationwide Permits are scheduled to be modified, reissued, or revoked. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit. Failure to comply with the General Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2009-01261 in any correspondence concerning this project. If you have any questions, please contact me at our California Delta Branch, 650 Capitol Mall, Suite 5-200, Sacramento, California 95814-2922, email *Marc.A.Fugler@usace.army.mil*, or telephone 916-557-5255. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Marc A. Fugler
Senior Project Manager
California Delta Branch

Enclosure(s)

Copy furnished without enclosure(s)

Mr. William Marshall, Storm Water and Water Quality Certification Unit, Central Valley Regional Water Quality Control Board, 11020 Sun Center Drive #200, Rancho Cordova, California 95670
Mr. Kent Smith, California Department of Fish and Game Region 2, 1701 Nimbus Drive, Rancho Cordova, California 95670-4599
Ms. Kim Squires, U.S. Fish and Wildlife Service, Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901
Mr. Doug Urry, CH2MHill, 2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833

Regional Water Quality Control Board 401 Permit

Linda S. Adams
Acting Secretary for Environmental Protection

California Regional Water Quality Control Board
Central Valley Region
Katherine Hart, Chair

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
(916) 464-3291 • FAX (916) 464-4645
http://www.waterboards.ca.gov/centralvalley

Edmund G. Brown Jr.
Governor

26 May 2011

Bo Buchynsky
Diamond Generating Corporation
333 South Grand Avenue, Suite 1570
Los Angeles, CA 90071

CERTIFIED MAIL
7010 1670 0002 0652 6546

CLEAN WATER ACT §401 TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS; FOR THE DIAMOND GENERATING CORPORATION, MARIPOSA ENERGY PROJECT (WDID#5B01CR00012), ALAMEDA COUNTY

This Order responds to your 12 April 2010 application submittal for Water Quality Certification for an energy project impacting approximately 0.0018 acre of waters of the United States.

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This Order serves as a Water Quality Certification (Certification) action that is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3. The validity of any non-denial Certification action shall be conditioned upon total payment of the full fee required under 23 CCR §3833, unless otherwise stated in writing by the certifying agency.

4. This Certification is valid for the duration of the described project. This Certification is no longer valid if the project (as currently described) is modified, or coverage under Section 404 of the Clean Water Act has expired.

5. All reports, notices, or other documents required by this Certification or requested by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) shall be signed by a person described below or by a duly authorized representative of that person.

(a) For a corporation: by a responsible corporate officer such as (1) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; (2) any other person who performs similar policy or decision-making functions for the corporation; or (3) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
(b) For a partnership or sole proprietorship: by a general partner or the proprietor.
(c) For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official.

6. Any person signing a document under Standard Condition number 5 shall make the following certification, whether written or implied:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated 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, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

ADDITIONAL TECHNICALLY CONDITIONED CERTIFICATION CONDITIONS:

In addition to the above standard conditions, Diamond Generating Corporation shall satisfy the following:

1. Diamond Generating Corporation shall notify the Central Valley Water Board in writing 7 days in advance of the start of any work within waters of the United States or State. The notification should include the name of the project and the WDID number, and should be sent to the Central Valley Water Board contact person shown on page six of this Certification.

2. Except for activities permitted by the U.S. Army Corps under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.

3. All areas disturbed by project activities shall be protected from washout or erosion.

4. Diamond Generating Corporation shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the Project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed project shall be adequately informed and trained regarding the conditions of this Certification.

5. All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.

6. Diamond Generating Corporation shall perform surface water sampling: 1) When performing any in-water work; 2) In the event that project activities result in any materials reaching surface waters or; 3) When any activities result in the creation of a visible plume in surface waters. The following monitoring shall be conducted immediately upstream out of the influence of the project and within 300 feet downstream of the active work area. Sampling results shall be submitted to this office within two weeks of initiation of sampling and every two weeks thereafter. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board.

Parameter	Unit	Type of Sample	Frequency of Sample
Turbidity	NTU	Grab	Every 4 hours during in water work
Settleable Material	ml/l	Grab	Same as above
Visible construction related pollutants	Observations	Visual Inspections	Continuous throughout the construction period

7. Activities shall not cause turbidity increases in surface water to exceed:
   (a) where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTU;
   (b) where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
   (c) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
   (d) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs;
   (e) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

   Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTU over background turbidity as measured in surface waters within 300 feet downstream of the working area. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be assessed by prior permission of the Central Valley Water Board.

8. Activities shall not cause settleable matter to exceed 0.1 ml/l in surface waters as measured in surface waters within 300 feet downstream of the project.

9. The discharge of petroleum products or other excavated materials to surface water is prohibited. Activities shall not cause visible oil, grease, or foam in the work area or downstream. Diamond Generating Corporation shall notify the Central Valley Water Board immediately of any spill of petroleum products or other organic or earthen materials.

10. Diamond Generating Corporation shall notify the Central Valley Water Board immediately if the above criteria for turbidity, settleable matter, oil/grease, or foam are exceeded.

11. Diamond Generating Corporation shall comply with all California Department of Fish and Game requirements for the project.

12. The use of netting material (e.g., monofilament-based erosion blankets) that could trap aquatic dependent wildlife is prohibited within the Project Area.

13. Diamond Generating Corporation must obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board for any project disturbing an area of 1 acre or greater.

14. The Conditions in this Certification are based on the information in the attached "Project Information." If the information in the attached Project Information Sheet is modified or the project changes, this Certification is no longer valid until amended by the Central Valley Water Board.

15. In the event of any violation or threatened violation of the conditions of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under State and Federal law. The applicability of any State law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with this Certification.

    (a) If Diamond Generating Corporation or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Certification, or falsifies any information provided in the monitoring reports, the applicant is subject to civil, for each day of violation, or criminal liability.
    (b) In response to a suspected violation of any condition of this Certification, the Central Valley Water Board may require Diamond Generating Corporation to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
    (c) Diamond Generating Corporation shall allow the staff(s) of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this Certification and determining the ecological success of the project.

16. Diamond Generating Corporation shall provide a Notice of Completion (NOC) no later than 30 days after the project completion. The NOC shall demonstrate that the project has been carried out in accordance with the project's description (and any amendments approved). The NOC shall include a map of the project location(s), including final boundaries of any in situ restoration area(s), if appropriate, and representative pre and post construction photographs. Each photograph shall include a descriptive title, date taken, photographic site, and photographic orientation.

17. Diamond Generating Corporation shall provide evidence of mitigation credits purchased in association with the compensatory mitigation requirements of this project to the Central Valley Water Board prior to proceeding with the activity authorized by this Certification.

ADDITIONAL STORM WATER QUALITY CONDITIONS:

Diamond Generating Corporation shall also satisfy the following additional storm water quality conditions:

1. During the construction phase, Diamond Generating Corporation must employ strategies to minimize erosion and the introduction of pollutants into storm water runoff. These strategies must include the following:
   (a) the Storm Water Pollution Prevention Plan (SWPPP) must be prepared during the project planning and design phases and implemented, as appropriate, before construction;
   (b) an effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working prior to the rainy season and during all phases of construction.

2. Diamond Generating Corporation must minimize the short and long-term impacts on receiving water quality from the Mariposa Energy Project (MEP) by implementing the following post-construction storm water management practices and as required by the local agency permitting the project, as appropriate:
   (a) provide treatment BMPs to reduce pollutants in runoff;
   (b) ensure existing waters of the State (e.g., wetlands, vernal pools, or creeks) are not used as pollutant source controls and/or treatment controls;
   (c) preserve and, where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones;
   (d) limit disturbances of natural water bodies and natural drainage systems caused by development (including development of roads, highways, and bridges);
   (e) identify and avoid development in areas that are particularly susceptible to erosion and sediment loss, or establish development guidance that protects areas from erosion/ sediment loss;

CENTRAL VALLEY WATER BOARD CONTACT:

Skyler Anderson, Environmental Scientist
11020 Sun Center Drive #200
Rancho Cordova, California 95670-6114
sanderson@waterboards.ca.gov
(916) 464-4849

WATER QUALITY CERTIFICATION:

I hereby issue an Order certifying that any discharge from the Diamond Generating Corporation, Mariposa Energy Project (WDID#5B01CR00012) will comply with the applicable provisions of §301 ("Effluent Limitations"), §302 ("Water Quality Related Effluent Limitations"), §303 ("Water Quality Standards and Implementation Plans"), §306 ("National Standards of Performance"), and §307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017 DWQ "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)".

Except insofar as may be modified by any preceding conditions, all Certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with Diamond Generating Corporation's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the *Water Quality Control Plan for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009.

for Pamela C. Creedon
Executive Officer

Enclosure: Project Information

cc: See enclosure, page 10

PROJECT INFORMATION

Application Date: 12 April 2010

Applicant: Bo Buchynsky
Diamond Generating Corporation
333 South Grand Avenue, Suite 1570
Los Angeles, CA 90071

Applicant Representatives: Doug Urry
CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833

Project Name: Mariposa Energy Project (MEP)

Application Number: WDID#5B01CR00012

Type of Project: Transmission line, natural gas pipeline, and water supply line construction

Approximate Timeframe of Project Implementation: The project is expected to occur between April 2011 and July 2012.

Project Location: Section 1, Township 2 South, Range 3 East, MDB&M.
Latitude: 37°47'23.86" and Longitude: -121°36'06.35"

County: Alameda County

Receiving Water(s) (hydrologic unit): Unnamed tributary of Italian Slough and Canal 45, San Joaquin Hydrologic Basin, North Diablo Range Hydrologic Unit #543.00

Water Body Type: Wetlands, Streambed

Designated Beneficial Uses: The *Water Quality Control Plan for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009 (Basin Plan) has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include, but are not limited to: Municipal and Domestic Water Supply (MUN); Agricultural Supply (AGR); Industrial Supply (IND), Hydropower Generation (POW); Groundwater Recharge, Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); and Wildlife Habitat (WILD). A comprehensive and specific list of the Beneficial Uses applicable for the project area can be found at
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

303(d) List of Water Quality Limited Segments: The project is not located within a water quality limited segment. The most recent list of approved water quality limited segments can be found at: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Project Description (purpose/goal): The Mariposa Energy Project (MEP) is located in an unincorporated area of northeastern Alameda County. The MEP will be a natural gas-fired,

simple cycle peaking facility with a generating capacity of 200-megawatts. The MEP will include construction of (1) a transmission line (2) natural gas pipeline (3) water supply line.

Electrical power will be transmitted to the grid at 230-kV through a new 0.7 mile transmission line that will connect to the existing Pacific Gas and Electric (PG&E) Kelso Substation. A new, 580 foot, 4 inch diameter natural gas pipeline will connect the project site to PG&E's Line 2, which is located northeast of the project site.

The MEP will use raw water supplied by Byron Bethany Irrigation District (BBID) via a 6 inch diameter, 1.8 mile long pipeline from an existing intake structure tie-in south of the MEP site. Raw water supply will be used at the facility headquarters for domestic water supply, safety and service. Approximately 1,000 feet of pipeline will be located adjacent to Bruns Road in an agriculture field from the existing pump station to the BBID headquarters facility. South of the BBID headquarters, the pipeline will be located within the Bruns Road right-of-way under the paved section of road way. The pipeline route will then follow the existing gravel access road from Bruns Road to the MEP site. Pipeline construction will temporarily impact 0.004 acre of an unnamed tributary to Italian Slough and 0.008 acre of alkaline seasonal wetland.

Construction equipment and vehicle access will be located at the north end of the project site. Construction of the access road will result in 0.017 acre of permanent impacts to a seasonal wetland.

The MEP will temporarily impact 0.0012 acre and permanently impact 0.017 acre of waters of the United States.

Preliminary Water Quality Concerns: Construction activities may impact surface waters with increased turbidity and settleable matter.

Proposed Mitigation to Address Concerns: Diamond Generating Corporation will implement Best Management Practices (BMPs) to control sedimentation and erosion. All temporary affected areas will be restored to pre-construction contours and conditions upon completion of construction activities. Diamond Generating Corporation will conduct turbidity and settleable matter testing during in-water work, stopping work if the Basin Plan criteria are exceeded or are observed.

Fill/Excavation Area: Approximately 10 yards of clean fill will be placed into 0.017 acre of jurisdictional wetland.

Dredge Volume: None

U.S. Army Corps of Engineers Permit Number: Nationwide Permit # 12

Department of Fish and Game Streambed Alteration Agreement: Diamond Generating Corporation applied for a Streambed Alteration Agreement on 1 April 2010.

Possible Listed Species: longhorn fairy shrimp, vernal pool fairy shrimp, California tiger salamander, California red-legged frog, San Joaquin kit fox

Status of CEQA Compliance: The California Energy Commission (CEC) approved the Final Staff Assessment and filed a Notice of Decision (NOD) on 18 May 2011. The CEC filed the NOD pursuant to a California Environmental Quality Act (CEQA) equivalent regulatory

program certified by the Secretary of Natural Resources under Section 21080.5 of the California Public Resources Code.

As a Responsible Agency under CEQA, the Central Valley Water Board reviewed the Final Staff Assessment and found that impacts to water quality were addressed. Impacts to water quality will be mitigated to a less than significant level. Mitigation for impacts to water quality is discussed in the "Proposed Mitigation to Address Concerns" section above, and the "Compensatory Mitigation" section below.

With regard to the remaining impacts identified in the Final Staff Assessment the corresponding mitigation measures proposed are within the responsibility and jurisdiction of another public agency, and not within the jurisdiction of the Central Valley Water Board.

Compensatory Mitigation: As required by the United States Fish and Wildlife Service, loss of branchiopod habitat will be mitigated at a 3:1 ratio offsite through the preservation of fairy shrimp habitat. As required by United States Army Corps of Engineers, the loss of wetland will be mitigated offsite at the Cosumnes Floodplain Mitigation Bank with the purchase 0.017 acres of wetland habitat to mitigate for 0.017 acre of impacts to waters of the United States.

Evidence of this purchase shall be provided to the Central Valley Water Board prior to proceeding with the activity authorized by this permit.

Application Fee Provided: Total fees of $640.00 have been submitted to the Central Valley Water Board as required by 23 CCR §3833b (3) (A) and by 23 CCR §2200(e).

DISTRIBUTION LIST

United States Army Corp of Engineers
Sacramento District Office
Regulatory Division
650 Capitol Mall, Suite 5-200
Sacramento, CA 95814-4708

United States Fish & Wildlife Service
Sacramento Fish & Wildlife Office
2800 Cottage Way
Sacramento, CA 95825

Jeff Drongesen
Department of Fish and Game
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

Bill Jennings
CA Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

(Electronic copy only) Bill Orme
State Water Resources Control Board
401 Certification and Wetlands Unit Chief

(Electronic copy only) Dave Smith
Wetlands Section Chief (W-3)
United States Environmental Protection Agency

U.S. Fish and Wildlife Service Biological Opinion

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:
84120-2009-F-1306-2

MAY 17 2011

Mr. Marc Fugler
Senior Project Manager
California Delta Branch
U.S. Anny Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Subject: Formal Consultation for the Mariposa Energy Project (MEP), Alameda County, California

Dear Mr. Fugler:

This letter is in response to the U.S. Army Corps of Engineers (Corps) April 20, 2010, request for section 7 consultation with the U.S. Fish and Wildlife Service (Service) on the proposed MEP in unincorporated northeast Alameda County, California. The Corps letter was received in our field office on April 22, 2010. This document represents the Service's biological opinion on the effects of the action on the federally endangered longhorn fairy shrimp (*Brachinecta logiantenna*), threatened vernal pool fairy shrimp (*Brachinecta lynchi*), threatened California red-legged frog (*Rana draytonii*) and its designated critical habitat, threatened California tiger salamander (*Ambystoma californiense*), and endangered San Joaquin kit fox (Vulpes macrotis mutica). 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).

The following sources of information were used to develop this biological opinion: (1) numerous revised project descriptions and effects assessments; (2) numerous meetings, letters, emails, and telephone conversations; and (3) other information available to the Service.

Consultation History

October 2009: The Service received emails from CH2M HILL and discussed the project in a phone conversation.

TAKE PRIDE IN AMERICA

December 22, 2009:	The Service participated in a site visit with the California Department of Fish and Game (CDFG), California Energy Commission (CEC), Mariposa Energy, LCC, and Mariposa Energy, LCC's consultant, CH2M HILL.
April 21, 2010:	The Service received the Biological Assessment from CH2M HILL.
April 22, 2010:	The Service received a letter dated April 20, 2010, from the Corps requesting consultation for the proposed project.
May 17, 2010:	The Service and CH2M HILL exchanged emails regarding the consultation request and Biological Assessment. An additional map was emailed to the Corps with a copy to the Service.
May 19, 2010:	The Service issued a letter to the Corps requesting information required to complete consultation.
June 30, 2010:	The Service and CH2M HILL discussed the May 19, 2010 letter and information required to complete consultation.
July 2, 2010:	The Service received, via email, a technical memorandum responding to the Service's May 19, 2010 letter.
August 12, 2010:	The Service met Mariposa Energy, LCC, CH2M HILL, Souza Realty & Development, CDFG, and CEC to discuss the project.
September 2010:	The Service, CDFG, CEC and CH2M HILL exchanged emails regarding the project.
September 9, 2010:	The Service received, via email, an updated project description and supplemental information.
October 21, 2010:	CH2M HILL called the Service to discuss revisions to the project description.
October 22, 2010:	The Service received, via email, a revised project description and relocation plans for the California tiger salamander and California red-legged frog.
January 2011:	The Service exchanged emails with Mariposa Energy, LCC's consultant, Westervelt Ecological Services.
February 2011:	The Service exchanged emails with Westervelt Ecological Services.
February 3, 2011:	The Service received emails from Gibson & Skordal, LCC regarding vernal pool fairy shrimp sampling and observations.

February 25, 2011: The Service received compensation proposals from Westervelt Ecological Services.

March 1, 2011: The Service received the Draft Biological Resources Mitigation Implementation and Monitoring Plan and met with Westervelt Ecological Services, Souza Realty & Development, CH2M HILL, CEC, and CDFG to discuss the new compensation proposals.

April 6, 2011: The Service received a phone call from CH2M HILL and discussed new information regarding vernal pool fairy shrimp and project timing.

April 8, 2011: The Service received, via email, new vernal pool fairy shrimp occurrence and effects information from CH2M HILL.

April 25, 2011: The Service received an email from CH2M HILL with additional project documents.

BIOLOGICAL OPINION

Description of the Action

The proposed MEP will provide flexible energy generation to facilitate alternative energy production, helping Pacific Gas and Electric (PG&E) meet new clean energy guidelines. The facility will be located in northeastern Alameda County, California, on approximately 12.6 acres of a 158-acre parcel that consists of non-irrigated grazing land, a former wind-turbine development, and an existing cogeneration power plant. The site is approximately 7 miles northwest of Tracy, 7 miles east of Livermore, 6 miles south of Byron, and approximately 2.5 miles west of the community of Mountain House. All MEP development will occur within a 35.5-acre work area, situated near the intersection of Bruns Road and Kelso Road, in unincorporated northeastern Alameda County, California. Development within the action area will consist of the construction of a 12.6-acre power generation facility, a 0.6-acre access area, an 8.5-acre overhead transmission line, a 1.0-acre natural gas line, a 2.6-acre water supply line with associated 1-acre lay down area, and a 9.2-acre general construction lay down area.

Power Generation Facility

The proposed 12.6-acre MEP power generation facility will be a nominal 200-megawatt simple cycle generating facility consisting of four power blocks. Each power block will contain one natural gas fired combustible turbine generator (CTG). Generated power from the facility will be delivered to the grid via PG&E's Kelso Substation, located on the adjoining property, approximately 0.7 mile north of the site. The 12.6-acre footprint for the facility will include the cut and fill of approximately 2.9 acres of the surrounding hillsides to establish the new elevated footprint of the facility with the adjoining site topography and to facilitate construction access to

the site. Upon completion of construction activities, this 2.9-acre area will be graded and re-seeded by Mariposa Energy, LLC.

Construction of the entire MEP facility will occur year-round and last approximately 14 months. Long term operation will be limited to activities within the fenced power generation facility and associated access road. While portions of the facility will be paved to provide internal access to buildings and structures within the site, ground surface areas surrounding power generation equipment will be limited to a gravel cover. Power will be generated by the four CTGs and stepped up using oil filled generator transformers. These transformers will be set on concrete foundations that will include secondary oil containment reservoirs to minimize potential contamination of listed species habitat in the event of accidental leaks or spills within the facility.

The MEP will be equipped with air emissions equipment and associated monitoring technology for the observation and control of air pollutants. This will require the use of a 19 percent aqueous ammonia solution and delivery system which will consist of a 10,000 gallon ammonia tank, spill containment basin, and refilling station with an additional spill containment basin and sump. Spill containment apparatuses will minimize effects to the surrounding natural grasslands and/or wetland features located adjacent to the MEP in the event of an accidental leak or spill within the facility. Air emissions will be controlled by the use of best combustion practices including the use of natural gas, which is low in sulfur, and high efficiency air inlet filtration. This will reduce particulate contamination of surrounding landscapes while limiting facility contributions to global climate change.

The MEP will also be a zero liquid discharge facility for wastewater. Site wastewater and storm water runoff from all facility equipment areas will be collected, treated, and recycled for use onsite via oil/water separators, Ph adjusters, and other similar technologies. Any oily waste collected in the oil/water separator will be transferred to 55 gallon drums and hauled offsite for disposal at an appropriate location. Sanitary wastewater from buildings within the power generation facility will be routed to an onsite holding tank and trucked offsite for treatment. Storm water runoff that is outside of the facility equipment areas but still associated with new asphalt and/or cement ground covering installed as part of the MEP will be captured and conveyed to an onsite detention basin that will be established within the power generation facility footprint. The basin will discharge via a discharge structure to one of two newly engineered grass lined swales which will convey storm water into upland grass areas surrounding the site.

Access Road

Proposed access to the site will include travel along 816 feet of existing gravel road from Bruns Road into the property as well as the development of 431 additional feet of new road which will allow access from the existing gravel roadbed to the power generation facility footprint. During construction, the 816 feet of existing road will be widened from10 feet to a 20-foot total width and paved to facilitate access by construction and ongoing maintenance vehicles. The new 431-foot portions of the road will also be developed and paved to the same dimensions. The access road will be utilized continuously for the duration of the approximate 14-month construction period as well as ongoing future MEP operation and maintenance activities. Public use of the

access road will be prohibited by the maintenance of the existing property perimeter fence and associated gate which will remain locked at all times. Keys to this gate will only be made available to the current land owner, cattle grazing lessee, and pertinent MEP employees or their representatives to limit public access to the site.

Transmission Line

The MEP power generating facility will be connected to the existing PG&E Kelso Substation by a proposed 230 kilovolt overhead transmission line that will extend approximately 0.7-mile north from the site and onto the adjoining property. This power line will be supported by eight new steel monopole structures, located at appropriate intervals. A 10-foot diameter (maximum) permanent concrete foundation will support each new monopole structure. No new access or service roads will be necessary for work associated in or with the approximately 100-foot wide transmission line construction corridor. Rather, rubber tired line trucks and support vehicles will access the transmission line corridor via overland designated temporary access routes for the duration of construction activities. Establishment of the transmission line will occur over approximately three months which may span the wet and dry seasons. Vehicles will only access the transmission line corridor when onsite soils are sufficiently dry to avoid the creation of tire ruts or other unanticipated ground disturbance.

Natural Gas Pipeline

A 580-foot natural gas pipeline will connect the MEP power generation facility to an existing PG&E high pressure gas line located immediately to the east of the site. The new trenched line will be established within an approximately 75-foot wide pipeline construction corridor that will be accessed by back hoe, excavator, or other required equipment using temporary designated access routes. Natural gas within this pipeline will be monitored by a gas metering station that will be located within the power generation facility footprint. Prior to construction, vegetation and topsoil over the proposed pipeline trench footprint will be removed and salvaged for post-construction restoration of the pipeline corridor. Any excess soils not needed for this restoration will be utilized for other activities associated with construction activities or disposed of at an appropriate licensed offsite landfill. If needed, disturbed areas will be reseeded to minimize erosion and maintain onsite water quality.

Water Supply Pipeline

The MEP will include the establishment of a proposed 1.8-mile water supply pipeline within a 25-foot construction corridor that will convey water to the proposed power facility from Byron-Bethany Irrigation District's (BBID) Canal 45. The pipeline will originate at a new permanent 36-square foot concrete turnout structure and associated 250-square foot (0.006-acre) pump station at Canal 45. The first approximately 1,000 feet of the pipeline will be located within an existing agricultural road used to access an existing BBID pump house at Canal 45. Just north of the headquarters, the proposed pipeline will be established within the existing county right-of-way associated with Bruns Road. In the six locations that Bruns Road crosses a drainage, swale, or wetland feature, the water pipeline will either be tunneled underground below four intermittent

features, or established via open trench methods across the two ephemeral features when these areas are dry. All pipeline activities will be limited to the Bruns Road right of way. Once the pipeline reaches the project property, the pipeline will follow the MEP main access road until its terminus at the power generation facility. All construction associated with the water pipeline will be conducted during the dry season. Activities associated with the water pipeline will also include the establishment of a 1.0-acre temporary water line lay down area. This lay down area will be located within the existing BBID maintenance yard at BBID's headquarters.

Construction Lay-Down Area

The construction and staging area for the MEP facility, gas pipeline, and transmission line will be limited to a temporary 9.2 acre worker parking and lay-down area immediately east of the power generation building footprint. The 9.2-acre lay-down area will be used for construction activities for approximately 14 months, including throughout the wet season, with an additional month anticipated for restoration activities. Portions of the 9.2 acre lay-down area will use gravel or road base with an underlayment of geotextile fabric for soil stabilization. Topsoil stripped from the lay-down area will be stockpiled onsite during initial ground disturbing activities. Upon completion of construction activities, the 9.2-acre area will be ripped to a depth of no less than two feet to reduce compaction of underlying native soils. The resulting roughed soil surface will be smoothed and covered with the stockpiled topsoil in order to facilitate the restoration of pre-construction conditions, including recolonization by fossoral mammals. Base rock and fabric underlayment will be removed from the site and disposed of at an appropriate offsite location.

In addition to the above mentioned activities, components from the previous wind farm facility within the MEP property will be removed from the site and disposed of at an appropriate licensed offsite facility in order to minimize delays during construction and to improve existing habitat for listed species within the site.

Minimization Measures

In order to minimize potential effects to listed species and their habitats during construction and operation, the MEP will implement the following minimization measures:

1. At least 15 days prior to any ground disturbing activities, the applicant will submit to the Service for review the qualifications of the proposed biological monitor(s). Upon Service approval, the biologist(s) will be given the authority to stop any work that may result in the take of listed species. If the on-site biologist(s) exercises this authority, the Service will be notified by telephone and electronic mail within one (1) working day. The on-site biologist will be the contact for any employee or contractor who might inadvertently kill or injure a California red-legged frog, San Joaquin kit fox or California tiger salamander, or anyone who finds a dead, injured, or entrapped individual of these species. The on-site biologist will possess a working cellular telephone whose number will be provided to the Service. Should take occur of a California red-legged frog, San Joaquin kit fox or

California tiger salamander individual, the Service-approved biologist will contact the Service and CDFG within 24 hours of the discovered occurrence.

2. Preconstruction surveys for the California red-legged frog, San Joaquin kit fox, and the California tiger salamander will be performed immediately prior to groundbreaking activities. Surveys will be conducted by Service-approved biologists. If at any point, activities associated with the establishment of the MEP cease for more than 15 consecutive days, additional preconstruction surveys will be conducted prior to the resumption of these actions.

3. Preconstruction surveys for San Joaquin kit fox dens will be conducted within a minimum of 200 feet of the MEP area. Any natal dens encountered will be avoided by a minimum of 100 feet for known dens and a minimum of 50 feet for potential dens. Non-natal dens will be monitored for a minimum of three days to determine their current use. If no San Joaquin kit fox activity is observed during this period, the den will be destroyed to prevent future use by San Joaquin kit fox. If San Joaquin kit fox activity is observed at the den during this period, the den will be monitored for at least five (5) consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den will be discouraged during this period by partially plugging its entrance(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied will it be excavated under the direction of the biologist. If the animal is still present after 5 or more consecutive days of plugging and monitoring, the den will be excavated when, as determined by the biologist, it is temporarily vacant (for example, during the San Joaquin kit fox's normal foraging activity). Potential dens will be temporarily marked for avoidance by a minimum of 50 feet and further studied by the qualified biologist. Destruction of potential dens will occur only after the biologist determines that no San Joaquin kit fox are inside. To determine the presence of San Joaquin kit fox, the potential den will be fully excavated to the end by either hand or machinery. Once determined empty, the den will be filled with dirt and compacted to ensure that San Joaquin kit fox cannot enter or use the den during the construction period. If any potential den is determined to be currently or previously used by San Joaquin kit fox, the measures described above for natal and non-natal dens (as applicable) will be followed.

4. Any California tiger salamanders or California red-legged frogs observed during preconstruction surveys will be monitored by the approved biologist and allowed to passively leave the site or, if determined necessary by the Service-approved biologist, removed from the work area(s) and relocated to an appropriate location.

5. Prior to the start of groundbreaking activities, all construction personnel will receive worker education training on listed species and their habitats by a Service-approved biologist or a video recording of this biologist. The importance of these species and their habitat will be described to all employees as well as the minimization and avoidance measures that are to be implemented as part of the project. An educational brochure containing color photographs of all listed species in the work area(s) will be distributed to

all employees working within the project site(s). Workers will also be informed of appropriate measures to take should a toxic materials spill occur. A list of employees who attend the training sessions will be maintained by the applicant to be made available for review by the Service and the CDFG upon request. Contractor training will be incorporated into construction contracts and will be a component of weekly project meetings.

6. Wildlife exclusion fencing will be established around the perimeter of the MEP power generation facility, 9.2-acre laydown area, MEP main access road, and gas line work corridor. Approximately 1,000 feet of the water line, located on the Lee Property, will be included with the gas line exclusion fence, as water line and access road occur in tandem with each other. A partial wildlife exclusion fence will also be established along the eastern right-of-way of the water supply pipeline corridor to deter California tiger salamander and/or California red-legged frog from entering the disturbance area from adjacent aquatic drainages. All fencing will be, at minimum, buried six (6) inches into the ground and extend 36 inches above ground level to discourage listed animals from entering the site. Exclusion fencing will remain around the specified work areas for the duration of ground disturbing activities.

7. The monitoring biologist will be onsite at all times during initial ground-breaking activities until wildlife exclusion fencing is installed around the power generation facility, access road, laydown yard, and gas line. Upon completion of these activities, the monitoring biologist will inspect all wildlife and wetland exclusion fencing as well as construction zone fencing or flagging associated with the specified areas each week, at minimum, for the duration of MEP construction to ensure fencing integrity. During the wet season, a biological monitor will remain on site each day to record any migrating California tiger salamander or California red-legged frog individuals and to ensure appropriate avoidance and minimization measures are being implemented for these animals. During this period, the Service-approved monitor will also survey wildlife exclusion and construction perimeter fencing on a daily basis to look for tears and to ensure no California tiger salamander or California red-legged frog have become trapped along the fence line. The applicant will maintain and/or replace these barriers immediately if necessary.

8. All work areas and designated temporary travel corridors will be clearly delineated via flagging, signage or other similar methods to minimize construction disturbances beyond the work area. Vehicles will only enter temporary travel corridors when dry soil conditions exist to avoid the creation of tire ruts or other impacts to the ground surface.

9. A 25-foot minimum no-work buffer will be established around all inundated seasonal wetlands near the overland designated temporary access routes associated with the gas pipeline, transmission line or their associated work corridors. This buffer will be clearly demarcated with orange snow fencing to avoid construction access into potential branchiopod habitat. This fencing will be established prior to the start of ground breaking activities and will be checked weekly, at a minimum, by Service-approved biological

monitors throughout the course of activities within these areas. Dry seasonal drainage features located along the transmission line will be crossed via temporary metal plates that will span the entire width of these features and will be installed prior to construction activities. All metal plates will be removed upon completion of MEP construction.

10. The Service-approved biologist will monitor the construction of the water supply pipeline and transmission line on a daily basis for the duration of these activities, regardless of the season.

11. The Service-approved biological monitor and construction manager will be notified immediately if a California tiger salamander, California red-legged frog, or San Joaquin kit fox are observed anywhere within the property. If the observed animal is a California tiger salamander or California red-legged frog, the Service-approved biologist will monitor these animals and determine if they are in danger of take from construction activities, predators, or entrapment. If they are, all construction in the immediate area will cease until the animal is allowed to passively leave the site. If this is not possible, the Service-approved biological monitor will remove the California tiger salamander or California red-legged frog from the property in a cool, moist container and relocate these individuals to either the adjacent Bryon Conservation Bank or the proposed Mountain House Conservation Bank site. Upon release of these animals, the Service-approved biologist will monitor the individual until it is determined that it is in no imminent danger. If a San Joaquin kit fox is observed on the site, construction activities that will directly affect the individual will cease until the animal passively leaves the site. Field survey forms will be completed for all California tiger salamander, California red-legged frog, or San Joaquin kit fox observations. These forms will be submitted to the California Natural Diversity Data Base (CNDDB) prior to completion of construction activities.

12. To the maximum extent practicable, fossorial mammal burrows that may provide refugia habitat for California tiger salamander and California red-legged frog will be avoided during the construction and long-term operation of the MEP. Exclusion fence and/or plywood will be placed around areas with high concentrations of burrows during the course of construction activities to avoid the destruction of these features.

13. Topsoil removed from the 9.2-acre temporary laydown area, access road widening, cut-and-fill area, and gas pipeline trenching locations will be stockpiled and reserved for the duration of construction activities. Upon completion of these actions, temporarily disturbed areas will be graded and restored with reserved topsoil to facilitate the re-establishment of fossoral mammal populations and upland listed species habitats. Any surplus topsoil will be hauled off site and disposed of at an appropriate facility.

14. To the maximum extent practicable, the water pipeline will be established in existing disturbed areas. Intermittent features will be crossed by pipe ramming under the current culverts associated with Bruns Road. Water pipeline activities that do require additional disturbance to ephemeral drainage and wetland features will only occur during the dry

season once these features no longer hold water. An onsite biological monitor will be present to advise all workers to stay inside approved work areas at all times.

15. Potential effects to water quality from contaminated runoff or airborne dust will be avoided by the implementation of standard erosion and/or sedimentation control devices, fugitive dust management, avoidance, and other best management practices (BMPs) prescribed by the MEP's approved Stormwater Pollution Prevention Plan (SWPPP) and Fugitive Dust Mitigation Plan. As-needed dust control measures (e.g., wetting dry ground) will minimize airborne transmission of soil particles into aquatic habitats. Erosion and sediment control devices (such as silt fences and fiber rolls) will be implemented as necessary during the wet season and before forecasted rain events to minimize impacts to water quality and effects to branchiopods. Equipment fueling, maintenance, and repairs as well as storage of hazardous materials such as fuels and lubricants will be limited to areas 250 feet or greater from any wetlands or drainage areas. Other hazardous material BMPs, including but not limited to secondary containment and not topping off fuel tanks will be enforced to prevent soil contamination. Prior to the start of construction activities, an emergency spill plan will be developed as part of SWPPP requirements and will be readily available to all employees throughout the duration of work activities. This plan will include appropriate prevention and cleanup measures for both upland and aquatic areas.

16. Plastic mono-filament netting or similar material will not be used for erosion control matting at the project site to avoid the entanglement or entrapment of California tiger salamander or California red-legged frog individuals. Acceptable substitutes include coconut coir matting, tackified hydroseeding compounds, or other similar materials.

17. Construction of the MEP will include the establishment of secondary emergency containment reservoirs for both ammonia and oil storage tanks associated with the long-term operation and maintenance of the power generation facility. This will minimize the potential leak or seepage of these materials into onsite habitats during long-term MEP operation.

18. To prevent the accidental entrapment of listed species during construction, all excavated holes or trenches deeper than six inches will be covered at the end of each work day with plywood or similar materials. Foundation trenches or larger excavations that cannot easily be covered will be ramped at the end of the work day to allow trapped animals an escape method. Prior to the filling of such holes, these areas will be thoroughly inspected for listed species by Service-approved biologists. In the event of a trapped animal is observed, construction will cease until the individual has been relocated to an appropriate location.

19. All construction pipes, culverts, or similar structures greater than 4 inches in diameter that are stored at the MEP overnight will be securely capped before storage or will be thoroughly inspected for San Joaquin kit fox and other sensitive species prior to pipe installation or capping to avoid entrapment or injury of this animal. If a San Joaquin kit fox or other sensitive species is discovered inside a pipe, that section of pipe will not be

moved until the Service and CDFG have been contacted by the Service-approved biologist to determine the appropriate course of action.

20. No discharge of pollutants from vehicle and equipment cleaning, maintenance, or repair will be allowed into storm drains, wetlands, or water courses. No discharge of sediment-laden water from project-related activities will be allowed into storm drains, wetlands, or water courses.

21. All trash and debris within the work area will be placed in containers with secure lids before the end of each work day in order reduce the likelihood of predators being attracted to the site by discarded food rappers and other rubbish that may be left on-site. Containers will be emptied as necessary to prevent trash overflow onto the site and all rubbish will be disposed of at an appropriate off-site location.

22. To the maximum extent practicable, construction will only occur between 7 a.m. and 7 p.m. to limit the need for night lighting which could attract California tiger salamanders or California red-legged frogs into the construction area and/or provide additional light for night time predators, increasing mortality of these animals. If night time work is required during certain periods, no nocturnal construction activities will occur outside of wildlife exclusion fences associated with the access road, power generation facility, laydown area, and gas pipeline corridor for the duration of the wet season.

23. All exterior lights associated with construction and long-term operation will be hooded, and directed onsite so that significant light or glare into the surrounding habitats is minimized. Low-pressure sodium lamps and other low glare fixtures will also be utilized. For areas where lighting is not required for normal operation, safety, or security, switched lighting circuits will be established, allowing these areas to remain dark to minimize attracting California tiger salamanders, California red-legged frogs, or other animals to the site.

24. All vehicles entering the work area(s) will be confined to existing roads or approved temporary routes. Speed limits within the work area(s) will be limited to 15 miles per hour. Trash dumping, firearms, and pets will be prohibited in the project area(s).

25. Construction of the power generation facility will include the installation of a permanent barrier to discourage movement of California tiger salamanders or California red-legged frogs onto the site. This barrier will be installed and maintained around the perimeter of the facility for the operational life of the project and will be comprised of tightly woven metal fencing, concrete curbing or other similar exclusionary materials. At minimum, the barrier will be buried 6 inches into the ground and extend for three vertical feet above the ground surface.

26. Upon completion of construction activities, all debris and materials associated with MEP construction will be removed and areas not needed for the long-term operation of the site will be recontoured to match adjoining grades. Post construction BMPs (as prescribed in

the SWPPP) will be implemented, including reseeding all areas as necessary to facilitate timely vegetative restoration.

27. Potential effects to listed species resulting from MEP activities will be compensated for by the preservation of 79.9 acres of upland California tiger salamanders, California red-legged frogs and San Joaquin kit fox habitats at the proposed Mountain House Mitigation Bank or other alternative Service, CDFG, and CEC -approved conservation property and 0.57-acre of preservation habitat at the Fitzgerald Ranch Conservation Bank or other alternative Service and CEC-approved conservation property for vernal pool fairy shrimp. Any conservation property utilized to offset MEP effects to listed species will be accompanied by a long-term management plan with an associated endowment, and will be placed under a permanent conservation easement. All documentation for the selected conservation property will be reviewed and approved by the Service, CDFG and CEC. Mariposa Energy, LLC will provide written verification to the Service, CDFG and CEC of the credit purchase or conservation easement within 18 months from the start of construction activities or prior to commercial operation of the power generation facility, whichever comes first. Prior to the start of construction, Mariposa Energy, LLC will provide a letter of credit to CDFG with sufficient funding to cover the higher of either the purchase of 79.9 upland acres at the Mountain House Mitigation Bank and 0.57-acre worth of preservation credits at the Fitzgerald Ranch Conservation Bank or the development and implementation of these acres at the alternative Service, CDFG, and CEC -approved conservation property.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the purposes of the effects assessment, the action area contains the MEP footprint.

Analytical Framework for the Jeopardy and Adverse Modification Analyses

Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the longhorn fairy shrimp, vernal pool fairy shrimp, California red-legged frog, California tiger salamander, and San Joaquin kit fox's range-wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the two species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the these listed animals; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the longhorn fairy shrimp, vernal pool fairy shrimp, California red-legged frog, California tiger salamander, and San Joaquin kit fox and; (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on them.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the longhorn fairy shrimp, vernal pool fairy shrimp, California red-legged frog, California tiger salamander, and San Joaquin kit fox's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these five species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the longhorn fairy shrimp, vernal pool fairy shrimp, California red-legged frog, California tiger salamander, and San Joaquin kit fox and the role of the action area in their survival and recovery as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

This Biological Opinion 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 statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this Biological Opinion relies on four components: (1) the *Status of Critical Habitat*, which evaluates the rangewide condition of proposed critical habitat for the California red-legged frog in terms of primary constituent elements PCE, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units and; (4) *Cumulative Effects* which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the California red-legged frog critical habitat are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional(or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the California red-legged frog.

The analysis in this Biological Opinion places an emphasis on using the intended range-wide recovery function of California red-legged frog critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of

the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

Status of the Species

California Red-Legged Frog

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (Service 1996). Critical habitat was designated for this species on April 13, 2006 (Service 2006) and revisions to the critical habitat designation were published on March 17, 2010 (Service 2010). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).
Description: The California red-legged frog 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 2003). The abdomen and hind legs of adults are largely red, while 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 2003), 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).

Distribution: The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 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 (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the Central California Coast. 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 (CDFG 2010).

Status and Natural History: California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, they also inhabit ephemeral creeks, drainages and ponds with minimal riparian and emergent vegetation. California red-legged frogs breed from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules or overhanging willows (Storer 1925, Hayes and Jennings 1988). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984).

Habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer including vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees (Fellers 2005). Sheltering habitat for California red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provide cover, such as 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 stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may 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.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5-mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al.* (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger *et al.* (2003) reported that non-migrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, i.e., California blackberry, poison oak (*Toxicodendron diversilobum*) and coyote brush. 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 *et al.* 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment in eastern Contra Costa County, Tatarian (2008) noted that a 57 percent majority of frogs fitted with radio transmitters in the Round Valley study area stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. Her study reported a peak seasonal terrestrial movement occurring in the fall months associated with the first 0.2-inch of precipitation and tapering off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the base of trees or rocks, logs, and under man-made structures; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from 1 to 4 days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Upland refugia closer to aquatic sites were used more often and were more commonly associated with areas exhibiting higher object cover, e.g., woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

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). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925, Jennings and Hayes 1994). 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 resulted 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 3½ to 7 months following hatching and reach sexual maturity 2 to 3 years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). 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). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations can fluctuate from year to year; favorable conditions allow the species to have 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, the animal may temporarily disappear from an area when conditions are stressful (e.g., during periods of drought, disease, etc.).

The diet of California red-legged frogs is highly variable and changes with the life history stage. The diet of the larvae is not well studied, but is likely similar to that of other ranid frogs, feeding on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005; Kupferberg 1996a, 1996b, 1997). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific chorus frog, three-spined stickleback and, to a limited extent, California mice, which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult frogs varied in their feeding activity periods; juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination, feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Threats: 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 local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs (*Rana aurora*), and suggested that bullfrogs could prey on subadult California red-

legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with California red-legged frog reproduction by eating adult male California red-legged frogs. Both California and northern red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; Jennings 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

Negative effects to wildlife populations from roads and pavement may extend some distance from the actual road. The phenomenon can result from vehicle-related mortality, habitat degradation, noise and light pollution, and invasive exotic species. Forman and Deblinger (1998) described the area affected as the "road effect" zone. One study along a 4-lane road in Massachusetts determined that this zone extended for an average of 980 feet to either side of the road for an average total zone width of approximately 1,970 feet. However, in places they detected an effect greater than 0.6-mile from the road. The road effect zone can also be subtle. Van der Zandt *et al.* (1980) reported that lapwings and black-tailed godwits feeding at 1,575 to 6,560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep increases near roads (MacArthur *et al.* 1979). Trombulak and Frissell (2000) described another type of "road-zone" effect due to contaminants. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads and elevated levels of metals in soil and plants were detected at 660 feet of roads. The "road-zone" varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the road-zone along primary roads of 1,000 feet in woodlands, 1,197 feet in grasslands, and 2,657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The road-zone with regard to California red-legged frogs has not been adequately investigated.

The necessity of moving between multiple habitats and breeding ponds means that many amphibian species, such as the California red-legged frog are especially vulnerable to roads and well-used large paved areas in the landscape. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are more vulnerable to traffic mortality than some other species. High-volume highways pose a nearly impenetrable barrier to amphibians and result in mortality to individual animals as well as significantly fragmenting habitat. Hels and Buchwald (2001) found that mortality rates for anurans on high traffic roads are higher than on low traffic roads. Vos and Chardon (1998) found a significant negative effect of road density on the occupation probability of ponds by the moor frog (*Rana arvalis*) in the Netherlands. In addition, incidences of very large numbers of road-killed frogs are well documented (Asley and Robinson 1996), and studies have shown strong population level effects of traffic density (Carr and Fahrig 2001) and high traffic roads on these amphibians (Van Gelder 1973; Vos and Chardon 1998). Most studies regularly count road mortalities from slow moving vehicles (Hansen 1982; Rosen and Lowe 1994; Drews 1995; Mallick *et al.* 1998) or by

foot (Munguira and Thomas 1992). These studies assume that every victim is observed, which may be true for large conspicuous mammals, but may be an incorrect assumption for small animals, such as the California red-legged frog. Amphibians appear especially vulnerable to traffic mortality because they readily attempt to cross roads, are small and slow-moving, and thus are not easily avoided by drivers (Carr and Fahrig 2001).

Recovery: The recovery plan for the California red-legged frog identifies eight recovery units (Service 2002). The establishment of these recovery units is based on the determination that various regional areas of the species' range are essential to its survival and recovery. The status of the California red-legged frog was considered within the small scale recovery units as opposed to their overall range. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of its range. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy will allow for the recolonization of habitats within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

California Red-legged Frog Critical Habitat

The Service designated critical habitat for the California red-legged frog on April 13, 2006 (Service 2006) and a revised designation to the critical habitat was published on March 17, 2010 (Service 2010). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection and; (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.12(b)). 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, the following: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, or dispersal and; (5) generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements defined for the California red-legged frog was derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for

breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The primary constituent elements and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California red-legged frog ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the primary constituent elements essential to the conservation of the California red-legged frog are: (1) aquatic breeding habitat defined as standing bodies of fresh water (with salinities less than 7.0 parts per thousand), including: natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years; (2) non-breeding aquatic habitat defined as freshwater and wetted riparian habitats, as described above, that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period; (3) upland habitat defined as upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile in most cases and comprised of various vegetational series such as grasslands, woodlands, wetland, or riparian plant species that provides the frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter and; (4) dispersal habitat defined as accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other and that allows for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified in primary constituent elements 1, 2, or 3 as essential to the conservation of the subspecies.

With the revised designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the primary constituent elements sufficient to support the life-history functions of the species. Because not all life-history functions require all the primary constituent elements, not all areas

designated as critical habitat will contain all the primary constituent elements. Refer to the final designation of critical habitat for California red-legged frog for additional information.

California Tiger Salamander

On May 23, 2003, the Service proposed to list the Central California Distinct Population Segment (DPS) of the California tiger salamander as threatened. At this time, the Service also proposed reclassification of the Santa Barbara County DPS and Sonoma County DPS from endangered to threatened (Service 2003). In the same notice we also proposed a special rule under section 4(d) of the Act to exempt take for routine ranching operations for the Central California DPS and, if reclassified to threatened, for the Santa Barbara and Sonoma County DPSs (Service 2003). On August 4, 2004, after determining that the listed the Central California population of the California DPS of the California tiger salamander was threatened (Service 2004b), we determined that the Santa Barbara and Sonoma County populations were threatened as well, and reclassified the California tiger salamander as threatened throughout its range, removing the Santa Barbara and Sonoma County populations as separately listed DPSs (Service 2004b). In this notice we also finalized the special rule to exempt take for routine ranching operations for the California tiger salamander throughout its range (Service 2004b).

On August 18, 2005, as a result of litigation of the August 4, 2004, final rule on the reclassification of the California tiger salamander DPSs (*Center for Biological Diversity et al.* v. *United States Fish and Wildlife Service et al.*, C 04-04324 WHA (N.D. Cal. 2005), the District Court of Northern California sustained the portion of the 2004 rule pertaining to listing the Central California tiger salamander as threatened with a special rule, vacated the 2004 rule with regard to the Santa Barbara and Sonoma DPSs, and reinstated their prior listing as endangered. The List of Endangered and Threatened Wildlife in part 17, subchapter B of Chapter I, title 50 of the Code of Federal Regulations (CFR) has not been amended to reflect the vacatures contained in this order, and continues to show the rangewide reclassification of the California tiger salamander as a threatened species with a special rule. We are currently in the process of correcting the CFR to reflect the current status of the species throughout its range.

Description: The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Recorded adult measurements have been as much as 8.2 inches (20.8 centimeters) long (Petranka 1998; Stebbins 2003). Tiger salamanders exhibit sexual dimorphism (differences in body appearance based on gender) with males tending to be larger than females. Tiger salamander coloration generally consists of random white or yellowish markings against a black body. The markings on adults California tiger salamanders tend to be more concentrated on the lateral sides of the body, whereas other tiger salamander species tend to have brighter yellow spotting that is heaviest on the dorsal surface.

Distribution: The California tiger salamander is endemic to California and historically inhabited the low-elevation grassland and oak savanna plant communities of the Central Valley, adjacent foothills, and Inner Coast Ranges (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species has been recorded from near sea level to approximately 3,900 feet in the Coast Ranges and to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer and

Trenham 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. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County. Three distinct California tiger salamander populations are recognized and correspond to Santa Maria area within Santa Barbara County, the Santa Rosa Plain in Sonoma County, and vernal pool/grassland habitats throughout the Central Valley.

Status and Natural History: The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae develop in the vernal pools and ponds in which they were born, California tiger salamanders are otherwise terrestrial and spend most of their post-metamorphic lives in widely dispersed underground retreats (Shaffer et al. 2004; Trenham *et al.* 2001). Because they spend most of their lives underground, California tiger salamanders are rarely encountered even in areas where salamanders are abundant. Subadult and adult California tiger salamanders typically spend the dry summer and fall months in the burrows of small mammals, such as California ground squirrels and Botta's pocket gopher (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Although ground squirrels have been known to eat California tiger salamanders, the relationship with their burrowing hosts is primarily commensal (an association that benefits one member while the other is not affected) (Loredo et al. 1996; Semonsen 1998).

California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets and other invertebrates that provide likely prey for tiger salamanders. Underground refugia also provide protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although California tiger salamanders are members of a family of "burrowing" salamanders, they are not known to create their own burrows. This may be due to the hardness of soils in the California ecosystems in which they are found. Tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia for the species. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo *et al.* 1996).

Upland burrows inhabited by tiger salamanders have often been referred to as aestivation sites. However, "aestivation" implies a state of inactivity, while most evidence suggests that tiger salamanders remain active in their underground dwellings. A recent study has found that California tiger salamanders move, feed, and remain active in their burrows (Van Hattem 2004). Because California tiger salamanders arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving, researchers have long inferred that tiger salamanders are feeding while underground. Recent direct observations have confirmed this (Trenham 2001; Van Hattem 2004). Thus, "upland habitat" is a more accurate description of the terrestrial areas used by California tiger salamanders.

California tiger salamanders typically emerge from their underground refugia at night during the fall or winter rainy season (November-May) to migrate to their breeding ponds (Stebbins 2003; Shaffer et al. 1993; Trenham *et al.* 2000). The breeding period is closely associated with the

rainfall patterns in any given year with less adults migrating and breeding in drought years (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Male salamanders are typically first to arrive and generally remain in the ponds longer than females. Results from a 7-year study in Monterey County suggested that males remained in the breeding ponds for an average of 44.7 days while females remained for an average of only 11.8 days (Trenham *et al.* 2000). Historically, breeding ponds were likely limited to vernal pools, but now include livestock stock ponds. Ideal breeding ponds are typically fishless, and seasonal or semi-permanent (Barry and Shaffer 1994; Petranka 1998).

While in the ponds, adult California tiger salamanders mate and then the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Egg laying typically reaches a peak in January (Loredo and Van Vuren 1996; Trenham *et al.* 2000). 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). Eggs are often attached to objects, such as rocks and boards in ponds with no or limited vegetation (Jennings and Hayes 1994). Clutch sizes from a Monterey County study had an average of 814 eggs (Trenham *et al.* 2000). Seasonal pools may not exhibit sufficient depth, persistence, or other necessary parameters for adult breeding during times of drought (Barry and Shaffer 1994). After breeding and egg laying is complete, adults leave the pool and return to their upland refugia (Loredo *et al.* 1996; Trenham 1998a). Adult California tiger salamanders often continue to emerge nightly for approximately the next two weeks to feed in their upland habitat (Shaffer *et al.* 1993).

California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The peak emergence of these metamorphs is typically between mid-June and mid-July (Loredo and Van Vuren 1996; Trenham *et al.* 2000). The larvae are totally aquatic and range in length from approximately 0.45 to 0.56 inches (1.14 to 1.42 centimeters) (Petranka 1998). They have yellowish gray bodies, broad fat heads, large, feathery external gills, and broad dorsal fins that extend well up 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 the tadpoles of Pacific treefrogs, western spadefoot toads, and California red-legged frogs (J. Anderson 1968; P. Anderson 1968). California tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water column in deeper water. Young salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925). The California tiger salamander larval stage is typically completed in 3 to 6 months with most metamorphs entering upland habitat during the summer (Petranka 1998). In order to be successful, the aquatic phase of this species' life history must correspond with the persistence of its seasonal aquatic habitat. Most seasonal ponds and pools dry up completely during the summer. 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).

Larval development and metamorphosis can vary and is often site-dependent. Larvae collected near Stockton in the Central Valley during April varied between 1.88 to 2.32 inches (4.78 to 5.89

centimeters) in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left breeding pools 60 to 94 days after eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. Longer ponding duration typically results in larger larvae and metamorphosed juveniles that are more likely to survive and reproduce (Pechmann et al. 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). Larvae will perish if a breeding pond dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1988) found a strong positive correlation between ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 sampled pools supported larval California tiger salamanders, and 5 of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only 6 (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).

Following metamorphosis, juveniles leave their pools and enter upland habitat. This emigration can occur in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Wet conditions are more favorable for upland travel but rare summer rain events seldom occur as metamorphosis is completed and ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under dry conditions, juveniles may be limited to seeking upland refugia in close proximity to their aquatic larval pool. These individuals often wait until the next winter's rains to move further into more suitable upland refugia. Although likely rare, larvae may over-summer in permanent ponds. Juveniles remain active in their upland habitat, emerging from underground refugia during rainfall events to disperse or forage (Trenham and Shaffer 2005). Depending on location and other development factors, metamorphs will not return as adults to aquatic breeding habitat for 2 to 5 years (Loredo and Van Vuren 1996; Trenham *et al.* 2000).

Lifetime reproductive success for California tiger salamander species is low. Results from one study suggest that the average female California tiger salamander bred 1.4 times and produced 8.5 young per reproductive effort that survived to metamorphosis (Trenham *et al.* 2000). This resulted in the output of roughly 11 metamorphic offspring over a breeding female's lifetime. The primary reason for low reproductive success may be that this relatively short-lived species requires two or more years to become sexually mature (Shaffer *et al.* 1993). Some individuals may not breed until they are four to six years old. While California tiger salamanders may survive for more than ten years, many breed only once, and in one study, less than 5 percent of marked juveniles survived to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well 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). After breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before attempting to breed again (Trenham *et al.* 2000).

California tiger salamanders are known to travel large distances between breeding ponds and their upland refugia. Generally it is difficult to establish the maximum distances traveled by any species, but California tiger salamanders in Santa Barbara County have been recorded dispersing up to 1.3 miles (2.1 kilometers) from their breeding ponds (Sweet 1998). California tiger salamanders are also 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 other ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during juvenile dispersal and adult migration, California tiger salamanders may reside in burrows far from their associated breeding ponds.

Although previously cited information indicates that California tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002/2003 suggested that juveniles dispersed and used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile salamanders were captured at traps placed at 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Approximately 20 percent of the captured juveniles were found at least 1,312 feet from the nearest breeding pond. The associated distribution curve suggested that 95 percent of juvenile salamanders were 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 at the same study site detected juvenile California tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from ponds (Ben Fitzpatrick, University of California at Davis, personal communication, 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 from aquatic habitat, radio-equipped adult California tiger salamanders were tracked to burrows between 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period.

California tiger salamanders are also known to use several successive burrows at increasing distances from an associated breeding pond. Although previously sited studies provide information regarding linear movement from breeding ponds, upland habitat features appear to have some influence on movement. Trenham (2001) found that radio-tracked adults were more abundant in grasslands with scattered large oaks, than in more densely wooded areas. Based on radio-tracked adults, there is no indication that certain habitat types are favored as terrestrial

movement corridors (Trenham 2001). In addition, captures of arriving adults and dispersing new metamorphs were evenly distributed around two ponds completely encircled by drift fences and pitfall traps. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Threats: The California tiger salamander is imperiled throughout its range due to a variety of human activities (Service 2004b). Current factors associated with declining tiger salamander populations include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native eastern tiger salamander (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. California tiger salamander populations are likely threatened by multiple factors but continued habitat fragmentation and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation 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 include disease, predation, interspecific competition, urbanization and population growth, exposure to contaminants, rodent and mosquito control, road-crossing mortality, and hybridization with non-native salamanders. Currently, these various primary and secondary threats are largely not being offset by existing federal, state, or local regulatory mechanisms. The California tiger salamander is also prone to chance environmental or demographic events, to which small populations are particularly vulnerable.

The necessity of moving between multiple habitats and breeding ponds means that many amphibian species, such as the California tiger salamander are especially vulnerable to roads and well-used large paved areas in the landscape. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are more vulnerable to traffic mortality than some other species. Large, high-volume highways pose a nearly impenetrable barrier to amphibians and result in mortality to individual animals as well as significantly fragmenting habitat. Hels and Buchwald (2001) found that mortality rates for anurans on high traffic roads are higher than on low traffic roads (Hels and Buchwald 2001). Vos and Chardon (1998) found a significant negative effect of road density on the occupation probability of ponds by the moor frog (*Rana arvalis*) in the Netherlands. In addition, incidences of very large numbers of road-killed frogs are well documented (e.g., Asley and Robinson 1996), and studies have shown strong population level effects of traffic density (Carr and Fahrig 2001) and high traffic roads on these amphibians (Van Gelder 1973; Vos and Chardon 1998). Most studies regularly count road kills from slow moving vehicles (Hansen 1982; Rosen and Lowe 1994; Drews 1995; Mallick *et al.* 1998) or by foot (Munguira and Thomas 1992). These studies assume that every victim is observed, which may be true for large conspicuous mammals, but it certainly is not true for small animals, such as the California red-legged frog. Amphibians appear especially vulnerable to traffic mortality because they readily attempt to cross roads, are slow-moving and small, and thus cannot easily be avoided by drivers (Carr and Fahrig 2001).

The direction and type of habitat used by dispersing animals is especially important in fragmented environments (Forys and Humphrey 1996). Models of habitat patch geometry predict that individual animals will exit patches at more "permeable" areas (Buechner 1987; Stamps et al. 1987). A landscape corridor may increase the patch-edge permeability by extending patch habitat (La Polla and Barrett 1993), and allow individuals to move from one patch to another. The geometric and habitat features that constitute a "corridor" must be determined from the perspective of the animal (Forys and Humphrey 1996).

Status of the Species: 31 percent (221 of 711 records and occurrences) of all Central Valley DPS California tiger salamander records and occurrences are located 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. Of these counties, most of the records are from eastern Alameda and Santa Clara counties (Buckingham in litt. 2003; CDFG 2011; Service 2004b). The CDFG (2011) now considers 13 of these records from the Bay Area region as extirpated or likely to be extirpated.

Of the 140 reported California tiger salamander localities where wetland habitat was identified, only 7 percent were located in vernal pools (CDFG 2011). The Bay Area is located 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). 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, 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 identified water bodies are stock, farm, or berm ponds used by cattle grazing and/or as a temporary water source for small farm irrigation (CDFG 2011). This places the California tiger salamander 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 artificial breeding habitats is uncertain relative to naturally occurring vernal pools that are dependent on the continuation of seasonal weather patterns (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 2003). California tiger salamanders are under increasing pressure from habitat conversion and urbanization, development (i.e. Dublin Ranch, Fallon Village, Fallon Sports Park, Staples Ranch, Shea Center Livermore, and Livermore Toyota), and infrastructure, utility and safety improvement projects (i.e. I-580 Eastbound HOV, I-580/Isabel Avenue Interchange, and I-580/Charro Avenue Interchange). The species' low recruitment and high juvenile mortality makes it particularly susceptible to habitat loss, fragmentation,

urbanization, and construction related harm and mortality. 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 (CDFG 2011).

San Joaquin Kit Fox

Listing Status: The San Joaquin kit fox was listed as an endangered species on March 11, 1967 (Service 1967) and it was listed by the State of California as a threatened species on June 27, 1971.

Distribution: 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; Service 1998). Records are currently documented north to the Antioch area of Contra Costa County.

Status and Natural History: Historically, San Joaquin kit fox 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. The species seems to prefer more gentle terrain and decreases in abundance as terrain ruggedness increases (Grinnell *et al.* 1937; Morrell 1972; Warrick and Cypher 1999). San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by man and have been observed in 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 (Service 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 (Egoscue 1962; Morrell 1972; Spiegel and Tom 1996; 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.* 2001). Pups appear above ground when they are approximately 3-4 weeks old, and are weaned at 6-8 weeks. Reproductive rates, the proportion of females bearing young, vary annually with environmental conditions, particularly food availability. Annual rates range from 0 to 100 percent, and reported mean rates include 61 percent at the Naval Petroleum Reserve (Cypher *et al.* 2001), 64 percent in the Lokern area (Spiegel and Tom 1996), and 32 percent at Camp Roberts (Spencer *et al.* 1992). Although some yearling female kit foxes will produce young, most do not reproduce until 2 years of age (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). 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.

Although most young kit foxes disperse less than 5 miles (Scrivner *et al.* 1987), dispersal distances of up to 76.3 miles have been documented for the San Joaquin kit fox (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 percent of the males dispersed from natal home ranges while only 24 percent of the females dispersed (Koopman *et al.* 2000). Among dispersing kit foxes, 87 percent did so during their first year of age. Some kit foxes delay dispersal and may inherit their natal home range.

San Joaquin kit foxes dens are usually located in areas with loose-textured, friable soils (Morrell 1972; O'Farrell 1983). Some studies have suggested that where hardpan layers predominate, kit foxes create their dens by enlarging the burrows of California ground squirrels or badgers (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 with average slope at den sites reported to range from 0 to 22 degrees (CDFG 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.* 1996).

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). Hall (1983) reported individual animals using up to 70 different dens. Kit foxes typically use individual dens for only brief periods, often for only one day before moving to another den (Ralls *et al.* 1990). 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). 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).

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, insects, California ground squirrels, kangaroo rats, San Joaquin antelope squirrels, black-tailed hares, and chukar (Jensen 1972; Archon 1992). Kit foxes also prey on desert cottontails, ground-nesting birds, and pocket mice.

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 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 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. White and Ralls (1993) reported average home ranges of 4.47 square miles, while others have reported home ranges of up to 12 square miles (Service 1998). 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). Individual home ranges can overlap considerably, at least outside core activity areas (Morrell 1972; Spiegel *et al.* 1996). Average distances traveled each night range from 5.8 to 9.1 miles and are greatest during the breeding season (Cypher 2000).

The territorial spacing behavior exhibited by the San Joaquin kit fox 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 kit 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 (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 (Service 1998).

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).

Historically, kit foxes may have existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinctions and recolonization (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).

Preliminary genetic assessments indicate that historic gene flow among populations was quite high, with effective dispersal rates of at least one to four dispersers per generation (M. Schwartz, 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).

Threats: 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 1999). 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 *et al.* 1996).

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.

Several species prey upon San Joaquin kit foxes. Predators such as coyotes, bobcats, non-native red foxes, badgers, and golden eagles will kill kit foxes. Badgers, coyotes, and red foxes also may compete for den sites (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.

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. 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.

Status of the Species: 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.

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 (Service 1983).

This rate of loss accelerated following the completion of the Central Valley Project and the State Water Project, which diverted and imported new water supplies for irrigated agriculture (Service 1995). Approximately 1.97 million acres of habitat were converted in the San Joaquin region between 1950 and 1980 (Service 1998). The counties specifically noted as having the highest wildland conversion rates included Kern, Tulare, Kings, and Fresno, all of which are occupied by kit foxes. From 1959 to 1969 alone, an estimated 34 percent of natural lands were lost within the then-known kit fox range (Laughrin 1970). By 1979, only approximately 370,000 acres out of a total of approximately 8.5 million acres on the San Joaquin Valley floor remained as non-developed land (Williams 1985; Service 1983). Virtually all of the documented loss of essential habitat was the result of conversion to irrigated agriculture.

The small size of the northernmost kit fox population and its isolation from other established populations make it 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. Additional development in these areas will further impede the movement of kit fox and isolate the northern population from more southern populations. The protection of the remaining kit fox 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.

Recovery Plan: The primary goal of the recovery strategy for kit foxes identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Service 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. In the northern range, from the Ciervo Panoche core population in Fresno County northward, kit fox populations are small and isolated, and have exhibited significant decline. Therefore, kit fox movement corridors between these populations must be preserved and maintained.

Vernal Pool Fairy Shrimp

Listing Status: A final rule was published on September 19, 1994, listing the vernal pool fairy shrimp as threatened under the Act (Service 1994). The final rule to designate critical habitat for 15 vernal pool species, including the vernal pool fairy shrimp, was published on August 6, 2003

(Service 2003a). A final rule was published again on August 11, 2005 (Service 2005a). Further information on the life history and ecology of the vernal pool fairy shrimp may be found in the final listing rule, the final rule to designate critical habitat, the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005b), Eng *et al.* (1990), Helm (1998), Simovich *et al.* (1992), and Volmar (2002).

Description: Vernal pool fairy shrimp have delicate elongate bodies; large stalked eyes; no hard shell, and eleven pairs of swimming legs. Typically less than 1 inch long, they swim or glide upside-down by means of complex wavelike beating movements while feeding on algae, bacteria, protozoa, rotifers, and detritus. Female vernal pool fairy shrimp carry eggs in a pear-shaped, ventral brood sac until the eggs are either dropped or sink to the pool bottom with the female when she dies. Eggs which remain at the bottom of the pools after the pools dry are known as cysts. These cysts are protected by a hard outer covering, making them able to withstand heat, cold, and prolonged desiccation. When pools refill in the same or subsequent seasons, some, but not all, of the cysts hatch, resulting in a cyst bank in the soil that may include cysts from several breeding seasons (Donald 1983). Vernal pool fairy shrimp develop rapidly and may become sexually mature within two weeks after hatching under ideal conditions (Gallagher 1996; Helm 1998). Under less than perfect conditions, maturity is reached within an average of 41 days (Helm 1998). Such quick maturation permits fairy shrimp populations to persist in short-lived, shallow bodies of water (Simovich *et al.* 1992).

Distribution: All known occurrences of vernal pool fairy shrimp occur in California and southern Oregon. The geographic range of this species encompasses most of the Central Valley from Shasta County to Tulare County and the central coast range from northern Solano County to Santa Barbara County, California. Additional isolated occurrences have been identified in western Riverside County, California, and in Jackson County, Oregon near the city of Medford (Helm 1998; Eriksen and Belk 1999; Service 1994, 2003a).

Status and Natural History: Vernal pool fairy shrimp inhabit vernal pools with clear to tea-colored water, most commonly in grass or mud-bottomed swales, or basalt flow depression pools in unplowed grasslands. Vernal pool fairy shrimp have been collected from early December to early May. They can mature quickly, allowing populations to persist in short-lived shallow pools (Simovich *et al.* 1992). Fairy shrimps 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;). 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), they are most frequently found in pools measuring fewer than 0.05 acre in area (Helm 1998; Gallagher 1996). Vernal pool fairy shrimp occur at elevations from 33 feet to 4,003 feet (Eng *et al.* 1990), and are typically found in pools with low to moderate amounts of salinity or total dissolved solids (Keeley 1984; Syrdahl 1993).

The primary historic dispersal method for vernal pool fairy shrimp was likely large scale flooding resulting from winter and spring rains which allowed colonization of different individual vernal pools and vernal pool complexes. This dispersal has been adversely affected by 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 the vernal pool fairy shrimp (Simovich *et al.* 1992). The eggs of these crustaceans are either ingested (Krapu 1974; Ahl 1991) and/or adhere to the legs and feathers upon which they are transported to new habitats.

Threats: Vernal pool fairy shrimp are threatened by the same activities as other vernal pool invertebrates. These threats include the conversion of vernal pool habitat to agricultural lands and urban development, and stochastic extinction because of the small and isolated nature of remaining populations (Service 1994). The limited and disjunct distribution of vernal pools, coupled with the even more limited distribution of the vernal pool fairy shrimp, means that any reduction in vernal pool habitat quantity could adversely affect this species.

Recolonization opportunities are diminished when physical barriers, such as development or lack of vernal pool habitat, isolate populations from one another or inhibit transport of cysts. Isolated populations could be more susceptible to inbreeding depression, which can result in local extinction or reduced fitness (Gilpin and Soule 1986, Goodman 1987). However, this has never been demonstrated for branchiopod crustaceans.

Activities that alter the suitability of vernal pool habitat may impact the special status crustaceans dependent on those habitats. These activities include damaging the impermeable clay and /or hardpan layers of the habitat bottom, filling in the habitat, and altering (e.g. through contaminants) or destroying the watershed that conveys overland flow into the habitat. Additionally, introduction of non-native plants, destruction or degradation of the surrounding upland habitat, introduction of fish (such as *Gambusia* spp.) into special-status shrimp habitats, and activities that would discourage or prevent waterfowl and waders from feeding at occupied habitats and thereby restrict gene flow between populations would also significantly affect mid-valley fairy shrimp populations.

Recovery Plan: The *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* presents an ecosystem-level strategy for recovery and conservation focused on habitat protection and management. As a basis, the plan uses the 17 vernal pool regions in the State of California as defined by the California Department of Fish and Game in the California Vernal Pool Assessment Preliminary Report (Keeler-Wolf *et al.* 1998). The Livermore Vernal Pool Region includes the Altamont Hills area. The plan further designates core areas that are distinct areas in each vernal pool region that provide the features, populations, and distinct geographic and/or genetic diversity necessary for recovery of the species. In order to delist the vernal pool fairy shrimp, 80 percent of all occurrences must be protected and 85 percent of suitable species habitat must be protected rangewide and within each vernal pool region.

Longhorn Fairy Shrimp

Listing Status: A final rule was published on September 19, 1994, to list longhorn fairy shrimp as endangered under the Act (Service 1994). The final rule to designate critical habitat for 15 vernal pool species, including the vernal pool tadpole shrimp and the vernal pool fairy shrimp, was published on August 6, 2003 (Service 2003a). A final rule was published again on August 11, 2005 (Service 2005a). Further information on the life history and ecology of the longhorn fairy shrimp may be found in the final listing rule, the final rule to designate critical habitat, the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005b), and Eng *et al.* (1990).

Description: Longhorn fairy shrimp are tiny freshwater crustaceans with delicate elongate bodies, large stalked compound eyes, and 11 pairs of phyllopods (swimming legs that also function as gills). Fairy shrimp do not have a hard shell, a characteristic of the order *Anostraca* to which they belong. This species is easily distinguished from other fairy shrimp by the male's extremely long second antennae.

Distribution: The four known populations of longhorn fairy shrimp include: (1) areas within and adjacent to the Carrizo Plan National Monument; (2) areas within the San Luis National Wildlife Refuge Complex, Merced County; (3) areas within the Brushy Peak Preserve, Alameda County; and (4) areas within the Vasco Caves Preserve near the town of Byron, Contra Costa County (Service 2005b). The Brushy Peak and Vasco Caves Preserves are located within three miles of each other.

Status and Natural History: Longhorn fairy shrimp occurrences are rare and highly disjunct with specific pool characteristics largely unknown (Service 2003a). Typical habitat for listed fairy shrimp in California include vernal pools, seasonally ponded areas within vernal swales, ephemeral freshwater habitats and artificial habitats (railroad toedrains, roadside ditches, abandoned agricultural drains, ruts left by heavy construction vehicles, and depressions in firebreaks) (Eng *et al.* 1990, Service 2003a).

Habitat for longhorn fairy shrimp in the Livermore Vernal Pool Region in Contra Costa and Alameda Counties occurs primarily in small, clear, sandstone outcrop vernal pools. These sandstone pools are sometimes no larger than 3.3 feet in diameter, have a pH near neutral, and very low alkalinity and conductivity. Water temperatures in these vernal pools have been measured between 50 and 64 degrees Fahrenheit (Helm 1988). Vernal pools in other parts of California that support longhorn fairy shrimp are either loam and sandy loam or shallow, alkaline pools (Service 1994). The seasonal pool habitat is subject to seasonal variations, and it is thought that longhorn fairy shrimp are dependent on the ecological characteristics of those variations. These characteristics include duration of inundation and presence or absence of water at specific times of the year (Service 1994). The longhorn fairy shrimp is capable of living in vernal pools of relatively short duration (pond 6 to 7 weeks in winter and 3 weeks in spring) (Eriksen and Belk 1999).

Longhorn fairy shrimp are omnivorous filter-feeders (Eriksen and Belk 1999). They are a component of the planktonic crustacea within seasonal temporary pools and can occur in densities as high as 200 per liter of water (Eng *et al.* 1990). Predator consumption of fairy shrimp cysts (resting eggs) aids in distributing populations. Predators expel viable cysts in their excrement, often at locations other than where they were consumed (Wissinger *et al.* 1999). If conditions are suitable, these transported cysts may hatch at the new location and potentially establish a new population. Cysts can also be transported in mud carried on the feet of animals, including livestock that may wade through their habitat (Eriksen and Belk 1999). Beyond inundation of the habitat, the specific cues for hatching are largely unknown (Eriksen and Belk 1999), although temperature is believed to play a role. Longhorn fairy shrimp have been reported to co-occur with the vernal pool fairy shrimp throughout its range.

Threats: Longhorn fairy shrimp are threatened by the same activities as other vernal pool invertebrates. These threats include the conversion of vernal pool habitat to agricultural lands and urban development, and extinction due to the small and isolated nature of remaining populations (Service 1994).

The limited and disjunct distribution of vernal pools, coupled with the even more limited distribution of the longhorn fairy shrimp, means that any reduction in vernal pool habitat could adversely affect this species. Recolonization opportunities are diminished when physical barriers, such as development or lack of vernal pool habitat, isolate populations from one another or inhibit transport of cysts. Isolated populations could be more susceptible to inbreeding depression, which can result in local extinction or reduced fitness (Gilpin and Soule 1986, Goodman 1987). However, this has never been demonstrated for branchiopod crustaceans.

Activities that alter the suitability of vernal pool habitat could impact the special-status crustaceans that depend on them. These activities include damaging the impermeable clay and /or hardpan layers of the habitat bottom, filling in the habitat, altering (e.g. through contaminants) or destroying the watershed that conveys overland flow into the habitat. Additionally, introduction of non-native plants, destruction or degradation of the surrounding upland habitat, introduction of fish (such as *Gambusia* spp.) into special-status shrimp habitats, and activities that would discourage or prevent waterfowl and waders from feeding at occupied habitats and thereby restrict gene-flow between populations would also significantly affect longhorn fairy shrimp populations.

Recovery Plan: The *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* presents an ecosystem-level strategy for recovery and conservation focused on habitat protection and management. As a basis, the plan uses the 17 vernal pool regions in the State of California as defined by the California Department of Fish and Game in the California Vernal Pool Assessment Preliminary Report (Keeler-Wolf *et al.* 1998). The Livermore Vernal Pool Region includes the Altamont Hills area. The plan further designates core areas that are distinct areas in each vernal pool region that provide the features, populations, and distinct geographic and/or genetic diversity necessary for recovery of the species. In order to downlist the longhorn fairy shrimp, 100 percent of all occurrences must be protected and 95 percent of suitable species habitat must be protected rangewide and within each vernal pool region.

Since the time of listing, surveys for longhorn fairy shrimp throughout its range have not located additional populations of the species, although additional occurrences within the four known populations have been detected. Currently, the CNDDB database reports 11 occurrences of longhorn fairy shrimp (CDFG 2011).

Informal monitoring of known populations of fairy shrimp has occurred within the Brushy Peak Preserve. There are several vernal pools that have longhorn fairy shrimp within the 507-acre Brushy Peak Preserve, which is owned by the Livermore Area Recreation and Park District and managed by the East Bay Regional Park District (EBRPD). These pools are within rock outcrops within multiple indentations that seasonally pool water, but the exact number of vernal pools containing longhorn fairy shrimp has not been quantified.

Environmental Baseline

The MEP site is located just above the Central Valley floor in a region of low-lying foothills to the Altamont Hills. In the vicinity are farmlands of row crops and cattle grazing, interspersed with irrigation aqueducts, canals, and cattle stockponds. The project parcel is managed as a cattle grazing pasture land.

Non-native annual grassland is the predominant habitat type in the action area. The annual grasslands found in the action area support a low diversity of endemic species. The spring 2009 rare plant survey conducted by CH2M HILL biologists identified the following non-native grassland species within the action area: Italian thistle, yellow star-thistle, Great valley gumweed, black mustard, filarees, horehound, soft chess, and foxtail barley. Numerous California ground squirrels burrows were found on the site.

Four drainage features, identified as D-1, D-2, D-3, and D-4 in the 2009 wetland delineation report and shown as blue line drainages on the United States Geological Survey Clifton Court Forebay 7.5-minute quadrangle, area within the project footprint. D-1, D-3, and D-4 have an obvious bed and bank; D-2 is more swale-like. With inundation being less frequent in D-1 and D-2, ephemeral conditions support non-emergent species including saltgrass, rabbitsfoot grass, Italian ryegrass, and brass buttons.

Prolonged saturation or inundation differentiates D-3 and D-4 from the other drainages found along Bruns Road. D-3 is characterized by dense growth of cosmopolitan bulrush with scattered rabbitsfoot grass, curly dock, and cattail. The channel at ordinary high water supports three to six inches of gently flowing water. The vegetated channel flows to the north into a seasonal pond. D-4 is a well-defined channel and characterized by dense cattails growing in the center of the channel with dense saltgrass growing around the outer edges. Mexican rush and curly dock are also present in scattered locations. At ordinary high water, D-4 is relatively shallow at less than one foot, flowing east into a seasonal pond. Numerous western toad tadpoles were observed during the 2009 delineation of D-4.

Seasonal wetlands identified in the action area range from small isolated seasonal features to larger alkali sink wetlands. Alkali sink wetland is immediately north and directly abuts D-4. Within the action area, this feature is characterized by saltgrass and common rusty molly with scattered sand spurry, alkali heath, and common spikeweed. This area is completely vegetated and appears to be subject to at least seasonal inundation and most likely a prolonged seasonally shallow water table. A small shallow seasonal wetland is located along the existing access road to the Byron Power Cogeneration Plant, along the northern edge of the MEP site. A partially collapsed 18-inch-diameter culvert hydrologically connects the two distinct basins found there. Vegetation within the basins is generally sparse and includes species such as popcorn flower, coyote thistle, Italian ryegrass, gumweed, dense-flower willowherb, wooly marbles, brass buttons, and water pygmyweed. The basins were both dry during the April 2009 field delineation, but inundation and aquatic invertebrates (*Branchinecta* sp.) were noted at this site during earlier site visits in 2009. This wetland area is located nearly 500 feet south of D-1 and there is no apparent hydrological connection between this basin and the drainage.

Other aquatic features in the action area include isolated seasonal wetlands including vernal pools, swales, erosional channels, and a small section of BBID's Canal 45. The portion of Canal 45 that runs through the action area is a constructed and routinely maintained earthen channel devoid of vegetation. Cement rip rap is present along the banks of the canal. There are other seasonal wetlands and shallow ephemeral pools but were located outside the wetland delineation survey area.

A large area of alkaline meadow habitat occurs northeast of the intersection of Bruns and Kelso roads, adjacent to the proposed water supply pipeline to the east and just north of the Kelso Substation

Agricultural uses occur near the north end of the water supply pipeline route. BBID owns the agricultural area where the water supply pipeline will be installed. The adjacent field has been in agricultural production for a number of years and was recently irrigated and planted with alfalfa in 2009. BBID also owns and operates a network of irrigation canals and agricultural developments found in the project vicinity. A large-scale agricultural infrastructure associated with the Central Valley Project and State Water Project exists nearby.

Other agricultural uses exist in the project vicinity. On a parcel to the west of the project parcel is a 10-acre cattle ranching development, which includes a ranch house and stock yard. Cattle stock ponds on this property and others support known breeding habitat for California red-legged frog and California tiger salamander. In general, the grasslands occupied by these cattle developments are moderately to heavily grazed, including the project parcel and the northern portion of the proposed transmission line route.

The 6.5-megawatt Byron Power Cogeneration Plant located on the project parcel is immediately next to the MEP site. The cogeneration site is underlain with approximately one acre of asphalt and gravel and served by the existing graveled access road from Bruns Road. No landscaping exists on or next to the property. As previously noted, non-native annual grassland characterizes the surrounding landscape. At the northeast corner of Kelso Road and Bruns Road are PG&E's

Bethany Gas Compressor Station and 230-kilovolt Kelso Substation. Both facilities occupy one site totaling approximately 17 acres of gravel and asphalt.

Landscaping by ornamental Bishop pine and patches of coyote brush border the PG&E property along Kelso Road and Bruns Road. Scattered residential parcels, farm buildings, and industrial areas are also present along the water supply pipeline alignment.

Numerous existing transmission lines transect the landscape in the action area and vicinity. Wood pole lines on the project parcel service the 66.5-megawatt Byron Power Cogeneration Plant. Taller lattice high-tension 230-kilovolt and 500-kilovolt transmission line towers exist on the project parcel and in other areas of the project vicinity.

California Red-legged Frog

Threats to California red-legged frogs in the action area include habitat loss, modification, degradation, and fragmentation from development and competition and predation by introduced species and/or feral animals.

The proposed project and Conservation Area are located within the South/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. 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, California red-legged frogs seem to have been nearly eliminated from the western lowland areas near urbanization. The species still occurs in isolated populations in the East Bay Foothills (between Interstate 580 and Interstate 680) and is abundant in several areas in eastern Alameda and Contra Costa counties. This Recovery Unit is essential to the survival and recovery of California red-legged frog, as it contains the largest number of occupied drainages in the northern portion of its range.

California red-legged frogs have been observed within the MEP property in an unnamed seasonal tributary that connects to other known occurrence locations (CDFG 2011). Seasonal drainages (D-1, D-2, D-3, and D-4) found along the water supply pipeline provide potential refugial and dispersal habitat for California red-legged frog. Stock ponds found less than one mile from the action area, northwest on the Byron Conservation Bank and west on another parcel provide known breeding sites for California red-legged frog. Numerous other observations have been recorded within a five mile radius of the project site including upstream of the site at the proposed Mountain House Conservation Bank, immediately to the west of the site, and at the Byron Conservation Bank, which adjoins the subject property to the northwest. Several seasonal wetland features that may serve as non-breeding aquatic habitat occur within the property as well as numerous small mammal burrows which provide refugial and cover habitat for dispersing California red-legged frogs. Additionally, two stock ponds on the 158-acre project parcel may support breeding for the species in certain wet years. Based on the habitat located within and adjacent to the action area, the biology and ecology of the California red-legged frog, and the records of the listed species on-site and in adjacent areas, the Service has determined this listed

animal utilizes the action area for foraging, resting, dispersal, mating, and other essential behaviors.

California Red-legged Frog Critical Habitat

The project area and Conservation Area are located within the CCS-2, Mt. Diablo, California red-legged frog critical habitat unit. This unit contains the features that are essential for the conservation of the subspecies. This unit also contains aquatic habitat for breeding and non-breeding activities (PCE 1 and PCE 2) and upland habitat for foraging and dispersal activities (PCE 3 and PCE 4). CCS-2 was known to be occupied at time of listing and is currently occupied. This unit is mapped from occurrences recorded at time of listing and subsequent to the time of listing. CCS-2 is located in eastern Contra Costa County and northeastern Alameda County, north of Highway 580 and consists of 9,869 acres of State land, 4,186 acres of local government land, and 124,803 acres of private land. The unit contains permanent and ephemeral aquatic habitats suitable for breeding, upland areas for dispersal, shelter and food, and provides for connectivity between populations farther south in the interior Coast Range. Threats that may require special management in CCS-2 include removal and alteration of habitat due to urbanization, overgrazing of aquatic and riparian habitats, erosion and siltation due to flooding, and predation by non-native species.

Non-breeding aquatic habitat (PCE 2) in conjunction with upland habitat for foraging and dispersal activities (PCE 3 and PCE 4) are present within both the project and conservation areas. These areas contains ponds for breeding, seasonal wetlands and swales, and upland areas for dispersal, shelter, and food. These features of the critical habitat, which are present at the site, are essential to the recovery of the species.

California Tiger Salamander

Threats to California tiger salamanders in the action area include habitat loss, modification, degradation, and fragmentation from development and competition and predation by introduced species and/or feral animals.

There are observations of California tiger salamanders less than one mile from the project area (CDFG 2011). California tiger salamander larvae have been documented in a seasonal stock pond is located less than 100 feet west of the MEP water supply pipeline route along Bruns Road, upgradient and separated by an earthen berm from the water supply pipeline work proposed at D-2. The breeding site is inside CDFG's Byron Conservation Bank property. There are no barriers to California tiger salamander dispersal from this pond to the action area. Numerous larvae observed during multiple site visits in vernal pools, associated with an upstream reach of D-1, surrounded by non-native annual grassland on the Borges Ranch mitigation property less than 600 feet west of the project area. There are no barriers to California tiger salamander dispersal from these vernal pools to the action area.

Upland areas within the proposed project site are comprised of open grasslands with seasonal wetlands interspersed throughout the area. Numerous gopher and ground squirrel burrows are

present throughout the property. While no California tiger salamanders have been found within stock ponds on the 158-acre parcel, these areas may support breeding populations during certain wet years. Protocol level surveys were not conducted. Based on the habitat located within and adjacent to the action area, the biology and ecology of the California tiger salamander, and the records of the listed species on-site and in adjacent areas, the Service has determined this listed animal utilizes the action area for foraging, resting, dispersal, mating, and other essential behaviors.

San Joaquin Kit Fox

Threats to San Joaquin kit foxes within the action area include loss, degradation, and fragmentation of habitat due to suburban and agricultural development, rodenticides, competition, and predation.

The proposed project is within the known range of the San Joaquin kit fox and is within one mile of recorded observations (CDFG 2011). A single adult running west from Bruns Road along Kelso Road was observed in 1992. A 1983 record documents a single San Joaquin kit fox den located just southeast of the Bethany Reservoir. Three individuals of unknown age were observed foraging in grazed non-native grassland on a wind farm in 1998. In addition, from 1972 to 1975, numerous dens and foxes were observed. However, the reservoir and associated California Aqueduct restrict access to the action area through several road overpasses and a 1,000-foot underground section of aqueduct. Additionally, there are several occurrences within two miles of the project site including 40 dens near the Delta Mendota Canal and frequent observations along the Delta Mendota Canal.

Upland areas within the proposed construction site are comprised of open grasslands on gently sloping hillsides. Soft friable soils are present throughout the site as well as a robust burrowing rodent population, which may encourage denning and foraging activities within the area. An unnamed seasonal drainage, which exists adjacent to the site, may provide a movement corridor and fresh water source for the San Joaquin kit fox as individuals move from the surrounding undeveloped foothills to lower elevations. Based on the habitat located within and adjacent to the action area and the biology and ecology of San Joaquin kit foxes, the Service has determined it is likely this listed animal utilizes the action area for foraging, dispersal, mating, and other essential behaviors.

Vernal Pool Fairy Shrimp

Threats to vernal pool fairy shrimp include habitat loss in the form of habitat alteration and degradation as a result of development and changes to natural hydrology, invasive species, incompatible grazing regimes, including insufficient grazing for prolonged periods; recreational activities (e.g., off-highway vehicles and hiking), erosion, and contamination.

The proposed project area is within the known range of the vernal pool fairy shrimp in the Livermore Vernal Pool Region and is approximately 0.5 mile southeast of the Altamont Hills Core Area, (Service 2005b). CH2M HILL provided supplemental information in April 2011

describing a total 31 wetland features on-site. Branchiopods were identified in 23 out of the 31 features which included vernal pools, seasonal wetlands, vegetated and unvegetated depressions, a man-made stormwater ditch partially lined with riprap, and unvegetated roadside despressions. Vernal pool fairy shrimp were positively identified by Westervelt Ecological Services in one unvegetated depression. Therefore, the Service has determined it is reasonable to conclude the vernal pool fairy shrimp inhabits the action area based on the recent observations of this animal the biology and ecology of the species, and the presence of suitable habitat.

Longhorn Fairy Shrimp

Threats to longhorn fairy shrimp include habitat loss the form of habitat alteration and degradation as a result of development and changes to natural hydrology, invasive species, incompatible grazing regimes, including insufficient grazing for prolonged periods; recreational activities (e.g., off-highway vehicles and hiking), erosion, and contamination.

The proposed project area is within the known range of the vernal pool fairy shrimp and the longhorn fairy shrimp in the Livermore Vernal Pool Region (Service 2005b). CH2M HILL provided supplemental information in April 2011 describing a total 31 wetland features on-site. Branchiopods were identified in 23 out of the 31 features which included vernal pools, seasonal wetlands, vegetated and unvegetated depressions, a man-made stormwater ditch partially lined with riprap, and unvegetated roadside despressions. Only one feature was identified to species. The closest known occurrences are approximately 5 miles west of the project in the East Bay Regional Park, Brushy Peak Preserve, and Vasco Caves Nature Preserve near the town of Byron in Contra Costa County. Although longhorn fairy shrimp in the Livermore Vernal Pool Region are known from sandstone outcrop vernal pools, they do occur in different types of vernal pool habitats. Therefore, the Service has determined it is reasonable to conclude the longhorn fairy shrimp inhabits the action area based on the biology and ecology of the species, and the presence of vernal pool habitat.

Effects of the Proposed Action

Individuals and habitat may be affected throughout the MEP. Individual California red-legged frogs, California tiger salamanders, San Joaquin kit foxes, vernal pool fairy shrimp, and longhorn fairy shrimp may be directly and/or indirectly injured or killed by activities that disturb breeding, feeding, sheltering, and dispersal habitat. The proposed project will/may (1) result in the injury and death of an unknown number of these species; (2) result in development-related harm and harassment to the surviving individuals in the area; (3) impede the dispersal of these species through the area; (4) increase the likelihood of predation; and (5) fragment and reduce the amount of habitat.

The development of the MEP will occur within a 35.5-acre work area. Within this work area approximately 22.2 acres of upland habitat for the California red-legged frog, California tiger salamander, and San Joaquin kit fox will be lost permanently or for more than one construction season. Approximately 12.1 acres will be temporarily disturbed and will be restored to grassland within year from start of construction. The time for the temporarily disturbed lands to return to

functional habitat for these species is unknown. An estimated 0.5 acre of vernal pool fairy shrimp and longhorn fairy shrimp habitat will be directly affected and 0.21 acre will be indirectly affected by project construction. The effects of the loss will be minimized by the protection and management of 79.9 acres of upland habitat for the California red-legged frog, California tiger salamander, and San Joaquin kit fox and 0.57 acre of habitat for vernal pool fairy shrimp and longhorn fairy shrimp.

California Red-Legged Frog and California Tiger Salamander

Construction work within the project footprint, access areas, and staging areas can result in direct mortality or injury to individual California red-legged frogs and California tiger salamanders, harassment of the animals, and entrapment. Some workers may pick up or otherwise handle individuals they encounter despite training to the contrary, and this could result in stress and injury. Mortality or injury to adults, sub-adults, and tadpoles can occur from being crushed by earth moving equipment and worker foot traffic. Individuals in burrows may be killed or injured by filling or grading activities. Work activities, including vibration, may cause California red-legged frogs and California tiger salamanders to leave the work site and surrounding areas. This disturbance and displacement may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on roadways. Implementation of the Minimization Measures and performing construction activities during the dry season will minimize effects to California red-legged frogs and California tiger salamanders.

Wildlife exclusion fencing (silt fence) in place for the duration of the construction project will introduce a temporary barrier to dispersing California red-legged frogs and/or California tiger salamanders from refugia to breeding sites or vice versa. Barrier fencing may also divert individuals away from their intended destination into less suitable habitats. California red-legged frogs and California tiger salamanders could congregate at the exclusion fence putting them in closer proximity to construction personnel or making them more susceptible to predation, or they may find holes or breaches in the fence and enter the active work area. However, weekly fence inspections and as-needed repairs will occur to ensure that fence is maintained sufficiently to exclude California red-legged frogs and California tiger salamanders from the work site. A full time biological monitor will be onsite daily during the wet season when these species are generally more active and moving around. The monitor will survey the fence on a daily basis and if in the opinion of the biologist any California red-legged frogs and California tiger salamanders found along the fence are in jeopardy of being killed or injured, the animal with be relocated. All wildlife exclusion fencing will be removed from the site during project completion.

Preconstruction surveys and the relocation of individual California red-legged frogs or California tiger salamanders may reduce injury or mortality. However, the capturing and handling of individuals to remove them from a work area may result in the harassment, mortality or injury of individuals. Stress, injury, and mortality may occur as a result of improper handling, containment, and transport of individuals. Death and injury of individual red-legged frogs or tiger salamanders could occur at the time of relocation or later in time subsequent to their release. Although survivorship for translocated animals has not been estimated, survivorship of

translocated wildlife, in general, is lower because of intraspecific competition, lack of familiarity with the location of potential breeding, feeding, and sheltering habitats, and increased risk of predation. Improper handling, containment, or transport of individuals would be reduced or prevented by use of a Service-approved biologist, by limiting the duration of handling, and requiring the proper transport of these species. However, given the amount of habitat available and the short distance individuals would be relocated, it is expected that this effect will be negligible.

The fragmentation of upland habitat coupled with the additional vehicular traffic and human activity resulting during operations will adversely affect California red legged frogs and California tiger salamanders. Any California red legged frogs and California tiger salamanders crossing roads or incidentally entering the site during overland dispersal could be crushed by vehicles or inadvertently killed or entrapped on the facility site. A six-inch tall concrete curb will be installed along the perimeter of the MEP facility for the operationally life of the project to discourage dispersal into the facility. The combination of curb and perimeter fence may also discourage these species from entering the site. An increase in human activity or operation noise from the power plant could displace the frogs or salamanders into less suitable habitats. The site would add cumulatively to habitat loss and fragmentation experienced in the region. Fewer refugia would be available and the curbed facility would be a barrier to California red legged frog and California tiger salamander dispersal.

As these species is partially nocturnal, outdoor illumination may cause disruption of surface movement and increase rates of predator or vehicle related injury or mortality. Beier (2006), Buchanan (2006), and Wise and Buchanan (2002) reviewed the adverse effects that may result from night time illumination and concluded that artificial lighting is likely to increase predation of the California red legged frogs if it occurs during fall, winter, or spring rains, because the amphibians will lose the cover of darkness for movement. To reduce effects from offsite lighting, lighting at the MEP facility will be restricted to areas required for safety, security, and operation. Exterior lights will be hooded, and lights will be directed onsite so that significant light or glare would be minimized. Low pressure sodium lamps and fixtures of a nonglare type will be specified. For areas where lighting is not required for normal operation, safety, or security, switched lighting circuits will be provided, allowing these areas to remain dark at most times, minimizing the amount of lighting visible offsite. For these reasons, nighttime lighting effects on California red legged frogs and California tiger salamander will be minimal.

Critical Habitat for the California Red-Legged Frog

The project is within proposed Unit CCS-2. The proposed action is not expected to appreciably diminish the value of the proposed critical habitat for the red-legged frog, or prevent the proposed critical habitat from sustaining its role in the conservation and recovery of this species. PCE 2 will be directly and indirectly affected by construction and restoration. PCE 3 and 4 will be fragmented but will be offset by the preservation habitat in perpetuity within Unit CCS-2. Provided the proposed actions described in the Minimization Measures are implemented, the project will not significantly interfere with the current capability of the proposed critical habitat to satisfy essential requirements of the species. Either purchase of credits at a Service-approved

conservation bank or the recordation of a Service-approved conservation easement with a fully funded endowment to implement a Service-approved management plan will provide preservation of the PCEs in perpetuity.

San Joaquin Kit Fox

The project will affect suitable foraging, dispersal, and denning habitat. San Joaquin kit foxes may enter the construction site in search of food and cover and as a result may be injured or killed by heavy equipment, or entrapped. There is also some potential for San Joaquin kit fox to be harmed during exploratory excavation of potential dens. However, implementation of the conservation measures, including preconstruction surveys and monitoring, observance of no work buffers from dens, construction monitoring, construction personnel training, and use of Service and CDFG-approved biologists during surveys and monitoring, will minimize the potential for take of San Joaquin kit fox.

The proposed project will result in both permanent and temporary effects to San Joaquin kit fox habitat. Also, project construction will destroy small mammal burrows that provide denning opportunities for the species. The temporary disturbance areas will be decompacted as needed, recontoured to match pre-existing grades, applied with salvaged top soil and/or reseeded. Fossorial mammals, including California ground squirrel, are expected to recolonize these areas, thereby providing a prey base and burrows for potential denning. Short-term temporary effects will also occur to terrestrial habitats, including non-native annual grassland, gravel surfacing including roads and road shoulders, seasonal drainages, and an agricultural road during construction of the offsite facilities. These offsite facility work corridors will be restored to pre-project conditions within one construction season and are expected to regain habitat value for San Joaquin kit fox less than one year following disturbance.

Operational activities may result in adverse effects on the San Joaquin kit fox. In addition to habitat loss, disturbance could result from noise, vibration, odors, or increased human activity. Attractants such as trash and food related debris could cause San Joaquin kit foxes to enter the fenced plant site in search of food. Operational activities may interfere with their sensory perception, which could inhibit their ability to locate prey, pups, or mates, or detect approaching predators or vehicles. Disturbance could induce stress, which may affect physiological parameters or behavior. Cumulative habitat fragmentation as a result of the facility will interfere with movement corridors potentially existing in the area.

The new facility is expected to be operated during high demand times, typically afternoon hours, to supplement base load and renewable generation capacity. However, the exact operation profile cannot be defined in detail since operation of the facility depends on the variable demand in the MEP service area. Therefore, the facility could operate at all times of the day depending on the demand for output. A security perimeter fence will keep cattle out of the property and may preclude San Joaquin kit fox access.

Vernal Pool Fairy Shrimp and Longhorn Fairy Shrimp

Direct effects to vernal pool fairy shrimp and longhorn fairy shrimp will occur from construction activities altering and/or removing habitat and individuals. Additionally, grading activities associated with the project could create short-term increases in erosion and sedimentation causing non-point source pollution within the existing wetlands. Movement of grading and excavation vehicles associated with the construction of the wetlands associated with the project could permanently or temporarily affect these crustaceans on the site and on adjacent wetlands areas. Work activities, including vibration, noise, erosion, sedimentation, or simply driving through an existing wetland, may result in harm, harassment, and/or mortality. Cysts may be crushed or transported by vehicles, construction equipment, or human foot traffic. Adverse effects may occur if stormwater laden with sediment or other deleterious material (for example, fuels or lubricants) were allowed to discharge from the action area into nearby vernal pools. However, implementation of the Minimization Measures, including construction monitoring, construction personnel training, avoidance of some habitat features, and use of qualified biologists during surveys and monitoring, should minimize these effects. Potential water quality issues related to sedimentation, erosion, or contaminants from construction materials or equipment will be minimized with the use of BMPs.

The MEP operation is not expected to result in adverse effects on listed branchiopods. Site operations personnel will stay within the established facility footprint and use the paved main access road to access the site from Bruns Road. The MEP has been designed to be a zero liquid discharge facility for wastewater and stormwater runoff that is outside of the process areas will be captured in the site stormwater drainage system and conveyed to the onsite extended detention basin located at the north end of the site.

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. The Service does not anticipate any future non-Federal actions to occur in the action area.

The global average temperature has risen by approximately 0.6 degrees Celsius during the 20th Century (Intergovernmental Panel on Climate Change 2001, 2007; Adger *et al* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (Intergovernmental Panel on Climate Change 2001, 2007; Adger *et al.* 2007), and that it is "very likely" that it is largely due to manmade emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Inkley *et al.* 2004; Kerr 2007; Adger *et al.* 2007; Kanter 2007) likely imperils these listed species and the resources necessary for their survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitat and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the California red-legged frog, California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and longhorn fairy shrimp, environmental baseline for the action area, the effects of the proposed action, and the cumulative effects on these species, it is the Service's biological opinion that the proposed MEP, as described herein, is not likely to jeopardize the continued existence of these species. The development project will reduce and fragment habitat for these species but will preserve habitat in perpetuity. Although designated critical habitat for the California red-legged frog will be affected, none will be destroyed or adversely modified by the project.

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

Amount or Extent of Take

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because of their life history. Specifically, when California red-legged frogs are not in their breeding ponds, they may be difficult to locate due to their cryptic appearance and behavior; they may be located a distance from the breeding ponds; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of these 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 the 35.5-acre work area will be subject to incidental take in the form of harm, harassment, capture, injury, and death. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed MEP in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by the project 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 the 35.5-acre work area will be subject to incidental take in the form of harm, harassment, capture, injury, and death. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed MEP in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by the project will become exempt from the prohibitions described under section 9 of the Act.

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because this mammal inhabits dens or burrows when it is not foraging, mating, or conducting other surface activity; the animal may range over a large territory; it is primarily active at night, it is a highly intelligent animal that 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 or utilizing areas 35.5-acre work area will be subject to incidental take in the form of harm and harassment. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with MEP in the form of harm and harassment of the San Joaquin kit fox caused by the project 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 and longhorn fairy shrimp will be difficult to detect because when these crustaceans are not in their active adult stage, the cysts or naupuli 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 these 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 and longhorn fairy shrimp inhabiting 0.71 acre of seasonal wetlands will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental

take associated with MEP in the form of harm, harassment, injury, and death of the listed vernal pool crustaceans caused by indirect effects associated with the proposed project 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 the level of anticipated take is not likely to result in jeopardy to the California red-legged frog, California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and longhorn fairy shrimp.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize the effects of the MEP on the California red-legged frog, California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and longhorn fairy shrimp:

1. All the conservation measures as described in this biological opinion shall be fully implemented and adhered to. Further, these conservation measures shall be supplemented by terms and conditions (a) through (c).

Terms and Conditions

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

The following Terms and Conditions implement the Reasonable and Prudent Measure:

a. The applicant shall make the terms and conditions in this biological opinion a required term in all contracts for the project that are issued by them to all contractors.

b. The applicant shall provide the Resident Engineer or their designee with a copy of this biological opinion, and the Resident Engineer or their designee shall be responsible for implementing the conservation measures and Terms and Conditions of this biological opinion and shall be the point of contact for the project. The Resident Engineer or their designee shall maintain a copy of this biological opinion onsite whenever construction is taking place. Their name and telephone number shall be provided to the Service at least thirty (30) calendar days prior to groundbreaking at the project. Prior to ground breaking, the Resident Engineer must submit a letter to the Service verifying that they posses a copy of this biological opinion and have read the Terms and Conditions.

c. If requested, during or upon completion of construction activities, the on-site biologist, and/or an applicant representative shall accompany the Service and CDFG, on an onsite inspection of the site to review project effects to the listed species and

their habitats.

Reporting Requirements

The Service must be notified within one (1) working day of the finding of any injured California red-legged frog, California tiger salamander, and/or San Joaquin kit fox, or any unanticipated damage to its habitat associated with the proposed project. Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Notification must include the date, time, and precise location of the individual/incident 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. Dead individuals must be sealed in a Zip-lock® plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site. The Service contact persons are the Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at (916) 414-6600; and the Resident Agent-in-Charge of the Service's Division of Law Enforcement, 2800 Cottage Way, Room W-2928, Sacramento, California 95825, at (916) 414-6660. The CDFG contact is Liam Davis at (707) 944-5529.

The applicant shall submit a post-construction compliance report prepared by the Service-approved biologist to the Sacramento Fish and Wildlife Office within thirty (30) 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 conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on listed species, if any; (v) occurrences of incidental take of listed species, if any; (vi) documentation of employee environmental education; and (vii) other pertinent information.

CONSERVATION RECOMMENDATIONS

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

1. The Corps through the applicant should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California Red-Legged Frog* (Service 2002).

2. The Corps through the applicant should assist the Service in developing and implementing recovery actions for the San Joaquin kit fox identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Service 1998).

3. The Corps through the applicant should assist the Service in developing and implementing recovery actions identified in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005b).

4. Sightings of any listed or sensitive animal species should be reported to the CNDDB of the CDFG. 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.

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

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed MEP. As provided in 50 CFR 402.16, reinitiating of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (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 biological 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 immediately cease, pending reinitiating.

If you have any questions regarding this biological opinion on the proposed MEP, please contact Kim Squires, Senior Endangered Species Biologist, or Ryan Olah, Coast Bay Branch Chief, at the letterhead address, telephone (916) 414-6600, or electronic mail at Kim_Squires@fws.gov or Ryan_Olah@fws.gov.

Sincerely,

for Susan K. Moore
Field Supervisor

cc:
Marcia Gresfrud, California Department of Fish and Game, Yountville, California
Sara Keeler, California Energy Commission, Sacramento, California
Chris Curry, Mariposa Energy, LLC, Los Angeles, California
Doug Urry, CH2M HILL, Sacramento, California

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Appendix B
Sensitive Biological Resource Maps

LEGEND

- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- Disturbance Area
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE

SPECIAL STATUS PLANT LOCATIONS

- ATRIPLEX CORDULATA

SWAINSON'S HAWK

- CONFIRMED SWAINSON'S HAWK NEST
- 1/4-MILE BUFFER OF KNOWN NEST
- 1/2-MILE BUFFER OF KNOWN NEST
- Burrowing Owl
- Nesting Birds
- RTHA Nest Site
- 160FT BUFFER OCCUPIED BURROW
- 250FT BUFFER OCCUPIED BURROW
- 250FT RTHA Nest Avoidance Buffer

FROG AND SALAMANDER KNOWN & POTENTIALLY SUITABLE BREEDING HABITAT

- EPHEMERAL POND
- PERENNIAL POND
- CALIFORNIA RED-LEGGED FROG BREEDING AND AQUATIC NON-BREEDING HABITAT
- CALIFORNIA TIGER SALAMANDER BREEDING HABITAT
- CALIFORNIA DEPARTMENT OF FISH AND GAME BYRON MITIGATION BANK
- PROPOSED MOUNTAIN HOUSE MITIGATION BANK
- BRANCHIOPOD HABITAT WITHIN 250 FT OF PROJECT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- FLOW DIRECTION
- BOX CULVERT
- CULVERT
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS

- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE
- WETLAND STUDY AREA

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Feet

FIGURE 1 OF 6
BIOLOGICAL RESOURCES

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

LEGEND

- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
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0 100 200
Feet

FIGURE 2 OF 6
BIOLOGICAL RESOURCES

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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FIGURE 3 OF 6
BIOLOGICAL RESOURCES

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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FIGURE 4 OF 6
BIOLOGICAL RESOURCES

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

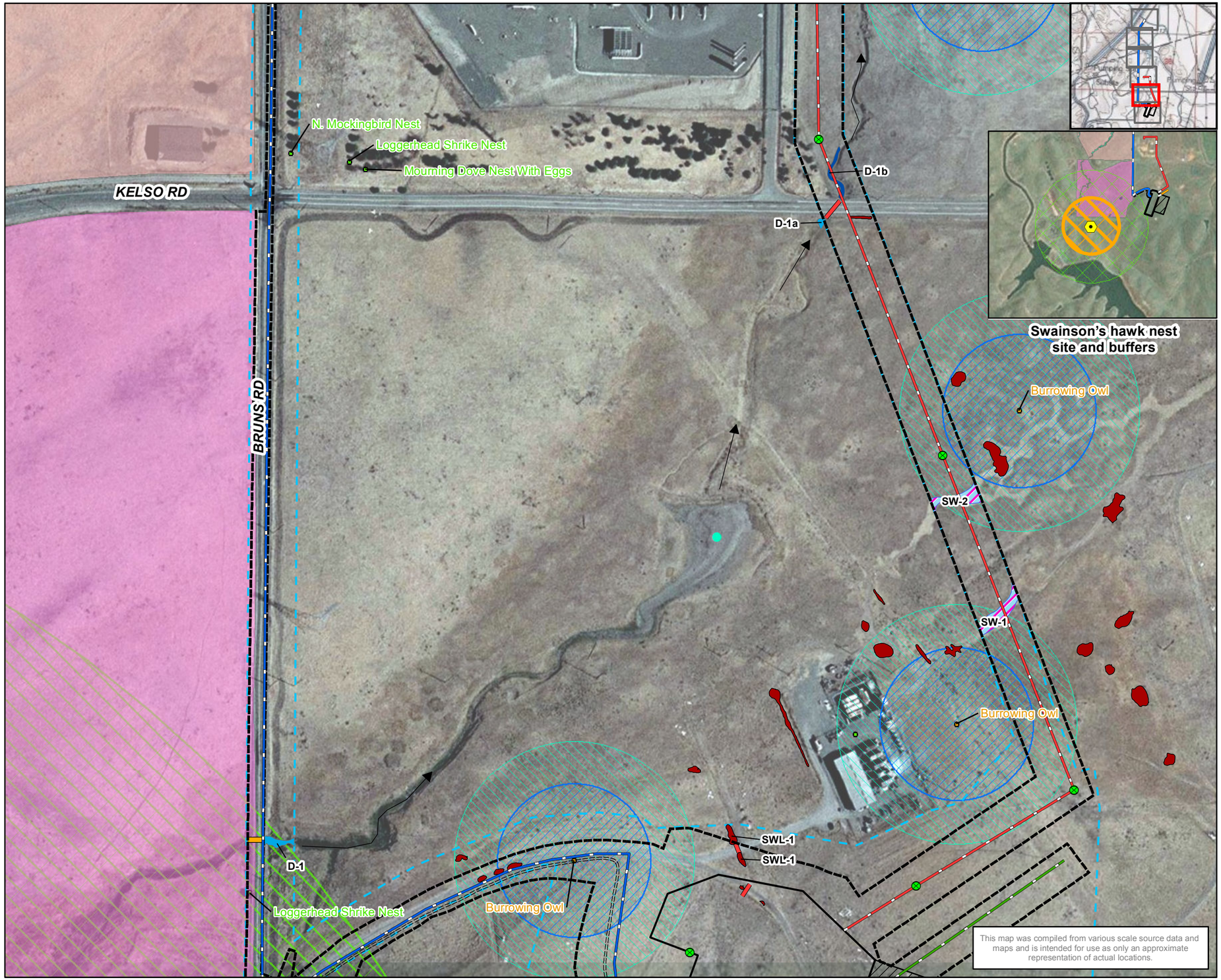

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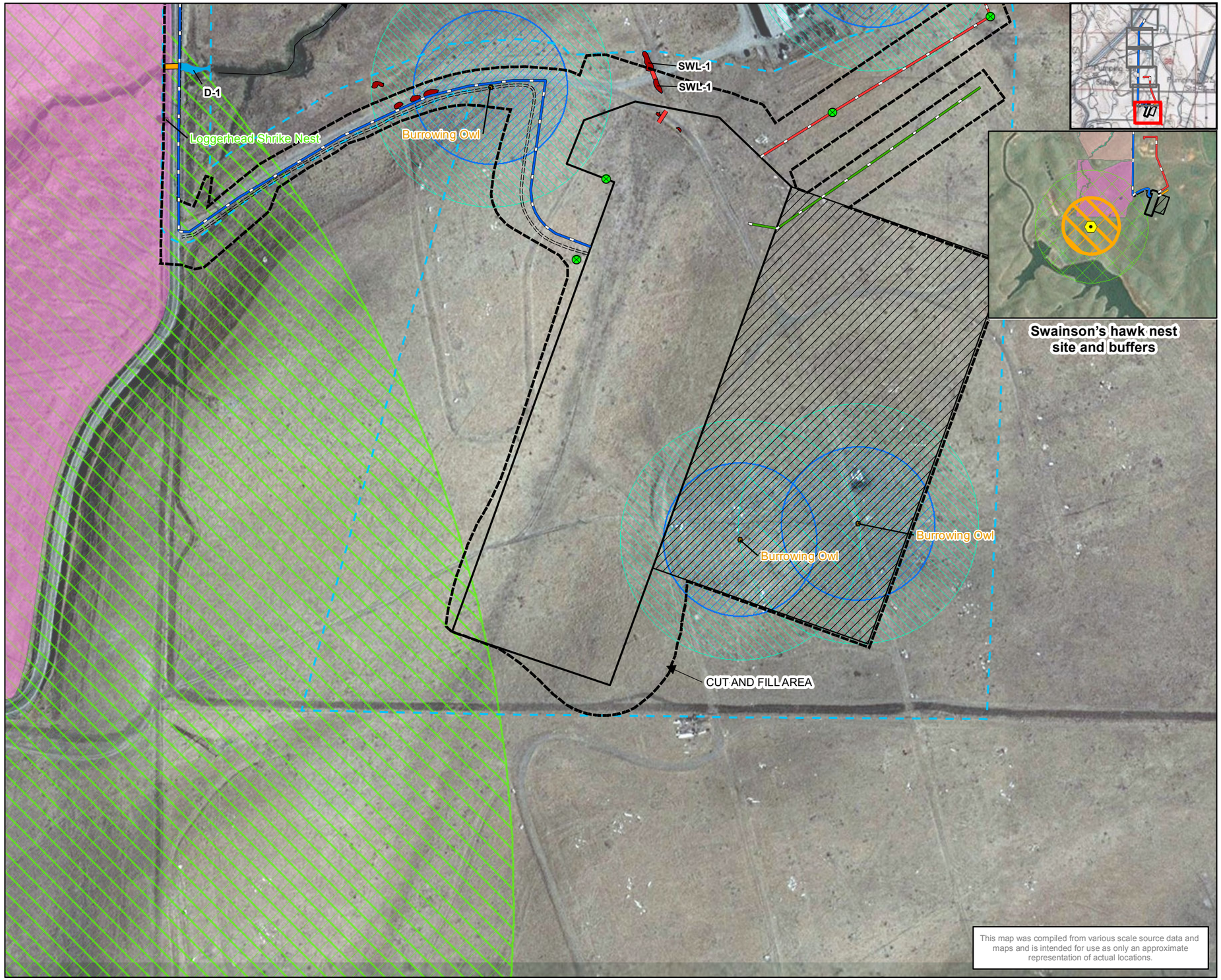
FIGURE 5 OF 6
BIOLOGICAL RESOURCES

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA



VICINITY MAP

LEGEND

- ACCESS ROAD
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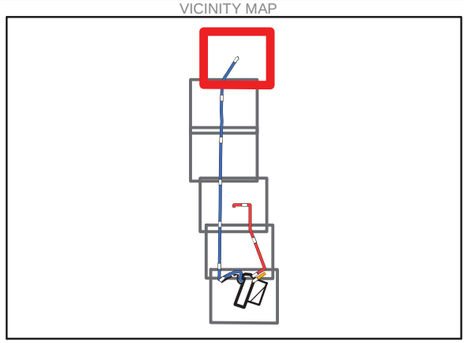
FIGURE 6 OF 6
BIOLOGICAL RESOURCES

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

Appendix C
Satellite Imagery Showing Preconstruction Conditions

VICINITY MAP



This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

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FIGURE 1 OF 6
SITE LOCATION PRECONSTRUCTION PHOTO MARIPOSA ENERGY PROJECT
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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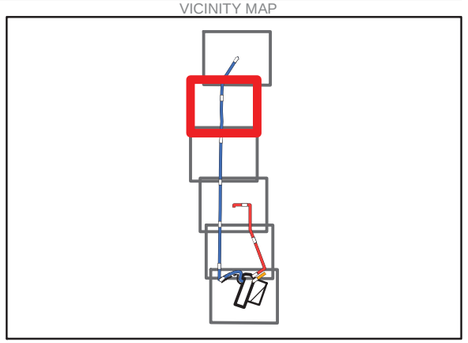

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FIGURE 2 OF 6
SITE LOCATION PRECONSTRUCTION PHOTO MARIPOSA ENERGY PROJECT
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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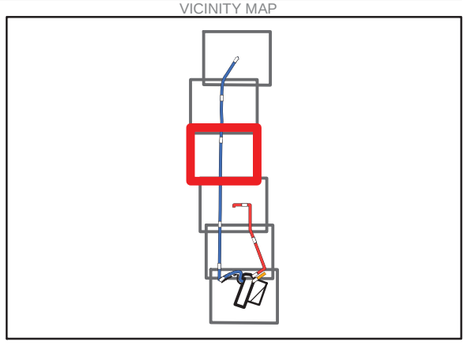

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FIGURE 3 OF 6
SITE LOCATION PRECONSTRUCTION PHOTO MARIPOSA ENERGY PROJECT
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

VICINITY MAP

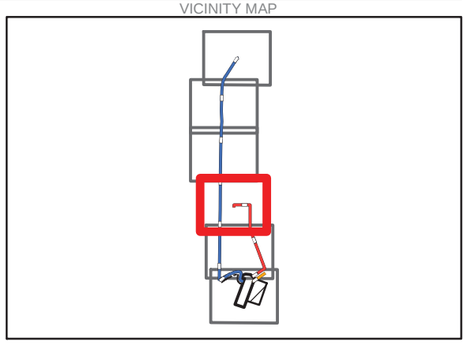

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FIGURE 4 OF 6
SITE LOCATION PRECONSTRUCTION PHOTO MARIPOSA ENERGY PROJECT
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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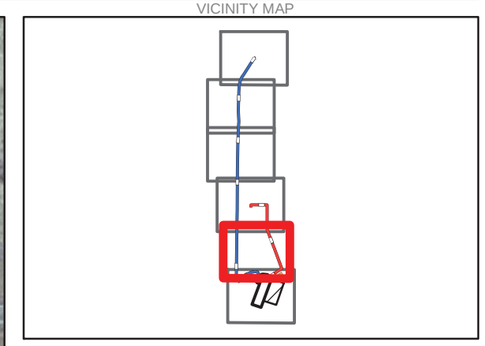

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FIGURE 5 OF 6
SITE LOCATION PRECONSTRUCTION PHOTO MARIPOSA ENERGY PROJECT
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

VICINITY MAP

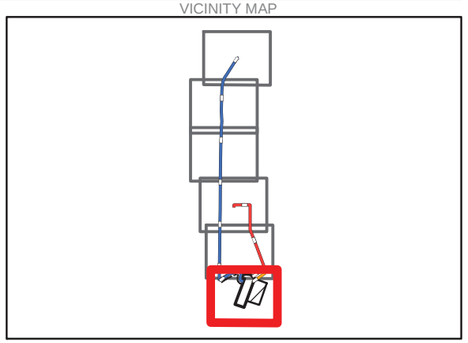

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FIGURE 6 OF 6
SITE LOCATION PRECONSTRUCTION PHOTO MARIPOSA ENERGY PROJECT
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

Appendix D
Resumes of Designated Biologist and Biological Monitors

Mariposa Energy, LLC
333 S. Grand Ave., Suite 1570, Los Angeles, CA 90071
Tel: (213) 473-0080 Fax: (213) 620-1170

February 28, 2011

Mr. Craig Hoffman, CPM
(09-AFC-3C)
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

SUBJECT: Mariposa Energy Project (09-AFC-3C)
BIO-1 Proposed Designated Biologist and Resume

Dear Mr. Hoffman:

Please find attached the resume for Todd Ellwood, who is our proposed Designated Biologist for the Mariposa Energy Project (MEP). Mr. Ellwood is a Project Biologist with CH2M HILL. The attached resume has been submitted for Staff review, in accordance with Condition of Certification BIO-1.

Mariposa Energy, LLC (Mariposa Energy) acknowledges that MEP has not yet been certified by the California Energy Commission (CEC). Submittal of this compliance information is at Mariposa Energy's risk and in no way implies or predisposes project certification by the CEC.

If you have any questions regarding this submittal, please do not hesitate to contact me at (213) 346-2134 or Keith McGregor at (916) 286-0221.

Sincerely,

Chris Curry
Mariposa Energy, LLC
Senior Manager - Development

Attachment: Resume for the Proposed Designated Biologist

cc: Bo Buchynsky, Mariposa Energy, LLC
Keith McGregor, CH2M HILL

Todd Ellwood
Project Biologist
CH2M HILL
8 Charles Hill Circle
Orinda, CA 94563
(408) 839-2402

Education

B.S., Renewable Natural Resources (Emphasis in Wildlife and Fisheries Science), University of Arizona, 1997

Professional Registrations

Department of Fish and Game Scientific Collecting Permit, #SC-006065, 2011

Distinguishing Qualifications

- Expertise in biological resource construction mitigation monitoring
- Knowledgeable with California wildlife natural history including identifying herpetile, mammalian, and bird species

Relevant Experience

As a biologist his experience includes performing general and special-status wildlife surveys. His has a knowledge of invertebrate and vertebrate natural history and identification of herpetile, mammalian and bird species. He is familiar with state (California) and federal regulations pertaining to both wetland and wildlife issues. He prepares biological assessments for special-status species and conducts site assessment surveys. Mr. Ellwood has extensive experience as an environmental inspector and biological monitor for construction projects in California. He has over 10 years experience working on applied environmental problems in terrestrial and aquatic habitats in the greater San Francisco Bay Area.

Project Experience with Special-Status Species

California red-legged frog (*Rana draytonni*)
California tiger salamander (*Ambystoma californiense*)
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)
Giant garter snake (*Thamnophis gigas*)
Alameda whipsnake (Masticophis lateralis)
California horned lizard (*Phrynosoma coronatum frontale*)
California legless lizard (*Anniella pulchra*)
Western pond turtle (*Clemmys marmorata*)
Steelhead (*Oncorhynchus mykiss*)
Vernal pool branchiopods
Bay checkerspot butterfly (*Euphydryas editha bayensis*)
San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)
San Joaquin kit fox (*Vulpes macrotis mutica*)
Western burrowing owl (*Athene cunicularia hypugea*)

Representative Projects

Biological Monitor, Electrical Power Plants. 2001 to 2005 (Metcalf Energy Center, Los Esteros Critical Energy Facility, Gilroy Energy Center, Walnut Energy Center, Sutter Energy Center), Northern California. Coordinated daily biological monitoring of project construction activities and administered WEAT as the CEC-approved biologist. Performed biological surveys to determine suitable habitat for sensitive plant and wildlife species. Performed breeding bird surveys during construction. Post-construction conducted avian collision survey along the new electrical transmission lines. Performed protocol-level surveys for Western burrowing owl. Performed focused surveys (non-protocol) for California red-legged frog, American bullfrog, California tiger salamander, Western pond turtle, and the Bay Checkerspot butterfly. Verified compliance with the project's SWPPP. Submitted a monthly Environmental Compliance Report to the CEC.

Project Biologist, PG&E Maxwell 1101 Reconductoring Project, Colusa County, CA. June 2008 to December 2008 Prepared a Biological Assessment for giant garter snake. Supervised a team of biological monitors during project construction and ensured no take of giant garter snake.

Environmental Inspector/Specialty Monitor, Hetch Hetchy Water System Improvement Program – Sunol Valley Region, San Francisco Public Utilities Commission, Alameda County, California. July 2009 to Current. Conducts daily inspections for compliance with Project's permits issued by USFWS, USACE, CDFG, and RWQCB. Also as the specialty monitor, serves as a USFWS-approved biologist during site surveys for San Joaquin kit fox, California red-legged frog, California tiger salamander and Alameda whipsnake. Approved by the USFWS to capture and relocate CRLF, CTS, and AWS and administer the WEAT.

Project Biologist, Mariposa Energy Project, Alameda County, California. December 2009 to Current. Task managed and/or self-performed all biological resources surveys in support of the project's CEQA-equivalent CEC Application for Certification and USFWS Biological Assessment addressing project effects on San Joaquin kit fox, California red-legged frog, California tiger salamander, vernal pool fairy shrimp, and longhorn fairy shrimp. Field surveys completed include general site assessments for listed species, wetland delineation, protocol-level botanical surveys, and protocol-level burrowing owl surveys. Coordinates regularly with resource agencies including USFWS, USACE, CDFG, and RWQCB.

Project Biologist, Confidential Wind Farm Client, California. February 2010 to Current. Task managed and/or self-performed all biological resources surveys including habitat characterization, wetland delineation, site assessments for San Joaquin kit fox, California red-legged frog, and California tiger salamander. Also prepared the project's Biological Assessment and is overseeing other permitting aspects including CWA 404/401 and CDFG 1602. Coordinates regularly with resource agencies including USFWS, USACE, CDFG, and RWQCB.

Biologist, East Altamont Energy Center, Alameda County, California. **October 2001.** Assisted with preparation of the Biological Resource Mitigation Implementation and Monitoring Plan, Erosion Control and Revegetation Plan, Avian Collision Monitoring Plan and Horizontal Directional Drilling Inadvertent Returns Contingency Plan.

Task Leader/Biologist, Caltrans District 4 Pigeon Pass Roadway Realignment Project, Alameda County, California. March 2007 to October 2007 Managed team of field biologists during the construction phase of the project. Field tasks included

preconstruction surveys for California tiger salamander, California red-legged frog, and San Joaquin kit fox. Under conditional approval by USFWS, conducted burrow surveys for aestivating California red-legged frog and California tiger salamander using a peeper scope and hand excavation. Also captured and relocated San Francisco dusky-footed woodrat under authorization by CDFG. Field duties also included surveys for active bird nests and biological construction monitoring.

Associate Scientist, Caltrans District 4 Red Top Road Truck Climbing Lane Project, Solano County, California. 2007. Prepared and submitted applications for state and federal permits under Section 7 of the Federal Endangered Species Act; CDFG Lake and Streambed Alteration; and Clean Water Act, Sections 401 and 404. Mapped locations of sensitive habitats, which included Waters of the U.S. and habitat for California red-legged frog.

Biologist, Pacific Gas and Electric's Vaca-Dixon Transmission Line Project, Solano County, California. January 2008 to April 2008. Under direction of a permitted biologist, performed weekly wet season sampling for state and federally listed Branchiopods including vernal pool fairy shrimp (*Branchinecta lynchi*) and tadpole shrimp (*Lepidurus packardi*).

Biologist, California Water Company Bear Gulch Creek Upper Diversion and Lower Reach Fish Screen Project, San Mateo County, California. October 2007 and October 2009 Conducted preconstruction surveys for California red-legged frog, San Francisco garter snake, and steelhead. Captured and relocated steelhead from within project site using seines and dip nets as authorized by National Marine Fisheries Service biological opinion. Monitored construction activities for compliance with state and federal permits.

Biologist, Army Corps of Engineers, Fort Ord Natural Reserve, Groundwater Extraction Treatment System Expansion Project, Former Fort Ord, Monterey County, CA. October 2004 to November 2004; March 2005, September 2005; February 2006 to May 2006 Ensured protection of the Reserve's special-status plants and wildlife through implementation of applicable environmental mitigation guidelines. Assisted in identifying and clearly delineating the least damaging access routes and staging areas through the local chaparral habitat. Advised project personnel on how to protect special-status wildlife including California black legless lizard, Monterey ornate shrew (*Sorex ornatus salarius*), and coast horned lizard and special-status plants including sand gilia (*Gilia tenuiflora arenaria*), Monterey spineflower (*Chorizanthe pungens pungens*), and sandmat manzanita (*Arctostaphylos pumila*).

Biologist, Caltrans District 4 Devil's Slide Project, San Mateo County, California. November 2004; October 2005 to February 2006 Member of field team that conducted bird nest and San Francisco dusky-footed woodrat surveys for the Devil's Slide Tunnel Project; and biological monitoring for California red-legged frog during construction of the project's Charthouse Mitigation Site.

Biologist, Santa Clara Valley Water District's Lower Silver Creek Flood Protection Construction Project, Santa Clara County, California. March 2003 to to April 2005 Performed capture/relocation of native vertebrates, reaches 1, 2 and 3 of Lower Silver Creek. Capture techniques included use of seines, dip nets, and electroshock.

Biologist, Olivehurst Wastewater Treatment Plant, Yuba County, California. Dates unknown. Conducted aquatic vertebrate salvaging using seines and giant garter

snake preconstruction surveys prior to installation of the Project's stormwater outfall into a nearby canal.

Field Team Member, Western Area Power Authority, Northern California. **Dates unknown** Conducted surveys for threatened and endangered wildlife along an electrical transmission line. Also used a habitat classification system to map (using Trimble GPS) sensitive areas including seasonal wetlands and vernal pools.

Biologist, Santa Clara Valley Water District's Lower Silver Creek Flood Protection Project, Santa Clara County, California. April 2005 Implemented a Mitigation Monitoring Plan annually for created wetlands, riparian/stream-riverine, and upland habitats. Also coordinated periodic environmental compliance monitoring of project's construction activities. Verified compliance with the project's SWPPP. Administered the project's environmental awareness training.

Biologist, Pacific Gas and Electric, Jefferson Martin 230kV Project-San Mateo County; TriValley Project, Contra Costa County, California. December 2004 to December 2005. Coordinated and conducted field assignments related to the San Francisco dusky-footed woodrat, a California species of special concern. Also conducted SWPPP performance verification inspections.

Team Member, United States Fish and Wildlife Service, Upper Penitencia Creek Habitat Evaluation Procedures, Santa Clara County, California. Dates unknown. Conducted a habitat evaluation of the Penitencia Creek Riparian Corridor. Collected data using a hypsometer, spherical densiometer and other data collection tools. Assessed general habitat suitability for fish and wildlife species against community-based models.

Biologist, City of San Jose Water Company, Lexington Reservoir Main Feed Reconstruction Project, Santa Clara County, California. January 2004 to February 2004. Performed reconnaissance-level survey to assess general habitat value for sensitive wildlife species along the proposed pipeline alignment. Assisted with project's application for a California Department of Fish and Game Streambed Alteration Agreement under a Categorical Exemption.

Biologist, Geothermal Inc. Landfill Closure, Lake County, California. September 2003 to September 2004 Performed an emergence count of Yuma myotis (*Myotis yumanensis*) and Mexican free-tailed bat (*Tadarida brasiliensis)* using ambient light. Observed acoustic monitoring using an ultrasonic detection system (e.g., Anabat). Performed species identification using a suite of morphological and physiological characteristics. Also conducted biological monitoring during landfill closure activities and creation of onsite vernal pool habitats.

Associate Scientist, Town of Windsor Eastside Road Storage Project, Sonoma County, California. September 2007 to December 2007. Performed periodic Stormwater Pollution Prevention Plan (SWPPP) site inspections. Also prepared an application for Lake or Streambed Alteration with the California Department of Fish and Game.

Professional Development

- Surveying and Identification Techniques Workshop-Amphibians of the San Francisco Bay Area, The Wildlife Society, 2002.
- Environmental Avoidance and Mitigation training related to Telecommunications projects, Jones and Stokes Associates, March 2000.
- 40-hour Hazardous Waste Operations and Emergency Response Training, 8-hour Refresher Course, 2004.

References

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April 8, 2011

Mr. Craig Hoffman, CPM
(09-AFC-3C)
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

SUBJECT: Mariposa Energy Project (09-AFC-3C)
BIO-3, BIO-14, BIO-15 Resumes for the Proposed Biological Monitors

Dear Mr. Hoffman:

As the proposed Designated Biologist for the Mariposa Energy Project (MEP), I am transmitting this letter to propose the team of biological monitors for MEP. The following biologists have been proposed for CPM approval, in consultation with the California Department of Fish and Game and the U.S. Fish and Wildlife Service, as outlined in Condition of Certifications BIO-3.

John Hale is proposed as the lead Biological Monitor for MEP, in accordance with COC BIO-3, BIO-14, and BIO-15. Mr. Hale is a Senior Biologist who will subcontract to CH2M HILL as an independent subconsultant. Mr. Hale has surveyed and assisted on surveys in the field and is familiar with the following species of concern including California red-legged frog, California tiger salamander, San Joaquin kit fox, western pond turtle, burrowing owl, Swainson's hawk and other nesting birds, vernal pool fairy shrimp, and American badger. Specifically, as the lead biologist for the Cosumnes Power Plant and Pipeline Project, he conducted pre-construction surveys for nesting birds including Swainson's hawk and burrowing owl. He was responsible for monitoring construction activities around nesting Swainson's hawks and vernal pool fairy shrimp habitat. He also successfully re-located California tiger salamanders from the construction site to offsite ground squirrel burrows. I have reviewed Mr. Hale's qualifications and they meet the minimum qualifications for biological monitoring required by Condition of Certification BIO-3, BIO-14, and BIO-15. Mr. Hale is available for work from the inception to conclusion of MEP. A copy of Mr. Hale's resume and three references are attached.

The following individuals are proposed to provide additional Biological Monitor support for MEP, in accordance with BIO-3, BIO-14, and BIO-15: Dan Williams, Thomas Davis, Daniel Weinberg, Rick Crowe, and Victor Leighton. All five additional biological monitors are biologists employed at CH2M HILL. I have reviewed their qualifications and they meet the minimum qualifications for biological monitoring required by Condition of Certification BIO-3, BIO-14, and BIO-15 and are available for work on MEP. Individual resumes and three references for each monitor are attached.

I will submit a written statement confirming that the individual biological monitors have been trained when the WEAP training materials have been finalized and the training has been completed.

If you have any questions regarding this submittal, please do not hesitate to contact me at (408) 839-2402, Chris Curry at (213) 346-2134, or Keith McGregor at (916) 286-0221.

Sincerely,

Todd Ellwood

Todd Ellwood
CH2M HILL
Proposed Designated Biologist for MEP

Attachment: Biological Monitor Resumes for MEP (09-AFC-3C)

cc: Marcia Grefsrud, California Department of Fish and Game
Kim Squires, U.S. Fish and Wildlife Service
Chris Curry, Mariposa Energy, LLC
Bo Buchynsky, Mariposa Energy, LLC
Keith McGregor, CH2M HILL

John Hale
5 Raintree Court
Chico, CA 95973
Phone: (530) 864-5049

John S. Hale, M.S., Senior Biologist/Environmental Compliance Monitor
Mr. Hale is a botanist and wetland ecologist with more than 15 years of professional experience. He earned his M.S. in Botany from California State University, Chico, in 1997, and his B.S. in Botany from California State University, San Francisco, in 1974.

Mr. Hale is an expert on California's flora and plant communities with particular knowledge of California's Sierra Nevada and Central Valley botanical resources. Mr. Hale has conducted botanical surveys throughout California in many varied plant communities including vernal pool, saltmarsh, riparian, alkali and desert habitats. He has conducted surveys and studies throughout the region including several linear corridor and site survey projects. He has taken many botanical workshops through the UC Berkeley Jepson Herbarium and served as a botanist for both the Modoc National Forest and California Department of Fish and Game. His expertise includes special-status plant surveys, floristic inventories, noxious weed surveys, vegetation mapping, wetland delineations, environmental compliance monitoring, riparian restoration and vegetation/biological monitoring. Through his project work, Mr. Hale has discovered numerous rare plant occurrences including several significant range extensions.

Mr. Hale has worked as lead biologist and environmental compliance monitor on numerous linear projects throughout California. Last year he served as biological monitor for the PGE Line 406 in Yolo County. In 2009, he served as lead botanist for the PGE Yuba- Bear Drum Spaulding Hydroelectric Re-licensing in Nevada, Placer and Sierra counties conducting special-status plant and noxious weed surveys. He recently served as biologist and environmental compliance monitor for the California Department of Water Resources levee repair and riparian restoration projects along the Sacramento River where he was responsible for enforcing environmental permits and assisting with riparian restoration planting. He has a working knowledge of Army Corps of Engineers 404, United States Fish and Wildlife Service Incidental Take, National Marine Fisheries Incidental Take, California Department of Fish and Game 1602 Streambed Alteration Agreement and Regional Water Quality Control Board 401 Water Quality Certification permits. Mr. Hale completed work as the designated biologist /lead monitor, approved by the California Energy Commission, for the Sacramento Municipal Utility District's Cosumnes Power Plant and Pipeline Project. He was responsible for successfully conducting and supervising the implementation of the biological resources Conditions of Certification for the project which included the construction of a 500 megawatt power plant and 28 mile gas pipeline. He was responsible for all biological resources mitigation, monitoring and compliance measures required by agency permits. He worked closely with the primary construction contractor, attending weekly meetings for construction scheduling and communicating any environmental concerns. Mr. Hale supervised three full time biological monitors and conducted the Worker's Environmental Awareness Program training for oncoming construction laborers.

Mr. Hale has also served as the lead environmental compliance monitor and on many large projects including the the California Department of Water Resources Emergency Levee

Repair Projects, California Department of Water Resources South Bay Aqueduct, Qwest fiber optic installation from Dunsmuir to Redding, Sutter Mutual Water Company pipe upgrade, Colusa Reclamation District 1004 pump and pipeline upgrade and revegetation project, the Williams fiber optic installations from Pt. Arena to Sacramento and Antioch to Sacramento, AT&T Bandon to Cloverdale fiber optic installation, AT&T cable upgrade from San Luis Obispo to Mojave, Southern California Edison Big Creek Hydroelectric Re-licensing and the Tuscarora Pipeline Project. His responsibilities have included conducting pre-construction biological surveys, delineating biological resource boundaries, monitoring construction activities and working with the primary contractor to assure compliance with CEQA and all environmental permits including United States Fish and Wildlife Service, Army Corps of Engineers, California Department of Fish and Game and Regional Water Quality Control Board. Mr. Hale has also been SWPPP trained and has been responsible for monitoring onsite SWPPP compliance and BMP implementations.

Mr. Hale has surveyed and assisted on surveys in the field and is familiar with the following species of concern including California red-legged frog, California tiger salamander, San Joaquin kit fox, western pond turtle, burrowing owl, Swainson's hawk and other nesting birds, vernal pool fairy shrimp, American badger, valley elderberry longhorn beetle and giant garter snake. Specifically, as lead biologist for the Cosumnes Power Plant and Pipeline Project he conducted pre-construction surveys for nesting birds including Swainson's hawk and burrowing owl, California tiger salamander using a peeper scope and giant garter snake. He was responsible for monitoring construction activities around nesting Swainson's hawks, vernal pool fairy shrimp habitat, and giant garter snake habitat. He successfully re-located California tiger salamanders from the construction site to offsite ground squirrel burrows. He was responsible to reporting to Carolyn Doody and Dan Gifford at the California Department of Fish and Game and Rick Kuyper of the US Fish and Wildlife Service.

Mr. Hale has taken workshops on California tiger salamander from the Wildlife Society, Swainson's hawk from Peter Bloom, and giant garter snake from Eric Hansen. He has surveyed and assisted other wildlife biologists on surveys for California red-legged frog, San Joaquin kit fox, western pond turtle, vernal pool fairy shrimp and tadpole shrimp, valley elderberry longhorn beetle and American badger. Some of the projects involving these species include Wildlife and Rare Plant Ecology of Eastern Merced County's Vernal Pool Grasslands (Merced County), PGE Line 406 (Yolo County), California Department of Water Resources Emergency Levee Repair (Butte, Colusa, Glenn, Sacramento, Sutter and Yuba Counties), PGE Yuba-Bear Drum Spaulding Hydroelectric Re-licensing (Nevada, Placer and Sierra Counties) and AT &T Cable Upgrade San Luis Obispo to Mojave (San Luis Obispo and Kern Counties).

Mr. Hale has assisted with the following wildlife biologists including Jeff Alvarez of the Wildlife Project, Brent Helm of Helm Biological Consulting, Peter Bloom of Bloom Biological, Inc., Eric Hansen of Hansen Consulting, Ed Whisler of Whisler Biological Consulting, Miriam Green of Miriam Green Associates, John Vollmar of Vollmar Consulting, Todd Sloat of Sloat Biological Consulting and James Hale, Vice Chairman of the Contra Costa Fish and Wildlife Advisory Committee.

References:

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Kevin Hudson
Sacramento Municipal Utility District
6201 S Street
Sacramento, CA 95817
Phone: (916) 732-7101

Daniel Williams
Staff Biologist

Education

B.S., Geography (Environmental Studies Minor), 2004

Distinguishing Qualifications

Experience conducting surveys for burrowing owls, Swainson's hawk and other raptors, riparian avian point counts, and general wildlife

Performs biological monitoring within project sites and construction zones

Relevant Experience

Mr. Williams is a staff biologist with 5 years of professional experience and more than 10 years of general field experience in avian ecology. He conducts general wildlife surveys in a wide variety of habitats throughout North America. He is experienced in using Global Positioning System technology for various mapping projects.

Representative Projects

Project Biologist; Construction Monitoring and Pre-disturbance Surveys for Special Status Species; Seismic Retrofit of Antioch Bridge, San Joaquin River, California; 7/2010 to 12/2010. Monitored construction activities to ensure permit compliance and avoidance of known bird nests on Antioch Bridge and Sherman Island. Delivered WEAT training to incoming construction workers to inform them of the potential presence of the state federal threatened giant garter snake on the island.

Project Biologist; Mapping and Cataloging of Special Status Plant Species; Confidential Project; San Bernardino County, California; 5/2010 to 6/2010. Located and marked previously found special status plant species and set up a seed collection system for species protection ahead of construction on a project site in the Mojave Desert.

Project Biologist; Pre-disturbance Surveys for Special Status Species; Confidential Project; Southwestern Utah; 5/2010. Performed pre-construction sweep surveys for Utah prairie dog in the Sevier Desert following protocol training by the BLM.

Project Biologist; Pre-disturbance Surveys for Special Status Species; Confidential Project; Kern County, California; 3/2010 to present. Performed pre-construction sweep surveys for several special status species including loggerhead shrike, American badger, and ringtail, as well as for nesting birds under the Migratory Bird Treaty Act.

Biological Monitor; Worker Environmental Awareness (WEAP) Training and Special Status Species Monitoring; PG&E; Bay Point, California; 2/2010 to 3/2010. Delivered Worker Environmental Awareness (WEAP) training to contractors prior to soil boring, weed abatement, bathymetry and aquatic soil sampling at a remediation site. Also conducted pre-disturbance biological investigations on the site, as well as surveys for California black and clapper rails.

Project Biologist; Pre-disturbance Surveys for Special Status Species; Union Pacific Railroad; Riverside and Imperial Counties, California; 2/2010. Performed pre-disturbance surveys for California black and Yuma clapper rails, as well as seine net surveys for desert pupfish in a wash under a railroad bridge in Imperial County ahead of the removal of flash flood deposited sediment from the base of the bridge. Also surveyed for least Bell's vireo, and Stephens' kangaroo-rat at another railroad bridge in need of maintenance in Riverside County.

Biological Monitor; Worker Environmental Awareness (WEAP) Training; Dow Chemical; Pittsburg, California; 6/2009 to 9/2009. Delivered Worker Environmental Awareness (WEAP) training to contractors before they started ground disturbance work on a transmission line project, and conducted pre-disturbance biological investigations on the project site.

Project Biologist; Confidential Project; Owl Surveys; Niland, California; 7/2009 to 8/2009. Performed western burrowing owl surveys according to 1993 California Burrowing Owl Consortium survey protocol on two proposed geothermal sites near the Salton Sea.

Project Biologist; Bridge Replacement; Union Pacific Railroad; Cottonwood, California; 7/2009 to 9/2008. Performed preconstruction surveys for western pond turtle, white-tailed kite, and silky cryptantha. Monitored bridge construction crews during construction of a new concrete bridge as well as demolition of the old structure. Maintained compliance with measures set forth in the California Department of Fish and Game's Streambed Alteration Agreement, U.S. Army Corps of Engineers Nationwide Permit 14 conditions, and the Regional Water Quality Control Board's Water Quality Certification conditions.

Project Biologist; Potential Solar Site Studies; Bright Source; San Bernardino County; California; 3/2009 to 4/2009. Helped develop an avian point count transect protocol with Bureau of Land Management (BLM) biologists, then implemented said protocol at a proposed solar site in southern California.

Project Biologist; Lodi Energy Center; Northern California Power Agency; San Joaquin County, California; 2/2009 to 7/2009, and again 3/2010 to present. Performed pre-construction biological surveys on a proposed pipeline route which included

mapping and monitoring nests of the California Threatened Swainson's hawk, and checking irrigation canals for the Federal Threatened giant garter snake.

Project Biologist; Plant 42; U.S. Air Force; Palmdale, California; 11/2008. Performed burrowing owl clearance surveys prior to disturbance of concrete rubble piles near military flight line.

Project Biologist; Bird Surveys; City of Las Vegas; Las Vegas, Nevada; 5/2008 and 5/2009. Performed two annual surveys for nesting birds along an urban creek corridor, marked creek with flagging, and drafted a report describing locations of bird nests prior to yearly mowing of the vegetation along creek.

Project Biologist; Line 406/Line 407 Pipeline Project; Pacific Gas and Electric; Sacramento, California; 4/2008 to 5/2008 and 4/2009 to 5/2009. Conducted Swainson's hawk nesting survey according to California Department of Fish and Game guidelines. Suitable nest trees located within 0.5 miles of the approximately 44-mile pipeline route were surveyed for Swainson's hawk or other raptor use.

Project Biologist; Kinder Morgan Energy Partners; Rocklin, California; 6/2008. Conducted preconstruction surveys prior to pipeline maintenance work. Surveys included identification of nesting birds and other sensitive wildlife species. Performed biological monitoring during vegetation removal to minimize disturbances to riparian vegetation and waterways.

Project Biologist; Annual Compliance Monitoring; Cosumnes Power Plant; Sacramento, California; 4/2008. Performed annual survey of plant laydown, water pipeline, and concrete batch plant construction areas to determine success of re-vegetation efforts after construction.

Project Biologist; Wind Corridor Studies; First Wind; Milford, Utah; 4/2008. Performed burrowing owl transect surveys of an 18,000-acre project site for a wind farm and utility corridor. Duties included mapping mammal burrows and documenting burrowing owl and kit fox observations, as well as identifying general wildlife resources.

Project Biologist; Camp Parks RFTA Biological Compliance—Oakland RPX, OMS and AMSA Construction; U.S. Army Corps of Engineers; Dublin, California; 3/2008 to 4/2008. Performed burrowing owl clearance surveys and conducted biological monitoring of burrowing owl populations within construction zones.

Experience Prior to CH2M HILL

Burrowing Owl Survey Crew Leader; Western Riverside County Multiple Species Habitat Conservation Plan; 3/2006 to 2/2008. Responsible for organizing and supervising a burrowing owl survey crew and a colony census crew. Conducted riparian avian point counts, coastal sage avian transects, and burrowing owl colony census in accordance with regulatory agency protocols. Also conducted Delhi Sands Flower-loving Fly surveys, baiting of small mammal traps for Stephens' Kangaroo-Rat grids, and vegetation surveys associated with all avian protocols. Completed data entry in Access and Excel formats and drafted seasonal reports of survey and census results.

Avian Biologist; North Carolina Wildlife Resources Commission; 1/2005 to 9/2005. Conducted state-wide winter bird transect surveys, vegetation surveys, Bald Eagle nest monitoring, avian point counts, and songbird nest searches. Established frog and bobwhite call routes.

Avian Field Technician; Iowa State University; 5/2002 to 8/2002. In support of a graduate research investigation, performed avian point counts and nest search protocol and assisted with mist netting and territory mapping of Bobolinks for a student in northern Iowa and southern Minnesota. Also conducted vegetation surveys and completed data entry of survey results.

Park Naturalist; Sandy Hook Bird Observatory; New Jersey Audubon; 3/2002 to 5/2002. At Sandy Hook Bird Observatory, served as park naturalist and conducted a spring migration census.

Avian Field Technician; University of Wisconsin; 5/2001 to 8/2001. Performed avian point count and nest search protocol, assisted with mist netting Grasshopper Sparrows and conducted vegetation surveys and data entry duties as part of a graduate research investigation conducted at Fort McCoy Military Reservation in western Wisconsin.

Biological Field Technician; Iowa State University; 5/2000 to 8/2000. Conducted avian point count protocol and butterfly surveys as part of a graduate research investigation conducted in the Grand Teton/Yellowstone Park region.

Specialized Training

OSHA-SARA 40-hour Health and Safety Course
OSHA 10-hour Construction Safety
CPR Certification, American Red Cross
Standard First Aid Certification, American Red Cross

Supplemental Information

CH2M HILL Hire Date: 3/2008
Years of Experience Prior to CH2M HILL: 2.6

References

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Thomas C. Davis

Project Scientist

Relevant Experience

Mr. Davis is a biologist with seven years of environmental consulting and biology experience. He has monitored for biological and environmental compliance on a variety of projects including utility installation projects and transportation projects. He has worked for clients such as the San Francisco Public Utilities Commission, Pacific Gas and Electric Company, California Department of Transportation, United States Navy, and United States Army. Mr. Davis has conducted biological surveys for special status species including nesting avian species. Mr. Davis has maintained storm water pollution prevention plans, written biological sections of reports for government agencies, and has conducted environmental trainings for construction personnel. He has coordinated teams of specialists to perform biological and cultural surveys and monitoring.

Representative Projects and Dates of Involvement

Tesla Power Plant Project (2008). Surveyed and monitored for burrowing owl during geotechnical investigations before construction of the power plant.

Newark-Fremont PG&E Reconductoring Project (2008). Conducted pre-construction burrowing owl surveys and prepared a memo report of survey findings. Monitored construction activities, communicated directly with PG&E, conducted environmental tailboard trainings for construction crews, prepared daily compliance reports, oversaw that all in-field Special Use Permit requirements were being implemented, and conducted pre-construction nesting bird surveys.

PG&E Vaca-Dixon-Peabody-Lambie-Birds Landing 230kV Reconductoring Project (2009). Conducted reconnaissance level field surveys at project impact areas for special-status wildlife species such as Swainson's hawk, burrowing owl, western pond turtle, giant garter snake, horned lark, California tiger salamander and golden eagle. Mapped all potential habitats for special-status species using ArcPad program on a GPS tablet.

Caltrans State Route 12 Roadway Rehabilitation and Safety Improvement Project burrowing owl Surveys, Solano County, CA (2009). Conducted Phase I and II protocol level burrowing owl surveys for western burrowing owl within the proposed construction impact areas. Recorded suitable burrowing owl habitat, locations of burrows, presence of sign and individual burrowing owls with a GEO XT Trimble unit.

PG&E Gas Line 210 Project (2009). Conducted wildlife habitat assessment surveys in Solano County, and wrote wildlife technical report. Habitat assessment included suitability for California tiger salamander, vernal pool branchiopods, and burrowing owl. Assisted in conducting wetlands delineations. Prepared SAA 1600 permit application.

Bay Area Toll Authority, Antioch Bridge Seismic Retrofit Project (2010-current): Monitoring construction for compliance with federal and state agency permit conditions for giant garter snake (*Thamnophis gigas*), nesting avian species, and water quality. Provide environmental compliance training to construction personnel.

San Francisco Public Utilities Commission Water System Improvement Program (2010-current): Environmental Inspector and Specialty Environmental Monitor for Bay Division Pipeline 5, Alameda Siphon, and New Irvington Tunnel Projects. Inspect construction sites for compliance with CEQA mitigation measures, federal, state, and regional permits, and contract specifications. Perform preconstruction surveys for special status species including nesting birds. On Bay Division Pipeline Project: Prepared minor project deviations, monthly reports, and reviewed contractor submittals. Coordinated a team of specialists including cultural and biological monitors. Provided environmental compliance training to project personnel. Approved by CDFG and USFWS for the implementation of mitigation measures pertaining to California tiger salamander, Mission blue butterfly, California red-legged frog, San Francisco garter snake, Alameda whipsnake, and San Francisco dusky-footed woodrat.

Caltrans Highway 101 Widening (2009-2010): Coordinated team of field biologists and monitors during construction. Monitored for California tiger salamander, storm water protection, environmental compliance, and nesting birds for highway expansion projects in Santa Rosa and Rohnert Park, CA. Provided environmental compliance training to project personnel. Received conditional approval to survey, handle and release California tiger salamander.

Desert Tortoise and Rare Plant Surveys, Mojave Desert, Twenty-Nine Palms, CA (2009). Conducted protocol level desert tortoise and rare plant surveys in creosote scrub habitat in Mojave Desert. Responsible for identifying over 100 species of plants, tracking wildlife sightings, and navigating with Trimble Geo XT handheld GPS units.

PG&E Maxwell 1101 12kV Reconductoring Project (2008). Monitored for the giant garter snake on an 11 mile long corridor during work on a PG&E reconductoring project near Maxwell, CA. Monitored and maintained lines of communication with work crews and ensured that the client was in compliance with all environmental laws and regulations. Conducted Worker's Environmental Awareness Program trainings and on-site tailboards for all project personnel. Monitoring logs were completed daily for PG&E documenting construction activities, communication, and compliance issues.

Lakeville-Sonoma PG&E 115kV Transmission Line Project (2006-2007). Performed onsite environmental inspection and biological monitoring. Monitored for western pond turtle and California red-legged frog during the installation of PG&E Lakeville-Sonoma 115kV transmission line project, and ensured that biological surveys were completed prior to construction work. Supervised field monitors and ensured that client was in compliance with CPUC mitigation measures, 1600 SAA, and USFW Biological Opinion. Compiled daily and weekly reports for CPUC, and provided timely biological and compliance information for U.S. Fish and Wildlife, Sonoma County Water Agency, Sonoma County Open Space District, and the City of Sonoma. Conducted Worker's Environmental Awareness Program trainings and on-site

tailboards for all project personnel, and collaborated with all PG&E construction managers, supervisors, and subcontractors involved on the project to ensure compliance with mitigation measures. Maintained the Storm Water Pollution Prevention Plan (SWPPP), inspected erosion and sediment control measures, and monitored storm water quality. Directed subcontractors, per the client's request, for the installation of erosion and sediment control measures. Recognized the need for specific CPUC variances on the project, and facilitated communication between PG&E crews and Environmental Program Manager on the status of variance requests. Collected samples of water and soil for lab analysis, and coordinated with PG&E specialists and field crews in their proper disposal.

PG&E Central California Clean Energy Transmission Project (2008). Conducted wildlife habitat assessment surveys throughout Kern and Tulare Counties. Assisted with site and habitat assessment for special status species such as blunt-nosed leopard lizard, Tipton kangaroo rat, San Joaquin kit fox, American badger and western pond turtle. Performed protocol-level surveys for blunt-nosed leopard lizard.

Jefferson-Martin PG&E 230 kV Transmission Line Project (2005-06). Monitored San Francisco garter snake and California red-legged frog during the installation of PG&E Jefferson-Martin 230 kV transmission line project. Monitored construction activities for overhead and underground transmission line installation, vegetation clearing, revegetation and erosion and sediment control activities, and the Jefferson substation upgrade from 115kV to 230kV. Conducted avian species nest searches and monitored active nests for impact by construction activities.

San Clemente Island Fox Research Project (2007-08). Conducted field research on San Clemente Island foxes for the United States Navy. Installed and maintained trapping grids, handled foxes and recorded data, marked foxes with PIT tags, and assisted with collecting blood samples.

PG&E Natural Gas Line 303 Project (2006). Monitored for California red-legged frog and California tiger salamander during work on PG&E natural gas pipeline project, and made recommendations for best management practices to minimize impact on these species.

Lakeville-Sonoma PG&E 115kV Transmission Line Project Nesting Bird Surveys (2006-08). Conducted avian species nest surveys along the PG&E right-of-way. Performed detailed behavioral observations of nesting avian species. Established species appropriate nest protection buffer zones. Documented the location, the status of nest and the species of bird. Supervised a crew of 3 ornithologists, maintained and managed data gathered by ornithologists and ensured that nesting bird surveys were completed prior to construction work. Monitored construction work to ensure that PG&E maintained compliance with CPUC mitigation measures.

California Department of Transportation Pigeon Pass Project (2006-07). Conducted nesting bird surveys along the Caltrans right-of-way. Performed detailed behavioral observations of nesting songbirds and raptors; documented the location, the status of nest and the species of

bird. Removed inactive nests from project site and performed nest clearance surveys prior to construction. Established species-appropriate nest protection buffer zones around active nests.

California Department of Transportation Devils Slide Tunnel Project (2007-2009). Conducted avian species nest searches and monitored active nest colonies for impact by construction activities. Monitored peregrine falcon breeding behavior and reproductive success. Monitored for California red-legged frog.

Caltrans Geyserville Bridge State Route 128 Replacement Project (2006). Monitored for special-status salmonids (*Oncorhynchus mykiss, kisutch,tshawytscha*), foothill yellow-legged frog (*Rana boylii*), and northern red-legged frog (*Rana aurora aurora*) during Caltrans' Highway 128 Geyserville Bridge Replacement Project for compliance with California Department of Fish and Game Biological Assessment and 1600 SAA.

Education

B.A., Environmental Studies and Economics, University of California at Santa Cruz, 2003

Specialized Training

Elkhorn Slough Coastal Training Program workshop on upland survey methods for California tiger salamander, June 2010. Conducted drift net surveys and handled dispersing juvenile CTS.

Elkhorn Slough Coastal Training Program workshop on Santa Cruz long-toed salamander aquatic survey methods, May 2010. Conducted aquatic surveys and handled SCLTS larvae

10-hour OSHA Construction Safety Training.

24-hour Storm Water Pollution Prevention Plan training (Certificate number 070926-02).

Red Cross First Aid/CPR training, March 2011.

Volunteer Experience

Don Edwards National Wildlife Refuge (2010). Assisted Service biologists in surveying for vernal pool branchiopods and amphibians in the Warm Springs section of the refuge in Newark, CA. Handled larval California tiger salamander, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

References

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Project Manager, CH2M HILL
(510) 587-7603

David Lundgren
Project Manager, CH2M HILL
(510) 587-7663

Colleen Taylor
Project Manager, CH2M HILL
(510) 587-7644

Daniel Weinberg

Project Biologist
CH2M HILL

Objective

Position of biologist

Education

B.A., Biological Field Science, University of California at Berkeley, 1990

Professional Registrations

USFWS 10(a)(1)(A) Scientific Recovery Permit for California Tiger Salamander and native endangered and threatened vernal pool branchiopods, TE081298-1

CDFG California Scientific Collecting Permit, 007972

Distinguishing Qualifications

- 19 years of experience in wildlife species surveys and habitat assessments
- Produces biological assessment and natural environment study documents
- Prepares federal and state permit applications to perform project work in sensitive habitats
- Provides worker environmental awareness trainings
- Monitors project construction actions for environmental compliance

Relevant Experience

Mr. Weinberg's background includes visual and auditory identification techniques, scientific survey protocol methods, and an understanding of optimal conditions to conduct field studies for wildlife and plant species in upland and wetland habitats throughout California. He also provides support for permitting projects within biologically sensitive habitats. Prior to assuming consulting responsibilities with private firms, Mr. Weinberg served as the acting district biologist for a 250,000-acre Bureau of Land Management field office in Redding, California. His other federal experience includes employment with the United States Fish and Wildlife Service, the United States Forest Service, and the Pacific Southwest Forest and Range Experiment Station.

Representative Projects and Dates of Involvement

Environmental Inspection/Biological Monitoring, San Francisco Public Utilities Commission Watershed Improvement Program, Sunol, California, 2009-2011. Inspected construction work areas and machinery for compliance with environmental permit conditions. Provided worker awareness trainings. Conducted preconstruction surveys for sensitive species. Approved by the U.S. Fish and Wildlife Service to handle and relocate federally listed species. Served as the project designated biologist as provided by the California Department of Fish and Game to handle and relocate State listed species.

Environmental Compliance Monitoring, Line 131 Natural Gas Pipeline Replacement, Pacific Gas and Electric Co., Brentwood, California, 2008-2010. Functioned as the US Fish and Wildlife-approved qualified biologist. per conditions specified in the project biological opinion. Conducted surveys for listed species including San Joaquin kit fox (*Vulpes macrotis mutica*), California red-legged frog (*Rana aurora draytonii*), California Tiger Salamander (*Ambystoma*

californiense) and the western burrowing owl (Athene cunicularia). Provided worker environmental awareness training and performed biological monitoring during active construction work.

Listed Vernal Pool Branchiopod Survey, PG&E, Vaca-Dixon Reconductoring Project, Solano Co., California, 2008. Located and identified occurrences of federally listed vernal pool branchiopods including *Lepidurus packardi* and *Branchinecta lynchi* in accordance with the U.S. Fish and Wildlife Service *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods*. Collected and processed voucher specimens in accordance with special conditions provided in scientific collection permit TE081298-1.

San Joaquin Kit Fox Den Survey, Caltrans, Pigeon Pass Realignment Project, Pleasanton, California, 2007. Approved by the U.S. Fish and Wildlife Service to conduct preconstruction den surveys for the Federally Endangered San Joaquin kit fox (*Vulpes macrotis mutica*) (SJKF). Survey was performed in accordance with the U.S. Fish and Wildlife Service *San Joaquin Kit Fox Survey Protocol for the Northern Range*.

California Tiger Salamander Larval Survey, U.S. Fish and Wildlife Service, Stanislaus County, California, 2006. Performed surveys for larval-stage California tiger salamander (*Ambystoma californiense*). Used dip and seine nets to potentially locate tiger salamander larvae prior to de-watering of creek impoundments. Survey was performed in accordance with the U.S. Fish and Wildlife Service *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander*.

California Red-legged Frog Survey, California Polytechnic University, Building Expansion Project, San Luis Obispo, California, 2006. Performed a protocol survey for the California red-legged frog (*Rana aurora draytonii*) in riparian habitats on Cal Poly property in accordance with the *U.S. Fish and Wildlife Service Revised Guidance and Field Surveys for the California Red-legged Frog*.

Environmental Compliance Monitoring, US Army Corps of Engineers, Hamilton Army Airfield Coastal Salt Marsh Remediation Project, Novato, California, 2005. Provided daily environmental compliance monitoring and worker awareness training for the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and California clapper rail during the pickleweed (*Salicornia virginica*) removal phase of the project. Coordinated with the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers to remove the mouse from the work site. Successfully recovered and relocated 32 harvest mice to adjacent pickleweed habitat.

California Aqueduct Site Assessment/Species Inventory, Colorado Desert, CA, Metropolitan Water District of Southern California (MWD), 2004: Performed site assessments, habitat characterizations and species inventories of various 200-acre study plots throughout the Colorado Desert in preparation for an MWD Habitat Conservation Plan. Observed listed, rare and sensitive desert species including desert tortoise (*Gopherus agassizii)* and foxtail cactus (*Escobaria vivipara).*

Valley Elderberry Longhorn Beetle Exit Hole Survey, U.S. Bureau of Land Management, Sacramento River, Redding, California. 2002. Performed surveys of elderberry shrubs (*Sambucus* sp.) for exit holes of the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) in accordance with the U.S. Fish and Wildlife Service *Conservation Guidelines for the*

Valley Elderberry Longhorn Beetle. Surveys were conducted on federal property in preparation of a BLM-approved, Shasta County vector abatement treatment program.

Honors and Awards

2005 Outstanding Achievement Award for Client Satisfaction, URS Corporation, Oakland, California
1993 Wildland Fire Incident Safety Award, U.S. Forest Service, Sierraville Ranger District, Tahoe National Forest, California

Specialized Computer Skills

Rarefind California Natural Diversity Database version 3.1.1.0

Professional Development

2006 Determining Federal Wetlands Jurisdiction
2006 California Tiger Salamander Larval Stage Survey Techniques
2004 (renewed 2005/2006/2007)/California OSHA 40-hour HAZWOPER
2003 U.S. Fish and Wildlife Service, native endangered and threatened species certification for vernal pool branchiopods
2002 U.S. Department of the Interior Office of Aircraft Services, Airplane/Helicopter Safety
2002 American Safety & Health Institute, Adult First Aid & CPR
2001 U.S. Bureau of Land Management, ATV Safety
1997 U.S. Forest Service Regions 5 & 6 salamander identification
1996 (renewed 2004) Mad River Biologists, Inc. marbled murrelet survey certification
1994 (renewed 2002) U.S. Forest Service, wildland incident firefighter qualification for arduous physical work

Publications

Weinberg, Daniel. 2005. *Atlas of the Breeding Birds of Humboldt County, California*. Contributing biologist. John E. Hunter, ed. Arcata: USFWS. Prepared for the Redwood Region Audubon Society.

Weinberg, Daniel. 2001. *Carnivore Survey Findings on the Interlakes Special Recreation Management Area.* July. Prepared for the U.S. Dept. of Interior Bureau of Land Management.

Employment History

01/07-Present: CH2M HILL, Project Biologist, Oakland, CA
06/02–01/07: URS Corporation, Biologist, Oakland, CA
10/01–06/02: ETI Professionals, BLM District Biologist, Redding, CA
04/01–08/01: U.S. Bureau of Land Management, Wildlife Biologist, Redding, CA
08/00–12/00: U.S. Fish and Wildlife Service, Fish and Wildlife Biologist, Red Bluff, CA
04/97–12/98: HSU Foundation Co-op Fisheries Unit, USFS Wildlife Biologist, Arcata, CA
05/96–09/96: U.S. Forest Service, Wildlife Biologist, Six Rivers National Forest, Orleans, CA
03/95–12/95: U.S. Forest Service, Wildlife Biologist, Cleveland National Forest, Ramona, CA
03/94–12/94: U.S. Forest Service, Wildlife Biologist, Lassen National Forest, Susanville, CA
06/93–11/93: U.S. Forest Service, Wildlife Biologist, Tahoe National Forest, Sierraville, CA
06/92–10/92: Biosystems Analysis, Inc., Biologist, Tiburon, CA
05/91–10/91: USFS Pacific Southwest Forest and Range Experiment Stn., Biologist, Berkeley, CA

Supplemental Information

CH2M HILL Hire Date: 01/29/2007
Years of Experience Prior to CH2M HILL: 15

References

1. Rene Langis-Environmental Compliance Manager, SFPUC New Irvington Tunnel project. (CH2MHILL) (510) 409-8194

2. Scott Oppelt-Regional Environmental Compliance Manager, SFPUC Sunol Valley CM projects. (CH2MHILL) (267) 283-6523

3. Robin Dakin-Lead Environmental Inspector, SFPUC Sunol Valley CM projects. (Avila Associates) (415) 694-9689

Richard E Crowe

Senior Environmental Technician/CH2M HILL

Mr. Crowe is an experienced field biologist with fourteen years of experience including specific expertise with special-status species surveys, wetland delineations, permitting, and construction management in the Central Valley. He is experienced in working within NEPA and CEQA guidelines and have conducted technical studies in support of numerous AFC's, EIR, NES, Initial Studies, and other environmental documents.

Education

B.S. – Wildlife Biology/Forestry in progress.

Professional Registrations

Endangered Species Act Section 10 Scientific Take Permit for Vernal Pool Invertebrates

California Department of Fish and Game Scientific Collector's Permit

Distinguishing Qualifications

- Over Fourteen years experience working in Central Valley ecosystems
- Extensive experience in conducting pre-construction surveys and construction monitoring
- Extensive experienced with monitoring horizontal directional drilling projects, monitored 53 horizontal directional drills to date
- Experienced and trained wetland delineator
- Experienced with vernal pool invertebrates
- Recognized by the California Department of Fish and Game as qualified to conduct surveys for sensitive raptors throughout San Joaquin and Sacramento counties
- Experienced with NEPA and CEQA guidelines
- Experienced with preparing a variety of environmental permits and documents

Selected Project Experience

Lodi Energy Center, Northern California Power Authority (NCPA), San Joaquin County, CA. Biologist in charge of endangered/threatened species and nesting bird surveys in support of mitigating project impacts through the San Joaquin County Habitat Conservation Program. Worked directly with California Energy Commission (CEC) staff on mitigating project impacts and with wording of the CEC Preliminary Staff Assessment and Final Staff Assessment. Currently CEC Designated Biologist for construction and operation of a 296-megawatt combined cycle power plant. Currently performing all duties associated with biological compliance and construction monitoring, as well as submitting Monthly Compliance Reports documenting compliance to the California Energy Commission.

Los Medanos Energy Center to Dow Pittsburg Transmission Line Project, Contra Costa County, CA. Designated Biologist for construction of transmission line project. Performed all duties associated with biological compliance and construction monitoring, submitted Monthly Compliance Reports (MCR's) documenting compliance to California Energy Commission.

Colusa Generating Station, PG&E, Colusa County, CA. Designated Biologist for construction and operation of a 660-megawatt combined-cycle power plant. Performed all duties associated with biological compliance and construction monitoring, submitted MCR's documenting compliance to the California Energy Commission.

Humboldt Generating Station, PG&E, Humboldt County, CA. Co-Designated Biologist for construction and operation of a 660-megawatt combined-cycle power plant. Performed all duties associated with biological compliance and coordinated Biological Monitoring with on-site Biological Monitor.

Gateway Generating Station, PG&E, Contra Costa County, CA. Biological Monitor for construction of 660-megawatt combined-cycle power plant**.** Performed all duties associated with biological compliance and construction monitoring, submitted Monthly Compliance Reports (MCR's) documenting compliance to California Energy Commission (CEC).

Praxair Hydrogen Pipeline Project, Contra Costa County, CA. Lead field biologist in support of permitting and Biological Resources Evaluation for a 21.5 mile, 12-inch diameter hydrogen gas pipeline and associated natural gas. Conducted wetland delineation, special status species surveys, extensive tree inventory, and assisted in rare plant and botanical surveys.

Roseville Electric, Roseville Electric Park, Roseville CA. Biological monitor for ongoing construction of a 125 mega-watt power plant. Conducted all forms of biological monitoring on power plant and associated linear facilities. Storm Water Pollution Prevention Plan inspector for City of Roseville on Roseville Electric Park project..

ARB, Inc., Concord to Sacramento Pipeline Project. Environmental Coordinator on 71-mile 20-inch petroleum products pipeline between Concord and Sacramento, California. Biologist responsible for environmental compliance and multi-agency liaison.

Roseville Electric, Reason Farms North Parcel, Placer County, CA. Conducted Jurisdictional Wetlands and Waters of the U.S. on 116 acre proposed mitigation parcel for future Roseville Energy Park.

Calpine Natural Gas Company, Rio Vista Pipeline Project. Biologist responsible for permitting, wetland delineating, threatened and endangered species surveys, biological monitoring, consultation with Fish and Wildlife Service and agency liaison. Project consisted of 11.5 mile 12" natural gas pipeline with an associated 1-mile horizontal directional drill beneath the Sacramento River.

Merced Irrigation District Foster Farms Transmission Line Project Supplemental EIR. Conducted biological studies for 25-mile transmission line in Stanislaus and Merced counties. Conducted wetland delineation using the ACOE 1987 methodology, mapped potential fairy shrimp habitat, and conducted site reconnaissance of potential substation and river crossing locations.

Wetland Delineation, Red Beach Training Area, Camp Pendleton, CA. Conducted wetland delineation on 1,122 acres of assorted plant communities within Camp Pendleton Marine Corps Base.

Calpine Corporation, Sutter Energy Center, Sutter County. Conducted 5 year Avian Collision Study on new Western Area Power Administration transmission lines from Sutter Energy Center to O'Banion Substation.

Modesto Irrigation District Utilities Project. Biologist responsible for construction monitoring and supervising crews during construction for protection of potential valley elderberry longhorn beetle habitat during transmission line upgrades and new substations in the vicinity of Ripon and Riverbank.

Calpine Sutter Power Plant Project. Field assistant for habitat mapping of Swainson's hawk, giant garter snake, and vernal pool fairy shrimp to determine potential construction impacts and the need for possible pre-construction surveys and monitoring during construction. Also assisted with wet-season vernal pool invertebrate sampling using USFWS approved protocols.

SMUD, Consumes Power Plant Project, Sacramento County. Conducted giant garter snake, burrowing owl, Valley Elderberry Longhorn Beetle surveys and consultation with Fish and Wildlife Service. Assisted with cultural studies on 26 +/- mile natural gas pipeline, studies included pedestrian transects, use of ground penetrating radar on selected areas, and sifting soil in 1-meter square points along right-of-way.

Obsidian Butte Pipeline Project, Salton Sea. Assisted with archeological pedestrian surveys for the Obsidian Butte pipeline project at the Salton Sea.

Calpine Corporation, Calpine Natural Gas Company, Sacramento and Solano Counties. On-call biologists for Calpine Natural Gas Company, duties include; Fish and Game, Army Corps permitting. And construction monitoring during construction.

Calpine Corporation, Delta Energy Center, Contra Costa County. Biological monitor for construction of a 880 mega-watt power plant. Conducted all forms of biological monitoring on power plant and associated linear facilities. Key contact with California Department of Fish and Game Wardens during all facets of construction.

1700-acre wetland delineation for the Army Corps of Engineers, Chico, California. Conducted wetland delineation on Rock Creek-Keefer Slough Flood Control Project.

Shotgun Creek Estates EIR. Field assistant for biological studies in support of EIR on proposed 1,600-acre residential subdivision in the Tuolumne County foothills. Assisted with 1994-95 USFWS protocol vernal pool invertebrate surveys in a 250-acre portion of the project site.

Camanche Greens EIR. Field technician for studies in support of Environmental Impact Report Biology Chapter for a proposed 514-acre residential and golf course subdivision in western Amador County. Assisted in wetland delineation using the ACOE 1987 methodology and conducted elderberry shrub inventory and inspection for the federally threatened valley elderberry longhorn beetle according to USFWS 1994 guidelines.

Army Corps of Engineers Phase 111 Levee Repairs at 284 individual work sites in San Joaquin and Stanislaus Counties. Developed and implemented a worker environmental awareness program. Conducted pre-construction surveys and photo-documentation, focused at ensuring contractor compliance with Endangered Species Act, Clean Water Act and Corps of Engineers Section 01130 environmental protection programs. Conducted photo-documentation of post-construction conditions at established photo-stations, and compiled all of the above documentation for submittal to the Corps.

Army Corps of Engineers Phase 111 Levee Repairs at 166 individual work sites in Sacramento, Solano, and Yolo Counties. Developed and implemented a worker environmental awareness program, with emphasis on identification of giant garter snake and its habitat. Conducted pre-construction surveys and photo-documentation, focused at ensuring contractor compliance with Endangered Species Act, Clean Water Act and Corps of Engineers Section 01130 environmental protection programs. Participated in field meetings at individual work sites with responsible agencies and their contractors to identify environmentally superior construction methods. Conducted photo-documentation of post-construction

conditions at established photo-stations, and compiled all of the above documentation for submittal to the Corps.

San Joaquin County Department of Public Works Roads and Bridges. Principal field biologist for all of San Joaquin Counties road maintenance projects, flood damaged road projects, flood damaged bridge projects and seismic retrofit projects. Duties include biological assessments of each site, Natural Environment Studies (NES) for federally funded sites and conducting database searches, evaluating biological resource impacts, developing mitigation measures as needed, and ensuring compliance with the Endangered Species Act and Clean Water Act on rapid turn-around public works projects.

Weston Ranch Bridge Project. Conducted intensive construction monitoring of an active Swainson's hawk nest for eight weeks during pile driving associated with construction of a new bridge. Documented hawk activity, monitored noise levels, and recorded construction activities. Upon completion, assisted in the preparation of a comprehensive monitoring report that was submitted to CDFG. Currently monitoring revegetation activities at the old bridge site as a requirement of the CDFG Streambed Alteration Agreement.

Central Valley Agriculture Facilitation. Conducted wetland determinations and formal wetland delineation's for numerous farmers in Merced, Stanislaus, San Joaquin, and Contra Costa counties; most of the projects involved conversion of grazing land to orchards and vineyards. The studies were conducted pursuant to both USDA Farm Bill and the Clean Water Act.

Kirkwood Ski Resort Biological Studies. Field assistant for biological studies for over 300 acres zoned for future land development activities in the Kirkwood community. Conducted wetland delineation using the ACOE 1987 methodology, processed field data, and prepared report for submittal to the ACOE. Conducted mountain yellow-legged frog surveys in all major waterways within the 300 acres project site.

Sutter Gold Venture Lincoln Project Access Road. Conducted inspection for the federally-threatened valley elderberry longhorn beetle or evidence of past inhabitation on an elderberry shrub located within the construction zone for a proposed access road to a gold processing plant.

Evaluation of Second-Growth Forest Treatments for Wildlife; USDA Forest Service, Clearwater Valley in Gifford Pinchot National Forest, WA. Field technician for conducting research to determine the effects of various silviculture modifications of second growth forest on wildlife. Fieldwork included, data collection for tree growth parameters, setting up and laying out research grids, and conducting wildlife observations.

Forest Stand Exams; USDA Forest Service, Deschutes National Forest; Oregon. Field crew leader for conducting intensive forest stand exams on 55,000 acres of the Deschutes National Forest. Responsible for data management and quality control of over 12,000 individual sample points, including forest measurements, forest disease evaluation, habitat evaluation, and sensitive plant and wildlife surveys. Assisted in coordination and organization of 20 crew members, including subcontractors, for field data collection and on-site daily planning.

Natural Resource Inventory for North Stockton Projects, CA. Field technician for biological studies in support of Environmental Impact Report for proposed 800-acre residential development in north Stockton. Assisted with 1994-95 USFWS protocol vernal pool invertebrate surveys in a 40-acre portion of the project site.

Calaveras Springs Special Plan Project Vernal Pool Invertebrates Surveys. Field assistant for biological studies for 150-acre commercial, industrial, and residential development project in Calaveras County. Conducted USFWS protocol vernal pool invertebrate surveys and assisted with field verification of previously delineated wetlands.

Ringtail Population Monitoring Project. Student research assistant for ringtail populations studies in Brockman Canyon, South Sutter Buttes, CA. Assisted with trapping, measuring, and tagging ringtails.

California Department of Transportation Beach Lake Mitigation Bank. Field assistant for full protocol giant garter snake surveys of Morrison Creek for I-5 overpass widening, construction of giant garter snake hibernacula, and installation and monitoring of artificial burrows for burrowing owls.

Specialized Training

- Wetland Delineation, Richard Chinn Environmental Training, Inc., 1998
- Fairy Shrimp Identification, Dr. Denton Belk, 1998
- OSHA, 40-hour Hazardous Materials Training, Network Environmental Systems
- First Aid and CPR Training, American Red Cross
- 10-Hour Construction Safety Awareness Training CH2M HILL
- Site Safety Coordinator Training, CH2M HILL
- Hydric Soils Workshop, Dr. J. Herbert Huddleston, Oregon State University

Memberships in Professional Organizations

- Burrowing Owl Consortium
- California Inland Invertebrate Working Group
- National Audubon Society
- Ducks Unlimited
- Stone Lakes National Wildlife Refuge Association
- Bat Conservation International
- California Waterfowl Association
- California Native Grass Association

REFERENCES:

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Victor N Leighton III
Wildlife and Wetland Biologist

Education

A.S. Forestry/Wildlife Biology, American River College

Distinguishing Qualifications

- Extensive experience in wetlands delineations throughout California, Nevada, and Utah, Wetland Delineation Certified (WTI) April 2003, advanced course and field work in hydric soils with specialized field training in saline and sodic soil conditions.
- California Native Plant Society Vernal Pool Plant Taxonomy Trained April 2007.
- GPS certified and trained in Trimble® and TerraSync® August 2006.
- Extensive experience in Global Positioning System (GPS) usage and training.
- Conducted numerous small and large scale rare plant surveys in California and Nevada. Experienced in plant population monitoring for terrestrial and aquatic species and conducted large and small scale native plant restoration projects within California's Central Valley.
- California Department of Fish and Game and U.S. Fish and Wildlife Service approved biologist and biological monitor for numerous species throughout California.
- Perform protocol surveys for: Northern spotted owl, Swainson's hawk, burrowing owl, valley longhorn elderberry beetle, San Joaquin kit fox, swift fox, Utah prairie dog, giant garter snake, California tiger salamander, California red-legged frog and desert tortoise. Including small and medium mammal surveys, trapping, track plates, and photo stations.
- Passive relocation and artificial burrow construction for burrowing owl.
- Nesting birds surveys for raptors and passerines in California, Utah, and Nevada.
- Extensive experience in construction monitoring on a wide variety of projects related to biological resources. Completed and orchestrated Worker Environmental Awareness Training (WEAT/WEAP) programs including resource videos, posters, and pamphlets for numerous projects throughout California, including California Energy Commission (CEC) projects.
- Experienced in Horizontal Directional Drilling (HDD) and monitoring procedures.
- Biological Report Writing: Permit, PEIR, Application for Certification and Biological Assessment.

Specialized Training

- OSHA-SARA 40-hour Health and Safety Course

- OSHA 8-hour Supervisor Training
- OSHA 10-hour Construction Supervisor Training
- CPR Certification, American Red Cross
- Standard First Aid Certification, American Red Cross
- Wetland Training Institute, Wetland Certification Program
- Hydric Soils Course and Specialized Field Training in Saline and Sodic Soils
- Certificate Training Trimble® GPS and GIS TerraSync® Software
- CNPS Plant Science Training Program- Vernal Pool Plant Taxonomy, attended April 2007
- Rare Pond Species Survey and Techniques Training – California Tiger Salamander, California Red-legged Frog, and Western Pond Turtle

Relevant Experience

Mr. Leighton has over 15 years of experience with a variety of environmental studies including general wildlife and plant surveys, wetland delineations, threatened and endangered species surveys, mammal surveys and trapping, native plant propagation, and restoration of native ecosystems, including native grasslands, wetlands, and riparian habitats. Mr. Leighton is knowledgeable of the flora and fauna of the Sacramento and San Joaquin Valley, foothills, and Sierra Nevada Mountain regions; familiar with the biology, distribution, listing status, and survey techniques of numerous Federal, State of California, and other rare and sensitive species occurring in California. Mr. Leighton work as a field and task lead for large and small scale project and has conducted protocol surveys for sensitive wildlife including California/Northern spotted owl, Valley elderberry longhorn beetle, Swainson's hawk, burrowing owl, giant garter snake, San Joaquin kit fox, vernal pool fairy shrimp, desert tortoise, and various denning mammals. Mr. Leighton has conducted water quality sampling using sterile techniques; sterile techniques for collection of aquatic invertebrates and fish tissues as well as performed growth rate analysis of aquatic flora for above and below ground bio-mass studies.

Extensive experience in conducting large and small scale wetland delineations, protocol surveys, pre-construction surveys and construction monitoring, report writing and GPS utilization. Preformed agency-mandated Worker Environmental Awareness Training packages and training sessions to construction crews, with regards to special-status species and habitat protection requirements during construction activities. Extensive monitoring experience of Horizontal Directional Drilling (HDD) and other construction related projects and construction crews working within or in close proximity to sensitive habitats and species; these efforts are frequently related to wetland and Waters of the U.S., Swainson's hawk, valley elderberry longhorn beetle, burrowing owl, and giant garter snake. Mr. Leighton has successfully negotiated construction methods and protocols with USFWS, CDFG, and the California Public Utility Commission. Knowledgeable about current

environmental laws, policies and regulation and familiar with environmental information resources and tools including scientific literature, computerized database, academic and agency specialist, and maps and aerial photographs.

Representative Projects

Pacific Gas and Electric, Pipeline 406 and 407 Project, California.
Lead Biological Monitor for 30-inch pipeline project through the Central Valley. Client and Environmental Compliance Manager liaison to support CEQA, U.S. Fish and Wildlife Service, the Federal Endangered Species Act (ESA) and the Migratory Bird Treaty Act (MBTA). This included Jurisdictional wetlands protected by the US Army Corps of Engineers under Section 404 of the Clean Water Act. The California Department of Fish and Game (CDFG), California Endangered Species Act, streams, water bodies, and riparian corridors covered under the Streambed Alteration Agreement process under Section 1600 of the CDFG Code, and under Section 3503.5, protecting wildlife and sensitive habitats.

Bright Source Energy, Ivanpah ISEGS Project, California.
Conducted USACE approved jurisdictional wetland and Waters of the U.S. delineation, rare plant surveys for the 2007 through 2009 survey periods. Assisted SNEI biologist in protocol desert tortoise surveys for the proposed translocation/relocation areas associated with the Ivanpah ISEGS Project components. Conducted habitat assessment surveys utilizing vegetation releve' plots for the Ivanpah solar sites and the translocation and relocations area components of this project.

Holly Energy Partners L.P., Utah to Nevada Pipeline, California, Utah.
Conducted USACE approved jurisdictional wetland and Waters of the U.S. delineation along the proposed 430-mile pipeline corridor from Las Vegas, Nevada to Salt Lake City, Utah. Surveys were conducted in difficult arid region environments. Surveys were conducted using GeoXT GPS units' aerial photos to provide sub-meter accuracy. Attended U.S. Fish and Wildlife Service approved desert tortoise workshop on protocols for construction monitoring and designated biologist training for survey techniques, relocation, transportation and handling techniques and instructional training with Southern Nevada Environmental Inc. (SNEI) and the U.S. Fish and Wildlife Service.

San Francisco Public Utility Commission, Hetch Hetchy Water and Power (HHWP), Moccasin CA. Field and task lead for biological habitat assessment and cursory wetland assessment surveys to be utilized for HHWP programmatic maintenance program. Client liaison and document preparer to support CEQA, U.S. Fish and Wildlife Service, the Federal Endangered Species Act (ESA) and the Migratory Bird Treaty Act (MBTA). This included Jurisdictional wetlands protected by the US Army Corps of Engineers under Section 404 of the Clean Water Act. The California Department of Fish and Game (CDFG), California Endangered Species

Act, streams, water bodies, and riparian corridors covered under the Streambed Alteration Agreement process under Section 1600 of the CDFG Code, and under Section 3503.5, protecting wildlife and sensitive habitats.

Reclamation District 108 (RD 108), Knights Landing, CA. Designated On-call biologist for water improvement construction projects along the Sacramento River. Mr. Leighton was the designated Fish and Wildlife Service giant garter snake (GGS) approved biologist. Mr. Leighton coordinated and administered Worker Environmental Awareness Training (WEAT) to construction crews at various RD 108 improvements at several locations along the Sacramento River. Mr. Leighton conducted preconstruction surveys and directed exclusion fencing related to several the giant garter snake per FWS Biological Opinion.

Army Corps of Engineers, Sacramento, CA. Lead biologist for levee upgrades along the Sacramento River system. Mr. Leighton was a Fish and Wildlife approved biologist for GGS and conducted pre-construction surveys, WEAT training and oversight to construction monitors and conducted biological monitoring during construction operation related to GGS.

UPC Wind, Milford Wind Corridor, Milford, UT. Field lead for presence/absence surveys for kit fox, *Vulpes macrotis* a Utah Wildlife Species of Concern. This work incorporated the following survey methods: denning surveys, spotlighting, camera and scent stations. Field biologist for Utah prairie dog surveys. Field survey techniques were focused on the approximately 25,000-acre wind farm. Project work also included 14 meteorological towers throughout the surrounding basin. The purpose of the survey was to visually inspect tower location to identify important biological resource concerns in the vicinity and evaluate to potential for adverse impacts to biological resources.

Oakdale Irrigation District (OID), Water Resource Plan PEIR, Oakdale, CA. Conducted biological reconnaissance surveys to address biological resources related to existing conditions and potential impacts of OID future projects. Prepared the biological section of the PEIR for OID to address CEQA, U.S. Fish and Wildlife Service, federal Endangered Species Act (ESA) and the Migratory Bird Treaty Act (MBTA). Jurisdictional wetlands protected by the US Army Corps of Engineers under Section 404 of the Clean Water Act. The California Department of Fish and Game (CDFG), California Endangered Species Act, streams, water bodies, and riparian corridors covered under the Streambed Alteration Agreement process under Section 1600 of the CDFG Code, and under Section 3503.5, protecting wildlife and sensitive habitats.

Pacific Gas and Electric Company, Pit 3, 4, and 5 Hydroelectric Project FERC Project, CA. Wrote and prepared the terrestrial wildlife monitoring plan for monitoring terrestrial USDA-FS special-status species. The plan included detailed survey methods, schedules, monitoring to be implemented using protocol methods

or where accepted protocols were not in place utilizing best scientific methods and standards for surveying special-status species (e.g., bats, fisher, marten) as part of Article 405 U.S. Department of Agriculture-USDA_FS 4(e) Condition 23 as part of the conditions for relicensing.

U.S. Army Combat Support Training Center, Camp Parks, Dublin, CA. Conducted USFWS approved methodology for survey protocol for the San Joaquin kit fox including denning surveys, spotlighting, camera and scent stations. CDFG/California Burrowing Owl Consortium protocol and survey and mitigation standards, these activities included mapping of all active burrows including satellite burrows, on-site creation of burrows for mitigation, passive relocation, and exclusion of owls. Burrows were peeped with and inferred down-burrow scope, prior to excavation.

Riverside County Transportation Commission, State Route 79 Realignment Project, Western Riverside County, CA. Conducted USACE approved jurisdictional wetland and Waters of the U.S. delineation along the proposed realignment of State Route 79 between Domenigoni Parkway to Gilman Springs Road, on over 16 air miles within the San Jacinto Valley, on 5,466 acres. This survey were conducted in difficult arid region environments that included sodic and saline soils that prohibit standard field indicators of hydric soils, redoximorphic features (mottles) commonly found in more acidic soils.

Department of Energy, Western Area Power Administration (WAPA), Sierra Nevada Customer Service Region, CA. Team leader for wildlife and botany biologist conducting comprehensive surveys for threatened and endangered wildlife, plants, wetlands and Waters of the U.S., and habit typing on over 900 miles of existing transmission lines right-of-way and over 400 miles of approved access roads currently in use that provide power to Northern California. Surveys were conducted using GeoXT GPS units' aerial photos to provide sub-meter accuracy later to be integrated into WAPA's GIS system to be proactive in environmental issues relating to transmission line maintenance work. Included in responsibilities was instruction and accuracy in utilizing the GPS units to field team members.

Roseville Electric, Reason Farms North Parcel, Placer County, CA. Conducted USACE approved jurisdictional wetland and Waters of the U.S delineation on a 116-acre vernal pool grassland and a 112-acre rice field formerly farmed on this parcel. The verified delineation was used for compensatory habitat mitigation required to compensate the unavoidable impacts to wetlands impacted during construction of the Roseville Energy Park. Mr. Leighton assisted in jurisdictional wetland report preparation and submittal. Wetland and waters were mapped using Corps approved methods on aerial photographs and with a Trimble® GeoXT GPS unit capable of submeter accuracy for recording special data in an electronic version. This data was integrated into GIS information for use in overlaying electronic data onto aerial maps for the jurisdictional report submittal.

United States Marine Corps Base, Camp Pendelton, San Diego County, CA. Conducted the wetland and Waters of the U.S. delineation on over 16 miles of stream corridors, on one of four watersheds existing on the USMC Base. These surveys were conducted using approved methodology by the Army Corp of Engineers, and Wetland Delineation Manual. Instructed and responsible for use of GeoXT GPS units capable of submeter accuracy for recording various stream morphology data and stream channel locations along the 16 miles of waters and wetlands found within the study area. Prepared an Army Corps of Engineers-approved Wetland Delineation Report from field work conducted; which was approved by Base biologist and adopted as part of the Base's Integrated Natural Resource Management Plan requirements.

Pacific Gas and Electric, Geothermal, Inc. Facility Closure Project, Middletown, CA. Conducted pre-construction survey, nesting bird surveys, photographic documentation, daily logs, reports, agency interaction and monitored construction activities for CEQA/NEPA compliance for 12 months as part of a three year site closure procedures. Responsible for cultural monitors, and Native American monitors, permit requirements, removal of wetland donor soil, installation of wetland mitigation enhancement/creation, and native seed collection and planting of created pools and swales per permits. Coordinated with USFWS, and CDFG for the removal/relocation of several nesting birds within the project closure area during the breeding season. Mr Leighton prepared methodology procedures for relocation of nesting avian species that were approved by the State and Federal Agencies. These removal/relocations were allowed, do to well document data of species when eggs were laid, duration of incubation and high potential for addled eggs.

California Energy Center, Obsidian Energy Center LLC, Salton Sea Geothermal Plant Unit 6, Imperial County, CA. Conducted protocol surveys for burrowing owls at the proposed power plant site, associated linears and well pads. Prepared survey report, including GPS documentation, photographic documentation for the California Energy Commission (CEC), California Department of Fish and Game (CDFG), and U.S. Fish and Wildlife Service (USFWS) as part of the Conditions of Certification (COC). Including interactions with the CEC, and CDFG, unoccupied burrows were examined with a burrow scope and closed if burrows were unoccupied.

East Bay Municipal Utilities District, Mokelumne Aqueduct Maintenance and Seismic Upgrade, San Joaquin, CA. Conducted burrowing owls and Swainson's hawk surveys along Jones Tract, Lower Roberts Tract. Prepared weekly reports and interactions with EBMUD's biologist. Burrowing owl surveys were conducted during the early part of the breeding season and into the breeding season while upgrades were being performed.

Sacramento Municipal Utilities District, Consumnes Power Plant, Sacramento County, CA. Conducted protocol burrowing owl surveys, presence/absence Swainson's hawk surveys, raptor and song bird surveys along 26 miles of proposed pipeline alignment including the 30-acre power plant site. Prepared survey report, including GPS documentation, photographic documentation for the California Energy Commission (CEC), California Department of Fish and Game (CDFG), and U.S. Fish and Wildlife Service (USFWS) as part of the Conditions of Certification (COC).

Sacramento Regional County Sanitation District, Arden Force Main, Sacramento County, CA. Conducted elderberry surveys and reports of survey results along the American River pipeline alignment. This survey work included stem counts, presence/absence of exit holes, GPS documentation, using the USFWS' *Conservation Guidelines for Valley Elderberry Longhorn Beetle*.

Federal Highways, Blue Lakes Road, Alpine County, CA. Conducted Denning mammal surveys along 11.6 miles of Blue Lakes Road for Pacific Fisher, Sierra Nevada red fox, and American marten. Potential Pacific fisher, American marten, and Sierra Nevada red fox sign, (tracks, scat, burrows, etc.) were investigated and photographed, and details of the mammals' presence were recorded and compared to published data.

Kinder Morgan Energy Partners, Northern California System. On-call permitting coordinator (PC) for their Northern California Petroleum pipeline system. Conducted field surveys and monitoring, development of field reports and permit applications as well as negotiations with agencies to obtain all required approvals.

Federal Highways, Hyampom Road, Hayfork, CA. Conducted protocol-level surveys for Northern spotted owls along several miles of proposed road improvements for Hyampom Road in Hayfork California (from 2002 to 2006). Conducted surveys for several species of amphibian endemic to the region.

Calpine Corporation, Delta Energy Center, Contra Costa County. Biological monitor of 880-megawatt power plant. Conducted all forms of biological monitoring and surveys on power plant and associated linear facilities and HDD. Including ongoing annual avian collision studies, scavenger removal study along transmission lines associated with the power plant as part of their COC.

Calpine Corporation, Sutter Energy Center, Sutter County. Biological monitor of 500-megawatt power plant. Conducted all forms of biological monitoring and surveys on power plant and associated linear facilities and HDD. Including ongoing annual avian collision studies, scavenger removal study along transmission lines associated with the power plant as part of their COC.

Calpine Natural Gas, Sevenmile Slough HDD, Twitchell Island, Sacramento County. Full-time Biological Monitor on site during all construction and drilling

operations. Throughout construction activities, I shared knowledge, and answered questions with the various agency personnel that were on site to observe directional drilling operations, procedures, equipment, and steps that would be taken in the event of a "frac-out."

Kinder Morgan Energy Partners, Concord to Sacramento, CA. Implemented a worker environmental awareness program. Conducted pre-construction surveys biological monitoring and photo-documentation, focused on ensuring contractor compliance with Endangered Species Act, and Clean Water Act on various repair sites from Concord to Sacramento.

Caltrans ,Levee improvements, Sacramento County. Conducted protocol surveys for giant garter snake, burrowing owl and Valley elderberry longhorn beetle along several miles of levees from Interstate 5 to the Natomas Cross Canal. Monitored drill rigs for presence of giant garter snakes during all phases of work per California Department of Fish and Game regulations.

Pacific Gas and Electric Company, Line 401 Capacity Loops project, Burney and Modoc, CA. Focused biological surveys for rare plants, wetlands, special-status wildlife species, and noxious weeds along the two loops of the 401 Expansion Project. Conducted electronic database searches for existing literature, and consulted with resource agencies and/or other experts to develop a target list of potentially occurring special-status wildlife species. Part of a four person team which surveyed the study area using accepted protocols, and identified locations of special-status plants and wildlife species, including amphibians and reptiles. Assisted in producing a biological resource report.

Williams Communications Fiber Optic Installation, Nevada to Sacramento. Environmental compliance monitor from Nevada to Sacramento. Monitored fiber optic cable installation with regards to State, California Environmental (CEQA) and local permit compliance. Ensured sensitive species and associated habitat protection, including erosion control activities and Best Management Practices (BMPs). Monitored numerous horizontal direction drills (HDD). Worked with State agencies, California Public Utilities Commission (CPUC), Department of Fish and Game (DFG) and Union Pacific Railroad. Maintained comprehensive Field notes, documented daily activities, (NCRs) Non Compliance Reports, Non Compliance Report Resolutions (NCRRs), Variance requests and photo records.

San Joaquin County Department of Public Works Roads and Bridges. Field biologist for San Joaquin County's road maintenance projects and seismic retrofit projects. Duties include conducting biological assessments of each site, preparing Natural Environmental Studies (NES) for federally funded sites and conducting database searches, evaluating biological resource impacts and ensuring compliance with the Endangered Species Act and Clean Water Act on rapid turn-around public

works projects. Conducted nesting raptor searches and protocol surveys for Swainson's hawk and burrowing owl.

Turlock Irrigation District City of Patterson Transmission Line Project EIR. Conducted biological studies for a 250-mile proposed transmission line in Stanislaus County. Mapped potential fairy shrimp habitat, Swainson's hawk nesting locations, and site reconnaissance of potential substation and river crossing locations.

Airport Gateway Dollar Tree Distribution Site. Conducted intensive construction monitoring of an active Swainson's hawk nest for 6 weeks during earth moving and compaction associated with construction. Documented hawk activity and recorded construction activities. Upon completion, assisted in the preparation of a comprehensive monitoring report that was submitted to CDFG. Assisted in agency-mandated worker Environmental Awareness Training sessions to construction crews.

County of Sacramento Regional Wastewater Treatment Plant. Established restoration of native ecosystems to 2,500 acres, including; riparian, native bunch grasses and wetland ecosystems. Conducted trapping, measuring and tagging on California golden beaver for population densities and age structure analysis. Conducted trapping and den census for population concentration on muskrat. Preformed waterfowl counts during the migratory season. Built mitigation mounds for burrowing owls, and monitored structures for occupancy and brood success. Conducted water quality analysis for pilot study on the alternative treatment of tertiary treated water in a constructed wetland facility.

Deganiawidah Quetzalcoatl University Riparian Restoration Project. Developed and implemented restoration plan for one half mile of realigned stream. Interacted with U.S. Fish and Wildlife Service and Yolo Regional Conservation District agencies in the cost share partnership of habitat improvements. Stream channel was restored to its historic condition through the use of earth-moving equipment to terrace the deeply incised channel. Stream banks were planted with native perennial grasses, native trees and shrubs were added to create the historic upper and lower riparian canopy with a diverse flora base.

Silva Ranch Vernal Pool Monitoring. Conducted quantitative analysis of vernal pool vegetation within created and pre-existing vernal pools, to comply with 5-year monitoring protocol.

Weston Ranch / Suncal Housing Development NES. Conducted biological studies for 150 acres within the project site. Conducted Burrowing Owl Consortium protocol nesting surveys to determine burrowing owl population within the project site. Evaluated biological resource impacts. Supervised construction crews within or in close proximity to habitats of sensitive species.

Forest Stand Exams; USDA Forest service, Deschutes National Forest; OR. Field crew leader for conducting intensive forest stand exams on 55,000 acres of the Deschutes National Forest. Responsible for data management and Quality control of over 12,000 individual sample points, including forest measurements, forest disease evaluation, habitat evaluation, and sensitive plant and wildlife surveys. Assisted in coordination and organization of crewmembers, including subcontractors, for field data collection.

Ringtail Population Monitoring Project. Student research assistant for ringtail populations studies in Brockman Canyon, South Sutter Buttes, CA. Assisted with trapping, measuring and tagging ringtails.

County of Sacramento Regional Wastewater Treatment Plant. Field assistant for full protocol giant garter snake surveys of Laguna Creek for pipeline construction.

References

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Appendix E
Wildlife Observation Form

WILDLIFE OBSERVATION FORM

To Record Animals Found In Mariposa Energy Project Work Areas

To be filled out by personell who find active nest sites and burrows, dens, and dead or injured wildlife, or other biological resources during daily construction activities.

Name of employee:

Date:

Location of observation:

Wildlife Species:
Condition of wildlife:
alive ☐ dead ☐

Possible cause of injury or death:

Where is the animal currently?

Is the resource in danger of project (or other) impacts?

Comments:

Please contact the Designated Biologist for questions and to report any wildlife, nest, or den in the project area that could be disturbed. The Designated Biologist will advise personnel on measures required by California Department of Fish and Game (CDFG) and United States Fish and Wildlife Service (USFWS) to protect fish, wildlife and vegetation from construction impacts.

DESIGNATED BIOLOGIST: Todd Ellwood Cell (408) 839-2402 Office (415) 541-7220
BIOLOGICAL FIELD MONITORS: TBD

COMPANY: CH2MHILL ADDRESS: 2485 Natomas Park Drive, St. 600

Appendix F
Noncompliance Resolution Report

Mariposa Energy Project
DAILY ENVIRONMENTAL MONITORING LOG

Date:____/_____/__Monitor(s): _____
Weather: _____ Page ___ of ___

A	Follow-Up Required? **Y / N**	**Subject:** Earthwork Erosion Control Revegetation Other
Follow-up date: / /		Construction Activities:
Photos? **Y / N**		
Roll: Frame(s):		Observation Summary:
Location:		
Additional Notes or Sketch:		

B	Follow-Up Required? **Y / N**	**Subject:** Earthwork Erosion Control Revegetation Other
Follow-up date: / /		Construction Activities:
Photos? **Y / N**		
Roll: Frame(s):		Observation Summary:
Location:		
Additional Notes or Sketch:		

C	Follow-Up Required? **Y / N**	**Subject:** Earthwork Erosion Control Revegetation Other
Follow-up date: / /		Construction Activities:
Photos? **Y / N**		
Roll: Frame(s):		Observation Summary:
Site Location:		
Additional Notes or Sketch:		

Mariposa Energy Project
PRE-ACTIVITY SURVEY FORM

Instructions: Fill out this form within 24 hours of completing the pre-activity survey. Maintain completed forms in the Designated Biologist's office.

Date: _____ Name: _____

General Location: _____

Description of Proposed Activity:[1] _____

Habitat Description and Sensitive Plant Species:[2] _____

Presence of Sensitive Wildlife Species:[3] _____

Avoidance Measures:[4] _____

Comments:[5] _____

Notes:
[1]= Include type and purpose of construction activity.
[2] = Identify habitat types, sensitive plant species
[3] = List the sensitive wildlife species present on the site and the number of sightings or sign that lead to the determination of their presence.
[4] = List the avoidance measures that will be implemented during construction activities, whether construction monitoring will be necessary (include brief summary of manpower requirements for monitoring), whether species trapping and holding or trapping and immediate release efforts will be conducted, and any other pertinent information. Include locations of avoidance areas, excavated dens, etc. on map.
[5] = Include any other information of importance. Also use this section to request specific instructions or information from the permitting agencies.

Mariposa Energy Project
NON-COMPLIANCE RESOLUTION REPORT

❑ **NON-COMPLIANCE REPORT** ❑ **RESOLUTION REPORT**

Date of Report: / / _____ Date/time of non-compliance violation: / / **AM / PM**

Non-Compliance Report Date: / / _____ Date Time

Monitoring Log Attached? **Y / N** General location of non-compliance: _____

Location Designation: _____ Layout(s): _____

Designated Monitor: _____

Level of Violation:

❑ **Level 1** Violations that do not result in significant impacts but require corrective action

❑ **Level 2** Violations that place environmental resources at an unnecessary risk and require immediate corrective action

Compliance Specification(s): _____

❑ **Level 3** Actual or imminent danger to environmental resources from a specific construction task or piece of equipment. Requires immediate corrective action.

Summary of Violation and Details of Corrective Action Required: _____

Notifications:

CPM:	Date: / /	Time:	AM/PM
Project:	Date: / /	Time:	AM/PM
Owner:	Date: / /	Time:	AM/PM

Appendix G
California Red-legged Frog and California Tiger Salamander Mitigation and Monitoring Plan

BIO-10

California Red-legged Frog and California Tiger Salamander Management Plan for the Mariposa Energy Project (09-AFC-03C)

Submitted to the

California Energy Commission

Submitted by

Mariposa Energy, LLC

June 2011

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Section **Page**

California Red-legged Frog and California Tiger Salamander Management Plan 1
1.0 Introduction.....1
2.0 Project Description 1
3.0 Proposed Mitigation Measures.....2
3.1 Preconstruction Surveys 2
3.2 Avoidance and Minimization 2
3.3 Capture and Relocation 5
4.0 Monitoring.....8
5.0 Reporting 8
6.0 Adaptive Management 9

Figure

Location of CRLF and CTS Relocation Sites

California Red-legged Frog and California Tiger Salamander Management Plan

1.0 Introduction

This document provides a mitigation and monitoring plan for California red-legged frog (CRLF, *Rana draytonii*) and California tiger salamander (CTS, *Ambystoma californiense*). This plan is being provided to meet Condition of Certification (COC) BIO-10 set by the California Energy Commission (CEC) for the proposed Mariposa Energy Project (MEP) (09-AFC-03C) and will be incorporated into the MEP Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP).

Implementation of this plan will provide for the protection and monitoring of CRLF and CTS that may be affected by project-related construction activities. The avoidance, minimization, and monitoring measures proposed in this plan are subject to final approval by the U.S. Fish and Wildlife Service (USFWS) and CEC's Compliance Project Manager (CPM) in consultation with the California Department of Fish and Game (CDFG).

2.0 Project Description

MEP will be a nominal 200-megawatt (MW), simple-cycle generating facility consisting of four power blocks. Each power block will contain one GE LM6000 PC-Sprint natural-gas-fired combustion turbine generator. The generated power will be delivered to the grid via Pacific Gas and Electric Company's (PG&E) Kelso Substation. The new facility will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards. The main access to the facility site will be from Bruns Road. A portion of the site will be paved to provide internal access to all project facilities and onsite buildings. The areas around equipment, where not paved, will have gravel surfacing. The project also includes: a new, approximately 0.7-mile-long, 230-kilovolt (kV) transmission line to deliver the plant output to the electrical grid via the existing 230-kV Kelso Substation located north of the project site; approximately 580 feet of new natural gas pipeline that will run directly northeast from the project site to interconnect with PG&E's existing high-pressure natural gas pipeline; and a new 1.8-mile water supply line from the Byron-Bethany Irrigation District Canal 45 to deliver raw water to the project site.

The facility site is in northeastern Alameda County, in an unincorporated area designated as Large Parcel Agriculture by the East County Area Plan. The site is located approximately 7 miles northwest of Tracy, 7 miles east of Livermore, 6 miles south of Byron, and approximately 2.5 miles west of the community of Mountain House in San Joaquin County. The facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of an approximate 158-acre parcel immediately south of the Bethany Compressor Station and 230-kV Kelso Substation, both owned by PG&E. The proposed power plant site is located in the southern portion of the project parcel. The existing, unrelated 6.5-MW Byron Power Cogen Plant occupies 2 acres of the 158-acre parcel

northeast of the proposed MEP site. The remainder of the parcel is non-irrigated grazing land and will remain as such during MEP operation. A wind turbine development was once located on the southern portion of the parcel, including the MEP site. Concrete foundations and other miscellaneous debris, including remnants of turbine housings, remain onsite.

3.0 Proposed Mitigation Measures

Construction of MEP will entail ground-disturbing activities that could directly or indirectly affect CRLF and CTS. This section presents proposed mitigation measures to minimize or eliminate impacts on frogs or salamanders if they are found onsite.

3.1 Preconstruction Surveys

Clearance surveys within the exclusionary fence will be conducted by the Designated Biologist and/or Biological Monitor 48 hours to 1 week prior to ground disturbance. In addition, after the first major rain event (as agreed upon with the CPM, in consultation with CDFG and USFWS), clearance surveys will be conducted within the exclusionary fence before construction commences. If CRLF or CTS are discovered during pre-construction surveys, individuals will be relocated to a CPM- (in consultation with CDFG) and USFWS-approved site. For relocation procedures, refer to Section 3.3 of this plan. Only biologists approved by USFWS, CDFG, and the CPM will capture and relocate these species.

No less than 10 days prior to the start of any ground-disturbing activities or construction equipment staging (unless a shorter review period is approved by USFWS, CDFG, and the CPM, Mariposa Energy, LLC (the project owner) will provide a letter-report to the CPM describing the findings of the preconstruction surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed, number of CTS and CRLF observed and moved, and location to which they were moved. Mariposa Energy will report monthly to USFWS, CDFG, and the CPM for the duration of construction on the implementation of CTS and CRLF avoidance and minimization measures. Within 30 days after completion of construction, Mariposa Energy will provide a written construction termination report to USFWS, CDFG, and the CPM identifying how mitigation measures described in the plan have been completed.

3.2 Avoidance and Minimization

Mariposa Energy will work with the Designated Biologist or Biological Monitor to site the least damaging temporary access routes and locations for temporary work areas during construction. These work areas will be positioned in a manner that avoids or minimizes impacts on CRLF and CTS habitat to the furthest extent feasible. A Biological Monitor will be present during all linear route construction.

Mariposa Energy, in consultation with the Designated Biologist, will implement the following CTS and CRLF management measures at the construction site and related facilities to avoid and minimize impacts on CRLF and CTS. Construction and operation management measures are described below.

3.2.1 MEP Construction

1. Avoidance: Concentrations of small mammal burrows and other refugia that may support CRLF or CTS will be avoided to the extent feasible. Prior to ground disturbance, linear routes will be mapped, marked in the field, and surveyed for burrows. Burrows within a vehicle access route that cannot be avoided and are susceptible to being crushed will be temporarily reinforced with PVC pipe or by other measures as deemed effective by the Designated Biologist or Biological Monitor, and approved by the CPM (in consultation with CDFG and USFWS) (dry season only) prior to allowing vehicle access. Any reinforcing materials will be removed immediately after access is completed.

2. Install Exclusionary Fencing: Prior to any site work, including debris removal, a solid barrier fence will be installed around the power plant site, laydown area, gas line, and access road, and will remain in place for the duration of the project. A partial wildlife exclusion fence will also be established along the eastern right-of-way of the water supply pipeline corridor to deter CTS and CRLF from entering the disturbance area from adjacent aquatic drainages. Additionally, the Biological Monitor will perform full-time construction monitoring during construction of the water line. The design and location of the exclusion fence are presented in a separate fencing plan. The Biological Monitor will survey and delineate the fence route, and will be present during fence installation. Exit funnels for CTS and CRLF will be provided. The exclusion fence will be routinely inspected for good repair for the duration of construction; any damage, such as holes or gaps, will be repaired immediately.

3. CTS and CRLF Relocation: CRLF and CTS found in or near the construction site and along Bruns Road during road monitoring (see item "9" below) will be captured and relocated by the Designated Biologist or Biological Monitor following the procedures outlined in Section 3.3 of this plan.

4. Linear Routes

    a. Before disturbance of aquatic habitat, the Designated Biologist or Biological Monitor will check for CRLF and CTS within the aquatic habitat or surrounding area.

    b. Before the start of linear work each morning, the Designated Biologist or Biological Monitor will check for CRLF and CTS under any equipment such as vehicles and stored pipes. The Biological Monitor will check all excavated steep-walled holes or trenches each morning before sunrise for any CRLF and CTS. CRLF and CTS will be removed by the Designated Biologist or Biological Monitor and relocated to the USFWS- and CPM-approved (in consultation with CDFG) relocation site (see Section 3.3). All excavated holes or trenches deeper than 6 inches located outside the MEP site will be ramped at the end of the work day, or escape boards will be placed in the trench to allow the animals to escape.

5. Timing: Construction outside of fenced areas (for example, transmission line and water line) will be scheduled to occur during the dry summer months between June 15 and October 15. Work will not take place outside of fenced areas during the wet season, unless approved by USFWS and the CPM (in consultation with CDFG).

6. Environmentally Sensitive Areas (ESA): An ESA fence (for example, orange exclusion fence) will be installed as necessary along linear routes to protect offsite habitat

including potential breeding sites. A separate fencing plan includes a map showing the preliminary location of the ESA fence for the project. Construction personnel will not enter the ESAs.

7. Speed limit: A 10-mile-per-hour speed limit will be enforced at all construction sites, except on roads with a posted speed limit. On roads with posted speed limits, construction traffic will go the minimum safe speed.

8. Bruns Road and Access Road Monitoring: During wet-season construction, approximately mid-November through mid-June (though earlier or later if conditions are wet and CRLF and CTS are observed) if large volumes of construction traffic (25 vehicles or more) are scheduled to arrive or depart after dusk or before dawn, frogs and salamanders moving between breeding sites and burrows will be protected by:

    a. A wildlife exclusion fence will be installed on both sides of Bruns Road from the project site to Kelso Road. During wet-season construction, worker traffic will be directed away from Bruns Road north of Kelso Road, and be required to use Kelso Road and Mountain House Road east of the project site.

    b. Biological monitors will walk the exclusion fence along Bruns Road to detect any CTS or CRLF. This will be completed daily concurrently with other biological monitoring duties. Any CTS or CRLF that are detected will be moved by the biologist only if, in the biologist's judgment, the animal would be in danger from vehicles.

        i. The Project Owner will contact the CPM to indicate when the construction traffic threshold is anticipated to be met, and therefore when exclusion fence and surveys are anticipated.

9. Throughout wet-season construction (including when surveys have not been conducted) as soon as practicable after the work crew arrives or departs, the biologist will walk or drive slowly along the survey route to determine if any CTS or CRLF have been affected. Any dead or injured CTS or CRLF will be reported as described in COC BIO-7, Item #14 contained in the BRMIMP. In the event that dead or injured CTS or CRLF are found, the biologist will consult with USFWS, CDFG, and the CPM to determine which, if any, adaptive management measures will be implemented. These measures may include more frequent surveys (lower traffic threshold), more intensive surveys, or controlled arrival and departures of construction traffic.

10. Best Management Practices (BMP): BMPs listed in the stormwater pollution prevention plan will be implemented during project construction to protect against adverse effects on sensitive aquatic areas. Dust control measures will be implemented during construction in the dry season. Work areas and dirt access roads will be watered regularly to minimize airborne dust and soil particles generated by construction.

3.2.2 MEP Operation

A barrier on the permanent fence sufficient to block access to the power plant site by CRLF and CTS will be installed. Within 60 days of completion of the permanent power plant site

fence, the Mariposa Energy will submit a map and photographs to USFWS, CDFG, and the CPM of the CTS and CRLF barrier fence.

3.3 Capture and Relocation

Project construction is anticipated to affect two breeding cycles involving both wet and dry seasons for CRLF and CTS. Occurrences that may be encountered during construction are anticipated in upland areas only when animals are either aestivating (during dry season) or on the move (during the wet season). The project will not affect known and potential breeding habitat for these species. CRLF and CTS encountered during construction will be treated on a case-by-case basis in coordination with the USFWS and CDFG. The following will occur under the direction of the USFWS- and CPM-approved (in consultation with CDFG) biological monitor:

1. Leave the non-injured animal if it is not in danger
2. Move the animal to a nearby location if it is in danger
3. Take the animal into custody for educational outreach and/or scientific research if the first two options are unavailable

These three options are further described below.

1. Leave the non-injured animal if it is not in danger

When a CRLF or CTS is encountered in the work area, the first priority will be to stop all activities in the surrounding area that have the potential to result in take of the individual. The Biological Monitor will assess the situation and select an appropriate course of action that will minimize the impact on the individual. Once the site is secure, a representative of Mariposa Energy will contact USFWS, Division of Endangered Species, at (916) 414-6600 for further direction. If a CTS is encountered, the CPM and CDFG will also be contacted.

The first priority is to avoid contact with the frog or salamander and allow it to move out of the work area on its own to a safe location. The animal will not be picked up and moved. This guidance only applies to situations where a frog or salamander is encountered on the move during conditions that make upland travel feasible (which is usually during the wet season). This does not apply to frogs or salamanders that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the life history of the animal should they move outside the construction footprint.

Avoidance is the preferred option if the frog or salamander is not moving and is using aquatic habitat or is within some sort of burrow or other refugia. The area should already be well marked for avoidance and a USFWS- and CPM-approved (in consultation with CDFG) biological monitor should be assigned to the area when work is taking place nearby.

2. Move the animal to a nearby location if it is in danger

Option #1 will not always be feasible and sometimes capturing and moving (salvaging) the animal is the only option to prevent its death or injury. Two proposed release locations have been identified for CRLF and CTS, as shown on Figure 1. All releases will be coordinated with USFWS, CDFG, and the CPM. In most situations, and regardless of season, the release site will be into the mouth of a small mammal burrow or other suitable refugia that provides immediate cover from potential predation. Releases will occur in the immediate vicinity of

aquatic habitat. No animal will be relocated to another property without the property owner's written permission, arranged for by Mariposa Energy.

The preferred release location is the Byron Conservation Bank, owned by CDFG. The CDFG property supports known breeding populations of both frog and salamander. A series of breeding pools occurring along an intermittent drainage would be suitable release sites for CRLF. A salamander breeding pond recorded in the California Natural Diversity Database (CNDDB) and the surrounding small mammal burrows located near the southeastern corner of the bank property would be a suitable release site for CTS. Access to the Byron Conservation Bank property would be closely coordinated with CDFG each time a frog or salamander is released.

An alternate release location for frog and salamander is the proposed Mountain House Mitigation Bank property (Figure 1). The property is privately owned by Mr. Robert Fletcher, who is currently developing it as a special-status species mitigation bank. Potentially suitable frog aquatic breeding and aquatic non-breeding habitat occurs onsite along an intermittent drainage (Figure 1). This drainage would be the release site for CRLF. The property is known to support breeding habitat of CTS, as recorded in the CNDDB (see Figure 1, southern pond). The two onsite stock ponds, including the surrounding burrow refugia, would be the release sites for CTS. Access to the property would be closely coordinated with Mr. Fletcher, or his appointee, each time a frog or salamander is released.

The following summarizes handling and transport procedures that will be implemented:

1. All field decisions concerning salvage activities by the Designated Biologist will be coordinated with USFWS (CTS and CRLF) and the CPM (in coordination with CDFG [CTS]).
2. Any CRLF or CTS individuals requiring transport will be released into habitat (within the property locations described above) equivalent to that from which it was removed.
3. Individual species observed migrating or dispersing on the surface, or aestivating within a burrow in upland habitat, will be released at the mouth of a ground squirrel burrow opening. The approved biologist will not vacate the release site until it is clear that the individual has entered the burrow. No more than one individual will be released into a single burrow repository, and the burrow location will be marked on a map using global position system technology so that it will not be used for any future releases. In the unlikely event that the numbers of salvaged individuals exceed the identified individual sites designated for release, coordination with USFWS, CDFG and the CPM to determine the feasibility of releasing individuals to the same repository will occur.
4. Individuals will not be moved distances longer than their appropriate dispersal range from suspected breeding habitats to avoid transferring disease or pathogens between aquatic habitats.
5. Entrapment time will be minimized to the extent practicable.
6. Nets or bare hands will be used.
7. The biologist will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating CRLF or CTS.

8. Biologists will avoid reaching for amphibians by the tail, head or limbs.
9. Containers used for holding or transporting adults will not contain any standing water. Captured adult amphibians will be kept moist, cool, and aerated environment, such as a bucket containing a damp sponge, and minimize periods of direct sun exposure.
10. Individual animals will not be placed in positions/containers where they may physically contact other individuals.
11. If available, vegetation clippings from the exact capture location will be placed in the container to help shade and calm the individual during transport. The vegetation will be discarded with any other plant materials, as specified in the following summary for disinfection.

Several amphibian diseases may be involved in amphibian declines and may be spread by relocating animals. Therefore, due to concerns regarding genetic and health issues and adverse effects on other CRLF and CTS, the long-distance relocation of frogs and salamanders on this project (i.e., out of the watershed) will not occur.

Only USFWS-, CDFG-, and CPM-approved biologists for the project will attempt to salvage CRLF and CTS. To avoid transferring disease or pathogens between sites during the course of handling the animals, the biologists will use the following guidance for disinfecting equipment and clothing. These recommendations are adapted from the Declining Amphibian Population Task Force's Code, which can be found in their entirety at: http://www.open.ac.uk/daptf/

- All project work will avoid aquatic habitats, therefore capture and relocation of CRLF and CTS will occur within dry upland areas. All dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, that would otherwise potentially harbor disease or pathogens will be avoided.
- Boots, containers, etc., will then be scrubbed with either a 70% ethanol solution, a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water), QUAT 128 (quaternary ammonium, use 1:60 dilution), or a 6% sodium hypochlorite 3 solution and rinsed clean with water. Cleaning equipment in the immediate vicinity of a pond or wetland will be avoided. All traces of the disinfectant will be removed before re-entering the relocation site.
- Used cleaning materials (liquids, etc.) will be disposed of safely, and if necessary, taken back to a lab for proper disposal.
- The handling biologists will limit the duration of handling and captivity. While in captivity, individual frog or salamanders will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge or cloth. Containers used for holding or transporting will not contain any standing water and will be disinfected before reuse.

3. Take the animal into custody for educational outreach and/or scientific research if the first two options are unavailable

If frogs or salamanders cannot be moved either because of injury or death, the individuals will be used for outreach and/or research. Delivery of individuals to the recipient will be coordinated with USFWS and the CPM (in coordination with CDFG). Unless otherwise directed, frogs and salamanders will be delivered to the Shaffer Lab at the University of California at Davis. Dr. H. Bradley Shaffer and the laboratory staff can be reached at (530) 752-2939 or hbshaffer@ucdavis.edu.

4.0 Monitoring

The mitigation measures presented in this plan are designed to minimize or eliminate the potential adverse effects of the project on CRLF and CTS. Ultimately, USFWS, CDFG, and the CPM will review and approve these measures before they are implemented onsite. To assess the effectiveness of the proposed mitigation measures, monitoring is included as part of this plan. If CRLF or CTS are identified onsite during the preconstruction survey, the following monitoring measures will be implemented, in coordination with USFWS and the CPM (in coordination with CDFG):

1. Record effects on CRLF and CTS during project construction and report these findings to USFWS, CDFG, and the CPM in the monthly and final compliance reports written by the Designated Biologist.

2. The Designated Biologist or Biological Monitor will conduct as-needed monitoring visits during the summer season and daily monitor visits during the winter season following the preconstruction survey until the completion of all project work areas to determine status and effectiveness of this management plan. The Designated Biologist will provide the results of the monitoring surveys and any recommendations to improve the effectiveness of take avoidance in the monthly compliance report. Any agency-approved remedial actions will be implemented immediately and monitored for their success by the Designated Biologist or Biological Monitor.

5.0 Reporting

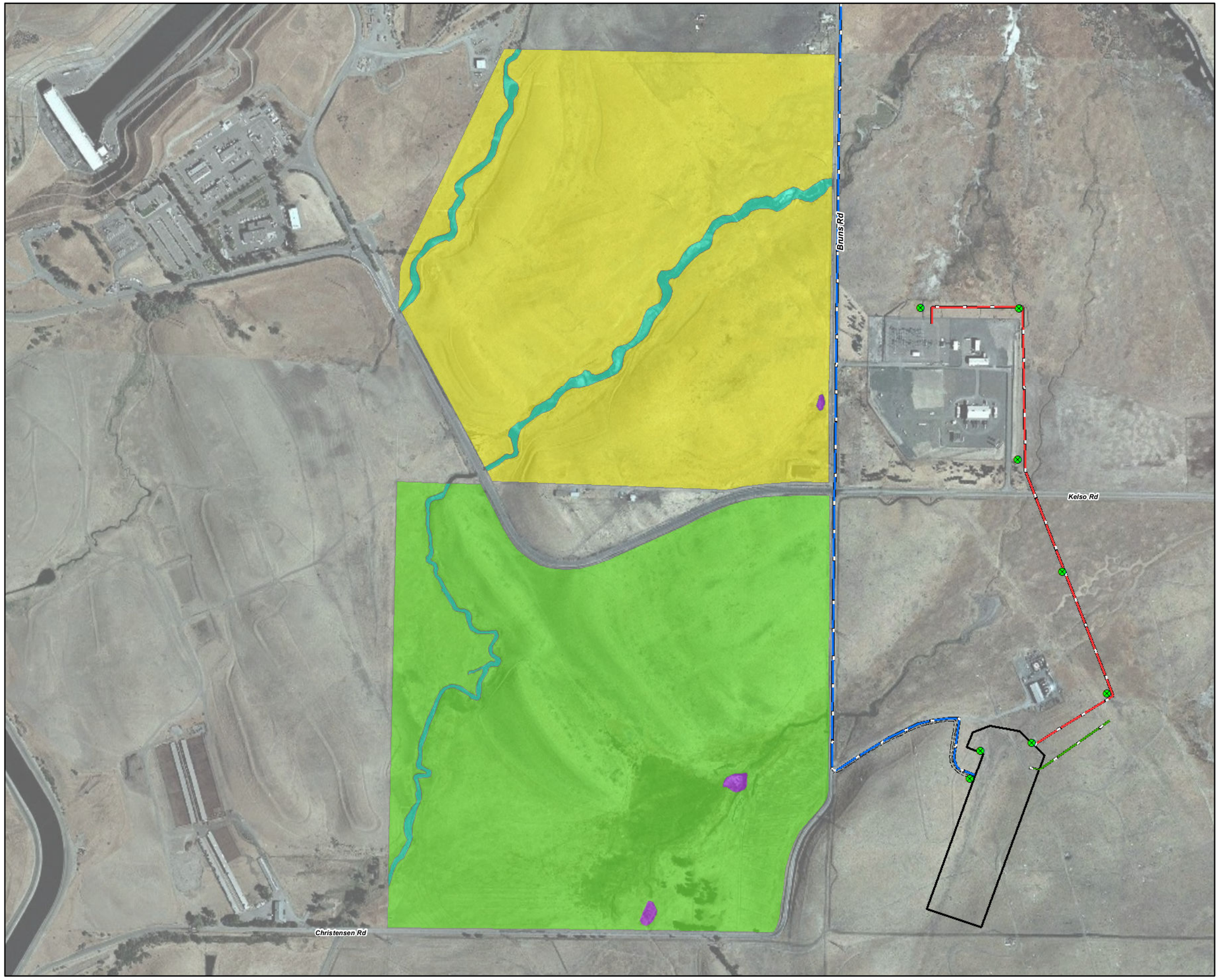
Any injuries, fatalities, or other unforeseen circumstances regarding CRLF and CTS will be reported to USFWS, CDFG, and the CPM within 24 hours. Construction monitoring for onsite CRLF and CTS will be reported on a monthly basis by the Designated Biologist, and the results of the monitoring effort will be included in the MEP monthly compliance report to be submitted to USFWS, CDFG and the CPM.All monitoring reports will generally include the following information:

- Survey methodology, including date and time of visits
- Description of the site including location, size, topography, and vegetation communities
- Photographs of the site
- Map showing the location and number of all CRLF and CTS observed
- Names of biologists conducting the survey

6.0 Adaptive Management

To manage any unforeseen conditions that may arise, adaptive management may be required to ensure that take of CRLF and CTS is minimized, or if possible completely avoided. Adaptations may include implementing new mitigation measures as appropriate based on the actual effects of the project on CRLF and CTS, and, as feasible, implement new mitigation measures developed by amphibian experts.

During construction, Mariposa Energy will work collaboratively with USFWS, CDFG, and the CPM to ensure that the most effective and reliable mitigation measures are implemented for the protection of CRLF and CTS. Adaptive management measures may include more stringent seasonal work restrictions, full-time construction monitoring regardless of season, and/or additional biological monitors. These measures will be considered if it appears that avoidance and minimization success are not being met.



LEGEND

- POWER POLE LOCATION
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- PROJECT SITE

Frog and Salamander Relocation Sites

- California Department of Fish and Game Byron Mitigation Bank
- California Red-legged Frog Breeding and Aquatic Non-breeding Habitat
- California Tiger Salamander Breeding Habitat
- Proposed Mountain House Mitigation Bank

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

N

0 500 1,000
Feet

FIGURE 1
PROPOSED CAIFORNIA RED-LEGGED FROG AND CALIFORNIA TIGER SALAMANDER RELOCATION SITES
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC P:\DIAMOND_376670\MAPFILES\MARIPOSA\MAPFILES\RED-LEGGED_FROG_AND_CALIFORNIA_TIGER_SALAMANDER_RELOCATION.MXD GPERDEW 4/25/2011 8:22:39 AM

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Appendix H
San Joaquin Kit Fox
Mitigation and Monitoring Plan

BIO-14

San Joaquin Kit Fox Management Plan for the Mariposa Energy Project (09-AFC-03C)

Submitted to the

California Energy Commission

Submitted by

Mariposa Energy, LLC

May 2011

With Assistance from

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Contents

Section **Page**

San Joaquin Kit Fox Management Plan 1
1.0 Introduction 1
2.0 Project Description 2
3.0 Regulatory Status for San Joaquin Kit Fox 2
4.0 Proposed Mitigation Measures 3
4.1 Preconstruction Surveys 3
4.2 Avoidance 4
4.3 Den Destruction 4
4.4 Construction and Operational Requirements 5
5.0 Monitoring 7
6.0 Reporting 8
7.0 Success Criteria 8
8.0 Adaptive Management 8
9.0 References 9

San Joaquin Kit Fox Management Plan

1.0 Introduction

This document provides a management plan for San Joaquin kit fox (*Vulpes macrotis mutica*). This plan is being provided to meet Condition of Certification (COC) BIO-14 set by the California Energy Commission (CEC) for the proposed Mariposa Energy Project (MEP) (09-AFC-03) and will be incorporated into the MEP Biological Resources Mitigation, Implementation and Monitoring Plan.

The San Joaquin kit fox is the smallest fox in North America, with an average body length of 20 inches and weight of about 5 pounds. It is a member of the Canidae family, which includes dogs, wolves, and foxes. San Joaquin kit foxes are lightly built, with long legs and large ears. Their coat ranges from tan to buff gray in the summer to silvery gray in the winter. Their belly is whitish and their tail is black-tipped (USFWS, 2011). In the northern portion of their range, which includes the MEP project area, kit foxes have been found to most frequently consume California ground squirrels. Cottontails, black-tailed hares, pocket mice, and kangaroo rats also are also part of the kit fox diet. Although ground squirrels are diurnal and kit foxes are predominantly nocturnal, kit foxes are commonly seen during the day during late spring and early summer (USFWS, 1998).

Kit foxes can breed when 1 year old, but may not breed their first year of adulthood. Adult pairs remain together all year, sharing the home range but not necessarily the same den. During September and October, adult females begin to clean and enlarge natal or pupping dens (they select dens with multiple openings). Mating and conception take place between late December and March. The median gestation period is estimated to range from 48 to 52 days. Litters of from two to six pups are born sometime between February and late March (USFWS, 1998).

Kit fox dens most often are located on the lower section of a hill. In the northern portion of the kit fox range, where the MEP is located, dens appear to be located higher than most surrounding ground compared to areas farther south, perhaps reflecting the topography of the area. Most northern region dens lack the ramp or runway characteristic of dens in the southern and central portions of their range. Kit foxes probably enlarge California ground squirrel burrows, but they also may construct their own dens. Kit foxes often change dens and numerous dens may be used throughout the year. However, evidence that a den is in use may be absent. Kit fox change dens four or five times during the summer months, and change natal dens one or two times per month. Den changes have been attributed to depletion of prey in the vicinity of the den or to increases in external parasites such as fleas. Avoidance of coyotes is a more probable reason for frequently changing dens (USFWS, 1998).

In California, kit fox are understood to have a home range of approximately 1 to 2 square miles. (California Department of Fish and Game [CDFG], 2011). No sign of kit fox was observed within the proposed project area during reconnaissance-level surveys in 2010 conducted for the project. However because kit fox are often difficult to detect and leave

very little sign at burrow entrances, implementation of this management plan will provide for the protection and monitoring of kit fox that may be detected during the course of project construction.

The avoidance, minimization, and monitoring measures being proposed in this plan are subject to final approval by the CEC's Compliance Project Manager (CPM) in consultation with CDFG and the U.S. Fish and Wildlife Service (USFWS). This plan follows the guidelines provided by the USFWS *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or during Ground Disturbance* (1999).

2.0 Project Description

MEP will be a nominal 200-megawatt (MW), simple-cycle generating facility consisting of four power blocks. Each power block will contain one GE LM6000 PC-Sprint natural-gas-fired combustion turbine generator. The generated power will be delivered to the grid via Pacific Gas and Electric Company's (PG&E) Kelso Substation. The new facility will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations and standards. The main access to the facility site will be from Bruns Road. A portion of the site will be paved to provide internal access to all project facilities and onsite buildings. The areas around equipment, where not paved, will have gravel surfacing. The project also includes: a new, approximately 0.7-mile-long, 230-kV transmission line to deliver the plant output to the electrical grid via the existing 230-kV Kelso Substation located north of the project site; approximately 580 feet of new natural gas pipeline that will run directly northeast from the project site to interconnect with PG&E's existing high-pressure natural gas pipeline; and a new 1.8-mile water supply line from the Byron-Bethany Irrigation District Canal 45 to deliver raw water to the project site.

The facility site is in northeastern Alameda County, in an unincorporated area designated as Large Parcel Agriculture by the East County Area Plan. The site is located approximately 7 miles northwest of Tracy, 7 miles east of Livermore, 6 miles south of Byron, and approximately 2.5 miles west of the community of Mountain House in San Joaquin County. The facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of an approximate 158-acre parcel immediately south of the Bethany Compressor Station and 230-kV Kelso Substation, both owned by PG&E. The proposed power plant site is located in the southern portion of the project parcel. The existing, unrelated 6.5-MW Byron Power Cogen Plant occupies 2 acres of the 158-acre parcel northeast of the proposed MEP site. The remainder of the parcel is non-irrigated grazing land and will remain as such during MEP operation. A wind turbine development was once located on the southern portion of the parcel, including the MEP site. Concrete foundations and other miscellaneous debris, including remnants of turbine housings, remain onsite.

3.0 Regulatory Status for San Joaquin Kit Fox

The San Joaquin kit fox was listed as endangered by the U.S. Department of the Interior in 1967, and by the State of California in 1971.

4.0 Proposed Mitigation Measures

Implementation of the measures presented in this plan may be necessary to avoid violating the provisions of the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA). Both the federal ESA and CESA prohibit "take" (defined as killing, harming, or harassing a listed species, including actions that damage or destroy its habitat). Such protection measures may also be required under the terms of a biological opinion pursuant to section 7 of the ESA and CEC Conditions of Certification (in coordination with CDFG pursuant to CESA) resulting in incidental take authorization. Construction of MEP will involve ground-disturbing activities that could directly or indirectly affect kit fox. This section presents proposed mitigation measures to minimize or eliminate impacts on kit fox if they occur onsite.

4.1 Preconstruction Surveys

Before project construction begins, biologists approved by USFWS and the CPM (in consultation with CDFG) will conduct preconstruction surveys for San Joaquin kit fox dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads.

Preconstruction surveys will be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to affect San Joaquin kit fox. Surveys will follow established protocols or guidance provided in this plan. Survey results will identify habitat features on the project site. An evaluation of potential habitat use by kit fox will be included in a discussion of the survey results and if possible, will include an assessment of the potential impacts on kit fox by proposed project activities. The status of all kit fox dens will be determined and mapped. If occupied dens are detected, each den will be classified as a known, potential, atypical, or natal/pupping den.

4.1.1 Survey Methodology

The Designated Biologist and/or Biological Monitors will conduct pedestrian transect surveys that achieve 100 percent visual coverage for potential San Joaquin kit fox dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads. Ground burrows with openings between 4 and 12 inches in diameter for a minimum of 36 inches in depth will be evaluated for evidence of San Joaquin kit fox occupation. To determine the presence of San Joaquin kit fox, the potential den will be fully excavated to the end by either hand or machinery. Once determined empty, the den will be filled with dirt and compacted to ensure that San Joaquin kit fox cannot enter or use the den during the construction period.

If any potential den is determined to be currently or previously used by San Joaquin kit fox, measures for natal and non-natal dens (as applicable) will be followed. Any natal dens encountered will be avoided by a minimum of 100 feet for known dens and a minimum of 50 feet for potential dens. Non-natal dens will be monitored for a minimum of three days to determine their current use.

4.2 Avoidance

4.2.1 Exclusion Zones

The configuration of exclusion zones around the San Joaquin kit fox dens will have a radius measured outward from the entrance or cluster of entrances. The following radii are minimums, and if they cannot be followed the USFWS and CPM (in coordination with CDFG) will be contacted.

- Known den: To ensure protection, a 100-foot exclusion zone will be demarcated by fencing that encircles each den and does not prevent access to the den by San Joaquin kit foxes. Exclusion zone fencing will be maintained until all construction-related disturbances have been terminated. At that time, all fencing will be removed to avoid attracting subsequent attention to the dens.
- Potential or Atypical Den: Placement of 4 to 5 flagged stakes 50 feet from the den entrance(s) will identify the den location; fencing will not be required, but the exclusion zone will be observed.
- Natal/pupping den (occupied and unoccupied): USFWS and the CPM (in coordination with CDFG) will be contacted by the Designated Biologist for further direction.

Construction and other project activities will be prohibited or greatly restricted within the exclusion zones. Only essential vehicle operation and foot traffic on existing county roads will be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity will be prohibited within the exclusion zones.

4.3 Den Destruction

Disturbance of all San Joaquin kit fox dens will be avoided to the maximum extent possible. Protection provided by San Joaquin kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Limited destruction of San Joaquin kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed.

Potential, known, and/or occupied San Joaquin kit fox dens will not be destroyed unless Mariposa Energy has obtained an Incidental Take Statement from USFWS and prior authorization from the CPM (in consultation with CDFG). The following measures will be implemented for any natal/pupping dens, active dens (non-natal), and potential dens observed during preconstruction project surveys:

1. Natal/pupping dens will be avoided, and USFWS and the CPM (in coordination with CDFG) contacted for further guidance. Natal/pupping dens will not be disturbed by project-related activities.

2. Known dens (if any) will be surveyed for three days with tracking medium or an infra-red beam camera to determine the current use. If no San Joaquin kit fox activity is observed during this period, the den will be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed at the den during this period, the den will be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied will the den be excavated under the direction of the Designated Biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of Designated Biologist, it is temporarily vacant, for example during the animal's normal foraging activities. CEC staff, USFWS, and CDFG encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.

3. Destruction of potential dens will be accomplished by careful excavation under the direct supervision of the Designated Biologist or Biological Monitor until it is certain that no San Joaquin kit foxes are inside. Either by using hand tools or small machinery (for example, mini excavator), the den will be fully excavated, filled with dirt and compacted to ensure that San Joaquin kit foxes cannot reenter or use the den during the construction period. If any den was considered unoccupied, but upon commencement of den destruction determined to be occupied, den destruction will cease and the CPM (in coordination with CDFG) and USFWS will be notified immediately. Monitoring of the den as described in item #2 above may be allowed to resume, as determined during consultation with the agencies. Destruction of the den would be completed when in the judgment of the Designated Biologist, the animal has escaped from the partially destroyed den.

4.4 Construction and Operational Requirements

Habitat subject to permanent and temporary construction disturbances and other types of project-related disturbance will be minimized. Project designs have limited or clustered permanent project features to the smallest area possible while still permitting project goals to be achieved. To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas will also be included in preconstruction surveys and, to the extent possible, will be established in locations disturbed by previous site actions to prevent further impacts. The following measures will also be implemented:

1. If construction personnel encounter a San Joaquin kit fox or any animal that construction personnel believe may be a San Joaquin kit fox, the following protocol will be followed:

    a. All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.

    b. The construction manager will be immediately notified.

    c. The construction manager will notify the onsite Designated Biologist or Biological Monitor.

d. The animal will be allowed to leave the site on its own.

2. Before any ground is disturbed, the boundaries of the construction zone will be clearly delineated with orange-colored plastic construction fencing or solid barriers (for example, a wildlife exclusion fence) to discourage workers or equipment from inadvertently straying from the project area.

3. Project-related vehicles will observe a 10-mph speed limit in all project areas, except on county roads and state and federal highways; this is particularly important at night when San Joaquin kit foxes are most active. To the extent possible, night-time construction will be minimized. Off-road traffic outside of designated project areas will be prohibited.

4. To prevent inadvertent entrapment of San Joaquin kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 feet deep will 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 will be thoroughly inspected for trapped animals. If at any time a trapped or injured San Joaquin kit fox is discovered, the procedures under item #13 below will be followed.

5. San Joaquin 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 will be thoroughly inspected for San Joaquin kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until USFWS and the CPM (in coordination with CDFG) have been consulted. If necessary, and under the direct supervision of the Designated Biologist or Biological Monitor, the pipe may be moved once to remove it from the path of construction activity, until the San Joaquin kit fox has escaped.

6. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a week from a construction or project site.

7. No firearms will be allowed on the project site.

8. To prevent harassment, mortality of San Joaquin kit foxes, or destruction of dens by dogs or cats, no pets will be permitted on project sites.

9. The Designated Biologist will be the contact source for any employee or contractor who might inadvertently kill or injure a San Joaquin kit fox or who finds a dead, injured or entrapped individual, including animals struck by project vehicles.

10. An employee education program will be conducted which consists of a presentation by persons knowledgeable in San Joaquin kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and agency personnel involved in the project. The program will include the following: a description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of San Joaquin kit fox in the project area; an explanation of the status of the species and its protection

under the federal ESA and CESA; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information will be part of the education program for distribution to the above-mentioned individuals and anyone else who may enter the project site.

11. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, pipeline corridors, etc. will 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 project construction, but that after completion of project construction will not be subject to further disturbance and has the potential to be revegetated.

12. In the case of trapped animals, escape ramps or structures will be installed immediately to allow the animal(s) to escape, or USFWS and the CPM (in coordination with CDFG) will be contacted for advice.

13. USFWS and the CPM (in coordination with CDFG) will be notified immediately within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825, (916) 414-6600. The CDFG contact for immediate assistance is State Dispatch at (831) 649-2817. They will contact the local warden or biologist and also contact Mr. Liam Davis at P.O. Box 47, Yountville, California, 94599, (707) 944-5529 and Ms. Marcia Grefsrud at P.O. Box 47, Yountville, California 94599, (707) 944-5559.

5.0 Monitoring

The mitigation measures presented in this plan are designed to minimize or eliminate the potential adverse impacts of the project on San Joaquin kit fox. Ultimately, USFWS and the CPM (in consultation with CDFG) must approve this plan before it is implemented onsite. To assess the effectiveness of the proposed mitigation measures, monitoring is included as part of this plan. The Designated Biologist or Biological Monitor will conduct daily or as-needed (depending on site activities and season) onsite monitoring visits following the preconstruction survey until the completion of all project work areas. In addition to enforcement of den avoidance, the onsite biologists will also monitor any inactive construction areas for presence of kit fox. Because not all project areas will be simultaneously disturbed during the 14-month construction period, kit fox may establish a den in an inactive construction area or immediately nearby (for example, within 200 feet). Kit fox could also enter the construction site. The Designated Biologist will provide the results of the monitoring surveys to USFWS and the CPM (in coordination with CDFG) in monthly compliance reports. Any agency-approved remedial actions will be implemented immediately and monitored for their success by the Designated Biologist or Biological Monitor.

6.0 Reporting

Any injuries, mortality, or other unforeseen circumstances regarding San Joaquin kit fox will be reported to the USFWS and CPM (in coordination with CDFG) within 24 hours. Construction monitoring and the results of kit fox monitoring will be reported on a monthly basis by the Designated Biologist.

A construction termination report written by the Designated Biologist will also be provided to USFWS and the CPM (in coordination with CDFG) within 30 days after completion of project construction. The report will identify when surveys were completed, survey observations, how mitigation measures were implemented, any remedial actions taken, how the measures were completed, and the results of the mitigation.

All monitoring reports will generally include the following information:

- Date and time of monitoring including, weather and visibility conditions, and methodology
- Description of the site including location, size, topography, vegetation communities and wildlife observed
- Photographs of the site
- A map showing the location of all identified kit fox burrow types
- Names of biologists conducting the monitoring

7.0 Success Criteria

Plan success is defined as no active San Joaquin kit fox dens marked for avoidance were impacted and no kit fox were directly or indirectly harmed during construction. These criteria apply to the project, during the entire 14-month construction period.

8.0 Adaptive Management

To manage any unforeseen conditions that may arise, adaptive management may be required to ensure that the success criteria are met. Adaptations may include implementing new mitigation measures as appropriate based on the actual effects of the project on San Joaquin kit fox.

During construction, Mariposa Energy will work collaboratively with USFWS and the CPM (in consultation with CDFG) to ensure that the most effective and reliable mitigation measures are implemented for the protection of active dens and individual kit fox. Adaptive management measures may include more stringent no-work offsets and constant construction monitoring of active den locations.

9.0 References

California Department of Fish and Game (CDFG). 2011. Online Information. http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx

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Appendix I
Bird Nest Monitoring Plan

Active Bird Nest Monitoring Plan for the Mariposa Energy Project (09-AFC-3C)

PREPARED FOR: Craig Hoffman/Compliance Project Manager

PREPARED BY: Todd Ellwood/Designated Biologist

COPIES: Andrea Martine/CEC
Marcia Grefsrud/CDFG
Liam Davis/CDFG
Jennifer Brown/USFWS Migratory Bird Office

DATE: May 27, 2011

This technical memorandum provides a plan to monitor active bird nests detected within the project area during preconstruction surveys. As required by Condition of Certification BIO-8, a no-disturbance buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with California Department of Fish and Game [CDFG] and the U.S. Fish and Wildlife Service [USFWS] Migratory Bird Office) shall be established and a nest monitoring plan shall be developed for all active nests. Active nests shall be monitored on a weekly basis until such time that the Designated Biologist determines the nestlings have fledged and disbursed or the nest is otherwise no longer active. Activities that might, in the opinion of the Designated Biologist, disturb nesting activities, shall be prohibited within the buffer zone until such a determination is made. The industry-standard avoidance buffers presented in Table 1 below are proposed during construction of the Mariposa Energy Project. In general, the nesting season for all avian species is February 1 to August 31.

TABLE 1
Proposed Nest Avoidance Buffer Distances
Mariposa Energy Project

Species	Avoidance Buffer Radius
Swainson's hawk	0.5 mile (nesting season)
Other raptors	250 feet (nesting season)
Burrowing owl	250 feet (nesting season), 160 feet (non-nesting season)
Passerines and songbirds	50 feet (nesting season)

To the furthest extent feasible, all nest buffers specified in this plan will be avoided until the nest is no longer active with eggs or young. The Designated Biologist may permit encroachment into the nest buffers on a case-by-case basis. The Designated Biologist will weigh the potential for nesting failure by taking into account the following site conditions:

1. Baseline human disturbances (for example, public traffic, agricultural use, etc.)
2. Line of sight barriers
3. Duration and type of work proposed (for example, use of an existing road within the buffer)

When active nests for Swainson's hawk and other avian species are found during preconstruction surveys, an initial temporary nest disturbance buffer will be established (see Table 1). If project related activities within the temporary nest disturbance buffer are determined to be necessary during the nesting season (approximately February 1 and August 31), then a biologist experienced with bird behavior will monitor the nest to determine the best course of action necessary to avoid nest abandonment or take of individuals. For Swainson's hawk, the CPM and CDFG will be consulted. Work may be allowed to proceed within the temporary nest disturbance buffer if birds are not exhibiting agitated behavior such as defensive flights at intruders, getting up from a brooding position, or flying off the nest. The biological monitor or designated biologist will be on-site daily while construction related activities are taking place and will have the authority to stop work if birds are exhibiting agitated behavior. In consultation with the CPM and CDFG and depending on the behavior of the birds, over time it may be determined that the on-site biologist/monitor may no longer be necessary due to the bird's acclimation to construction related activities.

Anytime the biological monitor issues a stop work order, the Designated Biologist will be consulted to discuss whether a greater avoidance buffer should be established around the nest site. If determined by the biological monitor that the nesting pair does not show signs of distress, onsite biological monitoring will decrease to an as-needed basis until construction activities are completed within the reduced avoidance buffer.

Appendix J
Burrowing Owl Mitigation and Monitoring Plan

BIO-12

Burrowing Owl Mitigation and Monitoring Plan for the Mariposa Energy Project (09-AFC-03C)

Submitted to the

California Energy Commission

Submitted by

Mariposa Energy, LLC

May 2011

With Assistance from

CH2MHILL
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Contents

Section **Page**

Burrowing Owl Mitigation and Monitoring Plan.....1
1.0 Introduction.....1
2.0 Project Description.....1
3.0 Regulatory Status and Requirements for Burrowing Owls.....2
4.0 Proposed Mitigation Measures.....3
Avoidance.....3
Relocation.....3
Habitat Compensation.....4
5.0 Monitoring.....5
6.0 Reporting.....5
7.0 Success Criteria.....6
8.0 Adaptive Management.....6
9.0 References.....7

Burrowing Owl Mitigation and Monitoring Plan

1.0 Introduction

This document provides a mitigation and monitoring plan for western burrowing owl (*Athene cunicularia*). This plan is being provided to meet Condition of Certification (COC) BIO-12 set by the California Energy Commission (CEC) for the proposed Mariposa Energy Project (MEP or project) (09-AFC-03) and will be incorporated into the MEP Biological Resources Mitigation Implementation and Monitoring Plan.

No burrows occupied by burrowing owl were observed within the proposed project footprint during 2010 protocol-level (CDFG, 1995) Phase II or Phase III surveys (CH2M HILL, 2010). Burrowing owl burrows observed during Phase I surveys were determined to be inactive during Phase III surveys. Five occupied burrows representing three breeding territories observed during Phase III surveys were less than 250 feet outside the project footprint adjacent to the transmission line work corridor; therefore, they are potentially vulnerable to project-related ground disturbances during the non-nesting (September 1 to January 31) and nesting (February 1 to August 31) seasons. Because burrowing owls exhibit high nest site fidelity, the three territories are likely to be occupied again during the 2011 season, and therefore could be subject to potential take as a result of project construction.

Implementation of this plan will provide for the protection and monitoring of western burrowing owls that may be affected by project-related construction activities. The avoidance, minimization, and monitoring measures proposed in this plan are subject to final approval by the CEC's Compliance Project Manager (CPM) in consultation with the California Department of Fish and Game (CDFG).

As required by COC BIO-12, this plan follows the CDFG's *Staff Report on Burrowing Owl Mitigation* guidelines (CDFG, 1995) and California Burrowing Owl Consortium's (CBOC) *Burrowing Owl Survey Protocol and Mitigation Guidelines* (CBOC, 1993), which document actions to take if owls are observed in the MEP impact area during preconstruction surveys. The avoidance and minimization measures listed under COC BIO-12 are in agreement with the CDFG and CBOC guidelines.

2.0 Project Description

MEP will be a nominal 200-megawatt (MW), simple-cycle generating facility consisting of four power blocks. Each power block will contain one GE LM6000 PC-Sprint natural-gas-fired combustion turbine generator. The generated power will be delivered to the grid via Pacific Gas and Electric Company's (PG&E) Kelso Substation. The new facility will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations and standards. The main access to the facility site will be from Bruns Road. A portion of the site will be paved to provide internal access to all project facilities and onsite buildings. The areas around equipment, where not paved, will have gravel surfacing. The project also includes: a new, approximately 0.7-mile-long, 230-kV transmission line to

deliver the plant output to the electrical grid via the existing 230-kV Kelso Substation located north of the project site; approximately 580 feet of new natural gas pipeline that will run directly northeast from the project site to interconnect with PG&E's existing high-pressure natural gas pipeline; and a new 1.8-mile water supply line from the Byron-Bethany Irrigation District Canal 45 to deliver raw water to the project site.

The facility site is in northeastern Alameda County, in an unincorporated area designated as Large Parcel Agriculture by the East County Area Plan. The site is located approximately 7 miles northwest of Tracy, 7 miles east of Livermore, 6 miles south of Byron, and approximately 2.5 miles west of the community of Mountain House in San Joaquin County. The facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of an approximate 158-acre parcel immediately south of the Bethany Compressor Station and 230-kV Kelso Substation, both owned by PG&E. The proposed power plant site is located in the southern portion of the project parcel. The existing, unrelated 6.5-MW Byron Power Cogen Plant occupies 2 acres of the 158-acre parcel northeast of the proposed MEP site. The remainder of the parcel is non-irrigated grazing land and will remain as such during MEP operation. A wind turbine development was once located on the southern portion of the parcel, including the MEP site. Concrete foundations and other miscellaneous debris, including remnants of turbine housings, remain onsite.

3.0 Regulatory Status and Requirements for Burrowing Owls

Federal and California state laws and resource codes protect burrowing owls and their nesting habitat. Specifically, burrowing owls are protected by the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code 703-711), making it illegal to take, possess, buy, sell, or barter any migratory bird, including feathers, other parts, eggs, nests, or products. Although the burrowing owl has no current status under the federal Endangered Species Act (ESA), in 1995 the owl was listed as a Category 2 candidate species, indicating population decline. However, in 1996, the U.S. Fish and Wildlife Service (USFWS) eliminated Category 2 and now considers species formerly listed in this category to be "Species of Concern" or "Species at Risk," although these designations are not formally recognized under the ESA. In California, the burrowing owl was listed in 1978 by CDFG as a Species of Special Concern, a category that has legal protections. As a special-status species, the burrowing owl is protected from direct and indirect impacts to birds and nests. Because disturbing nesting owls is a significant impact, measures to avoid or reduce the impact must be identified in accordance with the California Environmental Quality Act.

California Fish and Game Codes §3503, §3503.5, and §3800 also prohibit the take, possession, or destruction of birds, nests or eggs. To prevent take, project-related disturbances in owl breeding territories must be minimized or eliminated during the nesting season (typically February 1 to August 31). Take includes activities that cause nest abandonment, loss of reproductive effort, or loss of habitat necessary for owl survival and reproduction. Such activities would also violate the MBTA.

4.0 Proposed Mitigation Measures

Construction of MEP will entail ground-disturbing activities that could directly or indirectly affect burrowing owls. This section presents proposed mitigation measures to minimize or eliminate impacts on burrowing owls if they are found onsite.

During installation of the wildlife exclusion and construction boundary fencing, biologists will survey the fenceline alignment, including a 500-foot buffer, for burrowing owls. Burrowing owl surveys will be conducted no more than 30 days prior to the start of the fence installation. Once the site is fenced, a preconstruction pedestrian survey of suitable habitat within the interior of the fenced area will be surveyed for burrowing owls. Pedestrian surveys will occur along transects spaced approximately every 30 feet to allow for 100 percent visual coverage of the ground surface. The preconstruction survey within the fenced area will occur no more than 30 days prior to the start of any project-related site disturbance activities. If ground-disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the suitable habitat within the site will be resurveyed for burrowing owls.

Avoidance

The project will implement no-work buffers around active burrowing owl burrows during the nesting season (February 1 to August 31) and non-nesting season. As required by COC BIO-12, a 250-foot buffer from active burrowing owl burrows will be enforced during project construction activities occurring during the nesting season. The no-work buffer may be reduced to 160 feet if all project-related activities that might disturb burrowing owls are conducted during the non-breeding season. Signage in both English and Spanish will be posted designating the presence of a biologically sensitive area. A barrier fence (for example, high-visibility orange construction fence) will also be installed at the outer buffer limit to preclude entry by site workers. If construction activities would occur within 500 feet of an occupied burrow during the nesting season, the Designated Biologist or Biological Monitor will monitor to determine if construction activities have the potential to adversely affect nesting efforts, and will implement measures to minimize or avoid such disturbance.

Mariposa Energy will work with the Designated Biologist or Biological Monitor to site the least damaging temporary access routes and locations for temporary work areas during construction. These work areas will be positioned in a manner that avoids or minimizes impacts on active burrowing owl burrows to the furthest extent feasible.

Relocation

If occupied burrows are identified onsite during the preconstruction survey and cannot be avoided, the owls will be passively relocated (CDFG, 1995; CBOC, 1993) only with prior approval by the CPM (in consultation with CDFG). At least one or more weeks may be necessary to accomplish this and allow the owls to acclimate to alternate burrows. Passive relocation will entail use of one-way doors as described by Trulio (1995) and Clark and Plumpton (2005).

Passive relocation will implement the following take avoidance measures:

- Occupied burrows will not be disturbed during the nesting season (February 1 to August 31) unless the Designated Biologist or Biological Monitor can verify through non-invasive methods that egg laying/incubation has not begun or juveniles are foraging independently and able to fly.
- The Designated Biologist or Biological Monitor will passively relocate owls, confirm that owls have left burrows prior to ground-disturbing activities, and monitor the burrows to observe if owls return. Once evacuation is confirmed, the biologist will collapse burrows to prevent reoccupation.
- Passive relocation of owls will be approved by and conducted in consultation with the CPM (in coordination with CDFG).
- If burrowing owls or active burrows are not observed during the preconstruction survey, any unoccupied but potentially suitable burrows within the project footprint will be monitored by the Designated Biologist or Biological Monitor on a weekly basis to determine their activity status up to the time of construction. Passive relocation will be administered as necessary to keep owls from occupying the MEP construction site.

Burrowing owls will be allowed to relocate themselves to suitable offsite habitat, which is readily available and abundant throughout the project vicinity. MEP is located in a region of open annual grassland habitat, within the range of burrowing owl where California ground squirrels are abundant and owls are documented to occur. Within 1 mile of MEP, preserved lands including CDFG's Byron Conservation Bank, CDFG's Christensen Road Burrowing Owl Site, and the proposed Mountain House Conservation Bank property are known to support suitable burrowing owl habitat. Burrowing owls are also known to occur on these properties, currently. Because of the suitable nesting habitat in the project vicinity, construction of artificial burrows or enhancement of existing mammal burrows for passively relocated owls will not be included as a mitigation measure for this plan.

Habitat Compensation

Offsite mitigation at a CPM-approved (in consultation with CDFG) mitigation site will occur regardless if burrowing owls are found during preconstruction surveys. The project area currently supports suitable burrowing owl foraging habitat; therefore, habitat affected during construction will be mitigated at a 2:1 ratio at an approved offsite location. Construction of MEP will result in a loss of 22.1 acres of foraging habitat; therefore, 44.2 acres of compensation land will be acquired for burrowing owl habitat loss. In the event that destruction of an occupied burrow or relocation is required, compensation lands will also:

1. Currently support burrowing owls at twice the number of owls displaced by the project site. This requirement will be presumed to be met if compensation is through a conservation bank; or
2. If no owls are displaced by the project, the compensation lands must currently support burrowing owls or be within 1 mile of an active burrowing owl colony, or as approved by the CPM (in consultation with CDFG).

Burrowing owl habitat compensation mitigation will occur at the proposed Mountain House Conservation Bank or other CPM-approved (in consultation with CDFG) offsite location (acquired as part of BIO-16). The proposed Mountain House Conservation Bank is located just west of the MEP site across Bruns Road. The bank property is known to be occupied by burrowing owl and is expected to be approved by CDFG to sell burrowing owl mitigation credits.

5.0 Monitoring

The mitigation measures presented in this plan are designed to minimize or eliminate the potential adverse impacts of the project on burrowing owl. Ultimately, the CPM (in consultation with CDFG) will review and approve these measures before they are implemented onsite. To assess the effectiveness of the proposed mitigation measures, monitoring is included as part of this Plan. If burrowing owls are identified onsite during the preconstruction survey, the following burrowing owl monitoring measures will be implemented, in coordination with the CPM (in coordination with CDFG):

1. Monitor burrowing owl pairs identified during the preconstruction survey within 500 feet of any work activities that exceed ambient noise and/or vibration levels for signs of stress or changes in behavior caused by the work activity that could cause nest abandonment. If, in the opinion of the Designated Biologist or Biological Monitor assisting the Designated Biologist, the 250-foot buffer is inadequate to protect burrowing owl, the following will occur:
   - The no-work buffer will be extended until the offset distance is adequate to protect owls, as determined by the Designated Biologist;
   - Noise/visual barriers (for example, straw bales) will be installed; or
   - If the above actions are inadequate to protect owls, the CPM (in coordination with CDFG) will be consulted for further direction.
2. Record impacts to burrowing owls during project construction and report these findings to the CPM and CDFG in the monthly and final compliance reports written by the Designated Biologist.
3. The Designated Biologist or Biological Monitor will conduct as-needed monitoring visits following the preconstruction survey until the completion of all project work areas to determine status and effectiveness of owl passive relocation. The Designated Biologist will provide the results of the monitoring surveys and any recommendations to improve the effectiveness of passive relocation to the CPM and CDFG in the monthly compliance report. Any agency-approved remedial actions will be implemented immediately and monitored for their success by the Designated Biologist or Biological Monitor.

6.0 Reporting

Any injuries, fatalities, or other unforeseen circumstances regarding burrowing owls will be reported to the CPM, CDFG, and USFWS within 24 hours. Monitoring of onsite owls during construction will be reported on a monthly basis by the Designated Biologist, and the results

of the monitoring effort will be included in the MEP monthly compliance report to be submitted to the CPM and CDFG.

A construction termination report written by the Designated Biologist will be provided to the CPM and CDFG within 30 days after completion of project construction. The report will identify when surveys were completed, survey observations, how mitigation measures were implemented, any remedial actions taken, how the measures were completed, and the results of the mitigation.

All monitoring reports will generally include the following information:

- Date and time of visits including, weather and visibility conditions, and survey methodology
- Description of the site including location, size, topography, vegetation communities and animals observed during visits
- A spring and winter census of burrowing owls, as applicable
- Photographs of the site
- Map showing the location of all burrows and owls, including the numbers at each burrow, if present, and tracks, feathers, pellets, or other items (prey remains, animal scat)
- Behavior of owls during the surveys
- Names of biologists conducting the survey

7.0 Success Criteria

Plan success is defined as no active burrowing owl burrows marked for avoidance were affected and no owls were killed or harmed during project construction. These criteria apply to the project during the entire construction period.

8.0 Adaptive Management

To manage any unforeseen conditions that may arise, adaptive management may be required to ensure that the success criteria are met. Adaptations may include implementing new mitigation measures as appropriate based on the actual effects of the project on owls, and, as feasible, implement new owl mitigation measures developed by burrowing owl experts.

During construction, Mariposa Energy will work collaboratively with the CPM and CDFG to ensure that the most effective and reliable mitigation measures are implemented for the protection of active burrows and individual burrowing owls. Adaptive management measures may include more stringent no-work buffers, full-time construction monitoring of active burrows, and/or the use of effective noise/visual barriers. These measures will be considered if it appears that the avoidance/relocation success criteria are not being met.

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