CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833-2937
Tel 916.920.0300
Fax 916.920.8463

CH2MHILL

DOCKET	
09-AFC-3	
DATE	APR 07 2010
RECD.	SEP 21 2010

April 7, 2010

Mr. Greg Vaughn
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670
(916) 341-5427

Subject: Mariposa Energy Project, Clean Water Act Section 401 Water Quality Certification Application

Dear Mr. Vaughn:

Please find enclosed one (1) copy of the Clean Water Act Section 401 Water Quality Certification Application for the Mariposa Energy Project (MEP). On behalf of my client, Mariposa Energy, I request certification under the Clean Water Act Section 401 for MEP.

MEP is a proposed natural gas fired, peaking facility with an approximate generating capacity of 200-megawatts. The proposed project site is in northeastern Alameda County, in an unincorporated area 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 would be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel immediately south of the Pacific Gas and Electric Company (PG&E) Bethany Compressor Station and 230-kilovolt (kV) Kelso Substation. A complete description of MEP is provided in the enclosed application package. Additional information regarding MEP can be found in the California Energy Commission Application for Certification available online at: http://www.energy.ca.gov/sitingcases/mariposa/documents/index.html

The estimated fee for this project is $640. A check for this amount is enclosed. Please feel free to contact me at (916) 286-0348 or doug.urry@ch2m.com with any questions.

Sincerely,

Doug Urry
CH2M HILL Project Manager

Enclosures:
Clean Water Act Section 401 Water Quality Certification Application Package with CD
Section 401 Application Fee

cc: Bo Buchynsky, Mariposa Energy, LLC

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

SECTION 401 WATER QUALITY CERTIFICATION
APPLICATION FORM

A minimum of $640.00 processing fee is required however additional fees in accordance with Title 23 CCR § 2200 (a)(2) may also be required. Please use the fee calculator at http://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/dredgefillfeecalculator.xls to determine the total fee. Please include a check payable to the **State Water Resources Control Board.** Attach additional sheets as necessary. Submit the complete form to the appropriate Regional Board office.

1. APPLICANT INFORMATION	**2. AGENT INFORMATION***
Applicant: Diamond Generating Corporation	Agent* CH2M HILL
Contact Name: Bo Buchynsky, Executive Director	Contact Name: Doug Urry, Project Manager
Address: 333 South Grand Avenue, Suite 1570	Address: 2485 Natomas Park Dr, Suite 600
Los Angeles, CA 90071	Sacramento, CA 95833-2937
Phone No: (213) 473-0092	Phone No: (916) 286-0348
Fax No: (213) 620-1170	Fax No: (916) 920-8463

*Complete only if applicable

3. PROJECT DESCRIPTION

a) Project Title: Mariposa Energy Project (MEP)

b) Project Location:

The MEP is located in an unincorporated portion of northeastern Alameda County, California, approximately 7 miles northwest of the City of Tracy, 7 miles northeast of Livermore, and 6 miles south of Byron (Figure 1). The facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel immediately south of the Pacific Gas and Electric Company (PG&E) Bethany Compressor Station and 230-kV Kelso Substation (Figure 2. Project Location). The Assessor's parcel number is 099B-7050-001-10. Photographs of the MEP site are in the Wetland Delineation Report (Attachment A).

Linear features associated with the MEP include a transmission line, natural gas pipeline, and service water line (Figure 2). The MEP will interconnect to the Kelso Substation via a new 0.7-mile, 230-kV transmission line that will run generally north from the project site, then across Kelso Road and into the existing substation. The natural gas pipeline will consist of approximately 580 feet of new 4-inch-diameter pipe that will run directly northeast from the MEP to interconnect with PG&E's high-pressure natural gas pipeline, which is located on the project parcel. Service water will be provided from a new connection to the Byron Bethany Irrigation District (BBID) via a new pump station and a 6-inch-diameter, 1.8-milelong pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the MEP site.

County: Alameda Section: 1 Township: 2S Range: 3E

Latitude: 37° 47' 23.86" North Longitude: 121° 36' 06.35" West

*Attach site map with "waters" clearly indicated (e.g. USGS 7 ½ quadrangle map)

c) Project Description: *(include purpose and final goal)*:

Purpose and Final Goal:

The primary objective of the MEP is to provide dispatchable, operationally flexible, and efficient generation to meet PG&E's need for new energy sources and to satisfy the terms of Mariposa Energy's power purchase agreement with PG&E. PG&E issued a Request for Offers on April 1, 2008, indicating that additional peak electric generation capacity is needed in the vicinity. In accordance with the California Public Utilities Commission Decision 07-12-052, PG&E needs to acquire between 800 and 1,200 MW of new resources, with a preference for dispatchable and operationally flexible resources. The raw water delivered by the water supply pipeline from Canal 45 is for process water, safety showers, fire protection, service water, and domestic uses.

Description of Proposed Structures:

The MEP will be a nominal 200-Megawatt, 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 PG&E Kelso Substation. MEP will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations and standards. The main access to the MEP site will be from Bruns Road. A portion of the power blocks 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 (Figure 3).

Description of Water Supply Pipeline:

The MEP will use raw water supplied by BBID via the new pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the MEP site. Approximately 1,000 feet of pipeline will be located adjacent to Bruns Road in an agricultural field road from a new 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. At three culverts the pipeline will veer off the road surface and around the end of each culvert, and then back onto the roadway. One of these culverts is not associated with a drainage feature. The other two culverts are located at D-2 and ASW-1. Due to limited space between the right-of-way fence and end of culvert, smaller equipment such as a backhoe, compact/mini excavator, or hand operated trencher will be used to ensure construction stays within the existing right-of-way. In order to ensure the pipeline crossing of the drainage will remain undisturbed post-construction, a scour analysis will be completed to identify scour depth at each location. The pipeline route will follow the MEP main access road (an existing gravel road) from Bruns Road to the MEP site. Associated facilities at Canal 45 will include a 36 square-foot concrete intake structure on the canal bank and a 214 square-foot pump station consisting of a pre-cast concrete manhole wet well, redundant vertical turbine pumps, pipe manifold and valving, electrical cabinet, and instrumentation located on the side of the canal. The raw water is for MEP process water, safety showers, fire protection, service water, and domestic uses.

Description of Impacts to Waters of the U.S.:
Impacts to the USACE jurisdictional areas (D-2, ASW-1 and Canal 45) will occur during construction of the water supply pipeline. 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 maximum trench width is expected to be 18 inches and depth is 5 feet. The new piping at the D-2 and ASW-1 drainage crossings will be encased with approximately 6 inches of concrete for scour protection, and backfilled to original grade with native or import material. Please see the plan and cross-sectional views in Attachment B.

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.

National Pollutant Discharge Elimination System (NPDES):
In accordance with the requirements of the NPDES General Construction Activity Storm Water Permit, a Notice of Intent (NOI) will be submitted prior to project construction.

d) Proposed Schedule: *(start-up, duration, and completion dates)*:
Construction of the pipeline in jurisdictional features will take place during the dry conditions, and will be scheduled during the overall MEP construction period, beginning in April 2011 and ending in July 2012.

e) Total Project size: *(clearing, grading, other construction activities)*
approximately 37 acres ________linear feet *(if appropriate)*

The overall MEP project area is approximately 37 acres comprised by the following temporary and permanent impact areas:
1) Generating facility footprint and access road;
2) Temporary laydown area;
3) Underground gas line and temporary work corridor;
4) Overhead transmission line and temporary work corridor with 8 new permanent monopoles;
5) Underground water supply pipeline and temporary work corridor, temporary staging area, and 250 square foot permanent pump house and intake structure.

4. IMPACTED WATER BODIES

a) Name*(s)* of Receiving Water Body*(ies)*:

Water bodies that will be directly impacted by MEP include an alkali sink wetland (ASW-1), an unnamed tributary to Italian Slough referred to as Drainage Wetland (D-2), and Canal 45. All water bodies onsite are jurisdictional by the United States Army Corps of Engineers (USACE) and thus considered jurisdictional by the Central Valley Regional Water Quality Control Board (RWQCB). Water Body D-2 is also considered jurisdictional by the California

Department of Fish and Game (CDFG). Please see Section 3 of the Wetland Delineation Report (Attachment A) for descriptions of these water bodies, Figure 2-1 of the Wetland Delineation Report for exact locations of these water bodies, and Appendix F of the Wetland Delineation Report for photographs of these water bodies.

MEP is within the San Joaquin Delta Hydrologic Unit (HUC 18040003), which has a drainage area of 433,302 acres. Drainage in the vicinity of MEP area is generally to the north, where it is diverted around Clifton Court Forebay and into Italian Slough (please see Figure 2). Please see page 1-7 of the Wetland Delineation Report (Attachment A) and pages 5.15-1 through 5.15-9 of the Application for Certification (AFC) (http://www.energy.ca.gov/sitingcases/mariposa/documents/applicant/afc) for information on MEP area hydrology.

b) Anticipated potential stream flow during project activity:

All ground-disturbing activity in waters of the United States will take place in dry conditions. Dewatering or the use of cofferdams is not anticipated.

c) Describe potential impacts to water quality:

Direct Impacts:
Temporary fill within the wetland (ASW-1) and drainage areas (D-2 and Canal 45) would result from incidental fall back during excavation activities. Concrete will be used to encase the pipe at the bottom of a 4-foot-deep trench at D-2 and ASW-1. Permanent fill at Canal 45 will result from installation of the new 36 square foot concrete intake structure on the bank of the canal. All temporary impacts will be restored to pre-construction conditions.

Indirect Impacts:
Indirect effects have the potential to occur if hazardous materials (e.g., oils and fuels) or sediment-laden water was accidentally released into wetlands. These potential effects will be avoided by implementing measures included in the project's Storm Water Pollution Prevention Plan (SWPPP) and other BMPs such as proper maintenance and inspection of vehicles and the use of designated refueling areas.

MEP will have no effect on groundwater quantity or quality.

Cumulative Impacts:
Cumulative impacts are not expected as a result of the proposed discharge as the project involves predominately temporary fills.

d) Indicate in ACRES and LINEAR FEET *(where appropriate)* the proposed **waters of the United States** to be impacted by <u>any discharge other than dredging</u>, and identify the impacts*(s)* as permanent and/or temporary for each water body type listed below:

Water Body Type	**Permanent Impacts**		**Temporary Impacts**	
	(acres)	(linear feet)	(acres)	(linear feet)
Jurisdictional Wetland *(ASW-1)*			0.0008	NA
Riparian				
Streambed un-vegetated *(D-2)*			0.0004	NA

Lake/Reservoir				
Canal 45	0.0008	NA		

c) Indicate the volume of the dredged material (cubic yards) to be discharged to waters of the United States: No dredged material will be discharged to waters of the United States.

d) Indicate type(s) of material proposed to be discharged to waters of the United States:

1) Volume of concrete encasement at D-2 is approximately 0.2 cubic yards and 0.3 cubic yards at ASW-1.
2) Volume of native soil or import backfill material at D-2 is approximately 0.7 cubic yards and 1.3 cubic yards at ASW-1.
3) Volume of concrete for the new intake structure at Canal 45 is approximately 1.6 cubic yards.
4) The trenching through D-2 and ASW-1 is expected to be no greater than 5 feet deep, by 18 inches wide. The new concrete intake structure will be buried approximately 1-2 feet in the canal bank.

5. COMPENSATORY MITIGATION

a) Indicate in ACRES and LINEAR FEET *(where appropriate)* the total quantity of **waters of the United States** proposed to be Created, Restored and/or Enhanced for purposes of providing Compensatory Mitigation:

The total permanent impacts to waters of the United States are a negligible amount equaling 0.0008 acres. No compensatory mitigation is proposed.

Water Body Type	**Created**		**Restored**		**Enhanced**	
	(acres)	(linear ft)	(acres)	(linear ft)	(acres)	(linear ft)
Jurisdictional Wetland						
Riparian						
Streambed						
Lake/Reservoir						

b) If contributing to a Mitigation or Conservation Bank, indicate the agency, dollar amount, acreage, and water body type *(if applicable)*:

Conservation Agency____

$__________ for_______ acres of ______________________________ *(water body type)*

How many acres of this mitigation area qualify as waters of the United States?

____

c) Other Mitigation *(omit if not applicable)*: How many acres of this mitigation area qualify as waters of the United States?_________
d) Location of Compensatory Mitigation Site*(s) (attach map of suitable quality and detail)*: City of Area __________________________ County _____________________________ Longitude/Latitude _____________________ Township/Range _____________________

6. OTHER ACTIONS/BEST MANAGEMENT PRACTICES (BMPs)

Briefly describe other actions/BMPs to be implemented to Avoid and/or Minimize impacts to waters of the United States, including preservations of habitats, erosion control measures, project scheduling, flow diversions, etc.

The following measures will be incorporated into the MEP to minimize impacts to waters of the United States:

1) With the exception of D-2, ASW-1, and Canal 45, all wetlands, drainages, erosional gullies, creeks, and rivers will be avoided by the project.
2) To the extent possible, all work areas within wetlands and drainages will be limited to the minimum area necessary to install the new water supply pipeline.
3) A Worker Environmental Awareness Training Program including information on laws and regulations protecting wetlands and other water resources.
4) Employment of an onsite biological monitor to ensure protection of sensitive resource areas including wetlands and water resources.
5) Parking will occur in designated areas only.
6) An approved SWPPP will be implemented to ensure the protection of wetlands and water resources from deleterious discharges of soil, sediment-laden water, hazardous materials (e.g., fuels and lubricants), and other project–related construction debris and trash. Erosion control measures will be implemented where necessary to reduce erosion and sedimentation in wetlands, waters of the United States, and waters of the State, as well as aquatic habitats potentially occupied by sensitive species. BMPs may include, but are not limited to, the use of straw fiber rolls, silt fences, and demarcation of environmentally sensitive areas (ESAs) that are adjacent to the proposed project area. Erosion control measures will be monitored on a regularly scheduled basis, particularly during time 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 that soil stabilization is deemed adequate.
7) Access to the project site will be from existing roads, including Bruns Road. Temporary works areas will be the minimum necessary to accomplish the work.
8) All ground-disturbing activity in D-2, ASW-1, and Canal 45 will take place in dry conditions.

9) Onsite restoration will be conducted for temporary impacts to D-2 and ASW-1. All temporary work areas will be restored back to their pre-construction condition prior to project completion.

7. OTHER PERMITS/AGREEMENTS/ETC

a) U.S. Army Corps of Engineers Permit
Indicate the type of ACOE permit *(check one)*
Nationwide Permit No(s)__12__ Individual Permit No*(s)*:______ Regional Permit No*(s)*:____

Have you notified ACOE of project? __yes____

Have you reviewed the General Conditions for your ACOE permit? __yes________________

Have you attached a copy of the application/notification to ACOE? _yes, Attachment C____

b) California Department of Fish and Game Lake or Streambed Alteration Agreement

Date of Application: _April 2010____________

Have you attached a copy of the application? yes, Attachment D

Has the Agreement been issued? _no__ if so, list Agreement number:______

8. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

a) Indicate the type of CEQA Document required for project and Lead Agency:

Categorical Exemption __ Negative Declaration __ Environmental Impact Report _____

Application for Certification _Docket #09-AFC-03, June 2009 (Available at http://www.energy.ca.gov/sitingcases/mariposa/documents/applicant/afc/). Proof of filing is included as Attachment E._

Has the document been certified/approved, or has a Notice of Exemption been filed? _No__

If yes date of approval/filing __________ If no, expected approval/filing date:_Q3 2010_

Lead Agency _California Energy Commission, Rick York, Biology Unit Supervisor, ryork@energy.state.ca.us or (916) 654-3945 ______________________________

Submit final or draft copy if available*

b) Threatened or Endangered Species impacted by this project *(list potential)*:

Federally-listed (or proposed) threatened or endangered species or critical habitat within the MEP area include:

a. longhorn fairy shrimp (Branchinecta longiantenna) – Federally Endangered
b. vernal pool fairy shrimp (Branchinecta lynchi) – Federally Threatened
c. California tiger salamander (Ambystoma californiense) – Federally Threatened
d. California red-legged frog (Rana draytonii) – Federally Threatened
e. San Joaquin kit fox (Vulpes macrotis mutica) – Federally Endangered

Formal consultation with the United States Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA) will be initiated and a Biological Opinion (BO) will be issued by USFWS prior to construction. The applicant agrees to abide by the conditions of the Section 7 permit, which may include mitigation/protective measures that would be implemented in the project's sensitive areas. The Biological Assessment is included as Attachment F.

9. PAST/FUTURE PROPOSALS BY THE APPLICANT

Briefly list/describe any projects carried out in the last 5 years or planned for implementation in the next 5 years that are in any way related to the proposed activity or may impact the same receiving body of water. Include the estimated adverse impacts from the past or future projects.

The applicant has not carried out any projects in the last 5 years and is not planning any other projects in the next 5 years that are related to the proposed project or impact the receiving water bodies.

10. CERTIFICATION

"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel property gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, 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 that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: Bo Buchynsky Title: Executive Director

Signature: Bo Buchynsky Date: 4-1-2010

List of Attachments

Attachment A Wetland Delineation

Attachment A1 Wetland Delineation Report

CH2M HILL
2485 Natomas Park Drive
Suite 600
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Tel 916.920.0300
Fax 916.920.8463

CH2MHILL

September 29, 2009

Mr. Mark Fugler
Regulatory Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814

Subject: Mariposa Energy Project (File # SPK-2009-01261), Request for Waters of the U.S. Jurisdictional Determination

Dear Mr. Fugler:

Please find enclosed one (1) copy of the formal Wetland Delineation Report for the Mariposa Energy Project (MEP). On behalf of my client, Mariposa Energy, I request a waters of the U.S. Jurisdictional Determination at your earliest convenience. Either I and/or our wetlands specialist will attend your site visit to help familiarize you to the project area and answer any questions. In the event that the U.S. Army Corps of Engineers takes jurisdiction over any of the onsite wetlands and waters, I anticipate a federal nexus for MEP for formal consultation under Section 7 of the Endangered Species Act.

The MEP is a proposed natural gas fired, peaking facility with a generating capacity of 200-megawatts. The proposed project site is in northeastern Alameda County, in an unincorporated area 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 would be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel immediately south of the Pacific Gas and Electric Company (PG&E) Bethany Compressor Station and 230-kilovolt (kV) Kelso Substation. A complete description of MEP is provided in the California Energy Commission Application for Certification available online at: http://www.energy.ca.gov/sitingcases/mariposa/documents/index.html

Please feel free to contact either Doug Urry (CH2M HILL Project Manager) at (916) 286-0348 or me at (408) 839-2402 or todd.ellwood@ch2m.com with any questions. We look forward to meeting you at the project site.
Sincerely,

CH2M HILL

Todd Ellwood

Todd Ellwood
Project Biologist

Enclosure
cc: Doug Urry, CH2MHILL
Russell Huddleston, CH2M HILL
Bo Buchynsky, Mariposa Energy, LLC

Draft Report

USACE Delineation of Wetlands and Other Waters for the Mariposa Energy Project

Prepared for

Mariposa Energy, LLC

July 2009

CH2MHILL
155 Grand Avenue
Suite 1000
Oakland, CA 94612

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Acronyms and Abbreviations

BBID	Byron Bethany Irrigation District
BIOS	Biogeographic Information and Observation System
CFR	Code of Federal Regulations
cmp	corrugated metal pipe
CWA	Clean Water Act
FAC	facultative plant species
FACW	facultative wetland plant species
GPS	Global Positioning System
HUC	Hydrologic Unit Code
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
OBL	obligate wetland plant species
PEMF	Palustrine Emergent Semi-Permanently Flooded
PEMH	Palustrine Emergent Permanently Flooded
PG&E	Pacific Gas and Electric Company
USACE	United States Army Corps of Engineers
WRCC	Western Region Climate Center

SECTION 1.0

Introduction

Mariposa Energy, LLC proposes to construct, own, and operate an electrical generating plant in unincorporated Alameda County, California. The Mariposa Energy Project (Project) will be a natural gas-fired, simple-cycle electrical generating facility rated at a nominal generating capacity of 200 megawatts.

Wetlands and other waters are ecological habitats that are protected under the Federal Clean Water Act (CWA). Activities that have the potential to discharge fill materials into "waters of the United States," including wetlands, must be authorized by the U. S. Army Corps of Engineers (USACE). This report presents the results of a wetland delineation conducted for the proposed Mariposa Energy Project. The results presented in this report are preliminary, pending verification by USACE. Information on the Project location as well as a general description of the environmental setting follows. Study methods and results are provided in the following sections.

1.1 Project Location

The Project study area is in northeastern Alameda County, approximately 10 miles northwest of the City of Tracy, 12 miles northeast of Livermore, and 12 miles southeast of Brentwood (Figure 1-1). The Project study area is located in the northwest 1/4 of Section 1, Township 2S, Range 3E (Mount Diablo Base and Meridian). The facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel (known as the Lee Property) immediately south of the Pacific Gas and Electric Company (PG&E) Bethany Compressor Station and 230-kV Kelso Substation (Figure 1-2). The Assessor's parcel number is 099B-7050-001-10. The Project study area is located at 37° 47′ 23.86″ north latitude and 121° 36′ 06.35″ west longitude.

Linear features associated with the Project include a transmission line, natural gas pipeline, and service water line (Figure 1-2). The Project will interconnect to the Kelso Substation via a new 0.7-mile, 230-kV transmission line that will run north on the Lee Property, then across Kelso Road and into the existing substation. The natural gas pipeline will consist of approximately 580 feet of new 4-inch-diameter pipe that will run directly northeast from the Project study area to interconnect with PG&E's high-pressure natural gas pipeline (Line 2), which is located on the Lee Property. A new gas metering station will be constructed on the Project study area. Service water will be provided from a new connection to the Byron Bethany Irrigation District (BBID) via a new pump station and a 6-inch-diameter, 1.8-mile-long pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the Project study area.

1.2 Environmental Setting

The Project is located at the northeastern edge of the Eastern Hills subsection of the Central Valley Coast Range Ecological subregion (Miles and Goudey, 1998), immediately bordering the alluvial plain of the San Joaquin Valley to the east. Regionally, the landscape is characterized by low foothills along the northeastern edge of the Diablo Range. In the vicinity of the Project study area, this area is characterized by a series of gently rolling hills to the south and west with low terraces to the north and east. Elevation in the Project area ranges from approximately 75 to 175 feet above mean sea level with slopes ranging from approximately 2 to 12.5 percent. Drainage is generally to the east and north. The following sections provide a description of the terrestrial habitats, climate, regional hydrology, and soils.

1.2.1 Terrestrial Habitats and Land Use

California annual grassland is the predominant natural community found throughout the Project area. Characteristic species include non-native grasses such as foxtail barley (*Hordeum murinum* ssp. *leporinum*), soft chess (*Bromus hordeaceus*), and wild oat (*Avena barbata*). Common forbs include bur clover (*Medicago polymorpha*), filaree (*Erodium moschatum*), black mustard (*Brassica nigra*), and gumweed (*Grindelia camporum*). The grassland habitat on the 158-acre Lee property is currently used for cattle grazing. Portions of the Project study area (including the proposed laydown area) were previously developed for wind energy. The windmill towers have been removed, but some remnants of the cement tower bases and miscellaneous debris remain scattered throughout the area.

Developed and agricultural areas in the vicinity of the Project area include the Byron Power Cogen Plant, located in the center of the Lee Property, PG&E's Bethany Compressor Station and Kelso Substation located north of Kelso Road, and the BBID headquarters facilities located along Bruns Road. Agricultural lands are limited to field crops (wheat and alfalfa) immediately north and south of the BBID facilities on the east side of Bruns Road.

1.2.2 Climate and Hydrology

The regional climate is characterized by cool, wet winters and hot, dry summers. Average temperatures range from a low of 36°F in January to a high of 90°F in July (Western Regional Climate Center [WRCC], 2009). According to the Natural Resources Conservation Service (NRCS) Climate Analysis for Wetlands (NRCS, 2002) the growing season (based on data from Livermore, California, and defined as temperatures above 28°F with a probability of 50 percent) extends from January 9 through December 29 for a total of 355 days (Appendix A). The average annual rainfall recorded at the Livermore weather station (044997) is 14.5 inches, with the majority (82 percent) of the annual precipitation occurring between November and March (WRCC, 2009).

The wetland delineation was conducted during a slightly below-average rainfall year. Based on daily climate data recorded at the Livermore weather station, located approximately 12 miles southeast of the Project study area, rainfall between November 1, 2008, and March 31, 2009 was 7.1 inches, or approximately 80 percent of the average rainfall for this period (University of California Integrated Pest Management, 2009). The lower-than-normal rainfall was due to below-average precipitation from November through January; precipitation was slightly above average in February and March (Figure 1-3).

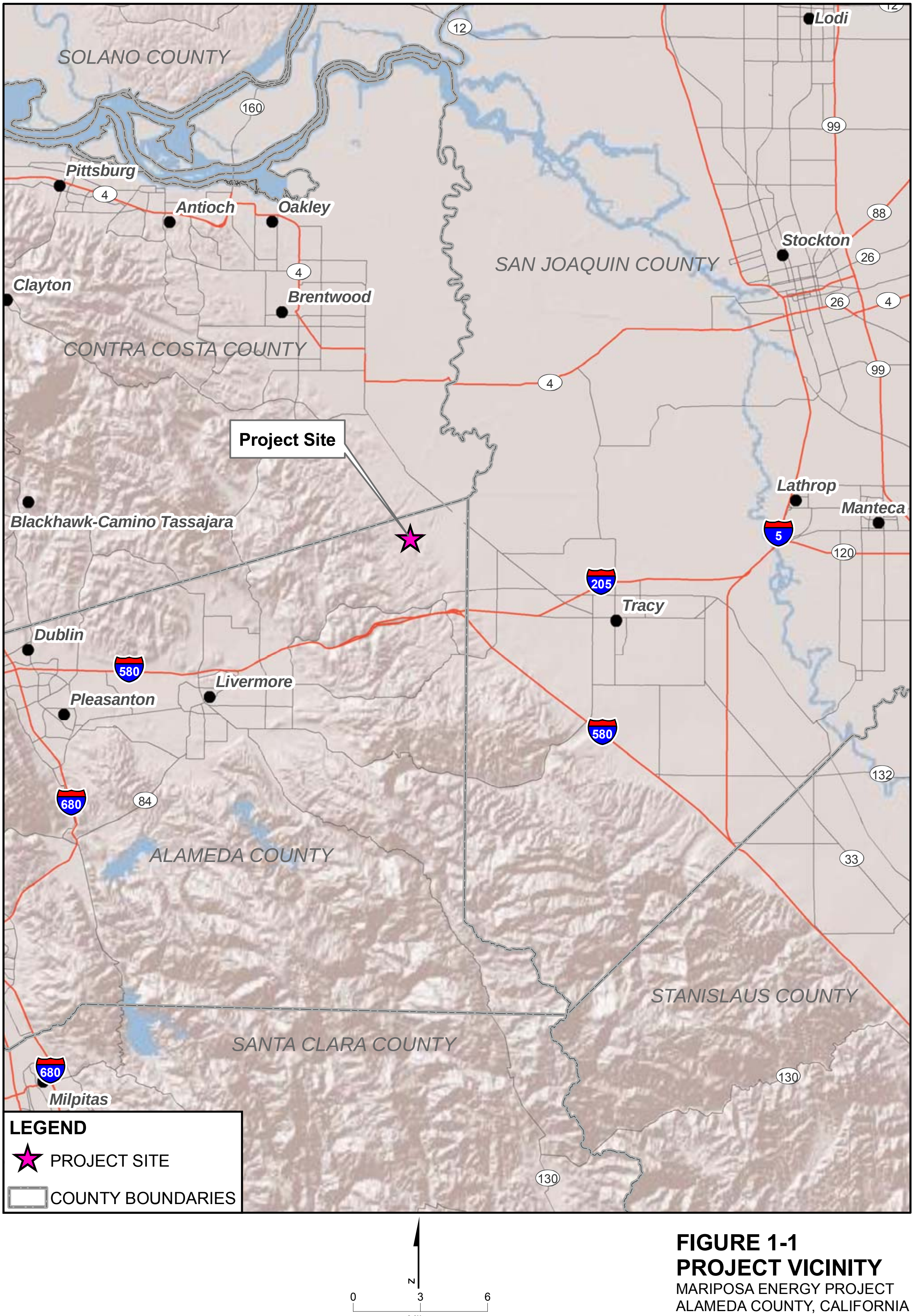

FIGURE 1-1
PROJECT VICINITY
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

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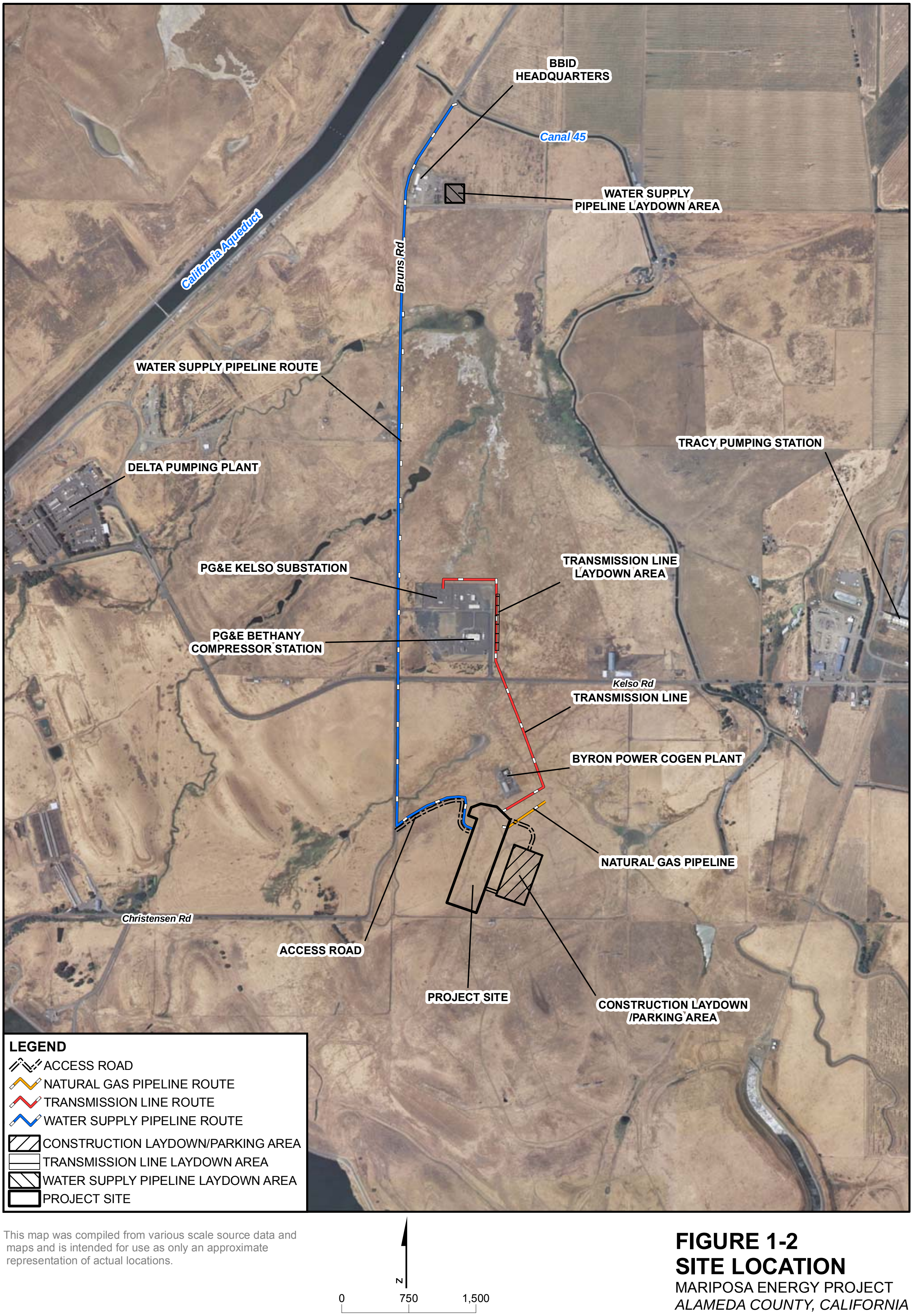

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

FIGURE 1-2
SITE LOCATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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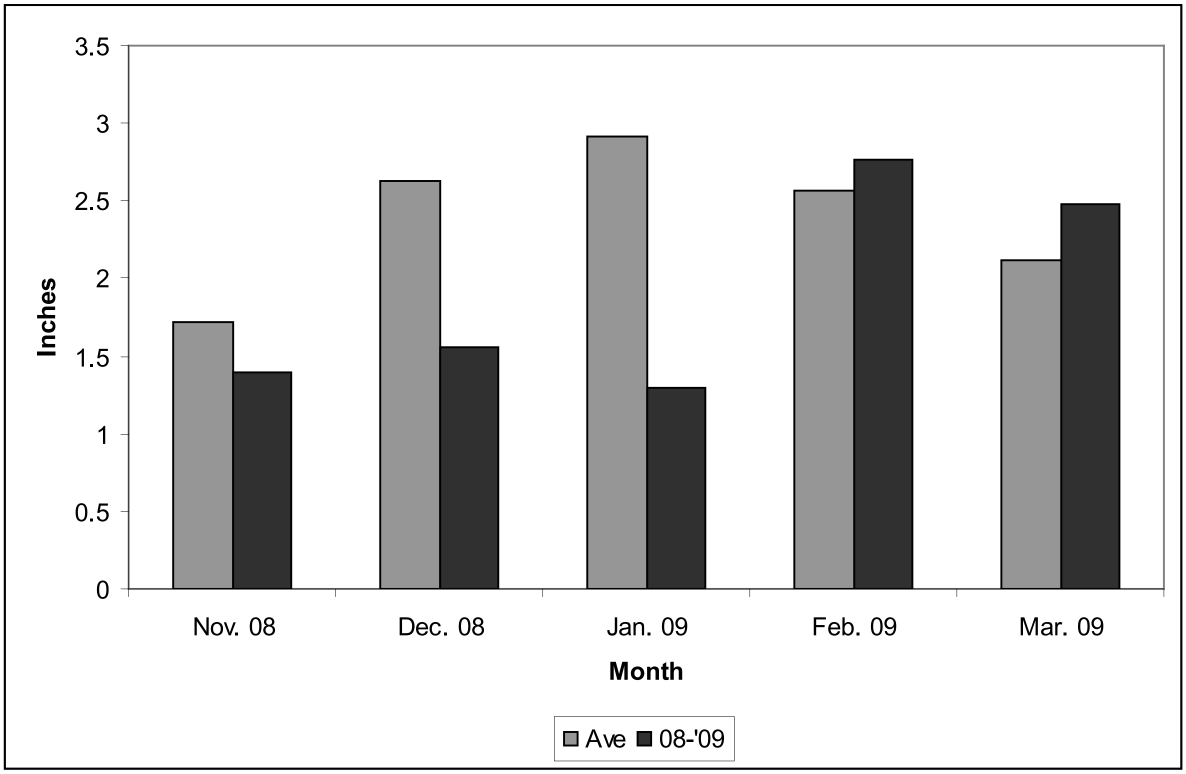


FIGURE 1-3
Precipitation Data November 2008 through March 2009

The Project is located in the San Joaquin Delta Hydrologic Unit (HUC 18040003), which has a drainage area of 433,302 acres (Biogeographic Information and Observation System [BIOS], 2009). The National Wetland Inventory (NWI) shows two palustrine emergent wetlands and two palustrine unconsolidated shore wetlands along the service water pipeline alignment along Bruns Road (Appendix B). USGS topographic information for the Clifton Court Forebay quadrangle indicates four blue line drainages along Bruns Road. Drainage in the vicinity of the Project area is generally to the north, where it is diverted around Clifton Court Forebay and into Italian Slough (Appendix C).

The natural hydrology in the vicinity of the Project area has been historically altered by the construction of reservoirs, aqueducts, canals, and agricultural drainages. Regionally, the most significant modifications are associated with the State Water Project, which was initiated in 1959 and fully operational by 1965. Water is diverted from the Delta into Clifton Court Forebay and is then pumped from the Harvey O. Banks Delta Pumping Plant into the Bethany Reservoir, where the South Bay Pumping Plant lifts water into the South Bay Aqueduct and the California Aqueduct.

1.2.3 Soils

Five soil series and nine different soil map units occur within the limits of the Project study area (Appendix D). General information on the soils based on local soil surveys (NRCS, 1977; 1966) and official soil series descriptions (NRCS, 2009) are provided below. All soil colors are for moist soils, unless otherwise noted.

Altamont Clays (AaC)

The Altamont series consists of well-drained soils with slow permeability derived from weathered shale and fine-grained sandstone. These soils are found on rolling hills and steep slopes east of Livermore. In a representative profile, the surface layer to a depth of 28 inches is dark brown (10YR 3/3) clay. A very thin, grayish-brown (10 YR 5/2) [dry] surface crust may be present in some areas and very dark brown to black films are often present on the upper ped surfaces. Light-colored calcium carbonate films and segregations are often common below 7 inches and soils become slightly alkaline with depth. The clay content in this soil ranges from 35 to 60 percent and wide, deep cracks are common throughout, once the soil is dry.

Linne Clay Loam (LaD, LbD, LaC)

The Linne series consists of well-drained calcareous soils derived from weathered shale and sandstone. These soils are found on rolling hills and slopes. In a typical profile, the upper 14 inches is a moderately alkaline, black (10 YR 2/1) clay loam. Between 14 and 29 inches, the soil is a moderately alkaline, very dark gray (10 YR 3/1) clay loam. Light-colored lime filaments and deposits are present in the lower part of the horizon, increasing with depth. Permeability is moderately slow and these soils have medium to very rapid runoff.

Rincon Clay Loam (RdB)

Rincon soils are found on alluvial fans and nearly level valley floors east of Livermore and north of Mountain House, where they formed in alluvium derived from sedimentary materials. In a typical profile, the surface horizon is a slightly acidic, very dark gray (l0YR 3/1) silty clay loam to a depth of 16 inches. From 16 to 25 inches, the soil is very dark grayish-brown (l0YR 3/2) sandy clay, often with clay films along the ped surfaces. These soils are well drained with slow permeability and slow to rapid runoff.

San Ysidro Loam (Sa, Sc)

The San Ysidro series consists of moderately well-drained soils formed in alluvium derived from sedimentary rocks. These soils occur on old valley fill and low terraces east of Livermore. In a representative profile, the surface layer (0 to 14 inches) is a slightly acidic, dark brown (10YR 4/3 to 3/3) fine sandy loam with few fine, distinct, brownish-yellow (10YR 6/6) concentrations. Below 14 inches, the soil is a dark brown (7.5YR 4/4) clay with a thin light gray (10 YR 6/2) bleach layer. Many moderately thick clay films are present along the ped surfaces and pore linings and common, fine iron and manganese concentrations are present. These soils have slow to medium runoff and very slow permeability.

Solano Fine Sandy Loam (Sf, Sfaa)

Solano soils are formed in alluvium derived from mixed sedimentary materials and are found on nearly level low terraces and in valley plains with slightly irregular or hummocky surface micro-topography. In a typical profile, the surface horizon is a strongly acidic, dark grayish-brown (10 YR 4/2) loam with few, fine, distinct dark reddish-brown (5 YR 3/4) concentrations. Below 9 inches, the soil is neutral to slightly alkaline, brown (10 YR 4/3) clay loam with dark, thin clay films on ped surfaces and pore linings. These soils are somewhat poorly drained with very slow to slow runoff and very slow permeability.

SECTION 2.0

Methods

An initial site survey was conducted on December 29, 2008, by CH2M HILL biologists Russell Huddleston and Todd Elwood, to identify potential wetlands and other waters and to collect data on seasonal hydrologic conditions in the Project study area. Additional surveys were conducted by Mr. Huddleston and/or Mr. Elwood on February 19, April 8, April 15, and June 4, 2009.

The approximately 69-acre Project study area included 41-acre area in which the power plant facility, laydown area, and natural gas pipeline would be located, as well as 100-foot-wide survey corridors along the transmission line and service water pipeline alignments (Figure 2-1). The following sections provide information on the methodology used for the delineation.

2.1 Wetland Delineation

The USACE defines wetlands as areas that are "inundated by surface water or groundwater with a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (Title 40 Code of Federal Regulations [CFR] Section 230.3 and Title 33 CFR Section 238). The wetland field surveys were conducted following the survey methodology described in 1987 *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual*: *Arid West Region* (USACE, 2008).

The USACE uses the three-criterion approach (vegetation, soils, and hydrology) to determine the presence of wetlands. As a general rule, under this method, evidence of a minimum of one positive indicator for each criterion must be found in order to make a positive wetland determination. In general, wetlands will normally meet the following criteria:

- **Hydrophytic Vegetation:** More than 50 percent of the dominant vegetation is composed of plant species that are adapted to survive and grow in hydrophytic (wet) conditions. These species have been assigned a wetland indicator value of facultative (FAC), facultative wetland (FACW), or obligate (OBL) on the *National List of Plant Species That Occur in Wetlands* (Reed, 1988).

- **Hydric Soils**: The NRCS defines hydric soil as "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part…" (Federal Register, July 13, 1994). The criteria for establishing the presence of hydric soils vary among soil types, drainage classes, and land resource regions. The NRCS (2006) has developed field indicators for identification of hydric soils. These indicators are currently used by the USACE in the *Arid West Regional Supplement to the 1987 Wetland Delineation Manual* (USACE, 2008). They rely on soil characteristics such as texture, color, and the amount of redoximorphic features to determine if soils are hydric.

- **Wetland Hydrology**: Areas with wetland hydrology are defined as "…inundated either permanently or periodically at mean water depths less than 2 meters (6.6 feet), or the soil is saturated to the surface at some time during the growing season" (Environmental Laboratory, 1987). Areas where saturation or inundation is present for at least 5 percent of the growing season may be considered wetlands. In the Project study area, wetlands would therefore need to be inundated or saturated for a minimum of 18 consecutive days to meet the wetland hydrology criterion.

A total of 15 sample points were established in potential wetlands and adjacent non-wetland areas (Figure 2-1). At each sample location vegetation, soil, and hydrology indicators were recorded on wetland determination data sheets, which are included in Appendix E. Representative Project study area photographs are provided in Appendix F.

Dominant plant species at each sample location were identified, and the percent cover was visually estimated within an approximately 5-foot radius area. All taxonomic designations follow *The Jepson Manual of Higher Plants of California* (Hickman, 1993) or the current revised taxonomy per the *Jepson Interchange for California Floristics* (University of California, 2009). The wetland indicator status was determined using the *National List of Plant Species that Occur in Wetlands: Region 0* (Reed, 1988). Dominant species within each vegetation strata included the most abundant species whose cumulative cover accounted for at least 50 percent of the total cover, as well as any single species that accounted for at least 20 percent of the vegetative cover. Strata that contained less than 5 percent total cover were not considered in the dominance test. A list of Plant species identified at each sample location is included in Appendix G.

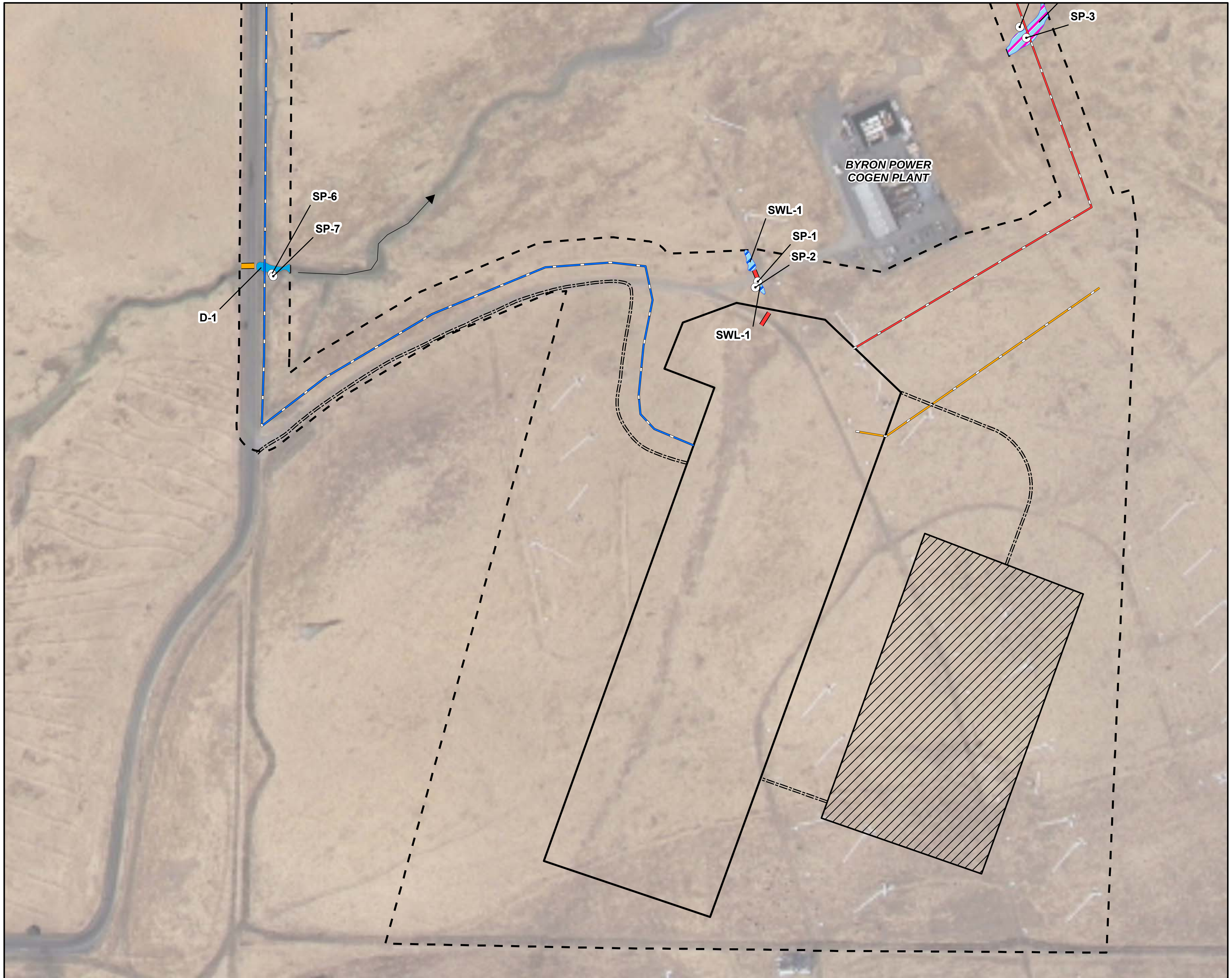
Descriptions of soils were made at each sample location by examining soil pits dug with a tile spade to depths of at least 12 inches where possible. Soil morphological features such as texture, color, and redoximorphic features were noted. Soils texture was estimated in the field using the "ribbon test" to approximate the clay, silt, and sand content. Moist soil colors were determined using Munsell® color charts.

Wetland hydrology was determined based on observations of saturation or inundation during the field surveys and other primary and secondary indicators of wetland hydrology such as presence of aquatic invertebrates, algal matting, water marks, and sediment deposits. Additional factors considered in the wetland hydrology determinations at each sample point included site drainage, landscape position, and micro-topography.

Wetland boundaries were determined in the field based on the vegetation, soils, and hydrology observed at selected sample points as well as distinct changes in vegetation and micro-topography and best professional judgment. A Trimble® Geo-XT global positioning system (GPS) unit was used to map all sample point locations, wetland boundaries, and other relevant features such as culverts and swales. The GPS data were then differentially corrected to generally sub-meter accuracy and plotted on aerial photograph base maps (Figure 2-1).

2.2 Other Features

Other features, including unvegetated ephemeral drainages and erosional channels, were identified and mapped with a GPS during the wetland delineation field surveys. The limits of these features were determined based on evidence of an ordinary high-water mark (e.g., scouring, drift lines, and/or sediment deposits) and/or defined bed and bank characteristics.



LEGEND

- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS

- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES

- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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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1 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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FIGURE 2-1
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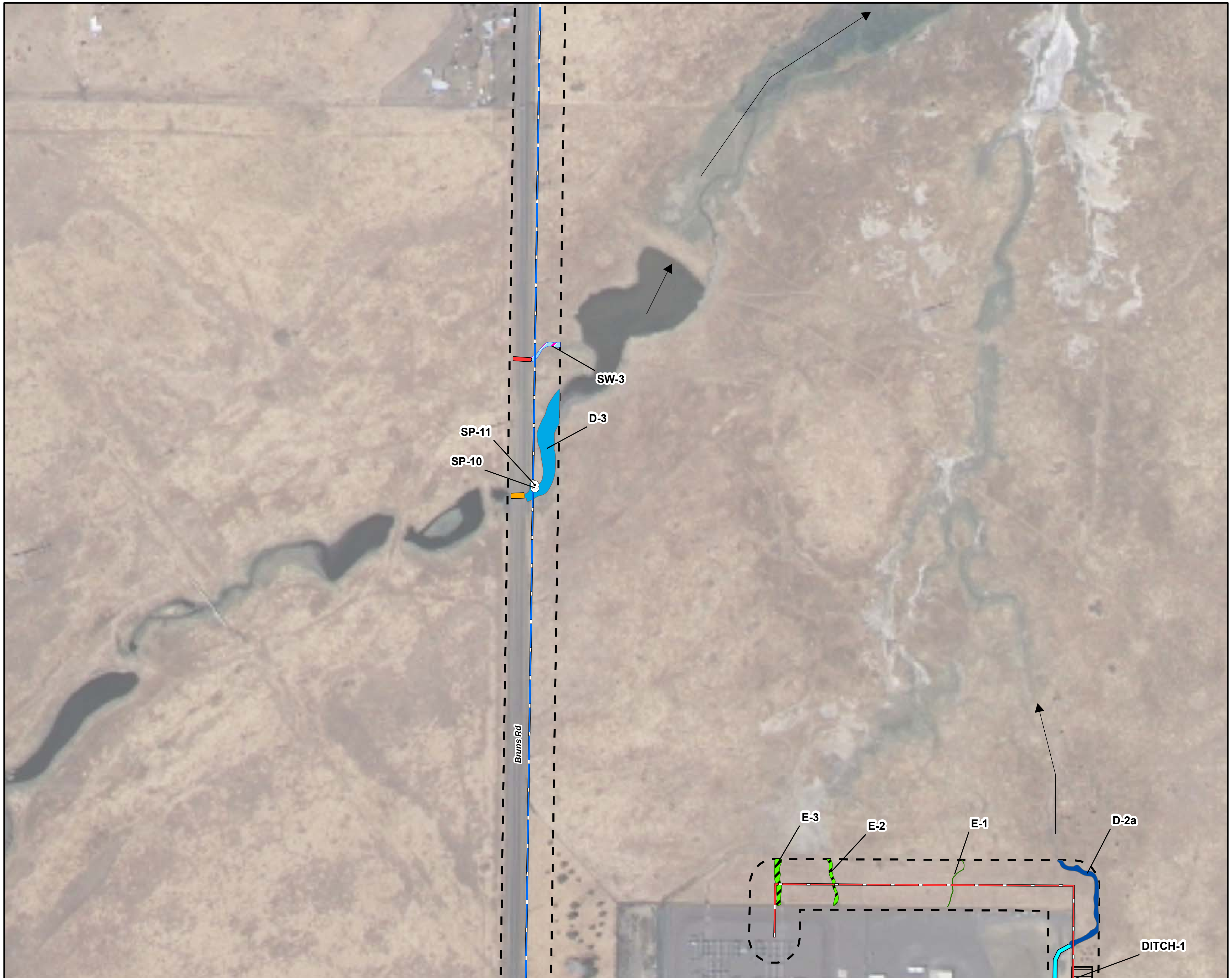

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3 OF 5

FIGURE 2-1
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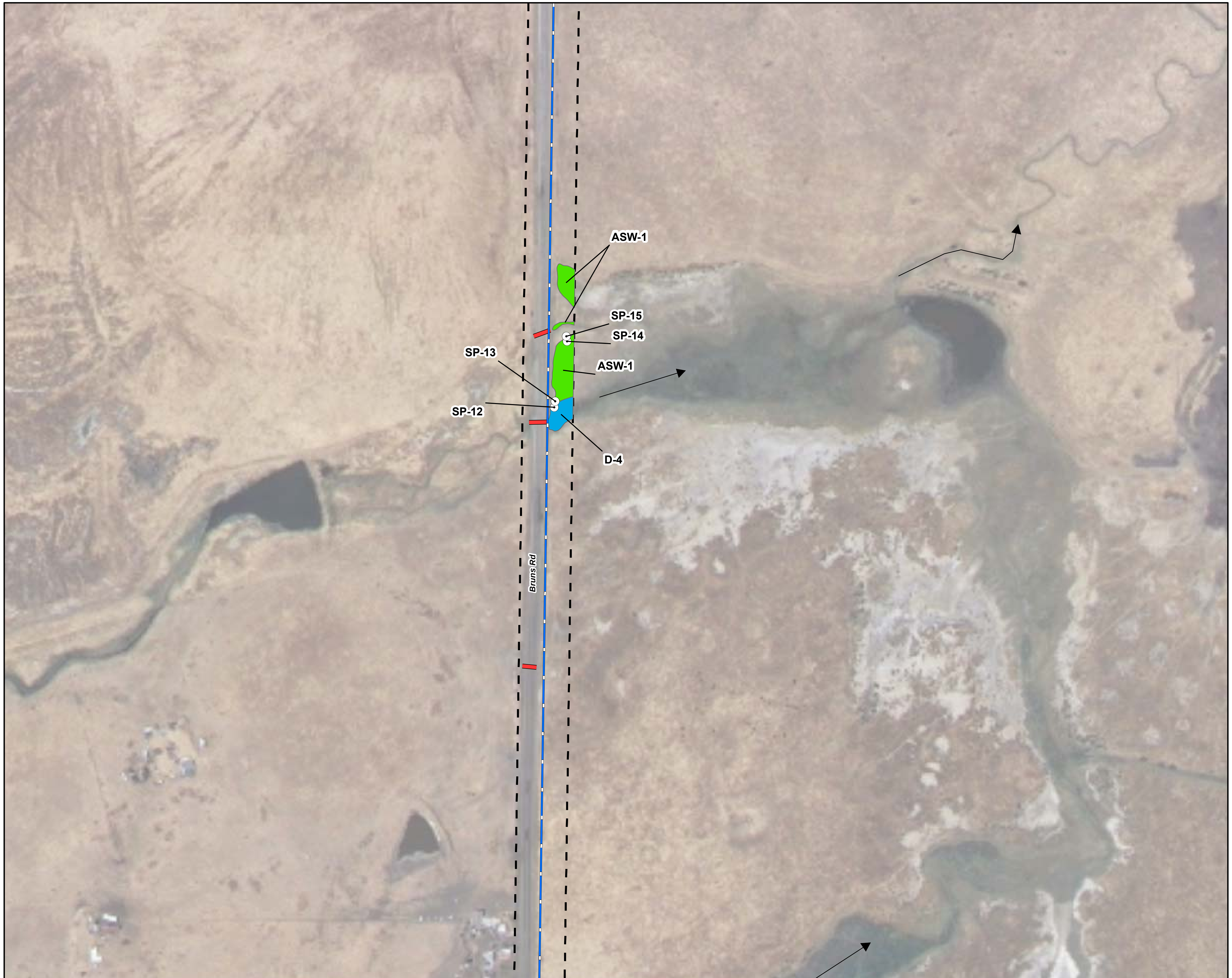

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4 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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FIGURE 2-1
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SECTION 3.0

Results

Based on the observations made during the field surveys, a total of 0.251 acre of potential jurisdictional drainage wetlands, 0.166 acre of alkali sink wetland, and 0.075 acre of potential jurisdictional waters of the U.S. occur within the approximately 69-acre Project study area (Table 1). 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 Project study area (Table 1). The following sections provide descriptions of the wetlands, waters, and other features that were identified and mapped in the Project study area.

TABLE 1
Potential Jurisdictional and Non-Jurisdictional Wetland and Waters Identified in the Project Study Area

Feature	Acreage	Description
Potential Jurisdictional Waters of the U.S.		
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 Map 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 Map and is a blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Waters of the U.S (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

TABLE 1
Potential Jurisdictional and Non-Jurisdictional Wetland and Waters Identified in the Project Study Area

Feature	Acreage	Description
Waters of the U.S. (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
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 U.S.		
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 (cmp); 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 low, 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 Kelso Substation
Erosional Channel (E-2)	0.013	Erosional channel resulting from direct runoff from the Kelso Substation
Erosional Channel (E-3)	0.022	Large, deeply scoured erosional channel resulting from direct runoff from the Kelso Substation
Canal 45	0.046	Constructed and routinely maintained irrigation canal
Total	**0.228**	

3.1 Potential Jurisdictional Wetlands

Four drainage features all of which are shown as blue line drainages on the USGS Clifton Court Forebay 7.5-minute quadrangle were identified in the Project study area. These drainages all flow into a broad seasonal wetland area on the west side of Bruns Road at the Alameda-Contra Costa County Line. From this wetland, water flows approximately 0.5 mile to the north through a natural drainage channel and then continues north through a series of constructed drainage ditches for approximately 2.5 miles, where water is eventually discharged into Italian Slough (Appendix C). An alkali sink wetland is located adjacent to one of the drainages within the Project study area. All of these features are found along the proposed water supply pipeline route and the transmission line route (Figure 2-1).

3.1.1 Drainage Wetlands (D-1 and D1a)

The service water pipeline would cross a seasonal drainage (D-1) on the east side of Bruns Road, approximately 0.3 mile south of the intersection with Kelso Road (Figure 2-1; Map 1). A 6-foot by 6-foot box culvert is located under the road in this area. Within the Project study area, the drainage channel is well-defined with gently sloping banks. The area immediately around the culvert is characterized by dense perennial pepperweed (*Lepidium latifolium*). To the east, the channel is characterized by saltgrass (*Distichlis spicata*), with scattered rabbitsfoot grass (*Polypogon monspeliensis*), Italian ryegrass (*Lolium multiflorum*), sand spurry (*Spergularia marina*), and brass buttons (*Cotula coronopifolia*). The surface soil, to a depth of 5 inches, is a dark gray (10 YR 4/1) clay loam. Between 5 and 12 inches, the soil is a dark gray (2.5 Y 4/1) silty clay loam with approximately 10 percent dark yellowish-brown (10 YR 4/6) and dark brown (7.5 YR 4/3) concentrations, and a few grayish-green (Gley 1 6/10Y) depletions. Below 12 inches, the soil is a light olive brown (2.5 Y 5/3) mixed with some dark gray (2.5 Y 4/1) inclusions and dark yellowish-brown (10 YR 4/6) concentrations. No flow was observed during the April 8, 2009, field survey; but saturated soils were present at a depth of 12 inches and shallow standing water was present in the deeper parts of the channel. From the Project study area, this channel continues to the northeast for approximately 900 feet, where it enters an impoundment area.

Drainage 1a is a continuation of Drainage D-1 on the north side of the impoundment. Only a small portion of the drainage is present within the Project study area along the transmission line alignment at Kelso Road (Figure 2-1: Map 2). In this area, the drainage is a low, swale-like feature that lacks defined bed and bank characteristics. The vegetation is characterized by saltgrass, Mediterranean barley (*Hordeum marinum* ssp. *gussonianum*), soft chess, and foxtail barley. The channel was dry during all surveys and lacks evidence of an ordinary high water mark. A 30-inch-diameter corrugated metal pipe (cmp) is present under Kelso Road in this area. The natural hydrology of this channel has been significantly altered by the impoundment approximately 700 feet south of the Project study area.

3.1.2 Drainage Wetland (D-2)

Drainage 2 is a small swale-like feature located along Bruns Road immediately west of PG&E's Bethany Compressor Station, approximately 600 feet north of the intersection of Kelso Road (Figure 2-1; Map 2). A 12-inch-diameter cmp is located under the road in this area. Vegetation within the channel is characterized by dense saltgrass, Italian ryegrass, and meadow barley (*Hordeum brachyantherum*). Soil in the upper 5 inches is a moderately alkaline, dark grayish-brown (10 YR 4/2) sandy clay loam with approximately 2 percent dark brown (7.5 YR 3/4) concentrations. From 5 to 16 inches the soil is a light yellowish-brown (2.5 Y 6/4) clay loam with approximately 5 percent black (10 YR 2/1) manganese concentrations. The channel was dry at the time of the survey, but some scouring was evident along the shallow banks of the channel. This drainage flows to the east where it enters a rock-lined, linear drainage channel that flows east through the PG&E facility and eventually discharges into Drainage 2a.

3.1.3 Drainage Wetland (D-3)

Drainage Wetland 3 is a shallow, well-defined channel on the east side of Bruns Road approximately 0.3 mile north of the intersection with Kelso Road (Figure 2-1; Map 3). A 6-foot by 6-foot cement box culvert is located under the road at this location. The drainage channel is characterized by dense growth of cosmopolitan bulrush (*Bolboschoenus maritimus*) with scattered rabbitsfoot grass, curly dock (*Rumex crispus*), and cattail (*Typha dominigensis*). Surface soils were inundated at the time of the survey and had a strong positive reaction to alpha alpha-dipyridyl. The upper 6 inches is a mixed greenish-black (Gley 1 2.5/5GY) and black (5 Y 2.5/2) clay loam with approximately 5 percent strong brown (7.5 YR 4/6) concentrations. The channel was inundated with 3 to 6 inches of gently flowing water at the time of the survey. The vegetated channel flows to the north into a larger open water area and then continues to flow to the north northeast into the larger seasonal wetland area. This feature is included as a Palustrine Emergent Permanently Flooded (PEMH) wetland on the National Wetland Inventory Map (Appendix B).

3.1.4 Drainage Wetland (D-4)

This drainage is located immediately north of the Alameda County line along the east side of Bruns Road (Figure 2-1; Map 4). The shallow, well-defined channel is characterized by dense cattails (*Typha latifolia* and *T. dominingensis*) growing in the center of the channel with dense saltgrass growing around the outer edges. Mexican rush (*Juncus mexicanus*) and curly dock are also present in scattered locations. The soil at the outer edge of the channel is a strongly alkaline, dark grayish-brown (10 YR 4/2) fine sandy clay loam to clay loam. No redoximorphic features were noted in this area, possibly due to the high soil pH; however, hydric conditions were presumed to be present based on the level of inundation and abundant, lush OBL and FACW vegetation in this area. Shallow water was observed flowing from a 36-inch-diameter cmp under the road into this area during the surveys. The channel continues to flow to the east into a larger wetland area. This feature is included as a Palustrine Emergent Semi-Permanently Flooded (PEMF) wetland on the National Wetland Inventory Map (Appendix B).

3.1.5 Alkali Sink Wetland (ASW-1)

A large alkali sink wetland is present immediately north and directly abutting Drainage D-4 (Figure 2-1; Map 4). Within the Project study area, this feature is characterized by saltgrass and common rusty molly (*Kochia californica*) with scattered sand spurry, alkali heath (*Frankenia salina*), and common spikeweed (*Centromadia pungens*). The surface soil is a strongly alkaline, dark grayish-brown (10YR 4/2) fine sandy clay loam to a depth of 8 inches. From 8 to 24 inches, the soil is a very dark grayish-brown (10 YR 3/2) clay loam that is also strongly alkaline. No redoximorphic features were observed in the upper part of the soil, but this area was considered problematic due to the high soil pH. This area was dry at the time of the survey, but appears to be subject to at least seasonal inundation and most likely a prolonged seasonally shallow water table. This feature is identified as a Palustrine Unconsolidated Shore Seasonally Flooded wetland by the National Wetland Inventory Map (Appendix B).

3.2 Potential Waters of the U.S. (Non-Wetlands)

Portions of two drainage channels within the Project study area were considered to be non-wetland waters of the U.S. due to the lack of vegetation cover and presence of well-defined bed and bank characteristics.

3.2.1 Drainage 1b

Drainage 1b is a continuation of Drainage 1 north of Kelso Road, approximately 0.2 mile east of the intersection with Bruns Road (Figure 2-1; Map 2,). A 30-inch-diameter cmp is located under the road in this area. The area along the channel immediately north of the road is highly eroded and disturbed and the bed and bank are poorly defined. As the channel continues north, it quickly becomes well-defined with steep 3-foot-tall to 3.5-foot-tall banks and an open channel that ranges from approximately 5 to 8 feet wide. With the exception of sparse saltgrass, the channel is devoid of vegetation. From the Project study area, this channel continues to the north where it eventually discharges into the large wetland area near the county line.

3.2.2 Drainage 2a (Includes Ditch 1)

Drainage 2a is a continuation of Drainage 2 on the northeast side of the Kelso Substation. Within the PG&E facility this drainage has been realigned, flows through a series of small, rock-lined, linear drainage channels. Where it exits the facility, it becomes a well defined earthen channel with steep cut banks 2 to 2.5 feet tall with a 2-foot-wide to 5-foot-wide bed. With the exception of sparse Italian ryegrass, the channel is devoid of vegetation. This channel flows to the north into a seasonal wetland area that continues north and eventually connects into a larger wetland area near the county line.

3.3 Non-Jurisdictional Features

Potentially non-jurisdictional features identified in the Project study area include two isolated seasonal wetlands, three swales, three erosional channels, and a small section of BBID’s Canal 45.

3.3.1 Seasonal Wetland (SWL-1)

This seasonal wetland occurs along the existing access road to the Byron Power Cogen Plant along the northern edge of the Project study area (Figure 2-1; Map 1). The two distinct basins are hydrologically connected by a partially collapsed 18-inch-diameter cmp. Vegetation within the basins is generally sparse and includes species such as popcorn flower (*Plagiobothrys stipitatus*), coyote thistle (*Eryngium vaseyi*), Italian ryegrass, gumweed dense-flower willowherb (*Epilobium densiflorum*), wooly marbles (*Psilocarphus oregonus*), brass buttons, and water pygmyweed (*Crassula aquatica*). Surface soil in this area is a dark grayish-brown (10 YR 4/2) clay loam with few (less than 1 percent), fine, dark yellowish-brown (10YR 4/4) concentrations present in the upper 3 inches. A dark brown (10 YR 4/3) clay layer is present at a depth of 10 inches below the surface. Surface soil had a neutral pH but no strong redoximorphic indicators were evident in the upper part of the soil at this sample location. The basins were both dry during the April field survey, but inundation and aquatic invertebrates were noted in this area during earlier site visits. Based on the presence of characteristic seasonal wetland vegetation, the distinct wetland-upland boundary, and observations of inundation and aquatic invertebrates, this area was presumed to also support hydric soils, despite the lack of redoximorphic features.

This wetland area is located nearly 500 feet south of Drainage D-1 and there is no apparent hydrological connection between this basin and the drainage. Because this feature lacks any evidence of a direct connection, was not considered to be an adjacent wetland, and does not appear to have a significant nexus to a traditional navigable water body, it was considered an isolated wetland.

3.3.2 Seasonal Wetland SWL-2

Seasonal wetland 2 is a very shallow, poorly defined depression along the east side of the transmission line laydown area (Figure 2-1; Map 2). Scattered Italian ryegrass is present along the outer edges of the basin and the central part is largely open soil with sparse, scattered coyote thistle. Surrounding grassland vegetation in this area is also sparse. Deep cattle hoof marks occur throughout the basin, which suggest this area is subject to at least some seasonal saturation and possible inundation. This small basin is located more than 100 feet from Drainage 1b with no apparent hydrologic connection or significant nexus to this channel.

3.3.3 Swales

Three weakly expressed, low topographic swales were observed in the Project area. Two swales were observed along the transmission line route south of Kelso Road (Figure 2-1; Map 2) and one swale was observed along the service water pipeline route north of Drainage Wetland D-3 (Figure 2-1; Map 3).

Swales SW-1 and SW-2 are very similar and are both located in the California grassland northeast of the Byron Power Cogen Plant. The vegetation in these areas is generally similar to the adjacent grassland, except Mediterranean barley becomes the dominant annual grass species within the swale areas, where soft chess and foxtail barley are dominant in the adjacent grassland. Other associated species include sparse saltgrass, alkali heath, and Italian ryegrass, all of which also occur in the adjacent grassland habitat. The upper 2 inches of the soil are a dark grayish-brown (10 TR 4/2) fine sandy clay loam with dark yellowish-brown (10 YR 4/4/ and 4/6) concentrations. Below 2 inches, the soil is a brown (10 YR 4/3) fine sandy loam with no evident redoximorphic features. Similar soils were noted in the adjacent grassland, but with fewer and faint (10 YR 4/4) redox features only in the upper 2 inches. These swales appear to convey short-duration flows in response to storm events and appear to be subject to short-duration inundation, but only shallow, intermittent inundation was noted in these areas during other wet season surveys of the site. It is uncertain, even in a more normal rainfall year, if these areas would support inundation or surface saturation for 18 consecutive days. Both swales drain to the southwest where water ponds in low depressions near the Byron Power Cogen Plant. There is no apparent surface hydrologic connection to any drainage or apparent significant nexus to any traditional navigable water body.

The third swale (SW-3), is found along the water supply line, just north of Drainage D-3 on the east side of Bruns Road. A 12-inch-diameter cmp is located under the road just west of the swale feature. Within the Project study area, the swale is generally weakly expressed and exhibits no ordinary high-water mark or evidence of recent flow. Vegetation in this area is similar to the adjacent California annual grassland and includes species such as soft chess, Italian ryegrass, and saltgrass with scattered gumweed, alkali heath, and coyote thistle. To the east of the Project study area, closer to the open water, the swale is characterized by a dense cover of lush saltgrass. Because this swale appears to convey very infrequent and low-volume flows and short-duration flow, it was not considered to be subject to jurisdiction under the Federal CWA.

3.3.4 Erosional Channels

Three erosional channels are present within the Project study area along the transmission line alignment, on the north side of the Kelso Substation (Figure 2-1; Map 3). These channels have formed as a result of directed stormwater runoff from the substation and range in size from a relatively small erosional rill to a large, deeply eroded channel with defined bed and bank characteristics. These erosional channels are largely devoid of vegetation within the active flow channel, but upland grassland species common along the sides and upper edges. These features appear to convey infrequent, short-duration flows in response to heavy rainfall events that drain only uplands and were therefore not considered to be jurisdictional waters of the U.S.

3.3.5 Canal 45

Service water for the Project will be supplied from the BBID Canal 45 (Figure 2-1; Map 5). In the Project study area, this portion of the canal is a constructed and routinely maintained earthen channel devoid of vegetation. Cement rip rap is present along the lower banks of the canal.

SECTION 4

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Appendix A
Natural Resource Conservation Service
WETS Tables for Alameda County, California

WETS Station : LIVERMORE, CA4997 Creation Date: 08/29/2002
Latitude: 3740 Longitude: 12146 Elevation: 00480
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	57.0	37.4	47.2	2.99	1.39	3.66	6	0.0
February	61.9	40.3	51.1	2.73	1.28	3.34	6	0.0
March	65.6	42.3	53.9	2.44	1.00	2.97	6	0.0
April	71.3	44.2	57.8	0.95	0.50	1.17	3	0.0
May	77.1	48.5	62.8	0.43	0.05	0.51	1	0.0
June	84.1	52.5	68.3	0.09	0.00	0.12	0	0.0
July	89.1	54.9	72.0	0.03	0.00	0.00	0	0.0
August	88.8	54.9	71.9	0.08	0.00	0.00	0	0.0
September	86.0	53.2	69.6	0.24	0.00	0.24	0	0.0
October	78.2	48.3	63.3	0.82	0.25	1.00	1	0.0
November	65.1	41.8	53.5	1.75	0.54	2.08	4	0.0
December	57.1	36.9	47.0	2.04	1.02	2.49	4	0.0
Annual	-----	-----	-----	------	10.76	16.37	--	----
Average	73.5	46.3	59.9	------	------	------	--	----
Total	-----	-----	-----	14.61	------	------	31	0.0

GROWING SEASON DATES

Probability	Temperature 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	> 365 days > 365 days	1/ 9 to 12/29 355 days	2/26 to 11/27 276 days
70 percent *	> 365 days > 365 days	> 365 days > 365 days	2/14 to 12/ 9 299 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1930-2002 prcp

Station : CA4997, LIVERMORE

------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
30				0.63									0.63
31	3.45	1.67	M0.57	0.36	0.93	0.11	0.00	0.00	M0.00	0.27	1.89	5.63	14.88
32	1.29	3.15	0.19	0.41	0.37	0.00	0.00	0.00	0.00	0.00	0.51	2.03	7.95
33	4.51	0.44	2.09	0.13	0.70	0.03	0.00	0.00	0.01	0.75	0.00	3.69	12.35
34	1.29	2.86	0.00	0.13	0.60	0.53	0.00	0.00	0.27	0.62	2.71	2.32	11.33
35	3.53	0.52	3.16	3.28	0.00	0.00	0.00	0.04	0.00	0.79	0.21	1.53	13.06
36	3.28	6.76	0.71		0.46	0.10	0.00	0.00	0.00	0.40	0.02	3.26	14.99
37	3.38	4.13	5.07	0.68	0.17	0.20	0.00	0.00	0.00	0.55	2.46	4.57	21.21
38	2.40	6.14	4.09	0.90	0.02	0.00	0.00	0.00	0.00	1.00	1.08	0.52	16.15
39	2.40	1.57	2.18	0.53	0.18	0.00	M0.00	0.00	0.16	1.23	0.15	0.78	9.18
40	8.13	M4.54	2.60	0.35	0.14	0.00	0.00	0.00	0.25	0.50	0.43	4.63	21.57
41	3.24	4.19	2.07	2.76	0.23	0.00	0.00	0.03	0.00	0.72	0.89	5.34	19.47
42	3.89	1.68	1.42	3.10	1.00	0.00	0.00	0.00	0.09	1.08	3.05	1.73	17.04
43	4.48	1.68	2.39	1.14	0.00	0.06	0.00	0.00	0.00	0.30	0.53	1.23	11.81
44	2.36	4.89	1.01	M0.94	0.73	0.00	0.00	0.00	0.00	0.77	3.41	2.03	16.14
45	0.87	3.68	3.19	0.20	0.17	0.00	0.00	0.02	0.00	1.07	2.07	M2.98	14.25
46	0.76	1.23	1.69	0.02	0.61	0.00	0.24	0.00	0.02	0.02	2.93	2.07	9.59
47	0.69	1.45	2.34	0.53	0.17	0.36	0.00	0.00	0.00	1.84	0.85	0.51	8.74
48	0.20	1.11	2.79	2.50	1.03	M0.16	0.03	M0.00	M0.00	M0.46	0.34	M2.71	11.33
49	M1.39	2.47	3.38	0.02	M0.34	M0.00	0.03	0.16	0.05	0.08	1.20	M1.21	10.33
50	4.65	1.54	1.44	M0.85	M0.59	0.01	M0.00	0.00	0.08	M1.84	M5.95	4.95	21.90
51	2.23	M1.81	M1.82	0.55	M0.35	M0.06	M0.00	M0.00	0.00	1.04	M3.01	6.07	16.94
52	7.60	1.40	M2.36	2.20	M0.16	0.04	M0.00	0.00	M0.10	0.01	2.11	6.33	22.31
53	2.07	0.05	M1.12	M1.42	0.61	0.59	M0.00	M0.15	0.00	M0.21	M1.33	M0.64	8.19
54	2.19	2.27	M3.00	0.73	0.16	M0.27	0.00	0.00	M0.04	M0.00	1.68	M3.33	13.67
55	M2.45	1.69	M0.38	M1.28	0.65	0.00	0.00	M0.01	0.01	M0.01	M1.31	10.15	17.94
56	5.49	M1.15	0.14	1.92	M0.63	0.00	0.00	0.00	M0.63	0.79	0.03	0.48	11.26
57	2.65	M2.23	1.30	1.14	M2.65	M0.04	0.00	0.00	M0.05	1.06	0.37	M1.62	13.11
58	3.16	5.37	4.44	3.74	0.66	0.41	0.00	0.00	0.02	0.09	0.14	0.86	18.89
59	2.45	3.59	0.29	0.35	0.00	0.00	0.00	0.07	1.89	0.00	0.00	0.75	9.39
60	2.98	4.12	0.60	0.48	0.42	0.00	0.02	0.00	0.01	0.05	2.92	1.25	12.85
61	2.08	1.04	1.92	1.03	0.69	0.19	0.00	0.13	0.16	0.15	2.24	0.82	10.45
62	0.73	5.61	1.82	0.22	0.00	0.00	0.00	0.00	0.00	3.64	0.28	1.55	13.85
63	1.40	4.50	2.60	3.47	M0.70	0.00	0.00	0.00	0.33	0.93	3.18	0.19	17.30
64	2.37	0.08	1.57	0.21	0.48	0.32	0.00	0.12	0.04	0.85	2.44	4.91	13.39
65	2.11	0.59	1.73	1.53	0.00	0.00	0.00	0.21	0.00	0.03	4.22	3.23	13.65
66	1.05	1.17	0.17	0.33	0.10	0.12	0.17	0.00	0.11	0.00	3.43	2.35	9.00
67	6.14	0.29	4.15	4.65	0.19	0.48	0.00	0.00	0.02	0.24	0.88	1.62	18.66
68	3.93	0.90	2.40	0.43	0.15	0.00	0.00	0.00	0.00	0.43	2.48	3.04	13.76
69	6.28	4.76	0.55	1.24	0.08	0.00	0.00	0.00	0.00	1.10	0.49	2.34	16.84
70	5.38	1.18	1.42	0.40	0.07	0.32	0.00	0.00	0.00	0.41	5.24	5.27	19.69
71	1.19	0.33	1.75	1.37	0.54	0.00	0.00	0.00	0.13	0.04	0.46	3.27	9.08
72	0.90	0.79	0.14	0.64	0.00	0.04		0.00	0.58	2.98		2.22	8.29
73	5.50			0.29	0.03	0.00	0.00	0.00	0.08	2.08	3.71	3.80	15.49
74	1.50	0.71	2.69	1.62	0.00	0.00	0.00	0.00	0.00	0.50	0.66		7.68
75	0.84	3.65	5.24	1.42	0.00	0.06	0.10	0.35	0.00	1.27	0.08	0.21	13.22
76	0.30	1.46	0.48	0.39	0.00	0.18	0.00	0.91	0.95	0.50	0.50	0.73	6.40
77	1.15	0.83	0.82	0.16	1.01	0.00	0.10	0.00	0.22	0.13		3.07	7.49
78	5.44	2.95		2.49	0.01	0.00	0.00	0.00	0.04	0.00	2.16	0.58	13.67
79	4.52	3.19	1.86	0.88	0.34	0.00	0.06	0.00	0.00	1.51	1.13	2.66	16.15
80	4.16	4.24	1.36	1.32	0.48	0.00	0.70	0.00	0.00	0.04	0.28	1.18	13.76
81	3.97	1.11	2.94	0.61	0.11	0.00	0.00	0.00	0.06	2.07	3.44	2.57	16.88
82	5.29	2.16	5.58	1.50	0.00	0.28	0.00	0.01	1.48	2.24	3.72	2.80	25.06
83	6.28	5.56	6.14	3.51	0.21	0.00	0.00	0.50	1.02	0.27	5.44	3.44	32.37
84	0.33	1.87	1.00	0.53	0.01	0.03	0.00	0.00	0.04	1.25	4.71	1.51	11.28
85	0.48	1.25	2.62	0.32	0.07	0.22	0.00	0.03	0.13	0.89	2.69	1.97	10.67

86	2.04	7.11	4.09	0.40	0.14	0.00	0.01	0.00	0.45	0.04	0.08	0.92	15.28
87	1.83	3.47	2.30	0.16	0.09		0.00	0.00	0.00	0.87	1.40	2.30	12.42
88	1.78	0.38	0.26	1.15	0.45	0.10	0.00	0.00	0.00	0.11	1.92	2.03	8.18
89	0.81	0.95	2.94	0.88	0.08	0.10	0.00	0.00	1.33	1.13	1.02	0.10	9.34
90	1.54	2.46	0.87	0.37	1.78	0.00	0.02	0.00	0.06	0.08	0.39	1.45	9.02
91	0.31	2.20	5.87	0.34	0.35	0.08	0.00	0.21	0.04	1.65	0.31	1.19	12.55
92	1.39	4.61	1.97	0.43	0.00	0.09	0.00	0.00	0.00	0.90	0.15	4.79	14.33
93	6.41	4.53	2.91	0.63	0.51	0.30	0.00	0.00	0.00	0.57	2.00	1.81	19.67
94	0.94	3.33	0.15	1.20	1.78	0.04	0.00	0.00	0.00	0.58		1.36	9.38
95	6.64	0.33	6.66	1.02	0.92	0.70	0.00	0.00	0.00	0.00	0.01	5.37	21.65
96	5.17	4.10	2.34	1.91	1.05	0.00	0.00	0.00	0.00	1.08	2.55	4.43	22.63
97	5.81	0.15	0.06	0.15	0.29	0.17	0.00	0.42	0.00	0.28	4.23	1.95	13.51
98	5.47	7.30	2.37	1.37	2.00	0.13	0.00	0.00	0.18	0.54	2.48	0.73	22.57
99	3.23	3.33	1.67	0.99	0.08	0.01	0.00	0.03	0.04	0.15	1.26	0.25	11.04
0	4.61	4.87	1.25	0.59	0.69	0.18	0.00	0.01	0.24		0.49	0.45	13.38
1	1.92	2.89	1.22	1.80	0.00	0.12	0.00	0.00	0.09	0.37	1.92	5.09	15.42
2													

WETS Station : NEWARK, CA6144
Latitude: 3731 Longitude: 12202 Elevation: 00010
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	57.6	42.0	49.8	2.96	1.35	3.62	6	0.0
February	61.1	45.2	53.1	2.81	1.27	3.43	6	0.0
March	63.7	47.3	55.5	2.39	1.03	2.92	6	0.0
April	67.2	49.8	58.5	2.62	0.40	2.83	2	0.0
May	70.4	52.9	61.7	0.42	0.03	0.47	1	0.0
June	74.5	56.0	65.3	0.12	0.00	0.12	0	0.0
July	76.7	57.7	67.2	0.03	0.00	0.00	0	0.0
August	77.1	58.4	67.7	0.07	0.00	0.01	0	0.0
September	76.8	57.5	67.2	0.20	0.00	0.24	0	0.0
October	72.8	53.8	63.3	0.90	0.29	1.10	2	0.0
November	64.1	47.1	55.6	1.84	0.61	2.20	4	0.0
December	57.7	41.7	49.7	2.08	1.16	2.57	5	0.0
Annual	-----	-----	-----	------	11.48	19.40	--	----
Average	68.3	50.8	59.6	------	------	------	--	----
Total	-----	-----	-----	16.44	------	------	32	0.0

GROWING SEASON DATES

	Temperature

Probability	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days
70 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1948-2002 prcp

Station : CA6144, NEWARK
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.00	0.00	0.00	0.59	0.17	3.10	3.86
49	0.97	2.45	4.33	0.00	0.19	0.01	0.03	0.08	0.00	0.26	1.22	1.67	11.21
50	5.18	M1.49	1.76	0.96	0.15	0.00	0.03	0.00	0.05	M0.80	M3.15	M3.94	17.51
51	2.42	1.88	1.83	0.75	0.41	0.04	0.00	0.01	0.00	M0.86	3.14	M6.44	17.78
52	6.63	1.15	M4.00	1.38	0.04	M0.17	0.00	0.00	0.00	0.05	2.29	M6.05	21.76
53	2.02	0.00	0.93	1.23	M0.63	0.16	0.00	0.12	0.02	M0.25	1.77	1.04	8.17
54	M2.42	M1.37	2.84	0.74	M0.16	M0.29	0.00	0.00	0.00	0.06	M1.20	M2.97	12.05
55	M4.44	M1.75	0.17	M0.87	M0.80	0.00	0.00	0.00	0.01	0.00	1.29	M7.93	17.26
56	M6.27	0.97	M0.04	1.35	0.83	0.00	0.00	0.00	0.25	0.69	0.02	0.32	10.74
57	M2.31	M1.96	1.63	1.26	M2.38	0.00	0.00	0.00	M0.25	M1.61	M0.51	3.34	15.25
58	4.27	M5.45	M4.36	M3.23	0.63	M0.02	0.02	0.00	0.05	M0.04	M0.16	M0.85	19.08
59	M2.78	M2.50	0.30	0.06	0.00	0.00	0.00	0.00	M0.75	0.05	0.00	M0.45	6.89
60	5.33	M3.41	M0.98	M0.35	0.45	0.00	0.00	0.00	0.02	0.17	M3.82	M1.06	15.59
61	M3.27	M1.04	M1.19	0.82	M0.56	0.18	0.00	0.09	0.30	0.05	M2.95	M0.91	11.36
62	M1.20	M6.62				0.00	0.00	0.00	0.00	M4.53	0.34	2.20	14.89
63	1.51	M2.88	M3.09	4.19	0.57	0.08	0.00	0.01	0.09	1.21	M2.93	0.24	16.80
64	3.54	0.00	1.31	0.07	0.45	0.41	0.00	0.09	0.00	0.67	M1.99	M4.23	12.76
65	M1.45	0.50	1.55	1.77	0.00	0.00	0.00	0.18	0.00	0.11	M4.21	2.84	12.61
66	1.54	1.27	0.32	0.36	0.05	0.11	0.24	0.00	0.13	0.00	2.71	2.28	9.01
67	M5.63	0.25	M2.84	M3.57	0.11	0.51	0.00	0.00	0.00	0.22	1.02	2.18	16.33
68	3.77	M0.56	M2.17	0.76	0.18	0.00	0.00	0.72	0.00	0.27	M2.48	M2.26	13.17
69	6.24	M3.96	1.38	M1.15	0.02	0.00	0.00	0.00	0.05	0.47	0.36	1.23	14.86
70	5.36	0.93	1.51	0.20	0.01	0.20	0.00	0.00	0.00	0.56	5.90	4.87	19.54
71	0.73	M0.79	1.43	1.25	0.12	0.00	0.00	0.09	0.12	0.01	0.81	2.90	8.25
72	0.77	0.65	0.04	0.38	0.00	0.20	0.00	0.00	0.58	M2.87	M5.90	1.70	13.09
73	3.79	M5.33	2.05	0.39	0.03	0.00	0.00	0.00	0.04	M1.63	M2.99	M3.84	20.09
74	M2.41	0.88	M2.23	M1.66	0.00	0.63	0.15	0.00	0.00	M0.89	0.61	1.38	10.84
75	0.84	M2.21	M3.28	M1.67	0.02	0.00	0.13	0.43	0.01	1.12	0.27	0.18	10.16
76	0.27	0.90	1.41	0.57	0.01	0.08	0.09	0.65	0.68	0.52	M0.82	0.89	6.89
77	0.81	0.63	1.64	0.18	1.09	0.00	0.14	0.00	0.44	0.22	M0.92	3.04	9.11
78	M6.26	3.07	M3.60	2.96	0.00	0.00	0.00	0.00	0.05	0.00	2.12	0.48	18.54
79	4.09	3.26	1.79	0.54	0.19	0.00	0.07	0.01	0.00	1.71	1.14	2.66	15.46
80	2.89	5.87	1.54	0.84	0.06	0.00	0.38	0.00	0.00	0.02	0.17	1.20	12.97
81	3.41	1.39	2.66	0.37	0.08	0.01	0.00	0.00	0.02	2.01	3.04	1.89	14.88
82	4.26	2.90	4.39	2.12	0.00	0.10	0.00	0.09	0.86	1.95	2.85	2.42	21.94
83	5.97	3.67	7.17	3.50	0.42	0.00	0.00	0.04	0.60	0.51	6.04	3.60	31.52
84	0.14	2.04	1.15	51.00	0.00	0.10	0.00	0.04	0.24	1.74	4.33	1.68	62.46

85	0.86	1.04	2.43	0.05	0.25	0.03	0.03	0.00	0.40	1.02	2.41	1.95	10.47
86	1.82	5.30	3.48	0.59	0.27	0.00	0.00	0.00	0.62	0.07	0.06	0.98	13.19
87	2.13	2.72	1.54	0.15	0.02	0.00	0.00	0.00	0.00	0.87	0.97	2.16	10.56
88	2.46	0.31	0.06	1.00	0.47	0.05	0.00	0.00	0.01	0.16	1.81	2.92	9.25
89	0.93	1.07	2.66	0.56	0.09	0.00	0.00	0.00	0.63	2.05	0.87	0.00	8.86
90	1.78	1.90	0.93	0.26	1.88	0.00	0.00	0.00	0.09	0.12	0.51	1.75	9.22
91	0.28	2.31	5.37	0.35	0.19	0.12	0.00	0.11	0.07	1.62	0.33	1.88	12.63
92	1.41	5.33	3.56	0.48	0.00	0.16	0.00	0.00	0.00	0.79	0.13	4.79	16.65
93	6.90	4.72	2.50	0.79	0.50	0.38	0.00	0.00	0.00	0.54	2.92	2.15	21.40
94	1.85	3.24	0.18	1.05	1.69	0.05	0.00	0.00	0.14	0.31	2.98	1.46	12.95
95	8.36	0.16	6.25	1.09	0.99	1.10	0.00	0.00	0.00	0.00	0.01	4.60	22.56
96	4.32	3.95	1.89	1.00	1.11	0.00	0.00	0.00	0.00	0.60	1.40	5.67	19.94
97	5.37	0.28	0.14	0.17	0.29	0.37	0.00	0.48	0.00	0.59	5.29	1.98	14.96
98	5.90	10.79	2.57	1.74	2.06	0.01	0.00	0.00	0.09	0.62	1.95	1.27	27.00
99	3.22	3.82	1.85	1.21	0.03	0.03	0.00	0.00	0.27	0.35	1.01	0.33	12.12
0	4.72	6.26	2.03	0.65	0.69	0.29	0.00	0.03	0.17	1.94	0.44	0.54	17.76
1	2.08	3.32	1.25	1.32	0.00	0.15	0.00	0.01	0.04	0.27	1.97	4.68	15.09
2													

WETS Station : OAKLAND MUSEUM, CA6336 Creation Date: 08/29/2002
Latitude: 3748 Longitude: 12216 Elevation: 00030
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)				
	avg daily max	avg daily min	avg	avg	30% chance will have less than	30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	57.3	44.6	51.0	4.85	2.24	5.93	7	0.0
February	61.6	47.9	54.7	4.40	1.83	5.35	7	0.0
March	63.3	49.1	56.2	3.56	1.54	4.34	6	0.0
April	66.5	50.6	58.5	1.35	0.53	1.66	3	0.0
May	69.0	53.4	61.2	0.59	0.05	0.65	1	0.0
June	71.7	55.7	63.7	0.12	0.00	0.12	0	0.0
July	72.5	56.9	64.7	0.07	0.00	0.00	0	0.0
August	73.5	58.3	65.9	0.10	0.00	0.01	0	0.0
September	74.7	58.3	66.5	0.31	0.00	0.36	0	0.0
October	72.1	55.4	63.8	1.38	0.53	1.69	2	0.0
November	63.9	49.5	56.7	3.24	1.30	3.93	5	0.0
December	57.7	44.6	51.1	3.13	1.71	3.88	5	0.0
Annual	-----	-----	-----	------	16.81	25.64	--	----
Average	67.0	52.0	59.5	------	------	------	--	----
Total	-----	-----	-----	23.10	------	------	36	0.0

GROWING SEASON DATES

Probability	Temperature: 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days
70 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1971-2002 prcp

Station : CA6336, OAKLAND MUSEUM
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
71	1.73	0.43	2.80	0.93	0.13	0.00	0.00	0.00	0.26	0.10	2.04	4.19	12.61
72	1.32	1.58	0.18	1.02		0.34	0.00	0.01	0.90	4.25	6.39	3.20	19.19
73	10.43	6.31	2.95	0.02	0.04	0.00	0.00	0.00	0.64	1.77	9.67	5.39	37.22
74	3.39	1.76	5.15	3.33	0.00	0.15	1.19	0.00	0.00	M1.16	0.78	2.52	19.43
75	2.29	3.88	5.68	2.25	0.01	0.08	0.21	0.05	0.03	3.85	0.56	0.52	19.41
76	0.31	2.01	1.08	0.89	0.00	0.04	0.00	1.09	0.61	0.57	1.09	2.30	9.99
77	1.55	0.77	2.10	0.00	0.54	0.00	0.01	0.00	0.68	0.21	2.83		8.69
78	7.87	4.80	6.89	3.76	0.00	0.00	0.00	0.00	0.59	0.00	1.64	0.70	26.25
79	7.18	5.52	2.82	1.04	0.10	0.00	0.43	0.00	0.00	2.37	3.96	5.77	29.19
80	4.81	7.63	M1.82	1.66	0.44	0.00		0.00	0.00	0.13	0.20	2.42	19.11
81	6.15	1.33	4.41	0.30	0.10	0.00	0.00	0.00	0.08	2.80	5.93	4.65	25.75
82	10.75	3.80	8.55	4.13	0.00	0.19	0.03	0.00	M0.00	2.89	5.31	3.11	38.76
83	7.22	8.08	9.83	3.87	0.42		0.00	0.05	0.61	0.23	7.12	6.84	44.27
84	0.33	2.28	1.60	0.98	0.09	M0.00	0.00	0.17	0.31	2.99	M6.89		15.64
85	0.77	2.08	3.65	0.15	0.04			0.00	0.53	1.18	M3.26	1.67	13.33
86	5.24	8.92	5.89	0.70	0.13	0.00	0.03	0.00	1.54	0.14	0.32	1.47	24.38
87	3.60	4.93	2.32	0.20	0.04	0.00	0.00	0.00	0.00	1.57	2.34	4.29	19.29
88	3.83	0.49	0.03	2.77	0.98	0.44	0.00	0.01	0.00	0.37	2.49	3.81	15.22
89	1.27		5.16	0.63	0.04	0.04	0.00	0.00	1.45	1.73	1.25	0.00	11.57
90	4.41		1.21	0.24	2.92	0.01	0.00	0.00	0.06	0.35	0.49	1.58	11.27
91	0.42	3.49	7.04	0.72	0.20	0.24	0.00	0.19	0.00	M1.20	0.36	2.22	16.08
92	1.71	7.53	4.54	0.26	0.00	0.30	0.00	0.03	0.00	2.49	0.30	6.82	23.98
93	8.90	3.94	2.61	0.60	0.94	0.11	0.00	0.00	0.00	0.62	2.08	3.01	22.81
94	2.56	4.52	0.28	1.69	1.54	0.00	0.00	0.00	0.04	0.40	9.37	3.23	23.63
95	M9.77	0.21	7.60	1.86	1.07	0.92	0.00	0.00	0.00				21.43
96	6.40	M5.87	2.01		2.67	0.00					3.44	8.90	29.29
97	7.80	0.22	0.56	0.57	0.27	0.28	0.00	1.25	0.01	1.18	M6.79	3.36	22.29
98	12.45	15.14	2.76	1.83	2.98	0.01	0.00	0.00	0.04	0.81	3.82	1.23	41.07
99	4.04	7.17	2.89	1.80	0.09	0.03	0.00	0.06	0.13	0.50	2.55	0.48	19.74
0	7.13	9.94	2.45	1.01	1.21		0.00	0.00	0.26	2.75	M0.70	0.77	26.22
1	3.27	7.39	1.27	1.69	0.00	0.07	0.00	0.00	0.26	0.54	4.41	9.40	28.30
2													

WETS Station : TRACY PUMPING PLANT, CA9001 Creation Date: 08/29/2002
Latitude: 3748 Longitude: 12135 Elevation: 00060

State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	54.8	38.5	46.7	2.68	1.16	3.26	6	0.0
February	61.6	41.9	51.8	2.29	1.01	2.79	5	0.0
March	66.4	45.0	55.7	1.98	0.80	2.40	5	0.0
April	72.8	48.0	60.4	0.73	0.39	0.90	2	0.0
May	80.0	53.4	66.7	0.45	0.00	0.46	1	0.0
June	87.4	57.5	72.4	0.09	0.00	0.07	0	0.0
July	92.1	60.4	76.3	0.04	0.00	0.00	0	0.0
August	91.6	60.3	76.0	0.06	0.00	0.00	0	0.0
September	87.4	58.5	72.9	0.25	0.00	0.19	0	0.0
October	78.5	52.2	65.4	0.72	0.22	0.91	1	0.0
November	64.6	44.1	54.3	1.63	0.58	2.03	4	0.0
December	55.3	38.0	46.7	1.55	0.75	1.89	4	0.0
Annual	-----	-----	-----	------	8.76	13.96	--	----
Average	74.4	49.8	62.1	------	------	------	--	----
Total	-----	-----	-----	12.48	------	------	28	0.0

GROWING SEASON DATES

Probability	Temperature: 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	1/17 to 12/20 338 days
70 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1955-2002 prcp

Station : CA9001, TRACY PUMPING PLANT
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
55		0.87	0.59	1.24	0.36	0.00	0.00	0.00	0.00	0.12	1.07	6.33	10.58
56	4.13	0.48	0.00	1.35	0.46	0.00	0.00	0.00	0.68	0.32	0.04	0.21	7.67
57	1.78	2.38	0.93	M0.92	M1.32	0.02	0.00	0.00	0.17	M0.70	0.21	1.81	10.24
58	3.19	4.68	3.78	3.03	0.67	0.15	0.00	0.09	0.06	0.00	0.00	0.59	16.24
59	2.53	3.05	0.11	0.10	0.05	0.00	0.00	0.00	2.60	0.00	0.00	0.79	9.23
60	2.27	2.39	0.27	0.24	0.25	0.00	0.01	0.00	0.01	0.07	2.91	0.40	8.82
61	2.21	0.58	1.13	0.69	0.89	0.00	0.00	0.06	0.19	0.03	2.50	0.55	8.83
62	0.60	5.93	1.02	0.01	0.00	0.00	0.00	0.00	0.05	2.87	0.18	1.35	12.01
63	1.90	2.45	1.84	2.27	0.30	0.00	0.00	0.00	0.17	0.68	3.21	0.11	12.93
64	1.48	0.01	0.80	0.17	0.15	1.80	0.02	0.30	0.00	1.03	1.95	3.74	11.45
65	1.90	0.50	1.19	1.16	0.00	0.00	0.05	0.36	0.00	0.02	3.14	2.23	10.55
66	0.82	1.19	0.11	0.42	0.15	0.00	0.25	0.00	0.06	0.00	3.21	2.93	9.14
67	5.27	0.24	3.11	2.53	0.02	0.55	0.00	0.00	0.00	0.09	0.66	0.92	13.39
68	3.32	1.33	1.64	0.44	0.00	0.00	0.00	0.60	0.00	0.19	2.22	2.44	12.18
69	5.02	3.88	0.29	0.65	0.00	0.00	0.00	0.00	0.04	0.95	0.36	1.97	13.16
70	5.40	1.70	1.17	0.21	0.00	0.19	0.00	0.00	0.00	0.64	4.42	3.62	17.35
71	0.81	0.28	1.11	1.00	1.32	0.00	0.00	0.00	0.03	0.00	0.36	2.06	6.97
72	0.51	0.62	0.05	0.30	0.03	0.02	0.00	0.00	0.69	1.77	4.15	1.17	9.31
73	4.38	3.97	2.35	0.41	0.00	0.00	0.00	0.00	0.00	1.35	3.36	2.80	18.62
74	2.03	0.26	1.82	1.23	0.00	0.05	0.10	0.00	0.00	0.63	0.31	1.96	8.39
75	0.33	3.04	3.40	0.92	0.00	0.00	0.18	0.32	0.00	0.98	0.28	0.30	9.75
76	0.25	1.17	0.25	0.55	0.00	0.03	0.00	0.73	0.89	0.43	0.45	0.69	5.44
77	0.52	0.66	0.74	0.63	0.83	0.00	0.01	0.00	0.24	0.13	1.71	2.45	7.92
78	5.61	2.87	3.11	1.14	0.00	0.00	0.00	0.00	0.07	0.00	1.93	0.25	14.98
79	3.68	2.53	2.05	0.62	0.00	0.00	0.20	0.00	0.00	1.30	0.92	2.24	13.54
80	3.46	3.28	1.02	0.98	0.13	0.00	0.62	0.00	0.00	0.03	0.17	0.85	10.54
81	3.16	0.75	2.11	0.27	0.02	0.00	0.00	0.00	0.08	1.29	3.12	2.09	12.89
82	5.46	1.47	4.10	1.45	0.00	0.29	0.00	0.00	2.20	1.64	3.87	1.99	22.47
83	5.12	3.89	5.89	2.91	0.16	0.00	0.00	0.51	0.76	0.43	4.93	2.88	27.48
84	0.45	1.48	0.45	0.30	0.01	0.01	0.00	0.00	0.00	1.41	3.80	1.25	9.16
85	0.42	0.81	1.20	0.21	0.00	0.40	0.00	0.00	0.00	0.48		2.89	6.41
86	1.66	5.10	4.74	0.31	0.07	0.00	0.03	0.00	0.71	0.00	0.00	0.87	13.49
87	1.48	4.15	1.65	0.13	0.00	0.00	0.00	0.00	0.00	M0.58	M1.02	M2.11	11.12
88	M2.27	M0.45	0.83	M1.35	M0.32	0.76	0.00	0.00	0.00	0.24	M1.02	M1.63	8.87
89	M0.83	M0.92	M1.67	M0.30	0.10	M0.02	0.00	M0.01	M1.56	M0.64	M0.85	M0.05	6.95
90	M1.04	M2.11	M0.57	M0.47	M2.00	0.00	0.00	0.00	M0.07	0.15	0.20	1.08	7.69
91	M0.22	M1.98	M3.60	M0.37	0.26	M0.00	0.10	0.15	0.00	1.01	M0.25	M0.70	8.64
92	M1.43	M3.73	M1.46	0.60	0.00	0.14	0.00	0.00	0.00	M0.71	M0.29	M4.42	12.78
93	M5.86	M2.89	M2.83	M0.53	M0.93	M0.14	0.00	0.00	0.00	0.30	2.11	1.39	16.98
94	1.02	2.71	0.07	1.01	1.39	0.00	0.00	0.00	0.05	0.33	2.55	0.67	9.80
95	5.13	0.16	M5.19	0.71	0.48	0.71	0.00	0.00	0.00	0.00	0.00	4.67	17.05
96	M4.02	3.79	2.45	1.09	1.19	0.00	0.00	0.00	0.00	1.11	1.99	3.58	19.22
97	5.22	M0.17	0.11	0.03	0.55	0.15	0.00	0.05	0.00	0.22	3.22	1.59	11.31
98	4.57	7.27	1.43	1.08	3.15	0.10	0.00	0.00	0.13	0.52	1.81	0.44	20.50
99	3.08	2.38	1.99	0.71	0.06	0.00	0.00	0.00	0.07	0.06	0.96	0.27	9.58
0	4.32	4.42	0.79	0.42	0.51	0.02	0.00	0.00	0.02	3.87	0.52	0.47	15.36
1	1.84	2.38	1.16	1.08	0.00	0.05	0.00	0.00	0.25	0.17	1.79	4.55	13.27
2													

WETS Station : UPPER SAN LEANDRO FLTR, CA9185   Creation Date: 08/29/2002
Latitude: 3746   Longitude: 12210   Elevation: 00390
State FIPS/County(FIPS): 06001   County Name: Alameda
Start yr. - 1971   End yr. - 2000

	Temperature (Degrees F.)	Precipitation (Inches)

Month	avg daily max	avg daily min	avg	avg	30% chance will have less than	30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	57.6	40.7	49.1	5.20	2.32	6.34	8	0.0
February	61.3	42.6	51.9	4.64	2.07	5.66	7	0.0
March	62.7	43.9	53.3	4.49	2.34	5.48	8	0.0
April	66.6	44.9	55.7	1.70	0.71	2.07	3	0.0
May	69.5	48.0	58.8	0.75	0.06	0.83	1	0.0
June	73.0	51.6	62.3	0.15	0.00	0.18	0	0.0
July	75.4	53.3	64.3	0.06	0.00	0.00	0	0.0
August	75.3	54.2	64.8	0.11	0.00	0.02	0	0.0
September	76.1	53.9	65.0	0.36	0.00	0.38	1	0.0
October	72.8	51.0	61.9	1.52	0.55	1.88	2	0.0
November	64.4	45.2	54.8	3.88	1.54	4.70	6	0.0
December	58.6	41.4	50.0	3.84	1.81	4.69	6	0.0
Annual	-----	-----	-----	------	20.36	29.92	--	----
Average	67.8	47.6	57.7	------	------	------	--	----
Total	-----	-----	-----	26.69	------	------	42	0.0

GROWING SEASON DATES

Probability	Temperature 24 F or higher	Temperature 28 F or higher	Temperature 32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days
70 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

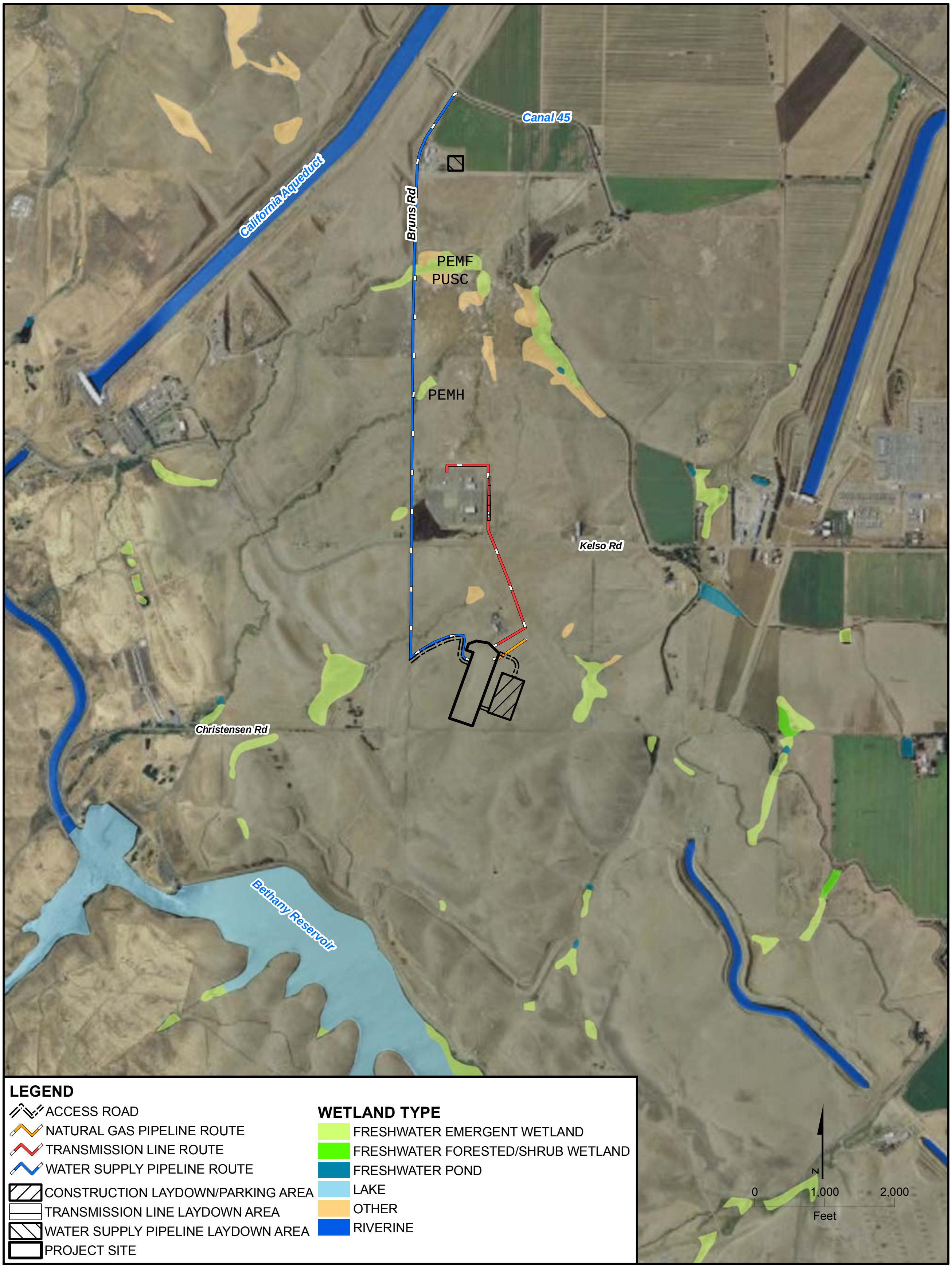
total 1948-2002 prcp

Station : CA9185, UPPER SAN LEANDRO FLTR
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.00	0.02	0.00	0.64	0.86	4.10	5.62
49	1.58	3.12	4.59	0.02	0.78	0.00	0.05	M0.12	0.00	0.32	M1.73	M2.24	14.55
50	9.80	2.31	3.32	1.57	0.91	0.02	0.00	0.00	0.00	2.36	6.08	6.19	32.56
51	6.25	M2.47	M2.24	1.09	0.70	0.01	0.00	0.34	0.03				13.13

58								0.00	0.06	0.22	0.12	1.93	2.33
59	4.73	4.70	0.83	0.02	M0.02	0.00	0.00	0.03	3.31	0.03	0.00	1.61	15.28
60	M3.01	5.63	3.05	0.97	0.96	M0.00	M0.00	0.00	0.00	0.32	M5.81	0.91	20.66
61	2.99	M1.44	3.76	M1.29	0.79	0.00	0.00	0.13	0.34	M0.34	4.07	2.90	18.05
62	1.74	8.93	2.61	0.53	0.00	0.00	0.00	0.14	0.43	13.13	0.95	2.97	31.43
63	2.62	4.47	4.09	5.64	0.69	0.00	0.00	0.00	0.23	1.83	4.10	0.57	24.24
64	4.91	0.19	2.13	0.32	0.66	0.69	0.03	0.05	0.00	1.35	4.21	7.52	22.06
65	4.86	0.98	2.04	3.99	0.00	0.00	0.02	0.10	0.00	0.28	5.48	4.22	21.97
66	2.98	2.97	0.84	0.73	0.34	0.00	0.15	0.14	0.15	0.00	5.03	4.18	17.51
67	10.20	0.37	5.23	5.80	0.09	1.15	0.00	0.00	0.02	0.66	1.20	3.79	28.51
68	6.61	2.81	3.61	0.44	0.57	0.00	0.00	0.25	0.03	0.28	3.26	4.74	22.60
69	9.00	9.14	1.63	2.27	0.00	0.12	0.00	0.00	0.00	2.31	0.73	5.70	30.90
70	9.71	1.59	1.99	0.06	0.01	0.81	0.00	0.00	0.00	0.77	8.03	8.77	31.74
71	1.61	0.76	3.81	1.02	0.23	0.00	0.00	0.00	0.18	0.12	2.13	4.43	14.29
72	1.73	1.97	0.19	1.89	0.01	0.30	0.00	0.00	1.56	3.70	7.02	3.85	22.22
73	11.00	6.89	3.77	0.09		0.00	0.00	0.00	0.79	1.52	9.20	6.94	40.20
74	4.01	2.21	6.80	4.68	0.00	0.10	1.16	0.00	0.00	0.90		2.37	22.23
75	2.21	6.17	6.05	2.85	0.00	0.11	0.14	0.11	0.02	6.41	1.05	0.38	25.50
76	0.33	1.10	2.51	0.98	0.00	0.06	0.00	1.30	0.88	0.72	1.34	1.98	11.20
77	1.29	1.22	2.52	0.20	1.22	0.00	0.00	0.03	0.96	0.48	3.95	5.73	17.60
78	9.51	4.82	7.30	6.17	0.03	0.00	0.00	0.00	0.48	0.00	2.43	0.91	31.65
79	8.83	5.82	4.06	0.96	0.19	0.00	0.02	0.00	0.00	3.11	3.45	5.79	32.23
80	5.79	7.40	2.55	2.19	0.36	0.05	0.19	0.00	0.00	0.15	0.35	2.33	21.36
81	6.05	1.45	5.60	0.61	0.25	0.00	0.00	0.00	0.08	3.66	6.77	6.93	31.40
82	9.38	5.03	7.68	5.05	0.00	0.12	0.05	0.01	1.12	2.80	7.94	4.33	43.51
83	8.11	8.20	13.10	3.57	0.41	0.00	0.00	0.17	0.45	0.93	9.18	7.77	51.89
84	0.22	2.83	2.21	0.99	0.17	0.92	0.00	0.09	0.04	3.82	8.90	2.08	22.27
85	0.56	2.35	4.24	0.08	0.56	0.26	0.08	0.07	0.54	0.90	3.85	1.90	15.39
86	5.23	10.80	6.52	0.81	0.26	0.00	0.04	0.00	1.90	0.17	0.58	1.90	28.21
87	4.25	5.77	3.26	0.53	0.10	0.00	0.00	0.00	0.00	1.24	2.30	5.13	22.58
88	4.40	0.50			0.70	0.41	0.00	0.00	0.00	0.62	5.01	4.17	15.81
89	1.41	1.80	6.85	0.59	0.03	0.08	0.01	0.00	0.91	3.31	2.10	0.03	17.12
90	4.66	2.44	1.31	0.48	3.83	0.01	0.00	0.00	0.12	0.57	0.73	2.21	16.36
91	0.53	3.06	8.35	0.49		0.13	0.00	0.10	0.00	2.76	0.57	2.57	18.56
92	1.84	7.74	4.68	0.34	0.00	0.02		0.01	0.00	2.12	0.27	8.14	25.16
93	9.17	4.55	2.73	1.37	1.19	0.22	0.00	0.00	0.00	0.66	1.75	2.89	24.53
94	2.29	5.51	0.33	1.83	1.69	0.02	0.00	0.00	0.02	0.29	9.46	3.03	24.47
95	11.17	0.12	8.41	2.49	2.13	1.00	0.00	0.00	0.00	0.00	0.10	8.38	33.80
96	6.68	6.29	3.35	2.45	3.18	0.00	0.00	0.00	0.10	1.08	4.38	10.98	38.49
97	M8.77	0.40	0.55	1.22	0.16	0.44	0.00	1.23	0.01	0.93	7.68	3.61	25.00
98	12.19	15.43	3.13	2.47	3.62	0.12		0.00	0.11	0.70	3.93	2.45	44.15
99	4.54	8.07	3.82	2.02	0.06	0.03	0.00	0.11	0.02	0.34	2.08	0.64	21.73
0	8.13	8.48		0.94		0.21		0.00	0.47			1.28	19.51
1	3.46		1.73	1.95	0.00	0.22	0.00	0.00	0.20	0.50	4.33	10.42	22.81
2													

Appendix B
National Wetland Inventory Map



Source: U.S. Fish and Wildlife Service, Division of Habitat and Resource Conservation, National Wetlands Inventory, California, 2008.

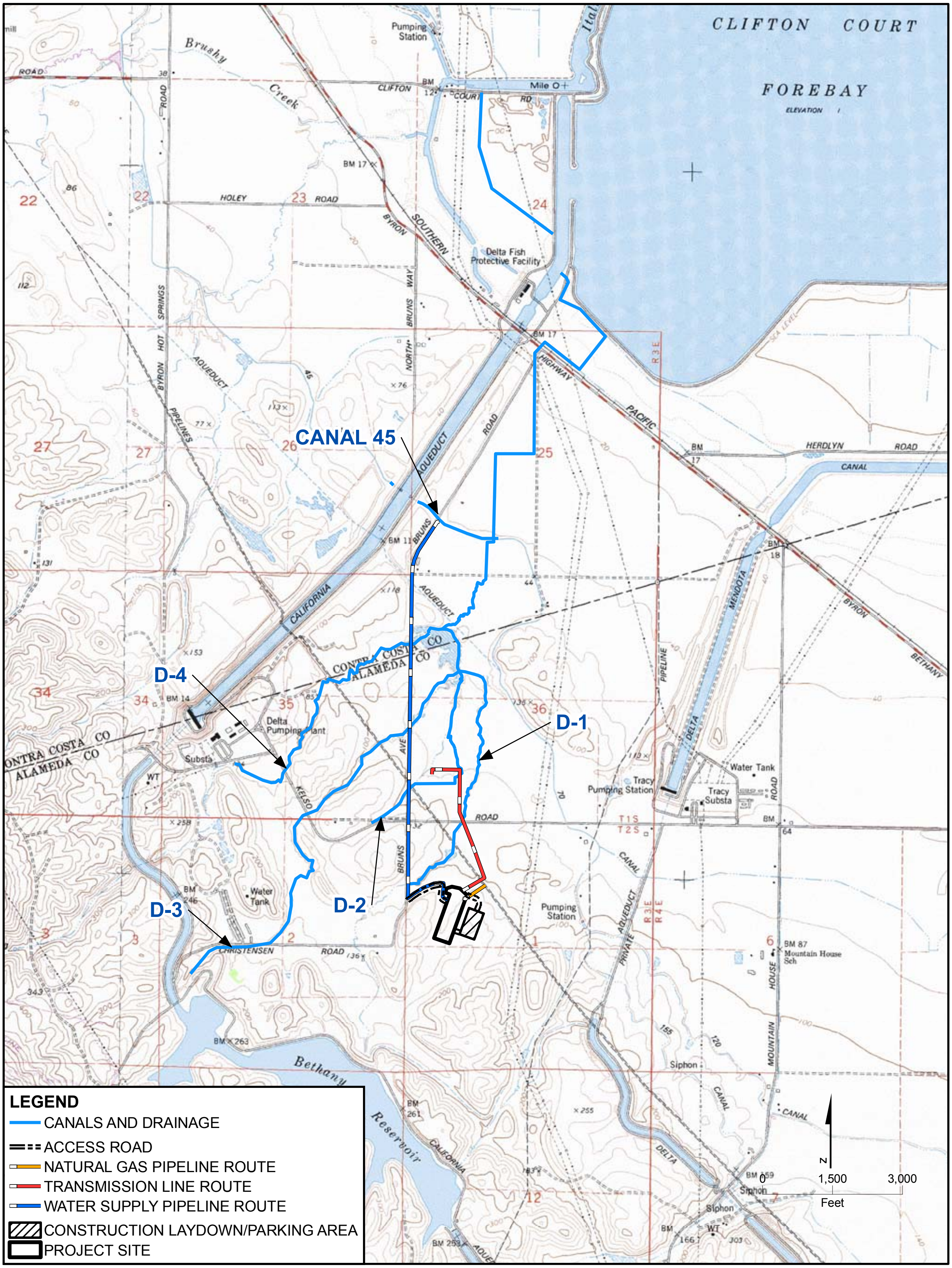
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

FIGURE B-1
NWI MAP
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_NWI.MXD MHASKELL 7/13/2009 09:57:52

CH2MHILL

Appendix C
Drainage and Topography Map



Notes:

1. Source: USGS, the National Atlas of the United States, Environmental Systems Research Institue (ESRI). Water Bodies - 2004, River and Streams - 2006.

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

FIGURE C-1
DRAINAGE AND TOPOGRAPHY

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_SURFACEWATER.MXD MHASKELL 7/13/2009 10:31:30

Appendix D
Mapped Soil Units in the Project Vicinity

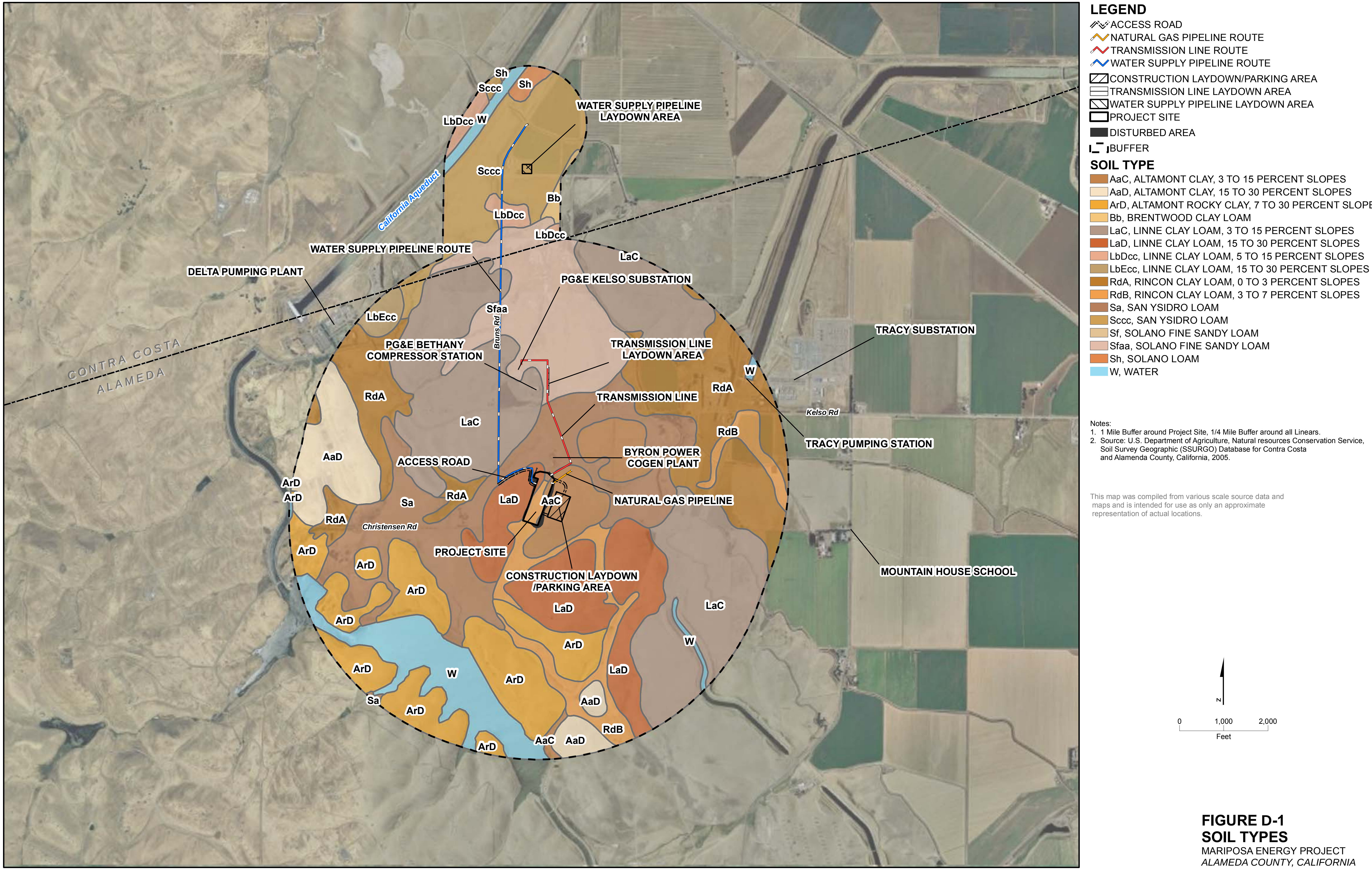


FIGURE D-1
SOIL TYPES
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_SOILS.MXD MHASKELL 7/10/2009 11:22:14

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Appendix E
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-01

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 28.127" Long: -121° 36' 05.172" Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam; 15 to 30 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks: Small concave depressional areas along gravel access road to the Byron CoGen Plant connected by a partially crushed 18-inch diameter culvert. Problematic area: seasonal wetland hydrology; no hydric soil indicators were noted but were presumed to meet the definition of a hydric soil as noted in the remarks.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Plagiobothrys stipitatus*	20%	X	OBL
2. *Lolium multiflorum*	3%		(FAC)
3. *Grindelia camporum*	3%		FACU
4. *Epilobium densiflorum*	2%		OBL
5. *Psilocarphus oregonus*	1%		OBL
6. *Crassula aquatica*	1%		OBL
7. *Veronica peregrina*	T		OBL
8. *Juncus bufonius*	T		FACW
Total Cover:	30%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0*
- ___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Basin is characterized by *Plagiobothrys* with other scattered vernal pool plants; species around the margins of the basin included *Bromus hordeaceus, Hordeum murinum, Erodium botrys, Grindelia,* and *Medicago polymorpha.* The small basin on the north side of the road is largely open soils (80% bare ground) with approximately 15% cover of *Cotula coronopifolia*; with 5% cover composed of *Plagiobothrys stipitatus, Eryngium vaseyi*, *Lolium multiflorum* and *Epilobium densiflorum.* **Note:** *Lolium multiflorum* is not included on the Reed (1988) plant list but is generally considered to be a facultative species and was therefore assigned a FAC indicator status.

SOIL

Sampling Point SP-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-3	10 YR 4/2	100	10 YR 4/4	<1	C	M	CL	pH 7.0 - 7.2
3-10	10 YR 4/2	100					CL	
10-16	10 YR 4/3	100					C	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: 10”

Depth (inches): Clay Layer

Hydric Soil Present? Yes X No ___

Remarks: At the time of the survey, soils were very dry and hard, difficult to excavate to depth. Soils in this area are mapped as part of the Linne Series, but appear to be somewhat transitional between the Lynne and San Ysidro Series. The soil pH was neutral (7.0 to 7.2) throughout the upper 16 inches. Despite the presence of OBL and FACW plants throughout the basin as well as observations of seasonal inundation and presence of aquatic invertebrates, no hydric soil indicators were evident; however, the assumption is that soils in this area are ponded long enough to become anaerobic in the upper part during the growing season and are therefore considered to meet the definition of a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

* Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
* Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
X Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >16

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >16

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Basin was dry at the time of the survey, but seasonal inundation and aquatic invertebrates were observed in this location during field surveys in February 2009. In addition, the defined topographic basin with an abrupt boundary with the adjacent grassland, abundance of OBL and FACW vegetation, and deep cattle prints all suggest prolonged seasonal saturation and/or inundation occurs at this sample location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center   City/County: Alameda   Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp.   State: CA   Sampling Point: SP-02

Investigator(s): Russell Huddleston, Todd Ellwood   Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace   Local relief (concave, convex, none): None   Slope (%): 0-1 %

Subregion (LRR): C   Lat: 37° 47' 28.013"   Long: -121° 36' 05.233"   Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam 15 to 30 percent slopes   NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed?   Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No *		
Wetland Hydrology Present?	Yes ___ No X		

Remarks: Sample point located adjacent to well-defined basin with distinct change in vegetation along gravel access road to the Byron Power Cogen Plant. Soils very gravelly and hard at this location and were not excavated at the time of the survey; this area is characterized by upland plants and has no evidence of seasonal saturation or inundation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Bromus hordeaceus*	45%	X	FACU-
2. *Erodium moschatum / E. botrys*	15%	X	NL
3. *Grindelia camporum*	10%		FACU
4. *Medicago polymorpha*	2%		NL
5. *Trifolium hirtum*	1%		NL
6. *Hordeum murinum* subsp. *leporinum*	1%		NL
7. *Lolium multiflorum*	1%		(FAC)
8.			
Total Cover:	75%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 25%   % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: Annual grassland habitat located adjacent to well-defined topographic basin; distinct upland/wetland boundary at this location. **Note:** *Lolium multiflorum* is not included on the Reed (1988) plant list but is generally considered to be a facultative species and was therefore assigned a FAC indicator status.

SOIL

Sampling Point SP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/2	100					CL	pH 7.0-7.2

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ **No** *

Remarks: Soil very hard with high gravel content at the time of the survey. Soil pit was not excavated in this location; no indication that this area is subject to seasonal saturation or inundation, therefore, soils are likely non-hydric. Note: No hydric soil indicators were noted in the adjacent depression basin characterized by OBL and FACW vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point taken in upland area adjacent to well-defined topographic depression. No evidence of seasonal saturation or inundation evident at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-03

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 32.965" Long: -121° 35' 58.615" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** Yes ___ **No** X
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes ___	No X	

Remarks: Swale feature within annual grassland that flows to the southwest where water collects in low areas around the Byron Power Cogen Plant. Wetland hydrology uncertain at this location, appears to support short-duration inundation and low-volume flow in response to rain events, but does not appear to support prolonged, continuous saturation or inundation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Hordeum marinum*	85	X	FAC
2. *Distichlis spicata*	5		FACW
3. *Frankenia salina*	5		FACW+
4. *Lolium multiflorum*	T		(FAC)
5.			
6.			
7.			
8.			
Total Cover:	95		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0*
- ___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: Vegetation notably different within the swale than the adjacent annual grassland – swales are characterized by Mediterranean barley where the adjacent areas are characterized by foxtail barley and soft chess. Saltgrass, alkali heath and Italian ryegrass are widely scattered throughout and not restricted to the swale areas. Note: *Lolium multiflorum* is not included on Reed (1988), but is generally considered to be a facultative species.

SOIL

Sampling Point SP-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/2	95	7.5 YR 4/4	2	C	M	FSCL	
2-12			7.5 YR 4/6	3	C	M	FSCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soils just meet the criteria for a depleted matrix at this location. Adjacent soils were similar, but lack the 7.5 YR 4/6 concentrations in the upper 2 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area was dry at the time of the survey and characterized by FAC vegetation; appears to convey low-volume flows in response to storm events and may be subject to temporary inundation, but does not appear to support prolonged inundation or saturation for a minimum of 18 consecutive days and was therefore unlikely to meet the wetland hydrology criterion. Only sporadic, very shallow pockets of water were noted in this area during site visits during the wet season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-04

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 33.174" Long: -121° 35' 58.781" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes ____ No X		

Remarks: California annual grassland adjacent to low topographic swale, dark brown concentrations in the upper part of the soil are characteristic for this soil type.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Bromus hordeaceus*	80%	X	FACU-
2. *Grindelia camporum*	10%		FACU
3. *Erodium botrys*	5%		NL
4. *Eryngium vaseyi*	3%		FACW
5.			
6.			
7.			
8.			
Total Cover:	98%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 2% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		
FAC species		
FACU species		
UPL species		
Column Totals:		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Annual grassland habitat adjacent to seasonal wetland swale.

SOIL

Sampling Point SP-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/2	98	7.5 YR 4/4	2	C	M	FSL	
2-14	10 YR 4/3	100					FSCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soils have 2 percent distinct concentrations in the upper 2 inches – just meets the criteria for a depleted matrix; the San Ysidro Series soils typically have few fine, distinct concentration in the upper part of the soils – unlikely that these concentrations are the result of current hydrologic conditions in this area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of seasonal saturation or inundation at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-05

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 36.220" Long: -121° 35' 59.921" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks: Soil point taken in very weakly expressed low area within slightly hummocky annual grassland habitat along transmission line alignment; no evidence of wetland hydrology was observed in this area during any of the surveys.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Bromus hordeaceus*	70	X	FACU-
2. *Erodium moschatum*	10		NL
3. *Eryngium vaseyi*	5		FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	85%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: Vegetation in this area similar to surrounding grassland habitat.

SOIL

Sampling Point SP-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/3	98	7.5 YR 4/4	2	C	M	FSL	
2-12	10 YR 4/3	100					FSL-FSCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? Yes ___ **No** X

Remarks: Brown concentrations in the upper part are typical for this soil unit, but chroma of 3 does not meet the depleted matrix hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		X	
Water Table Present?		X	>12
Saturation Present? (includes capillary fringe)		X	>12

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of seasonal inundation or saturation at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center   City/County: Alameda   Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp.   State: CA   Sampling Point: SP-06

Investigator(s): Russell Huddleston, Todd Ellwood   Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Drainage   Local relief (concave, convex, none): Concave   Slope (%): 0-1 %

Subregion (LRR): C   Lat: 37° 47' 28.170"   Long: -121° 36' 17.167"   Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam   NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Well-defined drainage channel with gently sloping banks shown as a blue line creek on USGS topographic map; sample point located within the ordinary high water line of seasonal drainage channel along Bruns Road within the work area for the proposed service water pipeline; 6-foot by 6-foot box culvert under the road at this location.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Distichlis spicata*	40%	X	FACW
2. *Polypogon monspeliensis*	5%		FACW
3. *Lolium multiflorum*	5%		(FAC)
4. *Cotula coronopifolia*	<1%		FACW+
5. *Spergularia marina*	<1%		FACW*
6. *Hordeum marinum* subsp. *leporinum*	<1%		NL
7.			
8.			
Total Cover:	55%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 45%   % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Dense *Lepidium latifolium* between the fence and the culvert west of the sample point. Lower part of channel characterized by saltgrass and rabbitsfoot grass. Note: *Lolium multiflorum* is not listed on Reed (1988) but is generally considered to be a facultative species.

SOIL

Sampling Point SP-06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-5	10 YR 4/1	100					CL	
5-12	2.5 Y 4/1	90%	10 YR 4/6	5	C	M	FS-SiCL	
			Gley 1 6/10Y	<1	D	RC		
			7.5 YR 3/4	5	C	RC		
12+	2.5 Y 5/3	80	10 YR 4/6	10	C	M	SiCL	
	2.5 Y 4/1	10						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? Yes X **No** ___

Remarks: Evidence of reducing conditions observed throughout the soil profile below a depth of 5 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
X Drift Deposits (B3) (**Riverine**)
X Drainage Patterns (B10)
X Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 12

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point is within the ordinary high water line of a seasonal drainage, some standing water present in the deeper part of the channel at the time of the survey. Saturated soils were observed at a depth of 12 inches and soil redox indicates prolonged saturated conditions within the upper part.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-07

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 28.119" Long: -121° 36' 17.137" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks: Sample point located in grassland adjacent to seasonal drainage D-1 on the east side of Bruns Road south of Kelso Road – along service water pipeline route.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Hordeum marinum* subsp. *leporinum*	60%	X	NL
2. *Bromus hordeaceus*	30%	X	FACU-
3. *Medicago polymorpha*	2%		NL
4. *Erodium moschatum*	1%		NL
5. *Lolium multiflorum*	<1%		(FAC)
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: *Lolium multiflorum* is not listed on Reed (1988) but is generally considered to be a facultative species. Vegetation in this area is typical for the grasslands throughout the Project study area.

SOIL

Sampling Point SP-07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-12	10 YR 4/1	100					CL	No Redoximorphic Features

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soils very hard and dense – difficult to excavate at this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	>12
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):	>12

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point located on terrace adjacent to seasonal drainage channel – no evidence of prolonged saturation or inundation at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-08

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 47.811" Long: -121° 36' 17.289" Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam 3 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X* No ____		

Remarks: Small drainage channel on east side of Bruns Road just west of PG&E Bethany Compressor Station, north of Kelso Road – flows to the east into rock-lined drainage ditch within the PG&E facility; 12-inch-diameter culvert (cmp) under the road in this area; shown as a blue line creek on the USGS topographic map – area may be more of a vegetated waters than a wetland, but duration of inundation/saturation is indeterminate.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Lolium multiflorum*	40	X	(FAC)
2. *Distichlis spicata*	35	X	FACW
3. *Hordeum brachyantherum*	25	X	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: *Lolium multiflorum* is not listed on Reed (1988) but is generally considered to be a facultative species. Vegetation in this area is similar to the adjacent grassland area on low terrace above the drainage feature.

SOIL

Sampling Point SP-08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-5	10 YR 4/2	98	7.5 YR 3/4	2	C	M	SCL	pH 8.2
5-16	2.5 Y 6/4	95	10 YR 2/1	5	C	M	CL	Mn Nodules

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? **Yes** X **No** ___

Remarks: Surface soil is moderately alkaline in this area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
X Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): >16
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >16

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Shallow, defined drainage channel, some evidence of scouring along the banks – area appears to convey seasonal flows for some duration – this area may function more as vegetated waters rather than a wetland, wetland hydrology (18 consecutive days of saturation or inundation) was indeterminate in this area at the time of the survey, but area appears to convey flows and therefore wetland hydrology was tentatively assumed to be present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-09

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47’ 47.881” Long: -121° 36’ 17.276” Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam 3 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are “Normal Circumstances” present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks: Elevated area adjacent to small drainage channel on the east side of Bruns Road, near PG&E Bethany Compressor Station – Vegetation similar to that found in adjacent drainage, but this area lacks evidence of wetland hydrology. May be occasionally flooded in response to heavy rains, but unlikely that water persists in this area.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Hordeum brachyantherum*	90	X	FACW
2. *Distichlis spicata*	<1		FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	90%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 10% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Sample point characterized by dense meadow barley; no distinct vegetation change with the adjacent drainage channel.

SOIL

Sampling Point SP-09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[a]	Loc[b]		
0-6	10 YR 4/1	100					CL	pH 8.6 to 8.8
6-15	10 YR 3/2	100	2.5 Y 7/4	<2	C	M	C	Light concentrations are $CaCO_3$ nodules and filaments – not redox features

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? Yes ___ **No** X

Remarks: Surface soil is strongly alkaline with calcium carbonate deposits present below 6 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	>16
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):	>16

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Elevated areas adjacent to small drainage feature, no evidence of prolonged saturation or inundation in this area. Possibly subject to short-term flooding due to heavy storm events.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-10

Investigator(s): Russell Huddleston Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 00.183" Long: -121° 36' 17.334" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PEMH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Shallow well-defined drainage perennial drainage channel on east side of Bruns Road; 6-foot by 6-foot cement box culvert under road. This feature is shown as a blue line creek on the USGS topographic map and is a Palustrine Emergent Permanently Flooded (PEMH) on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Bolboschoenus maritimus*	70	X	OBL
2. *Distichlis spicata*	15		FACW
3. *Chenopodium album*	<1		FAC
4.			
5.			
6.			
7.			
8.			
Total Cover:	85%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Dense cosmopolitan bulrush throughout the channel, relatively distinct vegetation boundary with the adjacent grasses.

SOIL

Sampling Point SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-6	Gley 1 2.5/5GY	60	7.5 YR 4/6	5	C	M	CL	Strong reaction to α α-dipyrdyl
	5Y 2.5/2	35						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >6

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soils were inundated at the time of the survey with extensive roots and rhizomes in the upper part, evidence of reducing condition noted in the upper part with alpha alpha-dipyrdyl dye test.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 3
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Shallow perennial drainage, flows to the north into open water area located outside of the Project study area.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-11

Investigator(s): Russell Huddleston Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 00.241" Long: -121° 36' 17.340" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks: Sample point on north side of drainage channel above the ordinary high water line, area is characterized by dense saltgrass, but lacks evidence of hydric soil and wetland hydrology.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Distichlis spicata*	100	X	FACW
2. *Cressa truxillensis*	<1		FACW
3. *Cirsium vulgare*	<1		FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0*
- ___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: Dense saltgrass along the upper edges of the channel.

SOIL

Sampling Point SP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-12	2.5 Y 4/2	80					SL	$CaCO_3$ Nodules Present
	2.5 Y 5.2	20						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? **Yes** ___ **No** X

Remarks: No redoximorphic features observed in this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Upper edge of drainage channel, possibly subject to occasional flooding, but no evidence this area is subject to prolonged saturation or inundation. Sample point is above the ordinary high water line of the drainage channel.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/15/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-12

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 19.996" Long: -121° 36' 17.153" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PEMF

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Sample point taken at outer edge of drainage channel on the east side of Bruns Road, 30-inch-diameter cmp culvert under the road in this area. Sample point at the edge of the ordinary high water line – likely subject to shallow groundwater saturation during the wet season. This feature is shown as a blue line on the USGS topographic map and is a Palustrine Emergent Semi-permanently Flooded (PEMF) on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Distichlis spicata*	75	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 25% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species	____	×1 = ____
FACW species	____	×2 = ____
FAC species	____	×3 = ____
FACU species	____	×4 = ____
UPL species	____	×5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Dense, lush saltgrass along the outer edges of the channel, center part of the channel filled with dense cattails.

SOIL

Sampling Point SP-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-3.5	10 YR 4/2	100					FSCL	pH 9.6
3.6-16	10 YR 4/2	100					CL	pH 9.2

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? **Yes** X **No** ___

Remarks: No redoximorphic features observed in this location; however, the soil is strongly alkaline and was therefore considered problematic. Lush FACW vegetation along with topographic low position adjacent to drainage channel suggest soils in this area are likely seasonally saturated or inundated for a period of time and hydric conditions likely exist.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- X Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	>16
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):	>16

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey, but water was present in the deeper part of the channel at the time of the survey; low topographic position adjacent to channel and lush saltgrass suggest this area may be subject to seasonal saturation or inundation. Wetland hydrology was assumed to be present at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Contra Costa Date: 4/15/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-13

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 20.115" Long: -121° 36' 17.127" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PUSC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X*	No	
Wetland Hydrology Present?	Yes X*	No	

Remarks: Sample point is within alkali sink wetland adjacent to drainage channel on the east side of Bruns Road – just north of the Alameda County line. Area is characterized by notable change in vegetation and soils from the surrounding grassland areas. Considered a problem area due to the strongly alkaline soils and probable seasonal wetland hydrology. Area is Palustrine Unconsolidated Shore Seasonally Flooded (PUSC) wetland on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Distichlis spicata*	30	X	FACW
2. *Kochia californica*	30	X	FACW
3. *Hordeum brachyantherum*	25	X	FACW
4. *Lolium multiflorum*	<1		(FAC)
5.			
6.			
7.			
8.			
Total Cover:	85%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0*

__ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: Vegetation includes hydrophytic plant species that area also tolerant of saline/alkaline soil conditions – notable change in vegetation from the adjacent grassland areas. *Lolium multiflorum is* not included on Reed (1988) but is generally considered a facultative species.

SOIL

Sampling Point SP-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-6	10 YR 4/2	100					CL	pH 8.8-9.0
6-16	10 YR 31/1	80					CL	
	10 YR 4/2	20						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
_X_ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? Yes X **No** ___

Remarks: No redoximorphic features observed in this location; however, the soil is strongly alkaline and was therefore considered problematic. Lush FACW vegetation along with topographic low position adjacent to drainage channel suggest soils in this area are likely seasonally saturated or inundated for a period of time and hydric conditions likely exist.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
_X_ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >16

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >16

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey, but this area potentially supports shallow seasonal inundation or shallow groundwater resulting in saturated soil condition in the upper 12 inches. Hydrology was indeterminate at this location, but topographic position and notable change in vegetation suggest wetland hydrology may be present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Contra Costa Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-14

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 21.291" Long: -121° 36' 16.854" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PUSC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Sample point take in the alkali sink wetland adjacent to drainage channel on the east side of Bruns Road – just north of the Alameda County line. Area is characterized by notable change in vegetation and soils from the surrounding grassland area. Shown as a Palustrine Unconsolidated Shore Seasonally Flooded wetland on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Distichlis spicata*	50	X	FACW
2. *Kochia californica*	25	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	75%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 25% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Vegetation includes hydrophytic plant species that area also tolerant of saline/alkaline soil conditions – notable change in vegetation from the adjacent grassland areas.

SOIL

Sampling Point SP-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-8	10 YR 4/2	100					FiSCL	pH 9.2 - 9.4; moderate rxn to HCl
8-24	10 YR 3/2	100					CL	pH 8.8; weak rxn to HCl

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): ______

Hydric Soil Present? **Yes** X* **No** ______

Remarks: No redoximorphic features observed in this location; however, the soil is strongly alkaline and was therefore considered problematic. Shallow soil saturation possible in this area resulting in the development of hydric condition during the wet season.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
X Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches): >24
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches): >24

Wetland Hydrology Present? **Yes** X* **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey, but potentially supports shallow seasonal inundation or shallow groundwater, resulting in saturated soil condition in the upper 12 inches. Hydrology was indeterminate at this location, but topographic position and notable change in vegetation suggest wetland hydrology may be present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Contra Costa Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-15

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 21.387" Long: -121° 36' 16.878" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation Yes , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks: Sample point taken in annual grassland adjacent to alkali sink wetland area, vegetation in this area is characterized by facultative plant species, but notable change from the adjacent vegetation in the alkali sink – possible difference is due to soil chemistry rather than wetland hydrology, but this could not be definitively determined at the time of the survey.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Hordeum marinum*	50	X	FAC
2. *Lolium multiflorum*	30	X	(FAC)
3. *Frankenia salina*	15		FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: *Lolium multiflorum* is not assigned an indicator status per Reed (1988) but is generally considered to be a facultative species. Sample point characterized by FAC plants, but these species are common and widespread throughout the annual grassland habitat in the surrounding area and may not be indicative of wetland conditions – notable change in vegetation from the adjacent alkali sink area.

SOIL

Sampling Point SP-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-7	10 YR 4/2	100					CL	pH 8.4; weak rxn to HCl
7-14	10 YR 4/2	90					CL	pH 8.4; weak rxn to HCl
	2.5 Y 4/3	10						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >14

Hydric Soil Present? Yes ___ **No** X

Remarks: Soil in this location is moderately alkaline as compared to strongly alkaline soil in the adjacent alkali sink area. No indication of hydric conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches):	
Water Table Present?	Yes	___	No	X	Depth (inches):	>14
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	>14

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey; facultative vegetation present, but consists of species that are common in grasslands throughout this area; no strong indication of wetland hydrology observed at this location.

Appendix F
Selected Site Photographs

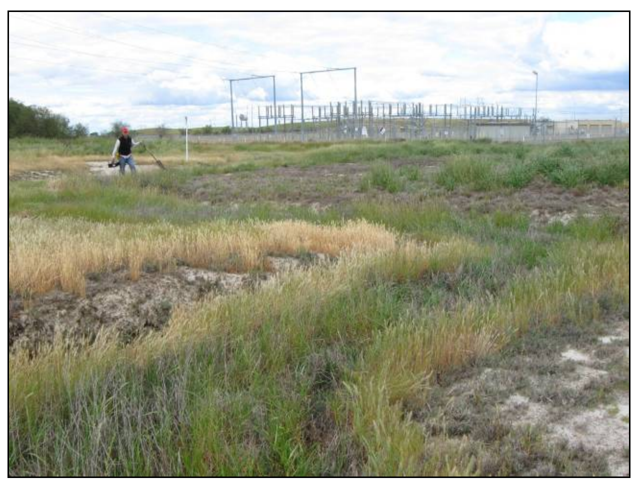
PROJECT SITE
Looking to the south-southeast from the existing access road

LAYDOWN AREA
Looking north from south end of property

DRAINAGE WETLAND (D-1)
Looking east from Bruns Road

DRAINAGE WETLAND (D-1)
Looking west; 6-foot by 6-foot box culvert under Bruns Road

DRAINAGE (1B)
North of Kelso Road, looking northeast at defined earthen channel



DRAINAGE WETLAND (D-2)
Looking east from Bruns Road

DRAINAGE (2A)
Looking east at earthen channel

DRAINAGE WETLAND (D-3)
Looking west; 6-foot by 6-foot box culvert under Bruns Road

DRAINAGE WETLAND (D-3)
Looking north along east side of Bruns Road

DRAINAGE WETLAND (D-4)
Looking east from Bruns Road (30-inch-diameter cmp under road)

DRAINAGE WETLAND (D-4)
Adjacent alkali sink wetland; looking south along Bruns Road

ALKALI SINK WETLAND (ASW-1)
Looking northeast from Bruns Road

SEASONAL WETLAND (SW-1)
Looking north, basins connected via 18-inch-diameter cmp

SEASONAL WETLAND (SW-1)
Inundated on February 19, 2009

PROJECT SITE
Low upland swale through center of site—no change in vegetation or evidence of any type of flow through this area

SEASONAL WETLAND (SW-2)
Weakly expressed shallow area with Italian ryegrass and sparse coyote thistle

SWALE (SW-1)
Looking west

SWALE (SW-3)
Looking east from Bruns Road

E-1
Small erosional rill; looking north; flows north into seasonal wetland area

E-2
Erosional feature; looking south toward the PG&E Kelso Substation

E-3
Large erosional channel with deeply scoured channel; looking north; flows north into large seasonal wetland area

BBID CANAL 45
Looking east from Bruns Road

Appendix G
List of Plant Species Observed at Sample Points

TABLE G-1
Plant Species Observed at Sample Point Locations

Scientific Name[1] (Name per Reed 1988)	Common Name (Name per Reed 1988)	Indicator Status[2]	Stratum
Bolboschoenus maritimus (*Scirpus maritimus*)	Cosmopolitan bulrush (Saltmarsh bulrush)	OBL	H
Bromus hordeaceus (*Bromus mollis*)	Soft chess (Soft brome)	FACU-	H
Chenopodium album	White goosefoot	FAC	H
Cirsium vulgare	Bull thistle	FACU	H
Cotula coronopifolia	Brass buttons	FACW+	H
Crassula aquatica	Water pigmy-weed	OBL	H
Cressa truxillensis	Spreading alkali weed	FACW	H
Distichlis spicata	Saltgrass (Inland)	FACW*	H
Epilobium densiflorum (*Boisduvalia densiflora*)	Dense flower willowherb (Dense flower spike-primrose)	OBL	H
Erodium botrys		NL	H
Erodium moschatum		NL	H
Eryngium vaseyi	Vasey's coyote thistle	FACW	H
Frankenia salina (*Frankenia grandiflora*)	Alkali heath	FACW+	H
Grindelia camporum	Great Valley gumweed	FACU	H
Hordeum brachyantherum	Meadow barley	FACW	H
Hordeum marinum ssp. *gussonianum* (*Hordeum hystrix*)	Mediterranean barley	FAC	H
Hordeum murinum ssp. *leporinum* (*Hordeum leporinum*)	Foxtail barley (Barley)	NI	H
Juncus bufonius	Toad rush	FACW+	H
Kochia californica	Rusty molly (California summer-cypress)	FACW	H
Lolium multiflorum	Italian Ryegrass	NL (FAC[3])	H
Medicago polymorpha	Bur clover	NL	H
Plagiobothrys stipitatus	Slender popcorn flower	OBL	H
Polypogon monspeliensis	Annual rabbit-foot grass	FACW+	H
Psilocarphus oregonus	Oregon woolly-heads	OBL	H
Spergularia marina	Saltmarsh sandspurry	OBL	H

TABLE G-1
Plant Species Observed at Sample Point Locations

Scientific Name[1] (Name per Reed 1988)	Common Name (Name per Reed 1988)	Indicator Status[2]	Stratum
Trifolium hirtum	Rose clover	NL	H
Veronica peregrina	Purslane speedwell	OBL	H

NOTES:
[1] Taxonomy follows current nomenclature per the University of California (2009) *Jepson On-Line Interchange for California Floristics*
[2] Indicator State follows the *National List of Plant Species that Occur in Wetlands: Region 0.* Reed (1988)
[3]*Lolium multiflorum* is not included on the Reed 1988 *National List of Plant Species that Occur in Wetlands: Region 0*, but is generally considered to be a facultative plant species

Indicator Status Codes

NL	Not included on the *National List of Plant Species that Occur in Wetlands: Region 0.* Reed (1988)
NI	Insufficient information available to assign an indicator status
FACU	Facultative Upland (67 to 99 percent probability of occurrence in non-wetlands)
FAC	Facultative (equally likely to occur in wetlands and non-wetlands)
FACW	Facultative Wetland (67 to 99 percent probability of occurrence in wetlands)
OBL	Obligate (99 percent probability of occurrence in wetlands)
+	Frequency tends toward the higher end of the category
-	Frequency tends toward the lower end of the category

Stratum

H	Herbaceous

Attachment A2 Wetland Delineation Amendment

Wetland Delineation Amendment for the for the Mariposa Energy Project – Field Verification Including the Alternative Water Supply Pipeline Route (File # SPK-2009-01261)

PREPARED FOR:	Mark Fugler U.S. Army Corps of Engineers Regulatory Branch
PREPARED BY:	Russ Huddleston
COPIES:	Doug Urry/CH2M HILL Todd Elwood/CH2M HILL Bo Buchynsky/Mariposa Energy Craig Hoffman/California Energy Commission
DATE:	November 30, 2009

A wetland delineation report for the Mariposa Energy Project (MEP) in unincorporated Alameda County, California was submitted to the U.S. Army Corps of Engineers for review and on September 24, 2009. Since that time an alternative water supply pipeline route extending from the project site to the Mountain House Waste Water Treatment Plant (WWTP) has been added to the study area. The alternate water line would extend to the northeast across the project parcel and continue approximately 2.5 miles east along Kelso Road to the Byron Highway. The alignment would then continue to the southeast along the highway for 2.3 miles to Wicklund Road where it would then continue directly north to the WWTP facility. The survey area for the water line alignment included approximately 75 acres consisting of a 100-foot corridor along the proposed alignment. For those sections where the water supply pipeline would be located within or immediately adjacent to an existing roadway, in which case only the areas adjacent to the excavation were included in the analysis as it was assumed areas on the opposite side of the roadway would not be affected. The total survey area for the MEP and associated linear features is provided in Table 1.

Seven water features and one seasonal wetland area were identified within the survey area for the alternate water supply pipeline. These features included:

- A small section of the Byron-Bethany Irrigation District's Canal 70 along Kelso Road (Figure 2-2, Map 2)
- A small drainage ditch along the south side of Kelso Road, just east of Canal 70
- A seasonal wetland associated with an agricultural drainage ditch system on the south side of Kelso Road, east of Mountain House Road (Figure 2-2, Map 4)
- A drainage ditch on the south side of Kelso Road west of Patterson Park Road (Figure 2-2, Map 5)

- A routinely maintained agricultural ditch on the south side of Kelso Road, east of Patterson Park Road (Figure 2-2, Map 6)
- Mountain House Creek along west Byron Road (Figure 2-2, Map 8)
- Finally a small portion of a diversion canal W1D from the Old River is included in the study near the terminus of the alignment at the Mountain House WWTP (Figure 2-2. Map 11)

TABLE 1.
Project Study Areas Included in the Wetland Delineation

Project Features	Acreage
Study area for Project Site and Laydown Area	41.0
Natural Gas Supply Pipeline	1.3
Transmission Line	8.5
Water Supply Pipeline	21.8
Alternate Water Supply Pipeline	75.0
Total Wetland Delineation Survey Area	**147.6**

Table 2 presents the acreages of each of these features within the Alternate Water Supply Pipeline delineation boundary study area.

TABLE 2.
Water Features and Wetlands Observed within the Alternate Water Supply Alignment Survey Area

Feature	Feature ID	Acreage
Drainage Ditch	Ditch -2	0.01
BBID Canal 70	Canal 70	0.04
Seasonal Wetland	SWL-3	0.25
Drainage Ditch	Ditch -3	0.05
Drainage Ditch	Ditch-4	0.04
Mountain House Creek	Mt. House Creek	0.18
Diversion Canal from Old River	W1D Canal	0.31
Total		**0.88**

A field verification of the original MEP wetland delineation study area and the additional alternate water supply pipeline route was conducted on November 19, 2009. Table 3 provides a list of all wetlands and waters included in the 147.6-acre study area as verified during the November 19, 2009 field visit. Figures 2-1 and 2-2 show the locations of all wetland and water features identified in the study area as revised per the November 19, 2009 field verification.

TABLE 3.
Summary of all Wetlands and Waters Identified in the 147.6-Acre Study Area for the Mariposa Energy Project

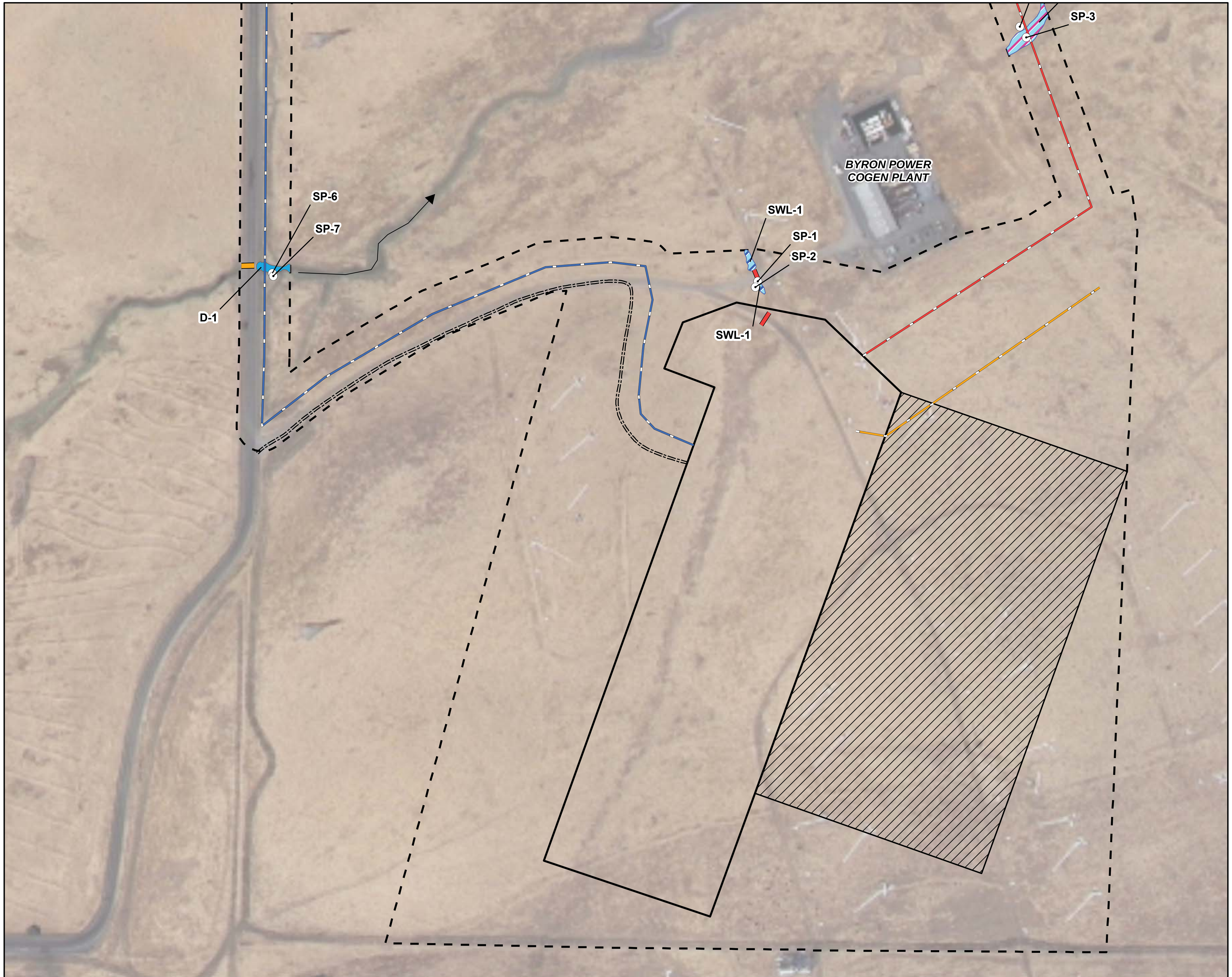
Feature	Acreage	Description	Map Page	Location
Seasonal Wetland (SWL-1)	0.018	Two shallow, well-defined basins along access road to the Byron Power Cogen Plant connected by a corrugated metal pipe; slender popcorn flower(*Plagiobothrys stipitatus*) and other vernal pool plants scattered within the basin	Figure 2-1; Map 1	37° 47’ 28.509” -121° 36’ 05.353”
Drainage Wetland (D-1)	0.021	Defined drainage channel characterized by saltgrass (*Distichlis spicata*) within the channel; blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough	Figure 2-1; Map 1	37° 47’ 28.259” -121° 36’ 17.217”
Drainage Wetland (D-2)	0.032	Small swale-like feature characterized by saltgrass ((*Distichlis spicata*), Italian ryegrass (*Lolium multiflorum*), and meadow barley (*Hordeum brachyantherum*)) with some scouring evident along the channel; blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough	Figure 2-1; Map 2	37° 47’ 47.880” -121° 36’ 17.099”
Swale (SW-1)	0.063	Low topographic swale characterized by Mediterranean barley (*Hordeum marinum*); 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	Figure 2-1; Map 2	37° 47’33.065” -121° 35’58.534”
Swale (SW-2)	0.045	Low topographic swale characterized by Mediterranean barley (*Hordeum marinum*); 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;	Figure 2-1; Map 2	37° 47’ 35.505” -121° 35’ 59.730”
Drainage Wetland (D1a)	0.006	Weakly expressed drainage swale characterized by saltgrass (*Distichlis spicata*), Mediterranean barley (*Hordeum marinum*), soft chess (*Bromus hordeaceus*) , and foxtail barley (*Hordeum murinum*), blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough	Figure 2-1; Map 2	37° 47’ 41.224” -121° 36’ 03.221”
Waters of the U.S. Drainage Channel (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	Figure 2-1; Map 2	37° 47’ 42.117” -121° 36’ 03.016”
Seasonal Wetland (SWL-2)	0.007	Shallow, weakly expressed topographic low area with scattered coyote thistle (*Eryngium vaseyi*) and Italian ryegrass (*Lolium multiflorum*), adjacent to transmission line laydown area	Figure 2-1; Map 2	37° 47’ 48.248” -121° 36’ 03.328”

TABLE 3.
Summary of all Wetlands and Waters Identified in the 147.6-Acre Study Area for the Mariposa Energy Project

Feature	Acreage	Description	Map Page	Location
Drainage Ditch -1 and Waters of the U.S. Drainage Channel (D-2a)	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	Figure 2-1; Maps 2 and 3	37° 47’ 51.702” -121° 36’ 03.300”
Drainage Wetland (D-3)	0.138	Shallow, well-defined drainage channel characterized by cosmopolitan bulrush (*Bolboschoenus maritimus*) with scattered rabbitsfoot grass (*Polypogon monspeliensis*), curly dock (*Rumex crispus*), and cattail (*Typha* spp.). Palustrine Emergent Permanently Flooded wetland on the National Wetland Inventory Map and is a blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough	Figure 2-1; Map 3	37° 48’ 01.203” -121° 36’ 17.094”
Swale (SW-3)	0.012	Small, weakly expressed swale from 12-inch-diameter culvert under Kelso Road; characterized by soft chess (*Bromus hordeaceus*), Italian ryegrass (*Lolium multiflorum*), and saltgrass (*Distichlis spicata*); appears to convey low, very-low volume flow for very short durations only in response to heavy rainfall	Figure 2-1; Map 3	37° 48’ 02.997” -121° 36’ 16.967”
Erosional Channel (E-1)	0.002	Small, weakly expressed erosional rill resulting from direct runoff from the Kelso Substation	Figure 2-1; Map 3	37° 47’ 52.507” -121° 36’ 06.909”
Erosional Channel (E-2)	0.013	Erosional channel resulting from direct runoff from the Kelso Substation	Figure 2-1; Map 3	37° 47’ 52. 489” -121° 36’ 09.849”
Erosional Channel (E-3)	0.022	Large, deeply scoured erosional channel resulting from direct runoff from the Kelso Substation	Figure 2-1; Map 3	37° 47’ 52.478” -121° 36’ 11.209”
Drainage Wetland (D-4)	0.053	Shallow, well-defined channel characterized by dense cattails (*Typha* spp.) growing in the center of the channel with dense saltgrass (*Distichlis spicata*) growing around the outer edges; Palustrine Emergent Semi-Permanently Flooded wetland on the National Wetland Inventory Map and is a blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough	Figure 2-1; Map 4	37° 48’ 19.799” -121° 36’ 17.079”

TABLE 3.
Summary of all Wetlands and Waters Identified in the 147.6-Acre Study Area for the Mariposa Energy Project

Feature	Acreage	Description	Map Page	Location
Alkali Sink Wetland (ASW-1)	0.166	Wetland area is characterized by saltgrass (*Distichlis spicata*)and seepweed (*Suaeda moquinii*) with scattered sand spurry (*Spergularia marina*), alkali heath (*Frankenia salina*), and common spikeweed (*Hemizonia pungens*); strongly alkaline soils; shown as a Palustrine Unconsolidated Shore Seasonally Flooded wetland on the National Wetland Inventory Map	Figure 2-1; Map 4	37° 48' 20.843" -121° 36' 17.045"
Canal 45	0.046	Constructed and routinely maintained irrigation canal	Figure 2-1; Map 5	37° 48' 45.039" -121° 36' 10.150"
Canal 70	0.046	Constructed and routinely maintained irrigation canal	Figure 2-2: Map 2	37° 47' 40.971" -121° 35' 34.754"
Drainage Ditch -2	0.006	Small drainage channel, approximately 3 feet wide, filled with annual grasses (*Lolium* spp.*)* Flows north under Kelso Road through a 14-inch diameter cement culvert	Figure 2-2: Map 2	37° 47' 41.140" -121° 35' 25.688"
Seasonal Wetland (SWL-3)	0.247	Seasonal wetland characterized by dense cattail (*Typha* spp.) along agricultural drainage ditch. Flows north through 24-inch diameter culvert under Kelso Road	Figure 2-2; Map 4	37° 47' 40.903" -121° 34' 24.044"
Drainage Ditch -3	0.050	Agricultural drainage ditch characterized by dense patch of giant reed (*Arundo donax*) and patches of Himalayan blackberry (*Rubus discolor*). Flows north through a 24-inch diameter culvert under Kelso Road.	Figure 2-2: Map 5	37° 47' 40.583" -121° 33' 44.585"
Drainage Ditch -4	0.036	Excavated agricultural drainage ditch	Figure 2-2: Map 6	37° 47' 40.583" -121° 33' 44.585"
Mt. House Creek	0.184	Mountain House Creek – channel within the project study area is entirely within existing culverts. Adjacent channel is characterized by emergent vegetation such as *Typha* spp.	Figure 2-2: Map 8	37° 47' 08.893" -121° 32' 09.950"
Canal W1D	0.309	Large excavated diversion canal off of the Old River, routinely maintained and devoid of vegetation.	Figure 2-2: Map 11	37° 47' 12.533" -121° 31' 03.740"
Total	**1.597**			



LEGEND
- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

Delineation:
R. Huddleston and T. Ellwood
July, 2006

Revised: November 19, 2009

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

1 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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LEGEND

- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES

- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

Delineation:
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2 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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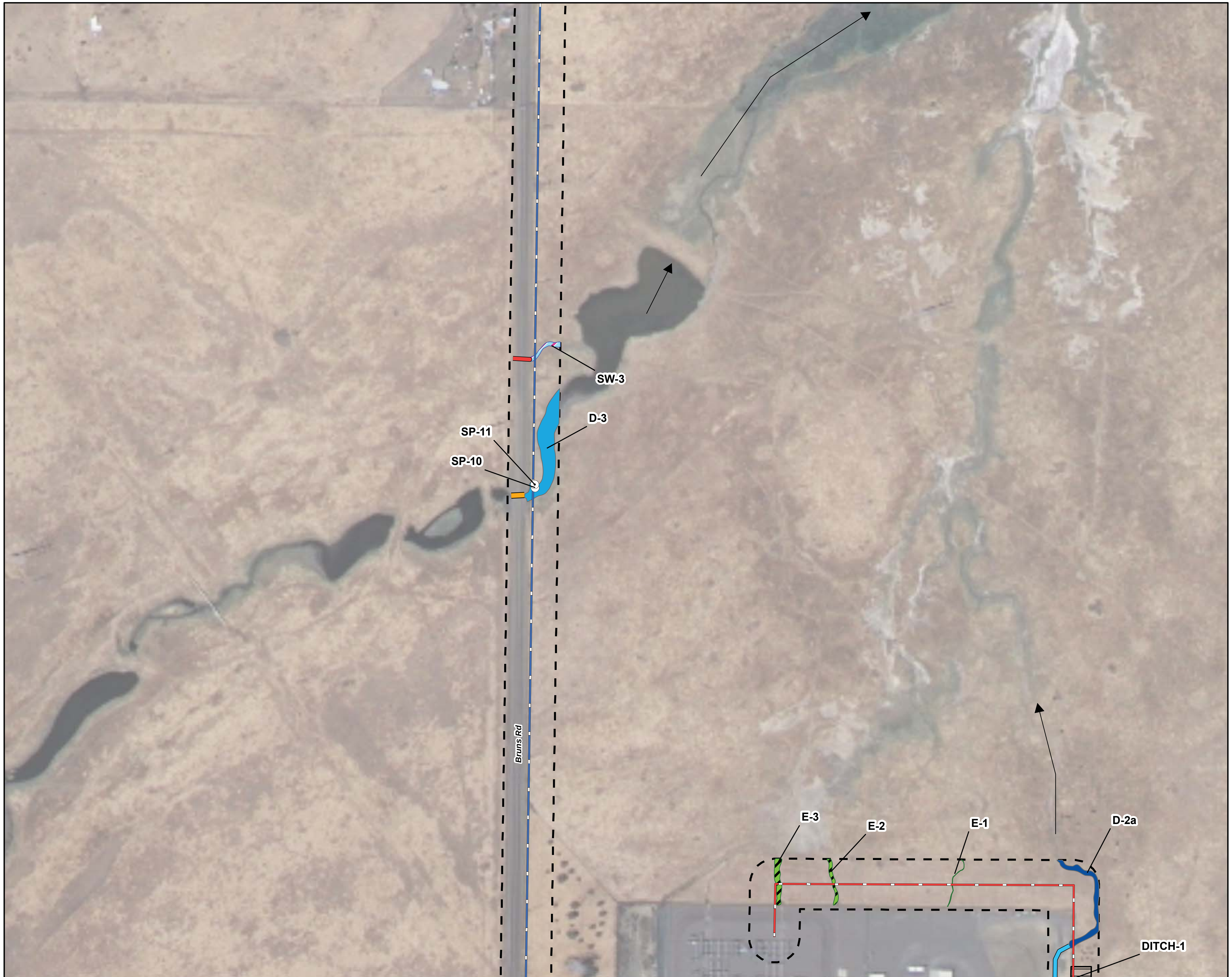

LEGEND

- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES

- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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R. Huddleston and T. Ellwood
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N

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Feet

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

LEGEND

- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES

- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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4 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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CH2MHILL

LEGEND
DATA POINTS
ACCESS ROAD
NATURAL GAS PIPELINE ROUTE
TRANSMISSION LINE ROUTE
WATER SUPPLY PIPELINE ROUTE
FLOW DIRECTION
BOX CULVERT
CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
DITCH
ALKALI SINK WETLAND
DRAINAGE WETLAND
WATERS OF THE U.S.
EROSIONAL CHANNEL
CANAL
SEASONAL WETLAND
SWALE

SITES
CONSTRUCTION LAYDOWN/PARKING AREA
TRANSMISSION LINE LAYDOWN AREA
WATER SUPPLY PIPELINE LAYDOWN AREA
PROJECT SITE
PROJECT STUDY AREA

Delineation:
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July, 2006

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Feet

5 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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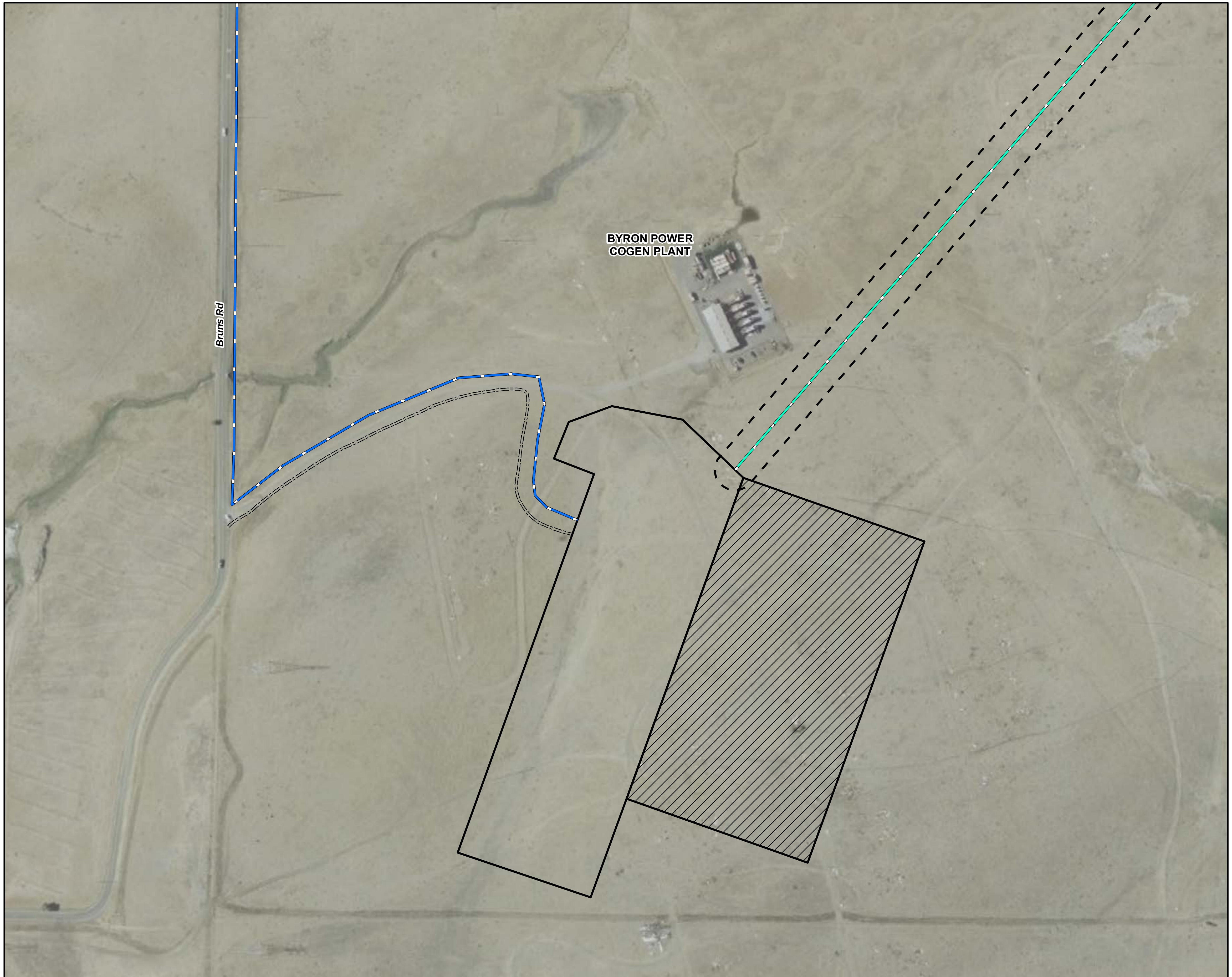

LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- CANAL
- DITCH
- SEASONAL WETLAND (SWL)
- CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

1 OF 11

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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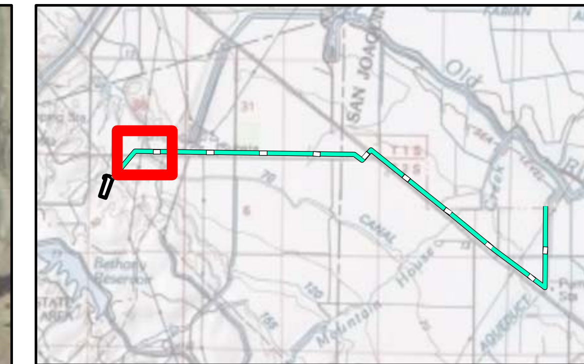
FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA



LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- CANAL
- DITCH
- SEASONAL WETLAND (SWL)
- CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

2 OF 11

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N

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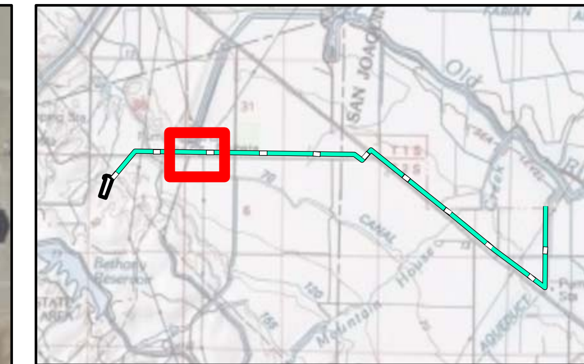
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA



LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- CANAL
- DITCH
- SEASONAL WETLAND (SWL)
- CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

3 OF 11

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N

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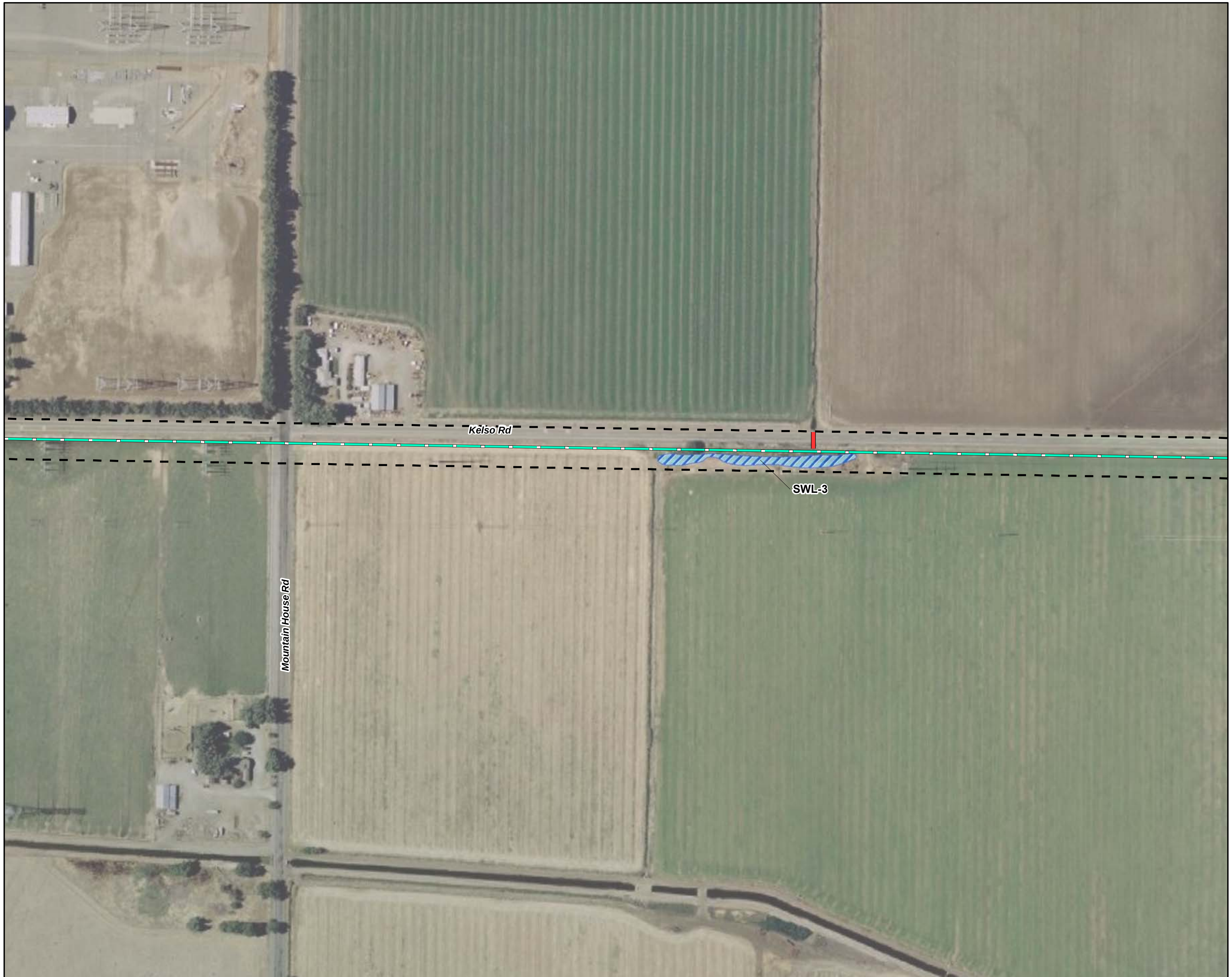
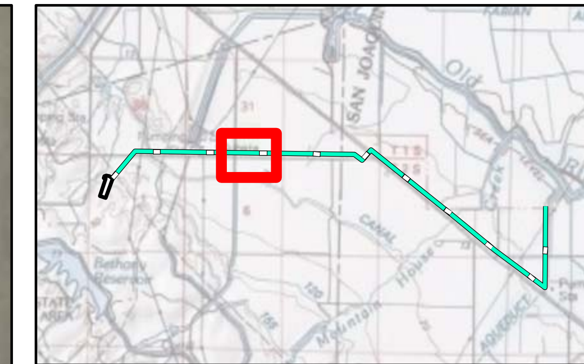
Feet

FIGURE 2-2
WETLAND DELINEATION

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL





LEGEND
ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CULVERT
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
CANAL
DITCH
SEASONAL WETLAND (SWL)
CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

4 OF 11

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N

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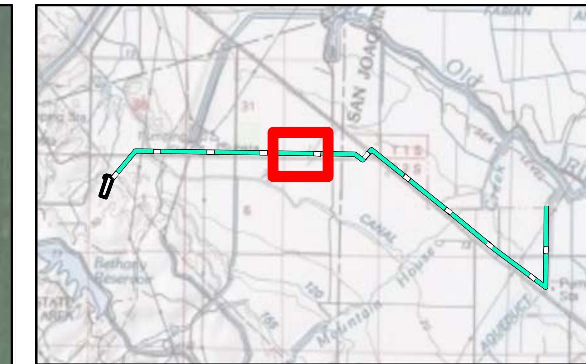
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL



LEGEND

ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CULVERT
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

CANAL
DITCH
SEASONAL WETLAND (SWL)
CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

5 OF 11

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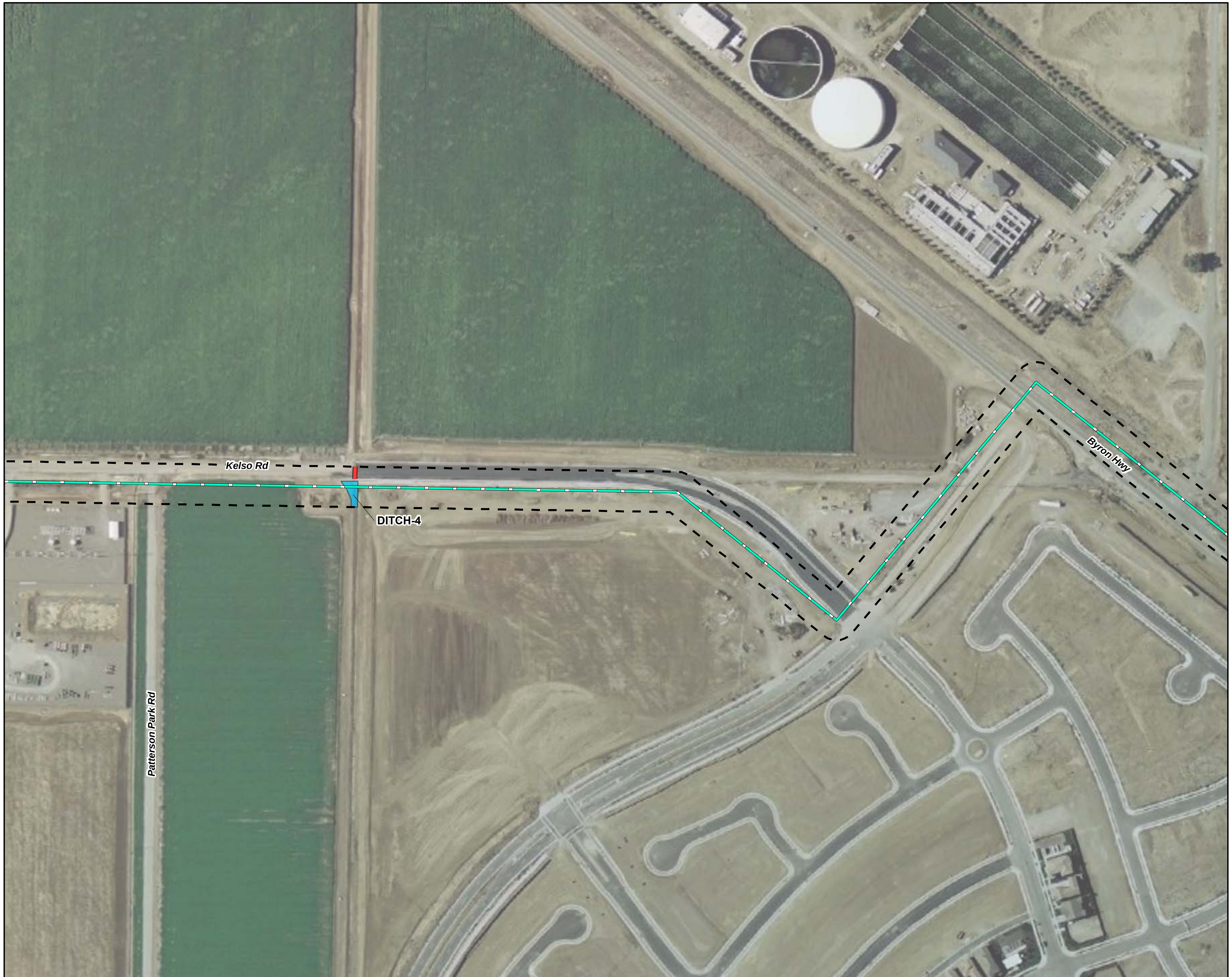
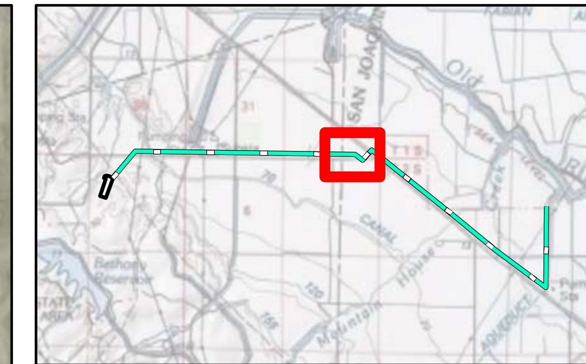
N

0 125 250
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL





LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- CANAL
- DITCH
- SEASONAL WETLAND (SWL)
- CREEK

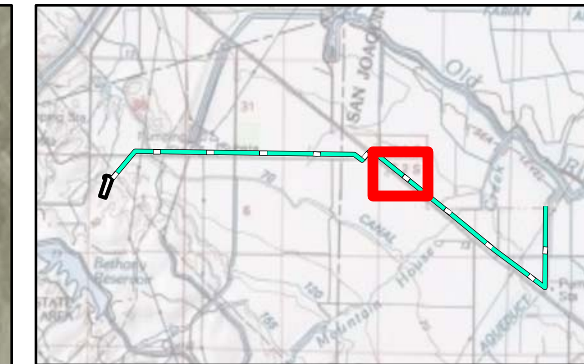
Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

6 OF 11

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

0 125 250
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA



LEGEND

ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CULVERT
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

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DITCH
SEASONAL WETLAND (SWL)
CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

7 OF 11

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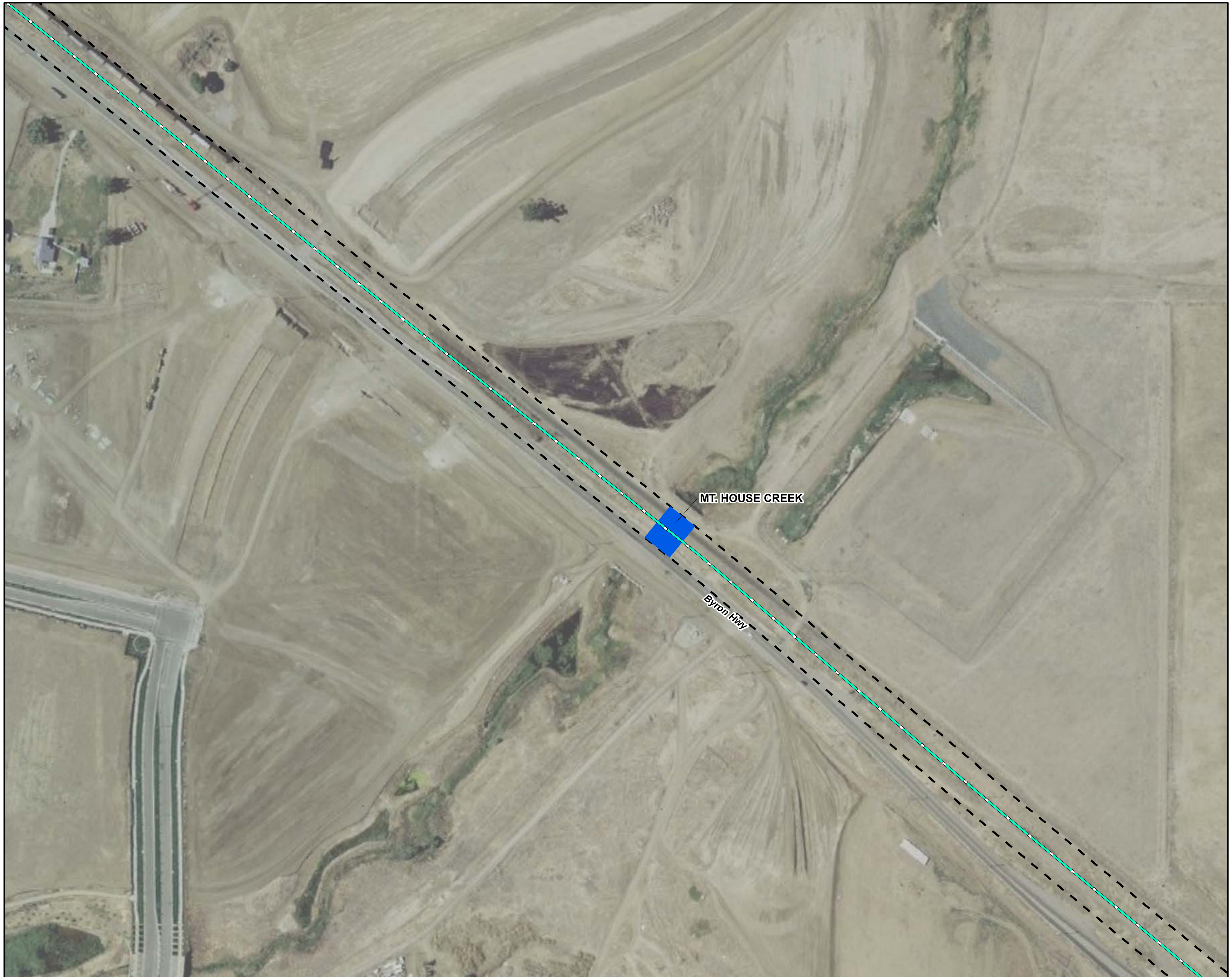
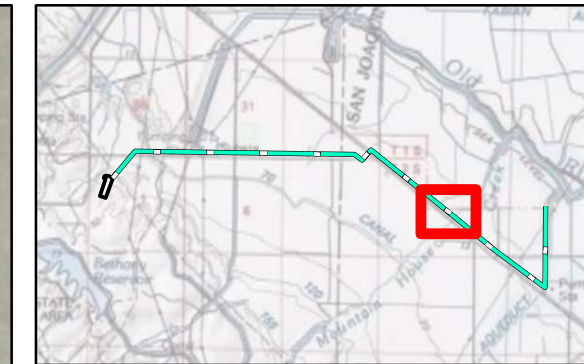
N

0 125 250
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL





LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
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- CONSTRUCTION LAYDOWN/PARKING AREA
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- CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

8 OF 11

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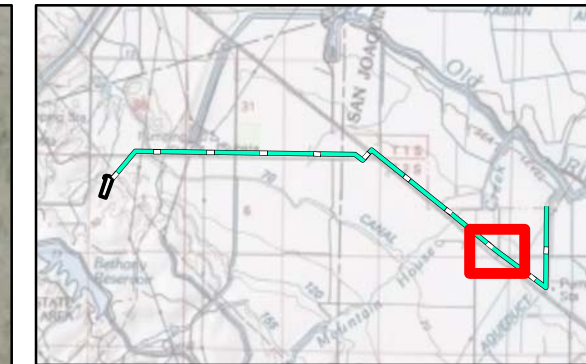
N

0 125 250
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL



LEGEND

ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CULVERT
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

CANAL
DITCH
SEASONAL WETLAND (SWL)
CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

9 OF 11

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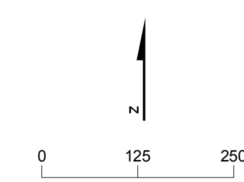

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
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- CANAL
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- CREEK

Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

10 OF 11

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N

0 125 250
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

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LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
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Delineation: T. Ellwood November 2, 2009
Revised: November 19, 2009

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N

0 125 250
Feet

FIGURE 2-2
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

Attachment A3 Preliminary Jurisdictional Determination

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

REPLY TO
ATTENTION OF

January 7, 2010

Regulatory Division SPK-2009-01261

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

Dear Mr. Buchynsky:

We are responding to your request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the Mariposa Energy Project site. The site is located near Old River, in Townships 1 and 2 South, Ranges 3 and 4 East, in the vicinity of Latitude 37.7902264922°, Longitude -121.6023337841°, MDB&M, Alameda, San Joaquin and Contra Costa Counties, California.

Based on available information, we concur with the estimate of potential waters of the United States, as depicted on CH2MHill's *Figure 2-1 Wetland Delineation, Sheets 1-5 and Figure 2-2 Wetland Delineation, Sheets 1-11 – Revised November 19, 2009*, drawings. The approximately 1.60-acres of wetlands or other water bodies present within the survey area may be jurisdictional waters of the United States. These waters may be regulated under Sections 404 of the Clean Water Act.

A copy of our RGL 08-02 Preliminary Jurisdictional Determination Form for this site is enclosed.

You should not start any work in any potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization, or if you intend to request an approved JD for this site. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

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 Marc Fugler at U.S. Army Corps of Engineers, Delta Branch, 1325 J Street, Room 1480, Sacramento, California 95814, 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,

Original Signed

Marc A. Fugler
Senior Project Manager
California Delta Branch

Enclosures

Copy Furnished without enclosures:

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
Kent Smith, California Department of Fish and Game Region 2, 1701 Nimbus Drive, Rancho Cordova, California 95670-4599
Dan Castleberry, U.S. Fish and Wildlife Service, Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901
Doug Urry, CH2MHill, 2485 Natomas Park Drive, Suite 600, Sacramento, California 95833

PRELIMINARY JURISDICTIONAL DETERMINATION FORM
Sacramento District

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Regulatory Branch: **California Delta** File/ORM #: **SPK-2009-01261** PJD Date: **December 16, 2009**

State: **CA** City/County: **Alameda County** Nearest Waterbody: Location (Lat/Long): **37.7902264922422° N, -121.602333784103° W** Size of Review Area: **147.6 acres**	Name/Address Of Property Owner/ Potential Applicant: **Bo Buchynsky** **Diamond Generating Corporation** **333 S. Grand Avenue, Suite 1570** **Los Angeles, CA 90071**
Identify (Estimate) Amount of Waters in the Review Area **Non-Wetland Waters:** linear feet ft wide **0.73** acres Stream Flow **Intermittent** **Wetlands: 0.87** acre(s) Cowardin Class: **Palustrine, emergent**	Name of any Water Bodies on the site identifies as Section 10 Waters: Tidal: **Canal W1D** Non-Tidal: ☒ Office (Desk) Determination ☒ Field Determination: Date(s) of Site Visit(s): **November 19, 2009**

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply – checked items should be included in case file and, where checked and requested, appropriately reference sources below)

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **CH2MHill**
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Data sheets prepared by the Corps.
☐ Corps navigable waters' study.
☐ U.S. Geological Survey Hydrologic Atlas:
  ☐ USGS NHD data.
  ☐ USGS HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: **1:24K; CA-CLIFTON COURT FOREBAY**
☒ USDA Natural Resources Conservation Service Soil Survey.
☐ National wetlands inventory map(s).
☐ State/Local wetland inventory map(s).
☐ FEMA/FIRM maps.
☐ 100-year Floodplain Elevation (if known):
☒ Photographs: ☒ Aerial
  ☒ Other
☐ Previous determination(s). File no. and date of response letter:
☐ Other information (please specify):

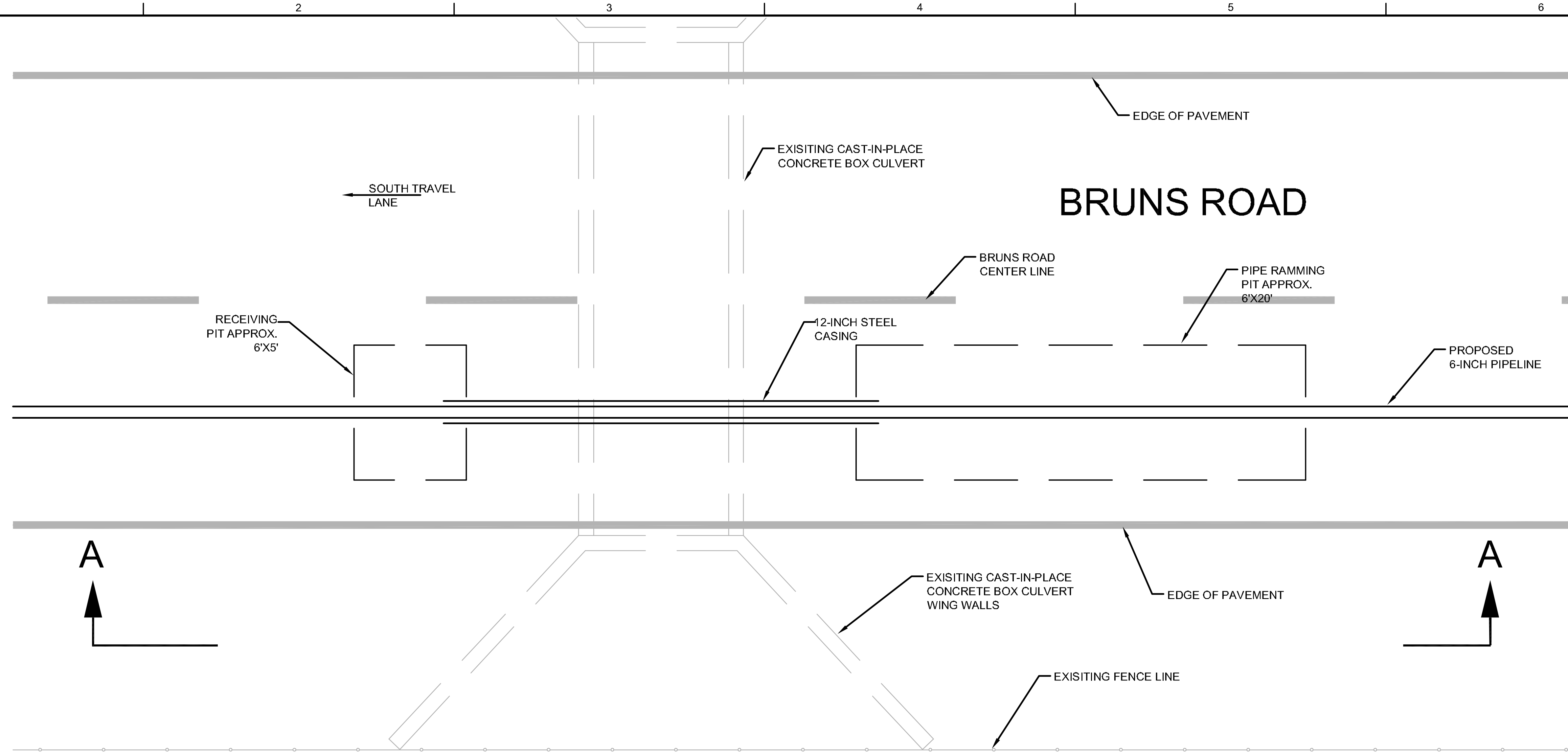
IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

[signature] 1-4-2010
Signature and Date of Regulatory Project Manager (REQUIRED)

Bohdan Buchynsky 1-5-2010
Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

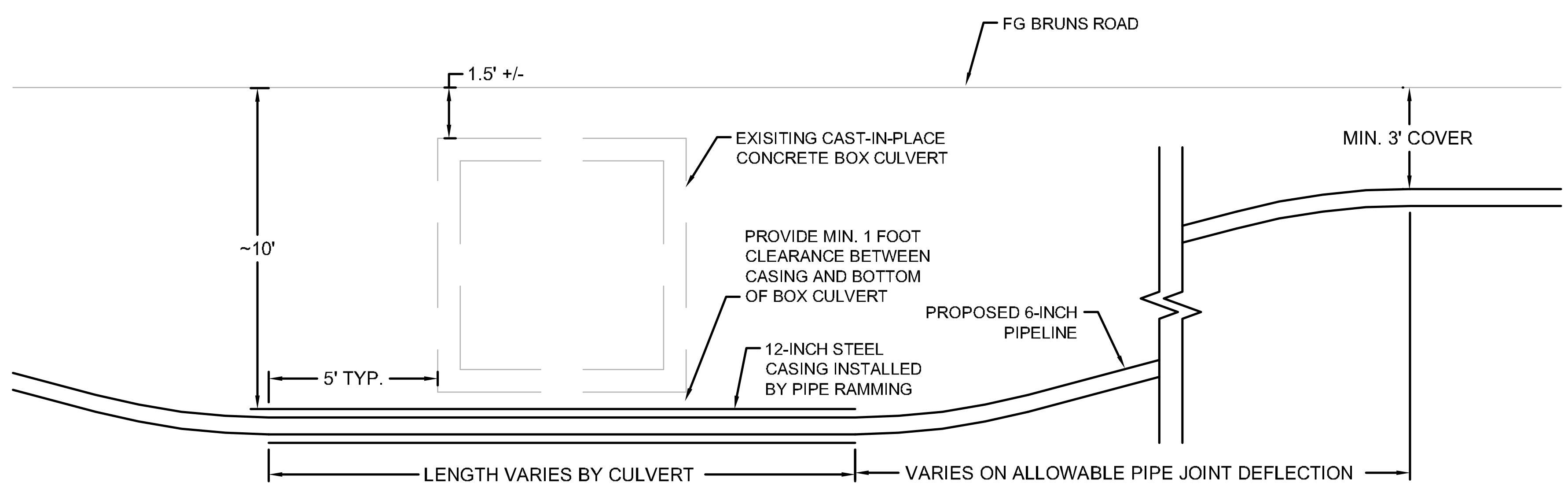
EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:
1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

Attachment B Project Plan and Cross-Sectional Views



BOX CULVERT CROSSING

N.T.S.



SECTION A-A

N.T.S.

CONCEPTUAL DESIGN

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD

DSGN J BORCHARDT | DR J BORCHARDT | CHK J SMITH | APVD

DIAMOND GENERATING CORPORATION

CH2MHILL

MARIPOSA ENERGY PROJECT

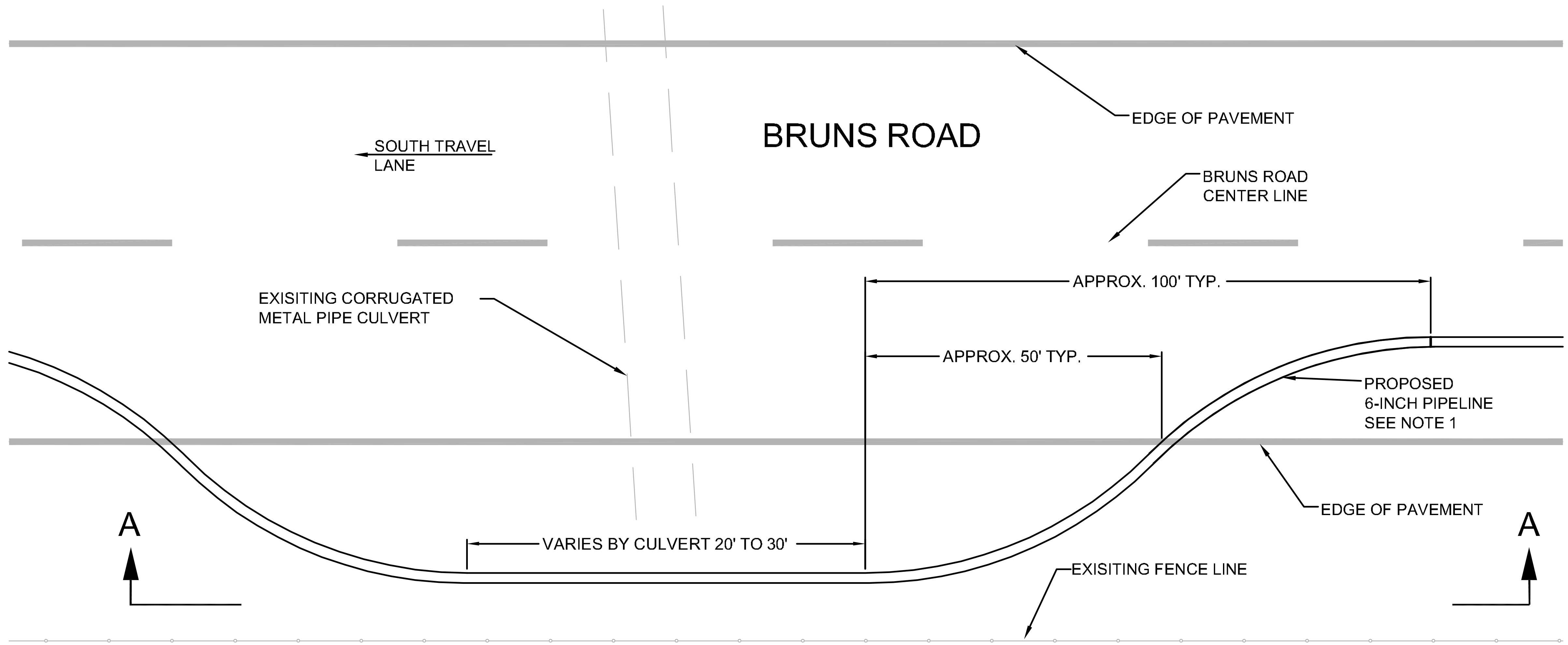
BOX CULVERT CROSSING

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JANUARY 2010
PROJ	382914
DWG	10-C-2
SHEET	2 OF 3

FILENAME: $FILENAME PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME

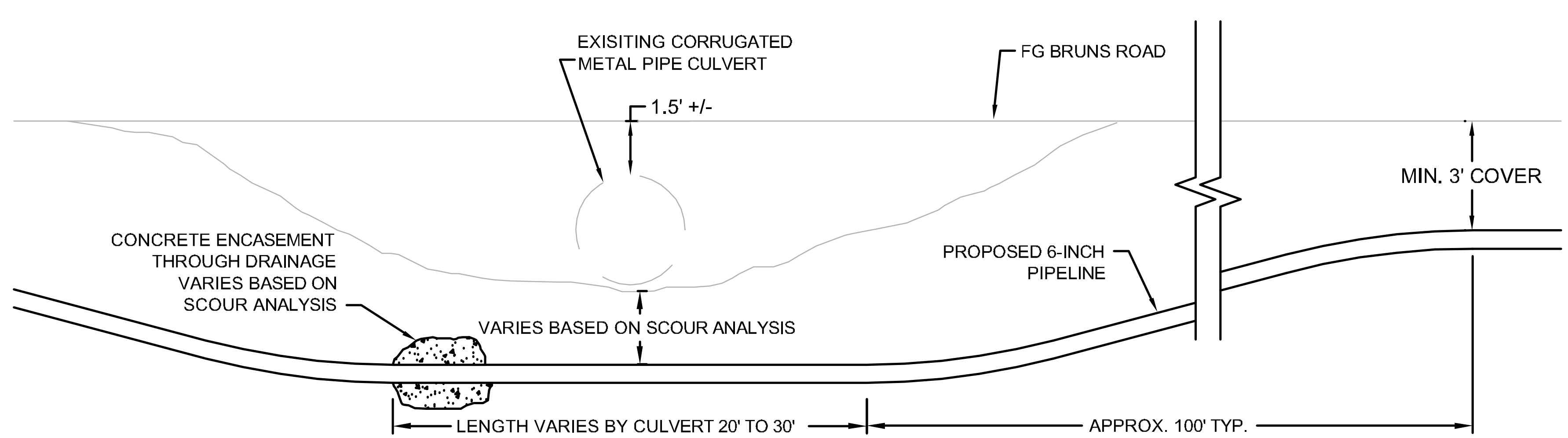


CMP CULVERT CROSSING

N.T.S.

NOTES:

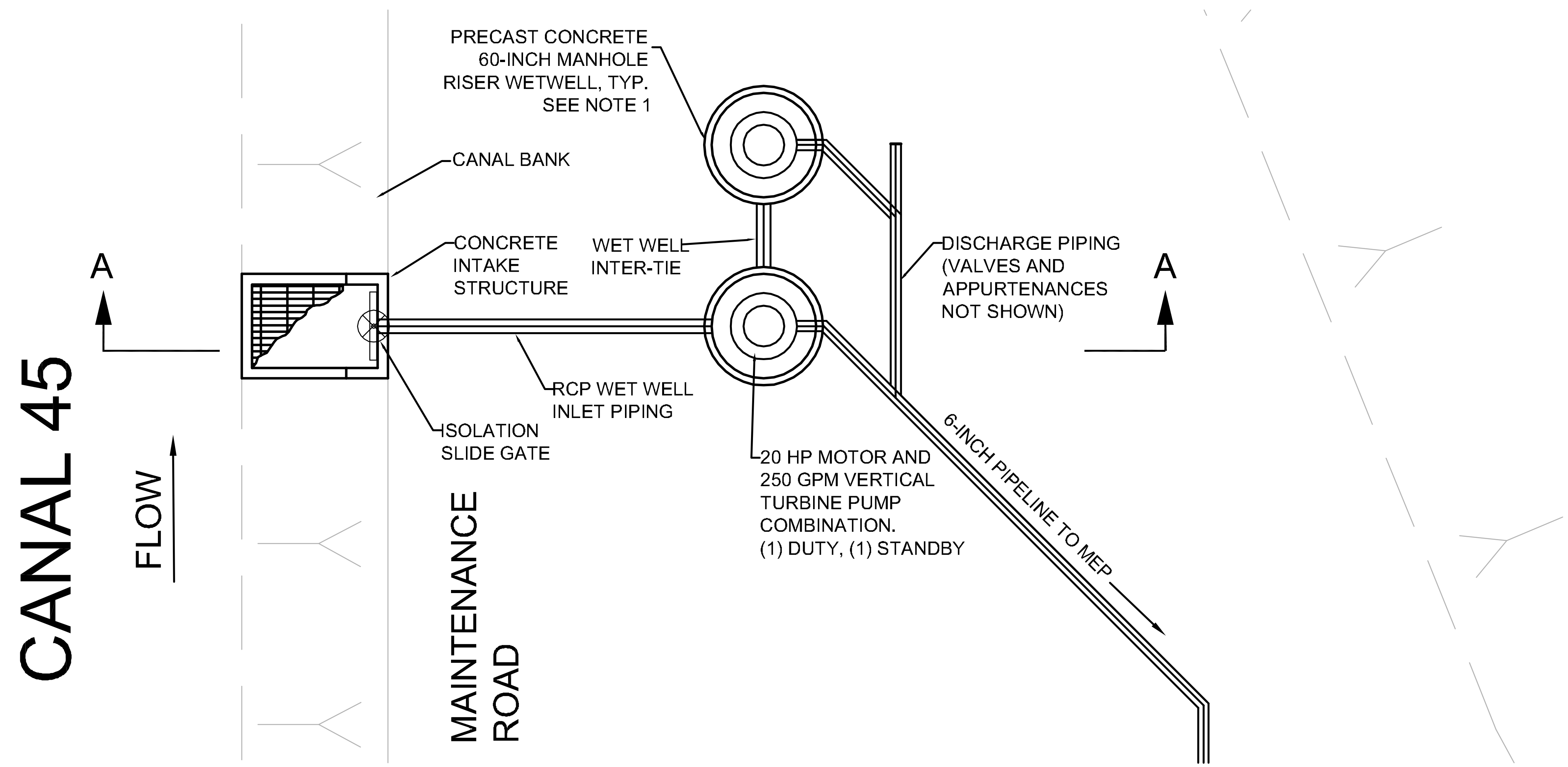
1. PIPE JOINT DEFLECTION SHOWN FOR ALIGNMENT SHIFT. USE OF 45° BENDS IS ALSO ACCEPTABLE.



SECTION A-A

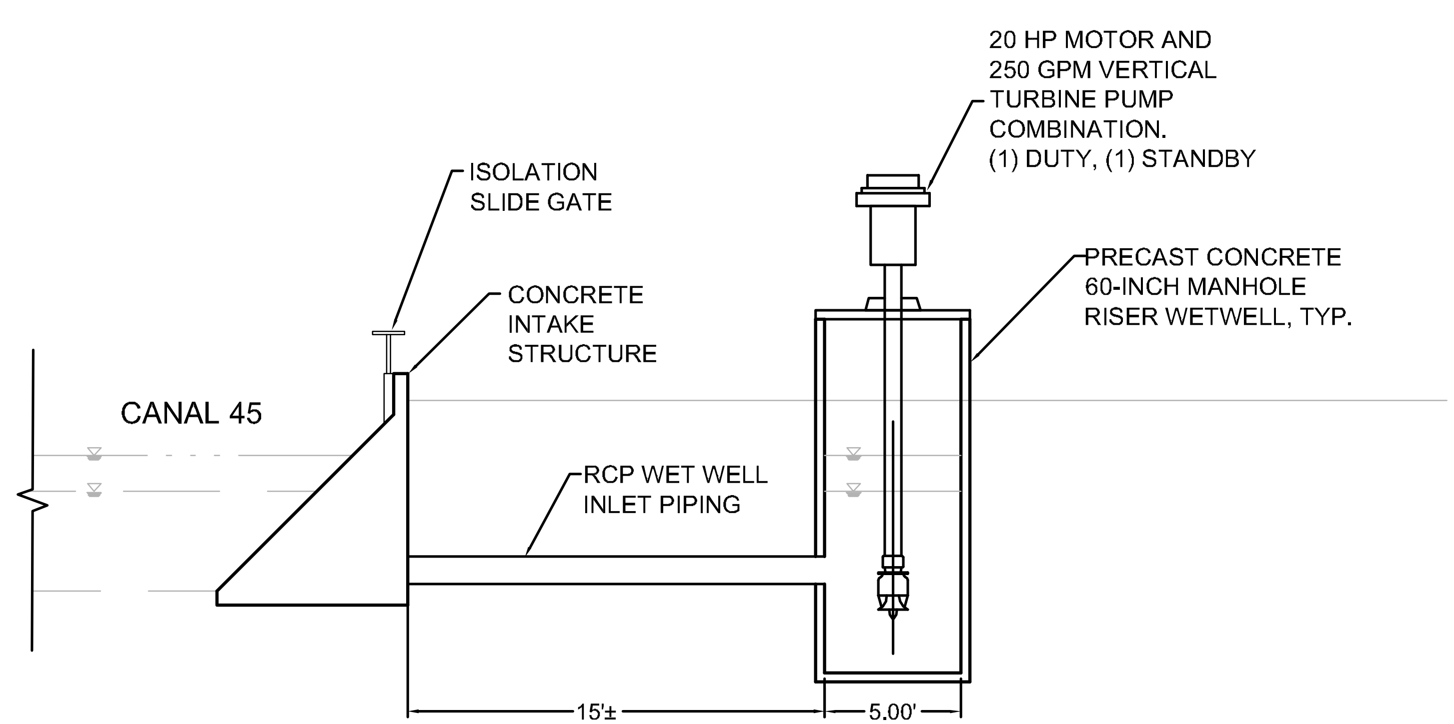
N.T.S.

CONCEPTUAL DESIGN	
NOT FOR CONSTRUCTION	
NO. / DATE / REVISION / BY / APVD	
DSGN	J BORCHARDT
DR	J BORCHARDT
CHK	J SMITH
APVD	
DIAMOND GENERATING CORPORATION	
CH2MHILL	
MARIPOSA ENERGY PROJECT	
CMP CULVERT CROSSING	
VERIFY SCALE	BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"
DATE	JANUARY 2010
PROJ	382914
DWG	10-C-3
SHEET	3 OF 3



PUMP STATION PLAN VIEW

N.T.S.



SECTION A-A

N.T.S.

NOTES:

1. CIRCULAR MANHOLE GEOMETRY SHOWN FOR WETWELL FOR CONSISTENCY WITH BBID'S FIRE PROTECTION PUMP STATION DESIGN. THE USE OF ONE (1) BOX CULVERT FOR BOTH PUMPS SHOULD BE EVALUATED IN THE NEXT DESIGN PHASE.

2. DISCHARGE PIPING NOT SHOWN IN SECTION VIEW FOR CLARITY.

CONCEPTUAL DESIGN

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD

DSGN J BORCHARDT | DR J BORCHARDT | CHK J SMITH | APVD

CH2MHILL

MARIPOSA ENERGY PROJECT

CANAL 45 RAW WATER PUMP STATION

DIAMOND GENERATING CORPORATION

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JANUARY 2010
PROJ	382914
DWG	10-C-1
SHEET	1 OF 3

FILENAME: $FILENAME PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME

Attachment C
Section 404 U.S. Army Corps of Engineers Application/Notification

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The Section 404 U.S. Army Corps of Engineers Application/Notification is enclosed. The attachments to the Section 404 permit are identical to those in the Section 401 Water Quality Certification Application documentation. Therefore, they are not provided here.

U.S. Army Corps of Engineers
South Pacific Division

Nationwide Permit Pre-Construction Notification (PCN) Form

This form integrates requirements of the Nationwide Permit Program within SPD, including General and Regional Conditions. Please consult instructions prior to completing this form.

Box 1 Project Name	**Applicant Name**
Mariposa Energy Project	Bo Buchynsky
Applicant Title	**Applicant Company, Agency, etc.**
Executive Director	Diamond Generating Corporation
Mailing Address	**Applicant's internal tracking number (if any)**
333 South Grand Avenue, #1570 Los Angeles, CA 90071	SPK-2009-01261

Work Phone with area code	**Home Phone with area code**	**Fax #**	**E-mail Address**
(213) 473-0092	n/a	(213) 620-1170	b.buchynsky@dgc-us.com

Relationship of applicant to property:

☐ Owner ☐ Purchaser ☐ Lessee ☒ Other: Right of Way Easement

Application is hereby made for verification that subject regulated activities associated with subject project qualify for authorization under a Corps nationwide permit or permits as described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities. I hereby grant to the agency to which this application is made, the right to enter the above-described location to inspect the proposed, in-progress or completed work. I agree to start work only after all necessary permits have been received.

Signature of applicant	**Date (m/d/yyyy)**
Bo Buchynsky	4-2-2010

Box 2 Authorized Agent/Operator Name and Signature (If an agent is acting for the applicant during the permit process)

Doug Urry

Agent/Operator Title	**Agent/Operator Company, Agency, etc.**
Project Manager	CH2M HILL

Mailing Address

2485 Natomas Park drive, Suite 600, Sacramento, California 95833-2937

E-mail Address

Doug.urry@ch2m.com

Work Phone with area code	**Home Phone with area code**	**Fax #**	**Cell Phone #**
(916)286-0348		(916) 920-8463	(919) 943-6397

I hereby authorize the above named authorized agent to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application. I understand that I am bound by the actions of my agent and I understand that if a federal or state permit is issued, I, or my agent, must sign the permit.

Signature of applicant	**Date (m/d/yyyy)**
Bo Buchynsky	4-2-2010

I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate.

Signature of authorized agent	Date (m/d/yyyy)
W. Douglas	4/6/2010

Box 3 Name of property owner(s), if other than applicant:	
NA – Construction within public road right-of-way	
Owner Title	**Owner Company, Agency, etc.**
Mailing Address	
Work Phone	**Home Phone**

Box 4 Name of contractor(s) (if known):	
To be determined prior to project construction in Spring 2011.	
Contractor Title	**Contractor Company, Agency, etc.**
Mailing Address	
Work Phone	**Home Phone**

Include multiple copies of Box 5 for separate sites.

Box 5 Site Number 1 of 1. Project location(s), including street address, city, county, state, zip code where proposed activity will occur:	
Drainage 2 (D-2), Alkali Seasonal Wetland 1 (ASW-1), and Canal 45 are located along the Mariposa Energy Project's (MEP) new 1.8 mile water supply pipeline route. A corrugated metal pipe culvert is associated with each of these three water features. The MEP is located in an unincorporated portion of northeastern Alameda County, California, approximately 7 miles northwest of the City of Tracy, 7 miles northeast of Livermore, and 6 miles south of Byron. See Figure 2-1, Maps 1 to 5 of the attached Wetland Delineation Report, Attachment A, for each culvert location. The other culverted drainages found along the water line route will be avoided by the project. All other jurisdictional areas found in the greater project area will be avoided during project implementation. The Wetland Delineation Report (Attachment A) also includes site vicinity map, mapped vegetation communities, and representative photographs of the Project area.	
Waterbody (if known, otherwise enter "an unnamed tributary to"): Unnamed tributaries to Italian Slough	
Latitude & longitude (D/M/S, DD, or UTM): D-2: 37° 47'47.51" N, 121° 36'17.65" W ASW-1: 37° 48'19.77" N, 121° 36'17.35" W Canal 45: 37° 48'45.22" N, 121° 36'10.09" W	**Zoning Designation** (no codes or abbreviations): Large Parcel Agriculture

Assessors parcel number:	Section, Township, Range:
The APN for the MEP project site is 099B-7050-001-10	Northwest 1/4 of Section 1, Township 2S, Range 3E (Mount Diablo Base and Meridian)
USGS Quad map name: Clifton Court Forebay	
Watershed and other location descriptions, if known: San Joaquin Delta Hydrologic Unit (HUC 18040003), which has a drainage area of 433,302 acres.	
Directions to the project location: The MEP site is accessed by Bruns Road, either from Kelso Road or Byron Highway (see Project Location Map, Wetland Delineation Report). Temporary and permanent work areas at D-2, ASW-1 and Canal 45 located on the east side of Bruns Road south and north of Kelso Road within the existing Bruns Road right-of-way. The right-of-way along Bruns Road is delineated by existing barbed wire fence along road shoulders.	

Nature of Activity (Description of project, include all features, see instructions):

The MEP will be a nominal 200-Megawatt, 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's (PG&E) Kelso Substation. MEP will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations and standards. The main access to the MEP site will be from Bruns Road. A portion of the power block 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 4-inch-diameter natural gas pipeline that will run directly northeast from the project site to interconnect with PG&E's existing high-pressure natural gas pipeline (Line 2); and a new 6-inch-diameter, 1.8-mile water supply line from Byron-Bethany Irrigation District (BBID) Canal 45 delivering raw water to the project site.

The MEP will use raw water supplied by BBID via the new pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the MEP site. Approximately 1,000 feet of pipeline will be located adjacent to Bruns Road in an agricultural field road from a new 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. At three culverts the pipeline will veer off the road surface and around the end of each culvert, and then back onto the roadway. One of these culverts is not associated with a drainage feature. The other two culverts are located at D-2 and ASW-1. Due to limited space between the right-of-way fence and end of culvert, smaller equipment such as a backhoe, compact/mini excavator, or hand operated trencher will be used to ensure construction stays within the existing right-of-way. In order to ensure the pipeline crossing of the drainage will remain undisturbed post-construction, a scour analysis will be completed to identify scour depth at each location. The pipeline route will follow the MEP main access road (an existing gravel road) from Bruns Road to the MEP site. Associated facilities at Canal 45 include a 36 square foot concrete intake structure on the canal bank and a 214 square foot pump station consisting of a pre-cast concrete manhole wet well, redundant vertical turbine pumps, pipe manifold and valving, electrical cabinet, and instrumentation located on the side of the canal. The raw water is for MEP process water, safety showers, fire protection, service water, and domestic uses.

Impacts to the USACE jurisdictional areas (D-2, ASW-1 and Canal 45) will occur during construction of the water supply pipeline. 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 maximum trench width is expected to be 18 inches and depth is 5 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 Regional Water Quality Control Board NPDES permit.

Project Purpose (Description the reason or purpose of the project, see instructions):

The primary objective of the MEP is to provide dispatchable, operationally flexible, and efficient generation to meet PG&E's need for new energy sources and to satisfy the terms of Mariposa Energy's power purchase agreement with PG&E. PG&E issued a Request for Offers on April 1, 2008, indicating that additional peak electric generation capacity is needed in the vicinity. In accordance with the California Public Utilities Commission Decision 07-12-052, PG&E needs to acquire between 800 and 1,200 MW of new resources, with a preference for dispatchable and operationally flexible resources. The raw water delivered by the water supply pipeline from Canal 45 is for process water, safety showers, fire protection, service water, and domestic uses.

Use Box 6 if dredged and/or fill material is to be discharged:

Box 6 Reason(s) for Discharge into waters of the United States:

Temporary fill within wetland (ASW-1) and drainage areas (D-2, Canal 45) would result from incidental fall back during excavation activities. Concrete will be used to encase the pipe at the bottom of a 4 foot deep trench at D-2 and ASW-1. Permanent fill at Canal 45 will result from installation of a new 36 square foot concrete intake structure on the bank of the canal. All temporary impacts will be restored to pre-construction conditions.

Type(s) of material being discharged and the amount of each type in cubic yards:

Volume of concrete encasement at D-2 is approximately 0.2 cubic yards and 0.3 cubic yards at ASW-1.

Volume of native soil or import backfill material at D-2 is approximately 0.7 cubic yards and 1.3 cubic yards at ASW-1.

Volume of concrete for the new turnout structure at Canal 45 is approximately 1.6 cubic yards.

The trenching through D-2 and ASW-1 is expected to be no greater than 5 feet deep, by 18 inches wide. The new concrete turnout structure will be buried approximately 1-2 feet in the canal bank.

Total surface area in acres of wetlands or other waters of the U.S. filled (see instructions):

The area of disturbance at D-2 is approximately 0.0004 acre (19.5 square feet). The area of disturbance at ASW-1 is approximately 0.0008 acre (33 square feet). The area of disturbance at Canal 45 is approximately 0.0008 acre (36 square feet). The grand total surface area of fill (both temporary and permanent) is 0.002 acre (88.5 square feet).

Indicate in ACRES and LINEAR FEET (where appropriate) the proposed impacts to waters of the United States, and identify the impact(s) as permanent and/or temporary for each water body type listed below:

	Permanent		**Temporary**	
Water Body Type	**Acres**	**Linear feet**	**Acres**	**Linear feet**
Wetland **(ASW-1)**			0.0008	
Riparian streambed				
Unveg. Streambed **(D-2)**			0.0004	
Lake				
Ocean				
Other: **Canal 45**	0.0008			
Total:	**0.0008**		**0.001**	

Potential indirect and/or cumulative impacts of proposed discharge (if any):

Indirect effects have the potential to occur if hazardous materials (e.g., oils and fuels) or sediment-laden water was accidentally released into wetlands. These potential effects will be avoided by implementing measures included in the project's Stormwater Pollution Prevention Plan (SWPPP) and other best management practices such as proper maintenance and inspection of vehicles and the use of designated refueling areas.

Cumulative impacts are not expected as a result of the proposed discharge as the project involves predominately temporary fills.

Required drawings (see instructions):

Vicinity map: ☒ Attached (or mail copy separately if applying electronically)

See Attachment A, Wetland Report

To-scale Plan view drawing(s): ☒ Attached (or mail copy separately if applying electronically)

See Attachment B

To-scale elevation and/or Cross Section drawing(s): ☒ Attached (or mail copy separately if applying electronically)

See Attachment B

Has a wetlands/waters of the U.S. delineation been completed?

☒ Yes, Attached (or mail copy separately if applying electronically) ☐ No

See Attachment A

If a delineation has been completed, has it been verified in writing by the Corps?

☒ Yes, Date of approved jurisdictional determination (m/d/yyyy): January 7, 2010 Corps file number: SPK-2009-01261 ☐ No

Please attach[1] one or more color photographs of the existing conditions (aerials if possible).

[1]or mail copy separately if applying electronically

Attachment A (Wetland Delineation Report) has photographs of D-2, ASW-1 and Canal 45.

Dredge Volume: Indicate in CUBIC YARDS the quantity of material to be dredged or used as fill:

Indicate type(s) of material proposed to be discharged in waters of the United States:

For proposed discharges of dredged material into waters of the U.S. (including beach nourishment), please attach[2] a proposed Sampling and Analysis Plan (SAP) prepared according to Inland Testing Manual (ITM) guidelines (including Tier I information, if available).

[2]or mail copy separately if applying electronically

Is any portion of the work already complete? ☐ **YES** ☒ **NO**

If yes, describe the work:

Box 7 **Intended NWP permit number[3]**: 12 (Utility Line Activities)

Intended NWP permit number (2nd):

Intended NWP number (3rd):

[3] Enter the intended permit type(s). See NWP regulations for permit types and qualification information (http://www.usace.army.mil/inet/functions/cw/cecwo/reg/nationwide_permits.htm).

Box 8 Authority:

Is Section 10 of the Rivers and Harbors Act applicable?: ☐ YES ☒ NO

Is Section 404 of the Clean Water Act applicable?: ☒ YES ☐ NO

Box 9 Is the discharge of fill or dredged material for which Section 10/404 authorization is sought part of a larger plan of development?: ☐ YES ☒ NO

If discharge of fill or dredged material is part of development, name and proposed schedule for that larger development (start-up, duration, and completion dates):

Location of larger development (If discharge of fill or dredged material is part of a plan of development, a map of suitable quality and detail of the entire project site should be included):

Total area in acres of entire project area (including larger plan of development, where applicable):

The overall MEP project area is approximately 37 acres comprised by the following temporary and permanent impact areas:

1. 13.9 acre generating facility footprint and access road; and 9.2 acre temporary laydown area;
2. 1 acre underground gas line temporary work corridor;
3. 8.5 acre overhead transmission line temporary work corridor with 8 new permanent monopoles;
4. 3.3 acre underground water supply line temporary work corridor, 1 acre temporary staging area, and 250 square foot permanent pump house and intake structure.

Box 10 Threatened or Endangered Species

Please list any federally-listed (or proposed) threatened or endangered species or critical habitat within the project area (use scientific names (e.g., Genus species), if known):

a. longhorn fairy shrimp (*Branchinecta longiantenna*) – Federally Endangered

b. vernal pool fairy shrimp (*Branchinecta lynchi*) – Federally Threatened

c. California tiger salamander (*Ambystoma californiense*) – Federally Threatened

d. California red-legged frog (*Rana draytonii*) and proposed critical habitat unit CCS-2 – Federally Threatened

e. San Joaquin kit fox (*Vulpes macrotis mutica*) – Federally Endangered

Have surveys, using U.S. Fish and Wildlife Service/NOAA Fisheries protocols, been conducted?

☐ Yes, Report attached (or mail copy separately if applying electronically) ☒ No

If a federally-listed species would be impacted, please provide a description and a biological evaluation.

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ Not attached

See Attachment C, Biological Assessment

Has the USFWS/NOAA Fisheries issued a Biological Opinion?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

If yes, list date Opinion was issued (m/d/yyyy):

Has Section 7 consultation been initiated by another federal agency?

☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Has Section 10 consultation been initiated for the proposed project?

☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Box 11 Historic properties and cultural resources:

Please list any historic properties listed (or eligible to be listed) on the National Register of Historic Places:

No historic properties are known to exist in the project area.

Are any cultural resources of any type known to exist on-site?

☐ Yes ☒ No

Has an archaeological records search been conducted?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

See Attachment D

Has an archaeological pedestrian survey been conducted for the site?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

See Attachment D

Has a Section 106 MOA been signed by another federal agency and the SHPO?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

If yes, list date MOA was signed (m/d/yyyy):

Has Section 106 consultation been initiated by another federal agency?

☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Box 12 Measures taken to avoid and minimize impacts to waters of the United States (if any):

The following measures will be incorporated into the Project to minimize impacts to waters of the United States:

1. With the exception of D-2, ASW-1, and Canal 45, all wetlands, drainages, erosional gullies, creeks, and rivers will be avoided by the project.
2. To the extent possible, all work areas within wetlands and drainages will be limited to the minimum area necessary to install the new water supply pipeline.
3. A Worker Environmental Awareness Training Program including information on laws and regulations protecting wetlands and other water resources.
4. Employment of an onsite biological monitor to ensure protection of sensitive resource areas including wetlands and water resources.
5. Parking will occur in designated areas only.
6. An approved SWPPP will be implemented to ensure the protection of wetlands and water resources from deleterious discharges of soil, sediment-laden water, hazardous materials (e.g., fuels and lubricants), and other project–related construction debris and trash. Erosion control measures will be implemented where necessary to reduce erosion and sedimentation in wetlands, waters of the United States, and waters of the State, as well as aquatic habitats potentially occupied by sensitive species. 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 that soil stabilization is deemed adequate.
7. Access to the project site will be from existing roads, including Bruns Road. Temporary works areas will be the minimum necessary to accomplish the work.
8. All ground-disturbing activity in D-2, ASW-1, and Canal 45 will take place in dry conditions.

Include multiple copies of Box 13 for separate sites.

Box 13 Proposed Compensatory Mitigation (site _ of _) related to fill/excavation and dredge activities. Indicate in ACRES and LINEAR FEET (where appropriate) the total quantity of waters of the United States proposed to be created, restored, enhanced and/or preserved for purposes of providing compensatory mitigation. Indicate water body type (wetland, riparian streambed, unvegetated streambed, lake, ocean, other) or non-jurisdictional (uplands[5]). Indicate mitigation type (on- or off-site by applicant, mitigation bank, in-lieu fee program):

Water Body Type	Created	Restored	Enhanced	Preserved	Mitigation type
Totals:					

[5] For uplands, please indicate if designed as an upland buffer.

If no mitigation is proposed, provide detailed explanation of why no mitigation would be necessary:

No compensatory mitigation is proposed because the total permanent impact to Canal 45 is a negligible amount equaling 36 square feet (0.0008 acre). D-2 and ASW-1 are temporarily affected by the project and will be restored to pre-construction conditions.

Has a draft/conceptual mitigation plan been prepared in accordance with the Army Corps of Engineers District guidelines?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

Mitigation site latitude & longitude (D/M/S, DD, or UTM):	**USGS Quad map name:**
Assessors parcel number:	**Section, Township, Range, USGS Quadrangle Map, Latitude/Longitude:**

Other location descriptions, if known:

Directions to the mitigation location:

Box 14 Water Quality Certification (see instructions):

Applying for certification? ☒ Yes, Attached (or mail copy separately if applying electronically) ☐ No

See Attachment E, Water Quality Certification Application

Certification issued? ☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

Exempt? ☐ Yes ☒ No

If exempt, state why: Agency concurrence? ☐ Yes, Attached ☐ No

Box 15 Coastal Zone Management Act (see instructions):

Is the project located within the Coastal Zone? ☐ Yes ☒ No

If yes, applying for a coastal commission-approved Coastal Development Permit?

☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No

If no, applying for separate CZMA-consistency certification?

☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No

Permit/Consistency issued? ☐ **Yes, Attached (or mail copy separately if applying electronically)** ☐ No

Exempt? ☐ Yes ☐ No

If exempt, state why:

Box 16 List of other certifications or approvals/denials received from other federal, state, or local agencies for work described in this application:

Agency	Type Approval[4]	Identification No.	Date Applied	Date Approved	Date Denied
CEC	Application for Certification	Docket #09-AFC-03	Date Applied: June 2009		
CDFG	Section 1602 Streambed Alteration Agreement		Date Applied: April 2010		
RWQCB	Section 401 Water Quality Certification		Date Applied: April 2010		

[4] Would include but is not restricted to zoning, building, and flood plain permits

NWP General Conditions (GC) Checklist:

1. **Navigation:**

Project would be in compliance with GC?

☒ Yes ☐ No

The project will not install navigational aids or regulatory markers.

2. **Proper Maintenance:**

Project would be in compliance with GC?

☒ Yes ☐ No

Mariposa Energy will properly and regularly maintain all structures installed as part of the proposed project.

3. **Erosion and Siltation Controls:**

Project would be in compliance with GC?

☒ Yes ☐ No

To satisfy the requirements of the NPDES General Construction Activity Storm Water Permit, a Notice of Intent (NOI) will be submitted to the Regional Water Quality Control Board (RWQCB) prior to project construction. In addition, a detailed Stormwater Pollution Prevention Plan (SWPPP) will be prepared, and will describe the Best Management Practices (BMPs) that will be implemented for erosion control. BMPs may include, but are not limited to, the use of straw fiber rolls, silt fences, and demarcation of environmentally sensitive areas (ESAs) that are adjacent to the proposed project area.

4. Aquatic Life Movements:

Project would be in compliance with GC?

☒ Yes ☐ No

The proposed project will not disrupt the necessary life cycle movements of indigenous aquatic wildlife, including California tiger salamander, California red-legged frog, and vernal pool crustaceans. Work activities will occur when the wetland area is dry and aquatic organisms are inactive. BMPs and avoidance measures issued to the project by the USFWS and CDFG for branchiopods, California Tiger Salamander, and California red-legged frog will provide protection for sensitive aquatic resources.

5. Equipment:

Project would be in compliance with GC?

☒ Yes ☐ No

Equipment staging and storage areas will be positioned outside wetland areas. BMPs prescribed in the project's SWPPP (to be prepared) will be implemented to protect water resources found in the project area.

6. Regional and Case-by-Case Conditions:

Complete the Regional Conditions checklist below.

Project would be in compliance with any Case-by-case conditions?

☒ Yes ☐ No

The Central Valley District Branch regional conditions for NWP 12 are included below.

7. Wild and Scenic Rivers:

Project would be in compliance with GC?

☒ Yes ☐ No

No waterways designated as a Wild and Scenic River will be impacted by the Project.

8. Tribal Rights:

Project would be in compliance with GC?

☒ Yes ☐ No

The project will not involve tribal rights, such as tribal water, hunting and/or fishing rights.

9. Water Quality (401 Certification): see Box 14 above.

10. Coastal Zone Permit: see Box 15 above.

11. Endangered Species: see Box 10 above.

12. Historic Properties: see Box 11 above.

13. Notification (Check mark and provide those that apply)

☒ **NWP 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43:** Delineation of wetlands and other waters of the U.S.

☐ **NWP 7:** Original Design Capacity & Configurations

☐ **NWP 14:** Compensatory Mitigation Proposal & written statement describing how temporary losses will be minimized to the maximum extent possible

☐ **NWP 21:** Office of Surface Mining or State-approved mitigation Plan

☐ **NWP 27:** Documentation of Prior Condition of Site:

☐ **NWP 29:** Past use of NWP, statement of personal residence, parcel size description, land description

☐ **NWP 31 (for repeat use)**: 5 year Maintenance Plan, baseline channel information, delineation, and disposal site information

☐ **NWP 33:** Restoration Plan

☐ **NWP 39, 43, and 44:** Written Statement on Avoidance and Minimization Measures

☐ **NWP 39 and 42:** Compensatory Mitigation Plan/Justifications of no plan

☐ **NWP 40:** Compensatory Mitigation Proposal

☐ **NWP 43:** Maintenance Plan (for new construction) and compensatory mitigation proposal

☐ **NWP 44:** Description of affected waters, minimization measures and reclamation plan

☒ **NWPs 12, 14, 29, 39, 40, 42, 43, and 44:** FEMA map, FEMA construction requirements and demonstration of FEMA compliance.

The Federal Emergency Management Agency has not published flood insurance rate maps for the area where the MEP site is located. No nearby areas, however, are designated as special flood hazard areas; therefore, it is unlikely that the project site is subject to flooding. The MEP site is not in an area subject to flooding from a tsunami or seiche.

14. Compliance Certification:

Applicant is aware of this post-construction requirement?

☒ Yes ☐ No

15. Use of Multiple Nationwide Permits:

Applicant is aware that if total proposed acreage of impact exceeds acreage limit of NWP with highest specified acreage, no NWP can be issued?

☒ Yes ☐ No

16. Water Supply Intakes:

Project would be in compliance with GC?

☒ Yes ☐ No

This project will not take place near any water supply intakes.

17. Shellfish Beds:

Shellfish beds present?

☐ Yes ☒ No

Project would be in compliance with GC?

☒ Yes ☐ No

No discharge of dredged or fill material will occur near areas of shellfish production.

18. Suitable Material:

Project would be in compliance with GC?

☒ Yes ☐ No

All material that will be placed in Waters of the U.S. (including wetlands) as backfill will be clean native fill.

19. Mitigation:

Project would be in compliance with GC?

☒ Yes ☐ No

Onsite restoration will be conducted for temporary impacts to Waters of the U.S. including wetlands. All temporary work areas will be restored back to their pre-construction condition prior to project completion.

20. Spawning Areas :

Spawning areas present?

☐ Yes ☒ No

Project would be in compliance with GC?

☒ Yes ☐ No

21. Management of Water Flows:

Project would be in compliance with GC?

☒ Yes ☐ No

Construction of the proposed project will not affect water flows. The proposed project will be in compliance with this GC through conducting the work when the wetland areas and drainages are dry and use of standard BMPs.

22. Adverse Effects From Impoundments:

Project would be in compliance with GC?

☒ Yes ☐ No

The proposed project does not include any activities which will result in the impoundment of water.

23. Waterfowl Breeding Areas:

Waterfowl breeding areas present?

☐ Yes ☒ No

Project would be in compliance with GC?

☒ Yes ☐ No

The proposed project is not located within or adjacent to a known waterfowl breeding area.

24. Removal of Temporary Fills:

Project would be in compliance with GC?

☒ Yes ☐ No

Temporary fills and construction debris and trash will be removed in their entirety and the affected areas will be returned to pre-construction elevations. The affected areas will also be revegetated, as appropriate.

25. Designated Critical Waters (check those that apply)

Includes:

1. ☐ N0AA designated marine sanctuaries,
2. ☐ National Wild and Scenic Rivers,
3. ☐ Critical habitat for Federally listed species,
4. ☐ Coral reefs,
5. ☐ State natural heritage sites,
6. ☐ Officially designated waters

Applicant is aware of the restrictions a) and b) below?

☒ Yes ☐ No

a) NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44: No NWP can be issued (except in certain cases described in full text of GC#25).

b) NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38: Notification required.

26. Fills within 100-Year Floodplains:

Project would be within 100-year floodplains?

☐ Yes ☒ No

If yes, project would be in compliance with restrictions a) and b) below?

☐ Yes ☐ No

a) Discharges Below Headwaters (below point of 5 cfs) resulting in permanent above - grade fills:

NWP 29, 39, 40, 42, 43, and 44: No NWP can be issued.

NWP 12 and 14: Notification required.

b) Discharges in Headwaters (above point of 5 cfs) resulting in permanent above-grade fills:

Flood Fringe

NWP 12, 14, 29, 39, 40, 42, 43, and 44: Notification required.

Floodway

NWP 29, 39, 40, 42, 43, and 44: No NWP can be issued.

NWP 12 and 14: Notification required.

27. Construction Period

Applicant is aware of requirements under this GC?

☒ Yes ☐ No

NWP-specific Requirements Checklist:

1. Nationwide 03 (case iii):

Evidence of damage (due to storm, flood, etc.) such as recent topographic surveys or photographs attached?

☐ Yes ☐ No

2. Nationwide 07:

NPDES permit or other proof of CWA Section 402 compliance attached?

☐ Yes ☐ No

3. Nationwides 13, 14, 18, 29, 39, 40, 42, 43, 44:

Activity/crossing must be part of a single and complete project.

Project would be in compliance with this requirement?

☐ Yes ☐ No

4. Nationwide 31:

As-built or approved engineering drawings for each structure attached?

☐ Yes ☐ No

5. Nationwide 40:

Documentation of an NRCS exemption, a NRCS-certified wetland delineation, and a NRCS-approved compensatory mitigation plan attached?

☐ Yes ☐ No

NWP Regional Conditions (RC) Checklist:

I. Central Valley District:

No Regional Condition checklist from the Central Valley District is currently available. Please refer to original text of regional conditions.

End of Form

List of Attachments

Attachment D
Section 1602 CDFG Lake or Streambed Alteration Application/Notification

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The Section 1602 Lake or Streambed Alteration Application/Notification is enclosed. The attachments and figures to the Section 1602 permit are identical to those in the Section 401 Water Quality Certification Application documentation. Therefore, they are not provided here.

FOR DEPARTMENT USE ONLY				
Date Received	Amount Received	Amount Due	Date Complete	Notification No.
	$	$		

STATE OF CALIFORNIA

DEPARTMENT OF FISH AND GAME

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

Complete EACH field, unless otherwise indicated, following the enclosed instructions and submit ALL required enclosures. Attach additional pages, if necessary.

1. APPLICANT PROPOSING PROJECT

Name	Bo Buchynsky, Executive Director		
Business/Agency	Diamond Generating Corporation		
Street Address	333 South Grand Avenue, Suite 1570		
City, State, Zip	Los Angeles, CA 90071		
Telephone	(213) 473-0092	Fax	(213) 620-1170
Email	b.buchynsky@dgc-us.com		

2. CONTACT PERSON (*Complete only if different from applicant*)

Name	Doug Urry, CH2M HILL Project Manager		
Street Address	2485 Natomas Park Drive, Suite 600		
City, State, Zip	Sacramento, CA 95833-2937		
Telephone	(916) 286-0348	Fax	(916) 920-8463
Email	Doug.urry@ch2m.com		

3. PROPERTY OWNER (*Complete only if different from applicant*)

Name			
Street Address			
City, State, Zip			
Telephone		Fax	
Email			

4. PROJECT NAME AND AGREEMENT TERM

A. Project Name	Mariposa Energy Project (MEP)
B. Agreement Term Requested	☑ Regular (*5 years or less*) ☐ Long-term (*greater than 5 years*)

C. Project Term		D. Seasonal Work Period		E. Number of Work Days
Beginning (*year*)	Ending (*year*)	Start Date (*month/day*)	End Date (*month/day*)	
2011	2011	06/01	10/15	5.00

5. AGREEMENT TYPE

Check the applicable box. If box B, C, D, or E is checked, complete the specified attachment.	
A.	☑ Standard *(Most construction projects, excluding the categories listed below)*
B.	☐ Gravel/Sand/Rock Extraction (*Attachment A*) *Mine I.D. Number:* ____________
C.	☐ Timber Harvesting (*Attachment B*) THP *Number:* ____________
D.	☐ Water Diversion/Extraction/Impoundment (*Attachment C*) *SWRCB Number:* ____________
E.	☐ Routine Maintenance (*Attachment D*)
F.	☐ DFG Fisheries Restoration Grant Program (FRGP) *FRGP Contract Number:* ____________
G.	☐ Master
H.	☐ Master Timber Harvesting

6. FEES

Please see the current fee schedule to determine the appropriate notification fee. Itemize each project's estimated cost and corresponding fee. ***Note: The Department may not process this notification until the correct fee has been received.***

	A. Project	B. Project Cost	C. Project Fee
1	Open cut trench	$720.00	$224.00
2			
3			
4			
5			
		D. Base Fee *(if applicable)*	
		E. TOTAL FEE ENCLOSED	$224.00

7. PRIOR NOTIFICATION OR ORDER

A. Has a notification previously been submitted to, or a Lake or Streambed Alteration Agreement previously been issued by, the Department for the project described in this notification?

☐ Yes (*Provide the information below*) ☑ No

Applicant: ____________ Notification Number: ____________ Date: ____________

B. Is this notification being submitted in response to an order, notice, or other directive ("order") by a court or administrative agency (including the Department)?

☑ No ☐ Yes (*Enclose a copy of the order, notice, or other directive. If the directive is not in writing, identify the person who directed the applicant to submit this notification and the agency he or she represents, and describe the circumstances relating to the order.*)

☐ *Continued on additional page(s)*

8. PROJECT LOCATION

A. Address or description of project location.

(*Include a map that marks the location of the project with a reference to the nearest city or town, and provide driving directions from a major road or highway*)

MEP is located in an unincorporated portion of northeastern Alameda County, California, approximately 7 miles northwest of the City of Tracy, 7 miles northeast of Livermore, and 6 miles southeast of Byron (Figure 1). The MEP facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel immediately south of the Pacific Gas and Electric Company (PG&E) Bethany Compressor Station and 230-kV Kelso Substation (Figure 2). Linear features associated with the MEP include a transmission line, natural gas pipeline, and service water line. Drainage Wetland (D-2) is located along the MEP's new 1.8 mile water supply pipeline route, which will be placed in or along the east side of Bruns Road, from Canal 45 south to the MEP. D-2 is located along Bruns Road immediately west of PG&E's Bethany Compressor Station, approximately 600 feet north of the intersection of Kelso Road.

Take I-580 E to exit 63. which is approximately 7 miles east of Livemore. Turn left onto Grant Line Road and drive about 1.3 miles; turn left at Mountain House Road and drive about 3.2 miles; and turn left at Kelso Road and drive about 1.5 miles to Bruns Road. The site street address will be 4887 Bruns Road.

☐ *Continued on additional page(s)*

B. River, stream, or lake affected by the project.	"Drainage Wetland (D-2)", an unnamed tributary to Italian Slough
C. What water body is the river, stream, or lake tributary to?	Italian Slough
D. Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts?	☐ Yes ☑ No ☐ Unknown
E. County	Alameda

F. USGS 7.5 Minute Quad Map Name	G. Township	H. Range	I. Section	J. ¼ Section
Clifton Court Forebay	2 South	3 East	1	Northwest

☐ *Continued on additional page(s)*

K. Meridian (*check one*) ☐ Humboldt ☑ Mt. Diablo ☐ San Bernardino

L. Assessor's Parcel Number(s)

The assessor's parcel number for the MEP project site is 099B-7050-001-10

☐ *Continued on additional page(s)*

M. Coordinates (*If available, provide at least latitude/longitude or UTM coordinates and check appropriate boxes)*

Latitude/Longitude	*Latitude:* 37 47' 47.51"		*Longitude:* 121 36' 17.65" W	
	☑ Degrees/Minutes/Seconds		☐ Decimal Degrees	☐ Decimal Minutes
UTM	*Easting:*	*Northing:*		☐ Zone 10 ☐ Zone 11
Datum used for Latitude/Longitude or UTM		☐ NAD 27		☑ NAD 83 or WGS 84

9. PROJECT CATEGORY AND WORK TYPE *(Check each box that applies)*

PROJECT CATEGORY	NEW CONSTRUCTION	REPLACE EXISTING STRUCTURE	REPAIR/MAINTAIN EXISTING STRUCTURE
Bank stabilization – bioengineering/recontouring	☐	☐	☐
Bank stabilization – rip-rap/retaining wall/gabion	☐	☐	☐
Boat dock/pier	☐	☐	☐
Boat ramp	☐	☐	☐
Bridge	☐	☐	☐
Channel clearing/vegetation management	☐	☐	☐
Culvert	☐	☐	☐
Debris basin	☐	☐	☐
Dam	☐	☐	☐
Diversion structure – weir or pump intake	☐	☐	☐
Filling of wetland, river, stream, or lake	☐	☐	☐
Geotechnical survey	☐	☐	☐
Habitat enhancement – revegetation/mitigation	☐	☐	☐
Levee	☐	☐	☐
Low water crossing	☐	☐	☐
Road/trail	☐	☐	☐
Sediment removal – pond, stream, or marina	☐	☐	☐
Storm drain outfall structure	☐	☐	☐
Temporary stream crossing	☐	☐	☐
Utility crossing : Horizontal Directional Drilling	☐	☐	☐
Jack/bore	☐	☐	☐
Open trench	☑	☐	☐
Other *(specify)*:	☐	☐	☐

10. PROJECT DESCRIPTION

A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.

- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

Figure 3 shows an aerial of the project location and immediately surrounding area. Photographs of the project site and jurisdictional feature, D-2, are in the Wetland Delineation Report (Attachment A). Design drawing/plans for the proposed culvert crossings are included in Attachment B.

Please see the Addendum for a detailed description of the project.

☑ *Continued on additional page(s)*

B. Specify the equipment and machinery that will be used to complete the project.

Smaller equipment, such as backhoe, compact/mini excavator, or hand operated trencher, will be used between the right-of-way fence and end of culvert to ensure construction stays within the existing right-of-way. Other equipment used will be dump trucks, various light duty pick up trucks, concrete mixer truck, and flat bed trucks.

☐ *Continued on additional page(s)*

C. Will water be present during the proposed work period (specified in box 4.D) in the stream, river, or lake (specified in box 8.B).	☐ Yes ☑ No (*Skip to box 11*)
D. Will the proposed project require work in the wetted portion of the channel?	☐ Yes (*Enclose a plan to divert water around work site*) ☐ No

11. PROJECT IMPACTS

A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modifications in length (linear feet) and area (square feet or acres) and the type and volume of material (cubic yards) that will be moved, displaced, or otherwise disturbed, if applicable.

Please see Addendum.

☑ *Continued on additional page(s)*

B. Will the project affect any vegetation? ☐ Yes (*Complete the tables below*) ☑ No

Vegetation Type	Temporary Impact	Permanent Impact
Please see Addendum.	Linear feet: ________ Total area: ________	Linear feet: ________ Total area: ________
	Linear feet: ________ Total area: ________	Linear feet: ________ Total area: ________

Tree Species	Number of Trees to be Removed	Trunk Diameter (range)
Not Applicable		

☑ *Continued on additional page(s)*

C. Are any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site?

☑ Yes *(List each species and/or describe the habitat below)* ☐ No ☐ Unknown

☑ *Continued on additional page(s)*

D. Identify the source(s) of information that supports a "yes" or "no" answer above in Box 11.C.

Biological Assessment (Attachment C) and the California Energy Commission Application for Certification available online at: http://www.energy.ca.gov/sitingcases/mariposa/documents/index.html

☐ *Continued on additional page(s)*

E. Has a biological study been completed for the project site?

☑ Yes (*Enclose the biological study*) ☐ No

Note: A biological assessment or study may be required to evaluate potential project impacts on biological resources.

F. Has a hydrological study been completed for the project or project site?

☐ Yes (*Enclose the hydrological study*) ☑ No

Note: A hydrological study or other information on site hydraulics (e.g., flows, channel characteristics, and/or flood recurrence intervals) may be required to evaluate potential project impacts on hydrology.

12. MEASURES TO PROTECT FISH, WILDIFE, AND PLANT RESOURCES

A. Describe the techniques that will be used to prevent sediment from entering watercourses during and after construction.

Please see Addendum.

☑ *Continued on additional page(s)*

B. Describe project avoidance and/or minimization measures to protect fish, wildlife, and plant resources.

Please see Addendum.

☑ *Continued on additional page(s)*

C. Describe any project mitigation and/or compensation measures to protect fish, wildlife, and plant resources.

No compensatory mitigation is proposed because the total temporary impact to D-2 is a negligible amount equaling 0.0004 acres (19.5 square feet). D-2 temporarily affected by the project will be restored to pre-construction conditions.

☐ *Continued on additional page(s)*

13. PERMITS

List any local, state, and federal permits required for the project and check the corresponding box(es). Enclose a copy of each permit that has been issued.

A. CA Energy Commission Application for Certification (Docket #09-AFC-03) ☑ Applied ☐ Issued

B. Clean Water Act Section 404, Nationwide Permit #12 (Attachment D) ☑ Applied ☐ Issued

C. Clean Water Act Section 401, Water Quality Certification (Attachment #E) ☑ Applied ☐ Issued

D. Unknown whether ☐ local, ☐ state, or ☐ federal permit is needed for the project. (*Check each box that applies*)

☐ *Continued on additional page(s)*

14. ENVIRONMENTAL REVIEW

A. Has a draft or final document been prepared for the project pursuant to the California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), California Endangered Species Act (CESA) and/or federal Endangered Species Act (ESA)?

☑ Yes (*Check the box for each CEQA, NEPA, CESA, and ESA document that has been prepared and enclose a copy of each*)

☐ No (*Check the box for each CEQA, NEPA, CESA, and ESA document listed below that will be or is being prepared*)

☐ Notice of Exemption	☐ Mitigated Negative Declaration	☐ NEPA document (*type*): ________
☐ Initial Study	☐ Environmental Impact Report	☑ CESA document (*type*): AFC
☐ Negative Declaration	☐ Notice of Determination *(Enclose)*	☐ ESA document (*type*): ________
☐ THP/ NTMP	☐ Mitigation, Monitoring, Reporting Plan	

B. State Clearinghouse Number (*if applicable*)			
C. Has a CEQA lead agency been determined?	☑ Yes (*Complete boxes D, E, and F*)	☐ No (*Skip to box 14.G*)	
D. CEQA Lead Agency	California Energy Commission		
E. Contact Person	Rick York, Biology Unit Supervisor	F. Telephone Number	(916) 654-3945

G. If the project described in this notification is part of a larger project or plan, briefly describe that larger project or plan.

Not Applicable.

☐ *Continued on additional page(s)*

H. Has an environmental filing fee (Fish and Game Code section 711.4) been paid?

☑ Yes (*Enclose proof of payment*) ☐ No (*Briefly explain below the reason a filing fee has not been paid)*

Mariposa Energy, LLC paid a filing fee to the California Energy Commission when the Application for Certification was submitted (Attachment F).

Note: If a filing fee is required, the Department may not finalize a Lake or Streambed Alteration Agreement until the filing fee is paid.

15. SITE INSPECTION

Check one box only.

☐ In the event the Department determines that a site inspection is necessary, I hereby authorize a Department representative to enter the property where the project described in this notification will take place at any reasonable time, and hereby certify that I am authorized to grant the Department such entry.

☑ I request the Department to first contact (*insert name*) Doug Urry, CH2M HILL Project Manager at (*insert telephone number*) (916) 286-0348 to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.

16. DIGITAL FORMAT

Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?

☑ Yes (Please enclose the information via digital media with the completed notification form)

☐ No

17. SIGNATURE

I hereby certify that to the best of my knowledge the information in this notification is true and correct and that I am authorized to sign this notification as, or on behalf of, the applicant. I understand that if any information in this notification is found to be untrue or incorrect, the Department may suspend processing this notification or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand also that if any information in this notification is found to be untrue or incorrect and the project described in this notification has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.

Bo Buchynsky ____________________ 4-1-2010

Signature of Applicant or Applicant's Authorized Representative   Date

Bo Buchynsky ____________________

Print Name

Box 4. Project Name and Agreement Term

C. Project Term

Construction of the Mariposa Energy Project (MEP) will occur continuously from April 25, 2011 to July 1, 2012. However, work within the jurisdictional drainage wetland (D-2) will occur over approximately 4 to 5 days in 2011.

D. Seasonal Work Period

Work within the jurisdictional feature, D-2, will be limited when the drainage is dry.

Box 10. Project Description

Description of Proposed Mariposa Energy Project

The MEP will be a nominal 200-Megawatt, 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's (PG&E) Kelso Substation. MEP will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations and standards. The main access to the MEP site will be from Bruns Road. A portion of the power blocks 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 4-inch-diameter 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 6-inch-diameter, 1.8-mile water supply line from the Byron-Bethany Irrigation District (BBID) Canal 45 delivering raw water to the project site (Figure 3).

Description of Proposed Water Supply Pipeline

The MEP will use raw water supplied by the BBID via the new pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the MEP site. Approximately 1,000 feet of pipeline will be located adjacent to Bruns Road in an agricultural field road from a new 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. At three culverts the pipeline will veer off the road surface and around the end of each culvert, and then back onto the roadway. One of these culverts is not associated with a drainage feature. The other two culverts are located at D-2 and ASW-1. ASW-1 is not considered jurisdictional by the California Department of Fish and Game (per. comm. Marcia Grefsrud/CDFG). Due to limited space between the right-of-way fence and end of culvert, smaller equipment such as a backhoe, compact/mini excavator, or hand operated trencher will be used to ensure construction stays within the existing right-of-way. In order to ensure the pipeline crossing of the drainage will remain undisturbed post-construction, a scour analysis will be completed to identify scour depth at each location. The pipeline route will follow the MEP main access road (an existing gravel road) from Bruns Road to the MEP site. Associated facilities at Canal 45 include a 36 square foot concrete intake structure on the canal bank and a 214 square foot pump station consisting of a pre-cast concrete manhole wet well, redundant vertical turbine pumps, pipe manifold and valving, electrical cabinet, and instrumentation located on the side of the canal. The raw water is for MEP process water, safety showers, fire protection, service water, and domestic uses.

Description of Proposed Work in Jurisdictional Area

Impacts to the CDFG jurisdictional area (D-2) and the United States Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB) jurisdictional areas (D-2, ASW-1, Canal 45) will occur during construction of the water supply pipeline. Open cut trenching will affect D-2. The maximum trench width is expected to be 18 inches and depth is 5 feet. The new pipe at the D-2 drainage crossing will be encased with approximately 6 inches of concrete for scour protection, and backfilled to original grade with native or import material. The other potentially 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. All ground-disturbing activity in waters of the United States will take place in dry conditions, and dewatering is not anticipated. However, if any dewatering is required during pipeline construction, it will occur in accordance with the Regional Water Quality Control Board National Pollutant Discharge Elimination System (NPDES) permit.

Photographs of the project site and jurisdictional feature are located in Appendix F of the Wetland Delineation Report (Attachment A). The location of D-2 in relation to the water supply pipeline route is shown on Figure 2-1, Map 2 of the Wetland Delineation Report. Design plans of the drainage crossings are in Attachment B.

Box 11. Project Impacts

A. Impacts to Wetland Drainage (D-2)

Temporary fill within D-2 would result from incidental fall back during excavation activities. Concrete will be used to encase the pipe at the bottom of a 4 foot deep trench at D-2. All temporary impacts will be restored to pre-construction conditions.

The area of disturbance at D-2 is approximately 0.0004 acres (19.5 square feet).

The trench through D-2 is expected to be no greater than 5 feet deep, by 18 inches wide.

Volume of concrete encasement at D-2 is approximately 0.2 cubic yards.

Volume of native soil or import backfill material at D-2 is 0.7 cubic yards.

B. Vegetation

Work will be performed within the existing road shoulder at this drainage. Rock rip-rap exists within D-2 with trace amounts of roadside ruderal vegetation adjacent to D-2 inside the construction footprint.

C. Special Status Species

The following special-status animal or plant species, or habitat that could support such species, has the potential to occur on or near the MEP site:

1. longhorn fairy shrimp (*Branchinecta longiantenna*) – Federally Endangered
2. vernal pool fairy shrimp (*Branchinecta lynchi*) – Federally Threatened
3. California tiger salamander (*Ambystoma californiense*) – Federally Threatened
4. California red-legged frog (*Rana draytonii*) and proposed critical habitat unit CCS-2 – Federally Threatened
5. San Joaquin kit fox (*Vulpes macrotis mutica*) – Federally Endangered

Formal consultation with the United States Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act will be initiated and a Biological Opinion (BO) will be issued by USFWS prior to construction. The applicant agrees to abide by the conditions of the Section 7 permit, which may include mitigation/protective measures that would be implemented in the project's sensitive areas. The Biological Assessment is included as Attachment C.

Box 12. Measures to Protect Fish, Wildlife, and Plant Resources

A. Techniques to prevent sediment from entering watercourses

An approved Stormwater Pollution Prevention Plan (SWPPP) will be implemented to ensure the protection of wetlands and water resources from deleterious discharges of soil, sediment-laden water, hazardous materials (e.g., fuels and lubricants), and other project–related construction debris and trash. Erosion control measures will be implemented where necessary to reduce erosion and sedimentation in wetlands, waters of the United States, and waters of the State, as well as aquatic habitats potentially occupied by sensitive species. Best Management Practices (BMPs) may include, but are not limited to, the use of straw fiber rolls, silt fences, and demarcation of environmentally sensitive areas (ESAs) that are adjacent to the proposed project area. Erosion control measures will be monitored on a regularly scheduled basis, particularly during time 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 that soil stabilization is deemed adequate.

B. Project avoidance and/or minimization measures

1. With the exception of D-2, ASW-1, and Canal 45, all wetlands, drainages, erosional gullies, creeks, and rivers will be avoided by the project.
2. To the extent possible, all work areas within wetlands and drainages will be limited to the minimum area necessary to install the new water supply pipeline.
3. A Worker Environmental Awareness Training Program including information on laws and regulations protecting wetlands and other water resources.
4. Employment of an onsite biological monitor to ensure protection of sensitive resource areas including wetlands and water resources.
5. Parking will occur in designated areas only.
6. Access to the project site will be from existing roads, including Bruns Road. Temporary work areas will be the minimum necessary to accomplish the work.
7. All ground-disturbing activity in D-2, ASW-1, and Canal 45 will take place in dry conditions.
8. Onsite restoration will be conducted for temporary impacts to D-2, ASW-1, and Canal 45. All temporary work areas will be restored back to their pre-construction condition prior to project completion.

List of Attachments

Attachment E Application for Certification Filing (Docket 09-AFC-3)

Mariposa Energy, LLC
333 S. Grand Ave., Suite 1570, Los Angeles, CA 90071
Tel: (213) 473-0080 Fax: (213) 620-1170

DOCKET
09-AFC-3
DATE JUN 1 5 2009
RECD. JUN 1 5 2009

June 15, 2009

Ms. Melissa Jones
Executive Director
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Dear Ms. Jones:

Pursuant to the provisions of Title 20, a California Code of regulations, Mariposa Energy, LLC (Mariposa Energy) hereby submits this Application for Certification seeking authority to construct and operate the Mariposa Energy Project (MEP), a simple-cycle electrical generating facility rated at a nominal generating capacity of 200 MW. The project will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel in northeastern Alameda County

As the Treasurer/Assistant Secretary of Mariposa Energy, I hereby attest, under penalty of perjury, that the contents of this application are truthful and accurate to the best of my knowledge.

A check in the amount of $187,546 is attached to cover the filing fee.

Sincerely,

Bo Buchynsky

Bo Buchynsky
Treasurer/Assistant Secretary

Attachment F Biological Assessment

Mariposa Energy Project

(09-AFC-03)

Biological Assessment

Submitted to

U.S. Army Corps of Engineers

Submitted by

Mariposa Energy, LLC

With Assistance from

CH2MHILL

2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

April 2010

Contents

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Figures

Appendixes

Acronyms and Abbreviations

ACPLC	Alameda County Partnership of Land Conservation and Stewardship
AFC	Application for Certification
BA	biological assessment
BBID	Byron Bethany Irrigation District
BMP	best management practice
CRLF	California red-legged frog
CTS	California tiger salamander
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEMS	continuous emissions monitoring system
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CTG	combustion turbine generator
CVP	Central Valley Project
DPS	distinct population segment
ESA	Federal Endangered Species Act
FE	federally endangered
FT	federally threatened
GE	General Electric
GIS	geographic information system
GPS	global positioning system
HDPE	high-density polyethylene
HNO_2	nitrous acid
kV	kilovolt(s)

Mariposa Energy	Mariposa Energy, LLC
MEP	Mariposa Energy Project
MW	megawatt(s)
N	nitrogen
NOAA-Fisheries	National Marine Fisheries Service (including National Oceanic and Atmospheric Administration)
NOx	nitrogen oxides
PG&E	Pacific Gas and Electric
ppmvd	part(s) per million by volume, dry basis
PVC	polyvinyl chloride
SCR	selective catalytic reduction
SJKF	San Joaquin kit fox
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
VPFS	vernal pool fairy shrimp
VOC	volatile organic compound
WAPA	Western Area Power Administration
ZLD	zero liquid discharge

SECTION 1
Determination

This document describes the biological assessment (BA) conducted for the Mariposa Energy Project (MEP). The assessment concluded that suitable habitat found within 250 feet of the action area was inferred to be occupied by federally threatened vernal pool fairy shrimp and federally endangered longhorn fairy shrimp. Given conservation measures described in this document, MEP may affect, but is not likely to adversely affect, these species. Because longhorn fairy shrimp are rare and the probability of adverse effects being low, this effect may be considered "discountable" (U.S. Fish and Wildlife Service [USFWS] and National Marine Fisheries Service [NOAA-Fisheries], 1998).

There is a reasonable certainty that "take" (harassment or harm) of federally threatened California red-legged frog and California tiger salamander may occur during implementation of MEP. Therefore, MEP may affect, and is likely to adversely affect, California red-legged frog and California tiger salamander individuals likely occurring within the action area. However, given proposed conservation measures, mortality of these species is unlikely.

The federally endangered San Joaquin kit fox are reasonably certain to occur in the action area. However, San Joaquin kit fox are not known to den in the action area. Therefore, given proposed conservation measures, MEP may affect, but is not likely to adversely affect, this species.

SECTION 2

Introduction

This BA, prepared on behalf of the U.S. Army Corps of Engineers, evaluates whether implementation of MEP (proposed project) will affect threatened, endangered, or proposed-to-be-listed species, including listed species' critical habitat, under the federal Endangered Species Act (ESA) (16 USC 1536(c)). Temporary and permanent effects on threatened and endangered species, or those proposed for listing, that may occur as a result of construction and operation of the proposed project are described in this document. This BA is prepared in accordance with legal requirements found in Section 7(a) (2) of the ESA.

Mariposa Energy, LLC (Mariposa Energy) proposes to construct, own, and operate an electrical generating plant in Alameda County, California. The proposed project will be a natural gas-fired, simple-cycle electrical generating facility rated at a nominal generating capacity of 200 megawatts (MW). The project will have the following design features:

- Four General Electric (GE) LM6000 PC Sprint combustion turbine generators
- Air emissions control systems
- A new, approximately 0.7-mile-long, 230-kilovolt (kV) transmission line
- Approximately 580 feet of new 4-inch-diameter natural gas pipeline
- A new 6-inch diameter, 1.8-mile water supply line (raw water) with associated intake structure and pump house

This document addresses federally listed threatened and endangered species identified on the USFWS Species List Database for the U.S. Geological Survey (USGS) 7.5-minute quadrangle Clifton Court Forebay. The evaluations of the 18 special-status species listed by the USFWS Species List Database included field investigations by CH2M HILL biologists. Five species were determined to need further study:

- Federally endangered longhorn fairy shrimp (*Branchinecta longiantenna*)
- Federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*)
- Federally threatened California red-legged frog (*Rana draytonii*)
- Federally threatened California tiger salamander (*Ambystoma californiense*)
- Federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*)

2.1 Project Description

The proposed project's action area consists of the following elements and respective acreages. Action area is defined as all areas to be directly or indirectly affected during construction and operation of MEP.

- The 10.3-acre MEP facility site and main access road, and 9.2-acre temporary parking and construction laydown yard

- A 1-acre (580-linear-feet-by-75-feet-wide) natural gas pipeline work corridor comprising a new underground pipeline

- An 8.5-acre (0.7-mile-long-by-100-feet-wide) transmission line work corridor comprised of eight new transmission line poles, overland access routes, and a 0.6-acre temporary staging area
- A 4.3-acre (1.8-mile-long-by-15-foot-wide) water supply pipeline work corridor comprised of a new underground pipeline, a 250 square-foot permanent pump and intake structure, and a 1-acre temporary staging area

Representative photographs of the project area are included in Appendix A, and Figure 1 presents vicinity views of the project area. The following paragraphs describe the purpose and need, project location, project designs, site preparations, and avoidance, minimization, and compensation measures. All figures are at the end of this report.

2.1.1 Project Purpose and Need

The primary objective of the proposed project is to provide dispatchable, operationally flexible, and efficient electricity generation to meet Pacific Gas and Electric's (PG&E) need for new energy sources and to satisfy the terms of Mariposa Energy's power purchase agreement with PG&E. PG&E issued a Request for Offers on April 1, 2008, indicating that additional peak electric generation capacity is needed. In accordance with the California Public Utilities Commission Decision 07-12-052, PG&E needs to acquire between 800 and 1,200 MW of new resources, with a preference for dispatchable and operationally flexible resources.

Operationally flexible resources, such as peaker power plants, are required for integration of intermittent renewable resources, such as solar and wind facilities. Additionally, peaking capacity is needed to respond to increases in the local demand for electricity that typically occur in the afternoons of summer days. A facility that provides peaking capacity must be able to be up and running at peak generation within 10 minutes to meet California Independent System Operator requirements. As a peaking facility, MEP will not run continuously, but instead will start, run for as many hours as necessary, and then shut down. Although the facility will be licensed and permitted to operate up to 4,000 hours per year (46 percent of the time) with 300 start and stop cycles, as a peaking power plant, its actual capacity factor will be much less. The plant is expected to operate approximately 600 hours per year with 200 start and stop cycles (Mariposa Energy, 2009). The project is designed to reliably provide this type of fast-start capability and highly flexible dispatchable energy and capacity.

2.1.2 Project Location

The MEP 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 (Figure 1). 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.

2.1.3 Project Design

The project will have the following design features, as outlined on Figure 2 and included in Appendix B:

- Power generating facility consisting of four GE LM6000 PC Sprint combustion turbine generators (CTGs) and associated support equipment
- Air emissions control systems including selective catalytic reduction (SCR) systems for nitrogen oxides (NOx) control and oxidation catalyst for carbon monoxide (CO) control
- 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 4-inch-diameter natural gas pipeline that will run directly northeast from the project site to interconnect with PG&E's existing high-pressure natural gas pipeline
- A new 6-inch-diameter, 1.8-mile water supply line from the Byron-Bethany Irrigation District (BBID) Canal 45 delivering raw water to the project site

2.1.3.1 Onsite Facilities

MEP will be a nominal 200-MW (194 MW net at 59 degrees Fahrenheit [°F]), simple-cycle generating facility consisting of four power blocks. Each power block will contain one GE LM6000 PC-Sprint natural gas-fired CTG. The generated power will be delivered to the grid through the Kelso Substation. MEP will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards. The main access to the site will be from Bruns Road. A portion of the power blocks 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 generating facility CTGs are equipped with SCR air emissions control equipment and associated support equipment for NOx and CO control. Each CTG will generate approximately 50 MW (gross) at base load under average ambient conditions. The project is expected to have an overall annual availability of 92 to 98 percent, including scheduled and forced outages. The design of the plant will provide for operating flexibility. Each CTG is designed to start and ramp up to full power in 10 minutes. Each CTG also provides various ancillary services, such as ramp-up, ramp-down, and spinning reserve, allowing MEP to readily adapt to changing conditions in the energy and ancillary services markets.

Electrical Equipment and Systems – Alternate Current Power Transmission. The electric power generated by this facility will be transmitted to the electrical grid, with the exception of the power required for onsite auxiliaries such as pumps, fans, gas compressors, and other parasitic loads. A station battery system will be used to provide backup power for critical loads and control systems. Power will be generated by the four CTGs at 13.8 kV and then stepped up using four 13.8/230-kV, oil-filled generator step-up transformers to support connection to the local 230-kV network. Surge arrestors will protect the transformer from surges in the 230-kV system caused by lightning strikes or other system disturbances. The transformers will be set on a concrete foundation that includes a secondary oil containment reservoir (to contain the transformer oil in the event of a leak or spill). The high-voltage side of the generator step-up transformer will be connected to a single-circuit, three-phase, 230-kV transmission line, which will be connected to the PG&E 230-kV switchyard at the Kelso Substation located north of the project site on Bruns Road (Figure 2).

Air Emission Control and Monitoring. Air emissions from the combustion of natural gas in the CTGs will be controlled using state-of-the-art systems. To ensure that the systems perform correctly, NOx and CO will be continuously monitored. The CTGs selected for the proposed project include demineralized water injection and SCR to control emissions of NOx. The SCR process will use 19 percent aqueous ammonia. Ammonia slip, or the concentration of unreacted ammonia in the stack exhaust, will be limited to 5 parts per million by volume, averaged over 1 hour. The SCR equipment will include a reactor chamber, catalyst modules, ammonia storage system, ammonia vaporization and injection system, and monitoring equipment and sensors. The project will use an ammonia delivery system, which consists of a 10,000-gallon ammonia tank, spill containment basin, and refilling station with a spill containment basin and sump (Appendix B).

The combustion turbine combustors incorporate staged combustion of a premixed fuel/air charge, resulting in high thermal efficiencies with reduced CO and volatile organic compound (VOC) emissions. CO and VOC emissions will be further controlled by means of CO oxidation catalysts. Particulate emissions will be controlled by the use of best combustion practices; the use of natural gas, which is low in sulfur, as the sole fuel for the CTGs; and high-efficiency air inlet filtration.

For each CTG, a separate continuous emissions monitoring system (CEMS) will sample, analyze, and record fuel gas flow rate; NOx and CO concentration levels; and percentage of oxygen in the exhaust gas from the stacks. The CEMS sensors will transmit data to a data acquisition system that will store the data and generate emission reports in accordance with permit requirements. The system will also include alarm features that will send signals to the plant control system when the emissions approach or exceed preselected limits.

Wastewater and Stormwater Handling. MEP has been designed as a zero liquid discharge (ZLD) facility for wastewater. Process wastewater and stormwater runoff from all of the plant equipment process areas will be collected, treated, and recycled for use onsite. General plant drains will collect containment area washdown, sample drain water, and facility equipment drainage. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed through an oil/water separator before ZLD treatment. Equipment drains that have the potential to be contaminated with oil will be valved shut to prevent rain water from draining, unless the water has been first inspected.

A truck-mounted ZLD treatment system will include a walnut-shell-activated carbon vessel followed by a surge tank and five micron bag filters and pH adjustment if necessary. The treated ZLD reclaim water then will be recycled back to the raw water storage tank for reuse. Any oily waste collected in the oil/water separator will be transferred to 55-gallon drums and hauled offsite for proper disposal. Wastewater from infrequent combustion turbine water washes and from the fuel filtration skids will be collected in holding tanks or sumps and will be trucked offsite for disposal at an approved wastewater disposal facility. Sanitary wastewater from sinks, toilets, showers, and other sanitary facilities will be routed to an onsite holding tank and trucked offsite for treatment.

Stormwater collected in process areas will drain into the general plant drain system to be recycled, as previously described. 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 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 dissipators.

2.1.3.2 Offsite Linear Facilities

230-kV Transmission Line. The proposed project will be interconnected with the regional electrical grid by a new, approximately 0.7-mile-long, single-circuit, three-phase, 230-kV transmission line. The proposed 230-kV line will run generally north from the MEP 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 the Kelso Substation (Figure 2).

The proposed interconnecting 230-kV transmission circuit is expected to consist of a single circuit configuration, supported by eight new steel monopole structures, ranging in height from 84 to 95 feet, located at appropriate intervals. A 10-foot-diameter concrete foundation will support each new monopole structure. No new access or service roads are needed along the transmission line corridor. Because the topography of the transmission corridor is generally flat and grazed by cattle with no trees, grading will not be required to access the line during construction or operation. During construction, rubber-tired line trucks and support vehicles (for example, pickup trucks) will access the transmission line work corridor overland.

The proposed line will exit the onsite switchyard from the take-off structures and will connect to the new steel-monopole, single-circuit structures. The project switchyard will use a single 230-kV circuit breaker for the four generating units and a generator step-up transformer for each generating unit. Appendix B provides layout drawings of the facility including other descriptive engineer drawings for the proposed project. Startup and standby power will be supplied through the generator step-up transformers and four auxiliary transformers. Auxiliary controls and protective relay systems for the project’s switchyard will be located in the power plant control building.

Natural Gas Pipeline. The proposed project will require construction of an offsite pipeline to supply natural gas to the MEP site. PG&E operates two existing high-pressure natural gas transmission pipelines just northeast of the MEP site. The proposed 4-inch-diameter, natural gas supply pipeline will tap into the existing PG&E Line 2 and be routed underground, entering the MEP site at its northeastern corner. The entire approximately 580-foot pipeline will be constructed within the 158-acre project parcel. It is expected that PG&E will construct, own, and operate this new pipeline.

The 10-acre MEP site will include a gas metering station to measure and record gas volumes. Additionally, facilities to regulate the gas pressure and remove any liquids or solid particles will be installed as required. The new metering station will include a pad and above- and below-ground gas piping, metering equipment, gas conditioning, pressure regulation, and possibly pigging facilities. A distribution power line will also be needed to provide power for metering station operation lighting and communication equipment. A perimeter chain-link fence will provide security around the gas metering station.

Water Supply Pipeline. The project will use raw water supplied by BBID via a new 6-inch-diameter, 1.8-mile water supply pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the MEP site. Approximately 1,000 feet of pipeline will be located adjacent to Bruns Road on BBID property (an agricultural road) from the pump station to the new BBID headquarters facility. South of the BBID headquarters, the pipeline will be located within the Bruns Road right-of-way under the pavement. Seven culverts are located along the water line route in Bruns Road, including two concrete box culverts and five corrugated metal pipe culverts. Each culvert is associated with either an ephemeral drainage or roadside ditch. Because of right-of-way constraints, underground tunneling (for example, pipe ramming) will be used to install the pipeline beneath four of these culverts. For the remaining three drainages, open-cut trenching will be used to install the pipeline around the culverts, but within the road right-of-way. The pipeline route will follow the MEP main access road (an existing gravel road) from Bruns Road to the MEP site.

Associated facilities will include a 36-square-foot concrete turnout structure in Canal 45 and an approximately 250-square-foot pump station consisting of a precast concrete manhole wet wells, redundant vertical turbine pumps, pipe manifold and valving, an electrical cabinet, and instrumentation. The raw water is for all water uses needed by MEP, including process water, safety showers, fire protection, service water, and domestic uses.

2.1.4 Site Preparation Activities

Site preparation activities include the following:

- Preconstruction surveys for special-status species
- Designation of construction work areas and exclusionary zones
- As-needed vegetation removal
- As-needed removal of abandoned equipment and materials from previous wind farm
- Designation of temporary staging and laydown areas
- Designation of temporary construction access roads or routes

2.1.4.1 Preconstruction Surveys for Special-Status Species

A USFWS-approved biologist or team of approved biologists will conduct preconstruction surveys before vegetation removal or any other project-related ground disturbance activities. Species-specific preconstruction surveys, listed species relocation methods, and species-specific conservation efforts are detailed in Section 4.

2.1.4.2 Designated Construction Work Areas and Exclusion Zones

Disturbances will be minimized to the extent feasible by establishing the approved work area boundaries before ground-breaking activities. Access to sensitive habitats such as seasonal wetlands will be discouraged by developing construction exclusion zones around environmentally sensitive areas during project construction. To minimize the potential for entry into the construction zone by listed species, including California red-legged frog and California tiger salamander, an exclusion fence will be installed and properly maintained along the outside perimeter of the MEP construction site and adjacent 9.2-acre laydown area, and the main access road, for the duration of project construction. The exclusionary fence will also help to minimize the potential for indirect effects of erosion, such as sediment-laden water, on nearby water resources. All work areas will be delineated using high-visibility orange mesh fencing, flagging, signage, or other appropriate means to limit personnel and vehicular access outside the action area.

2.1.4.3 Vegetation Removal

In general, vegetation will be removed in areas requiring grading or excavation. Grading and excavation of the MEP site and offsite facilities, including pipelines and transmission pole foundations, will disturb annual grassland, topsoil, and other resources including small mammal burrows. Loss of grassland habitat will be permanent at the 10-acre MEP site and at each new transmission line pole, and temporary at staging areas and along the majority of offsite linear work corridors. To the extent feasible, initial ground disturbance inside the construction zone will occur during the summer dry months, and vegetation removal will be minimized.

No listed plant species were detected in the action area during 2009 protocol-level rare plant surveys. The final rare plant report prepared by CH2M HILL is attached as Appendix C. Note that the Rare Plant Report includes survey results for an Alternate Water Supply Pipeline Route; this feature is not part of the proposed project and is not evaluated in this BA. Because no trees exist in the action area, none will be affected by the proposed project. A USFWS-approved biologist will conduct preconstruction surveys for listed species before any vegetation disturbance. The 9.2-acre laydown area and temporary offsite facility work areas will be restored to annual grassland habitat immediately following their use. Because of the potential for excessive compaction in areas of the temporary 9.2-acre laydown and parking area from vehicles, equipment, and heavy machinery, ripping will be performed in the affected areas to facilitate restoration to preconstruction conditions.

2.1.4.4 Wind Farm Equipment Removal

Limited components from a prior wind farm were abandoned and remain at the site. Remaining features include electrical panel and turbine concrete foundations, underground utility conduit, and miscellaneous parts and debris. These features will be removed from the site prior to construction to minimize delays during construction.

2.1.4.5 Temporary Staging and Laydown Areas

Temporary construction facilities will include a 9.2-acre worker parking and laydown area immediately east of the MEP site; a 1-acre water supply pipeline parking and laydown area located at the BBID headquarters facility on Bruns Road; and a 0.6-acre laydown area along the transmission line route next to the PG&E Kelso Substation and Bethany Compressor Station. Equipment staging for the construction of the gas line will take place in the 9.2-acre laydown area. Figure 2 shows the project site in relation to the 9.2-acre construction laydown and parking area. This 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 postconstruction restoration, including recolonization by fossorial mammals. The temporary laydown area located within the transmission line work corridor will not require a base rock and fabric underlayment or vegetation removal. Because this laydown will be sited in grazed annual grassland that is generally flat, no grading will be required. The temporary laydown area for the water supply pipeline will be located within an existing maintenance yard at BBID's headquarters.

2.1.4.6 Construction Access

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 the 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. Figure 2 displays the main construction access road. 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.

2.1.5 Construction Activities

2.1.5.1 Main Site Facilities

Construction of the generating facility and use of the 9.2-acre laydown area, from site preparation, sub-excavation, grading, and installation of foundations and infrastructure, to commercial operation, is expected to take place from April 2011 to July 2012 (14 months total). After site preparation and preconstruction activities have been completed, the MEP components will be installed. The four power blocks will be constructed year round. The average and peak workforce will be approximately 89 and 177, respectively, of construction craft, supervisory, support, and construction management personnel onsite during construction. Typically, construction will be scheduled to occur between 7 a.m. and 7 p.m. on weekdays and 8 a.m. and 5 p.m. on Saturdays. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities, such as pouring concrete at night during hot weather or working around time-critical shutdowns and constraints. During some construction periods and the startup phase, some activities will continue 24 hours per day, 7 days per week.

2.1.5.2 Offsite Linear Facilities

Natural Gas Pipeline. The natural gas pipeline will generally consist of the following construction elements within the 75-foot wide construction corridor.

- **Trenching** width will depend on the type of soils encountered and requirements of the worker safety standards. Trenching will be performed using a backhoe excavator; the optimal trench will be approximately 30 inches wide and 54 inches deep. If loose soil is encountered, a trench up to 10 feet wide at the top and 2 feet wide at the bottom may be required. The pipeline will be buried to provide a minimum cover of 36 inches. The excavated soil will be piled on one side of the trench and used for backfilling after the pipe is installed. Any excess soil will be loaded into a dump truck and either used on the MEP site or hauled offsite by the construction contractor. The pipeline will be installed through trenching at all locations. No boring or directional drilling is required to pass beneath other buried utilities or infrastructure.
- **Stringing** consists of trucking lengths of pipe to the right-of-way and laying them on wooden skids beside the open trench.
- **Installation** consists of bending, welding, and coating the weld-joint areas of the pipe after it has been strung; padding the ditch with sand or fine spoil; and lowering the pipe string into the trench. Bends, if required, will be made using a cold bending machine or will be shop fabricated as required for various changes in bearing and elevation. Welds will undergo 100 percent radiographical inspection by an independent, qualified radiography contractor. All coating will be checked for defects and will be repaired before lowering the pipe into the trench.
- **Backfilling** consists of returning spoil back into the trench around and on top of the pipe, ensuring that the surface is returned to its original grade or level. The backfill will be compacted to protect the stability of the pipe and to minimize subsequent subsidence.
- **Plating** consists of covering any open trench in areas of foot or vehicle traffic at the end of a work day. Plywood plates will be used in areas of foot traffic and steel plates will be used in areas of vehicle traffic. Plates will be removed at the start of each work day.
- **Hydrostatic testing** consists of filling the pipeline water, venting all air, increasing the pressure to the specified code requirements, and holding the pressure for a period of time. After hydrostatic testing, the test water in the pipe and any that might leak out into the open trench will be analyzed for water quality and either discharged in accordance with regulatory requirements or trucked to an appropriate offsite treatment or disposal facility. The construction contractor will obtain all necessary approvals for test water use and disposal.

- **Cleanup** consists of restoring the surface of the ground by removing any construction debris, grading to the original grade and contour, and revegetating or restoring where required.
- **Commissioning** consists of cleaning and drying the inside of the pipeline, purging air from the pipeline, and filling the pipeline with natural gas.

Construction equipment includes, but is not limited to, a backhoe or tracked excavator; dump trucks; boom trucks or side booms; flat bed tractor trailers; and various smaller support vehicles, including light-duty pick-up trucks.

Water Supply Pipeline. Generally, the construction process for the water supply pipeline is similar to the gas pipeline construction process described above. However, the pipe for the water conveyance may be either polyvinyl chloride (PVC) or high-density polyethylene (HDPE), determined by the construction contractor. With the exception of the jointing technologies required for PVC or HDPE pipe, all the other construction elements described for the gas line would be essentially the same. Additionally, the trenching width is expected to be 12 to 18 inches for this pipeline. The 1-acre temporary laydown area located immediately next to BBID's headquarters is an existing active construction yard; therefore, no additional site preparation, including grading, clearing and grubbing, or armoring with base rock, is anticipated at the yard.

Two concrete box and five corrugated metal pipe (CMP) culverts under Bruns Road along the pipeline route must be avoided during water line construction. Four of these culverts (shown in Appendix D, Figure 1) convey ephemeral surface water from D-1, D-2, D-3, and D-4. The other three culverts are associated with roadside ditches or swales. Because of space constraints between the existing culverts and right-of-way edge, the new water pipeline will be installed under the culverts at D-1, D-3, SW-3 and D-4 by way of pipe ramming. Adequate space between the end of the culvert and the right-of-way boundary allows for open-cut trenching to install the new pipeline around the other three CMP culverts.

Pipe ramming will entail excavation of two access pits in the Bruns Road paved surface, approximately 10 feet on either side of the culvert, followed by use of a pneumatic hammer to drive a metal pipe/sleeve at least 1 foot below the bottom of the culvert. New pipe will then be inserted into the sleeve and the pits backfilled.

Transmission Line. Transmission line construction will generally entail the following activities within the 100-foot-wide work corridor identified on Figures 5C, 5D, and 5E:

- **Construction access** to the transmission line work corridor will be provided by existing roads and designated overland temporary access routes. Rubber-tired machinery and vehicles will drive through grassland areas during the dry season to the extent feasible. Trench plates will be used as necessary to avoid ground disturbance to nearby ephemeral drainages.
- **Monopole installation** will entail excavation for eight 10-foot diameter concrete foundations, installation of formwork, and pouring of concrete. Cranes and other support equipment will be used to erect each monopole on the new foundations.

In general, a 1,000 square foot temporary work space is required at each pole site to accomplish these tasks.

- **Pull and tension sites** are the sites from which the conductors (wires) will be installed. Pull sites are generally located between designated monopoles. Reel and bullwheel puller trucks (wheeled vehicles with appropriate equipment) will be set up to pull the new conductor. Tension sites are generally located along the line, and equipment will be set up to pull in and tension the new conductor. The pull and tension sites will be sited within the established 100-foot-wide construction corridor. No mowing or grading of the work corridor will be required.
- **Line conductoring** will be accomplished using travelers (pulleys), insulators, and hardware. Travelers and insulators will be transported to each monopole by vehicle. Travelers will be installed on the pole arms, and a sock line will be used to pull the new line. After the new conductor is in place, it will then be “sagged” (pulled to the appropriate height and tension, which are interdependent), then transferred from the travelers and clipped permanently to the insulator. At dead-end poles/line end points, a boom truck will be needed to access the towers so crews can attach the dead-end eye to the monopole. Additionally, where splices exist along the alignment, a boom truck will be used to reach the conductor for the installation of new splices in areas where it will be feasible.

2.1.6 Site Cleanup and Restoration

All construction-related materials and the temporary laydown areas, staging areas, construction site security fences, and wildlife exclusion barriers will be removed after construction is complete. The staging areas and access routes will be cleaned up, returned to original grade, and revegetated with appropriate species, as necessary. An erosion control plan, detailed in the proposed project’s Stormwater Pollution Prevention Plan (SWPPP), will help minimize erosion after construction. The plan will include soil stabilization measures such as hydroseeding and other appropriate stormwater best management practices (BMPs) for all temporarily affected areas within the action area.

2.1.7 Conservation Measures

The federal ESA has special requirements when an action could result in take or adverse modification to critical habitat for plant and animal species listed as threatened or endangered. Protective measures for listed species were developed using existing USFWS guidelines. The protective measures will also reduce or eliminate adverse effects on the action area’s biological resources and species that do not have special ESA protective requirements. Protective measures developed for unavoidable project effects to eliminate or minimize adverse effects are described in detail in Section 5. Compensation for loss of federally listed species habitat will be replaced at an appropriate loss to replacement ratio as described in Section 5.

2.2 Nitrogen Deposition

Nitrogen (N) deposition is the process where reactive nitrogen species settle to the ground from the atmosphere. Derivatives of NO_x and NH_3 pollutants are the major contributing elements of N deposition. These pollutants are removed from the atmosphere by wet deposition (e.g., precipitation) and dry deposition. Deposition in California is dominated by dry deposition, ranging from 1 to over 50 kg-N ha^{-1} $year^{-1}$ (Tonnesen et al., 2007). Blanchard et al (1996) estimates 10-20 kg-N ha^{-1} $year^{-1}$ in California Central Valley Cities (Stockton and Merced). Tonnessen et al (2007) simulation modeling of the 2002 total N-deposition baseline for California shows the MEP region at approximately 6-10 kg-N ha^{-1} $year^{-1}$. For comparison, high intensity agricultural uses exceed 100 kg-N ha^{-1} $year^{-1}$.

Worst case scenario nitrogen deposition modeling performed for the Metcalf Energy Center, a large 600-MW base-load power plant located near N-sensitive serpentine habitats south of San Jose, California,(available at: www.cal-ipc.org/symposia/archive/pdf/11929.pdf) estimated a maximum deposition rate of 1.29 kg-N ha^{-1} $year^{-1}$ on an adjacent hillside. The deposition values diminished to less than 0.4 kg-N ha^{-1} $year^{-1}$ at a distance of about 1.25 miles from the plant site.

N deposition from mobile and stationary combustion emission sources has been shown to have a detrimental effect on sensitive ecosystems in California (Weiss, 2006). Research conducted in the South San Francisco Bay Area indicates that intensified annual grass invasions can occur in areas with nitrogen deposition levels of 11-20 kg-N ha^{-1} $year^{-1}$, with limited invasions at levels of 4-5 kg-N ha^{-1} $year^{-1}$ (Weiss 2006a and Weiss 2007, as cited in CEC 2007). These effects are especially damaging in naturally N-limited terrestrial settings such as serpentine habitats. Regions downwind of air pollution sources can receive substantial inputs of N from wet and dry deposition. Many terrestrial ecosystems are currently N-limited and respond strongly to incremental additions of N (Weiss, 1999). Nitrogen fertilization of natural ecosystems generally results in the loss of plant species diversity when an N-loving species become dominant (Silvertown, 1980; Tilman, 1987; Huenneke et al., 1990).

Losses of plant diversity can lead to losses of animal diversity, particularly of host-restricted herbivores (Weiss, 1999). Weiss (1999) concluded that vehicle emissions near serpentine grasslands in the San Francisco Bay Area resulted in the drastic decline of Bay checkerspot butterfly (*Euphydryas editha bayensis*) populations, a federally threatened species. N-deposition on serpentine grasslands supporting this species' larval food plant, dwarf plantain (*Plantago errecta)*, fertilizes the N-deficient serpentine soils allowing the vigorous growth of invasive plant species such as *Lolium multiflorum*, *Avena fatua*, and *Bromus hordaceous* to outcompete with the *P. errecta* and other native species. Similar effects on other habitats supporting native taxa, including desert grass and coastal sage communities, as well as soil biota and lichens have also been studied (Fenn et al, 2003).

Currently, there is little research available to show that N deposition has a direct detrimental effect on aquatic organisms such as the California red-legged frog and California tiger salamander. In a controlled experiment Griffis-Kyle (2006) explored the hypothesis that mineral N can cause both lethal and sublethal toxic effects in amphibians in agricultural landscapses. In the report, Griffis-Kyle (2006) questions whether mineral N stays in the water column long enough to be toxic. In the end, the Griffis-Kyle study was inconclusive, but did highlight the potential importance of elevated ammonium on the development and survival of amphibians.

N deposition may have an indirect effect on aquatic organisms living in ephemeral pools. Non-native herbaceous plant species that are N-loving have become a threat to native vernal pool species because of their capacity to change pool hydrology (Marty, 2005). It is likely that the lack of fires, coupled with the lack of adequate grazing, has increased the densities of non-native herbaceous vegetation surrounding vernal pools, degrading the habitat (Wells et al, 1997) by outcompeting natives for available light and soil moisture. Species such as *L. multiflorum* and *Glyceria declinata* increase thatch buildup (Sacramento County, 2006), which can lead to oxygen depletion in the pools (Dunne and Leopold, 1978), and contribute to the shortening of inundation periods through increased evapo-transpiration in the vernal pools (Marty, 2005) or other seasonal aquatic sites. Thatch build up also results in the reduction of the amount of water entering the system through surface and subsurface flows. This negatively affects vernal pool crustaceans (e.g., fairy shrimp) and frogs and salamanders through a decrease in available aquatic habitat both spatially and temporally (USFWS, 2007a). Appropriate grazing practices may be a necessary component to ensure proper function of hydrology in vernal pools (Marty, 2005; Pyke and Marty, 2005) to ensure that non-native weedy plants, which increase thatch buildup and decrease ponding durations, do not decrease the aquatic habitat availability (USFWS, 2007a). Vernal pools, seasonal wetlands, and cattle stockponds occurring in the project area that are either known to, or could potentially support, California tiger salamander, California red-legged frog, and listed Branchiopods occur on land grazed by cattle. Therefore build-up of non-native plant species due to nitrogen deposition would not be expected.

As MEP will be a peaking facility, energy production will not run continuously, but instead will start, run for as many hours as necessary, and then shut down. Although the facility will be licensed and permitted to operate up to 4,000 hours per year (46 percent of the time) with 300 start and stop cycles, as a peaking power plant its actual capacity factor will be much less. An annual operating profile of approximately 600 hours per year with 200 start and stop cycles is expected (Mariposa Energy, 2009). Operational emissions from MEP will be minimized by the use of best-available control technology (BACT) and mitigated through (1) the purchase of NO_x emission reduction credits within the Bay Area Air Quality Management District in accordance with applicable regulatory requirements and (2) providing voluntary funding for local emissions reduction programs through the San Joaquin Valley Air Pollution Control District.

The MEP site is located in an area with westerly prevailing winds, which would generally transport emissions east from MEP towards the San Joaquin Valley, a region known to be N-saturated (Weiss, 2006). Based on a search of Natural Resources Conservation Service Maps, the nearest occurrences of N-sensitive habitat in the region are serpentine outcrops along Bald Ridge in the Mount Diablo State Park located approximately 20 miles west of the MEP site, and therefore would not be affected by MEP operations due to both the distance and direction from the project..

Although operation of MEP will result in some additional N deposition in the project area, these cumulative inputs are not expected to have an adverse effect on California red-legged frog, California tiger salamander, or listed Branchiopods. N-saturation is currently the baseline condition in the action area and vicinity, and past and ongoing cattle grazing help control non-native weedy plant growth in the ephemeral pools found in the action area and vicinity.

2.3 Construction Schedule

On June 15, 2009, Mariposa Energy filed an Application for Certification (AFC) under the CEC's 12-month licensing process, and was found to be "data adequate" on August 26, 2009, beginning the CEC 12-month review process. Mariposa Energy anticipates receiving a license by fall 2010 and beginning construction in April 2011. Pre-operational testing of the power plant will begin in January 2012, and full-scale commercial operation is contractually obligated to commence by July 1, 2012.

2.4 Summary of Consultation to Date

On November 19, 2009, Marc Fugler (U.S. Army Corps of Engineers [USACE]) conducted a field verification of the action area in support of a preliminary jurisdictional determination. Mariposa Energy received the USACE preliminary determination on January 7, 2010. Therefore, project-related effects to waters of the U.S. are expected to provide the federal nexus for Section 7 formal consultation between the USACE and USFWS.

On March 5, 2009, CH2M HILL contacted Angela Picco (USFWS Sacramento Office, Coastal Branch) regarding the proposed project. The conversation pertained to the federally listed species known from the action area and Mariposa Energy's intent to infer presence of listed Branchiopods, California red-legged frog, California tiger salamander, and San Joaquin kit fox.

On October 26, 2009, Ms. Picco informed CH2M HILL by telephone that the proposed project was reassigned to Kim Squires (Forest-Foothills Branch of the USFWS Sacramento Field Office). CH2M HILL then contacted Ms. Squires to discuss the proposed project, including the listed species potentially affected. Ms. Squires requested a site visit with Mariposa Energy, recommending that the other regulatory agencies including the California Department of Fish and Game (CDFG) also be invited to attend.

On December 22, 2009, Ms. Squires, Marcia Grefsrud of the CDFG, and Rick York and Sara Keeler of the CEC made a preconsultation site visit. On behalf of Mariposa Energy, Doug Urry (CH2M HILL project manager), Todd Ellwood (CH2M HILL biologist), and Jim Gwerder (Souza Realty and Development) also attended.

SECTION 3

Environmental Setting

3.1 Regional Context

The proposed project is located east of the Altamont Hills in northeastern Alameda County. The MEP site is located at the northwest corner of Section 1, Township 2 South, Range 3 East in the vicinity of Latitude 37.7902264922°, Longitude -121.6023337841°, Mount Diablo Base and Meridian. The assessor's parcel number is 099B-7050-001-10. The site is approximately 125 feet above mean sea level on the USGS Clifton Court Forebay, California 7.5-minute series topographic quadrangle. The property is located south of Kelso Road and east of Bruns Road; I-580 is located approximately 3.5 miles to the south, and the closest segment of the Byron Highway is approximately 2.0 miles to the northeast (Figure 1). The region supports low-density industrial developments, with widely spaced rural (farm) housing. An extensive network of paved roads, irrigation canals, and aqueducts result in habitat fragmentation and barriers to wildlife dispersal.

The Central Valley Project (CVP) and California State Water Project (SWP) are in the project vicinity. The CVP and SWP are large-scale water and power conveyance projects consisting of aqueducts, forebays, and pumping and power stations. CVP's Delta-Mendota Canal, located less than 1 mile east of the MEP site, travels more than 100 miles within California's Central Valley; the CVP's Clifton Court Forebay is located less than 2 miles north of the MEP site. The SWP manages and operates the California Aqueduct, located less than 1 mile west of the MEP site. This aqueduct is more than 400 miles long and typically concrete-lined; it originates in the Delta, which supports numerous fish that are important to sport fishing and considered special status by the resource agencies. Although the aqueducts are significant barriers to wildlife dispersal interspersed with movement corridors such as underground culverts and roadway overpasses, the elevated berms provide breeding opportunities for burrow-dwelling wildlife.

The Bethany Reservoir, located less than 1 mile southwest of the MEP site, functions as a forebay for the CVP conveyance system, and represents the northern terminus of the California Aqueduct. Bethany Reservoir, designated a State Recreation Area, is a popular location for fishing and windsurfing. Other infrastructure in the area includes PG&E's Bethany Compressor Station and Kelso Electrical Substation located across Kelso Road from the MEP site, and the Western Area Power Administration (WAPA) Tracy Substation with significant transmission line infrastructure located due east. Finally, a significant wind resource area is located to the west in the Altamont Pass, with numerous wind turbine generators, meteorological towers, and transmission lines.

Of particular biological significance in the project vicinity is the Byron Conservation Bank. The 140-acre property is owned by CDFG and managed by the Alameda County Resource Conservation District. The bank is approximately 0.5 mile from the MEP site and has sold out of all of its mitigation credits for California red-legged frog, California tiger salamander, western pond turtle (*Clemmys mamoratta*), San Joaquin kit fox, and western burrowing owl

(*Athene cunicularia*). It is preserved in perpetuity under a conservation easement as habitat for these species.

Less than 500 feet northwest of the proposed MEP site is the 6.5-MW Byron Power Cogen Plant owned and operated by the Altamont Cogen Corporation. This facility is accessed by an existing gravel road from Bruns Road and occupies approximately 2 acres within the project parcel. A portion of the graveled access road will be improved and used during construction and operation of the proposed project. The existing cogeneration plant will not be decommissioned or otherwise modified as part of the proposed project. A buried PG&E natural gas pipeline and remnants of a former wind farm, including concrete foundations and other debris, also exist on the project parcel.

3.2 Habitat and Vegetation Communities

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. Low-density industry and rural residences are scattered throughout the region. The larger industrial developments are associated with the CVP and SWP, including the Harvey O. Banks Pumping Plant and Tracy Pumping Plant. West of the Bethany Reservoir, located approximately 1 mile west of the MEP site, is the Altamont Pass Wind Farm development.

Non-native annual grassland is the predominant habitat type in the action area, including for the proposed gas line and transmission line. While the first several hundred feet of the water supply pipeline will be located in annual grassland (found on the project parcel), the remaining pipeline alignment primarily will be located in existing roads or along road shoulders characterized by ruderal vegetation. The pipeline will intersect four ephemeral drainages comprising seasonal wetland habitat. Figure 3 shows the vegetation communities within a 1-mile radius of the MEP site and temporary laydown area, and from 1,000 feet of either side of each the project's offsite linear facilities. Habitats affected by the proposed project will include annual grasslands, waters of the United States (including wetlands), agricultural areas (including Canal 45), and paved and unpaved rural roads.

3.2.1 Annual Grasslands

Annual grasslands are still relatively widespread and common throughout the Central Valley foothills; they 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*). 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 (*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*). A complete list of plant species observed in the action area is included in Appendix C.

3.2.2 Waters of the United States (Including Wetlands)

During a formal wetland delineation in April 2009, CH2M HILL used the 1987 USACE Wetland Delineation Manual and Arid West Regional Supplement to identify potentially jurisdictional wetlands and waters action areas. The wetland delineation report is provided as Appendix D. On November 19, 2009, USACE verified all wetlands and waters within the action area as jurisdictional.

Four drainage features, identified as D-1, D-2, D-3, and D-4 in the wetland delineation report (Appendix D) and shown as blue line drainages on the USGS Clifton Court Forebay 7.5-minute quadrangle, may be affected during project construction (Figure 3). 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 (*Distichlis spicata*), rabbitsfoot grass (*Polypogon monspeliensis*), Italian ryegrass (*Lolium multiflorum*), and brass buttons (*Cotula coronopifolia*).

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 (*Bolboschoenus maritimus*) with scattered rabbitsfoot grass, curly dock (*Rumex crispus*), and cattail (*Typha dominigensis*). The channel at ordinary high water supports 3 to 6 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 (*Typha latifolia* and *T. dominingensis*) growing in the center of the channel with dense saltgrass growing around the outer edges. Mexican rush (*Juncus mexicanus*) and curly dock are also present in scattered locations. At ordinary high water, D-4 is relatively shallow at less than 1 foot, flowing east into a seasonal pond. Numerous western toad (*Bufo boreas*) 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 (ASW-1, Appendix D) is immediately north and directly abuts D-4. Within the action area, this feature is characterized by saltgrass and common rusty molly (*Kochia californica*) with scattered sand spurry, alkali heath (*Frankenia salina*), and common spikeweed (*Centromadia pungens*). 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 Cogen Plant, along the northern edge of the MEP site (Figure 3). 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 (*Plagiobothrys stipitatus*), coyote thistle (*Eryngium vaseyi*), Italian ryegrass, gumweed, dense-flower willowherb (*Epilobium densiflorum*), wooly marbles (*Psilocarphus oregonus*), brass buttons, and water pygmyweed (*Crassula aquatica*). 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. Other seasonal wetlands and shallow ephemeral pools located outside the wetland delineation survey area, but within 250 feet of the project area, are also shown in the figures at the end of this report.

3.2.3 Alkaline Meadow

Alkaline meadow as described by Holland (1986) occurs sporadically in the Central Valley where shallow water tables, hardpan clay soils, or saline waters intrude on surface growth. It looks superficially like annual grassland, but has more sparse vegetation, often showing barren earth or small amounts of salt encrustation. 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 (Figure 2).

These meadows are often habitat for a community of uniquely adapted plant species that are native and potentially rare. Recurved larkspur (*Delphinium recurvatum*), a California Native Plant Society (CNPS) 1B species, is known to occur in this meadow (California Natural Diversity Data Base [CNDDB], 2009). The low-growing and sparse plant cover is also attractive to some wildlife such as burrowing owls.

3.2.4 Agricultural

Agricultural uses occur near the north end of the water supply pipeline route. In the region, agriculture comprises a mixture of irrigated crops including oat, hay, alfalfa, and tomatoes (depending on the season). Typically, the edge zones of croplands support weeds and ruderal grassland species. 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. As mentioned earlier, large-scale agricultural infrastructure associated with the CVP and SWP 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.

3.2.5 Industrial, Landscape, and Urban

The 6.5-MW Byron Power Cogen Plant located on the project parcel is immediately next to the MEP site. The cogen site is underlain with approximately 1 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-kV Kelso Substation. Both facilities occupy one site totaling approximately 17 acres of gravel and asphalt.

Landscaping by ornamental Bishop pine (*Pinus muricata*) and patches of coyote brush (*Baccharis pilularis*) 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 6.5-MW Byron Power Cogen Plant. Taller lattice high-tension 230-kV and 500-kV transmission line towers exist on the project parcel and in other areas of the project vicinity.

3.2.6 Wildlife Use

The grasslands in the action area support a variety of small mammals and provide foraging and nesting habitat for ground nesting birds. Birds commonly found foraging in annual grasslands include red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and turkey vulture (*Cathartes aura*). Common seed eaters, including mourning dove (*Zenaida macroura*) and western meadowlark (*Sturnella neglecta*), will nest on the ground in grasslands. Other common species, such as western scrub-jay (*Aphelocoma californica*), barn swallow (*Hirundo rustica*), and northern mockingbird (*Mimus polyglottos*), will disperse through and forage within grassland habitats.

Common mammals of annual grasslands include California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), California vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), and black-tailed jackrabbit (*Lepus californicus*). These small mammals use open grassland for both foraging and breeding. Larger mammals such as California mule deer (*Odocoileus hemionus*) will browse on grassland plants and rest here at night. The numerous burrows of California ground squirrels found on the MEP site and adjacent 9.2-acre laydown area provide potential refuge sites for other species known to be in the project vicinity, including California red-legged frog and California tiger salamander. The grassland wildflowers occurring in the action area provide important nectar sources for butterflies, bees, and other insects.

Aquatic habitats found in the action area and vicinity are likely to support their own suite of wildlife opportunities and uses. Seasonal drainages (D-1, D-2, D-3, and D-4) found along the water supply pipeline provide potential refugia and dispersal habitat for California red-legged frog and California tiger salamander. CH2M HILL biologists observed that a cattail marsh in D-4 provides breeding habitat for western toad. Stock ponds found less than 1 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 and California tiger salamander. Shallow vernal pools found within 250 feet of the MEP site provide habitat for freshwater invertebrates including crustaceans from the Branchinectidae family.

SECTION 4

Study Methods

CH2M HILL obtained an inventory of federally listed and proposed-for-listing plant and animal species potentially occurring within the action area from the USFWS Species List Database (USFWS, 2009) for the USGS 7.5-minute quadrangle (Clifton Court Forebay). In addition, the California Natural Diversity Database (CNDDB, 2009) and the CNPS Inventory of Rare and Endangered Plants (CNPS, 2009) were consulted for known occurrences of listed species in the action area and vicinity.

The results of the USFWS, CNDDB, and CNPS database searches are provided in Table 4-1 and Figure 4. The potential for the federally listed species to occur was evaluated with the use of knowledge of the quality and quantity of suitable habitat present in the action area, the proximity of the area to a known or potential breeding location, known barriers to dispersal or reproduction, information available in literature or previously published reports, contacts with local experts familiar with the action area and the species being addressed, and CH2M HILL reconnaissance-level survey data.

4.1 Rare Plants

The literature search found no records of federally listed plant species within 5 miles of the action area. The proposed action area was evaluated using aerial photographs in conjunction with reconnaissance surveys and the results of species database queries to determine if suitable habitat for federally listed plant species currently exists. The plant species included in this evaluation are those determined to have potential to occur within the action area based on habitat preferences and known geographic range. These include palmate-bracted bird’s-beak (*Cordylanthus palmatus*) and Contra Costa goldfields (*Lasthenia conjugens*), both federally endangered species.

Botanical surveys were completed during the appropriate season to identify all of the potential listed plant species identified during the presurvey evaluation. Field surveys conducted on April 7, April 15, May 20, and August 18, 2009, coincided with the blooming period for large-followed fiddleneck (*Amsinckia grandiflora*), palmate-bracted bird’s beak (*Cordylanthus palmatus*), and Contra Costa goldfields (*Lasthenia conjugens*), which were floristic in nature. The surveys were completed in accordance with the botanical survey guidelines of USFWS (USFWS, 1996a), CDFG (CDFG, 2000) and CNPS (CNPS, 2001). Botanical surveys included meandering transects throughout the natural terrestrial habitats included in the action area and recording all plant species observed. A complete description of the rare plant surveys, including methodology and results, is presented in Appendix C.

4.2 Threatened and Endangered Wildlife

As described in Table 4-1, most of the federally listed species identified by the database search are not expected to occur within the action area, either because the action area does

TABLE 4-1
Listed Species Obtained from the USFWS Species List Database
Biological Assessment for the Mariposa Energy Project

Common Name Scientific Name	Status	General Habitat Description	Likelihood of Presence	Comments
Invertebrates				
Conservancy fairy shrimp *Branchinecta conservatio*	FE	Large, cool-water vernal pools with moderately turbid water in the Central Valley across to the Sierra Nevada foothills. Pools may range in depth. The pools generally last until June.	Absent	Currently, USFWS is aware of eight populations of Conservancy fairy shrimp, which include (from north to south): (1) Vina Plains, Butte and Tehama counties; (2) Sacramento National Wildlife Refuge, Glenn County; (3) Yolo Bypass Wildlife Area, Yolo County; (4) Jepson Prairie, Solano County; (5) Mapes Ranch, Stanislaus County; (6) University of California, Merced, Merced County; (7) Grasslands Ecological Area, Merced County, and (8) Los Padres National Forest, Ventura County. No large vernal playa pools occur within the action area. The closest known population is on the Mapes Ranch site located greater than 20 miles to the southeast of the proposed project. Furthermore, as observed during the rare plant surveys conducted by CH2MHILL, none of the seasonal depressional pools located in the action area are likely to remain inundated past early April. Therefore, this species is considered absent from the action area.
Longhorn fairy shrimp *Branchinecta longiantenna*	FE	Vernal pools or other kinds of depressions of similar volume, depth, and surface area, and for a similar duration and seasonality as vernal pools, in the Central Valley. Pools can have clear to high turbid waters and can range in size, depth, and temperature.	Inferred present	The longhorn fairy shrimp was formally described relatively recently, in 1990, and there is little information on the historical range of the species. Longhorn fairy shrimp are only known to occur in four disjunct populations (USFWS, 2007b). The known populations include (1) areas within and next to the Carrizo Plain National Monument, San Luis Obispo County; (2) areas in the San Luis National Wildlife Refuge complex, Merced County; (3) areas in the Brushy Peak Preserve, Alameda County; and, (4) areas in the Vasco Caves Preserve, near the town of Byron in Contra Costa County. The Vasco Caves Preserve population is approximately 5 miles west of the action area. In southern California, this species inhabits classic vernal pools; therefore it is considered potentially present in the action area.

TABLE 4-1
Listed Species Obtained from the USFWS Species List Database
Biological Assessment for the Mariposa Energy Project

Common Name Scientific Name	Status	General Habitat Description	Likelihood of Presence	Comments
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	A variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools.	Inferred present	The vernal pool fairy shrimp is currently known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in seasonal depressional habitats found at Wildland's Byron Conservation Bank (USFWS, 2007b). Unknown *Branchinecta* spp. have been observed on the Project parcel by CH2M HILL during several reconnaissance level surveys.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	Vernal pools and lakes in the Central Valley to the east side of the San Francisco Bay, with the majority of populations occurring in the Sacramento Valley. Occur in a wide variety of seasonal habitats, including vernal pools, clay flats, alkaline pools, ephemeral stock tanks, roadside ditches, and road ruts (Rogers, 2001; CNDDB 2009). Pools can have clear to high turbid waters and can range in size and depth.	Absent	The vernal pool tadpole shrimp has a patchy distribution across the Central Valley of California, from Shasta County southward to northwestern Tulare County, with isolated occurrences in Alameda and Contra Costa counties. This species is known to co-occur with vernal pool fairy shrimp, but is typically associated with large playa pools or vernal pool complexes. Playa pools and vernal pool complexes do not exist in the action area, so this species is considered absent.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Found on elderberry (*Sambucus* spp.) plants along riparian forests of the Central Valley from Redding to Bakersfield in patchy, localized populations. Host shrubs must have stems that are 1.0 inch or greater in diameter at ground level.	Absent	There are no elderberry shrubs in the action area; therefore, this species is considered absent.
Fish				
Delta smelt+ *Hypomesus transpacificus*	FT	Found upstream of the Suisun Bay through the delta, primarily in the mixing zone, but dispersing up rivers and sloughs in the spawning season.	Absent	The action area does not include rivers or sloughs, and barriers to fish passage preclude this species from occurring in Canal 45. Therefore, this species is considered absent.

TABLE 4-1
Listed Species Obtained from the USFWS Species List Database
Biological Assessment for the Mariposa Energy Project

Common Name Scientific Name	Status	General Habitat Description	Likelihood of Presence	Comments
Amphibians				
California tiger salamander *Ambystoma californiense*	FT	Vernal pools, seasonal ponds in annual grasslands and foothill hardwoods.	Inferred present	Two CNDDB records document presence of the California tiger salamander breeding less than 100 feet from the action area (Figure 4). The CNDDB lists seven other occurrences within 1.5 miles of the action area from 1981 to 1999.
California red-legged frog[++] *Rana draytonii*	FT	Marshes, slow-moving water; prefers areas with good plant cover.	Inferred present	CNDDB records document presence of the California red-legged frog breeding within 100 feet of the action area (Figure 4). There are also eight other CNDDB occurrences within 1 mile of the action area dating from 1986 to 1999. The MEP is within the proposed revised boundary of critical habitat unit CCS-2.
Reptiles				
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT	Occurs primarily in coastal scrub and chaparral habitats, and forages in adjacent grasslands and open woodlands (Swaim, 1994).	Absent	This species distribution in California parallels that of chaparral habitat (Stebbins, 1985); therefore, it is considered absent from the action area.
Giant garter snake *Thamnophis gigas*	FT	Low-gradient streams, small ponds, and drainage canals that provide food and cover along with emergent, herbaceous wetland vegetation, such as cattails and bulrushes. Grassy banks and openings in waterside vegetation for basking and higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter. Avoids large rivers.	Absent	This species is endemic to the valley floor of the Sacramento and San Joaquin valleys of California. There are no known occurrences within 16 miles of the project. Furthermore, the action area is well outside the known range of the species; therefore, this species is considered absent from the action area.

TABLE 4-1
Listed Species Obtained from the USFWS Species List Database
Biological Assessment for the Mariposa Energy Project

Common Name Scientific Name	Status	General Habitat Description	Likelihood of Presence	Comments
Mammals				
San Joaquin kit fox *Vulpes macrotis mutica*	FE	Annual grassland or grassy open stages with scattered shrubby vegetation.	Inferred present	One CNDDB record documented San Joaquin kit fox on Kelso Road near the MEP site (Figure 4). The CNDDB lists six other occurrences within 1 mile of the action area from 1989 to 2000. Although no signs of denning were observed in the action area during reconnaissance and rare plant surveys, the numerous ground squirrel burrows provide suitable denning sites.
Plants				
Large-flowered fiddleneck *Amsinckia grandiflora*	FE	Found in cismontane woodlands and valley/foothill grasslands between elevations of 800–1,700 feet. Blooms April–May.	Absent	Known from fewer than five natural occurrences in California across three counties: Alameda, Contra Costa, and San Joaquin. The project is out of the species elevation range. In addition, no known occurrences are within 5 miles of the project site and no plants were observed during protocol-level surveys in spring 2009.
Palmate-bracted bird's-beak *Cordylanthus palmatus*	FE	Found in chenopod scrub and valley/foothill grasslands between elevations of 15–500 feet. Blooms May–October.	Absent	The nearest reported occurrence is in the Springtown Wetlands Reserve, 2.5 miles north of Livermore and approximately 9 miles southwest of the action area. No plants were observed during protocol-level surveys in spring 2009.
Contra Costa Goldfields *Lasthenia conjugens*	FE	Found in cismontane woodlands, playas, valley/foothill grasslands, and vernal pools between elevations of 0–1,500 feet. Blooms March–June.	Absent	Known from fewer than 24 occurrences in California. No known occurrences from within 5 miles of the project site and no plants were observed during protocol-level surveys in 2009.

[a] Includes designated critical habitat
[b] Includes proposed critical habitat

Notes:

FE = federally endangered
FT = federally threatened

not support their required habitat or because the action area is well outside the species' known range. The remaining species warrant detailed analysis in this biological assessment as they are known from the project vicinity or have the potential to occur because of potentially suitable habitat:

- Longhorn fairy shrimp (*Branchinecta longiantenna*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- California red-legged frog (*Rana aurora draytonii*) and proposed critical habitat
- California tiger salamander (*Ambystoma californiense*)
- San Joaquin kit fox (*Vulpes macrotis mutica*)

The action area is not within designated critical habitat for any federally listed species. On April, 28, 2009, however, USFWS proposed a revised critical habitat boundary (Unit CCS-2) for California red-legged frog, which encompasses the entire action area. Three of these five federally listed species have been observed within 1 mile of the action area (CNDDB, 2009): California red-legged frog, California tiger salamander, and San Joaquin kit fox. Vernal pool fairy shrimp occur around the Byron Airport located approximately 2 miles northwest of the project site, and a population of Longhorn fairy shrimp occur approximately 5 miles west at East Bay Regional Park District's Vasco Caves Regional Preserve. Because of the suitability of onsite habitat and proximity of known breeding sites, Mariposa Energy is opting to infer presence of these listed species in and next to (for example, within 250 feet) the project area.

4.2.1 Listed Branchiopods

The proposed project is located just inside the eastern boundary of the Livermore Vernal Pool Region (CDFG, 1998). Approximately 0.5 mile northwest of the action area is the Altamont Hills Core Area, which has been designated for protection to meet USFWS recovery criteria for vernal pool ecosystems. While conducting reconnaissance surveys in January 2009 and November 2009, CH2M HILL biologists detected unknown *Branchinecta* species in two seasonal wetlands on the project parcel. Also in November 2009, California fairy shrimp (*Linderiella occidentalis*), a California species of concern, was found in a small, unvegetated muddy pool located near the northeast corner of the Byron Cogen plant.

Suitable branchiopod habitat in the action area is characterized as small, isolated depressional wetlands, a roadside ditch, and a muddy pool lacking vegetation. The action area vicinity lacks larger playa pool habitats and vernal pool complexes typically considered habitat for the other listed branchiopods, including Conservancy fairy shrimp and vernal pool tadpole shrimp. Furthermore, there are no known occurrences of Conservancy fairy shrimp in Alameda, Contra Costa, and San Joaquin counties (CNDDB, 2009), and vernal pool tadpole shrimp have a patchy distribution in Alameda and Contra Costa counties.

With the anecdotal sightings of numerous *Branchinecta* by CH2MHILL, and known populations of vernal pool fairy shrimp and longhorn fairy shrimp within 5 miles of the action area, it is reasonable to assume these species occur in the action area. Therefore, protocol-level surveys were not conducted, as presence of these federally listed branchiopod species is being inferred. Although the longhorn fairy shrimp in northern California occupies sandstone rock outcrop pools, habitat not affected by the proposed project, this species is also known from classic vernal pool habitats in southern California. Longhorn fairy shrimp was thus considered to have a slight potential to occur in the action area because of its rarity.

Most of the mapping of suitable habitat areas for listed branchiopods occurred after the rainy season of 2008/2009. Additional mapping occurred in early November 2009 before the onset of the 2009/2010 wet season, but after a significant rain event in October 2009 that resulted in local inundation of habitat areas. All suitable seasonal pond resources within 250 feet of the proposed project were mapped via global-positioning system (GPS). Figure 5F presents the locations of potential branchiopod habitat within 250 feet of the project area. Indirect effects on potential branchiopod breeding habitat were quantitatively determined based on these potential breeding sites. The acreage calculation included the entire pool area regardless if only a portion of the pool area overlapped with the 250-foot buffer area.

4.2.2 California Red-Legged Frog

Protocol-level surveys for California red-legged frog were not conducted, because presence of the federally listed amphibian species is being inferred. All suitable dispersal and foraging habitat within the proposed work areas were mapped using GPS or digitized in geographic information system (GIS), as shown on Figures 5A through 5E. Temporary and permanent loss of potential foraging and dispersal habitats for this species was quantitatively determined based on the proximity of known breeding sites less than 100 feet from the action area (CNDDB breeding sites shown on Figure 5C), and other potential breeding found in the action area vicinity. The acreage calculation included all affected terrestrial areas within the action area, as California red-legged frog are known to disperse greater distances (over 1 mile) during the wet season (Rathbun et al., 1993). There are no significant barriers to California red-legged frog dispersal from known or potential breeding sites to the action area.

4.2.3 California Tiger Salamander

Protocol-level surveys were not conducted, because presence of the federally listed amphibian species is being inferred. All suitable dispersal and aestivation habitat within the action area were mapped using GPS or digitized in GIS, as shown on Figures 5A through 5E. Temporary and permanent loss of California tiger salamander dispersal and aestivation habitat was quantitatively determined based on the proximity of known CNDDB breeding sites less than 100 feet from the action area (shown on Figure 5D) and other potential breeding sites in the vicinity. The acreage calculation included all affected terrestrial areas within the action area, as California tiger salamander are known to disperse into uplands up to and greater than 1.24 mile from breeding sites. No barriers (for example, road curbing or canals) between the known breeding sites and the action area would preclude California tiger salamander dispersal.

4.2.4 San Joaquin Kit Fox

Protocol-level surveys for San Joaquin kit fox were not conducted, as the presence of the federally listed mammal is being inferred. All undeveloped areas in the action area were assumed to provide some habitat value to San Joaquin kit fox, mainly for foraging and dispersal. The action area has numerous ground squirrel burrows with openings greater than 4 inches, providing potential den sites for San Joaquin kit fox. To date, CH2M HILL biologists have observed no signs of denning activity in the action area. In addition, there are no known records of denning in the action area. Presence of San Joaquin kit fox is considered to be limited in the action area because of existing habitat fragmentation caused by the California Aqueduct. Dispersal of San Joaquin kit fox from the known breeding locations west of the aqueduct may be restricted to a few known wildlife corridors, or road overpasses and a 1,000-foot section of the aqueduct. Although San Joaquin kit fox are known from the CNDDB to den east of the aqueduct (circa 1990), existing habitat fragmentation and development likely have resulted in the species being less common in the action area.

Temporary and permanent loss of potential foraging and dispersal habitat for this species was quantitatively determined based on presence of terrestrial habitats in the action area. The acreage calculation included all affected project areas within potential foraging and dispersal habitats.

SECTION 5

Life History, Study Results, and Proposed Effects and Conservation Measures for Listed Species

This chapter describes the life history of the California tiger salamander, California red-legged frog, San Joaquin kit fox, longhorn fairy shrimp, and vernal pool fairy shrimp. This section also presents the survey results, project effects, conservation measures proposed, and compensation efforts for these listed species.

Field surveys conducted for the proposed project to date include both reconnaissance- and protocol-level surveys. Table 5-1 provides the dates, type, and names of CH2M HILL biologists for all field surveys performed for the project as of the date of this BA. Table 5-2 summarizes expected project actions and the expected construction footprint.

TABLE 5-1
Biological Resources Surveys Conducted to Date
Biological Assessment for the Mariposa Energy Project

Date	Type of Survey	Surveyor Name(s)
December 31, 2009	Biological resources general reconnaissance (plants and wildlife)	Todd Ellwood, Russell Huddleston
February 19 and 23, 2009	Wildlife habitat reconnaissance	Todd Ellwood
April 7 to 8, 2009	Protocol-level rare plant survey	Russell Huddleston, Todd Ellwood
April 8 and 15; June 4, 2009	Formal wetland delineation	Russell Huddleston, Todd Ellwood
April 7 and 15; May 20; August 18, 2009	Protocol-level rare plant survey	Russell Huddleston, Todd Ellwood
November 2, 2009	Aquatic site mapping; habitat quality assessment for California red-legged frog and California tiger salamander; survey for potential kit fox dens	Todd Ellwood, Daniel Weinberg

TABLE 5-2
Summary of Total Project Action Area
Biological Assessment for the Mariposa Energy Project

Location	Project Work	Maximum Construction Zone Size	Habitat Type	Estimated Disturbance: Temporary	Estimated Disturbance: Permanent
MEP site	Grading for footprint construction; widening and improving onsite gravel access road	13.9 acres; includes facility site, improvement of existing access road, and cut/fill grading from edge of the MEP site and access road	Annual grassland and gravel road	3.6 acres (cut/fill disturbance)	10.3 acres
MEP laydown area	Grade and construct level area and improve existing access routes found in the grassland	9.2 acres	Annual grassland	9.2 acres* (Will be restored as part of project completion)	None
Natural gas line	Open-cut trenching; temporary work areas	Approximately 580-foot-long trench, 75-foot-wide work corridor	Annual grassland	1 acre	None
230-kV transmission line	Installation of eight new monopoles, stringing of new conductor, equipment staging and overland access	Approximately 0.7-mile transmission line route with 100-foot-wide construction corridor for access and staging. Eight new poles mounted on a new 10-foot-diameter concrete foundation.	Annual grassland	Approximately 8.5 acres, minimal disturbance during overland access to new pole sites and equipment staging.	0.014 acres for eight new concrete foundations
Water supply line	Open cut trenching; construction of pump house and intake structure at Canal 45; staging area located within existing BBID facility	Approximately 1.8-mile water supply pipeline within a 15-foot-wide construction corridor; 1 acre laydown area; 250 square-foot pump house station footprint at Canal 45.	Annual grassland, paved roads, ephemeral drainages, agricultural road, existing construction yard (laydown area) and irrigation canal	Approximately 4.3 acres of grassland, roadway, drainage wetlands, and agricultural area	0.006 acre (Canal 45)

* USFWS considers a temporary construction disturbance with a temporal effect greater than one construction season to be a mitigated as if it were a permanent effect (Kim Squires, December 2009, personal communication)

5.1 Listed Branchiopods

5.1.1 Vernal Pool Fairy Shrimp

5.1.1.1 Life History and Habitat Requirements

The vernal pool fairy shrimp was listed as a federally threatened species on September 19, 1994 (59 FR 48153). The vernal pool fairy shrimp is a small crustacean in the branchinectidae family. The species has elongate bodies, large-stalked compound eyes, no carapaces (hard protective outer covers), and 11 pairs of swimming legs (Eng et al., 1990). Adult shrimp range between 0.4 and 1.0 inch in length (Eng et al., 1990). The diet of vernal pool fairy shrimp consists of algae, bacteria, protozoa, rotifers, and bits of organic detritus (Pennak, 1989). The shrimp swim or glide upside down by means of beating movements that pass along their 11 pairs of swimming legs in a wave-like motion from head to tail.

The historic range of the vernal pool fairy shrimp likely occurred throughout the Central Valley of California. Currently, the range of the species extends from disjunct locations in Riverside County and the Coast Ranges, north through Central Valley grasslands to Tehama County, and then to a disjunct area of remnant vernal pool habitat in the Agate Desert of Oregon (USFWS, 2007b).

Simovich et al. (1992) reported that the vernal pool fairy shrimp typically is found at low population densities. The species is rarely found with other fairy shrimp species, but where they do co-exist with other species, the vernal pool fairy shrimp is never the numerically dominant species (Eng et al., 1990). Vernal pool fairy shrimp mature quickly and can both persist in short-lived shallow pools and longer-lasting pools that remain later into the spring (Simovich et al., 1992).

Female vernal pool fairy shrimp carry their eggs in a pyriform brood pouch on their abdomen. Eggs either are dropped to the pool bottom or remain in the brood sac until the female dies and sinks (Federal Register, 1994). Resting (summer) eggs are known as cysts and are capable of withstanding heat, cold, and prolonged dry periods. The cyst bank in the soil may comprise cysts from several years of breeding (Donald, 1983). As the vernal pools refill with rainwater, in the same or subsequent seasons, some of the cysts may hatch. Early stages of fairy shrimp develop rapidly into adults. These nondormant populations often disappear early in the season, long before the vernal pools dry up (Federal Register, 1994). The species has been collected from early December to early May (Federal Register, 1994).

Vernal pool fairy shrimp inhabit pools with clear to tea-colored water, most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands, but sometimes in sandstone rock outcrops and alkaline vernal pools (Federal Register, 1994). The water in these pools has low total dissolved solids, conductivity, alkalinity, and chloride (Collie and Lathrop, 1976). Vernal pool fairy shrimp are sporadically distributed within vernal pool complexes (Federal Register, 1994) where some or many of the pools in a complex may not be inhabited during any one year.

Historically, vernal pool fairy shrimp might have dispersed via large scale flood events that allowed the species to colonize different individual pools or pool complexes (USFWS, 1999a). Urban development and the construction of dams, levees, and other flood control measures have limited this dispersal method. Waterfowl or shorebirds are likely the shrimp's primary dispersal agent (Simovich et al., 1992), because they ingest the diapaused eggs or transport the eggs to new habitats while attached to their legs or feathers (Krapu, 1974, Swanson et al., 1974; Driver, 1981; Ahl, 1991). Cysts may also be dispersed and transported in mud on cattle and other livestock that graze in vernal pool areas.

5.1.1.2 Presence Determination

The vernal pool fairy shrimp is known from 12 locations in the greater project vicinity (USFWS, 2007b), including one occurrence less than 2 miles northwest (CNDDB, 2009; USFWS, 2007b) at Wildlands' Byron Conservation Bank. It is important to note that Wildlands' bank is located in Contra Costa County and is not the Byron Conservation Bank owned by CDFG and identified earlier in this BA. Listed below in ascending distance from the proposed project are descriptions of the five nearest extant occurrences of this species (also shown on Figure 4):

- CNDDB Occurrence #417 (January 2006) is a population east of Byron Hot Springs Road approximately 2 miles south of the Byron Airport. The sighting in habitat characterized as vernal pools interspersed through non-native grassland is located 2.3 miles north of the action area in Contra Costa County.
- CNDDB Occurrence #219 (February 2000) is a population of the species near the Byron Airport in habitat characterized as grazed annual and alkali grasslands with constructed seasonal wetlands. This record of hundreds of breeding individuals was found approximately 3 miles north of the action area in Contra Costa County on Wildlands' Byron Conservation Bank (USFWS, 2007b).
- CNDDB Occurrence #588 (January 2008) is a population located approximately 4 miles north of the action area near Byron Hot Springs in Contra Costa County. Hundreds of individuals inhabit several uncharacterized pools at this site.
- CNDDB Occurrence #587 (January 2008) is a population located 4.6 miles northwest of the action area near Canada de los Vaqueros in Contra Costa County. Natural vernal pools in alkali swells characterize the habitat in the database record.
- CNDDB Occurrence #625 (April 2006) is a population located approximately 5 miles west of the action area near the South Bay Aqueduct Dyer Canal in Alameda County. Several vouchers were collected from a deep rock outcrop pool at this site.

5.1.2 Longhorn Fairy Shrimp

5.1.2.1 Life History and Habitat Requirements

The longhorn fairy shrimp was listed as a federally endangered species on September 19, 1994 (59 FR 48136). The longhorn fairy shrimp is a small crustacean in the branchinectidae family. The species has relatively long antennae and was formally described for the first time in 1990 (Eng et al., 1990). Although this species looks fairly similar to vernal pool fairy shrimp, the antennae of the male longhorn fairy shrimp is about twice as long as other species, making it easily distinguished from other fairy shrimp. Both male and female longhorn fairy shrimp have been measured between 0.5 and 0.8 inch in length (Eriksen and Belk, 1999; Eng et al., 1990). Female longhorn fairy shrimp may be confused with alkali fairy shrimp (*Branchinecta mackini*), but there are no dorsal outgrowths on the thoracic segments of longhorn fairy shrimp females, while these structures are present in alkali fairy shrimp females (Eng et al., 1990).

Helm (1998) found no significant difference between the life span or reproductive rate of longhorn fairy shrimp and other species of fairy shrimp studied (USFWS, 2006). However, as Helm's (1998) study showed, longhorn fairy shrimp required a minimum of 23 days, but averaged 43 days, to reach maturity in artificial pools.

This shrimp species is extremely rare (USFWS, 2006). While historically the distribution of the species may have been limited to most of the Central Valley, it was likely more widespread in the regions where it currently is known to exist, and in areas such as the San Joaquin and Southern Sierra Foothill Vernal Pool regions (USFWS, 2006). Currently, longhorn fairy shrimp are found in pools located in a matrix of alkali sink and alkali scrub plant communities north and northwest of Soda Lake and at the southern end of the Carrizo Plain National Monument in the Carrizo Vernal Pool Region, in a series of sandstone outcrop pools in the Livermore Vernal Pool Region, and from alkaline grassland vernal pools at the Kesterson National Wildlife Refuge and a roadside ditch located 2 miles north of Los Banos in the San Joaquin Vernal Pool Region (USFWS, 2006; CNDDB, 2009).

The longhorn fairy shrimp is known from a variety of different vernal pool habitats. In Contra Costa County at the Vasco Caves Regional Preserve, they live in small, clear, sandstone outcrop pools (CNDDB, 2009) that are as small as approximately 3 feet in diameter (Eng et al., 1990). Water temperatures in these pools have been measured between 50 and 64 degrees Fahrenheit (USFWS, 2006). However, in the San Joaquin and Carrizo Vernal Pool Regions, the longhorn fairy shrimp live in clear to turbid, grassland vernal pools (Helm 1998; Eriksen and Belk, 1999). The water temperatures in these grassland pools are also warmer, between 50 to 82 degrees Fahrenheit (USFWS, 2006).

5.1.2.2 Presence Determination

Longhorn fairy shrimp are extremely rare and are only known to occur in four disjunct populations (USFWS, 2007b), the closest of which are approximately 5 miles west of the action area in the East Bay Regional Park, Brushy Peak Preserve, and Vasco Caves Nature Preserve near the town of Byron in Contra Costa County. The other two localities are in and near the Carrizo Plain National Monument, San Luis Obispo County, and the San Luis NWR Complex, Merced County. The East Bay Regional Park occurrences are described in the CNDDB (2009) as small, clear water pools in eroded sandstone masses or outcrops. The other CNDDB (2009) records describe habitats as ephemeral grass-lined pools, swales, and roadside ditches ranging from clear-water to highly turbid conditions. The habitat found at the San Luis NWR is described as vernal pools interspersed with grasslands and alkali sink communities (CNDDB, 2009).

5.1.3 Listed Branchiopod Critical Habitat

Final critical habitat for the vernal pool fairy shrimp and longhorn fairy shrimp was designated collectively with other vernal pool endemics on August 11, 2005 (70 FR 46924). The nearest critical habitat unit for vernal pool fairy shrimp is located less than 0.5 mile west of the action near the Byron Airport in Contra Costa County. The California Aqueduct divides this critical habitat area from the action area. The nearest critical habitat units for the longhorn fairy shrimp are the areas of Brushy Peak Preserve and Vasco Caves Preserve located approximately 5 miles west of the action area. The proposed project will not affect critical habitat for listed branchiopods.

5.1.4 Project Effects

5.1.4.1 Construction

Potential adverse effects to listed branchiopod habitat may occur if stormwater laden with sediment or other deleterious material (for example, fuels or lubricants) were allowed to discharge from the MEP action area into nearby vernal pools. In addition, listed branchiopod habitat could be directly affected if personnel, construction vehicles, or machinery caused ground disturbance within a vernal pool. However, implementation of the conservation measures, including construction monitoring, construction personnel training, avoidance of suitable habitat, and use of qualified biologists during surveys and monitoring, will minimize the potential for indirect effects and prevent the direct effect on listed branchiopod habitat. Potential water quality issues related to sedimentation, erosion, or contaminates from construction materials or equipment will be minimized with the use of BMPs.

5.1.4.2 Operation

MEP operations, including atmospheric emissions, are not expected to result in adverse effects on listed branchiopods.

5.1.5 Listed Branchiopod Conservation Measures

The following conservation measures will be implemented during project construction:

- A USFWS-approved biological monitor will administer a construction personnel education program, explaining to construction personnel how best to avoid the accidental take of listed branchiopods.
- A biological monitor will be onsite during all ground-disturbing work within 250 feet of potential branchiopod habitat.
- Construction work areas including any off-road access routes will be clearly flagged and marked. Potential listed branchiopod habitat in the action area will be marked for avoidance.
- A USFWS-approved biological monitor will oversee all off-road vehicle access for the proposed project.
- Ground disturbance related to the offsite facilities within 250 feet of listed branchiopod habitat will be conducted during the dry season to the extent feasible, which typically occurs from April 15 to October 15.

The potential for adverse effects to water quality in habitats potentially occupied by listed branchiopods will be significantly minimized, and possibly avoided, by the enforcement of seasonal restrictions and implementation of temporary BMPs such as those outlined in the California Stormwater Quality Association's Construction Handbook (California Stormwater Quality Association, 2003). Mariposa Energy's SWPPP and erosion control

BMPs will be used to minimize any wind- and water-related erosion and sedimentation, and restore temporarily disturbed areas as quickly as possible to preproject conditions. Protective measures will also include the following:

- 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 work will be allowed into storm drains, wetlands, or water courses.
- Vehicle and equipment fueling and maintenance operations will be kept at least 100 feet from vernal pools and other aquatic habitats.
- Dust control will 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.
- 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.
- Disturbed work areas will be restored to preproject conditions and will be reseeded, as appropriate.

5.1.6 Vernal Pool Fairy Shrimp and Longhorn Fairy Shrimp Offsite Compensation

No offsite compensation is proposed for listed branchiopods, as there will be no direct effects on vernal pool fairy shrimp or longhorn fairy shrimp habitat. Implementation of a SWPPP will significantly reduce, or possible eliminate, the potential for detrimental effects to water quality of nearby vernal pool habitats.

5.2 California Red-legged Frog

5.2.1 Life History and Habitat Requirements

The California red-legged frog, the largest native frog in California, is federally listed as threatened and is a state species of special concern. The frogs occupy dense, shrubby, or emergent riparian or wetland vegetation closely associated with ponds or deep, slow-moving water. Well-vegetated terrestrial areas within riparian corridors provide important sheltering habitat during winter.

California red-legged frog breed in ponds or slow-moving pools in streams. Habitats that contain the highest densities of California red-legged frog are associated with deep-water pools (greater than 2.3 feet deep) with stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*), tules (*Scirpus* spp.), or sedges. However, California red-legged frogs have also been observed inhabiting stock ponds, sewage treatment ponds, and artificial (concrete) pools completely devoid of vegetation (Storer, 1925; Jennings, unpub. data). Continued survival of frogs in all aquatic habitats seems to be based on the continued presence of ponds, springs, or pools that are disjunct from perennial streams. Such habitats provide the continued basis for successful reproduction and recruitment year after year into nearby drainages that may lose frog populations because of stochastic events such as extreme flooding or droughts (USFWS, 2001).

Breeding typically occurs from late November through early May, after the onset of warm rains (Storer, 1925; Jennings and Hayes, 1994). Most larvae metamorphose into juvenile frogs (at 0.98 to 1.2 inches total length) between July and September, although there are scattered observations of overwintering larvae in perennial ponds (Jennings, unpub. data).

California red-legged frogs may move away from breeding sites to forage in other aquatic habitats during summer, although if habitat is suitable at breeding ponds, individuals may remain there year-round (USFWS, 2001). Bulger et al. (2003) found that California red-legged frogs in coastal central California typically remain in aquatic habitat during dry summer months, but move up to 426 feet from this habitat during seasonal summer rains. During fall and early winter rains, most frogs remain within 328 feet of aquatic habitat (90 percent remained within 197 feet), then make little use of upland habitats during the late winter/spring-breeding season. Bulger et al. (2003) found that some frogs migrated fairly long distances to and from breeding ponds and foraged at other aquatic sites during the summer. Distance traveled during these migrations ranged from 656 feet to 1.7 mile, although no migrating individual ever ranged more than 0.3 mile from aquatic habitat.

During wet periods, and especially in the winter and early spring months, the California red-legged frog can move long distances (for example, more than 1.2 miles) between aquatic habitats, often over areas that are considered to be unsuitable for them, such as roads, open fields, and croplands (Rathbun et al., 1993). Such activities can result in the frogs ending up in isolated aquatic habitats well away from the nearest known species populations (USFWS, 2001). Such movement over upland areas has been best documented in mesic coastal areas.

In addition to the aquatic habitats, juvenile and adult California red-legged frogs have been observed in areas of riparian vegetation, usually within a few feet of the water's edge. They have been found using small mammal burrows often in or under vegetation and willow root wads, or hiding under old boards and other debris within the riparian zone. Juvenile frogs are often observed sunning themselves during the day in the warm, surface-water layer associated with floating and submerged vegetation (Hayes and Tennant, 1985). Adult frogs are largely nocturnal and are known to sit on stream banks or on the low-hanging limbs of willow trees over pools of water where they can detect small mammal prey (Hayes and Tennant, 1985; Jennings and Hayes, 1994).

5.2.2 Presence Determination

The CNDDB includes several records of California red-legged frogs near the action area, as shown on Figure 4. The database lists 10 records of occurrence within 1 mile of the proposed project, including one record on the project parcel (#100). Descriptions of five extant occurrences within 1 mile of the action area are as follows:

- CNDDB #100 (March 1996) documents an unknown number of adult California red-legged frogs in an ephemeral drainage (otherwise known as D-1) found on the project parcel. This drainage intersects the action area along the proposed water supply pipeline route.

- CNDDB #510 (June 1999) documents adults and tadpoles in six freshwater impoundments found along an intermittent drainage (otherwise known as D-3, but upstream of the action area). The known breeding sites are on CDFG's Byron Conservation Bank property. The action area is less than 100 feet east from the downstream-most pond.
- CNDDB #509 (June 1999) documents adults and tadpoles in five freshwater impoundments found along an intermittent drainage (otherwise known as D-4, but upstream of the action area). The known breeding sites are on CDFG's Byron Conservation Bank property. The action area is approximately 2,000 feet east from the downstream-most pond.
- CNDDB #300 (May 2000) documents adults and juveniles in a small perennial stream vegetated with emergent *Typha* and *Scirpus*. This perennial stream is hydrologically connected to the drainage named in CNDDB #509. The action is approximately 2,500 feet east of this recorded breeding site.
- CNDDB #28 (November 1989) documents numerous red-legged frogs in an artificial impoundment (a cattle stock pond) of a historic drainage feature. The pond, protected from grazing by fencing, is vegetated with *Typha*. Bullfrog (*Rana catesbeiana*) is known at this site. The action area is approximately 0.75 mile west of this recorded breeding site.

CH2M HILL biologists Todd Ellwood and Daniel Weinberg conducted an aquatic site field assessment for California red-legged frog on November 2, 2009. The assessment focused primarily on four ephemeral drainages potentially affected during construction of the water supply pipeline. Each drainage within the pipeline corridor along Bruns Road was reviewed for its potential to support California red-legged frog breeding. The site assessment concluded inadequate hydrology and vegetative cover to provide species breeding at D-1, D-2, D-3, and D-4 but suitable dispersal habitat at these four sites. No California red-legged frogs were observed during any of the biological resource surveys conducted for the proposed project (see Table 5-1 for dates of these surveys). All terrestrial areas within the action area were assumed as being suitable for dispersal and refugia for California red-legged frogs because of known breeding sites nearby and an abundance of small mammal burrows.

5.2.3 Critical Habitat

On September, 16, 2008 (73 FR 53491), USFWS proposed a revision to the boundary of final critical habitat for the California red-legged frog previously designated on April 13, 2006 (71 FR 19243). The entire action area of the MEP is within revised boundary Unit CCS-2. Pursuant to the ESA, construction of the MEP must not result in the destruction or adverse modification of critical habitat. Although CCS-2 represents a proposed revised boundary, Mariposa Energy will assume for this analysis that USFWS will designate Unit CCS-2 as final critical habitat sometime before project implementation.

As defined by 50 CFR 402.02, destruction or adverse modification is in other words:

> "direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to alterations adversely modifying any of those

> physical or biological features that were the basis for determining the habitat to be critical."

Physical or biological features are otherwise known as primary constituent elements. An area to have the primary constituent elements for California red-legged frog must include all of the following within 1.25 mile of one another and connected by barrier-free dispersal habitat at least 300 feet in width (USFWS, 2002):

- Two or more suitable breeding locations
- A permanent water source
- Uplands surrounding breeding locations and permanent water sources up to 300 feet from the water's edge

As described in this BA, California red-legged frog breeding is known on CDFG's Byron Conservation Bank property in several freshwater impoundments. Review of aerial photographs of the property indicates that these impoundments are ephemeral, and that there could be permanent water sources within 1.25 mile of these breeding sites on nearby private properties. The nearest breeding pond of the five described in the CNDDB on the CDFG site is less than 100 feet west of the water supply pipeline route. The other four breeding ponds on the bank site are further upstream from the action area.

No potential or known breeding sites will be adversely affected during project construction. A 300-foot buffer was extended from all known and potential California red-legged frog breeding sites, in addition to permanent water sources, to determine if the MEP would potentially result in the adverse modification of surrounding California red-legged frog upland habitat. The only element of MEP that would directly affect upland habitat within 300 feet of a water source or breeding site would be along the proposed water line route. Open-cut trenching around three corrugated metal culverts for the new water pipeline will result in temporary effects to roadside ruderal habitat. This habitat is marginal at best for California red-legged frogs because of the level of ongoing disturbance within the right-of-way and general lack of cover sites, such as small mammal burrows. Following construction, any temporary effects to roadside habitat along the water line route will be restored to preproject conditions. Therefore, because of habitat conditions and the temporary nature of the effect, MEP is not expected to result in destruction or adverse modification of proposed critical habitat unit CCS-2.

5.2.4 Project Effects

5.2.4.1 MEP Construction

The proposed project will affect proposed critical habitat and suitable dispersal and refugia habitat for the species, and could result in effects on individual California red-legged frog. Small mammal burrows in the action area provide potential upland refugia for the species. Some take of California red-legged frog is anticipated during construction and relocation efforts. Frogs that are not detected during preconstruction surveys and monitoring may be crushed by heavy equipment or trampled by workers or may flee the action area into less-suitable habitat. There is also some potential for the frogs to be harmed during capture and relocation. However, implementation of the conservation measures, including preconstruction surveys, installation of wildlife exclusion, frog relocation, construction monitoring, construction personnel training, and use of qualified biologists during surveys and monitoring, will minimize the potential for lethal take of California red-legged frog. There is also potential for water quality issues related to sedimentation or erosion, or contaminates from construction materials or equipment; however, BMPs incorporated into the project will minimize this potential.

USFWS considers a temporary construction disturbance with a temporal effect greater than one construction season to require mitigation as if it were a permanent effect to California red-legged frog (Kim Squires, December 2009, personal communication). This scenario exists at the 9.2-acre temporary laydown and parking area. Although the project will use this laydown area during one California red-legged frog breeding cycle (construction schedule is April 2011 to June 2012), upland refugia removed during development of the laydown area may not be restored in the foreseeable future. Heavy machinery, trucks, and other vehicles using the laydown area during the 14-month work period could result in over-compaction of the underlying native soils, therefore making it difficult for small mammals to dig new burrows after the temporary laydown area is removed. Thus, ripping will be performed to a minimum depth of 2 feet to relieve any over-compaction. This effort should provide a reasonable opportunity for fossorial mammals, including California ground squirrel, to recolonize the area within a year of restoration. Small mammal burrows would provide upland refugia for California red-legged frogs.

Permanently disturbed areas include the MEP site and access road; eight new monopole foundations along the proposed transmission line route; and the pump house and intake structure at Canal 45. In addition to the laydown area discussed above, temporary effects will occur to terrestrial habitats, including non-native annual grassland, roadways, drainages, and agricultural development during construction of the offsite facilities. The temporarily affected offsite utility areas will be restored to pre-project conditions within one construction season and are expected to regain habitat value for California red-legged frog less than one year following restoration.

5.2.4.2 MEP Operation

Over the longer term, the additional vehicular traffic and human activity resulting during MEP operations may cause additional take of California red-legged frogs in the action area. Any frogs crossing roads or incidentally entering the MEP site during overland dispersal could be crushed by vehicles or inadvertently killed on the project site. An increase in human activity or operation noise from the power plant could displace the frogs into less-suitable habitats. The 10-acre MEP site would add cumulatively to habitat loss and fragmentation experienced in the region. Fewer refugia would be available and the facility site may be a barrier to California red-legged frog dispersal between breeding habitats in the action area vicinity. As discussed earlier in this BA, atmospheric emissions from MEP are not expected to result in adverse effects on California red-legged frogs.

As this species is partially nocturnal, outdoor illumination may cause disruption of surface movement and increase rates of predator or vehicle-related injury or mortality. Rich and Longcore (2006), 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, night-time illumination at the MEP site is not expected to result in adverse effects on California red-legged frogs.

5.2.5 Conservation Measures

Pursuant to ESA, conservation measures will be implemented as part of the proposed project. These measures include seasonal avoidance, preconstruction surveys, BMPs, and construction monitoring for the species. The following measures will be implemented to avoid and minimize effects of the proposed project on the California red-legged frog:

- **Wildlife exclusion fence.** Before project construction, a wildlife exclusion fence will be installed along the entire perimeter of the 10-acre MEP site, 9.2-acre temporary laydown area, and along the main access road serving the site from Bruns Road. The exclusion fence around these project areas will remain in place for the duration of ground disturbance. The wildlife exclusion fence will be tall enough to discourage dispersal of California red-legged frogs and California tiger salamanders into the active work site. One fence that could be used is manufactured by Ertec Environmental Systems (www.ertecsystems.com). Any damage or gaps in the fence observed during routine inspections will be repaired immediately. A wildlife exclusion fence will not be needed along the offsite linear work corridors because this work will occur under the direct supervision of a USFWS-approved biologist(s) and during the summer when the frogs are less active.

- **Construction monitoring and removal of California red-legged frogs from the action area.** At least 15 days before any construction-related activities, Mariposa Energy will submit to USFWS the name(s) and credentials of biologist(s) who will conduct activities specified in the following measures. No project construction will begin until Mariposa Energy has received written approval from USFWS that the biologist(s) is qualified to conduct the work.

  - Before any removal or disturbance of vegetation along the water supply pipeline, the USFWS-approved biologist(s) will conduct surveys for California red-legged frogs in and near the work area. Two night-time surveys and one day-time survey will be conducted, with the final night-time survey occurring the night before vegetation removal or construction begins. Any California red-legged frogs detected in the work area will be captured and transported immediately in a cool, moist container to a suitable location elsewhere within the local watershed, following the methodology described in Appendix E. A qualified biologist in consultation with USFWS will determine the means of capture and handling of the frogs and the location of the relocation site in advance. The relocated frog(s) will be monitored until it is determined that no imminent danger to the animal(s) is apparent.

  - The proposed project will avoid small mammal burrows that provide suitable refugia for California red-legged frogs to the extent feasible. If damage to burrows is determined necessary, a USFWS-approved biologist(s) will search the burrows for frogs. The end of each burrow will be reached by either careful hand excavation or use of a fiber optic peeper scope. Burrows will be collapsed only after all frogs and any other special-status species have been removed, if present.

- Following the preconstruction surveys and any necessary frog relocation, the approved biologist will then monitor the work in question (for example, vegetation removal or construction) to minimize the potential for frogs to enter the action area and to capture any frogs that may be present. Monitoring at the MEP site and adjacent laydown area will be on a continuous basis until the wildlife exclusion fence is installed and all terrestrial habitats have been removed. Monitoring along the offsite linear facilities will occur at all times during ground disturbance. If work associated with the offsite facilities is suspended for more than 15 days (for example, between initial removal of vegetation and the initiation of construction), preconstruction surveys will be conducted again before construction activity resumes
- At the MEP site and adjacent temporary laydown and parking area, the USFWS-approved biologist(s) will be present each day during ground-breaking activities until the wildlife exclusion fence is installed and all suitable habitats are removed. Thereafter, the biologist will conduct weekly site visits of the MEP site and laydown yard to survey the wildlife exclusion fence for good repair as well as for other monitoring duties.

- **Avoidance of entrapment.** To prevent inadvertent entrapment of California red-legged frogs or other animals during construction, at the end of each work day, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered with plywood or similar materials or will be equipped with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, the onsite biologist or construction personnel trained by the biologist will be thoroughly inspected for trapped animals. If, at any time, a trapped California red-legged frog or other special-status wildlife is discovered, USFWS and CDFG will be contacted.
- **Onsite construction personnel education program.** A construction personnel education program will occur before the start of construction so that the USFWS-approved biologist can explain to construction personnel how best to avoid the accidental take of California red-legged frogs. The training session will be mandatory for contractors and all construction personnel. The meeting will cover species identification, life history descriptions, habitat requirements during various life stages, and the species' protected status, and will explain the authority of the biological monitor to stop work if imminent danger to a listed species is likely. The biologist will emphasize the importance of the habitat and life-stage requirements within the context of project conservation measures. This training may be delivered via a prerecorded video presentation to allow for repeated training sessions for new construction personnel. Handouts, illustrations, photographs, or project maps that show the areas where conservation measures are being implemented will be included as part of this education program. In addition, wallet-sized cards that include a general reporting protocol and contact information for the biological monitor will also be provided to construction personnel. The program will increase contractors' and construction workers' awareness of federal and state laws

regarding endangered species, as well as increase compliance with conditions and requirements of both Mariposa Energy and resource agencies.

- **Procedure for California Red-legged Frog discovery onsite.** If construction personnel encounter a California red-legged frog, or any amphibian that construction personnel believe may be a frog, or if any contractor or employee inadvertently kills or injures a California red-legged frog, the following protocol will be followed:
  - All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.
  - The construction manager will be immediately notified.
  - The construction manager will notify the approved onsite biologist.
  - The approved onsite biologist will move the frog to the previously approved relocation area as determined in consultation with USFWS.
  - The biologist will contact USFWS within 24 hours for further direction if a California red-legged frog is found, killed, or injured. Field survey forms will be completed for any California red-legged frog observations and submitted to the CNDDB.
- **Construction area delineation.** Before any ground is disturbed along the offsite work corridors, the boundaries of the work area will be clearly delineated with orange-colored plastic construction fencing (ESA fencing) or solid barriers to discourage workers or equipment from inadvertently straying offsite.
- **Trash removal.** To discourage attracting predators of protected species, all food-related trash items, such as wrappers, cans, bottles, and food scraps, will be disposed of in solid, closed containers (trash cans) on a daily basis. Onsite trash receptacles will be emptied as necessary (for example, weekly) to prevent overflow of trash. Trash removed from the receptacles will be hauled to an offsite waste disposal facility.
- **Avoidance of accidental spills and a spill response plan.** All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 200 feet from any water body. Spill response materials will be kept onsite at all times. Before work begins, Mariposa Energy will ensure that a plan has been prepared to allow a prompt and effective response to any accidental spills. During the worker education program, all workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
- **Implementation of BMPs.** To control erosion during and after project implementation, Mariposa Energy will implement BMPs, as required by the California Regional Water Quality Control Board and USACE. More detail on these BMPs will be provided in a SWPPP.
- **Prohibition of use of erosion control materials potentially harmful to California red-legged frogs.** Tightly woven fiber netting or similar material will be used for erosion control or other purposes at the project to avoid trapping California red-legged frogs. This limitation will be communicated to the contractor through use of special provisions included in the bid solicitation package. Plastic mono-filament netting (erosion-control

matting and fiber rolls) will not be used because the frogs may become entangled or trapped in this material.

5.2.6 Offsite Compensation

Loss of California red-legged frog habitat will be compensated as follows:

- The approximately 13.9 acres of California red-legged frog dispersal and upland refugia temporarily lost during construction of the offsite facilities will be restored to preproject conditions within a single construction season, so no offsite compensation is required (Kim Squires, 2009, USFWS, personal communication with Todd Ellwood).
- The 9.2 acres of California red-legged frog dispersal and upland refugia temporarily lost during construction and long-term use of the MEP temporary laydown area will be compensated at a **1:1 ratio** (offsite preservation of grassland habitat supporting or near known breeding sites). Thus, preservation of 9.2 acres of upland habitat will occur at a suitable offsite location determined in coordination with USFWS.
- Permanent loss of 10.1 acres of California red-legged frog dispersal and upland refugia during construction and operation of the MEP site and new transmission line will be compensated at a **3:1 ratio** (offsite preservation of grassland habitat supporting or near known California tiger salamander and California red-legged frog breeding sites). Thus, an additional 30.3 acres of California red-legged frog upland habitat will be preserved at a suitable offsite location determined in coordination with USFWS.

Additional details about habitat compensation are provided in Section 6.

5.2.7 Cumulative Effects

Cumulative effects on California red-legged frogs would be those effects of future state or private activities, not involving federal activities that are reasonably certain to occur within the action area of the MEP (50 CFR 402). Cumulative effects may occur as a result of new developments projects, or during regular routine maintenance and operation of existing facilities. The MEP action area comprises the following existing facilities: PG&E 230-kV transmission line; county roads including Bruns Road and Kelso Road; BBID agricultural developments including Canal 45; and the 6.5-MW Byron Cogen Plant. Ongoing vehicular access to these facilities could kill California red-legged frogs, and any overland travel by PG&E to access its easements could degrade upland habitat. Any routine herbicidal spraying along the county right-of-way could have a toxicological effect on individual frogs or an indirect effect on the water quality of nearby breeding sites.

There are no known proposed future developments in the action area. As described in the project's AFC (Mariposa Energy, 2009), applications for six proposed projects have been filed in the region surrounding the MEP, including both Alameda and San Joaquin counties. These projects include power generation facilities, a residential development, a motorway rezoning, and a composting facility. The nearest project is a 2-MW utility-scale solar farm, which is approximately 1 mile from the MEP site.

5.3 California Tiger Salamander

5.3.1 Life History and Habitat Requirements

The California tiger salamander breeds in temporarily ponded environments, such as vernal pools or human-made ponds providing water for at least 3 months, surrounded by uplands that support small mammal burrows and other refugia, including soil cracks. This species will use permanent ponds, but any aquatic vertebrate predators such as bullfrog and predatory fish are likely to reduce the overall quality of the habitat. Such ponds provide breeding and larval habitat, while small mammal burrows and other voids in the soil surface in adjacent upland habitats provide refugia and aestivation sites for juvenile and adult salamanders during the dry season.

The range of the California tiger salamander is restricted to the central and the south coast mountain ranges of California from Butte County south to Santa Barbara County. California tiger salamanders have disappeared from a significant portion of their range because of habitat loss from agriculture and urbanization and the introduction of non-native aquatic predators. USFWS listed the Santa Barbara and Santa Rosa distinct population segments (DPS) of California tiger salamander as endangered on January 19, 2000, and July 22, 2002, respectively; and USFWS listed the Central California DPS as threatened on August 4, 2004 (USFWS, 2009). The proposed project occurs within the Central California DPS. A recovery plan has not been prepared for the California tiger salamander.

Adult salamanders are 3 to 5 inches long and colored jet-black with white or yellow spots or bars (Stebbins, 1985). Larvae are approximately 0.5 inch long when hatched and vary from 1.5 to 3 inches at metamorphosis. Larvae are usually a dull yellowish gray with broad, flat heads and large feathery gills. At metamorphosis, larvae weigh approximately 10 grams (Jennings, 2000).

The historic range of the California tiger salamander is believed to have included much of the Central Valley from the southern San Joaquin Valley into the southern Sacramento Valley, the foothills of the Coast Range from Monterey County to Santa Barbara County, and the areas around Petaluma in Sonoma County (Jennings and Hayes, 1994; Center for Biological Diversity, 2001). According to Jennings and Hayes (1994), the California tiger salamander has been extirpated from approximately 55 percent of this historic range. California tiger salamanders live in grasslands and low foothills in pools or ponds for breeding. They are seen less commonly in the grassy understory of valley foothill woodlands (Shaffer and Austin, 1993) in the central Coast Range of California, from southern Solano County to eastern Kern County, and in the Sierra Nevada foothills, from southern Sacramento County to northern Tulare County (LSA Associates, Inc., 1994). The species occurs at elevations up to 3,000 feet in the coastal mountain range (LSA Associates, Inc., 1994), but is considered uncommon at elevations over 1,500 feet (Shaffer and Austin, 1993).

Adult salamanders migrate to aquatic sites during the first major rainfall events of fall and early winter for breeding, after which they migrate back into upland habitat (Loredo et al., 1996; Trenham, 1998). Breeding habitat includes vernal pools, seasonal or fishless natural ponds, intermittent streams, or stock ponds. Males tend to arrive at breeding sites first and remain in ponds longer than females (Twitty, 1941; Loredo and Van Vuren, 1996; Trenham, 1998). It has been suggested that males arrive earlier and stay longer to maximize breeding success, while females may maximize reproductive success by waiting for a prolonged period of favorable environmental conditions (Douglas, 1979; Loredo and Van Vuren, 1996). Some studies have shown that after leaving breeding sites, adults travel at least 426 feet before entering rodent burrows (Loredo et al., 1996).

Eggs are fertilized internally by means of a spermatophore (Twitty, 1941). Then they are laid singly or in clumps on submerged or emergent vegetation, in ponds without vegetation on the bottom, or on submerged debris in shallow water. Females can lay between 400 to 1,300 eggs (Trenham, 1998; Trenham et al., 2000) and eggs hatch after 10 to 14 days (Storer, 1925; Jennings and Hayes, 1994). Size at metamorphosis can be dependent on diet, pond age, pond temperature, and pond depth (Anderson, 1968a). The diet of small larvae consists mainly of small invertebrates, such as ostracods and copepods, and algae. As larvae grow, they appear to become more carnivorous, eventually feeding on amphibian larvae, including their own species, and larger invertebrates, such as water beetles and backswimmers (Anderson, 1968b; Feaver, 1971). Larvae metamorphose in late spring or early summer 60 to 94 days after the eggs are laid, usually coinciding with the drying out of their habitat (Anderson, 1968a; Feaver, 1971; Loredo and Van Vuren, 1996; Trenham et al., 2000).

Very little is known about the activity patterns of juveniles. After metamorphosis, juvenile salamanders emerge from aquatic breeding sites where they have been observed moving up to 200 feet in an evening before seeking shelter in rodent burrows or cracks in the soil (Loredo et al., 1996). It is presumed that juveniles remain below ground in rodent burrows or other natural crevices for 2 to 6 years before reaching sexual maturity and returning to pools to breed (Loredo and Van Vuren, 1996; Trenham et al., 2000).

Adult California tiger salamanders spend the majority of the year below ground in rodent burrows or other natural crevices (Storer, 1925; Twitty, 1941; Anderson, 1968; Feaver, 1971; Shaffer and Austin, 1993). Individuals are most frequently observed in the vicinity of burrows of California ground squirrels (Storer, 1925; Loredo et al., 1996; Shaffer and Austin, 1993), but extensive populations have been found in locations that do not contain ground squirrel burrows. Shaffer and Austin (1993) suggest that salamanders primarily aestivate while in burrows. Shaffer and Austin (1993) cite the emaciated appearance of salamanders emerging from burrows during the winter rainy season as evidence of this. Other researchers have reported observing salamanders active in burrows during much of the year including summer months (Trenham, 1998). The diet of adult salamanders is assumed to be similar to other ambystomids and includes insects, worms, and other invertebrates.

The ability for juveniles and adults to disperse and move between uplands and breeding habitats is important for the long-term survival of the species. California tiger salamanders are known to move through grasslands and agricultural areas and across roads. Jennings and Hayes (1994) report the species moves in nocturnal migrations over distances in excess of 3,280 feet. Trenham and Schaffer (in press) conducted an extensive study at Olcott Lake in Solano County and found 95 percent of the adult salamanders within 1,480 feet and 95 percent of the subadult salamanders within 2,100 feet of the breeding pond (Olcott Lake). From this data, they predicted the maximum movement distance for both adults and juveniles from the breeding habitat to be 2,790 feet. However, other sources have identified adult California tiger salamanders in locations up to 1.24 mile from suitable breeding habitat (CDFG, 2003).

5.3.2 Presence Determination

CNDDB includes several records of California tiger salamander near the action area, as shown on Figure 4. The database lists four records within approximately 1 mile of the action area. These occurrences are considered extant and described as follows:

- CNDDB #205 (June 1999) documents California tiger salamander larvae in a seasonal stock pond. This 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.
- CNDDB #150 (May 2008) documents numerous larvae observed during multiple site visits in vernal pools surrounded by non-native annual grassland on the Borges Ranch mitigation property. The breeding sites are associated with an upstream reach of D-1 less than 600 feet west of the action area. There are no barriers to California tiger salamander dispersal from these vernal pools to the action area.
- CNDDB #206 (May 1982) documents juvenile California tiger salamander in a farm pond surrounded by grazed grassland. Non-native game fish and bullfrog also are noted at this location. The breeding site is located on the west side of the California Aqueduct in Contra Costa County. The aqueduct is a barrier to California tiger salamander dispersal from this site to the action area.
- CNDDB #933 (April 2005) documents numerous larvae at a large vernal pool breeding site surrounded by annual grassland. This sighting is near CNDDB #206 just west of the California Aqueduct in Contra Costa County. The aqueduct is a barrier to California tiger salamander dispersal from this site to the action area.

CH2M HILL biologists Todd Ellwood and Daniel Weinberg conducted a field assessment for California tiger salamander on November 2, 2009. The effects of unseasonably wet weather in October 2009 were still evident onsite, with inundation being observed in the drainages at ordinary high water. The assessment focused primarily on the four drainages potentially affected during construction of the water supply pipeline. Specifically, each drainage within the pipeline corridor was reviewed for its potential to support California tiger salamander breeding. Drainages D-1, D-2, and D-3 convey flow in a shallow vegetated channel with an ordinary high water of about 3 to 6 inches. At D-4, a shallow pool of standing water supports a dense stand of cattail. The drainage at this location is approximately 10 feet wide and 6 inches deep at ordinary high water. Because of inadequate hydrologic conditions to provide California tiger salamander breeding, D-1, D-2, D-3, and D-4 provide suitable dispersal habitat only. No California tiger salamanders were observed during any of the biological resource surveys conducted for the proposed project (Table 5-1 lists the dates of these surveys).

5.3.3 Critical Habitat

USFWS designated critical habitat for the Central California DPS on August 23, 2005 (70 FR 49379). The action area is approximately 11 miles east of the nearest designated critical habitat for this species, Unit 18 - Doolan Canyon.

5.3.4 Project Effects

5.3.4.1 MEP Construction

The proposed project will affect suitable dispersal and aestivation habitat for the species, and could result in effects on individual salamanders. Some take of California tiger salamander is anticipated during construction and relocation efforts. Salamanders that are not detected during preconstruction surveys and monitoring may be crushed by heavy equipment or trampled by workers or may flee the action area into less-suitable habitat. There is also some potential for salamanders to be harmed during capture and relocation. However, implementation of conservation measures, including preconstruction surveys, installation of wildlife exclusion, salamander relocation, construction monitoring, construction personnel training, and use of qualified biologists during surveys and monitoring, will minimize the potential for lethal take of California tiger salamander. There is also potential for water quality issues at nearby potential breeding habitat related to sedimentation or erosion, or contaminates from construction materials or equipment; however, BMPs incorporated into the project will minimize this potential.

The proposed project will result in both permanent and temporary effects to suitable dispersal and aestivation habitat for California tiger salamander. USFWS considers a temporary construction disturbance with a temporal effect greater than one construction season to be mitigated as if it were a permanent effect (Kim Squires, December 2009, personal communication). This scenario exists at the 9.2-acre temporary laydown and parking area. Although the project will use this laydown area during one breeding cycle of the species (construction schedule is April 2011 to June 2012), potential upland aestivation sites will be removed during development of the laydown area and may not return in the foreseeable future. Therefore, ripping will be performed to a minimum depth of 2 feet to relieve any over-compaction. This effort should provide a reasonable opportunity for fossorial mammals, including California ground squirrel, to recolonize the area within a year of restoration.

Permanently disturbed areas include the MEP site and access road; eight new monopole foundations along the proposed transmission line route; and the pump house and intake structure at Canal 45. In addition to the laydown area discussed above, temporary effects will occur to terrestrial habitats, including non-native annual grassland, roadways, drainages, and agricultural development during construction of the offsite facilities. The temporarily affected offsite utility areas will be restored to preproject conditions within one construction season and are expected to regain habitat value for California tiger salamander less than 1 year following restoration.

5.3.4.2 MEP Operation

Similar to California red-legged frog, additional vehicular traffic and human activity resulting during operations may cause additional take of California tiger salamander in the action area. Any salamanders crossing roads or incidentally entering the MEP site during overland dispersal could be crushed by vehicles or inadvertently killed within the plant site. An increase in human activity or operational noise from the power plant could displace salamanders into less suitable habitats. The 10-acre MEP site would add cumulatively to habitat loss and fragmentation experienced in the region. Fewer aestivation sites would be available for salamanders and the facility site would be a barrier to their dispersal between breeding habitats found in the action area vicinity. As previously discussed, atmospheric emissions from MEP are not expected to result in adverse effects on California tiger salamander.

As discussed in Section 5.2.4.2, MEP night-time illumination is not expected to result in adverse effects to California tiger salamander.

5.3.5 Conservation Measures

Conservation measures being implemented to minimize effects on the California red-legged frog will also provide some assurance that potential effects on the California tiger salamander are avoided or minimized. These measures follow:

- **Construction monitoring and relocation**. Construction monitoring for California red-legged frog and California tiger salamander will be done concurrently by a USFWS-approved biological monitor(s). In the event that a California tiger salamander is found, it will be relocated to a suitable location outside the construction area, following the methodology described in Appendix E. The location will be determined in advance by a qualified biologist in consultation with USFWS. This location may be a burrow, or near a known breeding site, depending on the time of year and direction the animal was moving. The relocated animal(s) will be monitored until it is determined there is no imminent danger from predators or other hazards.
- **Onsite construction personnel education program.** The USFWS-approved biologist will include California tiger salamander in the education program, including a discussion of the species' natural history and the conservation measures relevant to the construction personnel.
- **Procedure for California tiger salamander discovery onsite.** If construction personnel encounter a California tiger salamander or any amphibian that construction personnel believe to be California tiger salamander during project construction, or if any contractor or employee inadvertently kills or injures a California tiger salamander, the following protocol will be followed:
  - All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.
  - The construction manager will be immediately notified.
  - The construction manager will notify the approved biologist.
  - The approved biologist will move the California tiger salamander to the previously approved relocation area and monitor the animal until it is determined that it does not face imminent danger.
  - If a California tiger salamander has been found, killed, or injured, the biologist will contact USFWS and CDFG within 24 hours. Field survey forms will be completed for any observations of California tiger salamander and submitted to the CNDDB.

- **Construction area delineation.** Before any ground is disturbed along the offsite work corridors, the boundaries of the work area will be clearly delineated with orange-colored plastic construction fencing or solid barriers to discourage workers or equipment from inadvertently straying offsite. The wildlife exclusion fence previously described will be used to delineate the MEP site and adjacent laydown area.
- **Trash removal.** To discourage attraction from predators of protected species, all food-related trash items, such as wrappers, cans, bottles, and food scraps, will be disposed in solid, closed containers (trash cans) on a daily basis. Onsite trash receptacles will be emptied as necessary (for example, weekly) to prevent overflow of trash. Trash removed from the receptacles will be hauled to an offsite waste disposal facility.
- **Prohibition of use of erosion control materials potentially harmful to California tiger salamander.** Tightly woven fiber netting or similar material will be used for erosion control or other purposes at the project to minimize the potential of California tiger salamander entrapment. This limitation will be communicated to the contractor through use of special provisions included in the bid solicitation package. Plastic mono-filament netting (erosion-control matting and fiber rolls) or similar material will not be used at the project site because California tiger salamander may become entangled or trapped in this material.

5.3.6 Offsite Compensation

Loss of California tiger salamander habitat will be compensated as follows:

- The 13.9 acres of California tiger salamander dispersal and upland refugia temporarily lost during construction of the offsite facilities will be restored to preproject conditions within a single construction season, so no offsite compensation is required (Kim Squires [USFWS], December 2009, personal communication with Todd Ellwood).
- The 9.2 acres of California tiger salamander dispersal and upland refugia temporarily lost during construction and long-term use of the MEP temporary laydown area will be compensated at a **1:1 ratio** (offsite preservation of grassland habitat supporting or near known California tiger salamander breeding sites). Thus, 9.2 acres of California tiger salamander upland habitat will be preserved at a suitable offsite location determined in coordination with USFWS and CDFG.
- Permanent loss of 10.1 acres of California tiger salamander dispersal and upland refugia during construction and operation of the MEP site and new transmission line will be compensated at a **3:1 ratio** (offsite preservation of grassland habitat supporting or near known California tiger salamander and its breeding sites). Therefore, an additional 30.3 acres of California tiger salamander upland habitat will be preserved at a suitable offsite location determined in coordination with USFWS and CDFG.

5.3.7 Cumulative Effects

Cumulative effects would be those effects of future state or private activities, not involving federal activities that are reasonably certain to occur within the action area of the MEP (50 CFR 402). Cumulative effects on California tiger salamander may occur as a result of new development projects, or during regular routine maintenance and operation of existing facilities. The MEP action area comprises the following existing facilities: PG&E 230-kV transmission line; county roads including Bruns Road and Kelso Road; BBID agricultural developments including Canal 45; and the 6.5-MW Byron Cogen Plant. Ongoing vehicular access to these facilities could kill California tiger salamander, and any overland travel by PG&E to access its easements could degrade upland habitat. Any routine herbicidal spraying along the county right-of-way could have a toxicological effect on individual salamanders or an indirect effect on the water quality of nearby breeding sites.

There are no known proposed future developments in the action area. As described in the project's AFC (Mariposa Energy, 2009), applications for six proposed projects have been filed in the region surrounding the MEP, including both Alameda and San Joaquin counties. These projects include power generation facilities, a residential development, a motorway rezoning, and a composting facility. The nearest project is a 2-MW utility-scale solar farm, which is approximately 1 mile from the MEP site.

5.4 San Joaquin Kit Fox

5.4.1 Life History and Habitat Requirements

Grinnell et al. (1937) believed that by 1930, the range of the San Joaquin kit fox had been reduced by half. Before 1930, the range had been described as including most of the San Joaquin Valley from southern Kern County north to Tracy in San Joaquin County on the west side of the valley and up to La Grange in Stanislaus County, on the east side. No comprehensive survey of its entire historical range has been completed, but local surveys, research projects, and incidental sightings indicate that San Joaquin kit fox currently inhabit suitable habitat on the San Joaquin Valley floor and in the surrounding foothills of the coastal ranges, Sierra Nevada, and Tehachapi Mountains from southern Kern County north to Contra Costa, Alameda, and San Joaquin counties on the west and near La Grange and Stanislaus counties on the east side of the valley (USFWS, 1998). USFWS (1998) also reported San Joaquin kit fox occurring "westward into the interior coastal ranges in Monterey, San Benito, and Santa Clara counties (Pajaro River Watershed); in the Salinas River watershed, Monterey, and San Luis Obispo counties; and in the upper Cuyama River watershed in northern Ventura and Santa Barbara counties and southeastern San Luis Obispo County." A study conducted by the State of California found that about 85 percent of the San Joaquin kit fox population in 1975 occurred in six counties: Fresno, Kern, Kings, Monterey, San Luis Obispo, and Tulare (USFWS, 1998). About half of the San Joaquin kit fox population could be found in Kern (41 percent) and San Luis Obispo (10 percent) counties.

The current range and population size of the San Joaquin kit fox is likely to be restricted by many factors: interspecies competition; prey availability; loss and degradation of habitat by agricultural, industrial, and urban developments and associated practices; decreased carrying capacity of remaining habitat (such losses contribute to San Joaquin kit fox declines through displacement, direct and indirect mortalities, barriers to movement, and reduction of prey populations); den availability; displacement to marginal habitats; non-native species introductions; and urban-associated benefit to competitive or predatory species.

Although the majority of the San Joaquin kit fox population occurs in the southern San Joaquin Valley, satellite populations and individuals occur on the western edge of the San Joaquin Valley extending north nearly to Antioch in Contra Costa County and in the Salinas Valley (Bell, 1994). Recent observations (CNDDB, 2009) indicate that San Joaquin kit fox still occur in the Altamont Hills and in areas east of the California Aqueduct towards the Central Valley.

The kit fox inhabits valley and foothill grasslands, arid shrub habitats, and oak-savanna communities in the greater San Joaquin and Salinas valleys in California. USFWS listed the San Joaquin kit fox as endangered in 1967. The State of California listed it as threatened in 1971. The species is included in the Recovery Plan for the Upland Species of the San Joaquin Valley, California (USFWS, 1998). The action area does not overlap with any San Joaquin kit fox core areas, all located in southern part of the Central Valley of California.

Agricultural, industrial, and urban development, including the development of water and transportation infrastructure, has resulted in considerable habitat loss, fragmentation, and degradation. More than 95 percent of the historical habitat for the San Joaquin kit fox on the San Joaquin Valley floor has been converted to irrigated agriculture or has been urbanized, forcing the kit fox to use marginal habitat where it may not have normally occurred or to adapt to urbanization within its habitat.

The San Joaquin kit fox is one of the smallest canid species in North America. The diet of San Joaquin kit fox varies geographically, seasonally, and annually based on prey abundance, but throughout most of its range, its diet consists primarily of kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp.), deer mice (*Peromyscus* spp.), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), California ground squirrels (*Spermophilus beecheyi*), rabbits (*Sylvilagus* spp.), black-tailed jackrabbits (*Lepus californicus*), ground nesting birds, and insects (Morrell, 1972; Orloff et al., 1986; Scrivner et al., 1987; Cypher and Spencer, 1998). In the southern part of the range, one-third of the San Joaquin kit fox diet consists of kangaroo rats, pocket mice, deer mice, and other nocturnal rodents. In the northern portion of the range (San Joaquin, Alameda, and Contra Costa counties), San Joaquin kit fox most often preys on California ground squirrels.

San Joaquin kit fox require underground dens for temperature regulation, shelter, rearing young, and predator avoidance (Golightly and Ohmart, 1984). San Joaquin kit fox commonly modify and use dens constructed by other animals, as well as human-made structures (USFWS, 1998). In the southern part of the species' range, dens are usually located in loose-textured soils on slopes less than 40 degrees (O'Farrell et al., 1980), but the character of San Joaquin kit fox dens varies across the geographic range in regard to the number of openings, shape, and the slope of the ground on which they occur (USFWS, 1998). Natal or maternal dens tend to be found on slopes of less than 6 degrees (O'Farrell and McCue, 1981). San Joaquin kit fox change dens often, using numerous dens each year. Orloff et al. (1986) reported individual foxes using more than 20 den sites per year and family groups using as many as 43 dens per year. In another study, a single fox used 70 different dens over a 2-year period (USFWS, 1998). As described by USFWS (1999c), a typical San Joaquin kit fox den may include the following: (1) one or more entrances that are approximately 5 to 8 inches in diameter; (2) dirt berms next to the entrances; (3) kit fox tracks, scat, or prey remains in the vicinity of the den; (4) matted vegetation next to the den entrances; and (5) human-made features such as culverts, pipes, and canal banks.

San Joaquin kit fox may be solitary from mid-summer through late fall, then occur in family groups from late fall through early summer. According to K. Ralls (USFWS, 1998), adult pairs may share home ranges, but not necessarily the same den, outside of the breeding season. "Home range" is the area an animal regularly frequents in its daily activities of foraging, roaming, resting, and caring for young. For carnivores in general, home-range size is usually related to prey availability. Home ranges of from less than 1 square mile up to approximately 12 square miles have been reported by several researchers (Morrell, 1972; Knapp, 1978; Zoellick et al., 1987; Spiegel and Bradbury, 1992; White and Ralls, 1993; Paveglio and Clifton, 1988), and individual home ranges overlap extensively (Morrell, 1972; Ralls et al., 1990; Spiegel and Bradbury, 1992).

San Joaquin kit fox is subjected to competitive exclusion or predation by other species, such as the non-native red fox (*Vulpes vulpes*), coyote, domestic dog (*Canis familiaris*), bobcat (*Felis rufus*), and large raptors. Non-native red foxes may invade and occupy historical San Joaquin kit fox habitats, compete for resources, and limit recovery efforts (Clark et al., 2005). Coyotes are highly adapted to disturbed environments and may out-compete San Joaquin kit fox for available resources, as well as kill them opportunistically (White and Garrott, 1997; Cypher and Spencer, 1998; White, et al.; 2000). Predation by large carnivores may account for the majority of the annual adult mortality rate observed among San Joaquin kit fox in some areas (Berry et al., 1987; White et al., 2000).

5.4.2 Presence Determination

CNDDB includes several records of San Joaquin kit fox near the action area, as shown on Figure 4. The following first three records are within approximately 1 mile of the action area and the remaining three are within 2 miles of the site. These occurrences are considered extant, as explained:

- CNDDB #41 (June 1992) documents a single adult running west from Bruns Road along Kelso Road.
- CNDDB #557 (ca. 1983) documents a single San Joaquin kit fox den located just southeast of the Bethany Reservoir. 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.
- CNDDB #42 (August 1998) documents three individuals of unknown age foraging in grazed non-native grassland on a wind farm. In addition, from 1972 to 1975, numerous dens and foxes were observed. The California Aqueduct restricts access to the action area through several road overpasses and a 1,000-foot underground section of aqueduct.
- CNDDB #44 (March 1992) documents a single adult foraging in lightly grazed grassland bordered by the Delta Mendota Canal and numerous agricultural fields. This sighting is east of the action area, separated from the MEP by the Delta Mendota Canal. The canal is a restrictive barrier to San Joaquin kit fox dispersal.
- CNDDB #34 (May 2000) documents 40 dens, some of which are old in earthen berms extending from a detention basin near the Delta Mendota Canal. A fox "yip" was detected at this site in May 2000. The database record also indicates that WAPA employees frequently observe foxes along the Delta Mendota Canal.

- CNDDB #561 (October 1987) documents species foraging from 1972 to 1987. The record is from near the California Aqueduct along the Contra Costa County line near a wind farm meteorological tower. The California Aqueduct restricts access to the action area through several road overpasses and a 1,000-foot underground section of aqueduct.

CH2M HILL biologist Todd Ellwood conducted reconnaissance-level surveys for sign of kit fox activity in the action area. In addition, CH2M HILL biologists Todd Ellwood and Daniel Weinberg conducted focused surveys for the San Joaquin kit fox dens at the MEP site on November 2, 2009. No evidence of San Joaquin kit fox was observed during any of the site surveys. The project site, however, supports burrows with the characteristics (for example, similar diameter and depth) of potential dens for San Joaquin kit fox.

The CNDDB records show that San Joaquin kit fox are known throughout the project vicinity, particularly west of the MEP site in the Altamont Hills. A relatively recent record in 2000 noted this species east of the action area in an area near agricultural and industrial developments. Underground segments of the California Aqueduct and Delta Mendota Canal and road overpasses restrict movement by the species to and from the action area from the Altamont Hills area. Because the action area is within an apparent dispersal corridor of San Joaquin kit fox, conservation measures for the species have been incorporated into the proposed project.

5.4.3 Critical Habitat

Designated critical habitat does not exist for the San Joaquin kit fox.

5.4.4 Project Effects

5.4.4.1 MEP Construction

The project will affect suitable foraging, dispersal, and denning habitat. The potential for lethal take of San Joaquin kit fox is considered low given the protective measures previously proposed in the event that denning is observed onsite. Nevertheless, some individual San Joaquin kit fox 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 USFWS-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. Establishment of the 9.2-acre laydown area is considered to result in a permanent loss of potential San Joaquin kit fox denning habitat. Although removal and restoration of the temporary laydown area will restore the forage value for San Joaquin kit fox, over-compaction during project construction could result in a long-term loss of potential denning on the site. For these reasons, ripping will be performed to a minimum depth of 2 feet to relieve any over-compaction. This effort should provide a reasonable opportunity for fossorial mammals to recolonize the area within a year of restoration.

Permanently disturbed areas include the MEP site and access road; eight new monopole foundations along the proposed transmission line route; and the pump house and intake structure at Canal 45. In addition to the laydown area discussed above, temporary effects will occur to terrestrial habitats, including non-native annual grassland, roadways, drainages, and agricultural development during construction of the offsite facilities. The temporarily affected areas will be restored to preproject conditions within one construction season. Areas temporarily affected are expected to regain habitat value for San Joaquin kit fox less than 1 year after restoration.

5.4.4.2 MEP Operation

MEP operational activities could 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 fox 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 10-acre facility could interfere with movement corridors potentially existing in the MEP 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. As discussed in Section 5.2.4.2, MEP night-time illumination is not expected to result in any adverse effects to San Joaquin kit fox.

5.4.5 Conservation Measures

Although no evidence of kit fox denning has been observed in the action area, numerous ground squirrel burrows provide potentially suitable den sites. Therefore, measures related to the protection of San Joaquin kit fox dens are proposed in the event that an active den is discovered during preconstruction surveys. In addition, measures to protect individual San Joaquin kit fox are proposed in the event that a fox enters the action area during construction. These measures are derived from the *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or during Ground Disturbance* USFWS (1999c) and include:

- **Onsite Construction Personnel Education Program.** The USFWS-approved biologist will include discussion of San Joaquin kit fox in the education program.
- **Preconstruction Surveys and Monitoring.** Before project construction begins, a USFWS-approved biologist will conduct a preconstruction survey for San Joaquin kit fox dens. The following measures will be implemented for any natal/pupping dens, active dens (non-natal), and potential dens observed during the survey:

- Natal/pupping dens will be avoided and USFWS contacted for further guidance. Natal/pupping dens will not be disturbed by the proposed project.
- Non-natal dens in the action area will be monitored for 3 days with a tracking medium to determine their current use. If no kit fox activity is observed during this period, the den will be destroyed immediately to prevent future use by kit fox. If kit fox activity is observed at the den during this period, the den will be monitored for at least 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 fox's normal foraging activity).
- Potential dens will be temporarily marked for avoidance and further studied by the qualified biologist. Destruction of potential dens will occur only after the biologist determines that no kit fox are inside. To determine the presence of kit foxes, the potential den will be fully and carefully excavated to the end by either hand or machinery. Once determined empty, the den will be filled with dirt and compacted to ensure that kit foxes cannot enter or use the den during the construction period. If any potential den is determined to be currently or previously used by kit fox, the measures described above for natal and non-natal dens (as applicable) will be followed.

- **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, or if any contractor or employee inadvertently kills or injures a San Joaquin kit fox, the following protocol shall be followed:
  - All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.
  - The construction manager will be immediately notified.
  - The construction manager will notify the USFWS-approved onsite biologist.
  - The animal will be allowed to leave the site on its own.
  - If a San Joaquin kit fox has been killed or injured, the biologist will contact USFWS and CDFG within 24 hours.
- **Construction Area Delineation.** 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.
- **Trash Removal.** To discourage attraction to predators of protected species, all food-related trash items, such as wrappers, cans, bottles, and food scraps, will be disposed in solid, closed containers (trash cans) on a daily basis. Onsite trash receptacles

will be emptied as necessary (for example, weekly) to prevent overflow of trash. Trash removed from the receptacles will be hauled to an offsite waste disposal facility.

- **Speed Limit.** Project-related vehicles will observe a 15-mile-per-hour speed limit in all project areas, except on county roads and state highways.
- **Avoidance of Entrapment.** To prevent inadvertent entrapment of San Joaquin kit fox or other animals during construction, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the end of each working day using plywood or similar materials, or one or more escape ramps will be constructed using 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 San Joaquin kit fox (or other wildlife) is discovered, USFWS and CDFG will be contacted.
- **Capping/Inspection of Pipes.** Because San Joaquin kit fox are attracted to den-like structures such as pipes and may enter stored pipes and become trapped, all construction pipes, culverts, or similar structures greater than 4 inches in diameter that are stored at a construction site overnight will be either securely capped before storage or will be thoroughly inspected for San Joaquin kit fox 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, then that section of pipe will not be moved. The USFWS-approved biologist will immediately contact USFWS and CDFG to determine the appropriate course of action, which may include moving the pipe under the direct supervision of a biologist to remove it from the construction area and allow the fox to escape.

5.4.6 Offsite Compensation

The potential effects of project construction on San Joaquin kit fox will be offset by preservation of offsite upland habitat in perpetuity as close to the action area as possible as follows:

- Temporary loss of 13.9 acres of SJKF dispersal, foraging, and potential den sites during construction of the offsite facilities will be restored to pre-project conditions within a single construction season, so no offsite compensation is proposed. USFWS affirmed this approach (pers. comm. between Kim Squires [USFWS] and Todd Ellwood).
- Temporary loss of 9.2 acres of SJKF dispersal, foraging, and potential den sites during construction and long-term use of the temporary laydown area will be compensated at a **1:1 ratio** (offsite preservation of grassland habitat supporting California ground squirrel burrows). Therefore, preservation of 9.2 acres of San Joaquin kit fox upland habitat will occur at a suitable offsite location determined in coordination with USFWS.
- Permanent loss of 10.1 acres of San Joaquin kit fox dispersal, foraging, and potential den sites during construction and operation of the MEP site (including access road) and new transmission line will be compensated at a **3:1 ratio** (offsite preservation of grassland habitat supporting California ground squirrel burrows). Therefore, an additional 30.3 acres of San Joaquin kit fox upland habitat will be preserved at a suitable offsite location determined in coordination with USFWS.

5.4.7 Cumulative Effects

Cumulative effects on San Joaquin kit fox may occur as a result of new development projects, or during regular routine maintenance and operation of existing facilities. The MEP action area coincides with following existing facilities: PG&E 230-kV transmission line; county roads including Bruns Road and Kelso Road; BBID agricultural developments including Canal 45; and the 6.5-MW Byron Cogen Plant. Ongoing vehicular access to these facilities could kill San Joaquin kit fox, and any overland travel by PG&E to access its easements could degrade denning habitat.

There are no known proposed future developments in the action area. As described in the project's AFC (Mariposa Energy, 2009), applications for six proposed projects have been filed in the region surrounding the MEP, including both Alameda and San Joaquin counties. These projects include power generation facilities, a residential development, a motorway rezoning, and a composting facility. The nearest project is a 2-MW utility-scale solar farm, which is approximately 1 mile from the MEP site.

SECTION 6

Conclusions and Additional Notes on Offsite Compensation

6.1 Conclusions

The MEP action area is inferred to be occupied by vernal pool fairy shrimp, longhorn fairy shrimp, California red-legged frog, California tiger salamander, and San Joaquin kit fox. There are numerous historical and recent recorded occurrences of these species in the immediate vicinity of the action area. The proposed project will result in potential indirect effects to listed brachiopods and both temporary and permanent loss of dispersal habitat for California red-legged frog and California tiger salamander. In addition, construction of the MEP will result in the loss of potential San Joaquin kit fox den sites, and both temporary and permanent loss of San Joaquin kit fox foraging and dispersal habitat.

Operationally, emissions from MEP are not expected to adversely affect the listed species, either directly or indirectly. Day-to-day routine operation and maintenance activities at the MEP are expected to remain in developed areas including the new access road and facility site. Nevertheless, additional vehicular traffic traveling to and from the MEP site may result in some lethal take of listed species. Also, listed species may enter the MEP site in search for food or refuge, or during overland dispersal. For these reasons, operations staff will adhere to the applicable species conservation measures implemented during construction of the MEP.

Table 6-1 presents the total temporary and permanent construction effects of the proposed project on federally listed species habitats. Figures 5A, 5B, 5C, 5D, 5E, and 5F illustrate these affected areas and acreages.

6.2 Offsite Habitat Compensation Notes

Mariposa Energy has found potential offsite compensation opportunities for the proposed project, including USFWS-approved mitigation banks and partnerships with local resource agencies on habitat preservation/enhancement projects. At this time, no single conservation bank has mitigation credits for all the listed species potentially affected by the proposed project. Preference will be given to mitigation opportunities as close to the MEP site as possible and locations where layered mitigation is feasible for all listed species affected by the proposed project. Also, only banks whose service area encompasses the action area were considered. Therefore, the banks listed in Table 6-2 are considered applicable to the proposed project, but ultimately final approval will rest with USFWS and CDFG.

TABLE 6-1
Project Construction Effects on Listed Species Habitat
Biological Assessment for the Mariposa Energy Project

Habitat	Disturbance Type	Acreage of Temporary Effect	Acreage of Permanent Effect
Vernal pool fairy shrimp and longhorn fairy shrimp aquatic sites within 250 feet of project area	Grading, excavation, and overland access	**0.5**	**0**
California red-legged frog and California tiger salamander upland habitat	MEP site[a]	3.6	9.7
	MEP access road[b]	0	0.4
	Laydown area[c]	9.2	0
	Gas line	1	0
	Transmission line	8.5	0.01
	Water supply pipeline[d]	0.8	0.006
	Total	**23.1**	**10.1**
San Joaquin kit fox dispersal, foraging, and potential denning in all terrestrial habitats	MEP Site	3.6	9.7
	MEP access road	0	0.4
	Laydown area	9.2	0
	Gas line	1	0
	Transmission line and laydown area	8.5	0.01
	Water supply pipeline	0.8	0.006
	Total	**23.1**	**10.1**

Notes:

[a] Includes cut and fill areas
[b] Excludes existing impervious areas of gravel along existing road serving the Cogen Power Plant
[c] Laydown area will be in use for more than one construction season, but restored to pre project conditions following construction.
[d] Area of temporary effect to habitat occurs at 3 drainage crossings and along a dirt agricultural road. Area of permanent effects located at Canal 45.

TABLE 6-2
Potential Offsite Mitigation Banks
Biological Assessment for the Mariposa Energy Project

Bank Name and County	Bank Administrator	Covered Species*
Great Valley Conservation Bank at Flynn Ranch, Merced County	Wildlands, Inc. Julie Maddox, (916) 435-3555	California tiger salamander
Vieira-Sandy Mush Road Conservation Bank, Merced County	Center for Natural Lands Management Michael Stroud, (760) 731-7790	California tiger salamander
Haera Conservation Bank, Alameda County	Wildlands, Inc. Julie Maddox, (916) 435-3555	San Joaquin kit fox
Ohlone Preserve Conservation Bank, Alameda County	Robert Fletcher, (925) 447-2344	California red-legged frog

* The service area boundary of these covered species encompasses the proposed project area.

Notes:

All banks listed in this table are USFWS approved (http://www.fws.gov/sacramento/es/bank_list.htm). Only Haera Conservation Bank and Ohlone Preserve Conservation Bank are approved by CDFG (http://www.dfg.ca.gov/habcon/conplan/mitbank/catalogue/catalogue.html).

The service area boundary for California tiger salamander at the Ohlone Preserve Conservation Bank is just southwest of the MEP site.

In December 2009, Mariposa Energy contacted Julie Maddox (Wildlands, Inc.) regarding the Haera Conservation Bank. Ms. Maddox indicated that there is a potential to add California tiger salamander credits to the bank because of the presence of suitable habitat, but USFWS would be required to approve this amendment to the bank's management plan and conservation banking agreement. A project proponent seeking a significant amount of California tiger salamander mitigation acreage would give Wildlands, Inc. the incentive to issue the proposed amendments to USFWS. It is unknown at this time if the amendment process would be approved by USFWS, or settled in time to meet the offsite compensation goal of Mariposa Energy.

Mariposa Energy might also have opportunities to partner with local conservation agencies in the preservation of the listed species habitats. The Alameda County Partnership of Land Conservation and Stewardship (ACPLC) facilitates preservation and enhancement of land resources, including but not limited to wildlife habitat. Mariposa Energy contacted ACPLC to identify potential mitigation projects in the eastern part of the county that could be funded and protected in perpetuity. Any offsite compensation leads with the ACPLC will be discussed with the USFWS and CDFG for consideration. Mariposa Energy will secure offsite compensation prior to construction ground breaking activities scheduled for April 2011.

SECTION 7

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Figures

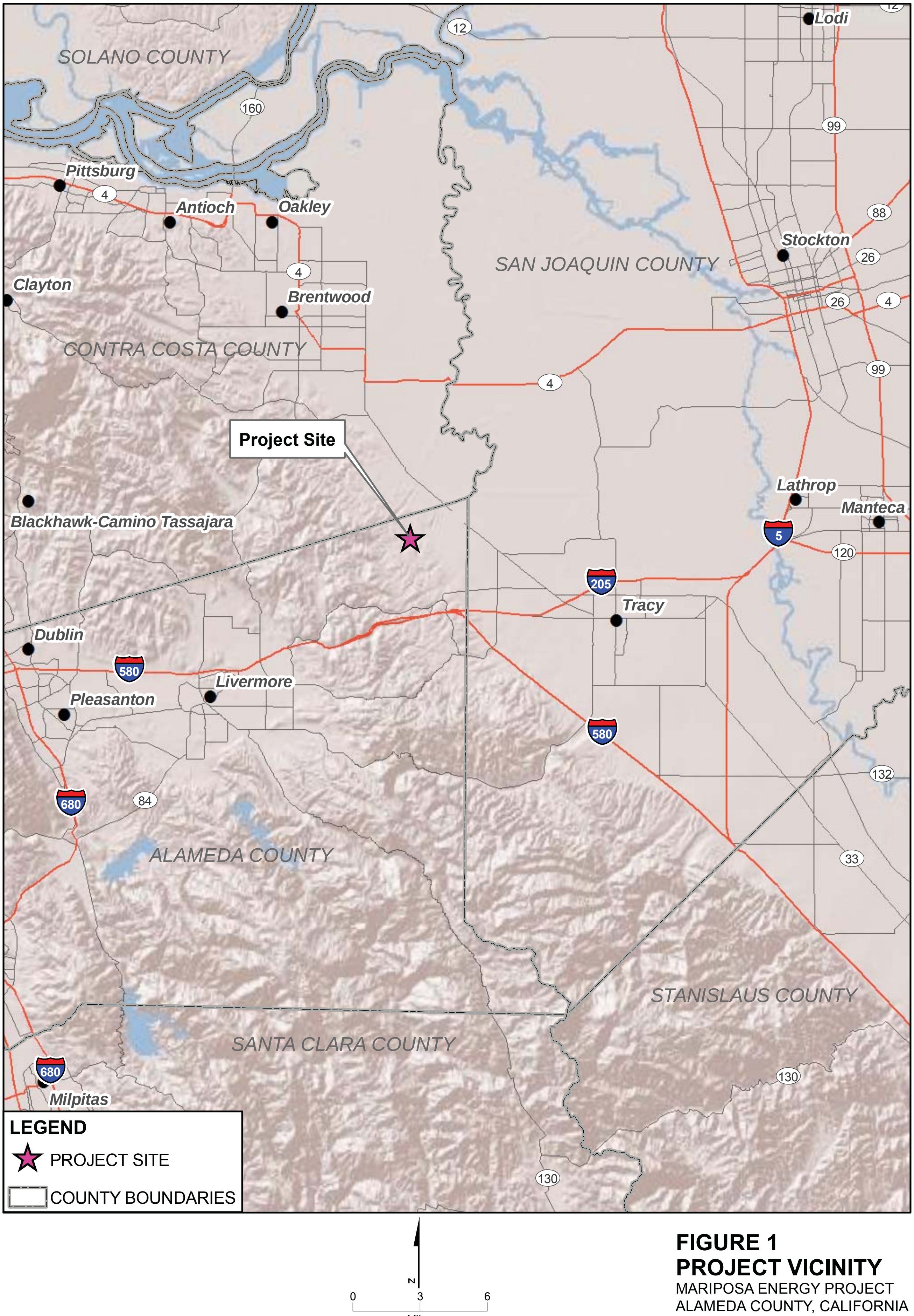

FIGURE 1
PROJECT VICINITY
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

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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
- TRANSMISSION LINE LAYDOWN 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.

N

0 750 1,500
Feet

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

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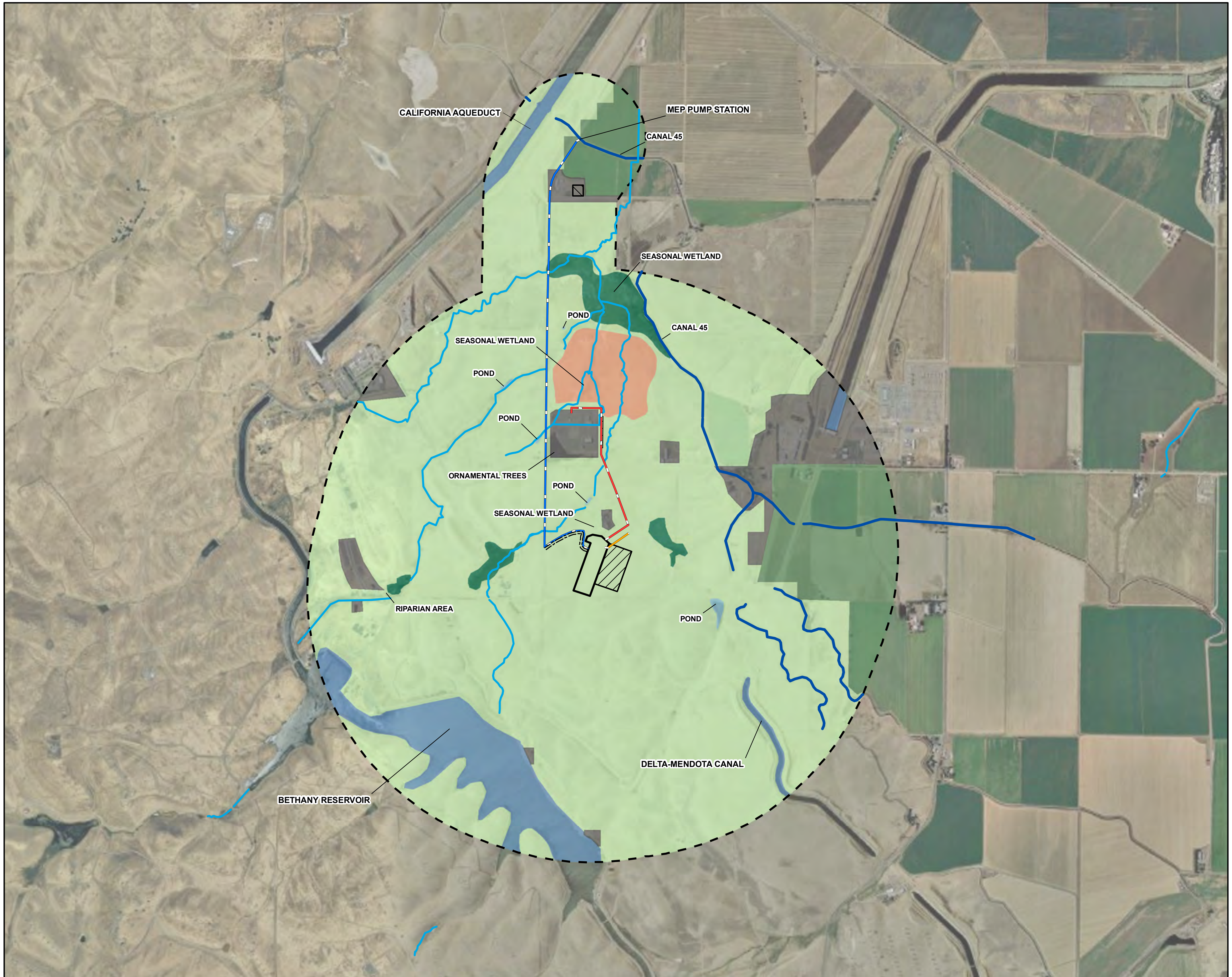

LEGEND

- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- Canal
- Drainages
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- BUFFER

HABITAT COMMUNITIES

- ALKALINE MEADOW
- GRASSLAND
- INDUSTRIAL, LANDSCAPE, URBAN
- AGRICULTURAL
- POND
- WETLANDS
- CANALS AND AQUEDUCTS

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

Note:
1. Source: CH2M HILL Biological Field Survey, 2009.
2. 1 Mile Buffer around Project Site, 1/4 Mile Buffer around waterlines.

N

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FIGURE 3
VEGETATION COMMUNITIES IN PROJECT AREA
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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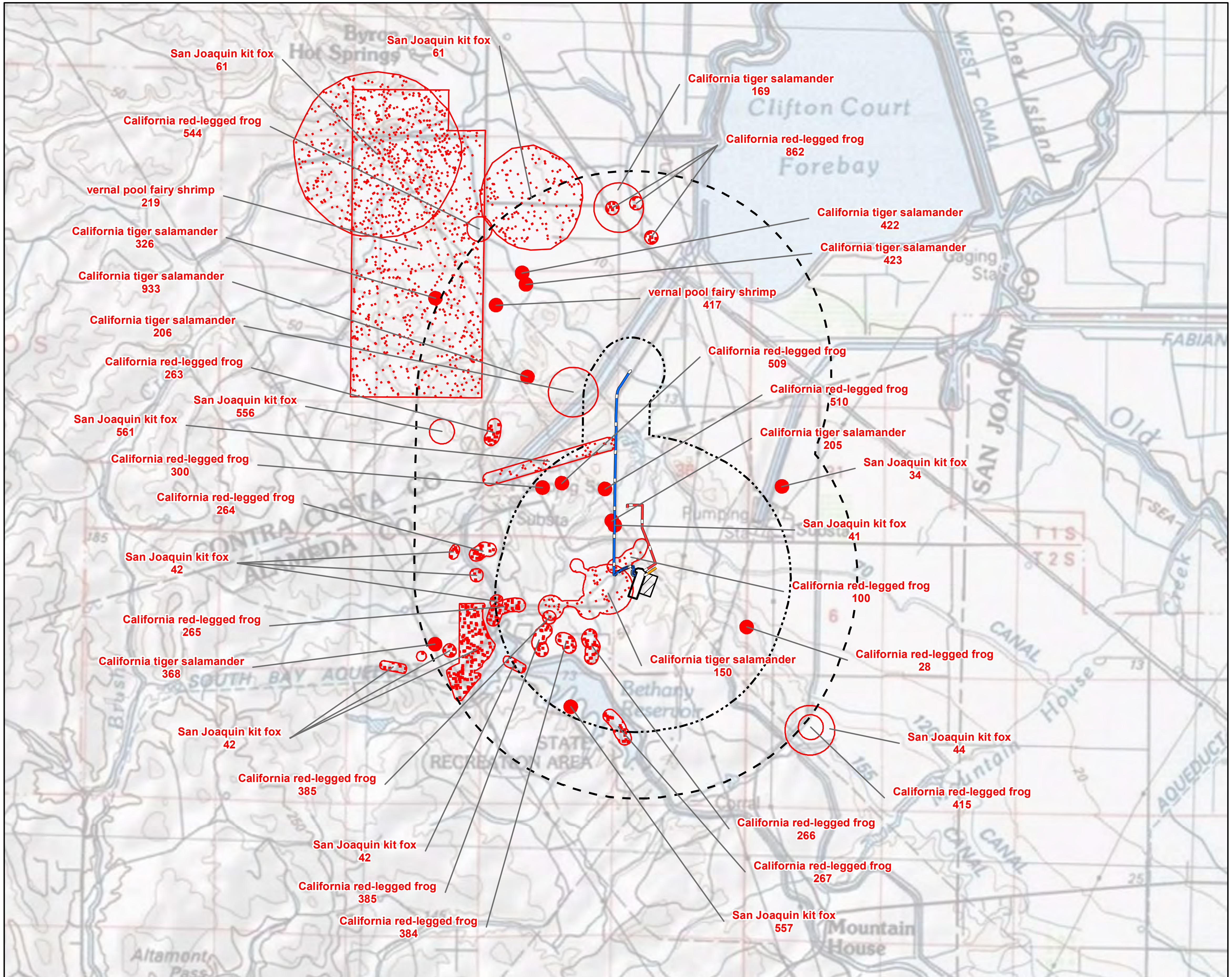

LEGEND

- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- 1.5 MILE BUFFER
- BUFFER *
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE

CNDDB DATA OCTOBER 2009

- ANIMAL (80m)
- ANIMAL (SPECIFIC)
- ANIMAL (NON-SPECIFIC)
- ANIMAL (CIRCULAR)

Note:
1. Source - California Dept. of Fish and Game, California Natural Diversity Database (CNDDB) October, 2009. Federal Listed Species Only.
2. Species name/Occurrence number which identifies a particular instance of species or community.
3. * 1 mile buffer around project site, 1/4 mile buffer around pipeline corridor.

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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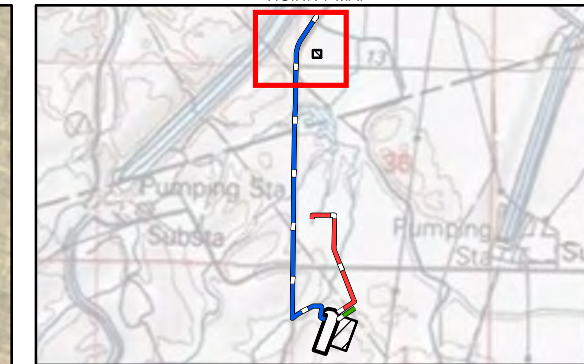
Feet

FIGURE 4
CNDDB FEDERALLY LISTED SPECIES WITHIN 1.5 MILES OF PROJECT AREA
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

VICINITY MAP



LEGEND

- PUMP STATION
- TURNOUT STRUCTURE
- NEW POWER POLE LOCATION
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT LOCATION
- DISTURBANCE AREA
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- DRAINAGE WETLAND
- KNOWN CTS BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- KNOWN CRLF BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- PERMANENT EFFECTS TO CTS AND CRLF UPLAND HABITAT
- TEMPORARY EFFECTS TO CTS AND CRLF UPLAND HABITAT

NOTE: CTS - California Tiger Salamander, CRLF - California Red-Legged Frog. The entire project area is suitable San Joaquin Kit Fox habitat.

SOURCE: Biological Surveys, 2009.

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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0 100 200
Feet

FIGURE 5A
CALIFORNIA TIGER SALAMANDER AND CALIFORNIA RED-LEGGED FROG AREA AFFECTS

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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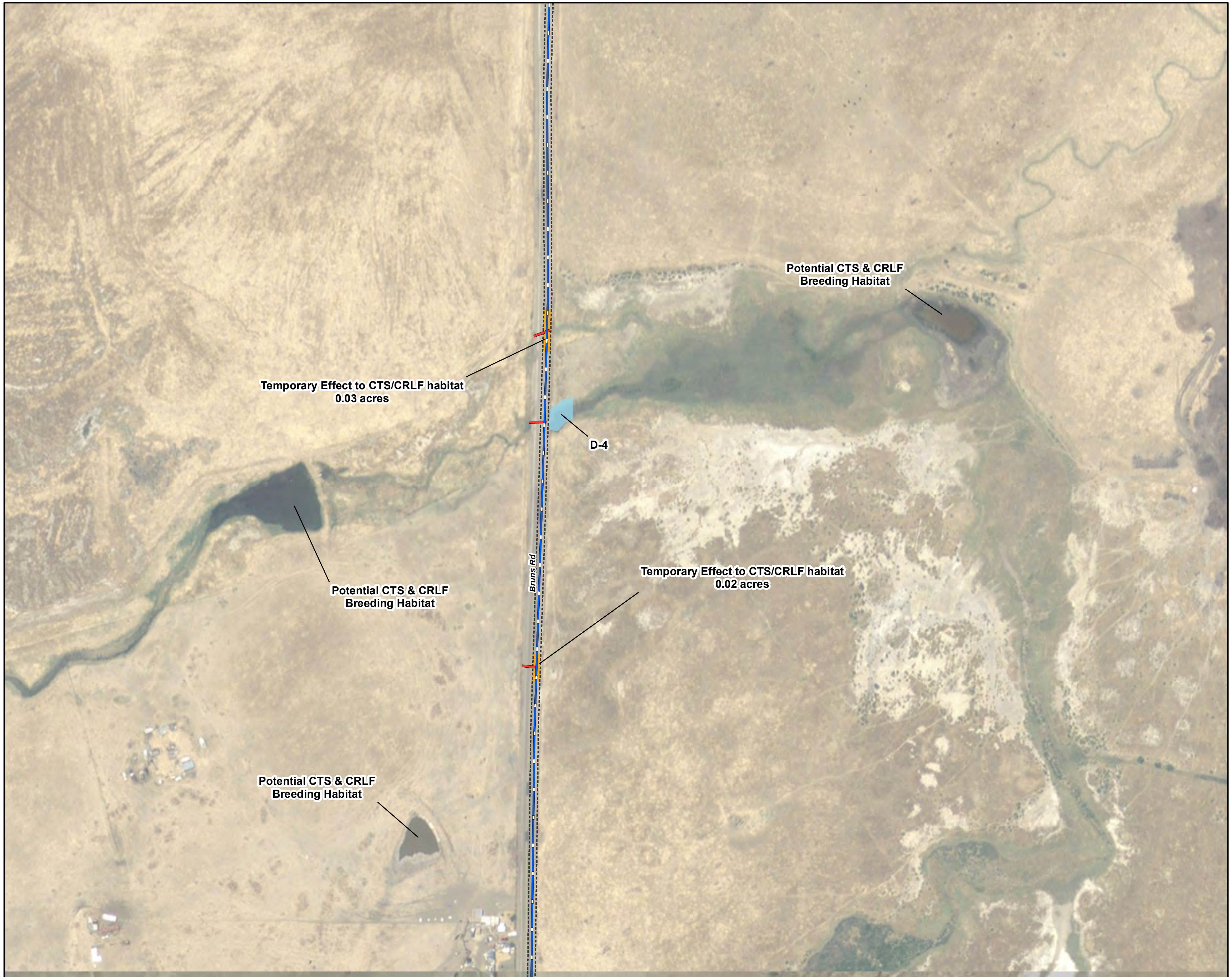

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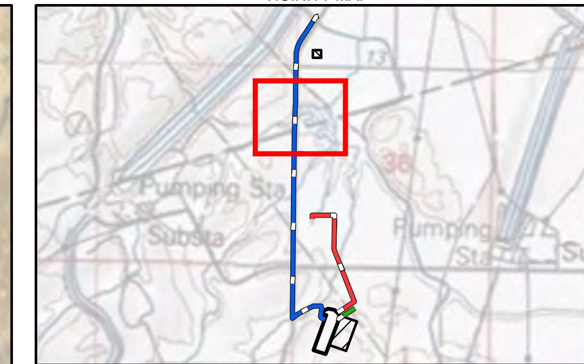


LEGEND

- PUMP STATION
- TURNOUT STRUCTURE
- NEW POWER POLE LOCATION
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT LOCATION
- DISTURBANCE AREA
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- DRAINAGE WETLAND
- KNOWN CTS BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- KNOWN CRLF BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- PERMANENT EFFECTS TO CTS AND CRLF UPLAND HABITAT
- TEMPORARY EFFECTS TO CTS AND CRLF UPLAND HABITAT

NOTE: CTS - California Tiger Salamander, CRLF - California Red-Legged Frog. The entire project area is suitable San Joaquin Kit Fox habitat.

SOURCE: Biological Surveys, 2009.

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

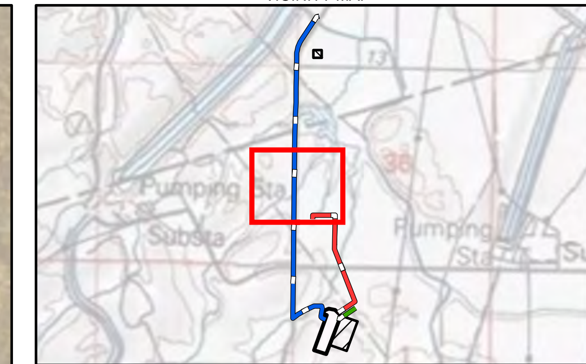
0 100 200
Feet

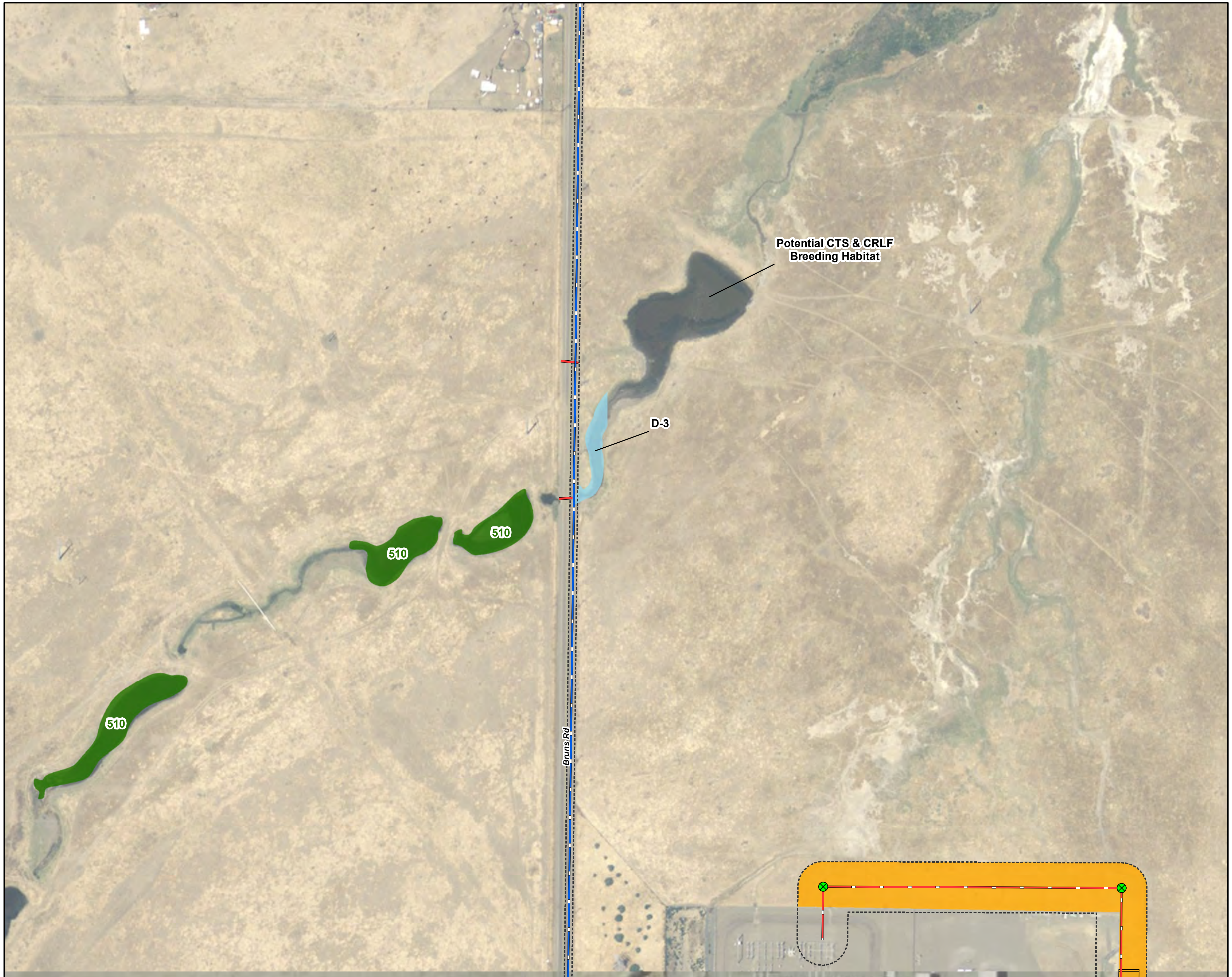
FIGURE 5B
CALIFORNIA TIGER SALAMANDER AND CALIFORNIA RED-LEGGED FROG AREA AFFECTS

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

VICINITY MAP





LEGEND

- PUMP STATION
- TURNOUT STRUCTURE
- NEW POWER POLE LOCATION
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT LOCATION
- DISTURBANCE AREA
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- DRAINAGE WETLAND
- KNOWN CTS BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- KNOWN CRLF BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- PERMANENT EFFECTS TO CTS AND CRLF UPLAND HABITAT
- TEMPORARY EFFECTS TO CTS AND CRLF UPLAND HABITAT

NOTE: CTS - California Tiger Salamander, CRLF - California Red-Legged Frog. The entire project area is suitable San Joaquin Kit Fox habitat.

SOURCE: Biological Surveys, 2009.

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

0 100 200
Feet

FIGURE 5C
CALIFORNIA TIGER SALAMANDER AND CALIFORNIA RED-LEGGED FROG AREA AFFECTS

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

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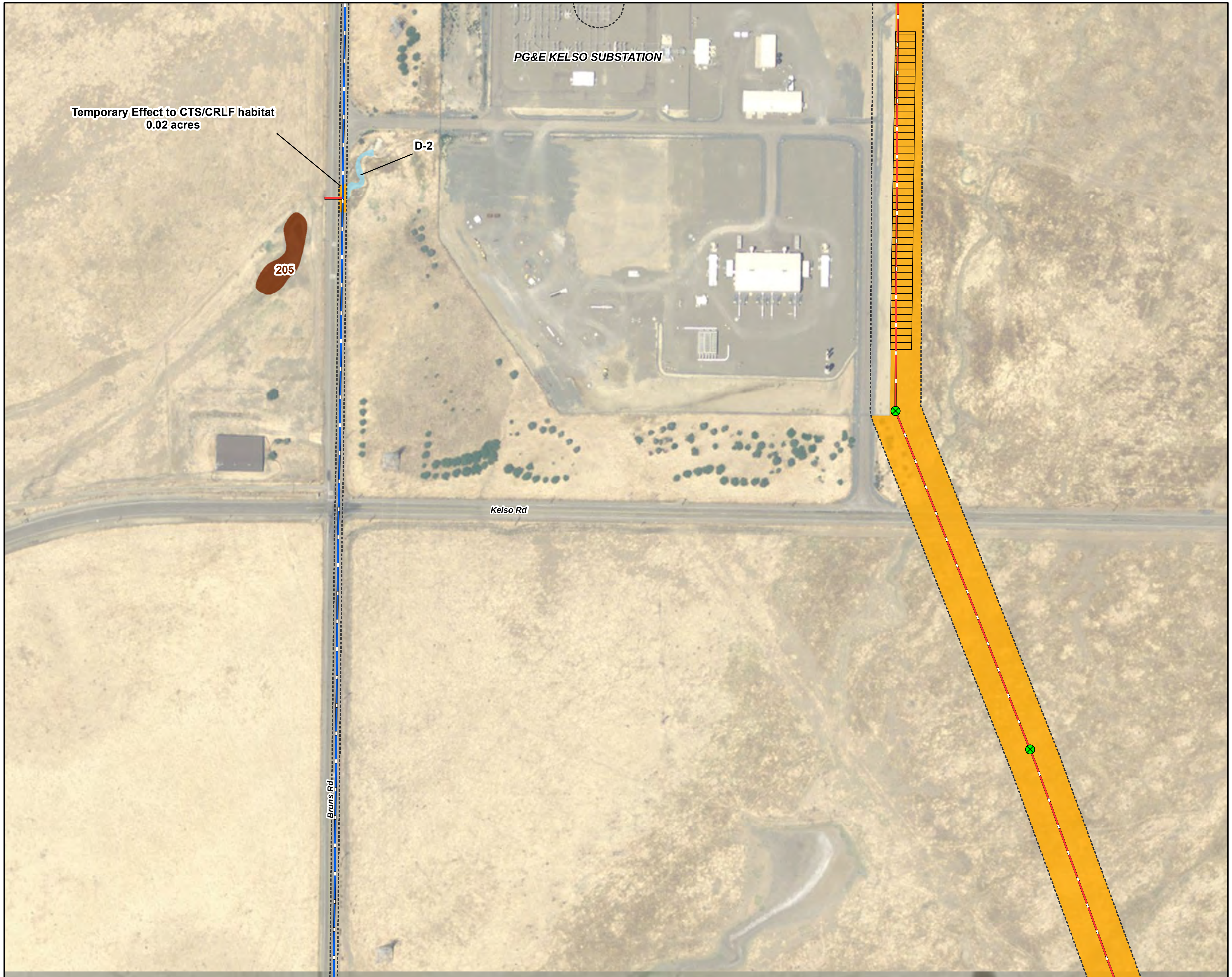
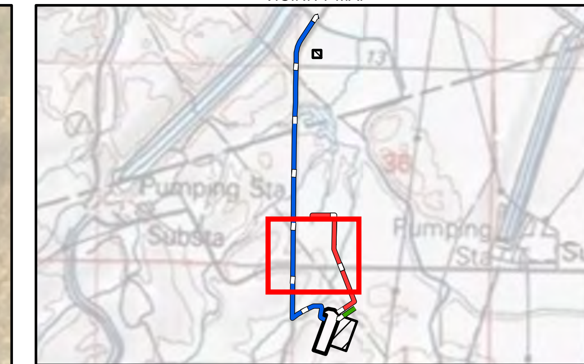


VICINITY MAP



LEGEND

- PUMP STATION
- TURNOUT STRUCTURE
- NEW POWER POLE LOCATION
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT LOCATION
- DISTURBANCE AREA
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- DRAINAGE WETLAND
- KNOWN CTS BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- KNOWN CRLF BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- PERMANENT EFFECTS TO CTS AND CRLF UPLAND HABITAT
- TEMPORARY EFFECTS TO CTS AND CRLF UPLAND HABITAT

NOTE: CTS - California Tiger Salamander, CRLF - California Red-Legged Frog. The entire project area is suitable San Joaquin Kit Fox habitat.

SOURCE: Biological Surveys, 2009.

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

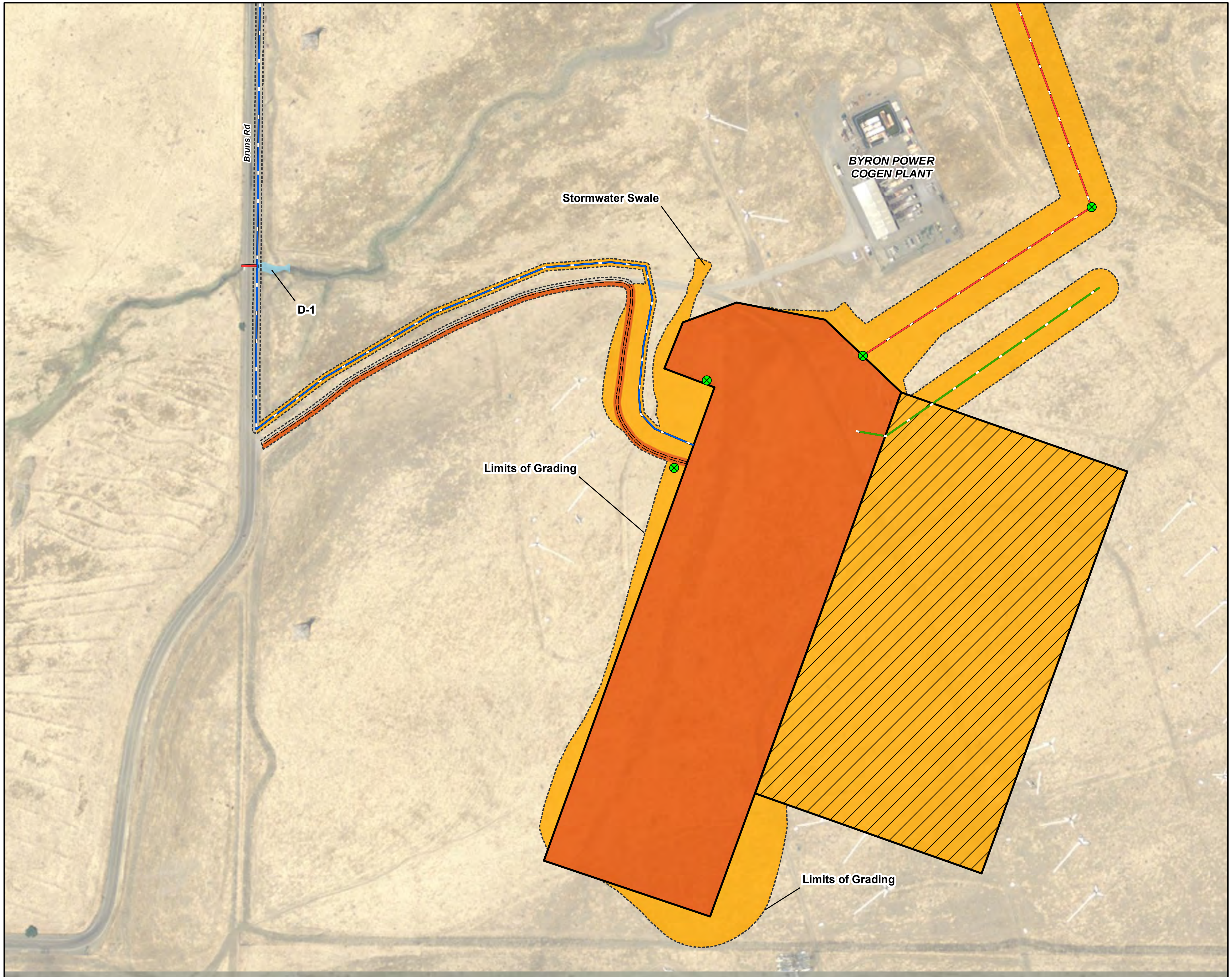
N

0 100 200
Feet

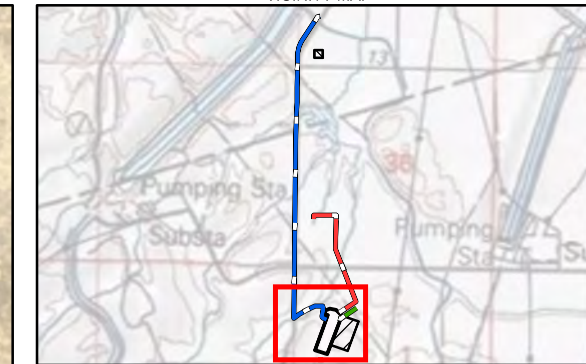
FIGURE 5D
CALIFORNIA TIGER SALAMANDER AND CALIFORNIA RED-LEGGED FROG AREA AFFECTS

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL



VICINITY MAP



LEGEND

- PUMP STATION
- TURNOUT STRUCTURE
- NEW POWER POLE LOCATION
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CULVERT LOCATION
- DISTURBANCE AREA
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- DRAINAGE WETLAND
- KNOWN CTS BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- KNOWN CRLF BREEDING HABITAT/CNDDB OCCURRENCE NUMBER
- PERMANENT EFFECTS TO CTS AND CRLF UPLAND HABITAT
- TEMPORARY EFFECTS TO CTS AND CRLF UPLAND HABITAT

NOTE: CTS - California Tiger Salamander, CRLF - California Red-Legged Frog. The entire project area is suitable San Joaquin Kit Fox habitat.

SOURCE: Biological Surveys, 2009.

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

0 100 200
Feet

FIGURE 5E
CALIFORNIA TIGER SALAMANDER AND CALIFORNIA RED-LEGGED FROG AREA AFFECTS

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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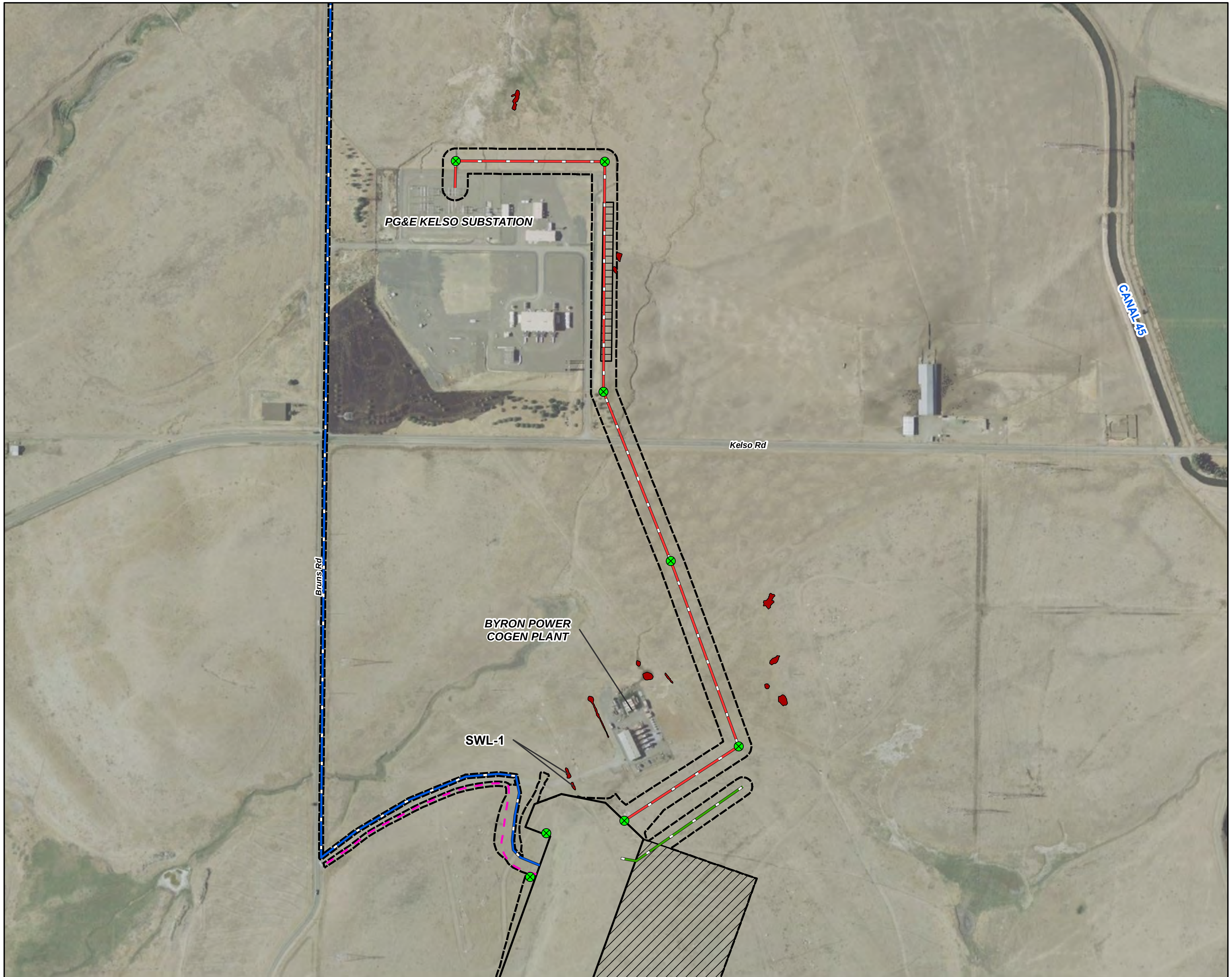
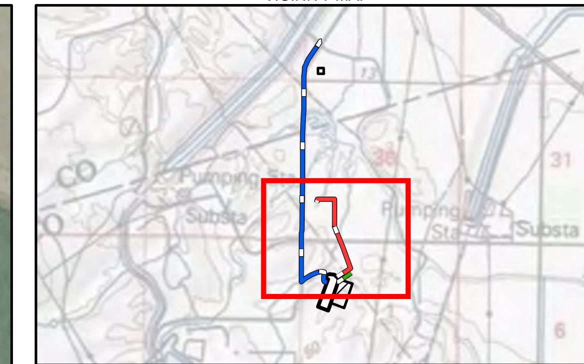
CH2MHILL



VICINITY MAP



LEGEND

- NEW POWER POLE LOCATION
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- TEMPORARY INDIRECT EFFECTS TO BRANCHIOPOD BREEDING HABITAT
- DISTURBANCE AREA
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- PROJECT SITE

NOTE:
Habitat within 250 feet of Project Area may support longhorn fairy shrimp and vernal pool fairy shrimp.

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

0 200 400
Feet

FIGURE 5F
BRANCHIOPOD AREA AFFECTS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\BRANCHIOPODSIMPACTS.MXD MHASKELL 2/4/2010 17:01:09

Appendix A
Site Photographs

#1: Photograph taken April 8, 2009, facing northeast. Existing parcel gravel access road servicing the 6.5 MW Byron Cogen Power Plant. This road will be widened and paved during MEP construction.

#2: Photograph taken April 8, 2009, facing south. Representative view of the proposed MEP site.

#3: Photograph taken April 8, 2009, facing north. Representative view of the proposed 9.2 acre temporary laydown yard and parking area.

#4: Photograph taken February 19, 2009, facing north. The 6.5 MW Byron Cogen Power Plant is shown on the right side. The inundated seasonal wetland (SWL-1) shown near the center of this photograph supports *Branchinecta* species.

#5: Photograph taken December 31, 2008, facing southeast. Inundated depression located near northeast corner of the 6.5 MW Byron Cogen Power Plant. California fairy shrimp (*Linderiella occidentalis*) observed in this seasonal pool on November 2, 2009.

#6: Photograph taken April 8, 2009, facing east. Representative view of the proposed natural gas pipeline route. The 6.5 MW Byron Cogen Power Plant is on the left side of this photograph.

#7: Photograph taken April 8, 2009, facing south. Representative view of the proposed transmission line route. The 6.5 MW Byron Cogen Power Plant is in the background.

#8: Photograph taken November 2, 2009, facing north. The temporary staging area for the MEP transmission line will be along the chain link fence in the background. A continuation of D-1 is shown here in the foreground. Moderate to heavy cattle grazing occurs on this property.

#9: Photograph taken April 8, 2009, facing west. This area is located on the north side of PG&E's Kelso Substation, a location where the MEP transmission line will interconnect with the existing power grid.

#10: Photograph taken February 19, 2009, facing north. Representative view of the proposed water supply pipeline route along Bruns Road.

#11: Photograph taken November 2, 2009, facing north. Representative view of the proposed water supply pipeline route along Bruns Road. A known breeding site for California tiger salamander shown here on the left (west) side of Bruns road. The stock pond is associated with D-2 (**Photo #13**).

#12: Photograph taken on February 19, 2009, facing west. Ephemeral drainage (D-1) at Bruns Road along the water supply pipeline route. D-1 provides suitable dispersal habitat for California red-legged frog and California tiger salamander.

#13: Photograph taken on February 19, 2009, facing north. Ephemeral drainage (D-2) at Bruns Road along the water supply pipeline route. D-2 provide suitable dispersal habitat for California red-legged frog and California tiger salamander. A pond located just upstream of this location (**Photo #11**) is known for California tiger salamander breeding.

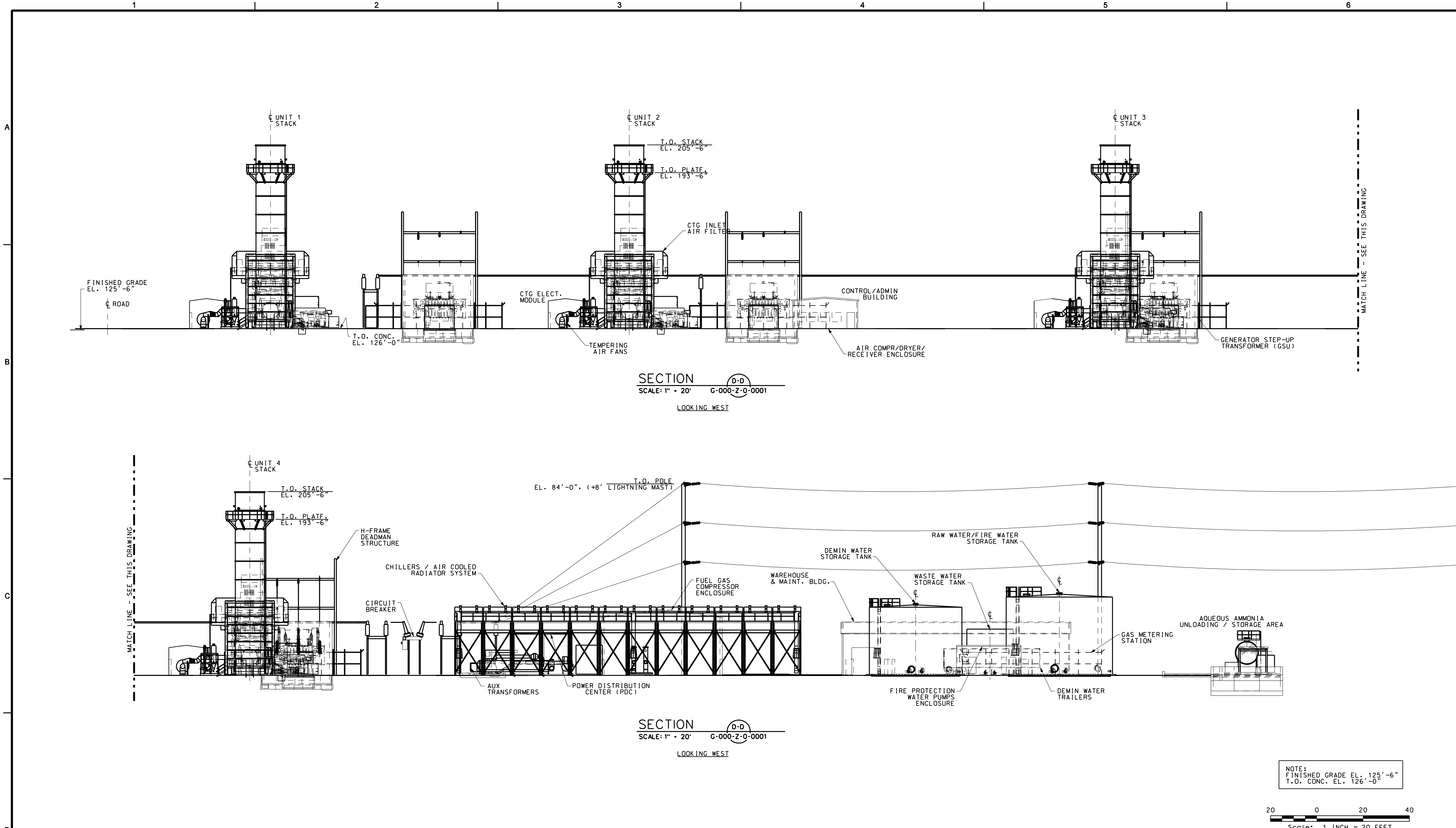
#14: Photograph taken on April 8, 2009, facing north. Ephemeral drainage (D-3) at Bruns Road along the water supply pipeline route. D-3 provides suitable foraging and dispersal habitat for California red-legged frog and California tiger salamander. A seasonal pond shown in the background provides potential breeding habitat for these species.

#15: Photograph taken on February 19, 2009, facing north. Ephemeral drainage (D-4) and seasonal marsh at Bruns Road along the water supply pipeline route. D-4 provides suitable foraging and dispersal habitat for California red-legged frog and California tiger salamander. The depth of ordinary high water at this location is less than 6 inches.

#16. Photograph taken April 8, 2009, facing south. The first 1000 feet of the MEP water supply pipeline will be installed within this BBID agricultural road.

#17: Photograph taken on February 19, 2009, facing southeast. The water supply line begins at this location, the Byron Bethany Irrigation District's Canal 45. The MEP pump house and concrete turnout structure will be adjacent to the existing building and intake structures.

Appendix B
Design Drawings



NO.	DATE	REVISION	BY	CHK
A	02/16/09	ISSUED FOR REVIEW	SR	
B	04/09/09	REVISED CHILLER AIR COOLED CONDENSER	SR	
C	4/27/09	RECONFIGURED POWER ISLANDS AND BOP EQUIPMENT LOCATIONS	EC	
	/ /			
	/ /			
	/ /			
	/ /			
	/ /			

RESPONSIBLE ENGINEER

PE #

REVISION APPROVAL		REV C	DATE 04/29/09
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL		ELECTRICAL	
STRUCTURAL		INST & CONT.	
MECHANICAL		ARCH.	
PROCESS		GEN. ARRANG.	
PIPING			

ISSUED	REV	DATE	DM	SDE	PEM
PRELIMINARY		/ /			
FOR REVIEW AND APPROVAL	C	04/29/09			
APPROVED FOR CONSTRUCTION		/ /			
REVISED & APPROVED FOR CONSTRUCTION		/ /			

STATUS

SCALE 1" = 20'

Diamond Generating Corporation
A Subsidiary of Mitsubishi Corporation

Mariposa Energy Project

PROJECT NO. 383206

CH2MHILL
CH2MHILL Engineers

GENERAL ARRANGEMENT
SECTION D-D
(4) GE LM 6000 PC SPRINT
COMBUSTION TURBINE GENERATORS

DWG. NO. G-000-H-0-0005 REV. C

BAR IS ONE INCH ON ORIGINAL DRAWING.
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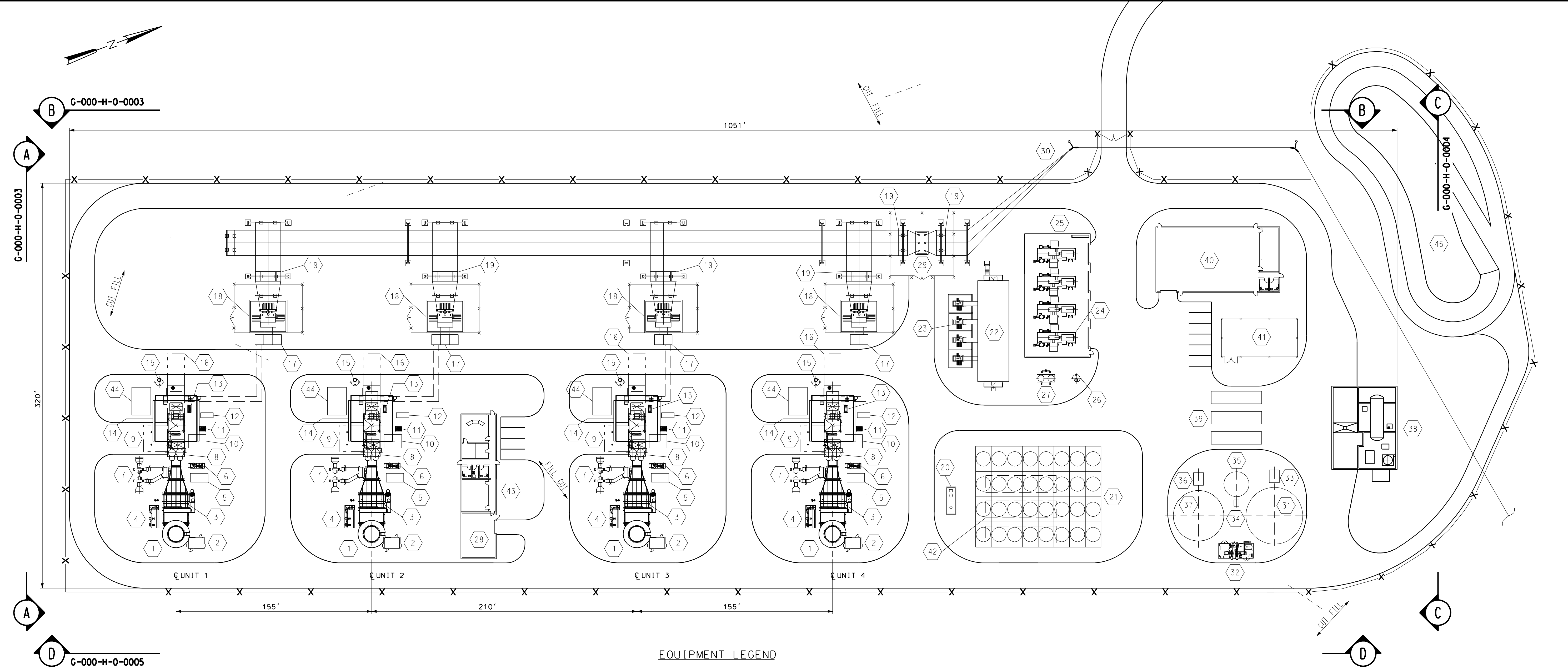

EQUIPMENT LEGEND

1. EXHAUST STACK
2. CEMS STATION
3. SCR/CO CATALYST
4. AMMONIA INJECTION SKID
5. LUBE OIL FIN FAN COOLER
6. WATER INJECTION SKID
7. TEMPERING AIR FANS
8. GAS TURBINE GENERATOR (CTG)
9. TURBINE REMOVAL AREA
10. AUXILIARY SKID
11. SPRINT SKID
12. FINAL GAS FUEL FILTER
13. CO2 BOTTLE STORAGE
14. CTG INLET AIR FILTER
15. WATER WASH DRAINS TANK
16. ROTOR PULL SPACE
17. SWGR. GENERATOR BREAKER (TYP OF 2 UNITS)
18. GENERATOR STEP-UP TRANSFORMER (GSU)
19. DISCONNECT
20. OIL/WATER SEPARATOR
21. CHILLER/AIR COOLED RADIATOR SYSTEM
22. POWER DISTRIBUTION CENTER (PDC)
23. AUX TRANSFORMERS
24. FUEL GAS COMPRESSORS
25. FUEL GAS COMPRESSOR ENCLOSURE
26. FUEL GAS WASTE SUMP
27. FUEL GAS COALESCING FILTERS
28. AIR COMPR/DRYER/RECEIVER ENCLOSURE
29. CIRCUIT BREAKER
30. OVERHEAD POWER LINES
31. 45' DIA. RAW WATER/FIRE WATER STORAGE TANK
32. FIRE PROTECTION WATER PUMPS
33. RAW WATER TRANSFER PUMPS
34. WASTE WATER TRANSFER PUMPS
35. 25' DIA. WASTE WATER STORAGE TANK
36. DEMIN WATER TRANSFER PUMPS
37. 40' DIA. DEMIN WATER STORAGE TANK
38. AQUEOUS AMMONIA UNLOADING/STORAGE AREA
39. DEMIN WATER TRAILERS
40. WAREHOUSE & MAINT. BUILDING
41. GAS METERING STATION
42. CHILLER SKIDS (3)
43. CONTROL/ADMIN. BUILDING
44. CTG ELECT. MODULE
45. RETENTION POND

NOTE:
FINISHED GRADE EL. 125'-6"
T.O. CONC. EL. 126'-0"

40 0 40 80
Scale: 1 INCH = 40 FEET

NO.	DATE	REVISION	BY	CHK
A	2/10/09	ISSUED FOR REVIEW	SR	
B	2/16/09	REVISED ITEM 32, RELOCATED ITEMS 34,35 & ADDED SECTION CUTS	SR	
C	2/23/09	ADDED CONFERENCE ROOM TO CONTROL / ADMIN BLDG.	SR	
D	4/01/09	REVISED ITEMS 21 & 42, RELOCATED ITEMS 22,23 & 40 & REROUTED ACCESS ROAD	SR	
E	4/22/09	RECONFIGURED POWER ISLAND AND B.O.P. EQUIPMENT LOCATIONS, ADDED CUT & FILL LINE	EC	
F	11/23/09	RECONFIGURED CHILLER FAN CELLS AND OIL/WATER SEPARATOR	EC	
	/ /			
	/ /			

RESPONSIBLE ENGINEER
PE #

REVISION APPROVAL — REV F — DATE 11/23/09

DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL		ELECTRICAL	
STRUCTURAL		INST & CONT.	
MECHANICAL		ARCH.	
PROCESS		GEN. ARRANG.	
PIPING			

STATUS

ISSUED	REV	DATE	DM	SDE	PEM
PRELIMINARY		/ /			
FOR REVIEW AND APPROVAL	F	11/23/09			
APPROVED FOR CONSTRUCTION		/ /			
REVISED & APPROVED FOR CONSTRUCTION		/ /			

SCALE 1" = 40'

Diamond Generating Corporation
A Subsidiary of Mitsubishi Corporation

Mariposa Energy Project

PROJECT NO. 383206

CH2MHILL
CH2MHILL Engineers

GENERAL ARRANGEMENT
EQUIPMENT PLAN
(4) GE LM 6000 PC SPRINT
COMBUSTION TURBINE GENERATORS

DWG. NO. G-000-Z-0-0001 REV. F

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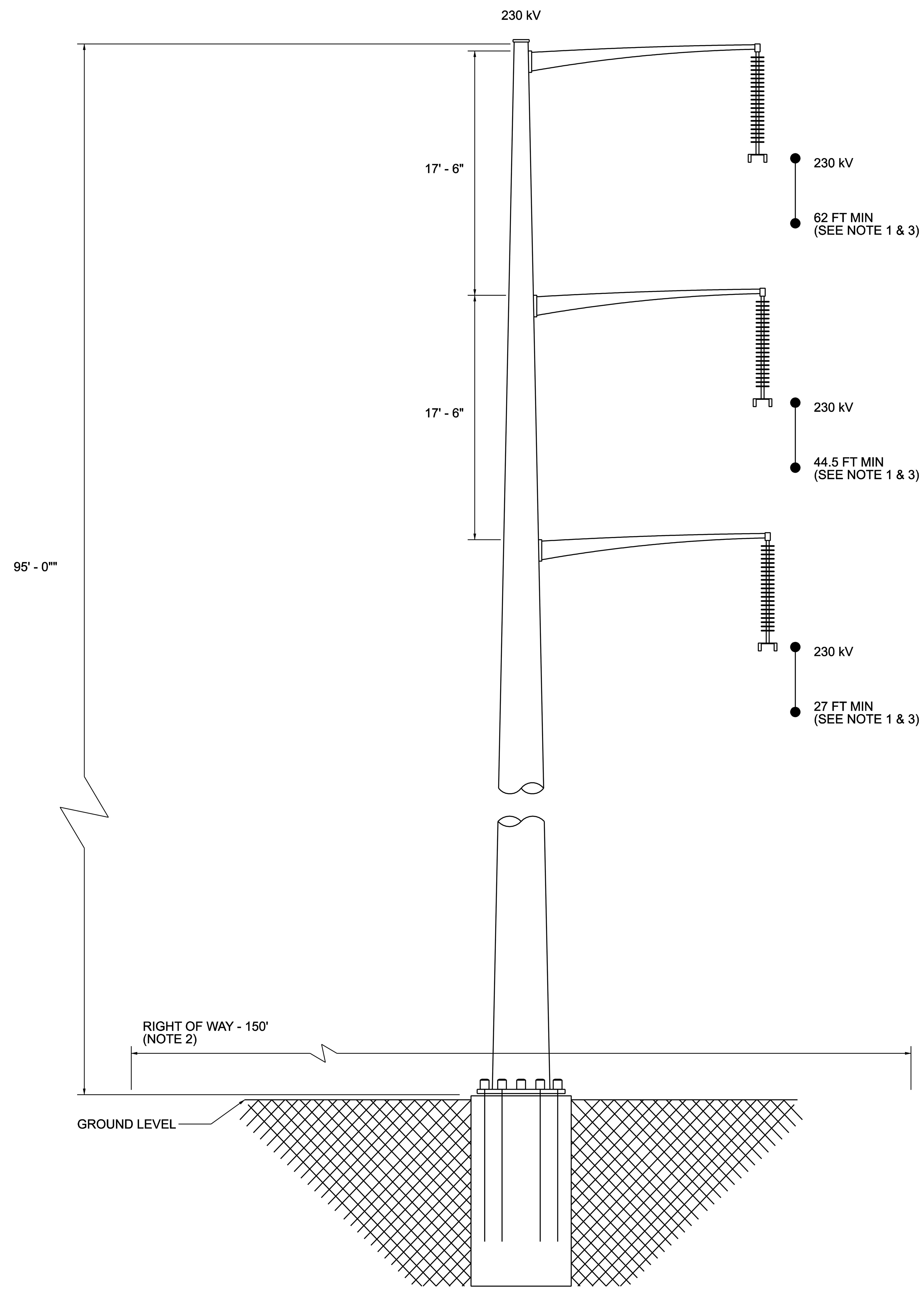

NOTES:

1. HEIGHTS ASSOCIATED TO EACH CABLE CORRESPOND TO THE DISTANCE BETWEEN THE LOWEST POINT ON THE CABLE TO THE EARTH.
2. RIGHT OF WAY WILL TYPICALLY BE 150 FEET WIDE. RIGHT OF WAY REQUIREMENTS MAY VARY FROM THE 150 FOOT WIDTH DEPENDING ON EXISTING FACILITIES OR OTHER CO-LOCATION OPPORTUNITIES.
3. CONDUCTOR SHALL BE: ACSR, DRAKE, 795 KCMILS WITH A CAPACITY OF 922A.

RESPONSIBLE ENGINEER
PE #

NO.	DATE	REVISION	BY	CHK
A	07/15/09	ISSUED FOR REVIEW	ET	PC
B	07/21/09	ADDED NOTES 2.3. & DIMENSIONS	ET	PC

REVISION APPROVAL — REV B — DATE 07/21/09

DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL		ELECTRICAL	
STRUCTURAL		INST & CONT.	
MECHANICAL		ARCH.	
PROCESS		GEN. ARRANG.	
PIPING			

STATUS

ISSUED	REV	DATE	DM	SDE	PEM
PRELIMINARY					
FOR REVIEW AND APPROVAL	B	07/21/09		PJC	
APPROVED FOR CONSTRUCTION					
REVISED & APPROVED FOR CONSTRUCTION					

SCALE NONE

Diamond Generating Corporation
A Subsidiary of Mitsubishi Corporation

Mariposa Energy Project

PROJECT NO. 383206

CH2MHILL
CH2MHILL Engineers

ELECTRICAL
230KV MONOPOLE STRUCTURE

DWG. NO. E-000-0-0001-SKE REV. B

BAR IS ONE INCH ON ORIGINAL DRAWING.
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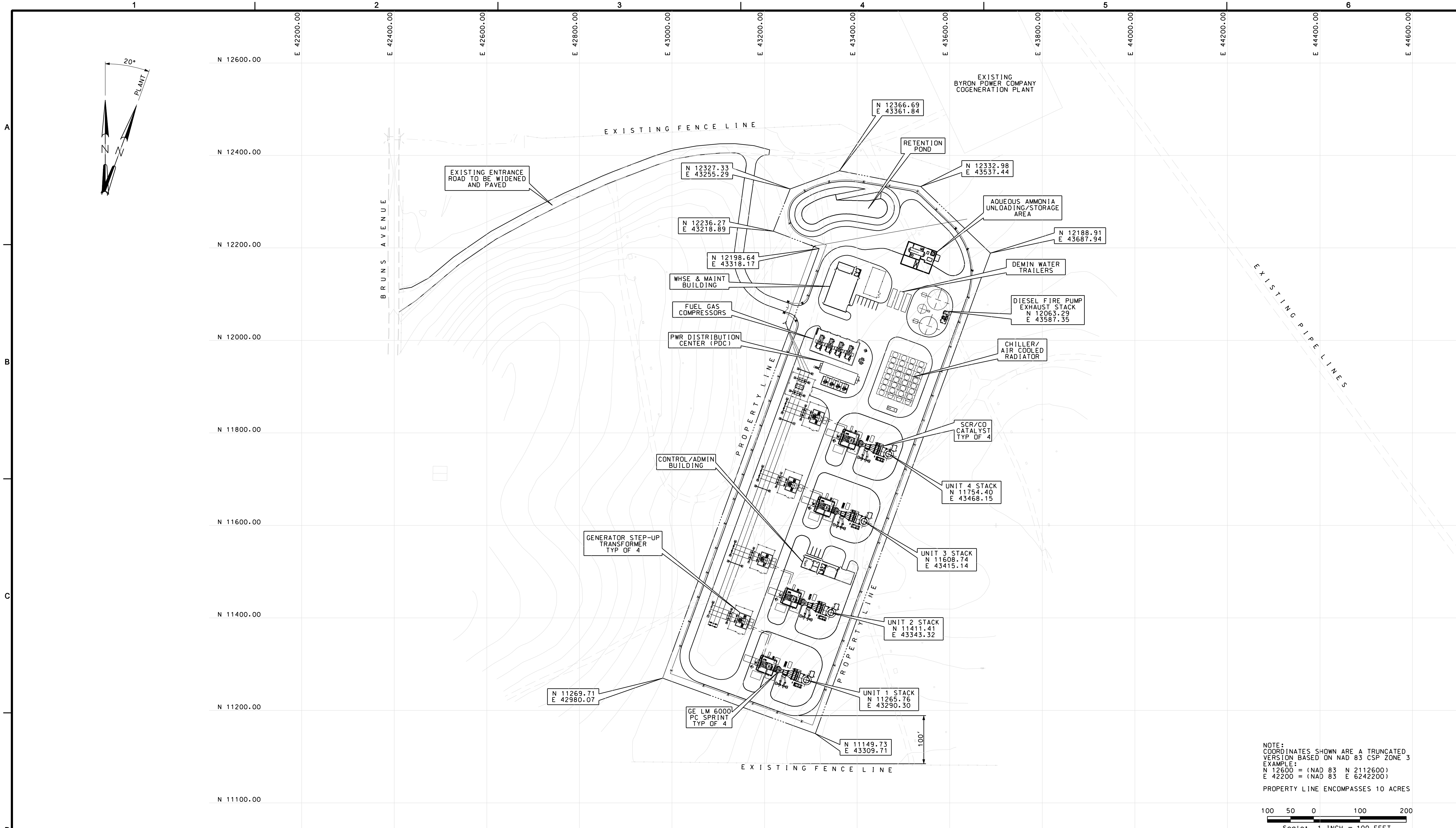

RESPONSIBLE ENGINEER

PE #

NO.	DATE	REVISION	BY	CHK
A	2/10/09	ISSUED FOR REVIEW	SR	
B	2/16/09	ADDED DIESEL FIRE PUMP EXHAUST STACK COORDINATES & PROPERTY LINE COORDINATES	SR	
C	2/25/09	ADDED CONFERENCE ROOM TO CNTRL/ADMIN BLDG & REVISED PROPERTY LINE COORDINATES	SR	
D	4/06/09	REVISED CHILLER ACC & SW NORTHING COORDINATE 11269.71 WAS 11260.71	SR	
E	4/23/09	RECONFIGURED POWER ISLAND AND BOP EQUIPMENT LOCATIONS AND COORDINATES	EC	
F	11/23/09	RECONFIGURED CHILLER FAN CELLS AND OIL / WATER SEPARATOR	EC	
	/ /			
	/ /			

REVISION APPROVAL — REV F — DATE 11/23/09

DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL		ELECTRICAL	
STRUCTURAL		INST & CONT.	
MECHANICAL		ARCH.	
PROCESS		GEN. ARRANG.	
PIPING			

STATUS

ISSUED	REV	DATE	DM	SDE	PEM
PRELIMINARY		/ /			
FOR REVIEW AND APPROVAL	F	11/23/09			
APPROVED FOR CONSTRUCTION		/ /			
REVISED & APPROVED FOR CONSTRUCTION		/ /			

SCALE 1" = 100'

Diamond Generating Corporation
A Subsidiary of Mitsubishi Corporation

Mariposa Energy Project

PROJECT NO. 383206

CH2MHILL
CH2MHILL Engineers

GENERAL ARRANGEMENT
SITE PLAN
(4) GE LM 6000 PC SPRINT
COMBUSTION TURBINE GENERATORS

DWG. NO. G-000-Z-0-0002 REV. F

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

FILENAME: $FILENAME PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME

Appendix C
Rare Plant Report

Rare Plant Survey Report for the Mariposa Energy Project

Prepared for

Mariposa Energy, LLC

November 2009

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Executive Summary

Botanical surveys for the proposed Mariposa Energy Project (MEP) in unincorporated Alameda County were conducted during the spring and summer of 2009. MEP would be located approximately 10 miles northwest of the city of Tracy and would consist of a natural gas-fired, simple-cycle electrical generating facility with a generating capacity of 200 megawatts. The survey area included the proposed facility site as well as an adjacent laydown area and associated project linear features including natural gas and water supply pipelines, a transmission line to the Pacific Gas and Electric Company Kelso Substation, and an alternate water supply pipeline route from the Mountain House Community Services District wastewater treatment plant. Surveys for special-status plants were completed in April, May, and August following established protocols and methodology. No rare, threatened, or endangered plants were observed in the project study area. One special-status plant, heartscale (*Atriplex cordulata*), was observed north of the proposed transmission line alignment, on the east side of Bruns Road, in an alkaline meadow north of the Kelso Substation.

Contents

Acronyms and Abbreviations

BBID	Byron Bethany Irrigation District
BIOS	Biogeographic Information and Observation System
CDFG	California Department of Fish and Game
CNDDB	California Natural Diversity Database
HUC	Hydrologic Unit Code
MHCSD	Mountain House Community Service District
kV	kilovolt
MEP	Mariposa Energy Project
NRCS	Natural Resource Conservation Service
PG&E	Pacific Gas and Electric Company
USFWS	United States Fish and Wildlife Service
WRCC	Western Region Climate Center
WWTP	Wastewater treatment plant

SECTION 1.0

Introduction

Mariposa Energy, LLC proposes to construct, own, and operate an electrical generating plant in unincorporated Alameda County, California. The Mariposa Energy Project (MEP) will be a natural gas-fired, simple-cycle electrical generating facility rated at a nominal generating capacity of 200 megawatts.

This report present the results of botanical surveys for rare, threatened, and endangered plant species conducted for the proposed project. Information on the project location and environmental setting are provided below, study methods and results are provided in the following sections.

1.1 Project Location

The MEP site is located in northeastern Alameda County, approximately 10 miles northwest of Tracy, 12 miles northeast of Livermore and 12 miles southeast of Brentwood (Figure 1-1). The site is located in the northwest 1/4 of Section 1, Township 02 south, Range 03 east (Mount Diablo Base and Meridian) in the Clifton Court Forebay United States Geological Survey 7.5-minute quadrangle. The facility will be located southeast of the intersection of Bruns Road and Kelso Road. MEP would occupy approximately 10 acres of a 158-acre parcel, located immediately south of Pacific Gas and Electric Company's (PG&E) Bethany Compressor Station and 230-kilovolt (kV) Kelso Substation (Figure 1-2). The assessor's parcel number is 099B-7050-001-10. The center of the project site is located at 37° 47′ 23.86″ north latitude and 121° 36′ 06.35″ west longitude.

Linear features associated with the project include a transmission line, natural gas pipeline, and water supply pipeline (Figure 1-2). MEP will interconnect to the Kelso Substation via a new 0.7-mile, 230-kV transmission line that will run north on the project parcel, then across Kelso Road and into the existing substation. The natural gas pipeline will consist of approximately 580 feet of new 4-inch-diameter pipe that will run directly northeast from the project site to interconnect with PG&E's high-pressure natural gas pipeline, which is located on the parcel. A new gas metering station will be constructed on the MEP site. Service water will be provided from a new connection to the Byron Bethany Irrigation District (BBID) via a new pump station and a 6-inch-diameter, 1.8-mile-long pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the project site. An alternative water supply pipeline route extending from the project site to the Mountain House wastewater treatment plant (WWTP) was also included in the botanical study area. The alternate water line would extend to the northeast across the project parcel and continue approximately 2.5 miles east along Kelso Road to the Byron Highway. The alignment would then continue to the southeast along the highway for 2.3 miles to Wicklund Road where it would then continue directly north to the WWTP facility (Figure 1-3).

1.2 Environmental Setting

MEP is located at the northeastern edge of the Eastern Hills subsection of the Central Valley Coast Range Ecological Subregion (Miles and Goudey, 1998), immediately bordering the alluvial plain of the San Joaquin Valley to the east. Regionally, the landscape is characterized by low foothills along the northeastern edge of the Diablo Range. In the vicinity of the MEP site the landscape is characterized by a series of gently rolling hills to the south and west with low terraces to the north and east. Elevation ranges from approximately 75 to 175 feet above mean sea level with slopes between approximately 2 to 12.5 percent. Drainage is generally to the east and north. The following sections provide a description of the general habitats, climate, regional hydrology, and soils.

1.2.1 Habitats and Land Use

Habitats and land use in the project area consist of California annual grassland, alkaline meadow, ruderal, developed/landscaped areas, agriculture, seasonal wetlands/swales, and drainages/canals. Descriptions of these types are provided below. Figures 1-4a through 1-4e depict the general habitats and land use in the vicinity of the Project area. Figures 1-5a through 1-5k show the habitat types along the alternative water supply pipeline route. Representative photographs of the habitats are provided in Appendix A.

California Annual Grassland

California annual grassland is the predominant natural community type found throughout the project area. Characteristic species include non-native grasses such as foxtail barley (*Hordeum murinum*), soft chess (*Bromus hordeaceus*), and wild oat (*Avena barbata*). Common forbs include bur clover (*Medicago polymorpha*), filaree (*Erodium moschatum*), black mustard (*Brassica nigra*), and gumweed (*Grindelia camporum*). The grassland habitat on the 158-acre project parcel is currently used for cattle grazing. The proposed laydown site was previously developed for wind energy. The windmill towers have been removed, but some remnants of the cement tower bases and miscellaneous debris was scattered throughout the area at the time of the survey.

Alkaline Sink Wetland

Alkaline sink wetland habitat is present on the north side of the PG&E Kelso Substation, west of Bruns Road. The majority of this habitat occurs outside the immediate survey area for the project with the exception of a few small areas along water supply pipeline route on the east side of Bruns Road. Vegetation in this area is characterized by saltgrass (*Distichlis spicata*) and seepweed (*Suaeda moquinii*). Other common associated species include sand spurry (*Spergularia marina*), alkali heath (*Frankenia salina*), and common spikeweed (*Centromadia pungens*). Soils in this area are moderately to strongly alkaline with pH ranging from 8.4 to 9.6.

Ruderal

Ruderal areas are most common along the alternate water line in the road and railroad rights-of-way along the Byron Highway. Ruderal vegetation also occurs along other roadsides, in fallow agricultural fields, and around developed areas. The ruderal habitat along the edges of roads, railroad tracks, and agricultural fields are routinely sprayed with herbicides and/or mowed. These areas are generally characterized by invasive, non-native species such as mustards (*Brassica* spp.), prostrate pigweed (*Amaranthus albus*), redroot amaranth (*Amaranthus retroflexus*), fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), yellow star-thistle (*Centaurea solstitialis*), bristly oxtongue (*Helminthotheca echioides*), prickly lettuce (*Lactuca serriola*), Russian thistle (*Salsola tragus*), bull mallow (*Malva nicaeensis*), puncturevine (*Tribulus terrestris*), and various non-native annual grasses.

Developed/Landscaped Areas

Developed and landscaped areas in the vicinity of MEP include the Byron Power Cogen Plant, located in the center of the project parcel (immediately north of the proposed project site), the PG&E Bethany Compressor Station and the Kelso Substation north of Kelso Road, and the BBID headquarters along Bruns Road. Scattered residential parcels, farm buildings, and industrial areas are also present along the alternate water supply pipeline alignment. Common landscape plants in these areas include oleander (*Nerium oleander*), Bishop pine (*Pinus muricata*), California fan palm (*Washingtonia filifera*), walnut (*Juglans hindsii*), London plane (*Platanus* x *acerifolia*), Tasmanian bluegum (*Eucalyptus globulus*), Lombardy poplar (*Populus nigra*), sheoak (*Casuarina* sp.), fountaingrass (*Pennisetum* sp.), rose (*Rosa* sp.), and rosemary (*Rosmarinus officinalis*).

Agriculture

Agricultural lands along the proposed water supply pipeline are limited to field crops (i.e., wheat, alfalfa and hay) immediately north and south of the BBID facilities on the east side of Bruns Road. Several agricultural fields, including alfalfa, various grains and hay are also present along the alternative water supply pipeline.

Seasonal Wetlands and Swales

Two small seasonal wetlands are present along the existing access road to the Byron Power Cogen Plant. The two distinct basins are hydrologically connected by a partially collapsed 18-inch-diameter corrugated metal pipe under the gravel road. Vegetation within the basins is generally sparse and includes species such as popcorn flower (*Plagiobothrys stipitatus*), coyote thistle (*Eryngium vaseyi*), Italian ryegrass (*Lolium multiflorum*), gumweed (*Grindelia camporum*), dense-flower willowherb (*Epilobium densiflorum*), wooly marbles (*Psilocarphus oregonus*), brass buttons (*Cotula coronopifolia*) and water pygmyweed (*Crassula aquatica*). A seasonal wetland characterized by dense cattails (*Typha latifolia)* is present on the south side of Kelso Road, along the alternate water supply pipeline route.

Three weakly expressed, low topographic swales are present in the project area. Two swales were observed along the transmission line route and one swale was observed along the proposed water supply pipeline route. The vegetation in these areas is generally similar to the adjacent grassland, except for the fact that Mediterranean barley (*Hordeum marinum*) becomes the dominant annual grass species within the swale areas, where soft chess and foxtail barley are abundant in the adjacent grassland. Other associated species include sparse saltgrass, alkali heath, and Italian ryegrass, all of which also occur in the adjacent grassland habitat.

Drainages/Canals

The proposed water supply pipeline would cross a seasonal drainage on the east side of Bruns Road, approximately 0.3 mile south of the intersection with Kelso Road. Within the project study area the drainage channel is well defined with gently sloping banks. The area immediately around the cement box culvert under Bruns Road is characterized by dense perennial pepperweed (*Lepidium latifolium*). To the east, the channel is characterized by saltgrass, with scattered rabbitsfoot grass (*Polypogon monspeliensis*), Italian ryegrass, sand spurry, and brass buttons (*Cotula coronopifolia*). From the project area this channel continues to the northeast for approximately 900 feet where it enters an impoundment area. The drainage continues on the north side of the impoundment area, but is more of a low swale-like feature characterized by saltgrass, Mediterranean barley, soft chess, and foxtail barley.

A small swale-like drainage feature is located along Bruns Road immediately west of PG&E's Bethany Compressor Station, approximately 600 feet north of the intersection of Kelso Road. Vegetation within the channel is characterized by dense saltgrass, Italian ryegrass and meadow barley (*Hordeum brachyantherum*). This drainage flows to the east where it enters a rock-lined, linear drainage channel that flows east through the PG&E facility.

There is a well-defined channel on the east side of Bruns Road approximately 0.3 miles north of the intersection with Kelso Road where there is a 6-foot by 6-foot cement box culvert under the road. The drainage channel is characterized by dense growth of cosmopolitan bulrush (*Bolboschoenus maritimus*) with scattered rabbitsfoot grass, curly dock (*Rumex crispus*) and cattail (*Typha domingensis*). The outer edges of the channel are characterized by dense cover of saltgrass with sparse lambs quarters (*Chenopodium album*). The vegetated channel flows to the north into a larger open water area and then continues to flow to the north-northeast into a large seasonal wetland area located outside of the project study area.

A second well-defined channel along the water supply pipeline route is located approximately 0.7 miles north of the intersection with Kelso Road. The deeper parts of this channel are characterized by dense cattails (*Typha latifolia* and *T. domininingensis*) with saltgrass growing around the outer edges. Mexican rush (*Juncus mexicanus*) and curly dock are also present in scattered locations. The channel continues to flow to the east into a larger wetland area located outside of the project study limits.

A few small earthen agricultural irrigation and roadside drainage ditches are present along the alternate water supply pipeline alignment. Vegetation associated with these features includes swamp pricklegrass (*Crypsis schoenoides*), Bermudagrass (*Cynodon dactylon*), jungle rice (*Echinochloa colona*), and rough cocklebur (*Xanthium strumarium*).

A minimal area of BBID's water delivery system, including small sections of Canal 45, Canal 70 and the W 1 D Canal occur within the project study area. These open water features appear to be routinely maintained and were devoid of emergent vegetation at the time of the survey.

1.2.2 Climate and Hydrology

The regional climate is characterized by cool wet winters and hot, dry summers. Average temperatures range from a low of 36°F in January to a high of 90°F in July (Western Regional Climate Center [WRCC], 2009). The average annual rainfall recorded at the Livermore weather station (044997) is 14.5 inches, with the majority (82 percent) of the annual precipitation occurring between November and March (WRCC, 2009).

The botanical surveys were conducted during a slightly below-average rainfall year. Based on daily climate data recorded at the Livermore weather station, located approximately 12 miles southeast of the project study area, rainfall between November 1, 2008 and March 31, 2009 was 7.1 inches, or approximately 80 percent of the average rainfall for this period (University of California Integrated Pest Management, 2009). The lower-than-normal rainfall was due to below-average precipitation from November through January; precipitation was slightly above average in February and March (Figure 1-6).

MEP is located in the San Joaquin Delta Hydrologic Unit (HUC 18040003), which has a drainage area of 433,302 acres (Biogeographic Information and Observation System [BIOS], 2009). Drainage in the vicinity of the project area is generally to north, where it is diverted around Clifton Court Forebay and into Italian Slough (aka, Brushy Creek). The natural hydrology in the vicinity of the project area has been historically altered by the construction of reservoirs, aqueducts, canals, and agricultural drainages. Regionally the most significant modifications are associated with the State Water Project, which was initiated in 1959 and fully operational by 1965. Water is diverted from the Delta into Clifton Court Forebay and is then pumped from the Harvey O. Banks Delta Pumping Plant into the Bethany Reservoir, where the South Bay Pumping Plant lifts water into the South Bay Aqueduct and the California Aqueduct.

1.2.3 Soils

Eight soil series occur within the limits of the project study area. General information on the soils based on local soil surveys (Natural Resource Conservation Service [NRCS]; 1992; 1977; 1966) and official soil series descriptions (NRCS, 2009) are provided below. All soil colors are for moist soils unless otherwise noted.

Altamont Clays (AaC)

The Altamont series consists of well-drained soils with slow permeability on rolling hills and steep slopes east of Livermore, and are derived from weathered shale and fine-grained sandstone. In a representative profile, the surface layer to a depth of 28 inches is dark brown (10YR 3/3) clay. A very thin grayish brown (10 YR 5/2) [dry] surface crust may be present in some areas and very dark brown to black films are often present on the upper ped surfaces. Light-colored calcium carbonate films and segregations are often common below 7 inches, and soils become slightly alkaline with depth. The clay content in this soil ranges from 35 to 60 percent and wide, deep cracks are common throughout once the soil is dry.

Linne Clay Loam (LaD, LbD, LaC)

The Linne series consists of well-drained calcareous soils found on rolling hills and slopes that are derived from weathered shale and sandstone. In a typical profile the upper 14 inches is a moderately alkaline, black (10 YR 2/1) clay loam. Between 14 and 29 inches the soil is a moderately alkaline, very dark gray (10 YR 3/1) clay loam. Light colored lime filaments and deposits are present in the lower part of the horizon, increasing with depth. Permeability is moderately slow and these soils have medium to very rapid runoff.

Rincon Clay Loam (RdB)

Rincon soils are found on alluvial fans and nearly level valley floors east of Livermore and north of Mountain House where they formed in alluvium derived from sedimentary materials. In a typical profile the surface horizon is a slightly acidic, very dark gray (l0YR 3/1) silty clay loam to a depth of 16 inches. From 16 to 25 inches the soil is very dark grayish brown (l0YR 3/2) sandy clay, often with clay films along the ped surfaces. These soils are well drained with slow permeability and slow to rapid runoff.

San Ysidro Loam (Sa, Sc)

The San Ysidro series consists of moderately well-drained soils formed in alluvium derived from sedimentary rocks. These soils occur on old valley fill and low terraces east of Livermore. In a representative profile the surface layer (0 to 14 inches) is a slightly acidic, dark brown (10YR 4/3 to 3/3) fine sandy loam with few fine, distinct, brownish yellow (10YR 6/6) concentrations. Below 14 inches, the soil is a dark brown (7.5YR 4/4) clay with a thin light gray (10 YR 6/2) bleach layer. Many moderately thick clay films are present along the ped surfaces and pore linings and common, fine iron and manganese concentrations are present. These soils have slow to medium runoff and very slow permeability.

Solano Fine Sandy Loam (Sf, Sfaa)

Solano soils are formed in alluvium derived from mixed sedimentary materials and are found on nearly level low terraces and in valley plains with slightly irregular or hummocky surface micro-topography. In a typical profile the surface horizon is a strongly acidic, dark grayish brown (10 YR 4/2) loam with few, fine, distinct dark reddish brown (5 YR 3/4) concentrations. Below 9 inches the soil is neutral to slightly alkaline, brown (10 YR 4/3) clay loam with dark thin clay films on ped surfaces and pore linings. These soils are somewhat poorly drained with very slow to slow runoff and very slow permeability.

Stomar Clay Loam (252, 253)

Stomar soils are very deep, well-drained soils found on dissected alluvial fans and terraces. These soils formed in alluvium from sedimentary rocks sources, predominantly sandstone and shale. In a typical profile the surface is a dark brown (10YR 3/3) to dark grayish brown (10YR 4/2) clay loam to a depth of 20 inches. These soils have slow permeability and negligible to high runoff.

Vernalis Clay Loam (268)

Vernalis soils formed in alluvium from mixed rock sources and are found on alluvial fans and flood plains. These soils are very deep, well drained and have moderate permeability with negligible to low runoff. In a typical profile the surface is a dark grayish brown (10YR 4/2) clay loam to a depth of 20 inches. The surface is often slightly alkaline (pH 7.4) becoming moderately alkaline (pH 8.1 -8.2) at depths below 34 inches.

Willows Clay (274)

The Willows soils are very deep, poorly to very poorly drained sodic soils found in basins. These soils formed in alluvium from mixed rock sources. In a typical profile the surface layer to a depth of 13 inches is a neutral (pH 7.0) to slightly alkaline (pH 7.5), very dark gray (5Y 3/1) clay. From 13 to 28 inches the soils is a strongly alkaline (pH 8.8) very dark gray (5Y 3/1) clay. These soils have very slow permeability, slow runoff with intermittent water tables at depths of 24 to 60 inches. In some areas, the water tables have been lowered by drainage and water control structures. Willows soils are uncommon in the survey area, only found in small patches along the alternate water supply pipeline route.

SECTION 2.0

Methods

The field investigation included both reconnaissance and protocol-level surveys to search for and document any special-status plants in the project study area. Reconnaissance-level surveys were completed by CH2M HILL biologists Russell Huddleston and Todd Ellwood on December 31, 2008, to obtain a general characterization of the habitats in the vicinity of project study area, as well as an overall understanding of the project and required work areas. Protocol-level surveys were conducted within the project survey area on April 7, April 15, May 20, and August 18, 2009. The following sections provide additional details on the pre-field preparations and survey methods.

2.1 Pre-field Preparations

Preparation for the protocol-level special-status plant surveys included compiling a list of rare, threatened, or endangered plant species that have the potential to occur within the limits of the project study area. A target list of special-status plant species was compiled based on the habitats and vegetation communities observed during the site reconnaissance surveys, as well as information from the following sources:

- United States Fish and Wildlife Service (USFWS) Species list for the Clifton Court Forebay USGS 7.5-minute Quadrangle (USFWS, 2009);
- California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB) search for the Clifton Court Forebay, Midway, Altamont, Holt, Union Island, Tracy, Woodward Island, Brentwood, and Byron Hot Springs USGS 7.5-minute quadrangles (CDFG, 2009);
- California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California (electronic version) search for the Clifton Court Forebay, Midway, Altamont, Holt, Union Island, Tracy, Woodward Island, Brentwood, and Byron Hot Springs USGS 7.5-minute quadrangles (CNPS, 2009).

The database searches identified 36 special-status plant species with reported or potential occurrences in the 12-quadrangle vicinity of the study area. Table 2-1 provides a list and summary information on the species considered potentially occurring in the project study area. Species list from the various data bases searches are included in Appendix B.

2.2 Reference Populations

Reference sites for four special-status plants were visited prior to the field surveys. Reference populations provide information on the current phonology, ensure proper identification of target species, and confirm that both the timing and environmental conditions are suitable for conducting the botanical surveys. Given the large number of potentially occurring plants it was impractical to observe reference populations for all of the

TABLE 2-1
Special-status Plant Species Potentially Occurring in the Project Study Area

Scientific Name	Common Name	Status		Habitat	Blooming Period	Potential To Occur
		Fed/State	CNPS			
Amsinckia grandiflora	large-flowered fiddleneck	E/E	1B.1	Cismontane woodland, Valley and foothill grassland	Apr-May	**Low:** Suitable habitat is present, but the CNDDB includes only 6 presumably extent populations; nearest occurrence is approximately 10 miles south of the Project area at the Lawrence-Livermore Laboratory.
Amsinckia lunaris	bent-flowered fiddleneck	-/-	1B.2	Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland	Mar-Jun	**Moderate:** Suitable habitat is present; nearest occurrence is less than five miles from the Project study area.
Astragalus tener var. *tener*	alkali milk-vetch	-/-	List 1B.2	Playas, grasslands and vernal pools usually on clay or alkaline soils	Mar-Jun	**Moderate:** Suitable habitat is present; historic occurrence within 5 miles of the Project study area; possibly extirpated
Atriplex cordulata	heartscale	-/-	List 1B.2	Chenopod scrub, moist meadows, seeps and grassland; usually on sandy alkaline soils	Apr-Oct	**Present:** Species observed in alkaline meadow north of PG&E Kelso Substation, just north of the Project study area
Atriplex depressa	brittlescale	-/-	List 1B.2	Chenopod scrub, meadows, seeps, playas, grasslands and vernal pools; usually on alkaline clay soils	May-Oct	**High:** Suitable habitat is present; nearest occurrence is approximately 3 miles from the Project study area.
Atriplex joaquiniana	San Joaquin spearscale	-/-	List 1B.2	Chenopod scrub, meadows seeps, playas and grasslands; usually on alkaline soils	Apr-Oct	**High:** Suitable habitat is present; nearest occurrence less than two miles from the Project study area.
Blepharizonia plumosa	big tarplant	-/-	List 1B.1	Grassland	Jul-Oct	**High:** Suitable habitat is present; nearest occurrence approximately 6.5 miles from the Project study area

TABLE 2-1
Special-status Plant Species Potentially Occurring in the Project Study Area

Scientific Name	Common Name	Status		Habitat	Blooming Period	Potential To Occur
		Fed/State	CNPS			
California macrophylla	round-leaved filaree	-/-	List 1B.1	Cismontane woodlands and grassland; generally on clay soils	Mar-May	**Moderate:** Suitable habitat is present; several historic occurrences in the Project vicinity from 1920's and 1930's; no recent observations
Carex comosa	bristly sedge	-/-	List 2.1	Coastal prairie, marshes, lake margins and grasslands	May-Sep	**Low:** Suitable habitat is present; only one historic occurrence near Holt; possibly extirpated
Carex vulpinoidea	brown fox sedge	-/-	List 2.2	Freshwater marshes and riparian woodland	May-Jun	**Low:** Limited suitable habitat present; nearest occurrence approximately 13 miles north of the Project study area
Caulanthus coulteri var. *lemmonii*	Lemmon's jewelflower	-/-	1B.2	Pinyon and juniper woodland, Valley and foothill grassland	Mar-May	**Low:** Marginal suitable habitat is present; only two historic occurrences from 1930's near Corral Hollow
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	-/-	1B.2	Valley and foothill grassland (alkaline)	May-Oct (Nov)	**High:** Suitable habitat is present; nearest occurrence approximately 5 miles from the Project study area
Cordylanthus mollis ssp. *hispidus*	hispid bird's-beak	-/-	List 1B.1	Meadows, seeps, playas, and grasslands; usually on alkaline soils	Jun-Sep	**Moderate:** Suitable habitat is present; nearest occurrence approximately 8 miles from the Project study area
Cordylanthus palmatus	palmate-bracted bird's-beak	E/E	List 1B.1	Chenopod scrub, Valley and foothill grassland (alkaline)	May-Oct	**Moderate:** Suitable habitat is present; nearest occurrence approximately 8 miles from the Project study area.
Deinandra bacigalupii	Livermore tarplant	-/-	1B.2	Meadows and seeps(alkaline)	Jun-Oct	**Moderate:** Suitable habitat is present; nearest occurrence approximately 8 miles from the Project study area.

TABLE 2-1
Special-status Plant Species Potentially Occurring in the Project Study Area

Scientific Name	Common Name	Status		Habitat	Blooming Period	Potential To Occur
		Fed/State	CNPS			
Delphinium californicum ssp. *interius*	Hospital Canyon larkspur	-/-	1B.2	Chaparral(openings) and Cismontane woodland (mesic)	Apr-Jun	**Low:** No suitable habitat present; historic occurrence from late 1920's 13 miles south-southwest of the Project study area.
Delphinium recurvatum	recurved larkspur	-/-	1B.2	Chenopod scrub, Cismontane woodland, Valley and foothill grassland/alkaline	Mar-Jun	**High:** Suitable habitat present; nearest reported occurrence just east of the water supply pipeline route along Bruns Road.
Eryngium racemosum	Delta button-celery	-/SE	List 1B.1	Riparian scrub associated with vernally mesic clay depressions	Jun-Sep	**Low:** Marginal habitat present, nearest reported occurrence approximately 8 miles north of the Project study area.
Eschscholzia rhombipetala	diamond-petaled California poppy	-/-	List 1B.1	Grasslands, usually alkaline, clay soils	Mar-Apr	**Moderate:** Suitable habitat present; nearest reported occurrence approximately 5.5 miles southwest of the Project study area.
Friillaria agrestis	stinkbells	-/-	4.2	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland (clay, sometimes serpentinite)	Mar-Jun	**Moderate:** Suitable habitat present; nearest reported occurrence approximately 7.5 miles northwest of the Project study area.
Helianthella castanea	Diablo helianthella	-/-	1B.2	Broad-leaf upland forest, Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland, Valley and foothill grassland	Mar-Jun	**Moderate:** Suitable habitat present; nearest reported occurrence approximately 10 miles northwest of the Project study area.

TABLE 2-1
Special-status Plant Species Potentially Occurring in the Project Study Area

Scientific Name	Common Name	Status: Fed/State	Status: CNPS	Habitat	Blooming Period	Potential To Occur
Hibiscus lasiocarpus	woolly rose-mallow	-/-	List 2.2	Freshwater marshes	Jun-Sep	**Low:** Limited to very marginal suitable habitat present along seasonal drainages and canals; several occurrences within 5 miles of the Project study area along larger sloughs, rivers and canals.
Isocoma arguta	Carquinez goldenbush	-/-	List 1B.1	Grasslands often on alkaline soils	Aug-Dec	**Low:** Suitable habitat present; no reported occurrences in the Project vicinity.
Lasthenia conjugens	Contra Costa goldfields	FE/-	List 1B.1	Cismontane woodland, alkaline playas, vernal pools and mesic grasslands	Mar-Jun	**Low:** Suitable habitat present; no reported occurrences in the Project vicinity.
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	-/-	List 1B.2	Freshwater marshes	May-Jul (Sep)	**Low:** Limited to very marginal suitable habitat present along seasonal drainages; several occurrences within 5 miles of the Project site along larger sloughs, rivers and canals.
Lilaeopsis masonii	Mason's lilaeopsis	-/SR	List 1B.1	Brackish/freshwater marshes and riparian scrub	Apr-Nov	**Low:** Limited to very marginal suitable habitat is present along seasonal drainages; several occurrences within 5 miles of the Project site along larger sloughs, rivers and canals.
Limosella subulata	Delta mudwort	-/-	List 2.1	Brackish/freshwater marshes	May-Aug	**Low:** Limited to very marginal suitable habitat is present along seasonal drainages; several occurrences within 5 miles of the Project site along larger sloughs, rivers and canals.

TABLE 2-1
Special-status Plant Species Potentially Occurring in the Project Study Area

Scientific Name	Common Name	Status: Fed/State	Status: CNPS	Habitat	Blooming Period	Potential To Occur
Madia radiata	showy golden madia	-/-	1B.1	Cismontane woodland, Valley and foothill grassland	Mar-May	**Low:** Suitable habitat is present; only occurrence is a historic record from the 1920's near Corral Hollow
Myosurus minimus ssp. *apus*	little mousetail	-/-	3.1	Valley and foothill grassland, Vernal pools(alkaline)	Mar-Jun	**Present*:** Myosurus minimus found on Lee Property, east of transmission line alignment study area; however, this sub-species is not currently recognized as a distinct taxon.
Plagiobothrys glaber	hairless popcorn-flower	-/-	1A	Meadows and seeps(alkaline), Marshes and swamps(coastal salt)	Mar-May	**Low:** Species is presumed extinct; only record is from the 1940's near Livermore.
Scutellaria galericulata	marsh skullcap	-/-	List 2.2	Lower montane coniferous forest, moist meadows and freshwater marshes	Jun-Sep	**Low:** Only known occurrence is along the Middle River between Victoria Island and Upper Jones Tract.
Senecio aphanactis	chaparral ragwort	-/-	2.2	Chaparral, Cismontane woodland, Coastal scrub/sometimes alkaline	Jan-Apr	**Low:** Marginal suitable habitat present; nearest reported occurrence is approximately 10 miles south of the Project study area.
Symphyotrichum lentum	Suisun Marsh aster	-/-	List 1B.2	Brackish/freshwater marshes	May-Nov	**Low:** Limited to very marginal suitable habitat present along seasonal drainages; several occurrences within 5 miles of the Project site along larger sloughs, rivers and canals.
Trifolium depauperatum var. *hydrophilum*	saline clover	-/-	List 1B.2	Marshes, moist grasslands and vernal pools, generally on alkaline soils	Apr-Jun	**Low:** Only record is an undocumented occurrence near Livermore, approximately 12 miles southwest of the project site.

TABLE 2-1
Special-status Plant Species Potentially Occurring in the Project Study Area

Scientific Name	Common Name	Status Fed/State	Status CNPS	Habitat	Blooming Period	Potential To Occur
Tropidocarpum capparideum	caper-fruited tropidocarpum	-/-	List 1B.1	Grasslands, generally on alkaline soils	Mar-Apr	**High:** Suitable habitat is present; nearest occurrence is less than 3 miles from the Project study area.

Notes:

Taxonomy follows the current status per the Jepson On-Line Interchange (University of California, Berkley, 2009)

Status Codes:

Federal/State
FE Federally-listed endangered species
SE State-listed endangered species
SR State-listed rare species

CNPS designations
1B Plants rare, threatened, or endangered in California and elsewhere
2 Plants rare, threatened, or endangered in California, but more common elsewhere

CNPS Threat Codes
.1 Seriously endangered in California
.2 Fairly endangered in California

Habitat and Blooming Period information based on the CNPS (2009) *Electronic Inventory of Rare, Threatened and Endangered Plants of California* target species. Imprecise location information, uncertainty of population status, distance from the project study area, and restricted access to private property also precluded visits to some reference locations. Collection information from the Consortium of California Herbaria (University of California, Berkley, 2009), local floras (Beidleman and Kozloff, 2003), and photographs of target species (CalPhotos, 2009) were also reviewed prior to the surveys to assist in identification of potential special-status and other plant species. Photographs of reference populations are provided in Appendix C.

The following reference sites were visited:

- **Diamond-petaled California poppy (*Eschscholzia rhombipetala*):** A total of 16 individuals were observed on April 6, 2009, on a north-facing slope north of Tesla Road, approximately 12 miles east of Livermore (CNDDB Occurrence #6). Eight of the plants were vegetative only, six were in bloom and two were in the fruiting stage.
- **Contra Costa goldfields (*Lasthenia conjugens*):** A large population was observed in Solano County along Scally Road, south of Highway 12 (CNDDB Occurrence #20) on April 15, 2009. At that time, several hundred individuals were in full bloom.
- **Livermore tarplant (*Deinandra bacigalupi*):** Several thousand plants were observed on August 18, 2009 at the Springtown Wetland Reserve north of Highway 580, on the west side of North Vasco Road in Livermore (CNDDB Occurrence #2). Nearly all of the plants were in full flower at this time.
- **Palmate-bracted bird's beak (*Cordylanthus palmatus*):** Approximately 100 plants were observed on August 18, 2009, at the Springtown Wetland Reserve north of Highway 580 on the west of side of North Vasco Road in Livermore (CNDDB Occurrence #10). All of the plants were in the vegetative state at the time of the survey, but this species was readily identifiable.

Reference locations for two other rare plants were also visited, but the species were not observed.

- **Hispsid bird's beak (*Cordylanthus mollis* ssp. *hispidus*):** This species has also been reported from the Springtown Wetland Reserve north of Highway 580 on the west of side of North Vasco Road in Livermore (CNDDB Occurrence #15). During the August 18, 2009, visit to this location no plants were observed in the general area identified by the CNDDB; however, due to time constraints an exhaustive survey of the entire area was not conducted.
- **Recurved larkspur (*Delphinium recurvatum*):** A population of 150 individuals of this species was reported from the west side of Bruns Road, approximately 0.6 miles north of Kelso Road, just south of the Contra Costa/Alameda county line in 1991 (CNDDB occurrence #61). While an extensive survey was not completed for this area, no plants were observed in this area during the April and May botanical surveys.

2.3 Field Surveys

Protocol-level surveys were conducted throughout the approximately 41-acre project study area for the proposed power plant facility and laydown area. In addition, surveys were completed along the natural gas pipeline, transmission line, and water supply pipeline alignments. The survey area for the project linear features generally included 50 feet to either side of the centerline of the alignment, except in areas where the water supply pipeline would be located within or immediately adjacent to an existing roadway, in which case only the areas adjacent to the excavation were included in the analysis as it was assumed areas on the opposite side of the roadway would not be affected. Botanical surveys were completed during the appropriate season to identify all of the potential special-status plant species identified in Table 2-1. Field surveys were completed on April 7, April 15, May 20, and August 18, 2009. The surveys were floristic in nature, meaning that all species encountered were identified to the taxonomic level needed to determine if they have special-status determinations. Surveys were conducted in accordance with the botanical survey guidelines of the U.S. Fish and Wildlife Service (USFWS, 1996), California Department of Fish and Game (CDFG, 2000) and the California Native Plant Society (CNPS, 2001).

Botanical surveys were completed by walking meandering transects throughout the natural terrestrial habitats included in the project study area and recording all plant species observed. Developed and landscaped areas associated with residential and industrial developments such as PG&E's Kelso Substation and the BBID headquarters were not intensively surveyed. Planted agricultural crops were also not included in the protocol-level surveys; however, the edges of all agricultural fields within the survey area were included. Any plant species that was not readily identifiable was either keyed in the field using *Plants of the San Francisco Bay Region* (Beidleman and Kozloff, 2003) or *The Jepson Manual, Higher Plants of California* (Hickman, 1993) or was collected for later identification, if a suitable number of plants was present. A complete list of plant species observed during the botanical surveys is presented in Appendix D. Plant taxonomy used throughout this report follows the currently accepted name for the taxon per the University of California's Jepson Interchange for California Floristics (U.C. Berkley, 2009).

SECTION 3.0
Results

No special-status plants were identified within the Project survey area. Incidental observations of one special status plant, heartscale (*Atriplex cordulata*), were noted in the vicinity of the proposed transmission line route, in an alkaline meadow north of the PG&E Kelso Substation, east of Bruns Road (Figure 3-1).

There is a reported occurrence of recurved larkspur (CNDDB Occurrence #61) near the project study area on the west side of Bruns Road, approximately 0.6 miles north of Kelso Road, just south of the Contra Costa/Alameda county line. Although most of this area was located outside of the study limits, the reported location was investigated during the April and May field surveys to look for this species and none were observed.

SECTION 4.0

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Figures

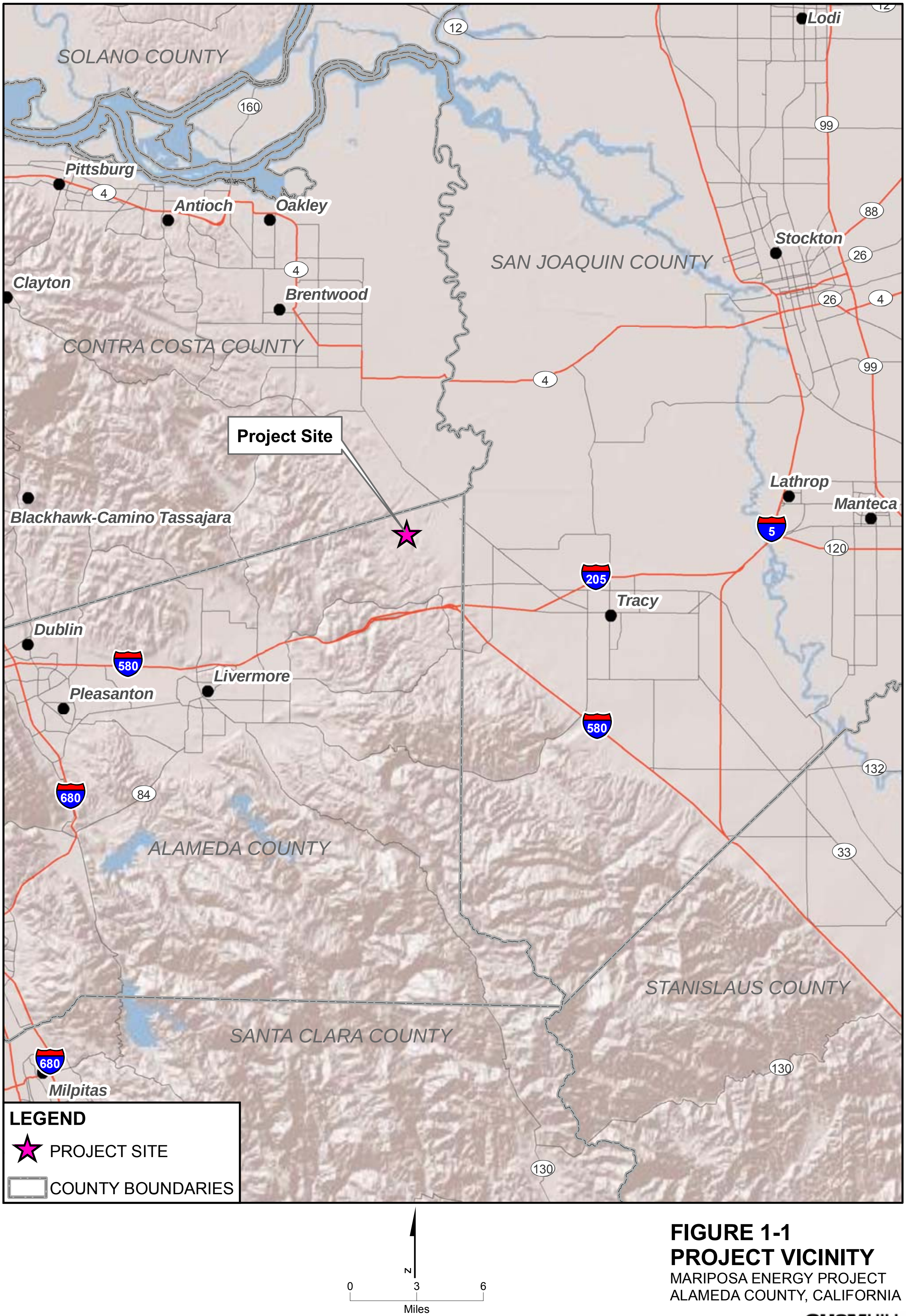
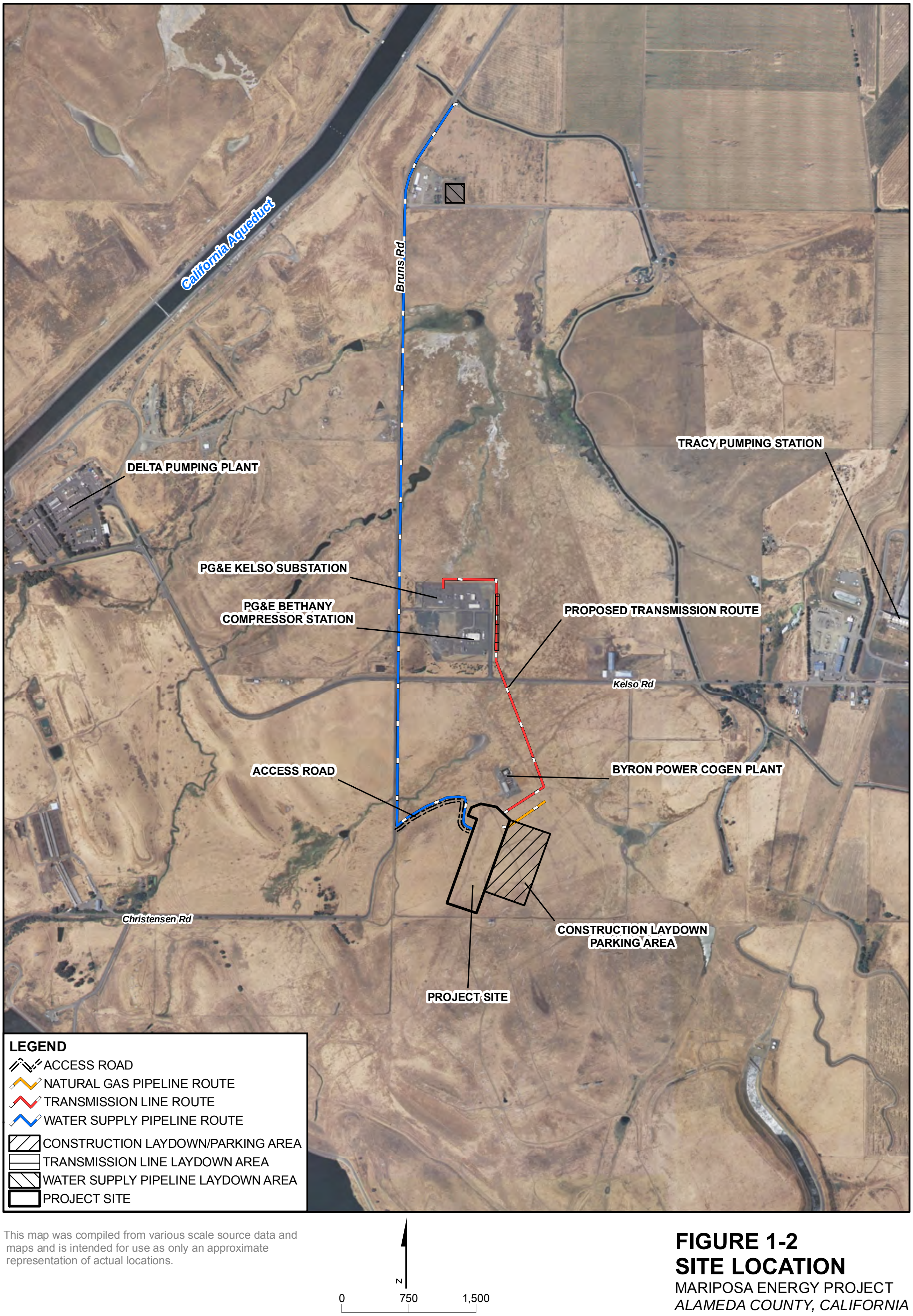


FIGURE 1-1
PROJECT VICINITY
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_VICINITYMAP.MXD MHASKELL 7/10/2009 11:32:58

CH2MHILL



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

FIGURE 1-2
SITE LOCATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\SITELOCATION.MXD MHASKELL 11/20/2009 13:35:39

CH2MHILL

LEGEND

ALTERNATE WATER SUPPLY PIPELINE ROUTE

CONSTRUCTION LAYDOWN/PARKING 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.

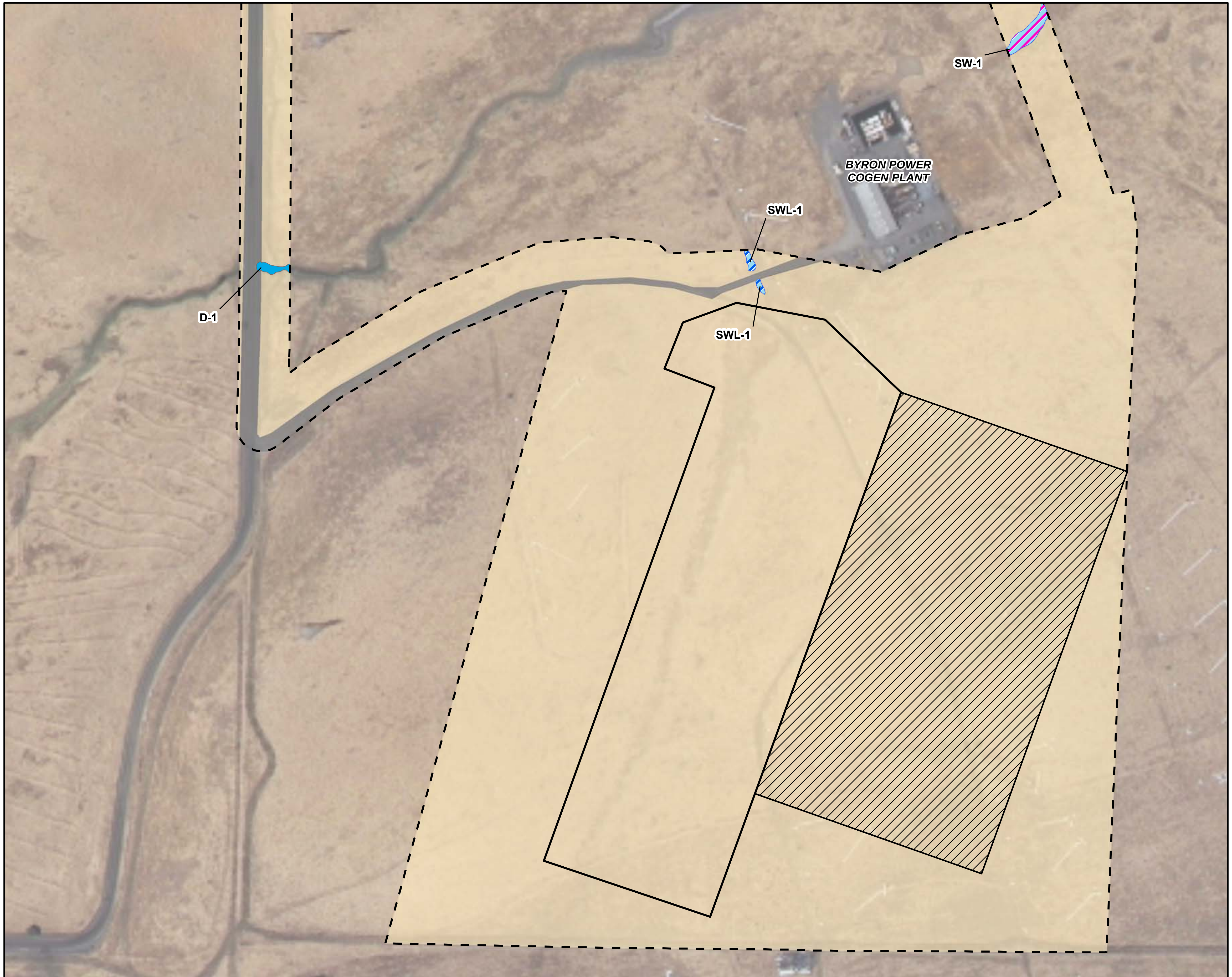
N

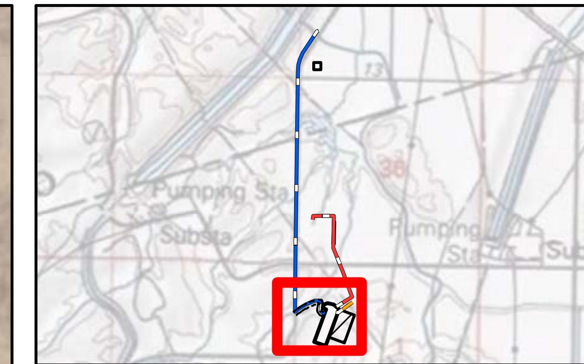
0 1,250 2,500
Feet

FIGURE 1-3
ALTERNATE WATER SUPPLY PIPELINE ROUTE - MOUNTAIN HOUSE WWTP

MARIPOSA ENERGY PROJECT

ALAMEDA COUNTY, CALIFORNIA





LEGEND

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

HABITAT COMMUNITIES
- CALIFORNIA ANNUAL GRASSLAND
- INDUSTRIAL, LANDSCAPE
- POND
- ROAD

SITES
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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

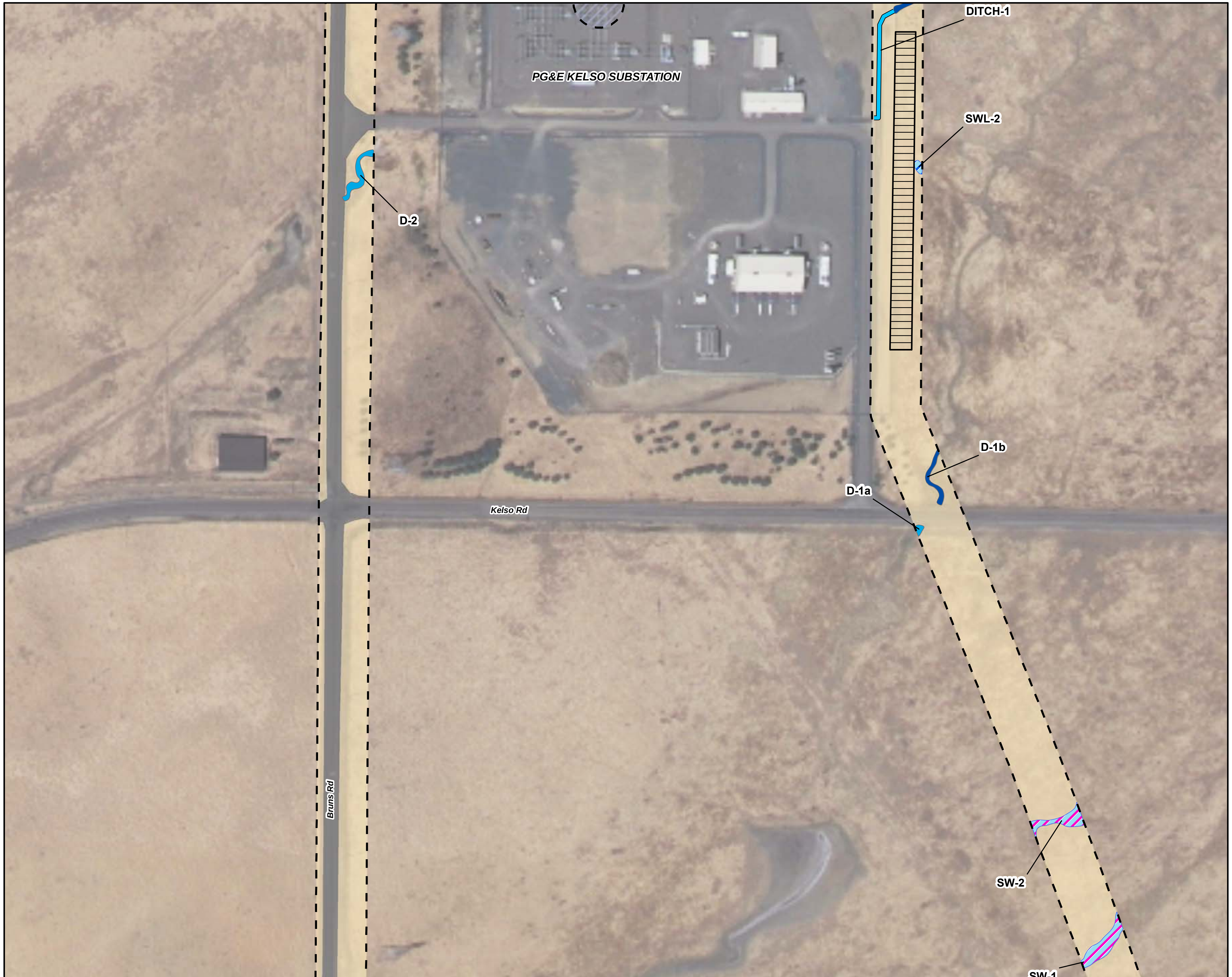
N

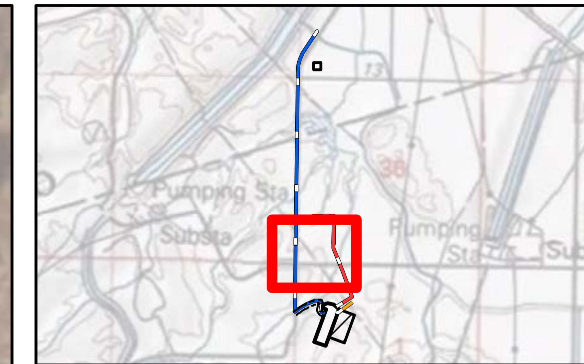
0 100 200
Feet

FIGURE 1-4A
HABITAT MAPS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\BIO_HABITATSV2.MXD MHASKELL 11/20/2009 14:50:01

CH2MHILL





LEGEND

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

HABITAT COMMUNITIES
- CALIFORNIA ANNUAL GRASSLAND
- INDUSTRIAL, LANDSCAPE
- POND
- ROAD

SITES
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

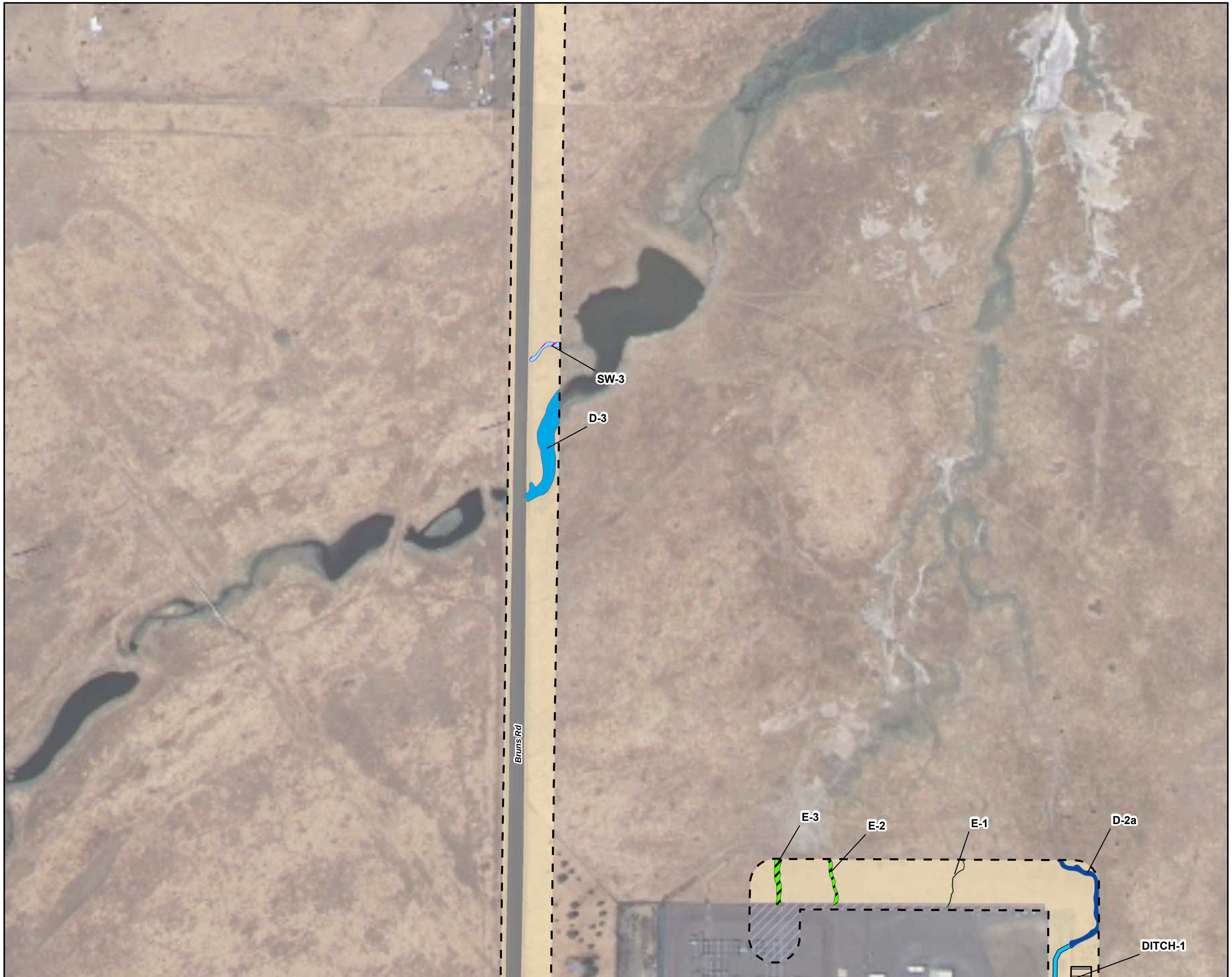
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

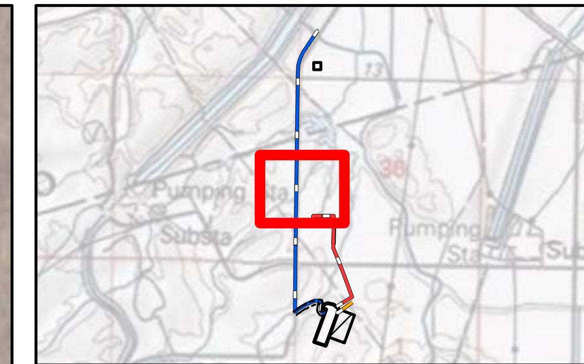
N

0 100 200
Feet

FIGURE 1-4B
HABITAT MAPS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL





LEGEND

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

HABITAT COMMUNITIES
- CALIFORNIA ANNUAL GRASSLAND
- INDUSTRIAL, LANDSCAPE
- POND
- ROAD

SITES
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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

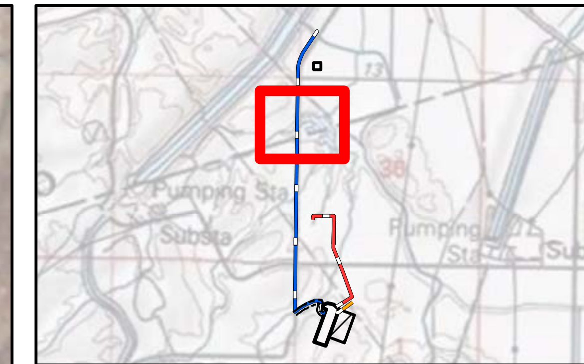
N

0 100 200
Feet

FIGURE 1-4C
HABITAT MAPS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\BIO_HABITATSV2.MXD MHASKELL 11/20/2009 14:50:01

CH2MHILL



LEGEND

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS

- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

HABITAT COMMUNITIES

- CALIFORNIA ANNUAL GRASSLAND
- INDUSTRIAL, LANDSCAPE
- POND
- ROAD

SITES

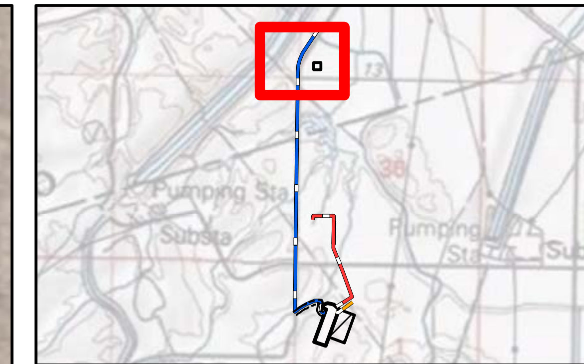
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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

0 100 200
Feet

FIGURE 1-4D
HABITAT MAPS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA



LEGEND

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

HABITAT COMMUNITIES
- CALIFORNIA ANNUAL GRASSLAND
- INDUSTRIAL, LANDSCAPE
- POND
- ROAD

SITES
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

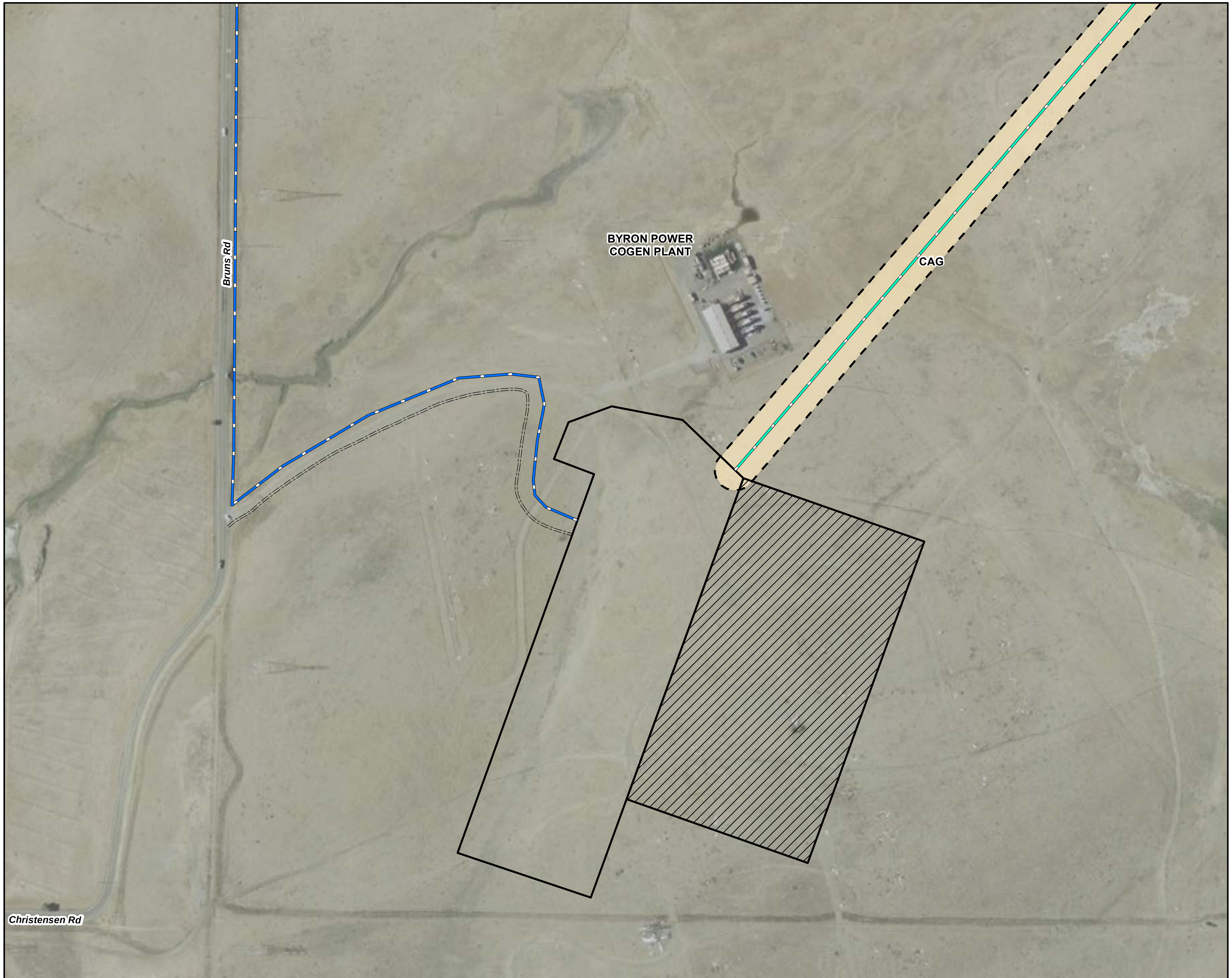
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

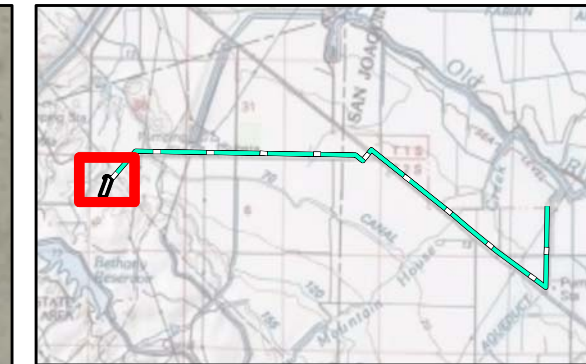
N

0 100 200
Feet

FIGURE 1-4E
HABITAT MAPS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL





LEGEND

ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

HABITAT TYPES

AGRICULTURE (AG)
CALIFORNIA ANNUAL GRASSLAND (CAG)
CANAL (CL)
DEVELOPED/LANDSCAPED (DL)
DITCH (DT)
ROAD (RD)
RUDERAL (RUD)
SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

1 OF 11

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

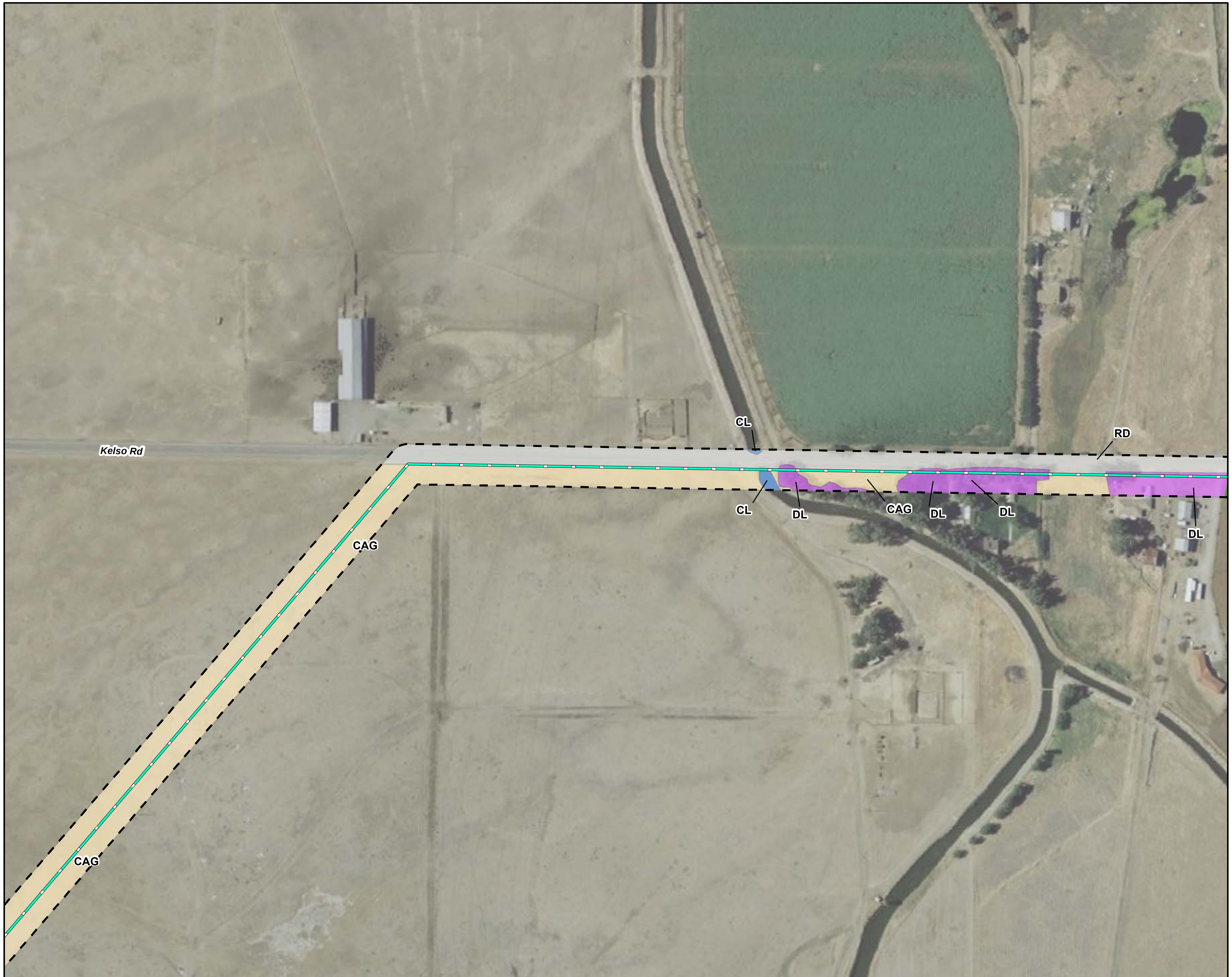
N

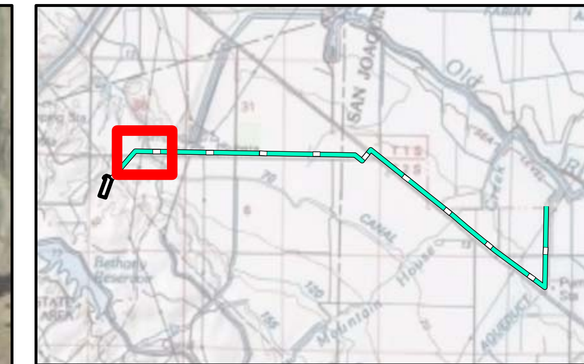
0 125 250
Feet

FIGURE 1-5A
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\ALTERNATEWATERRT_HABITAT.MXD MHASKELL 11/20/2009 15:29:48

CH2MHILL





LEGEND

ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

HABITAT TYPES

AGRICULTURE (AG)
CALIFORNIA ANNUAL GRASSLAND (CAG)
CANAL (CL)
DEVELOPED/LANDSCAPED (DL)
DITCH (DT)
ROAD (RD)
RUDERAL (RUD)
SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

2 OF 11

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

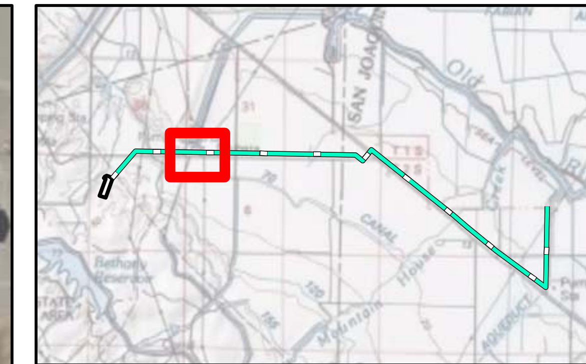
0 125 250
Feet

FIGURE 1-5B
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\ALTERNATEWATERRT_HABITAT.MXD MHASKELL 11/20/2009 15:29:48

CH2MHILL



LEGEND

ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

HABITAT TYPES

AGRICULTURE (AG)
CALIFORNIA ANNUAL GRASSLAND (CAG)
CANAL (CL)
DEVELOPED/LANDSCAPED (DL)
DITCH (DT)
ROAD (RD)
RUDERAL (RUD)
SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

3 OF 11

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

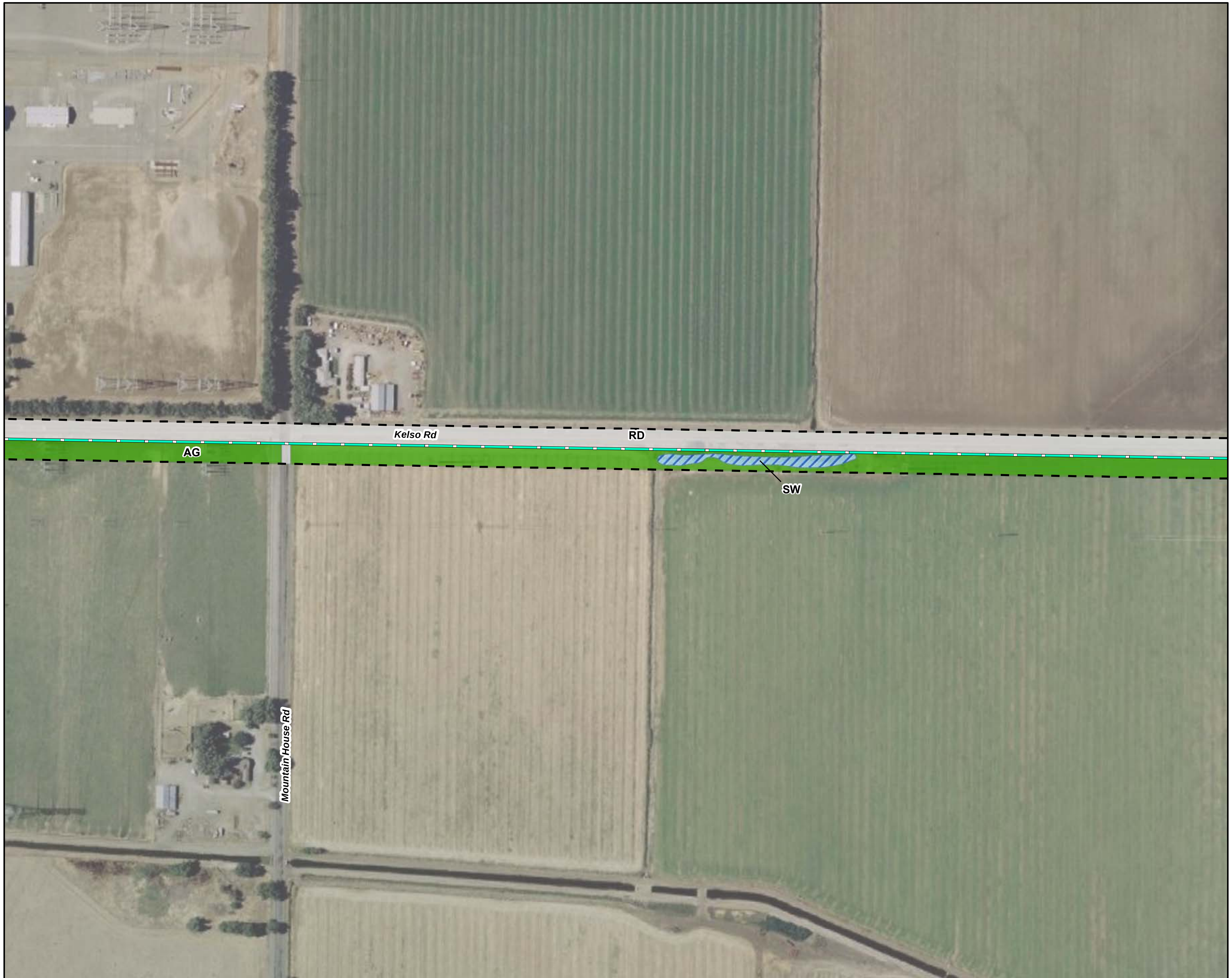
N

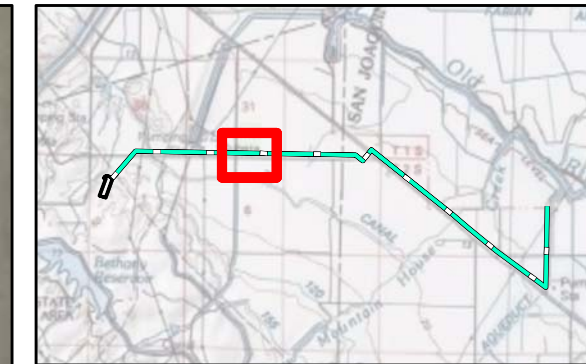
0 125 250
Feet

FIGURE 1-5C
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\ALTERNATEWATERRT_HABITAT.MXD MHASKELL 11/20/2009 15:29:48

CH2MHILL





LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

HABITAT TYPES

- AGRICULTURE (AG)
- CALIFORNIA ANNUAL GRASSLAND (CAG)
- CANAL (CL)
- DEVELOPED/LANDSCAPED (DL)
- DITCH (DT)
- ROAD (RD)
- RUDERAL (RUD)
- SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

4 OF 11

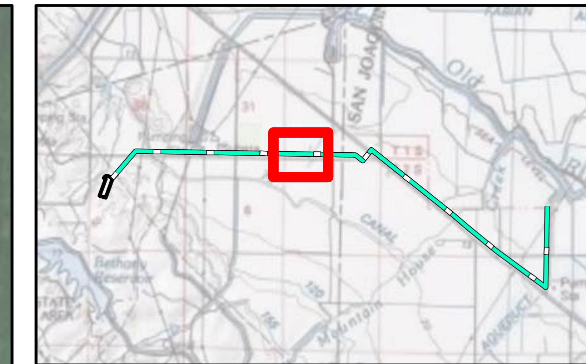
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

N

0 125 250
Feet

FIGURE 1-5D
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA



LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

HABITAT TYPES

- AGRICULTURE (AG)
- CALIFORNIA ANNUAL GRASSLAND (CAG)
- CANAL (CL)
- DEVELOPED/LANDSCAPED (DL)
- DITCH (DT)
- ROAD (RD)
- RUDERAL (RUD)
- SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

5 OF 11

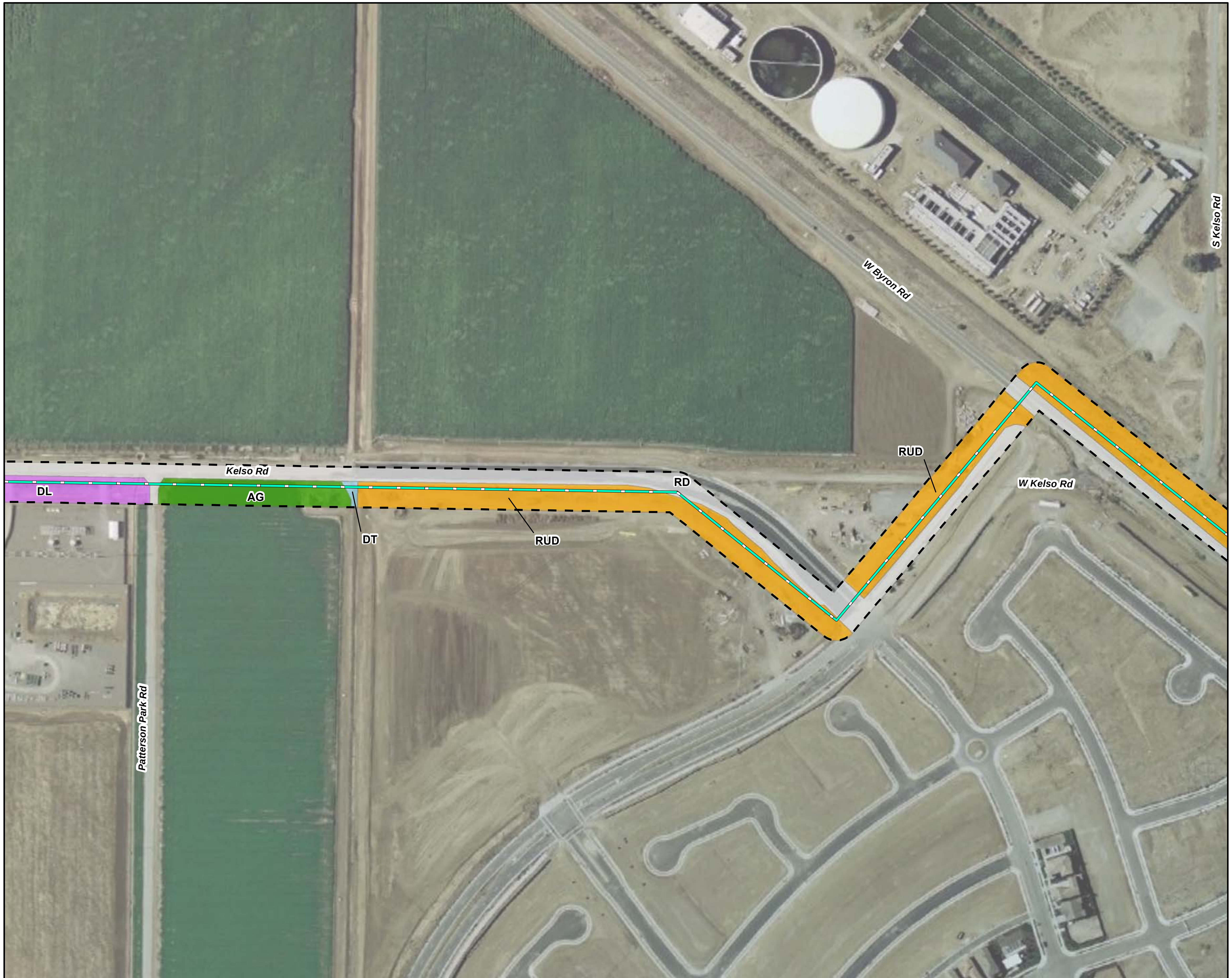
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

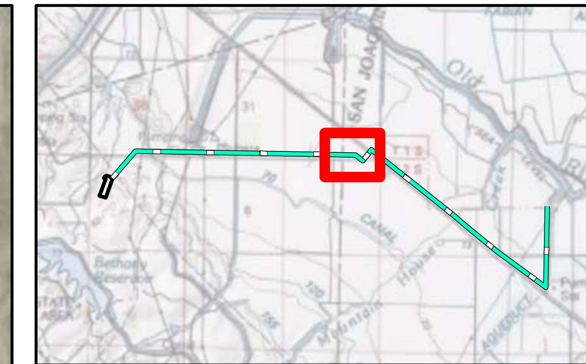
N

0 125 250
Feet

FIGURE 1-5E
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA





LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

HABITAT TYPES

- AGRICULTURE (AG)
- CALIFORNIA ANNUAL GRASSLAND (CAG)
- CANAL (CL)
- DEVELOPED/LANDSCAPED (DL)
- DITCH (DT)
- ROAD (RD)
- RUDERAL (RUD)
- SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

6 OF 11

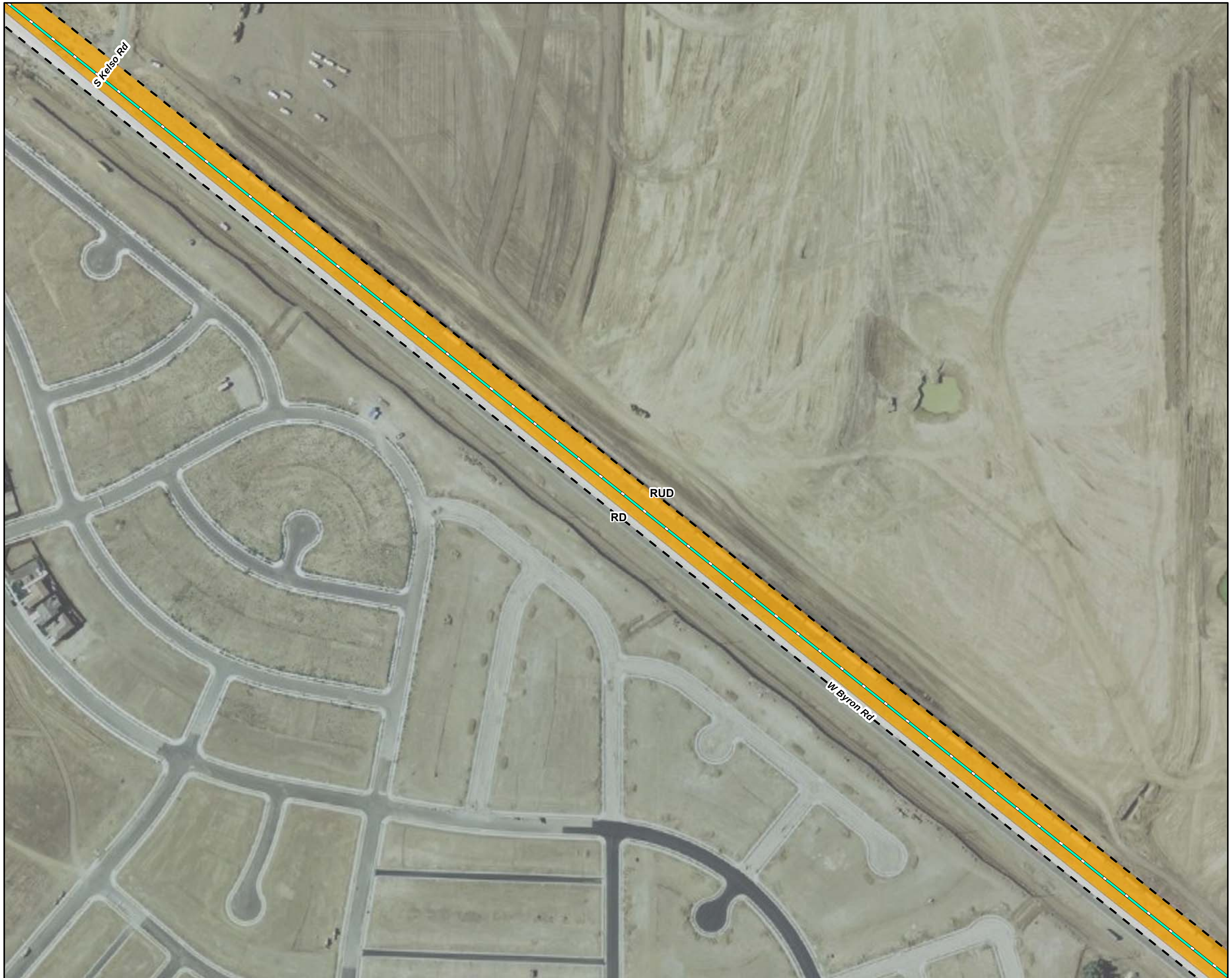
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

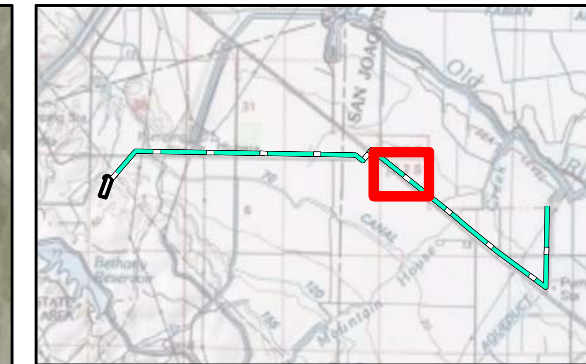
N

0 125 250
Feet

FIGURE 1-5F
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL





LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

HABITAT TYPES

- AGRICULTURE (AG)
- CALIFORNIA ANNUAL GRASSLAND (CAG)
- CANAL (CL)
- DEVELOPED/LANDSCAPED (DL)
- DITCH (DT)
- ROAD (RD)
- RUDERAL (RUD)
- SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

7 OF 11

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

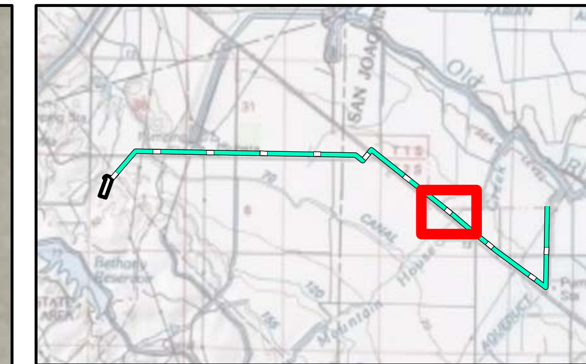
N

0 125 250
Feet

FIGURE 1-5G
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL



LEGEND

- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

HABITAT TYPES

- AGRICULTURE (AG)
- CALIFORNIA ANNUAL GRASSLAND (CAG)
- CANAL (CL)
- DEVELOPED/LANDSCAPED (DL)
- DITCH (DT)
- ROAD (RD)
- RUDERAL (RUD)
- SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

8 OF 11

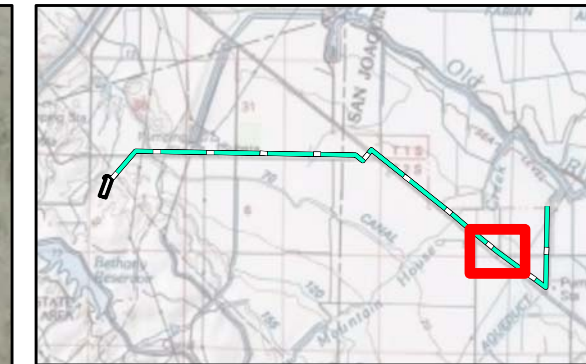
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

N

0 125 250
Feet

FIGURE 1-5H
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL



LEGEND

ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

HABITAT TYPES

AGRICULTURE (AG)
CALIFORNIA ANNUAL GRASSLAND (CAG)
CANAL (CL)
DEVELOPED/LANDSCAPED (DL)
DITCH (DT)
ROAD (RD)
RUDERAL (RUD)
SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

9 OF 11

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

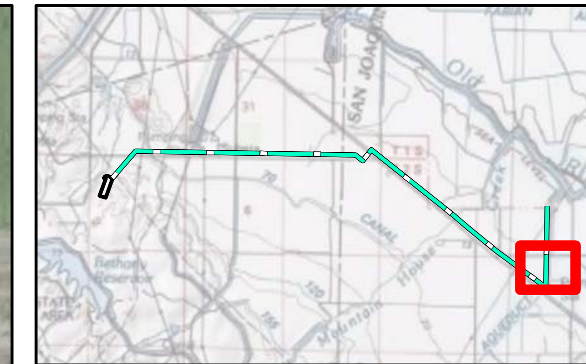
N

0 125 250
Feet

FIGURE 1-5I
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL



LEGEND
ACCESS ROAD
ALTERNATE WATER SUPPLY PIPELINE ROUTE
WATER SUPPLY PIPELINE ROUTE
CONSTRUCTION LAYDOWN/PARKING AREA
PROJECT SITE
50 FOOT BUFFER

HABITAT TYPES
AGRICULTURE (AG)
CALIFORNIA ANNUAL GRASSLAND (CAG)
CANAL (CL)
DEVELOPED/LANDSCAPED (DL)
DITCH (DT)
ROAD (RD)
RUDERAL (RUD)
SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

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

0 125 250
Feet

FIGURE 1-5J
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

LEGEND
- ACCESS ROAD
- ALTERNATE WATER SUPPLY PIPELINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- PROJECT SITE
- 50 FOOT BUFFER

HABITAT TYPES
- AGRICULTURE (AG)
- CALIFORNIA ANNUAL GRASSLAND (CAG)
- CANAL (CL)
- DEVELOPED/LANDSCAPED (DL)
- DITCH (DT)
- ROAD (RD)
- RUDERAL (RUD)
- SEASONAL WETLAND (SW)

SOURCE: CH2M HILL Biological Survey, 2009.

11 OF 11

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

0 125 250
Feet

FIGURE 1-5K
HABITAT TYPES ALONG ALTERNATE WATER SUPPLY PIPELINE ROUTE

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

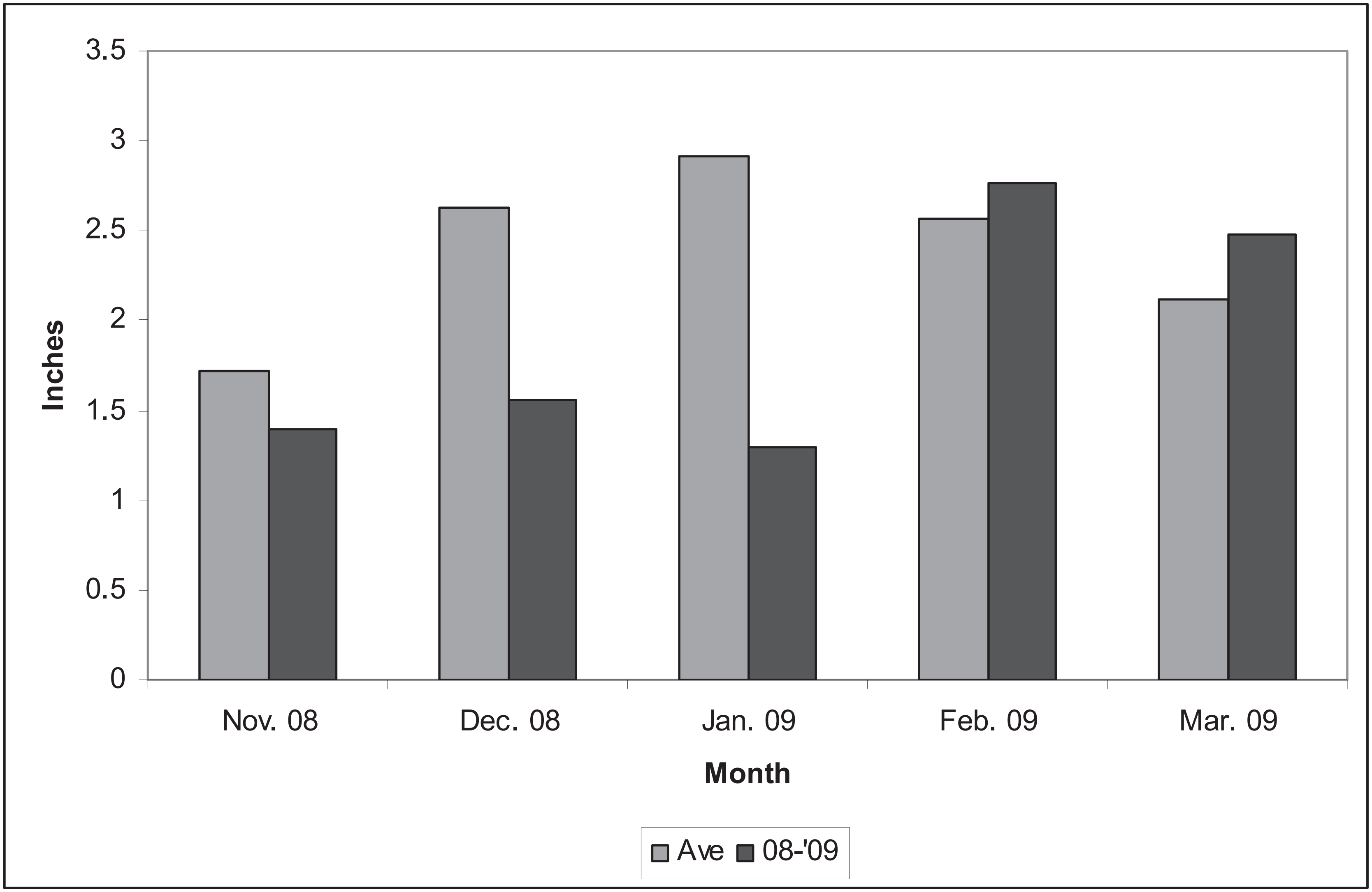


FIGURE 1-6
PRECIPITATION DATA NOVEMBER 2008 THROUGH MARCH 2009
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

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

FIGURE 3-1
SPECIAL-STATUS PLANT LOCATIONS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

Appendix A
Representative Site Photographs

Proposed plant site; looking south from existing gravel access road

Proposed lay-down area; view north from southern boundary of the property

Proposed power line route; view north toward Kelso Road from the south end of the alignment

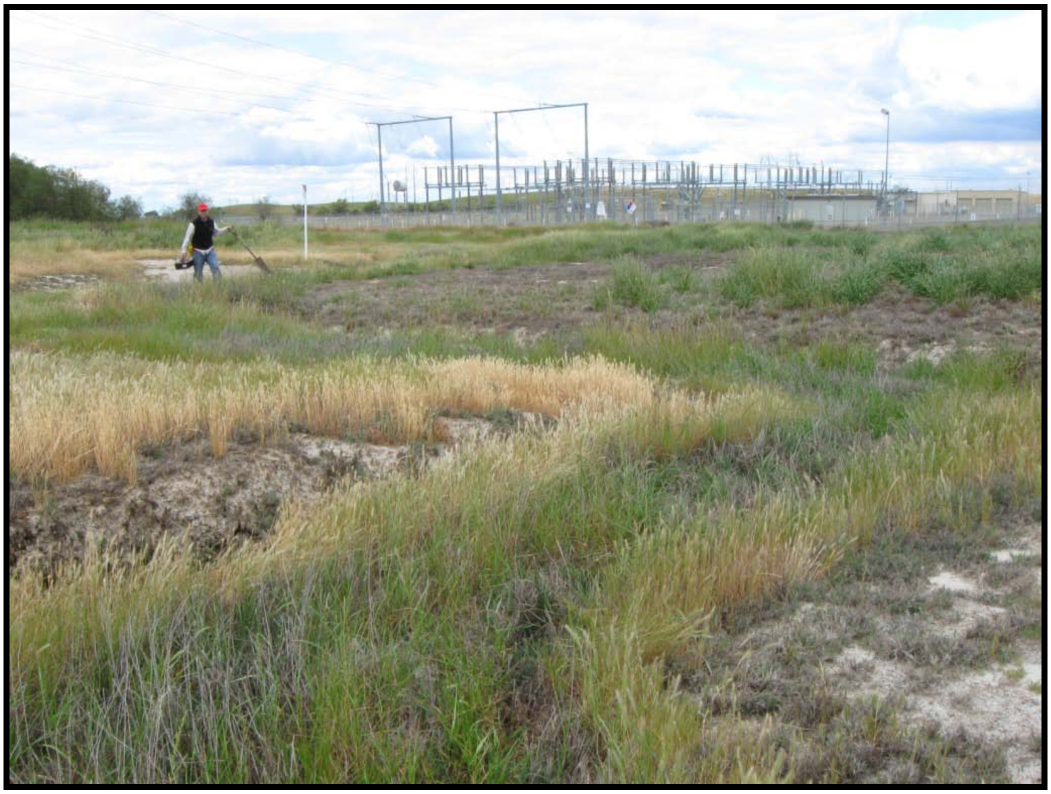
Proposed power line route; view south from the near the northeast corner of the PG&E facility at the intersection of Bruns and Kelso Roads

Proposed natural gas pipeline route; looking east-northeast from the northeast corner of the proposed facility site

Preferred service water pipeline route; view north along Bruns Road, south of Kelso Road

Preferred service water pipeline route; view north along Bruns Road, north of the Byron Bethany Irrigation District Headquarters facility

Drainage 1; view east from fence line east of Bruns Road



Drainage 2; view east northeast from Bruns Road

Drainage 3; view north from the east side of Bruns Road

Drainage 4; view east from Bruns Road

Alkaline Meadow Habitat east of Bruns Road, just north of Drainage 4

Alkaline meadow habitat north of PG&E's Kelso substation, just north of the Project survey area for the proposed transmission line; *Atriplex cordulata* (CNPS 1B) observed in this area.

Atriplex cordulata (CNPS 1B) observed just outside Project study area north of the PG&E's Kelso substation.

Alternate service water pipeline route; looking west along south side of Kelso Road, east of Mountain House Parkway

Alternate service water pipeline route; looking southeast along the Byron Highway adjacent to the Union Pacific Railroad tracks

Alternate service water pipeline route; looking north along Wicklund Road

Alternate service water pipeline route; looking north from Bethany Road toward water treatment facility.

Appendix B
Special-status Species Lists

APPENDIX B – CNPS

CNPS 9-Quad search for the Clifton Court Forebay 7.5 Munute Quadrangle

Scientific Name	Common Name	CNPS	State	Federal
Amsinckia grandiflora	large-flowered fiddleneck	1B.1	Endangered	Endangered
Amsinckia lunaris	bent-flowered fiddleneck	1B.2		
Astragalus tener var. tener	alkali milk-vetch	1B.2		
Atriplex cordulata	heartscale	1B.2		
Atriplex depressa	brittlescale	1B.2		
Atriplex joaquiniana	San Joaquin spearscale	1B.2		
Balsamorhiza macrolepis var. macrolepis	big-scale balsamroot	1B.2		
Blepharizonia plumosa	big tarplant	1B.1		
California macrophylla	round-leaved filaree	1B.1		
Carex comosa	bristly sedge	2.1		
Carex vulpinoidea	brown fox sedge	2.2		
Caulanthus coulteri var. lemmonii	Lemmon's jewelflower	1B.2		
Centromadia parryi ssp. congdonii	Congdon's tarplant	1B.2		
Cordylanthus mollis ssp. hispidus	hispid bird's-beak	1B.1		
Cordylanthus palmatus	palmate-bracted bird's-beak	1B.1	Endangered	Endangered
Deinandra bacigalupii	Livermore tarplant	1B.2		
Delphinium recurvatum	recurved larkspur	1B.2		
Eryngium racemosum	Delta button-celery	1B.1	Endangered	
Eschscholzia rhombipetala	diamond-petaled California poppy	1B.1		
Helianthella castanea	Diablo helianthella	1B.2		
Hibiscus lasiocarpus	woolly rose-mallow	2.2		
Lasthenia conjugens	Contra Costa goldfields	1B.1		Endangered
Lathyrus jepsonii var. jepsonii	Delta tule pea	1B.2		
Lilaeopsis masonii	Mason's lilaeopsis	1B.1	Rare	
Limosella subulata	Delta mudwort	2.1		
Madia radiata	showy golden madia	1B.1		
Myosurus minimus ssp. apus	little mousetail	3.1		
Plagiobothrys glaber	hairless popcorn-flower	1A		
Scutellaria galericulata	marsh skullcap	2.2		
Senecio aphanactis	chaparral ragwort	2.2		

APPENDIX B – CNPS

CNPS 9-Quad search for the Clifton Court Forebay 7.5 Munute Quadrangle

Scientific Name	Common Name	CNPS	State	Federal
Symphyotrichum lentum	Suisun Marsh aster	1B.2		
Trifolium depauperatum var. hydrophilum	saline clover	1B.2		
Tropidocarpum capparideum	caper-fruited tropidocarpum	1B.1		

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 090824104248

Database Last Updated: January 29, 2009

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio
- Conservancy fairy shrimp (E)

Branchinecta longiantenna
- longhorn fairy shrimp (E)

Branchinecta lynchi
- Critical habitat, vernal pool fairy shrimp (X)
- vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
- valley elderberry longhorn beetle (T)

Lepidurus packardi
- vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
- green sturgeon (T) (NMFS)

Hypomesus transpacificus
- Critical habitat, delta smelt (X)
- delta smelt (T)

Oncorhynchus mykiss
- Central Valley steelhead (T) (NMFS)
- Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
- Central Valley spring-run chinook salmon (T) (NMFS)
- winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
- California tiger salamander, central population (T)

Rana aurora draytonii
- California red-legged frog (T)

Reptiles

Masticophis lateralis euryxanthus

Alameda whipsnake [=striped racer] (T)

Thamnophis gigas

giant garter snake (T)

Mammals

Vulpes macrotis mutica

San Joaquin kit fox (E)

Plants

Lasthenia conjugens

Critical habitat, Contra Costa goldfields (X)

Proposed Species

Amphibians

Rana aurora draytonii

Critical habitat, California red-legged frog (PX)

Quads Containing Listed, Proposed or Candidate Species:

CLIFTON COURT FOREBAY (463D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about · size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** proje within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.

- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by t list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environment documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that n result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together t avoid or minimize the impact on listed species and their habitat. Such consultation would resu in a biological opinion by the Service addressing the anticipated effect of the project on listed proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and a likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct a indirect impacts to listed species and compensates for project-related loss of habitat. You shou include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essenti to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose th for listing as threatened or endangered. By considering these species early in your plannir process you may be able to avoid the problems that could develop if one of these candida was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defir by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, yo will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be November 22, 2009.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Amsinckia grandiflora large-flowered fiddleneck	PDBOR01050	Endangered	Endangered	G1	S1.1	1B.1
2	Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070			G2	S2.2	1B.2
3	Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2
4	Atriplex cordulata heartscale	PDCHE040B0			G2?	S2.2?	1B.2
5	Atriplex depressa brittlescale	PDCHE042L0			G2Q	S2.2	1B.2
6	Atriplex joaquiniana San Joaquin spearscale	PDCHE041F3			G2	S2.1	1B.2
7	Balsamorhiza macrolepis var. macrolepis big-scale balsamroot	PDAST11061			G3G4T2	S2.2	1B.2
8	Blepharizonia plumosa big tarplant	PDAST1C011			G1	S1.1	1B.1
9	California macrophylla round-leaved filaree	PDGER01070			G3	S3.1	1B.1
10	Carex comosa bristly sedge	PMCYP032Y0			G5	S2?	2.1
11	Carex vulpinoidea brown fox sedge	PMCYP03EN0			G5	S2.2	2.2
12	Caulanthus coulteri var. lemmonii Lemmon's jewelflower	PDBRA0M0E0			G4T2	S2.2	1B.2
13	Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1			G4T3	S3.2	1B.2
14	Cordylanthus mollis ssp. hispidus hispid bird's-beak	PDSCR0J0D1			G2T2	S2.1	1B.1
15	Cordylanthus palmatus palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1.1	1B.1
16	Deinandra bacigalupii Livermore tarplant	PDAST4R0V0			G1	S1.2	1B.2
17	Delphinium californicum ssp. interius Hospital Canyon larkspur	PDRAN0B0A2			G3T2?	S2?	1B.2
18	Delphinium recurvatum recurved larkspur	PDRAN0B1J0			G2	S2.2	1B.2
19	Eryngium racemosum Delta button-celery	PDAPI0Z0S0		Endangered	G2Q	S2.1	1B.1
20	Eschscholzia rhombipetala diamond-petaled California poppy	PDPAP0A0D0			G1	S1.1	1B.1
21	Fritillaria agrestis stinkbells	PMLIL0V010			G3	S3.2	4.2
22	Helianthella castanea Diablo helianthella	PDAST4M020			G3	S3.2	1B.2
23	Hibiscus lasiocarpus woolly rose-mallow	PDMAL0H0Q0			G4	S2.2	2.2

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2			G5T2	S2.2	1B.2
25	Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030		Rare	G3	S3.1	1B.1
26	Limosella subulata Delta mudwort	PDSCR10050			G4?Q	S2.1	2.1
27	Madia radiata showy golden madia	PDAST650E0			G2	S2.1	1B.1
28	Plagiobothrys glaber hairless popcorn-flower	PDBOR0V0B0			GH	SH	1A
29	Scutellaria galericulata marsh skullcap	PDLAM1U0J0			G5	S2.2?	2.2
30	Senecio aphanactis chaparral ragwort	PDAST8H060			G3?	S1.2	2.2
31	Symphyotrichum lentum Suisun Marsh aster	PDASTE8470			G2	S2.2	1B.2
32	Trifolium depauperatum var. hydrophilum saline clover	PDFAB400R5			G5T2?	S2.2?	1B.2
33	Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B.1

Appendix C
Reference Site Photographs

Diamond-petaled California poppy (*Eschscholzia rhombipetala*); observed April 6, 2009 on a north facing slope north of Tesla Road, approximately 12 miles east of Livermore

Contra Costa Goldfields (*Lasthenia conjugens*): observed along Scally Road, south of Highway 12 on April 15, 2009.

Livermore tarplant (*Deinandra bacigalupi*): observed on August 18, 2009 at the Springtown Wetland Reserve north of Highway 580, on the west side of North Vasco Road in Livermore.

Palmate-bracted bird's beak (*Cordylanthus palmatus*): observed on August 18, 2009 at the Springtown Wetland Reserve north of Highway 580 on the west of side of North Vasco Road in Livermore

Appendix D
Vascular Plants Observed

TABLE D-1
List of Vascular Plants Observed During 2009 Botanical Survey fro the Mariposa Energy Center

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]
Amaranthaceae			
Amaranthus albus	prostrate pigweed	I	A
Amaranthus blitoides	mat amaranth	N	A
Amaranthus retroflexus	redroot amaranth	I	A
Anacardiaceae			
Schinus molle	Peruvian peppertree	I (L[3])	T
Apiaceae			
Conium maculatum	poison hemlock	I (M[3])	B
Eryngium aristulatum	California eryngo	N	B P
Eryngium vaseyi	coyote thistle	N	B P
Foeniculum vulgare	sweet fennel	I (H[3])	P
Apocynaceae			
Nerium oleander	oleander	I	T S
Arecaceae			
Washingtonia filifera (planted landscape tree)	California fan palm	N	T
Asclepiadaceae			
Asclepias fascicularis	Mexican whorled milkweed	N	P
Asteraceae			
Achyrachaena mollis	blow wives	N	A
Baccharis pilularis	coyote brush	N	S
Carduus pycnocephalus	Italian plumeless thistle	I (M[3])	A B
Centaurea calcitrapa	red star-thistle	I (M[3])	A P
Centaurea solstitialis	yellow star-thistle	I (H[3])	A
Centromadia pungens (*Hemizonia pungens*)	common tarweed	N	A
Cichorium intybus	chicory	I	P
Cirsium vulgare	bull thistle	I (M[3])	B
Conyza bonariensis	asthma weed	I	A
Cotula coronopifolia	common brass buttons	I (L[3])	P
Gnaphalium palustre	western marsh cudweed	N	A
Grindelia camporum var. *camporum*	Great Valley gumweed	N	P
Helianthus annuus	common sunflower	N	A

TABLE D-1
List of Vascular Plants Observed During 2009 Botanical Survey fro the Mariposa Energy Center

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]
Helminthotheca echioides (*Picris echioides*)	bristly oxtongue	I (L[3])	A B
Hypochaeris glabra	smooth cat's ear	I (L[3])	A
Lactuca saligna	willowleaf lettuce	I	A
Lactuca serriola	prickly lettuce	I	A
Lasthenia californica	California goldfields	N	A
Matricaria matricarioides (*Chamomilla suaveolens, Matricaria discoidea*)	disc mayweed	I	A
Microseris douglasii ssp. *douglasii*	Douglas' silverpuffs	N	A
Psilocarphus oregonus	Oregon woollyheads	N	A
Senecio vulgaris	old-man-in-the-Spring	I	A
Silybum marianum	blessed milkthistle	I (L[3])	A B
Sonchus asper	spiny sowthistle	I	A
Sonchus oleraceus	common sowthistle	I	A
Xanthium spinosum	spiny cocklebur	N	A
Xanthium strumarium	rough cocklebur	N	A
Boraginaceae			
Amsinckia menziesii	Menzies' fiddleneck	N	A
Heliotropium curassavicum	salt heliotrope	N	P
Plagiobothrys greenei	Greene's popcornflower	N	A
Plagiobothrys stipitatus	stalked popcornflower	N	A
Plagiobothrys trachycarpus	roughfruit popcornflower	N	A
Brassicaceae			
Brassica nigra	black mustard	I (M[3])	A
Brassica rapa	field mustard	I (L[3])	A
Capsella bursa-pastoris	shepherd's purse	I	A
Hirschfeldia incana	shortpod mustard	I (M[3])	B P
Lepidium didymum (*Coronopus didymus*)	lesser swinecress	I	A
Lepidium draba subsp. *draba* (*Cardaria draba*)	whitetop	I	P
Lepidium latifolium	broadleaved pepperweed	I (H[3])	P
Lepidium latipes	San Diego pepperweed	N	A
Lepidium nitidum var. *nitidum*	shining pepperweed	N	A

TABLE D-1
List of Vascular Plants Observed During 2009 Botanical Survey fro the Mariposa Energy Center

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]
Raphanus sativus	cultivated radish	I (L[3])	A B
Sisymbrium orientale	hedgemustard	I	A
<u>Casuarinaceae</u>			
Casuarina sp.	sheoak	I	T
<u>Callitrichaceae</u>			
Callitriche marginata	winged water-starwort	N	A
<u>Campanulaceae</u>			
Downingia insignis	harlequin calicoflower	N	A
<u>Caryophyllaceae</u>			
Spergularia salina (*Spergularia marina*)	salt sandspurry	N	A
Stellaria media	common chickweed	I	A
<u>Chenopodiaceae</u>			
Allenrolfea occidentalis	iodine bush	N	S
Atriplex argentea var. *mohavensis*	silverscale saltbush	N	A
Atriplex cordulata	heartscale	N (1B[4])	A
Atriplex fruticulosa	ball saltbush	N	P
Atriplex triangularis (*Atriplex prostrate*)	triangle orache	N	A
Bassia hyssopifolia	fivehorn smotherweed	I (L[3])	A
Chenopodium album	lambsquarters	I	A
Chenopodium murale	nettleleaf goosefoot	I	A
Halogeton glomeratus	saltlover	I (M[3])	A
Salsola tragus	prickly Russian thistle	I (L[3])	A
<u>Convolvulaceae</u>			
Convolvulus arvensis	field bindweed	I	P
Cressa truxillensis	spreading alkaliweed	N	P
<u>Crassulaceae</u>			
Crassula aquatica	water pygmyweed	N	A
Crassula connata	sand pygmyweed	N	A
<u>Cyperaceae</u>			
Bolboschoenus maritimus (*Scirpus maritimus, Schoenoplectus maritimus*)	cosmopolitan bulrush	N	P

TABLE D-1
List of Vascular Plants Observed During 2009 Botanical Survey fro the Mariposa Energy Center

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]
Euphorbiaceae			
Croton setigerus (*Eremocarpus setigerus*)	dove weed	N	A
Chamaesyce maculata (*Euphorbia maculata*)	spotted sandmat	I	A
Fabaceae			
Astragalus asymmetricus	San Joaquin milkvetch	N	P
Lupinus bicolor	miniature lupine	N	A
Lupinus succulentus	hollowleaf annual lupine	N	A
Medicago polymorpha	burclover	I (L[3])	A
Medicago sativa	alfalfa	I	P
Melilotus indicus	annual yellow sweetclover	I	A
Trifolium hirtum	rose clover	I (M[3])	A
Frankeniaceae			
Frankenia salina	alkali seaheath	N	SS
Geraniaceae			
Erodium botrys	longbeak stork's bill	I	A
Erodium cicutarium	redstem stork's bill	I (L[3])	A
Erodium moschatum	musky stork's bill	I	A
Geranium dissectum	cutleaf geranium	I	A
Juglandaceae			
Juglans hindsii (planted landscape tree)	Northern California walnut	N	T
Juncaceae			
Juncus bufonius	toad rush	N	A
Juncus mexicanus	Mexican rush	N	P
Lamiaceae			
Lamium amplexicaule	henbit deadnettle	I	A
Marrubium vulgare	horehound	I (L[3])	P
Rosmarinus officinalis (landscape planting)	rosemary	I	S
Lythraceae			
Lythrum hyssopifolium	Purple loosestrife	I (L[3])	A B
Malvaceae			
Malva nicaeensis	bull mallow	I	A B

TABLE D-1
List of Vascular Plants Observed During 2009 Botanical Survey fro the Mariposa Energy Center

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]
Malvella leprosa	alkali mallow	-	A
Myrtaceae			
Eucalyptus globulus (planted landscape tree)	Tasmanian bluegum	I	T
Onagraceae			
Epilobium densiflorum	denseflower willowherb	N	A
Papaveraceae			
Eschscholzia californica	California poppy	N	A
Platanaceae			
Platanus x *acerifolia* (planted landscape tree)	London plane tree	I	T
Plantaginaceae			
Plantago elongata	prairie plantain	N	A
Plantago lanceolata	narrowleaf plantain	I (L[3])	P
Plantago major	common plantain	I	P
Pinaceae			
Pinus muricata (planted landscape tree)	Bishop pine	N	T
Poaceae			
Alopecurus saccatus	Pacific foxtail	N	A
Arundo donax	giant reed	I (H[3])	P
Avena barbata	slender oat	I (M[3])	A
Avena fatua	wild oat	I (M[3])	A
Bromus catharticus	rescuegrass	I	A P
Bromus diandrus	ripgut brome	I (M[3])	A
Bromus hordeaceus	soft brome	I (L[3])	A
Bromus madritensis ssp. *rubens* (*Bromus rubens*)	red brome	I (H[3])	A
Crypsis schoenoides	swamp pricklegrass	I	A
Cynodon dactylon	Bermudagrass	I (M[3])	P
Deschampsia danthonioides	annual hairgrass	N	A
Distichlis spicata	saltgrass	N	P
Echinochloa crus-galli	barnyardgrass	I	A
Echinochloa colona	jungle rice	I	A
Eragrostis sp.	lovegrass	I	A
Hordeum brachyantherum ssp. *brachyantherum*	meadow barley	N	P

TABLE D-1
List of Vascular Plants Observed During 2009 Botanical Survey fro the Mariposa Energy Center

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	I	A
Hordeum murinum ssp. *leporinum*	hare barley	I	A
Leymus triticoides	beardless wildrye	N	P
Lolium multiflorum (*Lolium perenne* ssp. *multiflorum*)	Italian ryegrass	I (M[3])	A B
Nassella pulchra	purple needlegrass	N	P
Panicum capillare	witchgrass	N	A
Parapholis incurva	curved sicklegrass	I	A
Phalaris minor	littleseed canarygrass	I	A
Puccinellia simplex	California alkaligrass	N	A
Poa annua	annual bluegrass	I	A B
Polypogon monspeliensis	annual rabbitsfoot grass	I (L[3])	A
Pennisetum sp. (landscape planting)	fountaingrass	I	P
Setaria pumila	yellow foxtail	I	A
Sorghum halepense	Johnsongrass	I	P
Triticum aestivum	common wheat	I	A
Vulpia bromoides	brome fescue	I	A
Vulpia myuros	rat-tail fescue	I (L[3])	A
Polygonaceae			
Polygonum aviculare ssp. *depressum* (*Polygonum arenastrum*)	oval-leaf knotweed	I	A P
Rumex crispus	curly dock	I (L[3])	P
Rumex pulcher	fiddle dock	I	P
Portulacaceae			
Calandrinia ciliata	fringed redmaids	N	A
Primulaceae			
Anagallis arvensis	scarlet pimpernel	I	A
Ranunculaceae			
Myosurus minimus[5]	tiny mousetail	N	A
Myosurus sessilis	vernal pool mousetail	N	A
Rosaceae			
Rosa sp. (landscape planting)	rose	I	S

TABLE D-1
List of Vascular Plants Observed During 2009 Botanical Survey fro the Mariposa Energy Center

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]
Salicaceae			
Populus nigra (planted landscape tree)	Lombardy poplar	I	T
Salix lasiolepis	arroyo willow	N	T
Scrophulariaceae			
Castilleja campestris	vernal pool Indian paintbrush	N	A
Triphysaria eriantha	johnny-tuck	N	A
Veronica peregrina	neckweed	N	A
Solanaceae			
Datura wrightii	sacred thorn-apple	N	A P
Solanum americanum	American Black Nightshade	N	A SS
Solanum elaeagnifolium	silverleaf nightshade	I	P
Typhaceae			
Typha latifolia	broadleaf cattail	N	P
Typha angustifolia	narrowleaf cattail	N	P
Urticaceae			
Urtica dioica	stinging nettle	N	P
Zygophyllaceae			
Tribulus terrestris	puncturevine	I	A

[1] Taxonomic name, origin and habitat based on the Jepson On-Line Interchange for California Floristics (August 2009).

[2]Common names are from the U.S. Department of Agriculture Natural Resource Conservation Service On-Line Plants Database (August 2009).

[3]California Invasive Plant Council Ratings On Line Inventory (August 2009)

H – High. These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

M – Moderate. These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

L – Limited. These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Scientific Name[1]	Common Name[2]	Origin[1]	Habit[1]

[4]California Native Plant Society's Inventory of Rare and Endangered Plants of California (August 2009)

1B – List 1B. The plants that are rare, threatened or endangered throughout their range. Most are endemic to California and have declined significantly over the last century.

[5] California Native Plant Society includes *Myosurus minimus* ssp. *apus* as a list 3.1 plant (watch list) in the On-line Inventory of Rare and Endangered Plants of California (August 2009). This subspecies is not recognized in the Current Jepson Manual (Hickman 1993) and the taxonomy remains unresolved (Jepson On-Line Interchange, August 2009).

Origin
N Native
I Introduced

Habit
A Annual
B Biennial
P Perennial
SS Sub-Shrub
S Shrub
T Tree

Appendix D
Wetlands Report

CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833-2937
Tel 916.920.0300
Fax 916.920.8463

CH2MHILL

September 29, 2009

Mr. Mark Fugler
Regulatory Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814

Subject: Mariposa Energy Project (File # SPK-2009-01261), Request for Waters of the U.S. Jurisdictional Determination

Dear Mr. Fugler:

Please find enclosed one (1) copy of the formal Wetland Delineation Report for the Mariposa Energy Project (MEP). On behalf of my client, Mariposa Energy, I request a waters of the U.S. Jurisdictional Determination at your earliest convenience. Either I and/or our wetlands specialist will attend your site visit to help familiarize you to the project area and answer any questions. In the event that the U.S. Army Corps of Engineers takes jurisdiction over any of the onsite wetlands and waters, I anticipate a federal nexus for MEP for formal consultation under Section 7 of the Endangered Species Act.

The MEP is a proposed natural gas fired, peaking facility with a generating capacity of 200-megawatts. The proposed project site is in northeastern Alameda County, in an unincorporated area 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 would be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel immediately south of the Pacific Gas and Electric Company (PG&E) Bethany Compressor Station and 230-kilovolt (kV) Kelso Substation. A complete description of MEP is provided in the California Energy Commission Application for Certification available online at: http://www.energy.ca.gov/sitingcases/mariposa/documents/index.html

Please feel free to contact either Doug Urry (CH2M HILL Project Manager) at (916) 286-0348 or me at (408) 839-2402 or todd.ellwood@ch2m.com with any questions. We look forward to meeting you at the project site.

Sincerely,

CH2M HILL

Todd Ellwood

Todd Ellwood
Project Biologist

Enclosure

cc: Doug Urry, CH2MHILL
Russell Huddleston, CH2M HILL
Bo Buchynsky, Mariposa Energy, LLC

Draft Report

USACE Delineation of Wetlands and Other Waters for the Mariposa Energy Project

Prepared for

Mariposa Energy, LLC

July 2009

CH2MHILL
155 Grand Avenue
Suite 1000
Oakland, CA 94612

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Acronyms and Abbreviations

BBID	Byron Bethany Irrigation District
BIOS	Biogeographic Information and Observation System
CFR	Code of Federal Regulations
cmp	corrugated metal pipe
CWA	Clean Water Act
FAC	facultative plant species
FACW	facultative wetland plant species
GPS	Global Positioning System
HUC	Hydrologic Unit Code
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
OBL	obligate wetland plant species
PEMF	Palustrine Emergent Semi-Permanently Flooded
PEMH	Palustrine Emergent Permanently Flooded
PG&E	Pacific Gas and Electric Company
USACE	United States Army Corps of Engineers
WRCC	Western Region Climate Center

SECTION 1.0

Introduction

Mariposa Energy, LLC proposes to construct, own, and operate an electrical generating plant in unincorporated Alameda County, California. The Mariposa Energy Project (Project) will be a natural gas-fired, simple-cycle electrical generating facility rated at a nominal generating capacity of 200 megawatts.

Wetlands and other waters are ecological habitats that are protected under the Federal Clean Water Act (CWA). Activities that have the potential to discharge fill materials into "waters of the United States," including wetlands, must be authorized by the U. S. Army Corps of Engineers (USACE). This report presents the results of a wetland delineation conducted for the proposed Mariposa Energy Project. The results presented in this report are preliminary, pending verification by USACE. Information on the Project location as well as a general description of the environmental setting follows. Study methods and results are provided in the following sections.

1.1 Project Location

The Project study area is in northeastern Alameda County, approximately 10 miles northwest of the City of Tracy, 12 miles northeast of Livermore, and 12 miles southeast of Brentwood (Figure 1-1). The Project study area is located in the northwest 1/4 of Section 1, Township 2S, Range 3E (Mount Diablo Base and Meridian). The facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of a 158-acre parcel (known as the Lee Property) immediately south of the Pacific Gas and Electric Company (PG&E) Bethany Compressor Station and 230-kV Kelso Substation (Figure 1-2). The Assessor's parcel number is 099B-7050-001-10. The Project study area is located at 37° 47′ 23.86″ north latitude and 121° 36′ 06.35″ west longitude.

Linear features associated with the Project include a transmission line, natural gas pipeline, and service water line (Figure 1-2). The Project will interconnect to the Kelso Substation via a new 0.7-mile, 230-kV transmission line that will run north on the Lee Property, then across Kelso Road and into the existing substation. The natural gas pipeline will consist of approximately 580 feet of new 4-inch-diameter pipe that will run directly northeast from the Project study area to interconnect with PG&E's high-pressure natural gas pipeline (Line 2), which is located on the Lee Property. A new gas metering station will be constructed on the Project study area. Service water will be provided from a new connection to the Byron Bethany Irrigation District (BBID) via a new pump station and a 6-inch-diameter, 1.8-mile-long pipeline placed in or along the east side of Bruns Road, from Canal 45 south to the Project study area.

1.2 Environmental Setting

The Project is located at the northeastern edge of the Eastern Hills subsection of the Central Valley Coast Range Ecological subregion (Miles and Goudey, 1998), immediately bordering the alluvial plain of the San Joaquin Valley to the east. Regionally, the landscape is characterized by low foothills along the northeastern edge of the Diablo Range. In the vicinity of the Project study area, this area is characterized by a series of gently rolling hills to the south and west with low terraces to the north and east. Elevation in the Project area ranges from approximately 75 to 175 feet above mean sea level with slopes ranging from approximately 2 to 12.5 percent. Drainage is generally to the east and north. The following sections provide a description of the terrestrial habitats, climate, regional hydrology, and soils.

1.2.1 Terrestrial Habitats and Land Use

California annual grassland is the predominant natural community found throughout the Project area. Characteristic species include non-native grasses such as foxtail barley (*Hordeum murinum* ssp. *leporinum*), soft chess (*Bromus hordeaceus*), and wild oat (*Avena barbata*). Common forbs include bur clover (*Medicago polymorpha*), filaree (*Erodium moschatum*), black mustard (*Brassica nigra*), and gumweed (*Grindelia camporum*). The grassland habitat on the 158-acre Lee property is currently used for cattle grazing. Portions of the Project study area (including the proposed laydown area) were previously developed for wind energy. The windmill towers have been removed, but some remnants of the cement tower bases and miscellaneous debris remain scattered throughout the area.

Developed and agricultural areas in the vicinity of the Project area include the Byron Power Cogen Plant, located in the center of the Lee Property, PG&E's Bethany Compressor Station and Kelso Substation located north of Kelso Road, and the BBID headquarters facilities located along Bruns Road. Agricultural lands are limited to field crops (wheat and alfalfa) immediately north and south of the BBID facilities on the east side of Bruns Road.

1.2.2 Climate and Hydrology

The regional climate is characterized by cool, wet winters and hot, dry summers. Average temperatures range from a low of 36°F in January to a high of 90°F in July (Western Regional Climate Center [WRCC], 2009). According to the Natural Resources Conservation Service (NRCS) Climate Analysis for Wetlands (NRCS, 2002) the growing season (based on data from Livermore, California, and defined as temperatures above 28°F with a probability of 50 percent) extends from January 9 through December 29 for a total of 355 days (Appendix A). The average annual rainfall recorded at the Livermore weather station (044997) is 14.5 inches, with the majority (82 percent) of the annual precipitation occurring between November and March (WRCC, 2009).

The wetland delineation was conducted during a slightly below-average rainfall year. Based on daily climate data recorded at the Livermore weather station, located approximately 12 miles southeast of the Project study area, rainfall between November 1, 2008, and March 31, 2009 was 7.1 inches, or approximately 80 percent of the average rainfall for this period (University of California Integrated Pest Management, 2009). The lower-than-normal rainfall was due to below-average precipitation from November through January; precipitation was slightly above average in February and March (Figure 1-3).

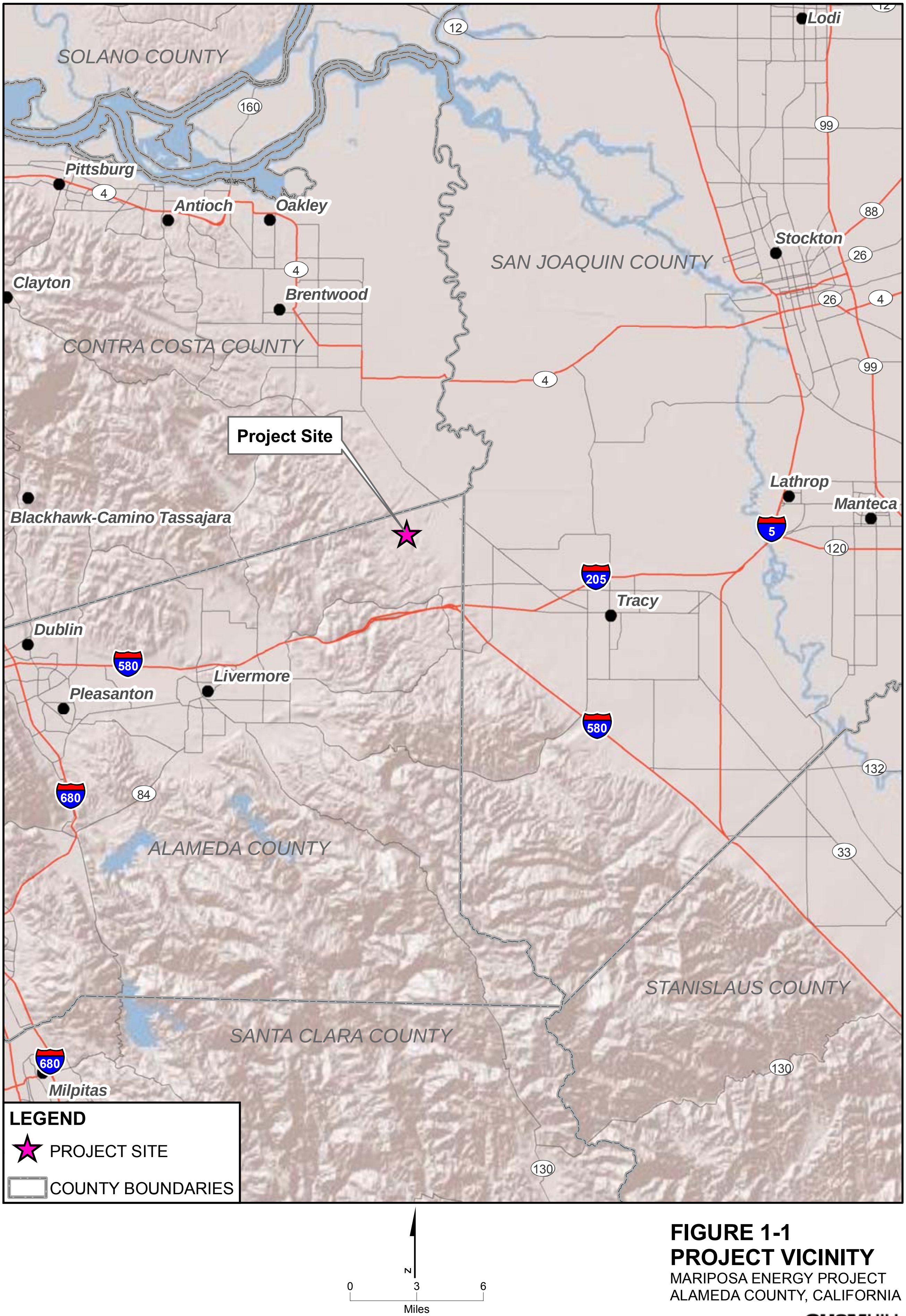

FIGURE 1-1
PROJECT VICINITY
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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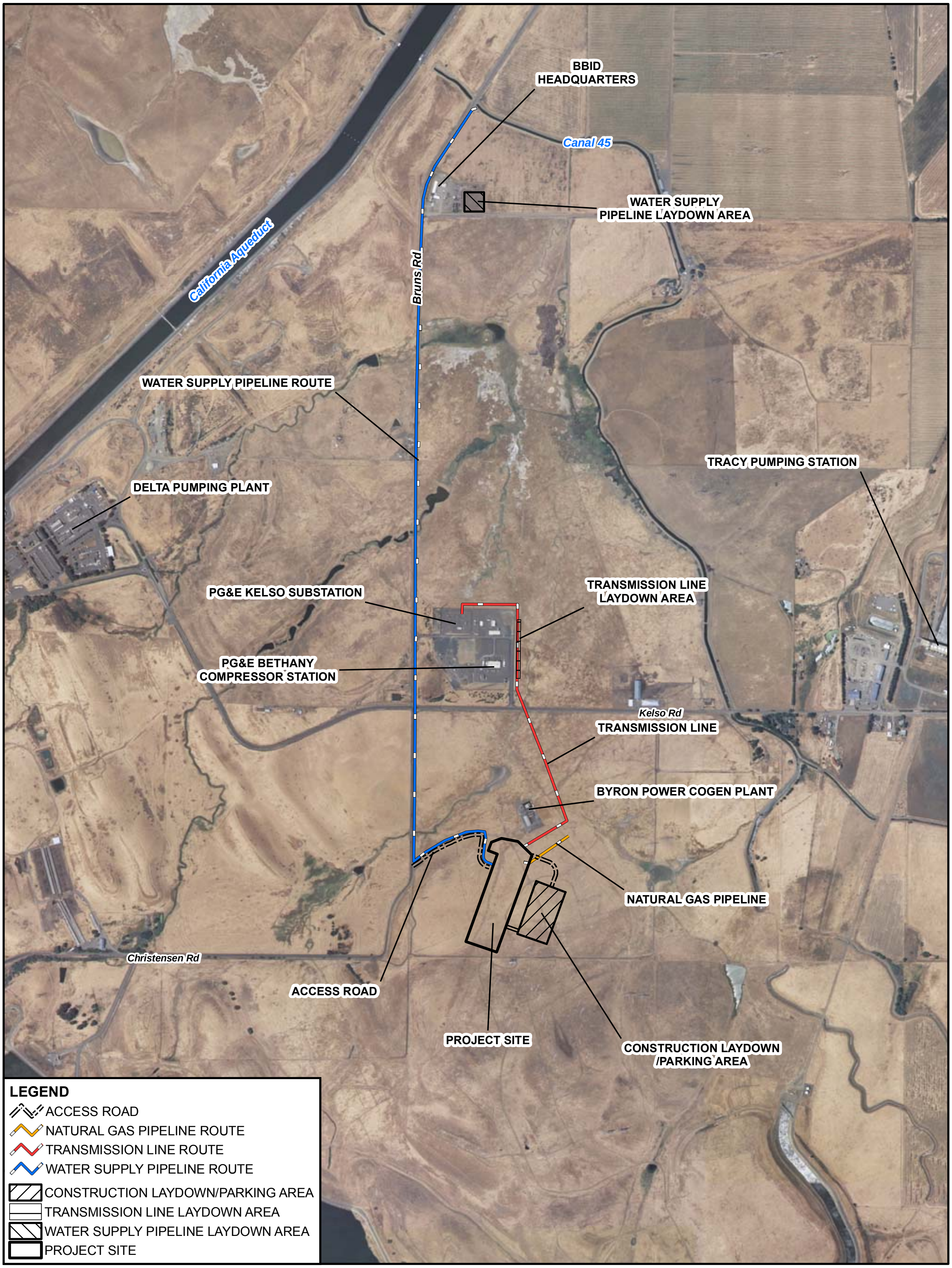

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

FIGURE 1-2
SITE LOCATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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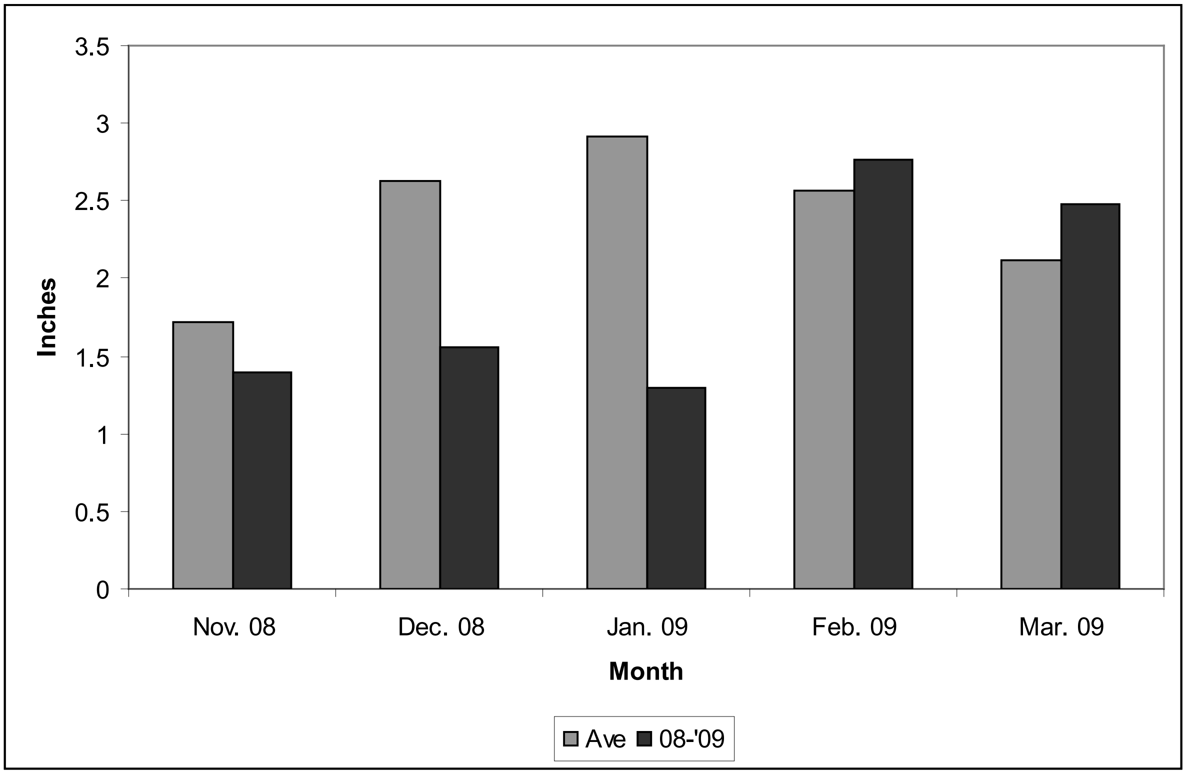


FIGURE 1-3
Precipitation Data November 2008 through March 2009

The Project is located in the San Joaquin Delta Hydrologic Unit (HUC 18040003), which has a drainage area of 433,302 acres (Biogeographic Information and Observation System [BIOS], 2009). The National Wetland Inventory (NWI) shows two palustrine emergent wetlands and two palustrine unconsolidated shore wetlands along the service water pipeline alignment along Bruns Road (Appendix B). USGS topographic information for the Clifton Court Forebay quadrangle indicates four blue line drainages along Bruns Road. Drainage in the vicinity of the Project area is generally to the north, where it is diverted around Clifton Court Forebay and into Italian Slough (Appendix C).

The natural hydrology in the vicinity of the Project area has been historically altered by the construction of reservoirs, aqueducts, canals, and agricultural drainages. Regionally, the most significant modifications are associated with the State Water Project, which was initiated in 1959 and fully operational by 1965. Water is diverted from the Delta into Clifton Court Forebay and is then pumped from the Harvey O. Banks Delta Pumping Plant into the Bethany Reservoir, where the South Bay Pumping Plant lifts water into the South Bay Aqueduct and the California Aqueduct.

1.2.3 Soils

Five soil series and nine different soil map units occur within the limits of the Project study area (Appendix D). General information on the soils based on local soil surveys (NRCS, 1977; 1966) and official soil series descriptions (NRCS, 2009) are provided below. All soil colors are for moist soils, unless otherwise noted.

Altamont Clays (AaC)

The Altamont series consists of well-drained soils with slow permeability derived from weathered shale and fine-grained sandstone. These soils are found on rolling hills and steep slopes east of Livermore. In a representative profile, the surface layer to a depth of 28 inches is dark brown (10YR 3/3) clay. A very thin, grayish-brown (10 YR 5/2) [dry] surface crust may be present in some areas and very dark brown to black films are often present on the upper ped surfaces. Light-colored calcium carbonate films and segregations are often common below 7 inches and soils become slightly alkaline with depth. The clay content in this soil ranges from 35 to 60 percent and wide, deep cracks are common throughout, once the soil is dry.

Linne Clay Loam (LaD, LbD, LaC)

The Linne series consists of well-drained calcareous soils derived from weathered shale and sandstone. These soils are found on rolling hills and slopes. In a typical profile, the upper 14 inches is a moderately alkaline, black (10 YR 2/1) clay loam. Between 14 and 29 inches, the soil is a moderately alkaline, very dark gray (10 YR 3/1) clay loam. Light-colored lime filaments and deposits are present in the lower part of the horizon, increasing with depth. Permeability is moderately slow and these soils have medium to very rapid runoff.

Rincon Clay Loam (RdB)

Rincon soils are found on alluvial fans and nearly level valley floors east of Livermore and north of Mountain House, where they formed in alluvium derived from sedimentary materials. In a typical profile, the surface horizon is a slightly acidic, very dark gray (l0YR 3/1) silty clay loam to a depth of 16 inches. From 16 to 25 inches, the soil is very dark grayish-brown (l0YR 3/2) sandy clay, often with clay films along the ped surfaces. These soils are well drained with slow permeability and slow to rapid runoff.

San Ysidro Loam (Sa, Sc)

The San Ysidro series consists of moderately well-drained soils formed in alluvium derived from sedimentary rocks. These soils occur on old valley fill and low terraces east of Livermore. In a representative profile, the surface layer (0 to 14 inches) is a slightly acidic, dark brown (10YR 4/3 to 3/3) fine sandy loam with few fine, distinct, brownish-yellow (10YR 6/6) concentrations. Below 14 inches, the soil is a dark brown (7.5YR 4/4) clay with a thin light gray (10 YR 6/2) bleach layer. Many moderately thick clay films are present along the ped surfaces and pore linings and common, fine iron and manganese concentrations are present. These soils have slow to medium runoff and very slow permeability.

Solano Fine Sandy Loam (Sf, Sfaa)

Solano soils are formed in alluvium derived from mixed sedimentary materials and are found on nearly level low terraces and in valley plains with slightly irregular or hummocky surface micro-topography. In a typical profile, the surface horizon is a strongly acidic, dark grayish-brown (10 YR 4/2) loam with few, fine, distinct dark reddish-brown (5 YR 3/4) concentrations. Below 9 inches, the soil is neutral to slightly alkaline, brown (10 YR 4/3) clay loam with dark, thin clay films on ped surfaces and pore linings. These soils are somewhat poorly drained with very slow to slow runoff and very slow permeability.

SECTION 2.0

Methods

An initial site survey was conducted on December 29, 2008, by CH2M HILL biologists Russell Huddleston and Todd Elwood, to identify potential wetlands and other waters and to collect data on seasonal hydrologic conditions in the Project study area. Additional surveys were conducted by Mr. Huddleston and/or Mr. Elwood on February 19, April 8, April 15, and June 4, 2009.

The approximately 69-acre Project study area included 41-acre area in which the power plant facility, laydown area, and natural gas pipeline would be located, as well as 100-foot-wide survey corridors along the transmission line and service water pipeline alignments (Figure 2-1). The following sections provide information on the methodology used for the delineation.

2.1 Wetland Delineation

The USACE defines wetlands as areas that are "inundated by surface water or groundwater with a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (Title 40 Code of Federal Regulations [CFR] Section 230.3 and Title 33 CFR Section 238). The wetland field surveys were conducted following the survey methodology described in 1987 *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual*: *Arid West Region* (USACE, 2008).

The USACE uses the three-criterion approach (vegetation, soils, and hydrology) to determine the presence of wetlands. As a general rule, under this method, evidence of a minimum of one positive indicator for each criterion must be found in order to make a positive wetland determination. In general, wetlands will normally meet the following criteria:

- **Hydrophytic Vegetation:** More than 50 percent of the dominant vegetation is composed of plant species that are adapted to survive and grow in hydrophytic (wet) conditions. These species have been assigned a wetland indicator value of facultative (FAC), facultative wetland (FACW), or obligate (OBL) on the *National List of Plant Species That Occur in Wetlands* (Reed, 1988).

- **Hydric Soils**: The NRCS defines hydric soil as "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part…" (Federal Register, July 13, 1994). The criteria for establishing the presence of hydric soils vary among soil types, drainage classes, and land resource regions. The NRCS (2006) has developed field indicators for identification of hydric soils. These indicators are currently used by the USACE in the *Arid West Regional Supplement to the 1987 Wetland Delineation Manual* (USACE, 2008). They rely on soil characteristics such as texture, color, and the amount of redoximorphic features to determine if soils are hydric.

- **Wetland Hydrology**: Areas with wetland hydrology are defined as "…inundated either permanently or periodically at mean water depths less than 2 meters (6.6 feet), or the soil is saturated to the surface at some time during the growing season" (Environmental Laboratory, 1987). Areas where saturation or inundation is present for at least 5 percent of the growing season may be considered wetlands. In the Project study area, wetlands would therefore need to be inundated or saturated for a minimum of 18 consecutive days to meet the wetland hydrology criterion.

A total of 15 sample points were established in potential wetlands and adjacent non-wetland areas (Figure 2-1). At each sample location vegetation, soil, and hydrology indicators were recorded on wetland determination data sheets, which are included in Appendix E. Representative Project study area photographs are provided in Appendix F.

Dominant plant species at each sample location were identified, and the percent cover was visually estimated within an approximately 5-foot radius area. All taxonomic designations follow *The Jepson Manual of Higher Plants of California* (Hickman, 1993) or the current revised taxonomy per the *Jepson Interchange for California Floristics* (University of California, 2009). The wetland indicator status was determined using the *National List of Plant Species that Occur in Wetlands: Region 0* (Reed, 1988). Dominant species within each vegetation strata included the most abundant species whose cumulative cover accounted for at least 50 percent of the total cover, as well as any single species that accounted for at least 20 percent of the vegetative cover. Strata that contained less than 5 percent total cover were not considered in the dominance test. A list of Plant species identified at each sample location is included in Appendix G.

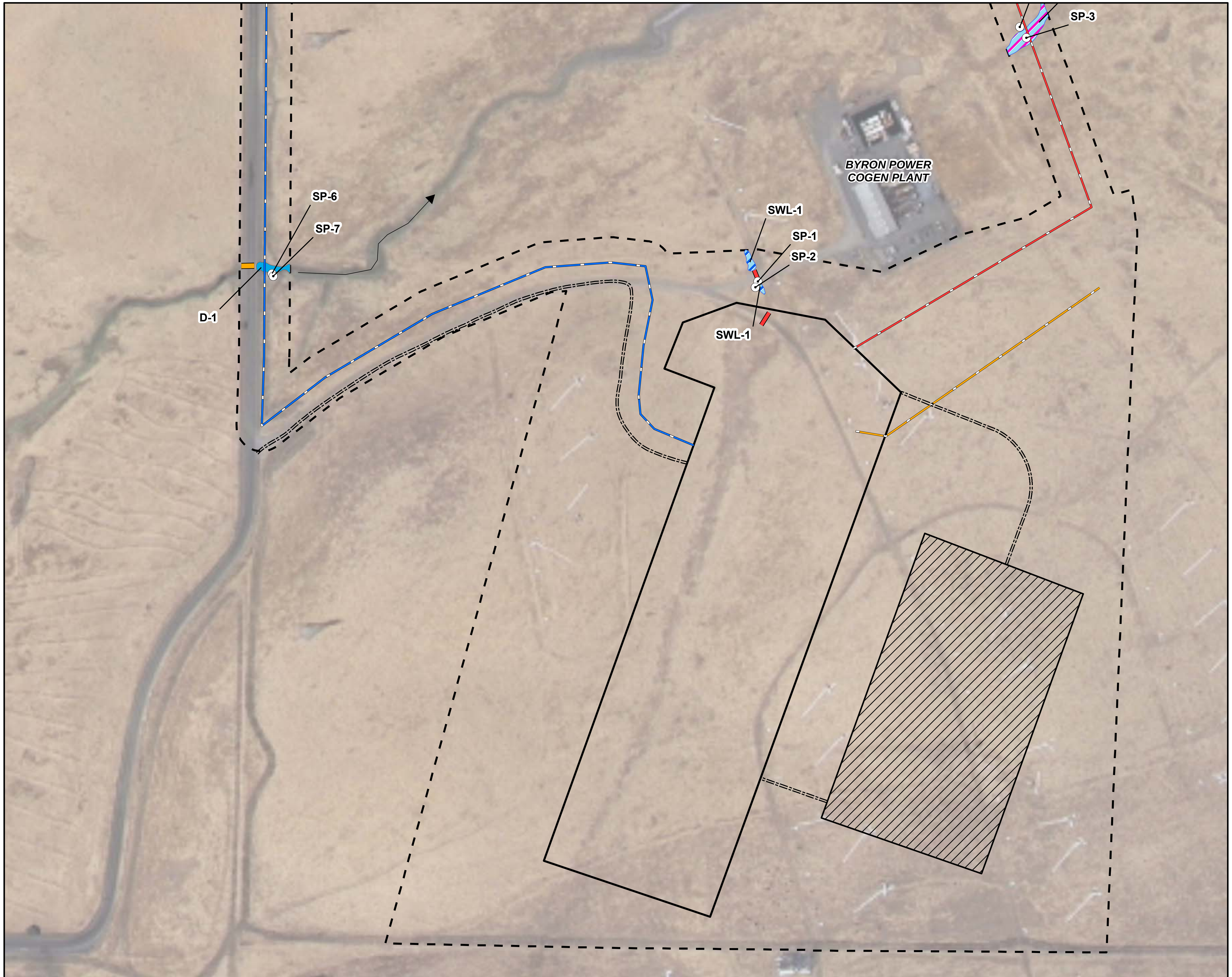
Descriptions of soils were made at each sample location by examining soil pits dug with a tile spade to depths of at least 12 inches where possible. Soil morphological features such as texture, color, and redoximorphic features were noted. Soils texture was estimated in the field using the "ribbon test" to approximate the clay, silt, and sand content. Moist soil colors were determined using Munsell® color charts.

Wetland hydrology was determined based on observations of saturation or inundation during the field surveys and other primary and secondary indicators of wetland hydrology such as presence of aquatic invertebrates, algal matting, water marks, and sediment deposits. Additional factors considered in the wetland hydrology determinations at each sample point included site drainage, landscape position, and micro-topography.

Wetland boundaries were determined in the field based on the vegetation, soils, and hydrology observed at selected sample points as well as distinct changes in vegetation and micro-topography and best professional judgment. A Trimble® Geo-XT global positioning system (GPS) unit was used to map all sample point locations, wetland boundaries, and other relevant features such as culverts and swales. The GPS data were then differentially corrected to generally sub-meter accuracy and plotted on aerial photograph base maps (Figure 2-1).

2.2 Other Features

Other features, including unvegetated ephemeral drainages and erosional channels, were identified and mapped with a GPS during the wetland delineation field surveys. The limits of these features were determined based on evidence of an ordinary high-water mark (e.g., scouring, drift lines, and/or sediment deposits) and/or defined bed and bank characteristics.



LEGEND

- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS

- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES

- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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

0 100 200
Feet

1 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

LEGEND
- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS
- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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

0 100 200
Feet

2 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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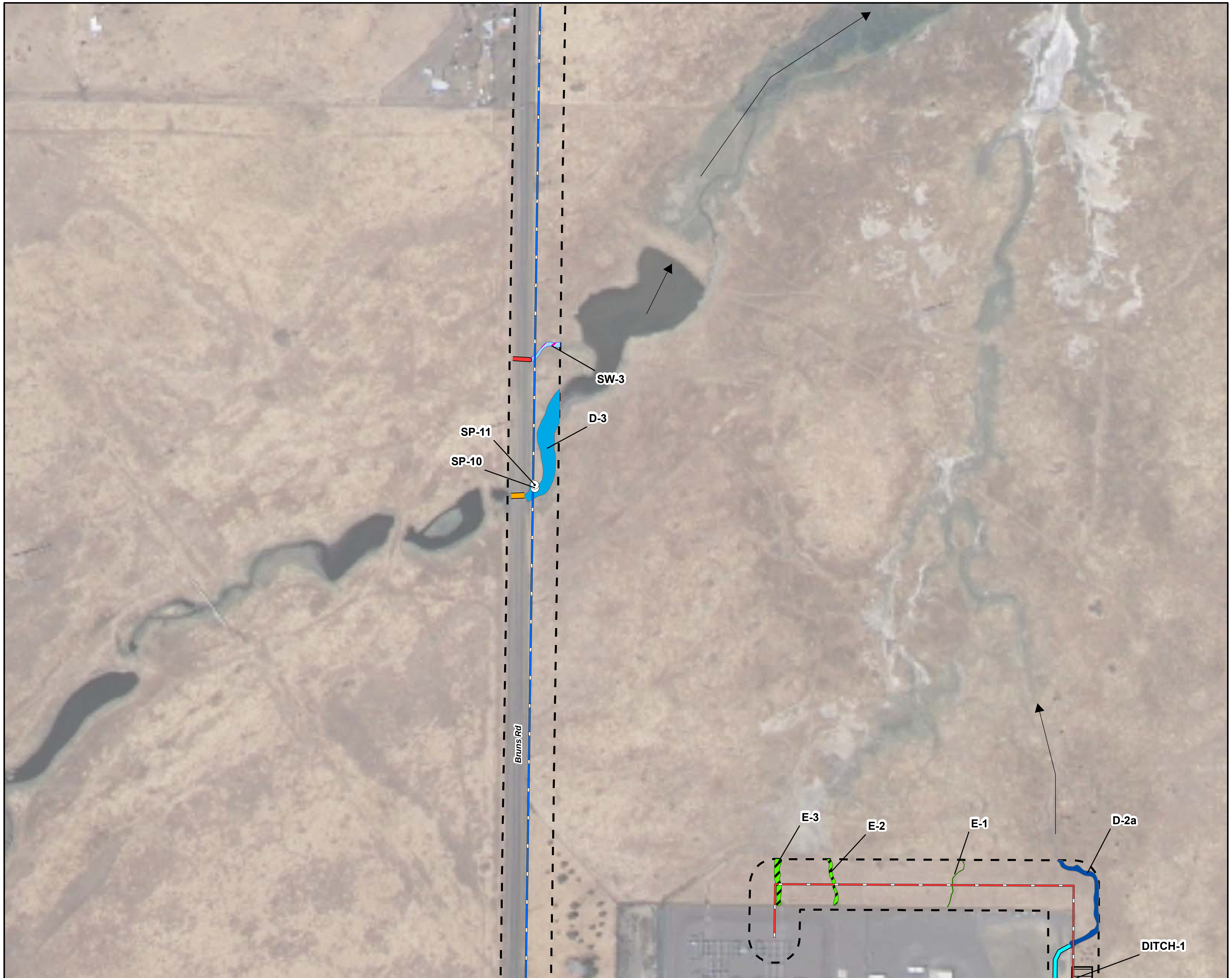

LEGEND

- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS

- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES

- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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

0 100 200
Feet

3 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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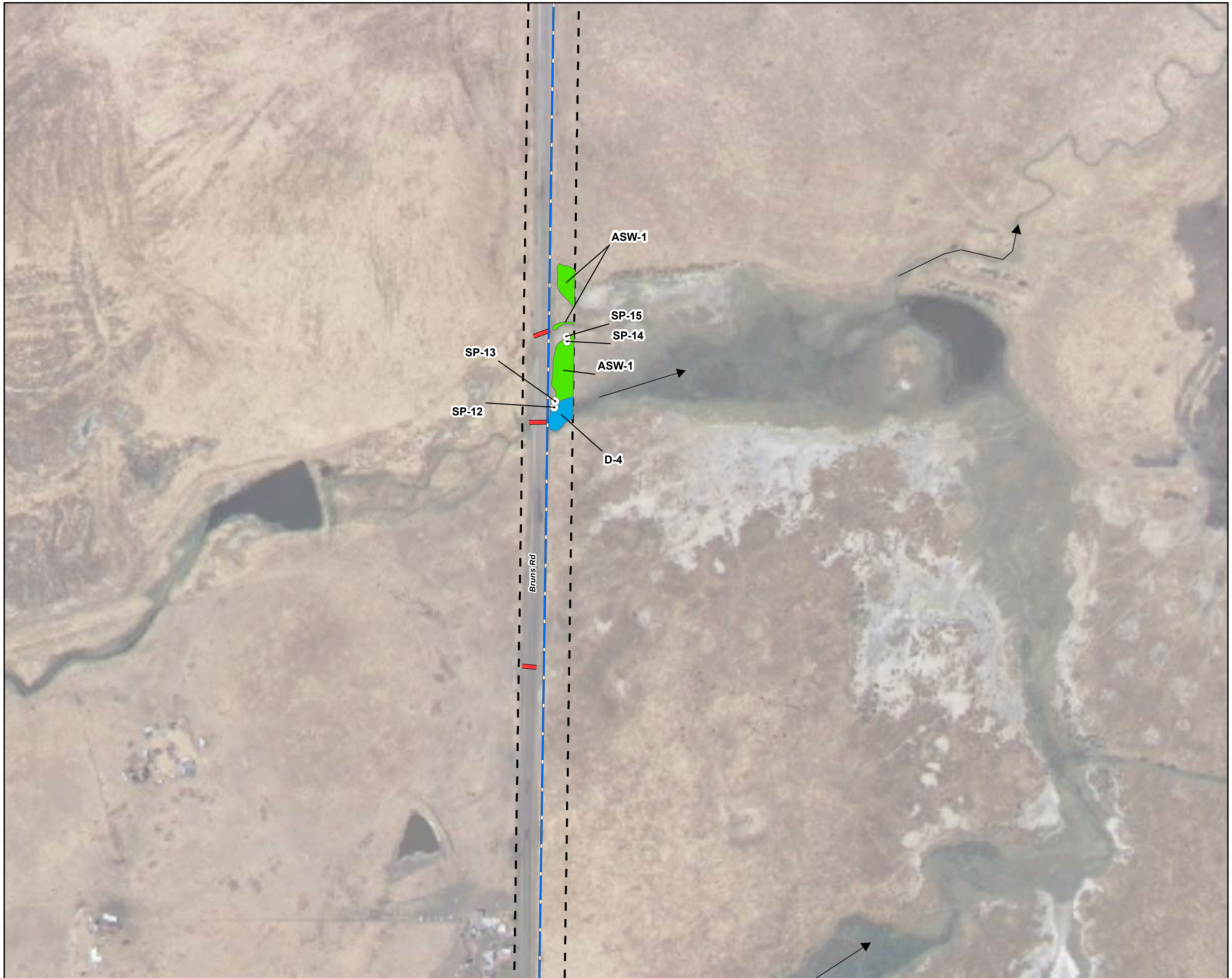
CH2MHILL



LEGEND

- DATA POINTS
- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- FLOW DIRECTION
- BOX CULVERT
- CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS

- DITCH
- ALKALI SINK WETLAND
- DRAINAGE WETLAND
- WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS

- EROSIONAL CHANNEL
- CANAL
- SEASONAL WETLAND
- SWALE

SITES

- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- PROJECT STUDY AREA

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

0 100 200
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4 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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LEGEND

DATA POINTS
ACCESS ROAD
NATURAL GAS PIPELINE ROUTE
TRANSMISSION LINE ROUTE
WATER SUPPLY PIPELINE ROUTE
FLOW DIRECTION
BOX CULVERT
CULVERT

POTENTIAL JURISDICTIONAL WATERS/WETLANDS
DITCH
ALKALI SINK WETLAND
DRAINAGE WETLAND
WATERS OF THE U.S.

POTENTIAL NON-JURISDICTIONAL WATERS/WETLANDS
EROSIONAL CHANNEL
CANAL
SEASONAL WETLAND
SWALE

SITES
CONSTRUCTION LAYDOWN/PARKING AREA
TRANSMISSION LINE LAYDOWN AREA
WATER SUPPLY PIPELINE LAYDOWN AREA
PROJECT SITE
PROJECT STUDY AREA

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

0 100 200
Feet

5 OF 5

FIGURE 2-1
WETLAND DELINEATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLANDS.MXD MHASKELL 7/13/2009 15:25:47

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SECTION 3.0

Results

Based on the observations made during the field surveys, a total of 0.251 acre of potential jurisdictional drainage wetlands, 0.166 acre of alkali sink wetland, and 0.075 acre of potential jurisdictional waters of the U.S. occur within the approximately 69-acre Project study area (Table 1). 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 Project study area (Table 1). The following sections provide descriptions of the wetlands, waters, and other features that were identified and mapped in the Project study area.

TABLE 1
Potential Jurisdictional and Non-Jurisdictional Wetland and Waters Identified in the Project Study Area

Feature	Acreage	Description
Potential Jurisdictional Waters of the U.S.		
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 Map 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 Map and is a blue line creek on USGS topographic map with apparent hydrologic connection with Italian Slough
Waters of the U.S (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

TABLE 1
Potential Jurisdictional and Non-Jurisdictional Wetland and Waters Identified in the Project Study Area

Feature	Acreage	Description
Waters of the U.S. (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
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 U.S.		
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 (cmp); 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 low, 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 Kelso Substation
Erosional Channel (E-2)	0.013	Erosional channel resulting from direct runoff from the Kelso Substation
Erosional Channel (E-3)	0.022	Large, deeply scoured erosional channel resulting from direct runoff from the Kelso Substation
Canal 45	0.046	Constructed and routinely maintained irrigation canal
Total	**0.228**	

3.1 Potential Jurisdictional Wetlands

Four drainage features all of which are shown as blue line drainages on the USGS Clifton Court Forebay 7.5-minute quadrangle were identified in the Project study area. These drainages all flow into a broad seasonal wetland area on the west side of Bruns Road at the Alameda-Contra Costa County Line. From this wetland, water flows approximately 0.5 mile to the north through a natural drainage channel and then continues north through a series of constructed drainage ditches for approximately 2.5 miles, where water is eventually discharged into Italian Slough (Appendix C). An alkali sink wetland is located adjacent to one of the drainages within the Project study area. All of these features are found along the proposed water supply pipeline route and the transmission line route (Figure 2-1).

3.1.1 Drainage Wetlands (D-1 and D1a)

The service water pipeline would cross a seasonal drainage (D-1) on the east side of Bruns Road, approximately 0.3 mile south of the intersection with Kelso Road (Figure 2-1; Map 1). A 6-foot by 6-foot box culvert is located under the road in this area. Within the Project study area, the drainage channel is well-defined with gently sloping banks. The area immediately around the culvert is characterized by dense perennial pepperweed (*Lepidium latifolium*). To the east, the channel is characterized by saltgrass (*Distichlis spicata*), with scattered rabbitsfoot grass (*Polypogon monspeliensis*), Italian ryegrass (*Lolium multiflorum*), sand spurry (*Spergularia marina*), and brass buttons (*Cotula coronopifolia*). The surface soil, to a depth of 5 inches, is a dark gray (10 YR 4/1) clay loam. Between 5 and 12 inches, the soil is a dark gray (2.5 Y 4/1) silty clay loam with approximately 10 percent dark yellowish-brown (10 YR 4/6) and dark brown (7.5 YR 4/3) concentrations, and a few grayish-green (Gley 1 6/10Y) depletions. Below 12 inches, the soil is a light olive brown (2.5 Y 5/3) mixed with some dark gray (2.5 Y 4/1) inclusions and dark yellowish-brown (10 YR 4/6) concentrations. No flow was observed during the April 8, 2009, field survey; but saturated soils were present at a depth of 12 inches and shallow standing water was present in the deeper parts of the channel. From the Project study area, this channel continues to the northeast for approximately 900 feet, where it enters an impoundment area.

Drainage 1a is a continuation of Drainage D-1 on the north side of the impoundment. Only a small portion of the drainage is present within the Project study area along the transmission line alignment at Kelso Road (Figure 2-1: Map 2). In this area, the drainage is a low, swale-like feature that lacks defined bed and bank characteristics. The vegetation is characterized by saltgrass, Mediterranean barley (*Hordeum marinum* ssp. *gussonianum*), soft chess, and foxtail barley. The channel was dry during all surveys and lacks evidence of an ordinary high water mark. A 30-inch-diameter corrugated metal pipe (cmp) is present under Kelso Road in this area. The natural hydrology of this channel has been significantly altered by the impoundment approximately 700 feet south of the Project study area.

3.1.2 Drainage Wetland (D-2)

Drainage 2 is a small swale-like feature located along Bruns Road immediately west of PG&E's Bethany Compressor Station, approximately 600 feet north of the intersection of Kelso Road (Figure 2-1; Map 2). A 12-inch-diameter cmp is located under the road in this area. Vegetation within the channel is characterized by dense saltgrass, Italian ryegrass, and meadow barley (*Hordeum brachyantherum*). Soil in the upper 5 inches is a moderately alkaline, dark grayish-brown (10 YR 4/2) sandy clay loam with approximately 2 percent dark brown (7.5 YR 3/4) concentrations. From 5 to 16 inches the soil is a light yellowish-brown (2.5 Y 6/4) clay loam with approximately 5 percent black (10 YR 2/1) manganese concentrations. The channel was dry at the time of the survey, but some scouring was evident along the shallow banks of the channel. This drainage flows to the east where it enters a rock-lined, linear drainage channel that flows east through the PG&E facility and eventually discharges into Drainage 2a.

3.1.3 Drainage Wetland (D-3)

Drainage Wetland 3 is a shallow, well-defined channel on the east side of Bruns Road approximately 0.3 mile north of the intersection with Kelso Road (Figure 2-1; Map 3). A 6-foot by 6-foot cement box culvert is located under the road at this location. The drainage channel is characterized by dense growth of cosmopolitan bulrush (*Bolboschoenus maritimus*) with scattered rabbitsfoot grass, curly dock (*Rumex crispus*), and cattail (*Typha dominigensis*). Surface soils were inundated at the time of the survey and had a strong positive reaction to alpha alpha-dipyridyl. The upper 6 inches is a mixed greenish-black (Gley 1 2.5/5GY) and black (5 Y 2.5/2) clay loam with approximately 5 percent strong brown (7.5 YR 4/6) concentrations. The channel was inundated with 3 to 6 inches of gently flowing water at the time of the survey. The vegetated channel flows to the north into a larger open water area and then continues to flow to the north northeast into the larger seasonal wetland area. This feature is included as a Palustrine Emergent Permanently Flooded (PEMH) wetland on the National Wetland Inventory Map (Appendix B).

3.1.4 Drainage Wetland (D-4)

This drainage is located immediately north of the Alameda County line along the east side of Bruns Road (Figure 2-1; Map 4). The shallow, well-defined channel is characterized by dense cattails (*Typha latifolia* and *T. dominingensis*) growing in the center of the channel with dense saltgrass growing around the outer edges. Mexican rush (*Juncus mexicanus*) and curly dock are also present in scattered locations. The soil at the outer edge of the channel is a strongly alkaline, dark grayish-brown (10 YR 4/2) fine sandy clay loam to clay loam. No redoximorphic features were noted in this area, possibly due to the high soil pH; however, hydric conditions were presumed to be present based on the level of inundation and abundant, lush OBL and FACW vegetation in this area. Shallow water was observed flowing from a 36-inch-diameter cmp under the road into this area during the surveys. The channel continues to flow to the east into a larger wetland area. This feature is included as a Palustrine Emergent Semi-Permanently Flooded (PEMF) wetland on the National Wetland Inventory Map (Appendix B).

3.1.5 Alkali Sink Wetland (ASW-1)

A large alkali sink wetland is present immediately north and directly abutting Drainage D-4 (Figure 2-1; Map 4). Within the Project study area, this feature is characterized by saltgrass and common rusty molly (*Kochia californica*) with scattered sand spurry, alkali heath (*Frankenia salina*), and common spikeweed (*Centromadia pungens*). The surface soil is a strongly alkaline, dark grayish-brown (10YR 4/2) fine sandy clay loam to a depth of 8 inches. From 8 to 24 inches, the soil is a very dark grayish-brown (10 YR 3/2) clay loam that is also strongly alkaline. No redoximorphic features were observed in the upper part of the soil, but this area was considered problematic due to the high soil pH. This area was dry at the time of the survey, but appears to be subject to at least seasonal inundation and most likely a prolonged seasonally shallow water table. This feature is identified as a Palustrine Unconsolidated Shore Seasonally Flooded wetland by the National Wetland Inventory Map (Appendix B).

3.2 Potential Waters of the U.S. (Non-Wetlands)

Portions of two drainage channels within the Project study area were considered to be non-wetland waters of the U.S. due to the lack of vegetation cover and presence of well-defined bed and bank characteristics.

3.2.1 Drainage 1b

Drainage 1b is a continuation of Drainage 1 north of Kelso Road, approximately 0.2 mile east of the intersection with Bruns Road (Figure 2-1; Map 2,). A 30-inch-diameter cmp is located under the road in this area. The area along the channel immediately north of the road is highly eroded and disturbed and the bed and bank are poorly defined. As the channel continues north, it quickly becomes well-defined with steep 3-foot-tall to 3.5-foot-tall banks and an open channel that ranges from approximately 5 to 8 feet wide. With the exception of sparse saltgrass, the channel is devoid of vegetation. From the Project study area, this channel continues to the north where it eventually discharges into the large wetland area near the county line.

3.2.2 Drainage 2a (Includes Ditch 1)

Drainage 2a is a continuation of Drainage 2 on the northeast side of the Kelso Substation. Within the PG&E facility this drainage has been realigned, flows through a series of small, rock-lined, linear drainage channels. Where it exits the facility, it becomes a well defined earthen channel with steep cut banks 2 to 2.5 feet tall with a 2-foot-wide to 5-foot-wide bed. With the exception of sparse Italian ryegrass, the channel is devoid of vegetation. This channel flows to the north into a seasonal wetland area that continues north and eventually connects into a larger wetland area near the county line.

3.3 Non-Jurisdictional Features

Potentially non-jurisdictional features identified in the Project study area include two isolated seasonal wetlands, three swales, three erosional channels, and a small section of BBID's Canal 45.

3.3.1 Seasonal Wetland (SWL-1)

This seasonal wetland occurs along the existing access road to the Byron Power Cogen Plant along the northern edge of the Project study area (Figure 2-1; Map 1). The two distinct basins are hydrologically connected by a partially collapsed 18-inch-diameter cmp. Vegetation within the basins is generally sparse and includes species such as popcorn flower (*Plagiobothrys stipitatus*), coyote thistle (*Eryngium vaseyi*), Italian ryegrass, gumweed dense-flower willowherb (*Epilobium densiflorum*), wooly marbles (*Psilocarphus oregonus*), brass buttons, and water pygmyweed (*Crassula aquatica*). Surface soil in this area is a dark grayish-brown (10 YR 4/2) clay loam with few (less than 1 percent), fine, dark yellowish-brown (10YR 4/4) concentrations present in the upper 3 inches. A dark brown (10 YR 4/3) clay layer is present at a depth of 10 inches below the surface. Surface soil had a neutral pH but no strong redoximorphic indicators were evident in the upper part of the soil at this sample location. The basins were both dry during the April field survey, but inundation and aquatic invertebrates were noted in this area during earlier site visits. Based on the presence of characteristic seasonal wetland vegetation, the distinct wetland-upland boundary, and observations of inundation and aquatic invertebrates, this area was presumed to also support hydric soils, despite the lack of redoximorphic features.

This wetland area is located nearly 500 feet south of Drainage D-1 and there is no apparent hydrological connection between this basin and the drainage. Because this feature lacks any evidence of a direct connection, was not considered to be an adjacent wetland, and does not appear to have a significant nexus to a traditional navigable water body, it was considered an isolated wetland.

3.3.2 Seasonal Wetland SWL-2

Seasonal wetland 2 is a very shallow, poorly defined depression along the east side of the transmission line laydown area (Figure 2-1; Map 2). Scattered Italian ryegrass is present along the outer edges of the basin and the central part is largely open soil with sparse, scattered coyote thistle. Surrounding grassland vegetation in this area is also sparse. Deep cattle hoof marks occur throughout the basin, which suggest this area is subject to at least some seasonal saturation and possible inundation. This small basin is located more than 100 feet from Drainage 1b with no apparent hydrologic connection or significant nexus to this channel.

3.3.3 Swales

Three weakly expressed, low topographic swales were observed in the Project area. Two swales were observed along the transmission line route south of Kelso Road (Figure 2-1; Map 2) and one swale was observed along the service water pipeline route north of Drainage Wetland D-3 (Figure 2-1; Map 3).

Swales SW-1 and SW-2 are very similar and are both located in the California grassland northeast of the Byron Power Cogen Plant. The vegetation in these areas is generally similar to the adjacent grassland, except Mediterranean barley becomes the dominant annual grass species within the swale areas, where soft chess and foxtail barley are dominant in the adjacent grassland. Other associated species include sparse saltgrass, alkali heath, and Italian ryegrass, all of which also occur in the adjacent grassland habitat. The upper 2 inches of the soil are a dark grayish-brown (10 TR 4/2) fine sandy clay loam with dark yellowish-brown (10 YR 4/4/ and 4/6) concentrations. Below 2 inches, the soil is a brown (10 YR 4/3) fine sandy loam with no evident redoximorphic features. Similar soils were noted in the adjacent grassland, but with fewer and faint (10 YR 4/4) redox features only in the upper 2 inches. These swales appear to convey short-duration flows in response to storm events and appear to be subject to short-duration inundation, but only shallow, intermittent inundation was noted in these areas during other wet season surveys of the site. It is uncertain, even in a more normal rainfall year, if these areas would support inundation or surface saturation for 18 consecutive days. Both swales drain to the southwest where water ponds in low depressions near the Byron Power Cogen Plant. There is no apparent surface hydrologic connection to any drainage or apparent significant nexus to any traditional navigable water body.

The third swale (SW-3), is found along the water supply line, just north of Drainage D-3 on the east side of Bruns Road. A 12-inch-diameter cmp is located under the road just west of the swale feature. Within the Project study area, the swale is generally weakly expressed and exhibits no ordinary high-water mark or evidence of recent flow. Vegetation in this area is similar to the adjacent California annual grassland and includes species such as soft chess, Italian ryegrass, and saltgrass with scattered gumweed, alkali heath, and coyote thistle. To the east of the Project study area, closer to the open water, the swale is characterized by a dense cover of lush saltgrass. Because this swale appears to convey very infrequent and low-volume flows and short-duration flow, it was not considered to be subject to jurisdiction under the Federal CWA.

3.3.4 Erosional Channels

Three erosional channels are present within the Project study area along the transmission line alignment, on the north side of the Kelso Substation (Figure 2-1; Map 3). These channels have formed as a result of directed stormwater runoff from the substation and range in size from a relatively small erosional rill to a large, deeply eroded channel with defined bed and bank characteristics. These erosional channels are largely devoid of vegetation within the active flow channel, but upland grassland species common along the sides and upper edges. These features appear to convey infrequent, short-duration flows in response to heavy rainfall events that drain only uplands and were therefore not considered to be jurisdictional waters of the U.S.

3.3.5 Canal 45

Service water for the Project will be supplied from the BBID Canal 45 (Figure 2-1; Map 5). In the Project study area, this portion of the canal is a constructed and routinely maintained earthen channel devoid of vegetation. Cement rip rap is present along the lower banks of the canal.

SECTION 4

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Appendix A
Natural Resource Conservation Service
WETS Tables for Alameda County, California

WETS Station : LIVERMORE, CA4997 Creation Date: 08/29/2002
Latitude: 3740 Longitude: 12146 Elevation: 00480
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	57.0	37.4	47.2	2.99	1.39	3.66	6	0.0
February	61.9	40.3	51.1	2.73	1.28	3.34	6	0.0
March	65.6	42.3	53.9	2.44	1.00	2.97	6	0.0
April	71.3	44.2	57.8	0.95	0.50	1.17	3	0.0
May	77.1	48.5	62.8	0.43	0.05	0.51	1	0.0
June	84.1	52.5	68.3	0.09	0.00	0.12	0	0.0
July	89.1	54.9	72.0	0.03	0.00	0.00	0	0.0
August	88.8	54.9	71.9	0.08	0.00	0.00	0	0.0
September	86.0	53.2	69.6	0.24	0.00	0.24	0	0.0
October	78.2	48.3	63.3	0.82	0.25	1.00	1	0.0
November	65.1	41.8	53.5	1.75	0.54	2.08	4	0.0
December	57.1	36.9	47.0	2.04	1.02	2.49	4	0.0
Annual	-----	-----	-----	------	10.76	16.37	--	----
Average	73.5	46.3	59.9	------	------	------	--	----
Total	-----	-----	-----	14.61	------	------	31	0.0

GROWING SEASON DATES

Probability	Temperature 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	> 365 days > 365 days	1/ 9 to 12/29 355 days	2/26 to 11/27 276 days
70 percent *	> 365 days > 365 days	> 365 days > 365 days	2/14 to 12/ 9 299 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1930-2002 prcp

Station : CA4997, LIVERMORE

------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
30				0.63									0.63
31	3.45	1.67	M0.57	0.36	0.93	0.11	0.00	0.00	M0.00	0.27	1.89	5.63	14.88
32	1.29	3.15	0.19	0.41	0.37	0.00	0.00	0.00	0.00	0.00	0.51	2.03	7.95
33	4.51	0.44	2.09	0.13	0.70	0.03	0.00	0.00	0.01	0.75	0.00	3.69	12.35
34	1.29	2.86	0.00	0.13	0.60	0.53	0.00	0.00	0.27	0.62	2.71	2.32	11.33
35	3.53	0.52	3.16	3.28	0.00	0.00	0.00	0.04	0.00	0.79	0.21	1.53	13.06
36	3.28	6.76	0.71		0.46	0.10	0.00	0.00	0.00	0.40	0.02	3.26	14.99
37	3.38	4.13	5.07	0.68	0.17	0.20	0.00	0.00	0.00	0.55	2.46	4.57	21.21
38	2.40	6.14	4.09	0.90	0.02	0.00	0.00	0.00	0.00	1.00	1.08	0.52	16.15
39	2.40	1.57	2.18	0.53	0.18	0.00	M0.00	0.00	0.16	1.23	0.15	0.78	9.18
40	8.13	M4.54	2.60	0.35	0.14	0.00	0.00	0.00	0.25	0.50	0.43	4.63	21.57
41	3.24	4.19	2.07	2.76	0.23	0.00	0.00	0.03	0.00	0.72	0.89	5.34	19.47
42	3.89	1.68	1.42	3.10	1.00	0.00	0.00	0.00	0.09	1.08	3.05	1.73	17.04
43	4.48	1.68	2.39	1.14	0.00	0.06	0.00	0.00	0.00	0.30	0.53	1.23	11.81
44	2.36	4.89	1.01	M0.94	0.73	0.00	0.00	0.00	0.00	0.77	3.41	2.03	16.14
45	0.87	3.68	3.19	0.20	0.17	0.00	0.00	0.02	0.00	1.07	2.07	M2.98	14.25
46	0.76	1.23	1.69	0.02	0.61	0.00	0.24	0.00	0.02	0.02	2.93	2.07	9.59
47	0.69	1.45	2.34	0.53	0.17	0.36	0.00	0.00	0.00	1.84	0.85	0.51	8.74
48	0.20	1.11	2.79	2.50	1.03	M0.16	0.03	M0.00	M0.00	M0.46	0.34	M2.71	11.33
49	M1.39	2.47	3.38	0.02	M0.34	M0.00	0.03	0.16	0.05	0.08	1.20	M1.21	10.33
50	4.65	1.54	1.44	M0.85	M0.59	0.01	M0.00	0.00	0.08	M1.84	M5.95	4.95	21.90
51	2.23	M1.81	M1.82	0.55	M0.35	M0.06	M0.00	M0.00	0.00	1.04	M3.01	6.07	16.94
52	7.60	1.40	M2.36	2.20	M0.16	0.04	M0.00	0.00	M0.10	0.01	2.11	6.33	22.31
53	2.07	0.05	M1.12	M1.42	0.61	0.59	M0.00	M0.15	0.00	M0.21	M1.33	M0.64	8.19
54	2.19	2.27	M3.00	0.73	0.16	M0.27	0.00	0.00	M0.04	M0.00	1.68	M3.33	13.67
55	M2.45	1.69	M0.38	M1.28	0.65	0.00	0.00	M0.01	0.01	M0.01	M1.31	10.15	17.94
56	5.49	M1.15	0.14	1.92	M0.63	0.00	0.00	0.00	M0.63	0.79	0.03	0.48	11.26
57	2.65	M2.23	1.30	1.14	M2.65	M0.04	0.00	0.00	M0.05	1.06	0.37	M1.62	13.11
58	3.16	5.37	4.44	3.74	0.66	0.41	0.00	0.00	0.02	0.09	0.14	0.86	18.89
59	2.45	3.59	0.29	0.35	0.00	0.00	0.00	0.07	1.89	0.00	0.00	0.75	9.39
60	2.98	4.12	0.60	0.48	0.42	0.00	0.02	0.00	0.01	0.05	2.92	1.25	12.85
61	2.08	1.04	1.92	1.03	0.69	0.19	0.00	0.13	0.16	0.15	2.24	0.82	10.45
62	0.73	5.61	1.82	0.22	0.00	0.00	0.00	0.00	0.00	3.64	0.28	1.55	13.85
63	1.40	4.50	2.60	3.47	M0.70	0.00	0.00	0.00	0.33	0.93	3.18	0.19	17.30
64	2.37	0.08	1.57	0.21	0.48	0.32	0.00	0.12	0.04	0.85	2.44	4.91	13.39
65	2.11	0.59	1.73	1.53	0.00	0.00	0.00	0.21	0.00	0.03	4.22	3.23	13.65
66	1.05	1.17	0.17	0.33	0.10	0.12	0.17	0.00	0.11	0.00	3.43	2.35	9.00
67	6.14	0.29	4.15	4.65	0.19	0.48	0.00	0.00	0.02	0.24	0.88	1.62	18.66
68	3.93	0.90	2.40	0.43	0.15	0.00	0.00	0.00	0.00	0.43	2.48	3.04	13.76
69	6.28	4.76	0.55	1.24	0.08	0.00	0.00	0.00	0.00	1.10	0.49	2.34	16.84
70	5.38	1.18	1.42	0.40	0.07	0.32	0.00	0.00	0.00	0.41	5.24	5.27	19.69
71	1.19	0.33	1.75	1.37	0.54	0.00	0.00	0.00	0.13	0.04	0.46	3.27	9.08
72	0.90	0.79	0.14	0.64	0.00	0.04		0.00	0.58	2.98		2.22	8.29
73	5.50			0.29	0.03	0.00	0.00	0.00	0.08	2.08	3.71	3.80	15.49
74	1.50	0.71	2.69	1.62	0.00	0.00	0.00	0.00	0.00	0.50	0.66		7.68
75	0.84	3.65	5.24	1.42	0.00	0.06	0.10	0.35	0.00	1.27	0.08	0.21	13.22
76	0.30	1.46	0.48	0.39	0.00	0.18	0.00	0.91	0.95	0.50	0.50	0.73	6.40
77	1.15	0.83	0.82	0.16	1.01	0.00	0.10	0.00	0.22	0.13		3.07	7.49
78	5.44	2.95		2.49	0.01	0.00	0.00	0.00	0.04	0.00	2.16	0.58	13.67
79	4.52	3.19	1.86	0.88	0.34	0.00	0.06	0.00	0.00	1.51	1.13	2.66	16.15
80	4.16	4.24	1.36	1.32	0.48	0.00	0.70	0.00	0.00	0.04	0.28	1.18	13.76
81	3.97	1.11	2.94	0.61	0.11	0.00	0.00	0.00	0.06	2.07	3.44	2.57	16.88
82	5.29	2.16	5.58	1.50	0.00	0.28	0.00	0.01	1.48	2.24	3.72	2.80	25.06
83	6.28	5.56	6.14	3.51	0.21	0.00	0.00	0.50	1.02	0.27	5.44	3.44	32.37
84	0.33	1.87	1.00	0.53	0.01	0.03	0.00	0.00	0.04	1.25	4.71	1.51	11.28
85	0.48	1.25	2.62	0.32	0.07	0.22	0.00	0.03	0.13	0.89	2.69	1.97	10.67

86	2.04	7.11	4.09	0.40	0.14	0.00	0.01	0.00	0.45	0.04	0.08	0.92	15.28
87	1.83	3.47	2.30	0.16	0.09		0.00	0.00	0.00	0.87	1.40	2.30	12.42
88	1.78	0.38	0.26	1.15	0.45	0.10	0.00	0.00	0.00	0.11	1.92	2.03	8.18
89	0.81	0.95	2.94	0.88	0.08	0.10	0.00	0.00	1.33	1.13	1.02	0.10	9.34
90	1.54	2.46	0.87	0.37	1.78	0.00	0.02	0.00	0.06	0.08	0.39	1.45	9.02
91	0.31	2.20	5.87	0.34	0.35	0.08	0.00	0.21	0.04	1.65	0.31	1.19	12.55
92	1.39	4.61	1.97	0.43	0.00	0.09	0.00	0.00	0.00	0.90	0.15	4.79	14.33
93	6.41	4.53	2.91	0.63	0.51	0.30	0.00	0.00	0.00	0.57	2.00	1.81	19.67
94	0.94	3.33	0.15	1.20	1.78	0.04	0.00	0.00	0.00	0.58		1.36	9.38
95	6.64	0.33	6.66	1.02	0.92	0.70	0.00	0.00	0.00	0.00	0.01	5.37	21.65
96	5.17	4.10	2.34	1.91	1.05	0.00	0.00	0.00	0.00	1.08	2.55	4.43	22.63
97	5.81	0.15	0.06	0.15	0.29	0.17	0.00	0.42	0.00	0.28	4.23	1.95	13.51
98	5.47	7.30	2.37	1.37	2.00	0.13	0.00	0.00	0.18	0.54	2.48	0.73	22.57
99	3.23	3.33	1.67	0.99	0.08	0.01	0.00	0.03	0.04	0.15	1.26	0.25	11.04
0	4.61	4.87	1.25	0.59	0.69	0.18	0.00	0.01	0.24		0.49	0.45	13.38
1	1.92	2.89	1.22	1.80	0.00	0.12	0.00	0.00	0.09	0.37	1.92	5.09	15.42
2													

WETS Station : NEWARK, CA6144
Latitude: 3731 Longitude: 12202 Elevation: 00010
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

	Temperature (Degrees F.)			Precipitation (Inches)				
					30% chance will have			
Month	avg daily max	avg daily min	avg	avg	less than	more than	avg # of days w/.1 or more	avg total snow fall
January	57.6	42.0	49.8	2.96	1.35	3.62	6	0.0
February	61.1	45.2	53.1	2.81	1.27	3.43	6	0.0
March	63.7	47.3	55.5	2.39	1.03	2.92	6	0.0
April	67.2	49.8	58.5	2.62	0.40	2.83	2	0.0
May	70.4	52.9	61.7	0.42	0.03	0.47	1	0.0
June	74.5	56.0	65.3	0.12	0.00	0.12	0	0.0
July	76.7	57.7	67.2	0.03	0.00	0.00	0	0.0
August	77.1	58.4	67.7	0.07	0.00	0.01	0	0.0
September	76.8	57.5	67.2	0.20	0.00	0.24	0	0.0
October	72.8	53.8	63.3	0.90	0.29	1.10	2	0.0
November	64.1	47.1	55.6	1.84	0.61	2.20	4	0.0
December	57.7	41.7	49.7	2.08	1.16	2.57	5	0.0
Annual	-----	-----	-----	------	11.48	19.40	--	----
Average	68.3	50.8	59.6	------	------	------	--	----
Total	-----	-----	-----	16.44	------	------	32	0.0

GROWING SEASON DATES

	Temperature

Probability	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days
70 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1948-2002 prcp

Station : CA6144, NEWARK
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.00	0.00	0.00	0.59	0.17	3.10	3.86
49	0.97	2.45	4.33	0.00	0.19	0.01	0.03	0.08	0.00	0.26	1.22	1.67	11.21
50	5.18	M1.49	1.76	0.96	0.15	0.00	0.03	0.00	0.05	M0.80	M3.15	M3.94	17.51
51	2.42	1.88	1.83	0.75	0.41	0.04	0.00	0.01	0.00	M0.86	3.14	M6.44	17.78
52	6.63	1.15	M4.00	1.38	0.04	M0.17	0.00	0.00	0.00	0.05	2.29	M6.05	21.76
53	2.02	0.00	0.93	1.23	M0.63	0.16	0.00	0.12	0.02	M0.25	1.77	1.04	8.17
54	M2.42	M1.37	2.84	0.74	M0.16	M0.29	0.00	0.00	0.00	0.06	M1.20	M2.97	12.05
55	M4.44	M1.75	0.17	M0.87	M0.80	0.00	0.00	0.00	0.01	0.00	1.29	M7.93	17.26
56	M6.27	0.97	M0.04	1.35	0.83	0.00	0.00	0.00	0.25	0.69	0.02	0.32	10.74
57	M2.31	M1.96	1.63	1.26	M2.38	0.00	0.00	0.00	M0.25	M1.61	M0.51	3.34	15.25
58	4.27	M5.45	M4.36	M3.23	0.63	M0.02	0.02	0.00	0.05	M0.04	M0.16	M0.85	19.08
59	M2.78	M2.50	0.30	0.06	0.00	0.00	0.00	0.00	M0.75	0.05	0.00	M0.45	6.89
60	5.33	M3.41	M0.98	M0.35	0.45	0.00	0.00	0.00	0.02	0.17	M3.82	M1.06	15.59
61	M3.27	M1.04	M1.19	0.82	M0.56	0.18	0.00	0.09	0.30	0.05	M2.95	M0.91	11.36
62	M1.20	M6.62				0.00	0.00	0.00	0.00	M4.53	0.34	2.20	14.89
63	1.51	M2.88	M3.09	4.19	0.57	0.08	0.00	0.01	0.09	1.21	M2.93	0.24	16.80
64	3.54	0.00	1.31	0.07	0.45	0.41	0.00	0.09	0.00	0.67	M1.99	M4.23	12.76
65	M1.45	0.50	1.55	1.77	0.00	0.00	0.00	0.18	0.00	0.11	M4.21	2.84	12.61
66	1.54	1.27	0.32	0.36	0.05	0.11	0.24	0.00	0.13	0.00	2.71	2.28	9.01
67	M5.63	0.25	M2.84	M3.57	0.11	0.51	0.00	0.00	0.00	0.22	1.02	2.18	16.33
68	3.77	M0.56	M2.17	0.76	0.18	0.00	0.00	0.72	0.00	0.27	M2.48	M2.26	13.17
69	6.24	M3.96	1.38	M1.15	0.02	0.00	0.00	0.00	0.05	0.47	0.36	1.23	14.86
70	5.36	0.93	1.51	0.20	0.01	0.20	0.00	0.00	0.00	0.56	5.90	4.87	19.54
71	0.73	M0.79	1.43	1.25	0.12	0.00	0.00	0.09	0.12	0.01	0.81	2.90	8.25
72	0.77	0.65	0.04	0.38	0.00	0.20	0.00	0.00	0.58	M2.87	M5.90	1.70	13.09
73	3.79	M5.33	2.05	0.39	0.03	0.00	0.00	0.00	0.04	M1.63	M2.99	M3.84	20.09
74	M2.41	0.88	M2.23	M1.66	0.00	0.63	0.15	0.00	0.00	M0.89	0.61	1.38	10.84
75	0.84	M2.21	M3.28	M1.67	0.02	0.00	0.13	0.43	0.01	1.12	0.27	0.18	10.16
76	0.27	0.90	1.41	0.57	0.01	0.08	0.09	0.65	0.68	0.52	M0.82	0.89	6.89
77	0.81	0.63	1.64	0.18	1.09	0.00	0.14	0.00	0.44	0.22	M0.92	3.04	9.11
78	M6.26	3.07	M3.60	2.96	0.00	0.00	0.00	0.00	0.05	0.00	2.12	0.48	18.54
79	4.09	3.26	1.79	0.54	0.19	0.00	0.07	0.01	0.00	1.71	1.14	2.66	15.46
80	2.89	5.87	1.54	0.84	0.06	0.00	0.38	0.00	0.00	0.02	0.17	1.20	12.97
81	3.41	1.39	2.66	0.37	0.08	0.01	0.00	0.00	0.02	2.01	3.04	1.89	14.88
82	4.26	2.90	4.39	2.12	0.00	0.10	0.00	0.09	0.86	1.95	2.85	2.42	21.94
83	5.97	3.67	7.17	3.50	0.42	0.00	0.00	0.04	0.60	0.51	6.04	3.60	31.52
84	0.14	2.04	1.15	51.00	0.00	0.10	0.00	0.04	0.24	1.74	4.33	1.68	62.46

85	0.86	1.04	2.43	0.05	0.25	0.03	0.03	0.00	0.40	1.02	2.41	1.95	10.47
86	1.82	5.30	3.48	0.59	0.27	0.00	0.00	0.00	0.62	0.07	0.06	0.98	13.19
87	2.13	2.72	1.54	0.15	0.02	0.00	0.00	0.00	0.00	0.87	0.97	2.16	10.56
88	2.46	0.31	0.06	1.00	0.47	0.05	0.00	0.00	0.01	0.16	1.81	2.92	9.25
89	0.93	1.07	2.66	0.56	0.09	0.00	0.00	0.00	0.63	2.05	0.87	0.00	8.86
90	1.78	1.90	0.93	0.26	1.88	0.00	0.00	0.00	0.09	0.12	0.51	1.75	9.22
91	0.28	2.31	5.37	0.35	0.19	0.12	0.00	0.11	0.07	1.62	0.33	1.88	12.63
92	1.41	5.33	3.56	0.48	0.00	0.16	0.00	0.00	0.00	0.79	0.13	4.79	16.65
93	6.90	4.72	2.50	0.79	0.50	0.38	0.00	0.00	0.00	0.54	2.92	2.15	21.40
94	1.85	3.24	0.18	1.05	1.69	0.05	0.00	0.00	0.14	0.31	2.98	1.46	12.95
95	8.36	0.16	6.25	1.09	0.99	1.10	0.00	0.00	0.00	0.00	0.01	4.60	22.56
96	4.32	3.95	1.89	1.00	1.11	0.00	0.00	0.00	0.00	0.60	1.40	5.67	19.94
97	5.37	0.28	0.14	0.17	0.29	0.37	0.00	0.48	0.00	0.59	5.29	1.98	14.96
98	5.90	10.79	2.57	1.74	2.06	0.01	0.00	0.00	0.09	0.62	1.95	1.27	27.00
99	3.22	3.82	1.85	1.21	0.03	0.03	0.00	0.00	0.27	0.35	1.01	0.33	12.12
0	4.72	6.26	2.03	0.65	0.69	0.29	0.00	0.03	0.17	1.94	0.44	0.54	17.76
1	2.08	3.32	1.25	1.32	0.00	0.15	0.00	0.01	0.04	0.27	1.97	4.68	15.09
2													

WETS Station : OAKLAND MUSEUM, CA6336 Creation Date: 08/29/2002
Latitude: 3748 Longitude: 12216 Elevation: 00030
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)				
					30% chance will have		avg # of days w/.1 or more	avg total snow fall
	avg daily max	avg daily min	avg	avg	less than	more than		
January	57.3	44.6	51.0	4.85	2.24	5.93	7	0.0
February	61.6	47.9	54.7	4.40	1.83	5.35	7	0.0
March	63.3	49.1	56.2	3.56	1.54	4.34	6	0.0
April	66.5	50.6	58.5	1.35	0.53	1.66	3	0.0
May	69.0	53.4	61.2	0.59	0.05	0.65	1	0.0
June	71.7	55.7	63.7	0.12	0.00	0.12	0	0.0
July	72.5	56.9	64.7	0.07	0.00	0.00	0	0.0
August	73.5	58.3	65.9	0.10	0.00	0.01	0	0.0
September	74.7	58.3	66.5	0.31	0.00	0.36	0	0.0
October	72.1	55.4	63.8	1.38	0.53	1.69	2	0.0
November	63.9	49.5	56.7	3.24	1.30	3.93	5	0.0
December	57.7	44.6	51.1	3.13	1.71	3.88	5	0.0
Annual	-----	-----	-----	------	16.81	25.64	--	----
Average	67.0	52.0	59.5	------	------	------	--	----
Total	-----	-----	-----	23.10	------	------	36	0.0

GROWING SEASON DATES

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                      |                    Temperature
----------------------|------------------------------------------------------
      Probability     | 24 F or higher  | 28 F or higher  | 32 F or higher  |
----------------------|-----------------|-----------------|-----------------
                      |              Beginning and Ending Dates
                      |                Growing Season Length
                      |
       50 percent *   |    ----------   |    ----------   |    > 365 days
                      |    > 365 days   |    > 365 days   |    > 365 days
                      |                 |                 |
       70 percent *   |    ----------   |    ----------   |    > 365 days
                      |    > 365 days   |    > 365 days   |    > 365 days
                      |                 |                 |
-----------------------------------------------------------------------------
 * Percent chance of the growing season occurring between the Beginning
   and Ending dates.
```

total 1971-2002 prcp

Station : CA6336, OAKLAND MUSEUM
-------   Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
71	1.73	0.43	2.80	0.93	0.13	0.00	0.00	0.00	0.26	0.10	2.04	4.19	12.61
72	1.32	1.58	0.18	1.02		0.34	0.00	0.01	0.90	4.25	6.39	3.20	19.19
73	10.43	6.31	2.95	0.02	0.04	0.00	0.00	0.00	0.64	1.77	9.67	5.39	37.22
74	3.39	1.76	5.15	3.33	0.00	0.15	1.19	0.00	0.00	M1.16	0.78	2.52	19.43
75	2.29	3.88	5.68	2.25	0.01	0.08	0.21	0.05	0.03	3.85	0.56	0.52	19.41
76	0.31	2.01	1.08	0.89	0.00	0.04	0.00	1.09	0.61	0.57	1.09	2.30	9.99
77	1.55	0.77	2.10	0.00	0.54	0.00	0.01	0.00	0.68	0.21	2.83		8.69
78	7.87	4.80	6.89	3.76	0.00	0.00	0.00	0.00	0.59	0.00	1.64	0.70	26.25
79	7.18	5.52	2.82	1.04	0.10	0.00	0.43	0.00	0.00	2.37	3.96	5.77	29.19
80	4.81	7.63	M1.82	1.66	0.44	0.00		0.00	0.00	0.13	0.20	2.42	19.11
81	6.15	1.33	4.41	0.30	0.10	0.00	0.00	0.00	0.08	2.80	5.93	4.65	25.75
82	10.75	3.80	8.55	4.13	0.00	0.19	0.03	0.00	M0.00	2.89	5.31	3.11	38.76
83	7.22	8.08	9.83	3.87	0.42		0.00	0.05	0.61	0.23	7.12	6.84	44.27
84	0.33	2.28	1.60	0.98	0.09	M0.00	0.00	0.17	0.31	2.99	M6.89		15.64
85	0.77	2.08	3.65	0.15	0.04			0.00	0.53	1.18	M3.26	1.67	13.33
86	5.24	8.92	5.89	0.70	0.13	0.00	0.03	0.00	1.54	0.14	0.32	1.47	24.38
87	3.60	4.93	2.32	0.20	0.04	0.00	0.00	0.00	0.00	1.57	2.34	4.29	19.29
88	3.83	0.49	0.03	2.77	0.98	0.44	0.00	0.01	0.00	0.37	2.49	3.81	15.22
89	1.27		5.16	0.63	0.04	0.04	0.00	0.00	1.45	1.73	1.25	0.00	11.57
90	4.41		1.21	0.24	2.92	0.01	0.00	0.00	0.06	0.35	0.49	1.58	11.27
91	0.42	3.49	7.04	0.72	0.20	0.24	0.00	0.19	0.00	M1.20	0.36	2.22	16.08
92	1.71	7.53	4.54	0.26	0.00	0.30	0.00	0.03	0.00	2.49	0.30	6.82	23.98
93	8.90	3.94	2.61	0.60	0.94	0.11	0.00	0.00	0.00	0.62	2.08	3.01	22.81
94	2.56	4.52	0.28	1.69	1.54	0.00	0.00	0.00	0.04	0.40	9.37	3.23	23.63
95	M9.77	0.21	7.60	1.86	1.07	0.92	0.00	0.00	0.00				21.43
96	6.40	M5.87	2.01		2.67	0.00					3.44	8.90	29.29
97	7.80	0.22	0.56	0.57	0.27	0.28	0.00	1.25	0.01	1.18	M6.79	3.36	22.29
98	12.45	15.14	2.76	1.83	2.98	0.01	0.00	0.00	0.04	0.81	3.82	1.23	41.07
99	4.04	7.17	2.89	1.80	0.09	0.03	0.00	0.06	0.13	0.50	2.55	0.48	19.74
0	7.13	9.94	2.45	1.01	1.21		0.00	0.00	0.26	2.75	M0.70	0.77	26.22
1	3.27	7.39	1.27	1.69	0.00	0.07	0.00	0.00	0.26	0.54	4.41	9.40	28.30
2													

WETS Station : TRACY PUMPING PLANT, CA9001   Creation Date: 08/29/2002
Latitude: 3748   Longitude: 12135   Elevation: 00060

State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	54.8	38.5	46.7	2.68	1.16	3.26	6	0.0
February	61.6	41.9	51.8	2.29	1.01	2.79	5	0.0
March	66.4	45.0	55.7	1.98	0.80	2.40	5	0.0
April	72.8	48.0	60.4	0.73	0.39	0.90	2	0.0
May	80.0	53.4	66.7	0.45	0.00	0.46	1	0.0
June	87.4	57.5	72.4	0.09	0.00	0.07	0	0.0
July	92.1	60.4	76.3	0.04	0.00	0.00	0	0.0
August	91.6	60.3	76.0	0.06	0.00	0.00	0	0.0
September	87.4	58.5	72.9	0.25	0.00	0.19	0	0.0
October	78.5	52.2	65.4	0.72	0.22	0.91	1	0.0
November	64.6	44.1	54.3	1.63	0.58	2.03	4	0.0
December	55.3	38.0	46.7	1.55	0.75	1.89	4	0.0
Annual	-----	-----	-----	------	8.76	13.96	--	----
Average	74.4	49.8	62.1	------	------	------	--	----
Total	-----	-----	-----	12.48	------	------	28	0.0

GROWING SEASON DATES

Probability	Temperature: 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	1/17 to 12/20 338 days
70 percent *	---------- > 365 days	12/30 to 12/30 > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1955-2002 prcp

Station : CA9001, TRACY PUMPING PLANT
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
55		0.87	0.59	1.24	0.36	0.00	0.00	0.00	0.00	0.12	1.07	6.33	10.58
56	4.13	0.48	0.00	1.35	0.46	0.00	0.00	0.00	0.68	0.32	0.04	0.21	7.67
57	1.78	2.38	0.93	M0.92	M1.32	0.02	0.00	0.00	0.17	M0.70	0.21	1.81	10.24
58	3.19	4.68	3.78	3.03	0.67	0.15	0.00	0.09	0.06	0.00	0.00	0.59	16.24
59	2.53	3.05	0.11	0.10	0.05	0.00	0.00	0.00	2.60	0.00	0.00	0.79	9.23
60	2.27	2.39	0.27	0.24	0.25	0.00	0.01	0.00	0.01	0.07	2.91	0.40	8.82
61	2.21	0.58	1.13	0.69	0.89	0.00	0.00	0.06	0.19	0.03	2.50	0.55	8.83
62	0.60	5.93	1.02	0.01	0.00	0.00	0.00	0.00	0.05	2.87	0.18	1.35	12.01
63	1.90	2.45	1.84	2.27	0.30	0.00	0.00	0.00	0.17	0.68	3.21	0.11	12.93
64	1.48	0.01	0.80	0.17	0.15	1.80	0.02	0.30	0.00	1.03	1.95	3.74	11.45
65	1.90	0.50	1.19	1.16	0.00	0.00	0.05	0.36	0.00	0.02	3.14	2.23	10.55
66	0.82	1.19	0.11	0.42	0.15	0.00	0.25	0.00	0.06	0.00	3.21	2.93	9.14
67	5.27	0.24	3.11	2.53	0.02	0.55	0.00	0.00	0.00	0.09	0.66	0.92	13.39
68	3.32	1.33	1.64	0.44	0.00	0.00	0.00	0.60	0.00	0.19	2.22	2.44	12.18
69	5.02	3.88	0.29	0.65	0.00	0.00	0.00	0.00	0.04	0.95	0.36	1.97	13.16
70	5.40	1.70	1.17	0.21	0.00	0.19	0.00	0.00	0.00	0.64	4.42	3.62	17.35
71	0.81	0.28	1.11	1.00	1.32	0.00	0.00	0.00	0.03	0.00	0.36	2.06	6.97
72	0.51	0.62	0.05	0.30	0.03	0.02	0.00	0.00	0.69	1.77	4.15	1.17	9.31
73	4.38	3.97	2.35	0.41	0.00	0.00	0.00	0.00	0.00	1.35	3.36	2.80	18.62
74	2.03	0.26	1.82	1.23	0.00	0.05	0.10	0.00	0.00	0.63	0.31	1.96	8.39
75	0.33	3.04	3.40	0.92	0.00	0.00	0.18	0.32	0.00	0.98	0.28	0.30	9.75
76	0.25	1.17	0.25	0.55	0.00	0.03	0.00	0.73	0.89	0.43	0.45	0.69	5.44
77	0.52	0.66	0.74	0.63	0.83	0.00	0.01	0.00	0.24	0.13	1.71	2.45	7.92
78	5.61	2.87	3.11	1.14	0.00	0.00	0.00	0.00	0.07	0.00	1.93	0.25	14.98
79	3.68	2.53	2.05	0.62	0.00	0.00	0.20	0.00	0.00	1.30	0.92	2.24	13.54
80	3.46	3.28	1.02	0.98	0.13	0.00	0.62	0.00	0.00	0.03	0.17	0.85	10.54
81	3.16	0.75	2.11	0.27	0.02	0.00	0.00	0.00	0.08	1.29	3.12	2.09	12.89
82	5.46	1.47	4.10	1.45	0.00	0.29	0.00	0.00	2.20	1.64	3.87	1.99	22.47
83	5.12	3.89	5.89	2.91	0.16	0.00	0.00	0.51	0.76	0.43	4.93	2.88	27.48
84	0.45	1.48	0.45	0.30	0.01	0.01	0.00	0.00	0.00	1.41	3.80	1.25	9.16
85	0.42	0.81	1.20	0.21	0.00	0.40	0.00	0.00	0.00	0.48		2.89	6.41
86	1.66	5.10	4.74	0.31	0.07	0.00	0.03	0.00	0.71	0.00	0.00	0.87	13.49
87	1.48	4.15	1.65	0.13	0.00	0.00	0.00	0.00	0.00	M0.58	M1.02	M2.11	11.12
88	M2.27	M0.45	0.83	M1.35	M0.32	0.76	0.00	0.00	0.00	0.24	M1.02	M1.63	8.87
89	M0.83	M0.92	M1.67	M0.30	0.10	M0.02	0.00	M0.01	M1.56	M0.64	M0.85	M0.05	6.95
90	M1.04	M2.11	M0.57	M0.47	M2.00	0.00	0.00	0.00	M0.07	0.15	0.20	1.08	7.69
91	M0.22	M1.98	M3.60	M0.37	0.26	M0.00	0.10	0.15	0.00	1.01	M0.25	M0.70	8.64
92	M1.43	M3.73	M1.46	0.60	0.00	0.14	0.00	0.00	0.00	M0.71	M0.29	M4.42	12.78
93	M5.86	M2.89	M2.83	M0.53	M0.93	M0.14	0.00	0.00	0.00	0.30	2.11	1.39	16.98
94	1.02	2.71	0.07	1.01	1.39	0.00	0.00	0.00	0.05	0.33	2.55	0.67	9.80
95	5.13	0.16	M5.19	0.71	0.48	0.71	0.00	0.00	0.00	0.00	0.00	4.67	17.05
96	M4.02	3.79	2.45	1.09	1.19	0.00	0.00	0.00	0.00	1.11	1.99	3.58	19.22
97	5.22	M0.17	0.11	0.03	0.55	0.15	0.00	0.05	0.00	0.22	3.22	1.59	11.31
98	4.57	7.27	1.43	1.08	3.15	0.10	0.00	0.00	0.13	0.52	1.81	0.44	20.50
99	3.08	2.38	1.99	0.71	0.06	0.00	0.00	0.00	0.07	0.06	0.96	0.27	9.58
0	4.32	4.42	0.79	0.42	0.51	0.02	0.00	0.00	0.02	3.87	0.52	0.47	15.36
1	1.84	2.38	1.16	1.08	0.00	0.05	0.00	0.00	0.25	0.17	1.79	4.55	13.27
2													

WETS Station : UPPER SAN LEANDRO FLTR, CA9185   Creation Date: 08/29/2002
Latitude: 3746   Longitude: 12210   Elevation: 00390
State FIPS/County(FIPS): 06001   County Name: Alameda
Start yr. - 1971   End yr. - 2000

	Temperature (Degrees F.)	Precipitation (Inches)

Month	avg daily max	avg daily min	avg	avg	30% chance will have less than	30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	57.6	40.7	49.1	5.20	2.32	6.34	8	0.0
February	61.3	42.6	51.9	4.64	2.07	5.66	7	0.0
March	62.7	43.9	53.3	4.49	2.34	5.48	8	0.0
April	66.6	44.9	55.7	1.70	0.71	2.07	3	0.0
May	69.5	48.0	58.8	0.75	0.06	0.83	1	0.0
June	73.0	51.6	62.3	0.15	0.00	0.18	0	0.0
July	75.4	53.3	64.3	0.06	0.00	0.00	0	0.0
August	75.3	54.2	64.8	0.11	0.00	0.02	0	0.0
September	76.1	53.9	65.0	0.36	0.00	0.38	1	0.0
October	72.8	51.0	61.9	1.52	0.55	1.88	2	0.0
November	64.4	45.2	54.8	3.88	1.54	4.70	6	0.0
December	58.6	41.4	50.0	3.84	1.81	4.69	6	0.0
Annual	-----	-----	-----	------	20.36	29.92	--	----
Average	67.8	47.6	57.7	------	------	------	--	----
Total	-----	-----	-----	26.69	------	------	42	0.0

GROWING SEASON DATES

Probability	Temperature: 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days
70 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

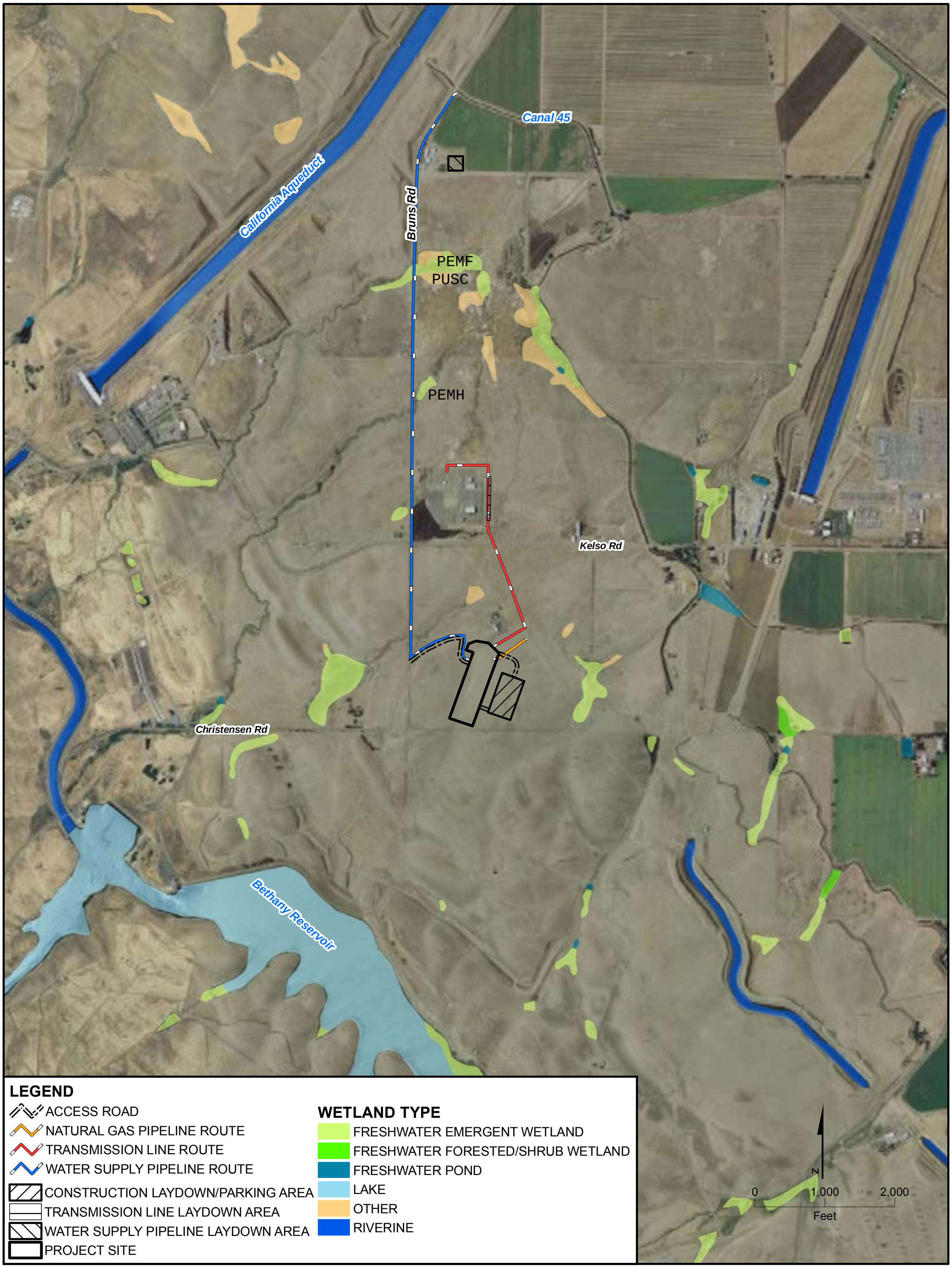
total 1948-2002 prcp

Station : CA9185, UPPER SAN LEANDRO FLTR
Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.00	0.02	0.00	0.64	0.86	4.10	5.62
49	1.58	3.12	4.59	0.02	0.78	0.00	0.05	M0.12	0.00	0.32	M1.73	M2.24	14.55
50	9.80	2.31	3.32	1.57	0.91	0.02	0.00	0.00	0.00	2.36	6.08	6.19	32.56
51	6.25	M2.47	M2.24	1.09	0.70	0.01	0.00	0.34	0.03				13.13

58								0.00	0.06	0.22	0.12	1.93	2.33
59	4.73	4.70	0.83	0.02	M0.02	0.00	0.00	0.03	3.31	0.03	0.00	1.61	15.28
60	M3.01	5.63	3.05	0.97	0.96	M0.00	M0.00	0.00	0.00	0.32	M5.81	0.91	20.66
61	2.99	M1.44	3.76	M1.29	0.79	0.00	0.00	0.13	0.34	M0.34	4.07	2.90	18.05
62	1.74	8.93	2.61	0.53	0.00	0.00	0.00	0.14	0.43	13.13	0.95	2.97	31.43
63	2.62	4.47	4.09	5.64	0.69	0.00	0.00	0.00	0.23	1.83	4.10	0.57	24.24
64	4.91	0.19	2.13	0.32	0.66	0.69	0.03	0.05	0.00	1.35	4.21	7.52	22.06
65	4.86	0.98	2.04	3.99	0.00	0.00	0.02	0.10	0.00	0.28	5.48	4.22	21.97
66	2.98	2.97	0.84	0.73	0.34	0.00	0.15	0.14	0.15	0.00	5.03	4.18	17.51
67	10.20	0.37	5.23	5.80	0.09	1.15	0.00	0.00	0.02	0.66	1.20	3.79	28.51
68	6.61	2.81	3.61	0.44	0.57	0.00	0.00	0.25	0.03	0.28	3.26	4.74	22.60
69	9.00	9.14	1.63	2.27	0.00	0.12	0.00	0.00	0.00	2.31	0.73	5.70	30.90
70	9.71	1.59	1.99	0.06	0.01	0.81	0.00	0.00	0.00	0.77	8.03	8.77	31.74
71	1.61	0.76	3.81	1.02	0.23	0.00	0.00	0.00	0.18	0.12	2.13	4.43	14.29
72	1.73	1.97	0.19	1.89	0.01	0.30	0.00	0.00	1.56	3.70	7.02	3.85	22.22
73	11.00	6.89	3.77	0.09		0.00	0.00	0.00	0.79	1.52	9.20	6.94	40.20
74	4.01	2.21	6.80	4.68	0.00	0.10	1.16	0.00	0.00	0.90		2.37	22.23
75	2.21	6.17	6.05	2.85	0.00	0.11	0.14	0.11	0.02	6.41	1.05	0.38	25.50
76	0.33	1.10	2.51	0.98	0.00	0.06	0.00	1.30	0.88	0.72	1.34	1.98	11.20
77	1.29	1.22	2.52	0.20	1.22	0.00	0.00	0.03	0.96	0.48	3.95	5.73	17.60
78	9.51	4.82	7.30	6.17	0.03	0.00	0.00	0.00	0.48	0.00	2.43	0.91	31.65
79	8.83	5.82	4.06	0.96	0.19	0.00	0.02	0.00	0.00	3.11	3.45	5.79	32.23
80	5.79	7.40	2.55	2.19	0.36	0.05	0.19	0.00	0.00	0.15	0.35	2.33	21.36
81	6.05	1.45	5.60	0.61	0.25	0.00	0.00	0.00	0.08	3.66	6.77	6.93	31.40
82	9.38	5.03	7.68	5.05	0.00	0.12	0.05	0.01	1.12	2.80	7.94	4.33	43.51
83	8.11	8.20	13.10	3.57	0.41	0.00	0.00	0.17	0.45	0.93	9.18	7.77	51.89
84	0.22	2.83	2.21	0.99	0.17	0.92	0.00	0.09	0.04	3.82	8.90	2.08	22.27
85	0.56	2.35	4.24	0.08	0.56	0.26	0.08	0.07	0.54	0.90	3.85	1.90	15.39
86	5.23	10.80	6.52	0.81	0.26	0.00	0.04	0.00	1.90	0.17	0.58	1.90	28.21
87	4.25	5.77	3.26	0.53	0.10	0.00	0.00	0.00	0.00	1.24	2.30	5.13	22.58
88	4.40	0.50			0.70	0.41	0.00	0.00	0.00	0.62	5.01	4.17	15.81
89	1.41	1.80	6.85	0.59	0.03	0.08	0.01	0.00	0.91	3.31	2.10	0.03	17.12
90	4.66	2.44	1.31	0.48	3.83	0.01	0.00	0.00	0.12	0.57	0.73	2.21	16.36
91	0.53	3.06	8.35	0.49		0.13	0.00	0.10	0.00	2.76	0.57	2.57	18.56
92	1.84	7.74	4.68	0.34	0.00	0.02		0.01	0.00	2.12	0.27	8.14	25.16
93	9.17	4.55	2.73	1.37	1.19	0.22	0.00	0.00	0.00	0.66	1.75	2.89	24.53
94	2.29	5.51	0.33	1.83	1.69	0.02	0.00	0.00	0.02	0.29	9.46	3.03	24.47
95	11.17	0.12	8.41	2.49	2.13	1.00	0.00	0.00	0.00	0.00	0.10	8.38	33.80
96	6.68	6.29	3.35	2.45	3.18	0.00	0.00	0.00	0.10	1.08	4.38	10.98	38.49
97	M8.77	0.40	0.55	1.22	0.16	0.44	0.00	1.23	0.01	0.93	7.68	3.61	25.00
98	12.19	15.43	3.13	2.47	3.62	0.12		0.00	0.11	0.70	3.93	2.45	44.15
99	4.54	8.07	3.82	2.02	0.06	0.03	0.00	0.11	0.02	0.34	2.08	0.64	21.73
0	8.13	8.48		0.94		0.21		0.00	0.47			1.28	19.51
1	3.46		1.73	1.95	0.00	0.22	0.00	0.00	0.20	0.50	4.33	10.42	22.81
2													

Appendix B
National Wetland Inventory Map



Source: U.S. Fish and Wildlife Service, Division of Habitat and Resource Conservation, National Wetlands Inventory, California, 2008.

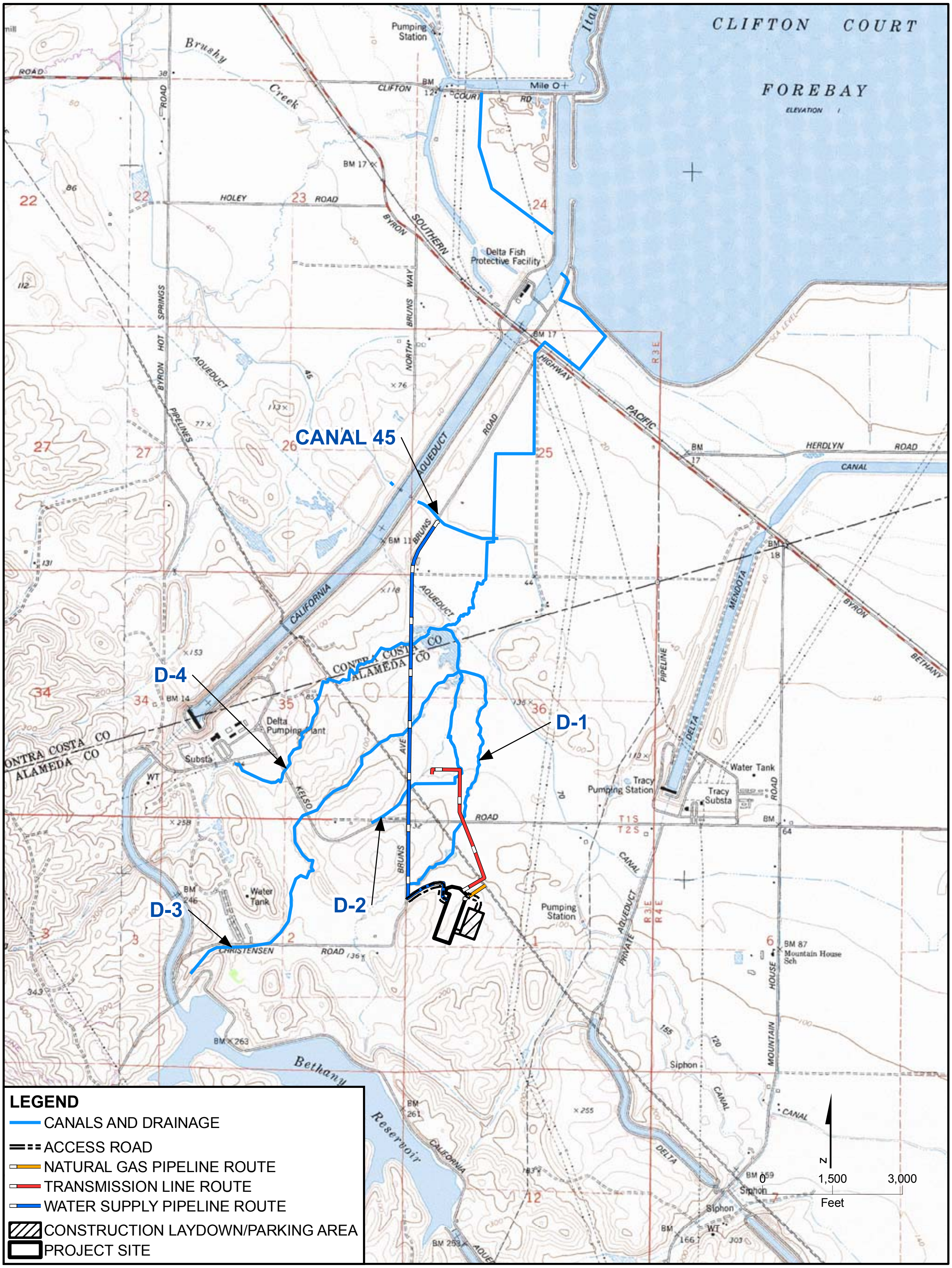
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

FIGURE B-1
NWI MAP
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_NWI.MXD MHASKELL 7/13/2009 09:57:52

CH2MHILL

Appendix C
Drainage and Topography Map



Notes:
1. Source: USGS, the National Atlas of the United States, Environmental Systems Research Institue (ESRI). Water Bodies - 2004, River and Streams - 2006.

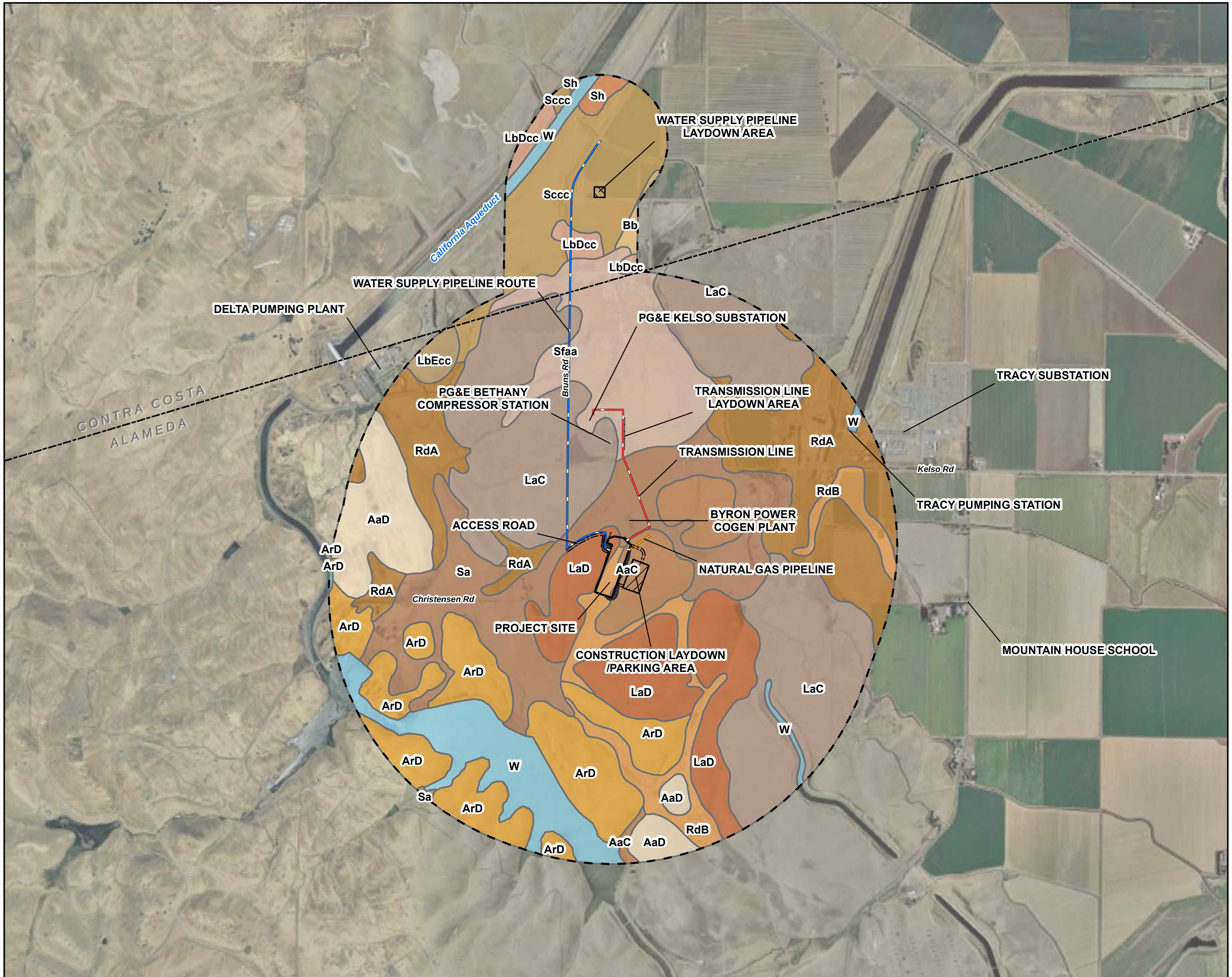
This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

FIGURE C-1
DRAINAGE AND TOPOGRAPHY
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_SURFACEWATER.MXD MHASKELL 7/13/2009 10:31:30

Appendix D
Mapped Soil Units in the Project Vicinity



LEGEND

- ACCESS ROAD
- NATURAL GAS PIPELINE ROUTE
- TRANSMISSION LINE ROUTE
- WATER SUPPLY PIPELINE ROUTE
- CONSTRUCTION LAYDOWN/PARKING AREA
- TRANSMISSION LINE LAYDOWN AREA
- WATER SUPPLY PIPELINE LAYDOWN AREA
- PROJECT SITE
- DISTURBED AREA
- BUFFER

SOIL TYPE

- AaC, ALTAMONT CLAY, 3 TO 15 PERCENT SLOPES
- AaD, ALTAMONT CLAY, 15 TO 30 PERCENT SLOPES
- ArD, ALTAMONT ROCKY CLAY, 7 TO 30 PERCENT SLOPES
- Bb, BRENTWOOD CLAY LOAM
- LaC, LINNE CLAY LOAM, 3 TO 15 PERCENT SLOPES
- LaD, LINNE CLAY LOAM, 15 TO 30 PERCENT SLOPES
- LbDcc, LINNE CLAY LOAM, 5 TO 15 PERCENT SLOPES
- LbEcc, LINNE CLAY LOAM, 15 TO 30 PERCENT SLOPES
- RdA, RINCON CLAY LOAM, 0 TO 3 PERCENT SLOPES
- RdB, RINCON CLAY LOAM, 3 TO 7 PERCENT SLOPES
- Sa, SAN YSIDRO LOAM
- Sccc, SAN YSIDRO LOAM
- Sf, SOLANO FINE SANDY LOAM
- Sfaa, SOLANO FINE SANDY LOAM
- Sh, SOLANO LOAM
- W, WATER

Notes:
1. 1 Mile Buffer around Project Site, 1/4 Mile Buffer around all Linears.
2. Source: U.S. Department of Agriculture, Natural resources Conservation Service, Soil Survey Geographic (SSURGO) Database for Contra Costa and Alamenda County, California, 2005.

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 D-1
SOIL TYPES

MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

Appendix E
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-01

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 28.127" Long: -121° 36' 05.172" Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam; 15 to 30 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks: Small concave depressional areas along gravel access road to the Byron CoGen Plant connected by a partially crushed 18-inch diameter culvert. Problematic area: seasonal wetland hydrology; no hydric soil indicators were noted but were presumed to meet the definition of a hydric soil as noted in the remarks.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Plagiobothrys stipitatus*	20%	X	OBL
2. *Lolium multiflorum*	3%		(FAC)
3. *Grindelia camporum*	3%		FACU
4. *Epilobium densiflorum*	2%		OBL
5. *Psilocarphus oregonus*	1%		OBL
6. *Crassula aquatica*	1%		OBL
7. *Veronica peregrina*	T		OBL
8. *Juncus bufonius*	T		FACW
Total Cover:	30%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Basin is characterized by *Plagiobothrys* with other scattered vernal pool plants; species around the margins of the basin included *Bromus hordeaceus, Hordeum murinum, Erodium botrys, Grindelia,* and *Medicago polymorpha.* The small basin on the north side of the road is largely open soils (80% bare ground) with approximately 15% cover of *Cotula coronopifolia*; with 5% cover composed of *Plagiobothrys stipitatus, Eryngium vaseyi*, *Lolium multiflorum* and *Epilobium densiflorum.* **Note:** *Lolium multiflorum* is not included on the Reed (1988) plant list but is generally considered to be a facultative species and was therefore assigned a FAC indicator status.

SOIL

Sampling Point SP-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-3	10 YR 4/2	100	10 YR 4/4	<1	C	M	CL	pH 7.0 - 7.2
3-10	10 YR 4/2	100					CL	
10-16	10 YR 4/3	100					C	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: 10”

Depth (inches): Clay Layer

Hydric Soil Present? Yes X No ___

Remarks: At the time of the survey, soils were very dry and hard, difficult to excavate to depth. Soils in this area are mapped as part of the Linne Series, but appear to be somewhat transitional between the Lynne and San Ysidro Series. The soil pH was neutral (7.0 to 7.2) throughout the upper 16 inches. Despite the presence of OBL and FACW plants throughout the basin as well as observations of seasonal inundation and presence of aquatic invertebrates, no hydric soil indicators were evident; however, the assumption is that soils in this area are ponded long enough to become anaerobic in the upper part during the growing season and are therefore considered to meet the definition of a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

* Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
* Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
X Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): >16
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >16

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Basin was dry at the time of the survey, but seasonal inundation and aquatic invertebrates were observed in this location during field surveys in February 2009. In addition, the defined topographic basin with an abrupt boundary with the adjacent grassland, abundance of OBL and FACW vegetation, and deep cattle prints all suggest prolonged seasonal saturation and/or inundation occurs at this sample location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-02

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 28.013" Long: -121° 36' 05.233" Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam 15 to 30 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No *
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks: Sample point located adjacent to well-defined basin with distinct change in vegetation along gravel access road to the Byron Power Cogen Plant. Soils very gravelly and hard at this location and were not excavated at the time of the survey; this area is characterized by upland plants and has no evidence of seasonal saturation or inundation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~$1m^2$			
1. *Bromus hordeaceus*	45%	X	FACU-
2. *Erodium moschatum / E. botrys*	15%	X	NL
3. *Grindelia camporum*	10%		FACU
4. *Medicago polymorpha*	2%		NL
5. *Trifolium hirtum*	1%		NL
6. *Hordeum murinum* subsp. *leporinum*	1%		NL
7. *Lolium multiflorum*	1%		(FAC)
8.			
Total Cover:	75%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 25% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species	____	×1 = ____
FACW species	____	×2 = ____
FAC species	____	×3 = ____
FACU species	____	×4 = ____
UPL species	____	×5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Annual grassland habitat located adjacent to well-defined topographic basin; distinct upland/wetland boundary at this location. **Note:** *Lolium multiflorum* is not included on the Reed (1988) plant list but is generally considered to be a facultative species and was therefore assigned a FAC indicator status.

SOIL

Sampling Point SP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/2	100					CL	pH 7.0-7.2

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ **No** *

Remarks: Soil very hard with high gravel content at the time of the survey. Soil pit was not excavated in this location; no indication that this area is subject to seasonal saturation or inundation, therefore, soils are likely non-hydric. Note: No hydric soil indicators were noted in the adjacent depression basin characterized by OBL and FACW vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___ **Wetland Hydrology Present? Yes** ___ **No** X
(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point taken in upland area adjacent to well-defined topographic depression. No evidence of seasonal saturation or inundation evident at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center | City/County: Alameda | Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. | State: CA | Sampling Point: SP-03

Investigator(s): Russell Huddleston | Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): None | Slope (%): 0-1 %

Subregion (LRR): C | Lat: 37° 47' 32.965" | Long: -121° 35' 58.615" | Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes X	No		
Wetland Hydrology Present?	Yes	No X		

Remarks: Swale feature within annual grassland that flows to the southwest where water collects in low areas around the Byron Power Cogen Plant. Wetland hydrology uncertain at this location, appears to support short-duration inundation and low-volume flow in response to rain events, but does not appear to support prolonged, continuous saturation or inundation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Hordeum marinum*	85	X	FAC
2. *Distichlis spicata*	5		FACW
3. *Frankenia salina*	5		FACW+
4. *Lolium multiflorum*	T		(FAC)
5.			
6.			
7.			
8.			
Total Cover:	95		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
____ Prevalence Index is ≤3.0*
____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Vegetation notably different within the swale than the adjacent annual grassland – swales are characterized by Mediterranean barley where the adjacent areas are characterized by foxtail barley and soft chess. Saltgrass, alkali heath and Italian ryegrass are widely scattered throughout and not restricted to the swale areas. Note: *Lolium multiflorum* is not included on Reed (1988), but is generally considered to be a facultative species.

SOIL

Sampling Point SP-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/2	95	7.5 YR 4/4	2	C	M	FSCL	
2-12			7.5 YR 4/6	3	C	M	FSCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? Yes X **No** ___

Remarks: Soils just meet the criteria for a depleted matrix at this location. Adjacent soils were similar, but lack the 7.5 YR 4/6 concentrations in the upper 2 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	>12
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):	>12

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area was dry at the time of the survey and characterized by FAC vegetation; appears to convey low-volume flows in response to storm events and may be subject to temporary inundation, but does not appear to support prolonged inundation or saturation for a minimum of 18 consecutive days and was therefore unlikely to meet the wetland hydrology criterion. Only sporadic, very shallow pockets of water were noted in this area during site visits during the wet season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-04

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 33.174" Long: -121° 35' 58.781" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes ____ No X		

Remarks: California annual grassland adjacent to low topographic swale, dark brown concentrations in the upper part of the soil are characteristic for this soil type.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Bromus hordeaceus*	80%	X	FACU-
2. *Grindelia camporum*	10%		FACU
3. *Erodium botrys*	5%		NL
4. *Eryngium vaseyi*	3%		FACW
5.			
6.			
7.			
8.			
Total Cover:	98%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 2% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		
FAC species		
FACU species		
UPL species		
Column Totals:		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Annual grassland habitat adjacent to seasonal wetland swale.

SOIL

Sampling Point SP-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/2	98	7.5 YR 4/4	2	C	M	FSL	
2-14	10 YR 4/3	100					FSCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soils have 2 percent distinct concentrations in the upper 2 inches – just meets the criteria for a depleted matrix; the San Ysidro Series soils typically have few fine, distinct concentration in the upper part of the soils – unlikely that these concentrations are the result of current hydrologic conditions in this area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______
Water Table Present? Yes ___ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of seasonal saturation or inundation at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-05

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 36.220" Long: -121° 35' 59.921" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Soil point taken in very weakly expressed low area within slightly hummocky annual grassland habitat along transmission line alignment; no evidence of wetland hydrology was observed in this area during any of the surveys.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Bromus hordeaceus*	70	X	FACU-
2. *Erodium moschatum*	10		NL
3. *Eryngium vaseyi*	5		FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	85%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ **No** X

Remarks: Vegetation in this area similar to surrounding grassland habitat.

SOIL

Sampling Point SP-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-2	10 YR 4/3	98	7.5 YR 4/4	2	C	M	FSL	
2-12	10 YR 4/3	100					FSL-FSCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? Yes ___ **No** X

Remarks: Brown concentrations in the upper part are typical for this soil unit, but chroma of 3 does not meet the depleted matrix hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): >12
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of seasonal inundation or saturation at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-06

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 28.170" Long: -121° 36' 17.167" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Well-defined drainage channel with gently sloping banks shown as a blue line creek on USGS topographic map; sample point located within the ordinary high water line of seasonal drainage channel along Bruns Road within the work area for the proposed service water pipeline; 6-foot by 6-foot box culvert under the road at this location.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Distichlis spicata*	40%	X	FACW
2. *Polypogon monspeliensis*	5%		FACW
3. *Lolium multiflorum*	5%		(FAC)
4. *Cotula coronopifolia*	<1%		FACW+
5. *Spergularia marina*	<1%		FACW*
6. *Hordeum marinum* subsp. *leporinum*	<1%		NL
7.			
8.			
Total Cover:	55%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 45% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0*
- ___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Dense *Lepidium latifolium* between the fence and the culvert west of the sample point. Lower part of channel characterized by saltgrass and rabbitsfoot grass. Note: *Lolium multiflorum* is not listed on Reed (1988) but is generally considered to be a facultative species.

SOIL

Sampling Point SP-06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-5	10 YR 4/1	100					CL	
5-12	2.5 Y 4/1	90%	10 YR 4/6	5	C	M	FS-SiCL	
			Gley 1 6/10Y	<1	D	RC		
			7.5 YR 3/4	5	C	RC		
12+	2.5 Y 5/3	80	10 YR 4/6	10	C	M	SiCL	
	2.5 Y 4/1	10						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? Yes X **No** ___

Remarks: Evidence of reducing conditions observed throughout the soil profile below a depth of 5 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
X Drift Deposits (B3) (**Riverine**)
X Drainage Patterns (B10)
X Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 12

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point is within the ordinary high water line of a seasonal drainage, some standing water present in the deeper part of the channel at the time of the survey. Saturated soils were observed at a depth of 12 inches and soil redox indicates prolonged saturated conditions within the upper part.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-07

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 1; T 2 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 28.119" Long: -121° 36' 17.137" Datum: WGS1984

Soil Map Unit Name: San Ysidro Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks: Sample point located in grassland adjacent to seasonal drainage D-1 on the east side of Bruns Road south of Kelso Road – along service water pipeline route.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Hordeum marinum* subsp. *leporinum*	60%	X	NL
2. *Bromus hordeaceus*	30%	X	FACU-
3. *Medicago polymorpha*	2%		NL
4. *Erodium moschatum*	1%		NL
5. *Lolium multiflorum*	<1%		(FAC)
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: *Lolium multiflorum* is not listed on Reed (1988) but is generally considered to be a facultative species. Vegetation in this area is typical for the grasslands throughout the Project study area.

SOIL

Sampling Point SP-07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-12	10 YR 4/1	100					CL	No Redoximorphic Features

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soils very hard and dense – difficult to excavate at this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):		
Water Table Present?	Yes ___	No X	Depth (inches):	>12	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>12	**Wetland Hydrology Present?** **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point located on terrace adjacent to seasonal drainage channel – no evidence of prolonged saturation or inundation at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-08

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 47.811" Long: -121° 36' 17.289" Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam 3 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X* No ____		

Remarks: Small drainage channel on east side of Bruns Road just west of PG&E Bethany Compressor Station, north of Kelso Road – flows to the east into rock-lined drainage ditch within the PG&E facility; 12-inch-diameter culvert (cmp) under the road in this area; shown as a blue line creek on the USGS topographic map – area may be more of a vegetated waters than a wetland, but duration of inundation/saturation is indeterminate.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m²			
1. *Lolium multiflorum*	40	X	(FAC)
2. *Distichlis spicata*	35	X	FACW
3. *Hordeum brachyantherum*	25	X	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: *Lolium multiflorum* is not listed on Reed (1988) but is generally considered to be a facultative species. Vegetation in this area is similar to the adjacent grassland area on low terrace above the drainage feature.

SOIL

Sampling Point SP-08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-5	10 YR 4/2	98	7.5 YR 3/4	2	C	M	SCL	pH 8.2
5-16	2.5 Y 6/4	95	10 YR 2/1	5	C	M	CL	Mn Nodules

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? Yes X **No** ___

Remarks: Surface soil is moderately alkaline in this area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- X Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches):
Surface Water Present?		X	
Water Table Present?		X	>16
Saturation Present? (includes capillary fringe)		X	>16

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Shallow, defined drainage channel, some evidence of scouring along the banks – area appears to convey seasonal flows for some duration – this area may function more as vegetated waters rather than a wetland, wetland hydrology (18 consecutive days of saturation or inundation) was indeterminate in this area at the time of the survey, but area appears to convey flows and therefore wetland hydrology was tentatively assumed to be present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/8/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-09

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 47' 47.881" Long: -121° 36' 17.276" Datum: WGS1984

Soil Map Unit Name: Linne Clay Loam 3 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks: Elevated area adjacent to small drainage channel on the east side of Bruns Road, near PG&E Bethany Compressor Station – Vegetation similar to that found in adjacent drainage, but this area lacks evidence of wetland hydrology. May be occasionally flooded in response to heavy rains, but unlikely that water persists in this area.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Hordeum brachyantherum*	90	X	FACW
2. *Distichlis spicata*	<1		FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	90%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 10% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0*
- ___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: Sample point characterized by dense meadow barley; no distinct vegetation change with the adjacent drainage channel.

SOIL

Sampling Point SP-09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-6	10 YR 4/1	100					CL	pH 8.6 to 8.8
6-15	10 YR 3/2	100	2.5 Y 7/4	<2	C	M	C	Light concentrations are $CaCO_3$ nodules and filaments – not redox features

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? Yes ___ **No** X

Remarks: Surface soil is strongly alkaline with calcium carbonate deposits present below 6 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches):	___
Water Table Present?	Yes	___	No	X	Depth (inches):	>16
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	>16

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Elevated areas adjacent to small drainage feature, no evidence of prolonged saturation or inundation in this area. Possibly subject to short-term flooding due to heavy storm events.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-10

Investigator(s): Russell Huddleston Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48’ 00.183” Long: -121° 36’ 17.334” Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PEMH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are “Normal Circumstances” present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks: Shallow well-defined drainage perennial drainage channel on east side of Bruns Road; 6-foot by 6-foot cement box culvert under road. This feature is shown as a blue line creek on the USGS topographic map and is a Palustrine Emergent Permanently Flooded (PEMH) on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Bolboschoenus maritimus*	70	X	OBL
2. *Distichlis spicata*	15		FACW
3. *Chenopodium album*	<1		FAC
4.			
5.			
6.			
7.			
8.			
Total Cover:	85%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0*
- ___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: Dense cosmopolitan bulrush throughout the channel, relatively distinct vegetation boundary with the adjacent grasses.

SOIL

Sampling Point SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-6	Gley 1 2.5/5GY	60	7.5 YR 4/6	5	C	M	CL	Strong reaction to α α-dipyrdyl
	5Y 2.5/2	35						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >6

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soils were inundated at the time of the survey with extensive roots and rhizomes in the upper part, evidence of reducing condition noted in the upper part with alpha alpha-dipyrdyl dye test.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 3
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Shallow perennial drainage, flows to the north into open water area located outside of the Project study area.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-11

Investigator(s): Russell Huddleston Section, Township, Range: SW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 00.241" Long: -121° 36' 17.340" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks: Sample point on north side of drainage channel above the ordinary high water line, area is characterized by dense saltgrass, but lacks evidence of hydric soil and wetland hydrology.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Distichlis spicata*	100	X	FACW
2. *Cressa truxillensis*	<1		FACW
3. *Cirsium vulgare*	<1		FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Dense saltgrass along the upper edges of the channel.

SOIL

Sampling Point SP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-12	2.5 Y 4/2	80					SL	$CaCO_3$ Nodules Present
	2.5 Y 5.2	20						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >12

Hydric Soil Present? **Yes** ___ **No** X

Remarks: No redoximorphic features observed in this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): >12
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Upper edge of drainage channel, possibly subject to occasional flooding, but no evidence this area is subject to prolonged saturation or inundation. Sample point is above the ordinary high water line of the drainage channel.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Alameda Date: 4/15/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-12

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 19.996" Long: -121° 36' 17.153" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PEMF

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks: Sample point taken at outer edge of drainage channel on the east side of Bruns Road, 30-inch-diameter cmp culvert under the road in this area. Sample point at the edge of the ordinary high water line – likely subject to shallow groundwater saturation during the wet season. This feature is shown as a blue line on the USGS topographic map and is a Palustrine Emergent Semi-permanently Flooded (PEMF) on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~$1m^2$			
1. *Distichlis spicata*	75	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 25% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: Dense, lush saltgrass along the outer edges of the channel, center part of the channel filled with dense cattails.

SOIL

Sampling Point SP-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-3.5	10 YR 4/2	100					FSCL	pH 9.6
3.6-16	10 YR 4/2	100					CL	pH 9.2

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? **Yes** X **No** ___

Remarks: No redoximorphic features observed in this location; however, the soil is strongly alkaline and was therefore considered problematic. Lush FACW vegetation along with topographic low position adjacent to drainage channel suggest soils in this area are likely seasonally saturated or inundated for a period of time and hydric conditions likely exist.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
X Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):		
Water Table Present?	Yes ___	No X	Depth (inches):	>16	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>16	**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey, but water was present in the deeper part of the channel at the time of the survey; low topographic position adjacent to channel and lush saltgrass suggest this area may be subject to seasonal saturation or inundation. Wetland hydrology was assumed to be present at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Contra Costa Date: 4/15/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-13

Investigator(s): Russell Huddleston, Todd Ellwood Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 20.115" Long: -121° 36' 17.127" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PUSC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X*	No	
Wetland Hydrology Present?	Yes X*	No	

Remarks: Sample point is within alkali sink wetland adjacent to drainage channel on the east side of Bruns Road – just north of the Alameda County line. Area is characterized by notable change in vegetation and soils from the surrounding grassland areas. Considered a problem area due to the strongly alkaline soils and probable seasonal wetland hydrology. Area is Palustrine Unconsolidated Shore Seasonally Flooded (PUSC) wetland on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Distichlis spicata*	30	X	FACW
2. *Kochia californica*	30	X	FACW
3. *Hordeum brachyantherum*	25	X	FACW
4. *Lolium multiflorum*	<1		(FAC)
5.			
6.			
7.			
8.			
Total Cover:	85%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Vegetation includes hydrophytic plant species that area also tolerant of saline/alkaline soil conditions – notable change in vegetation from the adjacent grassland areas. *Lolium multiflorum is* not included on Reed (1988) but is generally considered a facultative species.

SOIL

Sampling Point SP-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-6	10 YR 4/2	100					CL	pH 8.8-9.0
6-16	10 YR 31/1	80					CL	
	10 YR 4/2	20						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >16

Hydric Soil Present? **Yes** X **No** ___

Remarks: No redoximorphic features observed in this location; however, the soil is strongly alkaline and was therefore considered problematic. Lush FACW vegetation along with topographic low position adjacent to drainage channel suggest soils in this area are likely seasonally saturated or inundated for a period of time and hydric conditions likely exist.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
X Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):		
Water Table Present?	Yes ___	No X	Depth (inches):	>16	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>16	**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey, but this area potentially supports shallow seasonal inundation or shallow groundwater resulting in saturated soil condition in the upper 12 inches. Hydrology was indeterminate at this location, but topographic position and notable change in vegetation suggest wetland hydrology may be present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center City/County: Contra Costa Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp. State: CA Sampling Point: SP-14

Investigator(s): Russell Huddleston Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1 %

Subregion (LRR): C Lat: 37° 48' 21.291" Long: -121° 36' 16.854" Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam NWI classification: PUSC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil Yes , or Hydrology Yes naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks: Sample point take in the alkali sink wetland adjacent to drainage channel on the east side of Bruns Road – just north of the Alameda County line. Area is characterized by notable change in vegetation and soils from the surrounding grassland area. Shown as a Palustrine Unconsolidated Shore Seasonally Flooded wetland on the National Wetland Inventory Map.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Distichlis spicata*	50	X	FACW
2. *Kochia californica*	25	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	75%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 25% % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: Vegetation includes hydrophytic plant species that area also tolerant of saline/alkaline soil conditions – notable change in vegetation from the adjacent grassland areas.

SOIL

Sampling Point SP-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[a]	Loc[b]	Texture	Remarks
0-8	10 YR 4/2	100					FiSCL	pH 9.2 - 9.4; moderate rxn to HCl
8-24	10 YR 3/2	100					CL	pH 8.8; weak rxn to HCl

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
X Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): ______

Hydric Soil Present? **Yes** X* **No** ____

Remarks: No redoximorphic features observed in this location; however, the soil is strongly alkaline and was therefore considered problematic. Shallow soil saturation possible in this area resulting in the development of hydric condition during the wet season.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
X Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches): >24
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches): >24

Wetland Hydrology Present? **Yes** X* **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey, but potentially supports shallow seasonal inundation or shallow groundwater, resulting in saturated soil condition in the upper 12 inches. Hydrology was indeterminate at this location, but topographic position and notable change in vegetation suggest wetland hydrology may be present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Mariposa Energy Center   City/County: Contra Costa   Date: 6/4/2009

Applicant/Owner: Diamond Energy Corp.   State: CA   Sampling Point: SP-15

Investigator(s): Russell Huddleston   Section, Township, Range: NW ¼ Sec 36; T 1 S; R 3 E (MDM)

Landform (hillslope, terrace, etc.): Terrace   Local relief (concave, convex, none): None   Slope (%): 0-1 %

Subregion (LRR): C   Lat: 37° 48' 21.387"   Long: -121° 36' 16.878"   Datum: WGS1984

Soil Map Unit Name: Solano Fine Sandy Loam   NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation Yes , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks: Sample point taken in annual grassland adjacent to alkali sink wetland area, vegetation in this area is characterized by facultative plant species, but notable change from the adjacent vegetation in the alkali sink – possible difference is due to soil chemistry rather than wetland hydrology, but this could not be definitively determined at the time of the survey.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum Plot Area: ~1m^2			
1. *Hordeum marinum*	50	X	FAC
2. *Lolium multiflorum*	30	X	(FAC)
3. *Frankenia salina*	15		FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5%   % Cover of Biotic Crust N/A

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: *Lolium multiflorum* is not assigned an indicator status per Reed (1988) but is generally considered to be a facultative species. Sample point characterized by FAC plants, but these species are common and widespread throughout the annual grassland habitat in the surrounding area and may not be indicative of wetland conditions – notable change in vegetation from the adjacent alkali sink area.

SOIL

Sampling Point SP-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[a]	Loc[b]	Texture	Remarks
0-7	10 YR 4/2	100					CL	pH 8.4; weak rxn to HCl
7-14	10 YR 4/2	90					CL	pH 8.4; weak rxn to HCl
	2.5 Y 4/3	10						

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (LRR C)
___ 1 cm Muck (A9) (LRR D)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

___ 1 cm Muck (A9) (LRR C)
___ 2 cm Muck (A10) (LRR B)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: NE

Depth (inches): >14

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soil in this location is moderately alkaline as compared to strongly alkaline soil in the adjacent alkali sink area. No indication of hydric conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >14

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >14

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This point was dry at the time of the survey; facultative vegetation present, but consists of species that are common in grasslands throughout this area; no strong indication of wetland hydrology observed at this location.

Appendix F
Selected Site Photographs

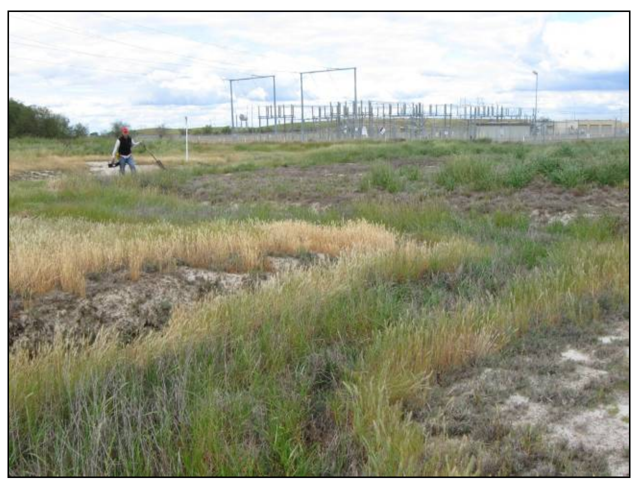
PROJECT SITE
Looking to the south-southeast from the existing access road

LAYDOWN AREA
Looking north from south end of property

DRAINAGE WETLAND (D-1)
Looking east from Bruns Road

DRAINAGE WETLAND (D-1)
Looking west; 6-foot by 6-foot box culvert under Bruns Road

DRAINAGE (1B)
North of Kelso Road, looking northeast at defined earthen channel



DRAINAGE WETLAND (D-2)
Looking east from Bruns Road

DRAINAGE (2A)
Looking east at earthen channel

DRAINAGE WETLAND (D-3)
Looking west; 6-foot by 6-foot box culvert under Bruns Road

DRAINAGE WETLAND (D-3)
Looking north along east side of Bruns Road

DRAINAGE WETLAND (D-4)
Looking east from Bruns Road (30-inch-diameter cmp under road)

DRAINAGE WETLAND (D-4)
Adjacent alkali sink wetland; looking south along Bruns Road

ALKALI SINK WETLAND (ASW-1)
Looking northeast from Bruns Road

SEASONAL WETLAND (SW-1)
Looking north, basins connected via 18-inch-diameter cmp

SEASONAL WETLAND (SW-1)
Inundated on February 19, 2009

PROJECT SITE
Low upland swale through center of site—no change in vegetation or evidence of any type of flow through this area

SEASONAL WETLAND (SW-2)
Weakly expressed shallow area with Italian ryegrass and sparse coyote thistle

SWALE (SW-1)
Looking west

SWALE (SW-3)
Looking east from Bruns Road

E-1
Small erosional rill; looking north; flows north into seasonal wetland area

E-2
Erosional feature; looking south toward the PG&E Kelso Substation

E-3
Large erosional channel with deeply scoured channel; looking north; flows north into large seasonal wetland area

BBID CANAL 45
Looking east from Bruns Road

Appendix G
List of Plant Species Observed at Sample Points

TABLE G-1
Plant Species Observed at Sample Point Locations

Scientific Name[1] (Name per Reed 1988)	Common Name (Name per Reed 1988)	Indicator Status[2]	Stratum
Bolboschoenus maritimus (*Scirpus maritimus*)	Cosmopolitan bulrush (Saltmarsh bulrush)	OBL	H
Bromus hordeaceus (*Bromus mollis*)	Soft chess (Soft brome)	FACU-	H
Chenopodium album	White goosefoot	FAC	H
Cirsium vulgare	Bull thistle	FACU	H
Cotula coronopifolia	Brass buttons	FACW+	H
Crassula aquatica	Water pigmy-weed	OBL	H
Cressa truxillensis	Spreading alkali weed	FACW	H
Distichlis spicata	Saltgrass (Inland)	FACW*	H
Epilobium densiflorum (*Boisduvalia densiflora*)	Dense flower willowherb (Dense flower spike-primrose)	OBL	H
Erodium botrys		NL	H
Erodium moschatum		NL	H
Eryngium vaseyi	Vasey's coyote thistle	FACW	H
Frankenia salina (*Frankenia grandiflora*)	Alkali heath	FACW+	H
Grindelia camporum	Great Valley gumweed	FACU	H
Hordeum brachyantherum	Meadow barley	FACW	H
Hordeum marinum ssp. *gussonianum* (*Hordeum hystrix*)	Mediterranean barley	FAC	H
Hordeum murinum ssp. *leporinum* (*Hordeum leporinum*)	Foxtail barley (Barley)	NI	H
Juncus bufonius	Toad rush	FACW+	H
Kochia californica	Rusty molly (California summer-cypress)	FACW	H
Lolium multiflorum	Italian Ryegrass	NL (FAC[3])	H
Medicago polymorpha	Bur clover	NL	H
Plagiobothrys stipitatus	Slender popcorn flower	OBL	H
Polypogon monspeliensis	Annual rabbit-foot grass	FACW+	H
Psilocarphus oregonus	Oregon woolly-heads	OBL	H
Spergularia marina	Saltmarsh sandspurry	OBL	H

TABLE G-1
Plant Species Observed at Sample Point Locations

Scientific Name[1] (Name per Reed 1988)	Common Name (Name per Reed 1988)	Indicator Status[2]	Stratum
Trifolium hirtum	Rose clover	NL	H
Veronica peregrina	Purslane speedwell	OBL	H

NOTES:
[1] Taxonomy follows current nomenclature per the University of California (2009) *Jepson On-Line Interchange for California Floristics*
[2] Indicator State follows the *National List of Plant Species that Occur in Wetlands: Region 0.* Reed (1988)
[3]*Lolium multiflorum* is not included on the Reed 1988 *National List of Plant Species that Occur in Wetlands: Region 0*, but is generally considered to be a facultative plant species

Indicator Status Codes

NL	Not included on the *National List of Plant Species that Occur in Wetlands: Region 0.* Reed (1988)
NI	Insufficient information available to assign an indicator status
FACU	Facultative Upland (67 to 99 percent probability of occurrence in non-wetlands)
FAC	Facultative (equally likely to occur in wetlands and non-wetlands)
FACW	Facultative Wetland (67 to 99 percent probability of occurrence in wetlands)
OBL	Obligate (99 percent probability of occurrence in wetlands)
+	Frequency tends toward the higher end of the category
-	Frequency tends toward the lower end of the category

Stratum

H	Herbaceous

Appendix E
CTS and CRLF Relocation Methodology

California Tiger Salamander and California Red-legged Frog Relocation Methodology

California tiger salamander and California red-legged frog encountered during project construction will be treated on a case-by-case basis in coordination with the Service. In general, the following will occur under the direction of the 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; or (3) the animal may be taken into custody for educational outreach and/or scientific research if the first two options are unavailable. These three options are further described below.

1. When a California tiger salamander or California red-legged frog are encountered in the action 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 then assess the situation in order to select an appropriate course of action that will minimize the effects to the individual. Once the site is secure, Mariposa Energy will contact the Service at (916) 414-6600 for further direction.
2. The first priority will be to avoid contact with the salamander or frog and allow it to move out of the action area and danger on its own to a safe location. The animal will not be picked up and moved. This guidance only applies to situations where a salamander or frog is encountered on the move during conditions that make their upland travel feasible (which is usually during the wet season). This does not apply to salamanders or frogs 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.
3. Avoidance is the preferred option if the salamander or frog is not moving and is using aquatic habitat or is within some sort of burrow or other refugia. The area should be well marked for avoidance and a Service-approved biological monitor should be assigned to the area when work is taking place nearby.

The above options will not always be feasible and sometimes capturing and moving the animal is the only option to prevent its death or injury.

If appropriate habitat is located immediately adjacent to the capture location then the preferred option will be short distance relocation to that habitat. This will be coordinated with the Service but the general guidance is that the animal will not be moved outside of the area it would have traveled on its own. No animal will be relocated to another property without the owner's written permission, arranged for by Mariposa Energy.

The release must be coordinated with the Service and will depend on where the individual was found and the opportunities for nearby release. In most situations the release location will likely to be into the mouth of a small burrow or other suitable refugia and in certain circumstances pools without non-native predators may be suitable.

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 to other California tiger salamanders and California red-legged frog, the long distance relocation of salamanders and frogs on this project (i.e., out of the watershed or greater than 300 feet) will not occur.

Only Service-approved biologists for the project will capture California tiger salamanders and California red-legged frog. Animals will be captured using nets or by hand. Soaps, oils, creams, lotions, repellents, or solvents of any sort cannot be used on hands within two hours before and during periods when they are capturing and relocating animals. To avoid transferring disease or pathogens between sites during the course of surveys or handling of the animals, the Service-approved 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 dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, will be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water and/or a salamander. Cleaned items will be rinsed with clean water before leaving each site.
- Boots, nets, traps, 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 between sites. Cleaning equipment in the immediate vicinity of a pond or wetland will be avoided. All traces of the disinfectant will be removed before entering the next aquatic habitat.
- Disposable gloves will be worn and changed after handling each animal.
- Used cleaning materials (liquids, etc.) will be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves will be retained for safe disposal in sealed bags.
- Service-approved biologists will limit the duration of handling and captivity. While in captivity, individual salamanders or frogs will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. Containers used for holding or transporting will not contain any standing water.
- If salamanders or frogs can not be moved, the individuals will be used for outreach and/or research. Delivery of individuals to the recipient shall be coordinated with the Service. Unless otherwise directed, salamanders will be delivered to the Brad Shaffer Lab at the University of California at Davis. Brad and the lab staff can be reached at (530) 752-2939 and hbshaffer@ucdavis.edu.

List of Figures

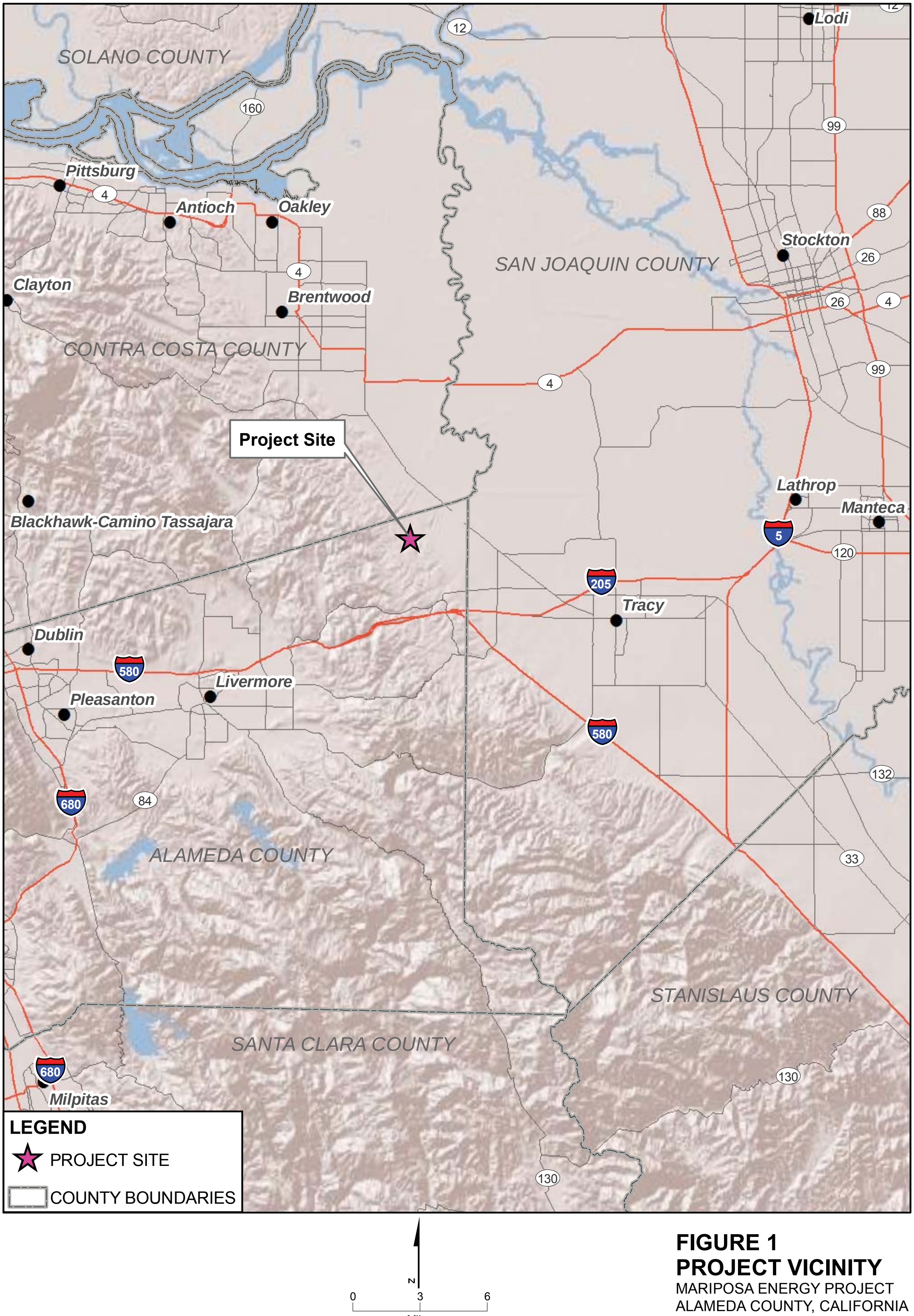
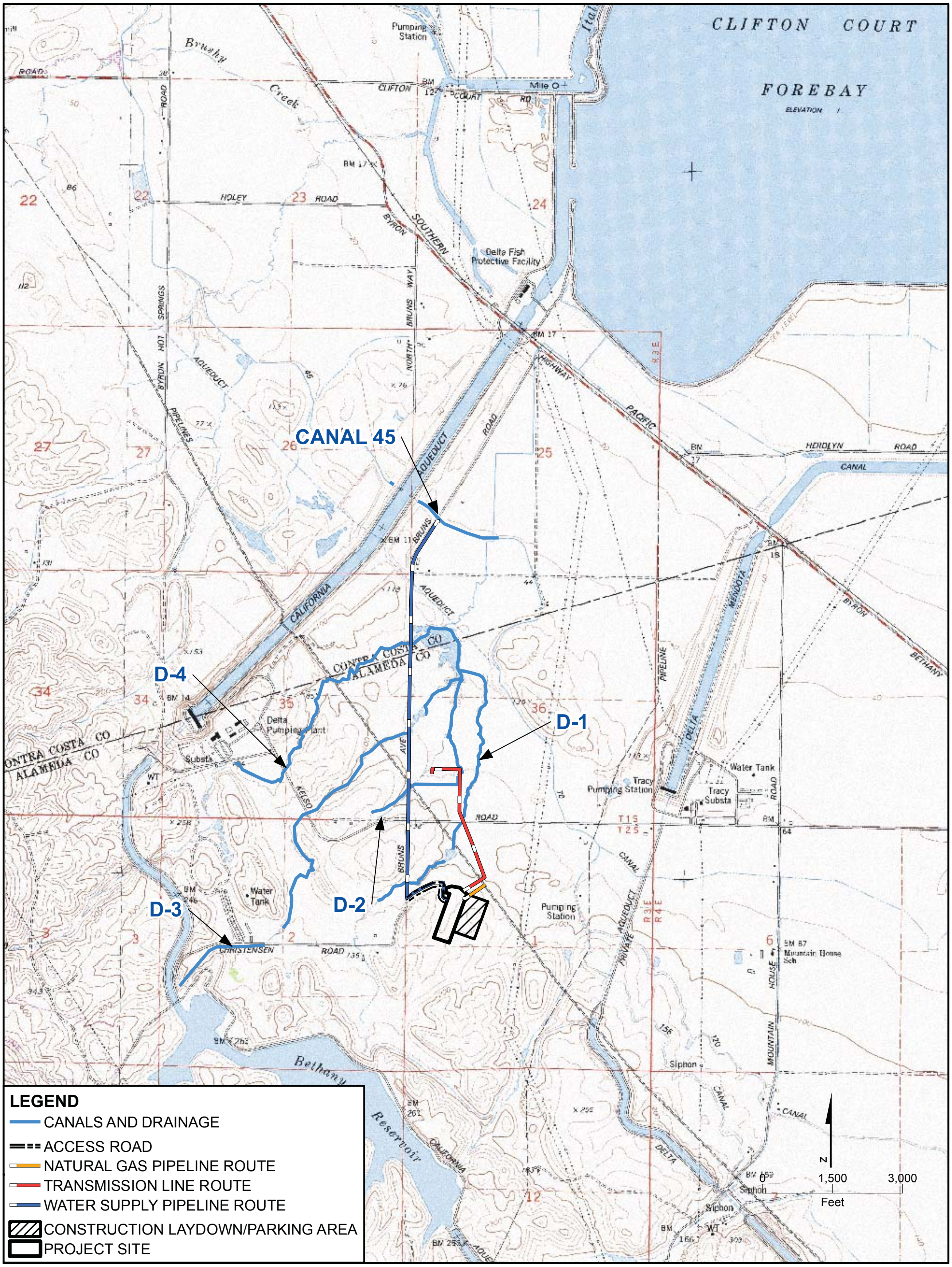


FIGURE 1
PROJECT VICINITY
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_VICINITYMAP.MXD KSWANSO3 3/2/2010 14:47:56

CH2MHILL



Notes:

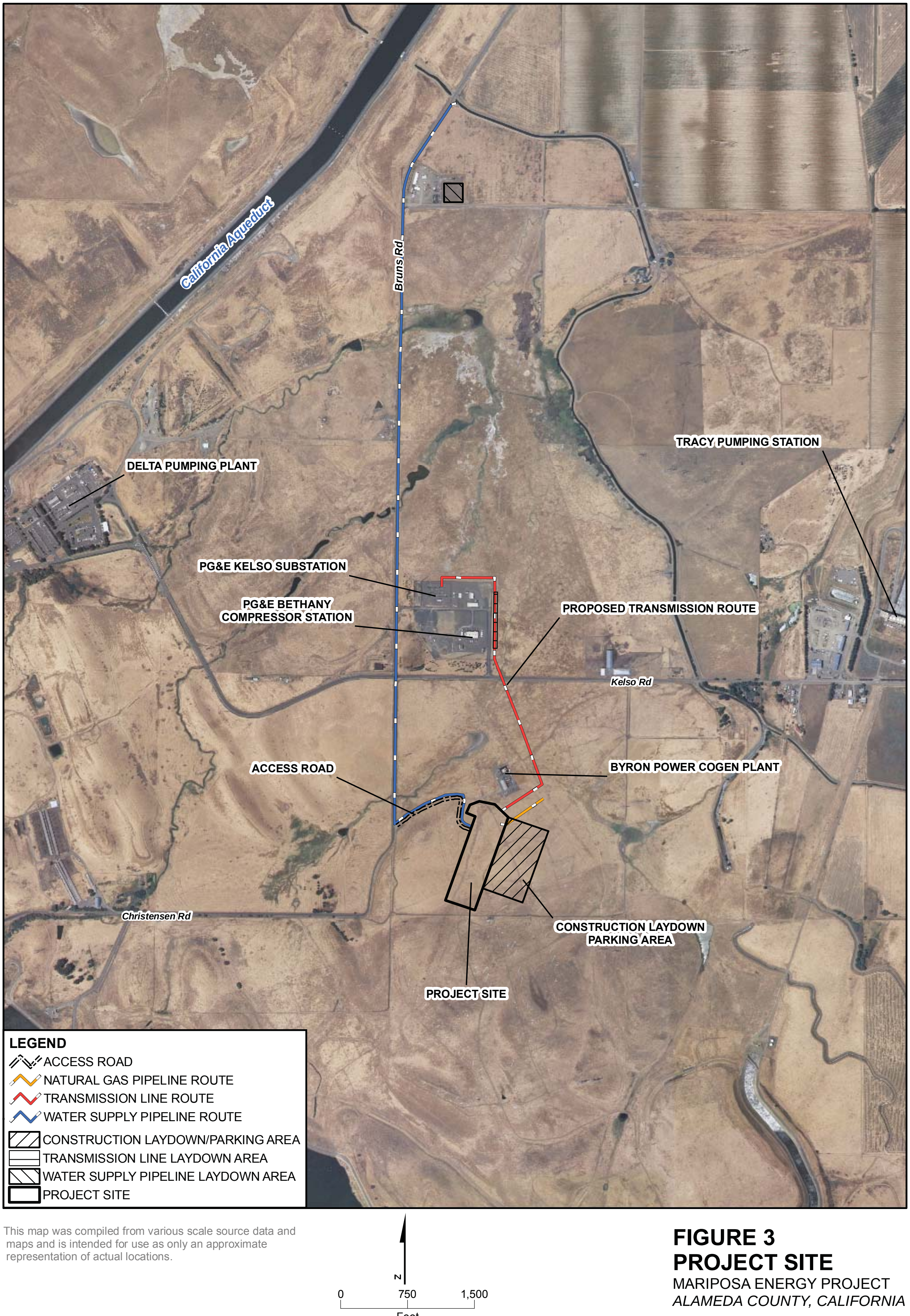
1. Source: USGS, the National Atlas of the United States, Environmental Systems Research Institue (ESRI). Water Bodies - 2004, River and Streams - 2006.

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

FIGURE 2
PROJECT LOCATION
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\WETLAND_SURFACEWATER.MXD KSWANSO3 3/2/2010 14:51:17

CH2MHILL



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

FIGURE 3
PROJECT SITE
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\SITELOCATION.MXD KSWANSO3 3/2/2010 14:52:36