

## DOCKETED

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<b>Document Title:</b>	Mariposa Energy Petition for Staff Approved Insignificant Modification
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<b>Filer:</b>	Joe Douglas
<b>Organization:</b>	Mariposa Energy, LLC
<b>Submitter Role:</b>	Applicant
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March 03, 2015

Mr. Joseph Douglas  
Compliance Project Manager  
Siting, Transmission and  
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California Energy Commission  
1516 Ninth Street, MS-2000  
Sacramento, CA 95814

**RE: Mariposa Energy Project (09-AFC-3C)- Drought Relief Petition for Staff Approved  
Insignificant Modification for Back-Up Water Supply Tanks**

Dear Mr. Douglas:

Enclosed is the Mariposa Energy, LLC ("Mariposa Energy") petition for CEC Staff approved modification of insignificant modification to the Mariposa Energy Project ("MEP"). This modification will allow MEP to prepare for the current drought conditions in California by providing a reserve water supply for plant operation in the event of curtailment conditions which may restrict normal water supply.

Should you have any questions or need additional information regarding this submittal, please contact Wayne Forsyth at (213) 473-0093 or [w.forsyth@dgc-us.com](mailto:w.forsyth@dgc-us.com).

Sincerely,

Yasuyuki Asakura  
President  
Mariposa Energy, LLC

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# **Petition for Staff-approved Insignificant Modification Back-up Water Supply Tanks**

## **Mariposa Energy Project**

(09-AFC-3C)

Submitted to  
**California Energy Commission**

Submitted by  
**Mariposa Energy, LLC**

March 2015

With Assistance from

**CH2MHILL®**

2485 Natomas Park Drive  
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# Acronyms and Abbreviations

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ACDEH	Alameda County Department of Environmental Health
AFC	Application for Certification
BBID	Byron Bethany Irrigation District
BHP	break-horsepower
CEC	California Energy Commission
CDFW	California Department of Fish and Wildlife
COC	Condition of Certification
CPM	Compliance Project Manager
DWR	California Department of Water Resources
LORS	laws, ordinances, regulations, and standards
MEP	Mariposa Energy Project
MG	million gallons
MW	megawatt
PERP	Portable Equipment Registration Program
SWRCB	State Water Resources Control Board

## SECTION 1

# Introduction

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Pursuant to Section 1769 of the California Energy Commission's ("CEC") regulations, Mariposa Energy, LLC ("Mariposa Energy") submits this petition for a staff-approved modification of the Mariposa Energy Project ("MEP") to provide for temporary storage of water supplies for the MEP to address drought conditions and provide a backup supply in the event of curtailment of water supplies.

Because there is no possibility that the proposed modification may have a significant effect on the environment and because the proposed modifications will not result in a change or deletion of a Condition of Certification ("COC") adopted by the CEC in certifying the MEP or cause the MEP not to comply with any applicable law, ordinance, regulation, or standard ("LORS"), Mariposa Energy requests that CEC Staff review the petition and issue its determination within 30 days after the filing of this petition.

## 1.1 Background

On May 18, 2011, the CEC issued a license to Mariposa Energy for the construction and operation of the MEP. On June 15, 2011, the CEC Compliance Project Manager ("CPM") issued a full notice to proceed and the project achieved commercial operation on October 1, 2012.

MEP is a nominal 200-megawatt ("MW") simple-cycle generating facility consisting of four General Electric LM6000 PC-SPRINT natural-gas-fired combustion turbine generators and associated equipment. The facility is located in northeastern Alameda County, California (see Figure 1), on approximately 10 acres of a 158-acre parcel that, in addition to MEP, consists of non-irrigated grazing land, a former wind-turbine development (prior to MEP), and the former 6.5 MW Byron Power Cogeneration Plant site. MEP is approximately 7 miles northwest of Tracy, 7 miles east of Livermore, 6 miles south of Byron, and approximately 2.5 miles west of the community of Mountain House.

## 1.2 Description of Proposed Insignificant Project Modification

The Byron-Bethany Irrigation District ("BBID") currently supplies raw surface water for process water, safety showers, fire protection, service water, and domestic water for the MEP site via Canal 45. To bring the water to the site, a 10 inch-diameter, 1.8-mile-long water supply pipeline was constructed along the east side of Bruns Road from Canal 45 to the site.

The raw surface water supplier, BBID, is a public agency operating under the California Water Code. BBID is a multi-county special district encompassing approximately 30,000 acres, with lands in Alameda, Contra Costa, and San Joaquin counties and is the jurisdictional water purveyor in the area. The source of BBID's water supply for MEP is pre-1914 water rights that were established by the Byron-Bethany Irrigation Company and acquired with the formation of BBID in 1921. BBID's original point of diversion on Italian Slough was destroyed by the California Department of Water Resources ("DWR") for the construction of the Harvey O. Banks Pumping Plant. To compensate BBID, DWR granted BBID the use of the Banks Pumping Plant Intake Channel as a replacement point of diversion. Accordingly, BBID diverts water under its pre-1914 water right at its facilities located on the Banks Pumping Plant Intake Channel.

However, with the severe drought conditions that California has faced, on January 17, 2014 Governor Jerry Brown proclaimed a State of Emergency and directed state officials to take all necessary action to make water immediately available. On April 25, 2014, the governor issued an executive order to speed up actions necessary to reduce harmful effects of the drought. With long-term drought conditions, it is possible that BBID's water consumption may be curtailed, which could also affect the water supply to MEP.



To provide a supplemental, temporary water supply for use during a possible water curtailment, Mariposa Energy is proposing two options for short-term water storage. The potential effects of both options are evaluated in this petition to provide Mariposa Energy flexibility in implementing the option that will best fit water storage needs upon implementation. Option 1 is the installation of a temporary approximately 1.70 million-gallon ("MG") tank and a smaller approximately 0.68 MG tank, for 2.38 MG total capacity. Option 2 is the installation of one approximately 1.03 MG tank and one approximately 0.68 MG tank, with 1.71 MG total capacity. The two tank configurations would allow MEP to operate approximately 7 months (Option 1) or 5 months (Option 2) during a curtailment scenario based on average water usage in 2013 and 2014 dispatch. In both cases the tanks will be open on the top with a floating (95 percent sized) cover to reduce evaporation. The tanks would be located at the site of the former 6.5 MW Byron Power Cogeneration Plant that is located on approximately 2 acres immediately north of the MEP site. A gravel access road connects this former cogeneration plant site and the MEP access road. Of the 2-acre site, about 1.3 acres remains disturbed (see Figure 2) from decommissioning the cogeneration plant.

Layflat water lines (between 6- to 12-inch diameter) will be laid on top of the ground from the temporary tanks to the MEP raw water storage tank for use in transporting water to and from the plant site. External trailer-mounted 49 break-horsepower ("BHP") diesel pump(s) (or a possible electric pump of similar size) would be used to convey water between the temporary storage tanks and the MEP raw water tank as necessary.

The same pumps used for conveyance would also recirculate the water within the storage tanks (as needed to prevent fouling) by pulling from one or more of the tank's fill/suction lines, and then discharging back through the recirculation lines. Water treatment chemicals would be added to the discharge side of the circulation pump(s) for chemical disinfection. Water treatment chemicals would include liquid sodium hypochlorite, or the wafer form, or other chemicals currently used for water treatment at MEP, as described in Hazardous Materials Attachment A of the Final Decision.

The temporary tanks would be installed and filled as needed based on the potential risk of water curtailment (potentially as early as May 2015). Following the end of a potential water curtailment period, Mariposa Energy would return most of the stored water to the MEP onsite storage tank for use in the facility with some being trucked back to BBID for use, then dismantle and remove the tanks and associated equipment. For analysis purposes, it is assumed that 500,000 gallons would need to be trucked back to BBID. Assuming a 4,000-gallon tanker truck is used, it would take 125 truck trips (one-way) to deliver the water to BBID.

The temporary water storage assembly and disassembly process may be repeated for subsequent years, if necessary, based on the future drought status and potential curtailment risks.

### 1.3 Necessity of Proposed Modification

Sections 1769 (a)(1)(A), (B), and (C) of the CEC Siting Regulations require a discussion of the necessity for the proposed modification to MEP and whether the modification is based on information known by the petitioner during the certification proceeding. The back-up temporary water supply tanks are necessary to ensure a water supply to MEP if water delivery from BBID is curtailed. The proposed modification will not increase the amount of water used by the MEP to levels above that analyzed and approved in the Final Decision. Section 2.2 provides additional information regarding the necessity of the proposed modification.

### 1.4 Summary of Environmental Impacts

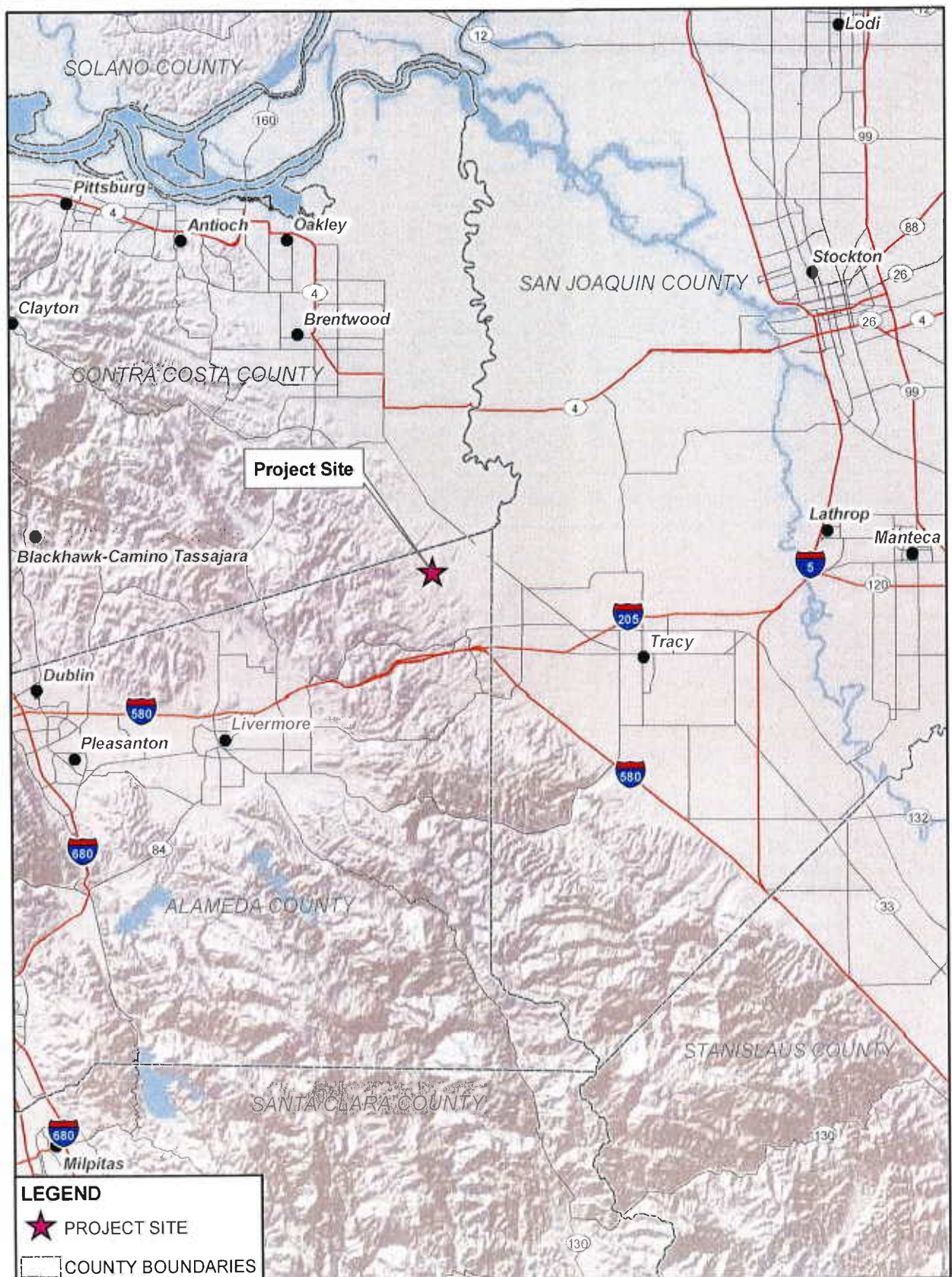
Section 1769 (a)(1)(E) of the CEC Siting Regulations requires that an analysis be conducted to address impacts the proposed modification may have on the environment and proposed measures to mitigate any significant adverse impacts. Section 1769 (a)(1)(F) requires a discussion of whether the proposed modification affects the facility's ability to comply with applicable LORS. The proposed temporary back-up



water supply tank installation and use would not result in any significant environmental impacts and is consistent with LORS. Section 3 provides an environmental analysis of the proposed modification and its consistency with LORS.

## **1.5 Consistency of Modifications with License**

Section 1769 (a)(1)(D) of the CEC Siting Regulations requires a discussion of the consistency of the proposed project modification with the assumptions, rationale, findings, or other bases of the Final Decision and whether the modification is based on new information that changes or undermines the basis of the final decision. Also required is an explanation of why the modification should be permitted. The proposed modification does not undermine the assumptions, rationale, findings, or other basis of the Final Decision for the MEP project. In addition, the proposed modification should be permitted because it would ensure a reliable water supply to MEP should there be insufficient water delivery from BBID.



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





**Figure 2**  
**Tank Site Location and**  
**Utility Corridor**  
Malpas Energy Project

## SECTION 2

# Description of Project Modification

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Consistent with the CEC Siting Regulations Section 1769(a)(1)(A), this section includes a description of the requested project modification, as well as the necessity for it.

## 2.1 Proposed Modification

Mariposa Energy proposes to install two temporary water supply tanks that will be rented. The tanks will be filled with water delivered by BBID to the plant site for use when drought or other circumstances prevent or curtail water deliveries to MEP. The tanks will be located adjacent to the MEP plant site on a parcel previously used by the Byron Power Cogeneration Plant, which was recently decommissioned by the property owner.

Two options are being considered:

- **Option 1** would provide approximately 2.38 MG of water by using a 0.68 MG tank and a 1.70 MG tank.
- **Option 2** would provide approximately 1.71 MG of water by using a 0.68 MG tank and a 1.03 MG tank.

Option 1 uses a small tank (0.68 MG, 100-foot diameter, 12 feet high, or similar size) on the north end of the tank site and a larger tank (1.70 MG, 160-foot diameter, 12 feet high, or similar size) on the south end. Figure 3a shows the location of each tank, the 20-foot-wide assembly area, and an additional 25-foot buffer area beyond the assembly area. These tank sizes are based on a current vendor, Rain-for-Rent, with competitors having similar sized tanks.

Option 2 uses a small tank (0.68 MG, 100-foot diameter, 12 feet high, or similar size) on the north end of the site and a mid-sized tank (1.03 MG, 125-foot diameter, 12 feet high, or similar size) on the south end. Figure 3b shows the location of each tank, the 20-foot assembly area, and an additional 25-foot buffer area beyond the assembly area. These tank sizes are based on a current vendor, Rain-for-Rent, with competitors having similar sized tanks.

Six- to 12-inch-diameter, temporary water lines (layflat lines) would be used to convey water to and from the MEP site and the temporary storage tanks. The lines would be placed on top of the ground and would lay flat when not in use. A 49 BHP diesel trailer-mounted pump (or similar sized electric pump) would be used to pump the water between the tanks and plant site. The same pump(s) would be used to recirculate the water by pulling water from one or more of the tank's fill/suction lines and then discharging back through the recirculation lines. For chemical disinfection, water treatment chemicals (such as 12.5 percent liquid sodium hypochlorite, or solid wafers) will be added to the discharge side of the recirculation pumps, or other chemicals currently used for water treatment at MEP, as described in Hazardous Materials Attachment A of the Final Decision.

The tanks will be located on approximately 1.3 acres of disturbed land (see Figure 2), within the 2-acre area previously used by the Byron Power Cogeneration Plant. That plant was removed between 2009 and 2012. The site has since been remediated for residual soil contamination, and Alameda County determined in May 2014 that no further action was required (see Section 3.4 for additional information). Using the disturbed area of this former cogeneration plant will minimize biological impacts. A 20-foot-wide area around each tank is needed for assembly. This area surrounding the tanks would have limited temporary use by light-weight vehicles such as rough-terrain fork-lifts and man lifts.

If electric pumps are used, electricity would be run to the tank site by extending an electric line on top of the ground to the project site and establishing electrical service. The cable would be laid on the ground in the same corridor as the layflat water line (Figure 2).

Diesel pumps (approximately 49 BHP in size), or similarly sized electric pumps, would be used to pump the water to and from MEP. The same (or smaller) pumps would be used to periodically recirculate the water in the tanks, and add water treatment chemicals, and move the water from the tanks to the MEP raw water tank. Once the temporary storage tanks have been filled, the pumps would not need to pump water to the MEP raw water tank unless a water curtailment occurred, or the tanks were no longer needed and were being emptied.

Construction activities would occur Monday through Friday between 7:00 a.m. and 7 p.m. Construction and assembly of the tanks requires some site preparation that involves light grading to level the site and possible installation of sand pads beneath the tanks. Site preparation is expected to take five workers about 3 days and require a scraper and excavator. In addition, sand would be brought in to place under the tank liners. The 1.70 MG tank would require about 375 cubic yards of sand, or about 31 dump truck loads. The 1.03 MG tank would require about 270 cubic yards of sand, or about 23 dump truck loads. The 0.68 MG tank would require about 172 cubic yards of sand, or about 15 dump truck loads. Less sand would be required if the ground is smooth and free of sharp objects or rocks.

Each tank's components would be delivered on three semi-trucks. Assembly of the 1.70 MG tank is expected to require 12 workers about 14 hours. Assembly of either the 1.03 MG or 0.68 MG tank is expected to require between 8 to 10 workers and take about 12 hours. Tank assembly will require three rough-terrain forklifts, two man lifts, and various small tools.

Once concern about a potential water curtailment is passed, Mariposa Energy plans to have the tanks disassembled and removed. After the tanks are removed, the site would remain unchanged should the need for tanks arise in the future requiring their reinstallation.

## 2.2 Necessity of Proposed Modification

Sections 1769 (a)(1)(B) and 1769(a)(1)(C) of the CEC Siting Regulations require a discussion of the necessity for the proposed modification to the project and whether this modification is based on information that was known by the petitioner during the certification proceeding. The back-up water supply is necessary to ensure MEP has adequate water if BBID suffers water curtailment due to drought or other circumstances outside its control.

The need for the proposed modification arose after the MEP was certified by the CEC, and the proposed modification is based on information that was not known during the certification proceeding. The proposed modification would provide a back-up water supply during curtailment, thus ensuring the plant's continued operation.









## Environmental Analysis of the Project Modification

Mariposa Energy has reviewed the modification proposed herein to determine if the modification would result in any environmental impacts that were not originally analyzed by the CEC when it approved the project in May 2011. The only disciplines that could potentially be affected by the modification described in this petition are Air Quality, Biological Resources, Cultural Resources, Hazardous Materials Handling, Traffic and Transportation, Visual Resources, and Water Resources.

The proposed modification discussed in this petition would not alter the operational impacts that were used as the basis to license the project during the original proceeding. Therefore, operational impacts are expected to be the same as those analyzed in the Final Decision and are not addressed in this petition.

### 3.1 Air Quality

#### 3.1.1 Temporary Construction Impacts

The construction of the temporary water supply tanks will require a total of 27 workers (5 workers for site preparation, 12 workers to assemble the 1.70 MG tank, and up to 10 workers for the 1.03 MG tank or the 0.68 MG tank) for approximately 8 days (3 days for site preparation and 5 days for tank assembly), 7 pieces of construction equipment (scraper and excavator for site preparation and up to 3 rough terrain forklifts and 2 lifts for assembly), and potentially 60 truck deliveries (54 sand deliveries and 6 material deliveries). The area of disturbance will be approximately 1 acre. Table 1 presents a summary of the construction-related vehicles required for the proposed project. Due to the short duration and nature of the construction work, there is no possibility that the proposed modification will have a significant adverse air quality impact.

For example, the Commission Decision for the MEP analyzed an average of 90 construction workers onsite,<sup>1</sup> 36 daily truck deliveries (one-way),<sup>2</sup> construction that would disturb 20 acres, and up to 25 pieces of construction equipment onsite during construction.<sup>3</sup> The Commission Decision found that there would be no significant impacts from the construction work. The assumptions used as the basis for the air quality analysis in the Commission Decision for the original project greatly exceed the expected number of construction workers, construction equipment, and material deliveries for the proposed project. As such, the construction air quality impacts will be comparable to, or lower than, those analyzed in the Commission Decision, and which were found not to be significant.

TABLE 1

#### Construction Equipment

##### *Mariposa Energy Project Temporary Water Supply Tanks*

Equipment/Vehicle List	Equipment/Vehicle Type	Quantity per Day
Off-Highway Truck	Construction Equipment	2
Rough Terrain Forklift	Construction Equipment	3
Lift	Construction Equipment	1
Offsite Delivery Trucks*	Heavy-duty Diesel	31

<sup>1</sup> Mariposa Energy Project Supplemental Staff Assessment, CEC 700-2010-017 – SUP, page 4.8-5. December 2010.

<sup>2</sup> Mariposa Energy Project Supplemental Staff Assessment, CEC 700-2010-017 – SUP, page 4.10-11. December 2010.

<sup>3</sup> Mariposa Energy Project Supplemental Staff Assessment, CEC 700-2010-017 – SUP, page 4.1-17. Air Quality Table 9. December 2010.

TABLE 1

**Construction Equipment***Mariposa Energy Project Temporary Water Supply Tanks*

Equipment/Vehicle List	Equipment/Vehicle Type	Quantity per Day
Construction Worker Commute	Light-duty Auto/Truck	27

\*Assumes fill material is delivered separately for each tank.

### 3.1.2 Operational Impacts

The operational impacts from the proposed project include truck delivery of water treatment chemicals and the use of either a diesel- or an electric-operated pump. No additional operational workers will be required. The primary water treatment chemical (sodium hypochlorite) is already being used at MEP, and the number of deliveries is not expected to increase.

Mixing of chemicals and circulating water within the storage tanks, and pumping water to MEP will be accomplished with either an electrical pump or a portable diesel pump. An electric pump would require extending a distribution electrical line to the project site and establishing electrical service. Because this system is intended to be temporary, an alternative is to use a 49 BHP portable diesel pump to mix the contents of the tanks and to provide pumping in the event the water is needed for MEP to operate. The portable diesel pump would be rented locally and the pump would be registered through the California Air Resources Board's Portable Equipment Registration Program ("PERP"). Because the pump is only required 2 days per week (up to 8 hours per tank per week), it will be moved to the tank site when needed, and stored at MEP when not in use. The air quality impacts from the operation of the storage tanks are expected to be insignificant. If the diesel pump option is selected, the Applicant will provide a copy of the PERP permit to the CPM consistent with the requirements of COC AQ-SC6.

The operational public health impact analyzed in the Commission Decision conservatively assumed that MEP's four combustion turbines were operated at their maximum fuel consumption rate for 4,300 hours per year, with fuel consumption directly proportional to air emissions. This level of fuel consumption correlates to a 46 percent<sup>4</sup> capacity factor. MEP's actual capacity factors for 2013 was 4.5 percent,<sup>5</sup> and with the air emissions being proportional, the MEP air emissions will be about one-tenth those used by the Commission to assess MEP's operational public health impacts. Therefore, operational public health impacts associated with the use of the temporary PERP-registered diesel water pump operation will be less than those impacts analyzed in the Commission Decision.

### 3.1.3 Mitigation Measures

The already less-than-significant construction air emissions would be further reduced by implementing applicable provisions of the existing Air Quality Construction Mitigation Plan and the Construction Fugitive Dust Plan (COCs AQ-SC2 and AQ-SC3) and COCs AQ-SC4 and AQ-SC5 for construction of the proposed modification.

If the diesel pump option is selected, the Applicant will provide a copy of the PERP permit to the CPM.

<sup>4</sup> Capacity factor is calculated assuming 4,000 hours/year of MEP operation at 200 MWs, not including megawatts generated during start up and shutdown events.

<sup>5</sup> MEP's 2013 net megawatts generated were 77,900 or a capacity factor of 4.5 percent (77,900 MWh/(200 MWs \* 8,760 hours) - [http://www.energyalmanac.ca.gov/electricity/web\\_qfer/Annual\\_Generation.php](http://www.energyalmanac.ca.gov/electricity/web_qfer/Annual_Generation.php)



### 3.1.4 Consistency with LORS

The 2011 Commission Decision approving MEP found the project to be in compliance with all applicable LORS (CEC, 2011). These modifications proposed for MEP are consistent with all applicable LORS, and will not change MEP's compliance with all applicable LORS.

### 3.1.5 Conditions of Certification

Construction and operation of the water storage tanks do not require changes to the COCs, or require additional COCs for air quality.

## 3.2 Biological Resources

Because all construction activities associated with the back-up water supply tanks would occur within graveled surfaces, graveled roads, or other previously disturbed areas, no temporary or permanent construction impacts or ongoing operations impacts are anticipated to sensitive habitats or biological resources. Attachment A contains a technical memorandum that provides information on the habitats in the project area and the results of the project biological survey.

Areas within 250 feet of the proposed tank site were surveyed on November 13, 2014, and environmental conditions were mapped (Figure 4). Mapped features from previous delineations and biological assessments conducted during MEP licensing were verified in the field against current conditions. Previously identified vernal pools, jurisdictional swales, and habitat types were consistent and appeared to be unchanged from historical survey documentation. Because no construction is planned to occur outside of previously disturbed areas, no vernal pools or jurisdictional swales will be disturbed. Impacts to special-status plants would also be unlikely because none were detected during MEP licensing.

The Option 1 configuration provides a minimum 25-foot setback from the vernal pools located on the north end of the tank site. On the south end, the 25-foot buffer overlaps the south end of the vernal pool that runs on the west side of an existing gravel road. Because the vernal pool occurs along the edge of an existing gravel road, site preparation work and tank assembly occurring on the other side of the road will not affect the hydrology of this vernal pool. The hoses used to transfer water to and from the plant site and the temporary tanks will cross the annual grassland (see Figure 2).

The Option 2 configuration provides a minimum 25-foot setback from the vernal pools located on the north end of the tank site. On the south end, the assembly area required for the 1.03 MG tank does not overlap into the vernal pools, nor does it overlap onto the annual grass land. In this configuration, the hoses used to transfer water to and from the plant site and the temporary tanks will also cross on top of the annual grassland (see Figure 2).

Suitable nesting trees occur within the California Department of Fish and Wildlife ("CDFW") recommended 0.5-mile buffer for protection of Swainson's hawk. In addition, burrowing owl nesting habitat occurs within the immediate project vicinity; however, no evidence of burrowing owl occupancy (feathers, pellets, or white wash) were observed during the project biological survey. Suitable upland habitat for San Joaquin kit fox, California red-legged frog, and California tiger salamander occurs within the adjacent lands to the project site. There is an abundance of small mammal burrows that provide refugia for California red-legged frog and aestivation habitat for California tiger salamander. All work and staging would occur in heavily disturbed areas, which lack suitable upland habitat for special-status species. No other special-status species or suitable habitats were noted or observed during the survey effort.

Although construction associated with the back-up water supply tanks would occur within previously disturbed areas, Attachment A contains proposed avoidance and minimization measures for biological resources in the project vicinity.

### 3.2.1 Mitigation Measures

The proposed modification will not create a significant biological resources impact and will not require additional mitigation measures. MEP will continue to comply with existing COC, and will implement avoidance and minimization measures to protect biological resources in the project vicinity. These measures are described in Attachment A. For convenience, they are repeated below.

- The Worker Environmental Awareness Program (BIO-5) would be administered to all project construction personnel.
- Preconstruction surveys would be conducted by a qualified biologist for nesting birds (BIO-8), California red-legged frog and California tiger salamander (BIO-10), western pond turtle (BIO-11), burrowing owl (BIO-12), American badger (BIO-13), San Joaquin kit fox (BIO-14), and Swainson's hawk (BIO-15).
- Applicable general measures (BIO-7) and species-specific measures (BIO-8, -10, -11, -12, -14, and -15) would be enforced.
- Due to the proximity of seasonal swales and vernal pools, the boundaries of the construction zone would be staked and flagged to identify the limits of the construction area. No ground disturbance would be allowed within 25 feet of vernal pools (BIO-17).
- A full-time biological monitor would be onsite prior to, during, and after ground disturbance to monitor compliance with these avoidance and minimization measures.

### 3.2.2 Consistency with LORS

The 2011 Commission Decision approving MEP found the project to be in compliance with all applicable LORS (CEC, 2011). These modifications proposed for MEP are consistent with all applicable LORS, and will not affect MEP's compliance with all applicable LORS.

### 3.2.3 Conditions of Certification

Site preparation and assembly of the water storage tanks do not require changes to the COCs, or require additional COCs for biological resources since all sensitive areas will be avoided. Because this site may be used for temporary water storage for the duration of the project, BIO-18, Revegetation and Restoration, will not apply and the temporary tank site will be left in a similar condition as it was before the temporary tanks were erected.

## 3.3 Cultural Resources

The project is not anticipated to affect historical or cultural resources. An extensive cultural resources pedestrian survey of the MEP project site and transmission line was performed and a survey for potential historic structures was performed as part of the Application for Certification ("AFC") for licensing the MEP facility. No cultural resources were identified during that process that would be adversely affected by construction of MEP. No significant cultural resources were found during the construction of MEP.

Additional review was conducted to determine whether the proposed modification would have any potential cultural resources impact. The archaeological sensitivity of the former Byron Power Cogeneration Plant site is considered low based on the high degree of ground disturbance and lack of known cultural resources from previous investigations. The summary of findings for archaeological resources is provided in Attachment B. Figure B-1 (in Attachment B) depicts the area surveyed for prehistoric, historic, and architectural cultural resources.

Michelle Kaye, Ph.D., RPA, conducted an archaeological survey for the proposed temporary water tank storage site on December 17, 2014. Dr. Kaye meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historical preservation (USNPS, 1983). Using pedestrian transects spaced no more than 5 meters apart, Dr. Kaye surveyed the former Byron

Power Cogeneration Plant, located to the northeast of MEP, a 200-foot buffer surrounding its footprint, and the potential water line routes to the MEP security fence (Figure 5). Dr. Kaye conducted a survey of the ground surface, including an examination of all areas of disturbed soil to inspect the immediate subsurface for cultural materials or any evidence of previous human occupation. She examined soil around rodent holes for any evidence of color or texture change. Dr. Kaye took photographs (see Appendix A of Attachment B) and survey notes, and carried a handheld GPS unit (Garmin™ Oregon 600 GPS) to record location data. Dr. Kaye was unable to survey the former surface impoundment on the northern end of the former Byron Power Cogeneration Plant because the water was several feet deep and dense Russian thistles (*Salsola tragus*) directly surrounded the former impoundment. Weather conditions during the survey were cloudy with light drizzle, with a temperature of 56°F, and winds 5 mph from the west.

Dr. Kaye identified no visual indicators of surface or immediate subsurface cultural resources (i.e., exposed midden soils, lithics, obsidian, shell fragments, etc.) during the pedestrian survey. There are no known historic properties or unique archaeological resources within the proposed water tank project area.

The former Byron Power Cogeneration Plant site measures approximately 330 feet long by 175 feet wide. The majority of the former cogeneration site is fenced; however, the fence was unlocked for the survey. The 200-foot buffer surrounding the project footprint consists of single-lane dirt/gravel roads leading toward and around MEP and non-irrigated grazing land. The proposed water line routes extend from near the southwest side of the former Byron Power Cogeneration Plant approximately 185 feet diagonally southwest across a dirt and gravel road, up a small hill, and into the fenced MEP site.

The ground visibility within the proposed project area and the buffer zone was fair to good in most areas, with 65 percent visibility. Vegetation consists primarily of short non-native annual grasses, gum plant (*Grindelia camporum*), and Russian thistles (*Salsola tragus*). However, a few areas contain large pools of water and/or dense vegetation, which hindered or prevented visibility. The area of the proposed water tank site consists of disturbed sediment, including medium- to fine-grained sandy loam to clay mixed with base and aggregate rock, and shale. The surrounding buffer zone includes disturbed sediment, artificial fill, and agricultural soils. The area surrounding the former Byron Power Cogeneration Plant is currently cattle grazing land intermixed with seasonal wetlands and vernal pools. However, there are remnants of the land's former use as a wind farm and cogeneration plant seen in concrete platforms, concrete electrical box foundations, downed power poles, rebar, wood piles, PVC conduit, wire bundles, and other debris.

Based on the anticipated extent of the work associated with the water tank project, the local topography, the distance from major fresh water sources, the scope of previous disturbance, the lack of archaeological sensitivities of the surface soils, and the evidence collected during the literature review and pedestrian survey, the probability for encountering unexpected subsurface cultural resources is low. Artificial fill, agricultural soils, and disturbed sediment, which extend to a depth of approximately 3 feet, represent a low potential for intact cultural deposits. A low to moderate archaeological sensitivity exists for undifferentiated alluvium soil below this zone.

### 3.3.1 Mitigation Measures

The proposed modification will not create a significant cultural resources impact and will not require additional mitigation measures. The existing COCs CUL-1, 2, and 4 through 8 mitigate any potentially adverse impacts, including the unanticipated discovery of buried resources during construction. Ground disturbance will be minimal—primarily grading the former cogeneration plant site—and affect mostly disturbed soils. The project will comply with applicable LORS and would not require any changes to the COCs.

### 3.3.2 Consistency with LORS

The 2011 Commission Decision approving MEP found the project to be in compliance with all applicable LORS (CEC, 2011). The proposed modification is consistent with all applicable LORS, and will not affect MEP's compliance with all applicable LORS.



### 3.3.3 Conditions of Certification

Site preparation and assembly of the water storage tanks do not require changes to the COCs, or require additional COCs for cultural resources.

## 3.4 Hazardous Materials

The modifications for the proposed water storage tanks are not anticipated to affect human health and the environment due to the storage, use, or discovery of hazardous materials. Any hazardous materials that may be used or stored in conjunction with the MEP facility are addressed as part of the AFC for licensing (Mariposa Energy, LLC, 2009, and CEC, 2011). Any chemicals that may be used for water treatment are also addressed as part of the AFC (Mariposa Energy, 2009, and CEC, 2011).

The proposed water tank site is on land that was previously part of the Byron Power Cogeneration Plant, which was in operation from 1995 through its closure in 2008. The majority of the former power plant site is fenced. The 200-foot buffer surrounding the project footprint consists of single-lane dirt/gravel roads leading toward and around MEP and non-irrigated grazing land. The proposed water line routes extend from near the southwest side of the former power plant approximately 185 feet diagonally southwest across a dirt and gravel road, up a small hill, and into the fenced MEP site.

The proposed water storage tank area consists of disturbed sediment, including medium- to fine-grained sandy loam to clay mixed with base and aggregate rock, and shale. The surrounding buffer zone includes disturbed sediment, artificial fill, and agricultural soils. The area surrounding the former Byron Power Cogeneration Plant is currently cattle grazing land intermixed with seasonal wetlands and vernal pools. Artificial fill, agricultural soils, and disturbed sediment extend to a depth of approximately 3 feet.

The former Byron Power Cogeneration Plant was decommissioned and demolished after 2008, creating the disturbed sediment and necessitating the fill materials. In August 2012, during removal of a storage tank from the lined pond area, a surface spill of petroleum hydrocarbons occurred (SWRCB, 2015). Petroleum hydrocarbons were also detected in soil samples collected in operational areas of the facility. It was determined that these compounds were released from piping to utility trenches containing the piping and to the soils beneath the piping, the building pad, and the evaporator pads (SWRCB, 2015). Additionally, it was reported that cooling water with anti-scaling agents discharged from a lined pond to areas east and north of the pond (SWRCB, 2015).

After these issues were discovered and reported, the Byron Power Cogeneration Plant site was placed under regulatory oversight of Alameda County Department of Environmental Health (“ACDEH”) for investigation and cleanup of volatile organic compounds and petroleum hydrocarbons (ACDEH, 2015). Site investigation activities took place in several areas of the site including the power plant building, evaporator pads, lined pond, and discharge areas for the lined pond. Following demolition of the power plant, remedial excavation with offsite disposal was conducted beneath the foundation of the power plant building. Remedial excavations and offsite disposal were also conducted in the areas of the evaporator pads after their demolition and along the utility trenches and piping following the removal of the piping and utility trenches (ACDEH, 2015). Interim actions cleaned up the spilled petroleum hydrocarbons from the lined pond, and the lined pond and its contents were ultimately removed during excavation of the impacted soils (SWRCB, 2015). Four monitoring wells were installed and approximately 390 cubic yards of contaminated soil was removed and disposed offsite (SWRCB, 2015). The case was closed on May 20, 2014, the monitoring wells were decommissioned, and no further investigation or cleanup of the site was deemed necessary (SWRCB, 2015). ACEH also reported that site investigation and cleanup activities were completed in February 2014 and the site no longer presents a risk to human health or the environment (ACDEH, 2015).

### 3.4.1 Mitigation Measures

The temporary water storage tanks will not create a significant hazardous materials impact and will not require additional mitigation measures. The proposed water storage tanks are not anticipated to affect

human health and the environment due to the storage, use, or discovery of hazardous materials. The contamination issues associated with the former Byron Power Cogeneration Plant have been addressed and certified complete (ACDEH, 2015, and SWRCB, 2015). Any chemicals that may be used for water treatment are addressed as part of the AFC (Mariposa Energy, 2009, and CEC, 2011). Compliance with COCs HAZ-6 and HAZ-7 will ensure that site security is maintained. The storage tank site will be fenced using temporary construction fencing when the tanks are in use.

### **3.4.2 Consistency with LORS**

The 2011 Commission Decision approving MEP found the project to be in compliance with all applicable LORS (CEC, 2011). The proposed modification is consistent with all applicable LORS, and will not affect MEP's compliance with all applicable LORS.

### **3.4.3 Conditions of Certification**

Site preparation, assembly, and operation of the water storage tanks for MEP do not require changes to the existing COCs HAZ-1 through HAZ-8, or require additional COCs for addressing hazardous materials.

## **3.5 Visual Resources**

Installation of the temporary water storage tanks would not result in any substantial, adverse effects to the existing level of visual quality in views toward the project location. This assessment applies to both options described in Section 2.1. The additional tanks would temporarily expand the horizontal space within which an industrial-appearing assemblage of structures, tanks, and stacks is visible from nearby publicly accessible roads (namely Kelso Road and Bruns Road), but would not alter the visual character of the area. With heights of 12 feet, the temporary tanks would appear substantially shorter than the most prominent MEP features, including the stacks (85 feet in height) and nearby tanks (approximately 40 to 45 feet in height).

The temporary tanks would appear to be relatively close to the MEP water tanks, which are located in the northern portion of the MEP site, and to which the temporary tanks would most directly relate in terms of form and character. The dark green color of the temporary tanks would not constitute substantial contrast with the MEP color scheme, or with the hues of the surrounding landscape. Further, the low profile of the temporary tanks would prevent them from dominating views, and will prevent their encroachment on the skyline formed by nearby hills. As noted in the MEP AFC, the project area exists within a topographical bowl, with hills obstructing or limiting the duration of most views toward the project site. This effect limits the visibility of MEP and will, to a certain extent, limit visibility of the temporary tanks.

### **3.5.1 Mitigation Measures**

Due to the size, location, and temporary nature, the proposed modifications will not create a significant visual resources impact and will not require additional mitigation measures. Compliance with COC VIS-3 will ensure that potential night lighting impacts from construction are minimized.

### **3.5.2 Consistency with LORS**

The 2011 Commission Decision approving MEP found the project to be in compliance with all applicable LORS (CEC, 2011). The proposed modification is consistent with all applicable LORS, and will not affect MEP's compliance with all applicable LORS.

### **3.5.3 Conditions of Certification**

Site preparation and assembly of the water storage tanks do not require changes to the COCs, or require additional COCs for visual resources.

## 3.6 Water Resources

The proposed modification would not result in impacts to water supply, because the water delivered to the water storage tanks is from the same BBID source and would be subject to the same water use terms and conditions as the approved MEP project (e.g., no more than 187 acre-feet per year). Other than the diversion of some of the MEP water supply to the storage tanks, no other changes in water use would occur. Likewise, the wastewater treated by MEP would continue to be in accordance with the terms and conditions of the approved project; there would be no change as a result of treating water to be used in the storage tanks, and MEP would continue to operate as zero-liquid-discharge facility.

The temporary water storage tank site is outside of the 67.5-acre drainage study area of the approved MEP project. As described in Attachment A, the surface of the tank site appears to be hydrologically isolated from the surrounding area. Because the tank site is small, appears to be hydrologically isolated, and will remain mostly permeable under the proposed modification, noticeable changes in runoff and downstream effects to local drainage patterns are unlikely. In addition, rainfall would be captured in the open-top storage tanks with floating covers, further minimizing the potential for changes in runoff.

### 3.6.1 Mitigation Measures

Construction and operation of the water storage tank will occur consistent with the MEP COCs, including implementation of a Drainage, Erosion, and Sediment Control Plan required by Soil&Water-2, and with other applicable LORS, as described for the approved MEP. The modifications would not result in new significant impacts, and therefore no changes to the COCs or additional mitigation is required.

### 3.6.2 Consistency with LORS

The 2011 Commission Decision approving MEP found the project to be in compliance with all applicable LORS (CEC, 2011). The proposed modification is consistent with all applicable LORS, and will not affect MEP's compliance with all applicable LORS.

### 3.6.3 Conditions of Certification

Site preparation and assembly of the water storage tanks do not require changes to the COCs, or require additional COCs for water resources.







SECTION 4

## Proposed Modifications to the Conditions of Certification

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Consistent with the requirements of the CEC Siting Regulations Section 1769 (a)(1)(A), this section addresses any proposed modifications to the project's COCs. No changes to the COCs for the MEP are required for the proposed modification.



## SECTION 5

# Potential Effects on the Public and Property Owners

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The CEC Siting Regulations Section 1769(a)(1)(I), requires the project owner address any potential effects the proposed project modification may have on nearby property owners, the public, and parties to the proceeding.

The proposed modification would have minimal and temporary impacts on nearby property owners, and would not result in any adverse effects to nearby property owners, the public, and parties to the proceeding. The assembly and use of the tanks would only be temporary since they are intended for use during drought periods. The tanks are not generally visible to the public and are much less visible than the former Byron Power Cogeneration Plant. Public health impacts associated with the use of the temporary PERP-registered diesel water pump operation will be less than those impacts analyzed in the Commission Decision's assessment of construction impacts, and would not result in any significant effects. Therefore, the proposed modification would have no significant effect on the public and parties to the proceeding.

SECTION 6

## List of Property Owners

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Consistent with the CEC Siting Regulations Section 1769(a)(1)(H), a list of property owners adjacent or near the proposed project will be provided under separate cover.

## SECTION 7

# References

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Alameda County Department of Environmental Health (ACDEH). 2015. Byron Power Company Case File at <http://ehgis.acgov.org/dehpublic/dehpublic.jsp>. Accessed January 2015.

California Energy Commission (CEC). 2011. Commission Decision for the Mariposa Energy Project (09-AFC-3). May. CEC 800-2011-001-CMF

Mariposa Energy, LLC (Mariposa Energy). 2009. Application for Certification (09-AFC-3). June 15.

State Water Resources Control Board (SWRCB). 2015. GeoTracker Database for Byron Power Company Cleanup Status at [http://geotracker.waterboards.ca.gov/profile\\_report.asp?global\\_id=T10000003401](http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000003401). Accessed January 2015.

US National Park Service (USNPS). 1983. *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines*. Washington, DC.

**Attachment A**  
**Biological Resources Technical Memorandum**

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## Habitat Assessment at the Former Byron Cogen Power Plant for the Mariposa Energy Project (09-AFC-03)

PREPARED FOR: Mariposa Energy, LLC  
PREPARED BY: Todd Ellwood/CH2M HILL (Designated Biologist)  
COPIES: John Carrier/CH2M HILL  
DATE: November 24, 2014

### Introduction

This technical memorandum summarizes the results of a field survey conducted to assess the potential for special-status species to occur at the former Bryon Cogeneration Power Plant (Cogen) site. Because state- and federally listed species [San Joaquin kit fox (*Vulpes macrotis mutica*), California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), Swainson's hawk (*Buteo swainsonii*), western burrowing owl (*Athene cunicularia*), and listed branchiopods] are known to occur in the general area, the survey focus was on the likelihood that listed species may be adversely affected during any future reuse of the Cogen site. Current site conditions would also affect which species-specific protection measures from the Mariposa Energy Project's (MEP) Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) would be applicable to any potential future use of the site.

Mariposa Energy, LLC (Mariposa Energy) is proposing to assemble and use temporary back-up water supply storage tanks adjacent to MEP. The tanks would be sited on the disturbed portion of the approximately 2-acre Cogen site, connected to MEP by above-ground piping and electrical facilities. This technical memorandum was prepared to support Mariposa Energy's petition to amend the operating license for the MEP to allow for the storage tanks and interconnection.

### Environmental Setting

The Cogen site is located in northeastern Alameda County, California 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. The Cogen site is immediately northeast of MEP on what is known as the Lee Property, a 158-acre privately-owned parcel comprised of grazed non-native annual grassland interspersed with a cattle stock pond, seasonal swales, and wetlands. The Lee Property formerly supported the 6.5 megawatt cogeneration power plant. Cogen operations ceased in late 2008, and in 2013 decommissioning of the power plant was performed.

Appendix 1 includes the following figures:

- Figure A-1. Project Overview
- Figure A-2. Habitat Types within the Survey Area

Appendix 2 includes representative photographs of the survey area.

## Survey Methodology

On November 13, 2014, MEP Designated Biologist (DB) Todd Ellwood conducted a pedestrian survey for special-status species including San Joaquin kit fox (*Vulpes macrotis mutica*), California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), western burrowing owl (*Athene cunicularia*), and listed branchiopods, achieving 100 percent visual coverage of the disturbed portion of the Cogen site including areas within a 250-foot buffer surrounding the site. The DB also assessed the hydrologic connectivity of the Cogen site with adjoining lands. A Trimble GeoXT global positioning system (GPS) unit was used to map sensitive areas, if any, and a digital camera to collect representative views of the survey area (Appendix 2).

## Survey Results

The Cogen site is occupied by remnants of the former power plant, including electrical transformers, sheds, pumps, a vehicle, and other trash and debris. Due to these items remaining onsite, decommissioning may still be ongoing by the landowner. The previously developed site is surrounded by a 6-foot-tall chain-link fence, is armored with a thick layer of aggregate base rock, and in the northeast corner of the site is a small earthen basin that is mostly denude of vegetation except for some patches of weedy vegetation such as thistle (*Salsola* sp.). A review of historic satellite imagery and site closure records shows that the basin was present as part of the Cogen and was used as a surface impoundment for equipment and material storage.

The surface of Cogen site appears to be hydrologically isolated from offsite habitats. Decommissioning activities and prior site operations have created an inward grade over most of the site and dirt berms along the perimeter fence (Appendix 2). Weather conditions during the field survey were scattered showers and some offsite vernal pools within the survey area were inundated with rainwater. However, no inundation was observed within the Cogen site at the time of the survey, which suggests that the soils onsite are well drained.

No special-status animal species were observed within the survey area. Small mammal burrows that would provide nesting, refugia, or aestivation habitat for special-status species are abundant in the adjacent grassland but were lacking at the disturbed portion of the Cogen site. The chain-link fence surrounding the former plant site hinders movement into the site by larger mammals. Any ongoing final decommissioning activities would further degrade the site's ability to support special-status species.

Consistent with biological surveys conducted in support MEP licensing, the surrounding grassland supports suitable habitat for San Joaquin kit fox, California red-legged frog, California tiger salamander, western burrowing owl, and listed branchiopods. Figure A-2



(Appendix 2) shows the habitat types within the survey area. Small mammal burrows are abundant and the seasonal swales and vernal pools in the grassland are known to be occupied by federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*). Potential Swainson's hawk nest sites are within 0.5-mile radius of the site.

## Conclusion/Recommendations

The previously developed portion of the 2-acre Cogen site lacks suitable habitat for special-status species and is isolated hydrologically from the adjacent lands. In addition, decommissioning activities are likely ongoing, which would further degrade the site. Therefore, due to the level of disturbance onsite and because Mariposa Energy would implement applicable avoidance and minimization measures (AMM) from the BRMIMP, project-related effects on San Joaquin kit fox, California red-legged frog, California tiger salamander, and listed branchiopods are not anticipated. The following are the applicable AMMs from the BRMIMP.

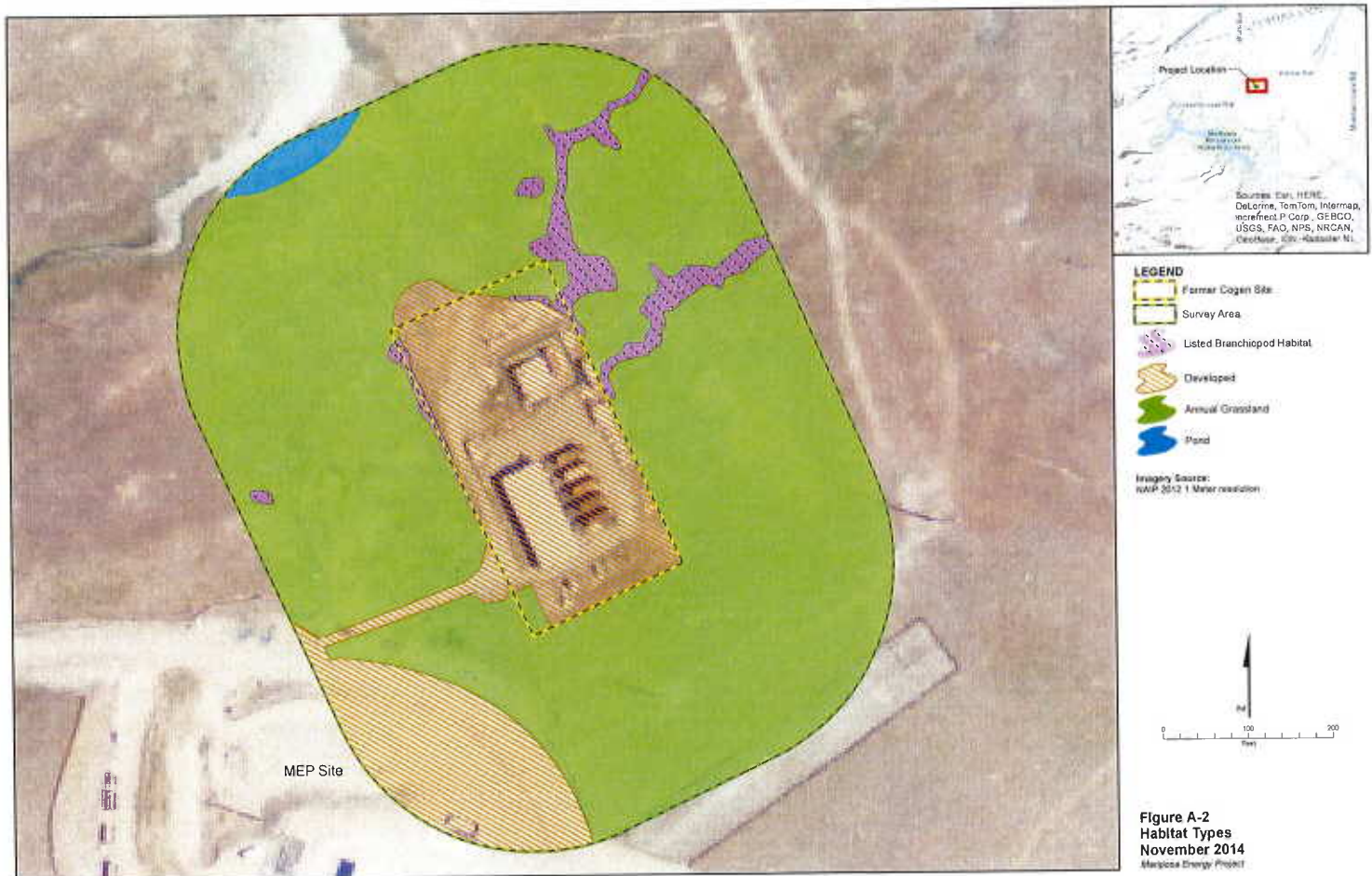
- The Worker Environmental Awareness Program (BIO-5) would be administered to all project construction personnel.
- Preconstruction surveys would be conducted by a qualified biologist for nesting birds (BIO-8), California red-legged frog and California tiger salamander (BIO-10), western pond turtle (BIO-11), burrowing owl (BIO-12), American badger (BIO-13), San Joaquin kit fox (BIO-14), and Swainson's hawk (BIO-15).
- Applicable general measures (BIO-7) and species-specific measures (BIO-8, -10, -11, -12, -14, and -15) would be enforced.
- Due to the proximity of seasonal swales and vernal pools, the boundaries of the construction zone would be staked and flagged to identify the limits of the construction area. No ground disturbance would be allowed within 25 feet of vernal pools.
- A full-time biological monitor would be onsite during ground disturbance and tank assembly to monitor compliance with the AMMs.

## **Appendix 1**

### **Map Figures**

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**Attachment B**  
**Cultural Resources Technical Memorandum**

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## Cultural Resources Assessment for the Mariposa Energy Project Backup Water Supply Tanks

PREPARED FOR: Mariposa Energy, LLC

PREPARED BY: Michelle Kaye/CH2M HILL  
Clint Helton/CH2M HILL

DATE: January 8, 2015

### Introduction

As requested by Mariposa Energy, LLC (Mariposa Energy), CH2M HILL conducted an environmental review to specifically address potential impacts to cultural resources for the Mariposa Energy Project (MEP). A field survey by CH2M HILL archaeologist Michelle Kaye, RPA for the proposed Mariposa Energy Plant water tank on December 17, 2014. The archaeological sensitivity of the water supply tanksite is considered low based on the high degree of ground disturbance and lack of known cultural resources from previous investigations. The summary of findings for archaeological and architectural resources is presented below. Attached Figure B-1 depicts the area surveyed for prehistoric, historic, and architectural cultural resources.

### Affected Environment

#### Regional Setting

The proposed MEP project is located within the boundaries of the existing site known as the Lee Property, located in the northeast corner of Alameda County, California.

The MEP project area lies within the historic Tulares or "Great Tule Swamp." This formerly marshy region provided a favorable environment for human occupation during the prehistoric period (Cook and Elsasser, 1956:31). Local Indian inhabitants had easy access to the San Francisco Bay to the west, the confluence of the Sacramento and San Joaquin rivers, the freshwater Old and Middle rivers, and various sloughs offering resources for subsistence and manufacture as well as providing travel vectors to the interior and bay.

Cook and Elsasser (1956), Heizer (1954), Bennyhoff (1977), and Cook and Heizer (1962) summarized aspects of Delta area prehistory (for areas to the north of the MEP project). Low mounds or sand islands throughout the tule marshes would have been excellent temporary occupation or village sites and suitable cemetery areas as well (Desgrandchamp and Chavez, 1984:14-17). Frequent and random accidental exposure of prehistoric Native American artifacts, sites, and skeletal remains in the Delta during levee building, land leveling, or ditching operations-coupled with the known historic era Native American population density-suggest that many unrecorded sites may be present in the region (Cook



and Elsasser, 1956:32; Desgrandchamp and Chavez, 1984:16; Bickel, 1978a, b; and Moratto et al., 1988, 1990).

Watercourses in the immediate project area, such as Old River, Mountain House Creek, and the former wetlands and marshes that once characterized the vicinity prior to Euroamerican settlement, were locations that favored prehistoric occupation in what now appears to be a large flat expanse of grasslands just east of the foothills behind the Delta Mendota Canal. From such spots, Native Americans could have exploited one or more ecological niches on the alluvial plain and nearby foothills or the rich ecological niches associated with the rivers, streams, and sloughs of the Delta. Archaeologists believe that the population of the prehistoric San Francisco Bay Area slowly increased from the Early to the Late Horizon time periods (see Table B-1). The population increase is thought to reflect more efficient resource procurement, increased ability to store food at village locations, and the development of increasing political complexity.

TABLE B-1  
Hypothesized Characteristics of Cultural Periods in California

1800 A.D. Upper Emergent Period Phase 2, Late Horizon	Clam disk bead money economy appears. More and more goods moving farther and farther. Growth of local specializations relative to production and exchange.  Interpenetration of south and central exchange systems.
1500 AD. Lower Emergent Period Phase 1, Late Horizon	Bow and arrow introduced replace atlatl and dart; south coast maritime adaptation flowers. Territorial boundaries well established. Evidence of distinctions in social status linked to wealth increasingly common. Regularized exchanges between groups continue with more material put into the network of exchanges.
1000 AD. Upper Archaic Period Middle Horizon Intermediate Cultures	Growth of sociopolitical complexity; development of status distinctions based on wealth. Shell beads gain importance, possibly indicators of both exchange and status. Emergence of group-oriented religious organizations; possible origins of Kuksu religious system at end of period. Greater complexity of exchange systems; evidence of regular, sustained exchanges between groups; territorial boundaries not firmly established.
500 B.C. Middle Archaic Period Middle Horizon Intermediate Cultures	Climate more benign during this interval. Mortars and pestles and inferred acorn economy introduced. Hunting important. Diversification of economy; sedentism begins to develop, accompanied by population growth and expansion. Technological and environmental factors provide dominant themes. Changes in exchange or in social relations appear to have little impact.
3000 B.C. Lower Archaic Period Early Horizon Early San Francisco Bay Early Milling Stone Cultures	Ancient lakes dry up as a result of climatic changes; milling stones found in abundance; plant food emphasis, little hunting. Most artifacts manufactured of local materials; exchange similar to previous period. Little emphasis on wealth. Social unit remains the extended family.
6000 B.C. Upper Paleo-Indian Period San Dieguito Western Clovis 8000 B.C.	First demonstrated entry and spread of humans into California; lakeside sites with a probable but not clearly demonstrated hunting emphasis. No evidence for a developed milling technology, although cultures with such technology may exist in state at this time depth. Exchange probably ad hoc on one-to-one basis. Social unit (the extended family) not heavily dependent on exchange; resources acquired by changing habitat.



## Prehistoric Period

Prior to about 5,000 to 7,000 years ago, Native American occupation of the San Francisco Bay Area was intermittent and sparse. Evidence for early occupation along the bayshores was hidden by rising sea levels from about 15,000 to 7,000 years ago, or was buried under sediments caused by bay marshland infilling along estuary margins from about 7,000 years onward (c.f. Moratto, 1984). Early occupants concentrated on hunting and gathering various plant foods and collecting shellfish.

A three-part cultural chronological sequence, the Central California Taxonomic System (CCTS) was developed by archaeologists to explain local and regional cultural change in prehistoric central California from about 4000 years ago to the time of European contact (c.f., Lillard, Heizer, and Fenenga, 1939; and Beardsley, 1948, 1954).

In 1969, several researchers met at U.C. Davis and worked out substantive taxonomic problems that had developed with the CCTS. Table 1 summarizes David Fredrickson's (1994) cultural periods model and provides CCTS classification nomenclature (such as "Early Horizon" etc.).

Moratto (1984) suggests the Early Horizon dated to ca. 4,500 to 3,500/3,000 years ago with the Middle Horizon dating to ca. 3,500 to 1,500 years ago and the Late Horizon dating to ca. 1,500 to 250 years ago. The Early Horizon is the most poorly known of the period with relatively few sites known or investigated. Early Horizon traits include hunting, fishing, use of milling stones to process plant foods, use of a throwing board and spear ("atlatl"), relative absence of culturally affected soils (midden) at occupation sites, and elaborate burials with numerous grave offerings.

Middle Horizon sites are more common and usually have deep stratified deposits that contain large quantities of ash, charcoal, fire-altered rocks, and fish, bird, and mammal bones. Significant numbers of mortars and pestles signal a shift to plant foods from reliance on hunted animal foods. Middle Horizon peoples generally buried their dead in a fetal position and only small numbers of graves contain artifacts (and these are most often utilitarian). Increased violence is suggested by the number of burials with projectile points embedded in the bones or with other marks of violence.

The Late Horizon emerged from the Middle Horizon with continued use of many early traits and the introduction of several new traits. Late Horizon sites are the most common and are noted for their greasy soils (midden) mixed with bone and fire-altered rocks. The use of the bow-and-arrow, fetal-position burials, deliberately damaged ("killed") grave offerings, and occasional cremation of the dead are the best known traits of this horizon.

Acorn and seed gathering dominated the subsistence pattern with short and long-distance trade carried out to secure various raw materials. Compared to earlier peoples, Late Horizon groups were short in stature with finer bone structure; evidence perhaps of the replacement of original Hokan-speaking settlers by Penutian-speaking groups by ca. 1,500 years ago.

Another scheme proposed by Chartkoff and Chartkoff (1984) is also used by archaeologists; its features are summarized in Table B-2.

**TABLE B-2****The Chartkoff and Chartkoff (1984) Model of Cultural Periods in California****Pre-Archaic Period -11,500-9,000 B.C.**

Pre-Archaic populations were small and their subsistence included big game hunting of now extinct mammoth and mastodon. Research indicates that the Pre-Archaic economies were based on a wide-ranging hunting and gathering strategy, dependent to a large extent on local lake-marsh or lacustrine habitats.

**Early to Middle Archaic Period—9,000-4,000 B.C.**

During the Early and Middle Archaic periods, prehistoric cultures began to put less emphasis on large-game hunting. Subsistence economies probably diversified somewhat, and Archaic era people may have started using such ecological zones as the coast littoral more intensively than before. Advances in technology (milling stones) indicate that new food processing methods became important, enabling more efficient use of certain plant foods, including grains and plants with hard seeds.

**Late Archaic Period—4,000-2,000 B.C.**

An important technological advance was the discovery of a tannin-removal process for the abundant and nutritious acorns. Prehistoric trade networks developed and diversified, bringing raw materials and finished goods from one region to another. Resource exploitation, as during the Early and Middle Archaic, was generally seasonal. Bands moved between established locations within a clearly defined/defended territory, scheduling resource harvests according to their availability. Clustering of food resources along the shores of large lakes or the banks of major fish-producing rivers allowed for larger seasonal population aggregates. Dispersed resources, such as large and small game, during the winter prompted small family groups to disperse across the landscape for more efficient food harvesting. The spear thrower (atlatl) may have been introduced or increased in importance, accounting for a change in projectile point styles from the Western Stemmed to the Pinto and Humboldt series. Seed grinding increased in importance.

**Early and Middle Pacific Periods—2,000 B.C.-AD. 500**

The Pacific Period is marked by the advent of acorn meal as the most important staple food. Increasing population densities made it desirable and necessary for Indian populations to produce more food from available land and to seek more dependable food supplies. The increasing use of seed grinding and acorn leaching allowed for the exploitation of more dependable food resources; increased use of previously neglected ecological zones (the middle and high Sierran elevations) may also have been part of this trend.

**Late Pacific Period—AD. 500-1400**

Around A. D. 500 – 600, a cultural watershed was triggered by the introduction of the bow and arrow, which replaced the spear thrower and dart as the hunting weapon of choice. The most useful time markers for this period tend to be small projectile points/arrow tips. Another trend is the marked shift from portable manos/metates to bedrock mortars/pestles (Moratto, 1984). Moratto, et al. (1978) demonstrated that this was a time of cultural stress, during which trading activity abated, warfare was common, and populations shifted away from the Sierra Nevada foothills to higher mountain elevations. They explain these changes in terms of rapid climatic fluctuations, including a drier climate and a corresponding shift of vegetation zones.

**Final Pacific Period—AD. 1400-1789**

Populations became increasingly sedentary and depended more on staple foods, even as the diversity of foods exploited increased. Permanent settlements with high populations were more common. Every available ecological niche was exploited, at least on a seasonal basis. Other trends included the resurgence of long distance trade networks and the development of more complex social and political systems.

## Ethnographic Setting

The MEP is located within the territory associated with the ethnographic and historic boundaries of the *Julpun* tribelet of the Bay Miwok and the *Jalalon*, *Nochochomne*, and *Asirin* tribelets of the Northern Valley Yokuts (Figure 4). Maps of ethnographic and historic tribal



boundaries are provided by Bennyhoff (1977: Map 2), Kroeber (1925), Schenck (1926:137), Levy (1978a and b), and Wallace (1978b). For the most part, the MEP project area appears to have been within Northern Valley Yokuts territory; a group that entered the San Joaquin drainage to displace Costanoans and/or Miwok groups (Wallace, 1978b:463).

Each Bay Miwok tribelet occupied a specific territory, using several more or less permanently inhabited settlements and a larger number of seasonal campsites at various times during their annual subsistence round (Levy, 1978a:398). The Northern Valley Yokuts relied on fishing and fowling and the harvesting of wild plant foods including tule roots (Wallace, 1978b:464). In historic times, the Yokuts trekked to Monterey Bay in Costanoan territory (Pilling, 1950, after Wallace, 1978b:465) and also traded with the Miwok and Costanoan (Davis, 1961:33, after Barrett and Gifford, 1933:270; and Pilling, 1950:438).

Most of the main settlements occupied the top of low mounds, on or near the banks of large watercourses (Wallace, 1978b:466; Schenck, 1926:132; Schenck and Dawson, 1929:308; Cook, 1960:242,259,285). The village of Pescadero, located on the southwest side of Union Islands ("a mile or two northeast of Bethany"), is the closest known village in the project area (Wallace, 1978b:469).

The aboriginal lifeway apparently disappeared by the early 1800s due to its disruption by new diseases, a declining birth rate, the impact of the mission system, depredation by prospectors on their way to the gold country, and later displacement by Euroamerican farming. As with other Native California groups, the Bay Miwok and Yokuts were transformed from hunters and gatherers into agricultural laborers who lived at the missions and worked with former neighboring groups such as the Costanoan and Esselen (Levy, 1978b:460). Thus, multi-ethnic Indian communities grew up in and around former Yokuts and Bay Miwok territory. The Native Americans that resided in these communities provided much of the ethnological data, along with the detailed accounts by contact explorers, which form the basis of the descriptions of the ethnographic inhabitants of the San Francisco Bay area and central California (Garaventa, et al., 1991:14). A more thorough review of the Native American groups in the project area can be found in Kroeber (1925), Latta (1977), Levy (1978a), Wallace (1978a, b), Silverstein (1978), Theodoratus et al. (1980), and Moratto et al. (1988,1990).

## Historic Setting

In 1542, Juan Rodriguez Cabrillo explored the California coast by ship. Much of the early exploration of California was conducted this way and the interior of California, including the San Joaquin Valley, remained unexplored by Europeans until the beginning of the Spanish Period.

The Spanish period spans the years from 1769 to 1822 in California beginning with the founding of the first mission, the Mission San Diego de Alcalá in 1769. It was not until March of 1772 that the first formal European expedition, led by Pedro Fages, entered the northern San Joaquin Valley. Fages went in search of the first Europeans to actually enter the San Joaquin Valley, Spanish deserters. The other purpose of the Fages expedition was to find an overland route to Point Reyes and the company kept to the shoreline until they reached the mouth of the San Joaquin River and first observed the valley (Smith 2004). Shortly after the Fages expedition returned to Monterey, Father Francisco Garcés entered

the San Joaquin Valley and made the first scientific observations of the valley, which included native villages, wide rivers, large tule swamps, and huge herds of tule elk.

In 1821, Mexico gained independence from Spain and in 1848 the United States formally obtained California in the Treaty of Guadalupe Hidalgo (Cleland 1941). The period from 1821-1848 is referred to as the Mexican Rancho Period. It was during this period that large tracts of land termed *ranchos* were granted by the various Mexican Governors of *Alta* California, usually to individuals who had worked in the service of the Mexican government.

In 1833, 11 years after gaining independence from Spain, the Mexican government's Secularization Act changed missions into civil parishes, and those natives who had inhabited regions adjacent to a Spanish Period mission were to obtain half of all mission possessions, including land. However, in most instances, this did not occur, and the Secularization Act resulted in the transfer of large mission tracts to politically prominent individuals.

The closest *ranch* to the project area is the *Rancho de los Franceses* situated on and around present day Stockton. *Rancho de los Franceses* was granted by Governor Micheltorena to William Gulnac, a native of New York on June 13, 1844. The *ranch* was comprised of eleven square leagues, or 48,747.03 acres. In 1845, shortly before the homestead deadline and after constructing several houses, corrals, planting a peach orchard, and raising several hundred cattle on the land, Gulnac sold the *ranch* to Captain Charles M. Weber for a \$60 grocery bill Gulnac owed the Weber Grocery Store in San Jose (Smith 2004: 153-154).

Following the end of hostilities between Mexico and the United States in January of 1847, the United States officially obtained California from Mexico through the Treaty of Guadalupe Hidalgo on February 2, 1848 (Cleland 1941). Thus, the American Period begins in 1848. In 1850, California was accepted into the Union of the United States primarily due to the population increase created by the Gold Rush of 1849.

In April of 1848, gold was first discovered in the San Joaquin Valley at Captain Sutter's now famous saw mill near present day Sacramento. Gold was never found in great quantities in the San Joaquin Valley, although mining in the adjacent foothills was prolific. The southern mines stretched from the Mokelumne River to the Kern River and Stockton became the main supply city for miners headed to these southern mines (Smith 2004: 179).

The cattle industry in California reached its greatest prosperity during the first years of the American Period. Mexican Period land grants had created large, pastoral estates in California, and a high demand for beef during the Gold Rush led to a cattle boom that lasted from 1849 to 1855. In 1855, however, the demand for California beef began to decline as a result of sheep imports from New Mexico, cattle imports from the Mississippi and Missouri valleys, and the development of stock breeding farms. When the beef market collapsed, the California ranchers were unprepared. Many had borrowed heavily during the boom, mortgaging their land at interest rates as high as 10 percent per month. The collapse of the cattle market meant that many of these ranches were lost through foreclosure, while others were sold to pay debts and taxes (Cleland 1941: 108-114).

Although no land grants were given to the Central Pacific in the San Joaquin Valley, the company financed itself and construction of the first railroad in San Joaquin Valley began in



1870 at a new railroad town named Lathrop. By the close of 1870, this line reached the Stanislaus River. The Central Pacific connected to the main Southern Pacific line at Goshen, approximately 150 miles south of Lathrop. Subsequently, other rail lines were constructed in the San Joaquin Valley and served as feeders to this main line. In 1903, the Western Pacific Railway incorporated and between 1905 and 1909, the company constructed a railroad that ran from Oakland through the San Joaquin Valley and into the Sierra Nevada Mountains (Smith 2004).

During the American period, in addition to cattle and sheep ranches, a growing number of farms appeared. A rural community cultural pattern existed in the study area from approximately 1870 to 1930. This pattern consisted of communities made up of population aggregates that lived within well-defined geographic boundaries, shared common bonds, and cooperated to solve shared problems. They lived on farmsteads, tied together by a common school district, church, post office, and country store. These farmsteads and dispersed farming communities gave way to horse ranches, dairies, and nurseries, which in turn were replaced by the establishment of the roadside service complex. The roadside service industry thrived in the highly mobile, mechanized pre- and post-war society, which was linked by state and federal roadways.

The project is located south of the Central Valley community of Byron, California and roughly 10 miles east of Tracy, California. Byron is a small community that was once a shipping center for apricot orchards (WPA 1939) and the location of Byron Hot Springs, a small resort that touted the beneficial waters of thermal pools located at the property. The warm salt water springs had been popular since the mid-nineteenth century, with informal camps set up in the area, but the property wasn't developed until the 1870s, when the Risdon/Mead family began constructing permanent buildings. Byron Hot Springs operated as a resort until it was selected by the United States Army as a temporary internment camp for Japanese and German prisoners of war. The camp closed in 1945 and a year later, the property was sold to a Greek Orthodox diocese from New York State (<http://www.byronhotsprings.com>, accessed March 19, 2009).

The city of Tracy, California was founded in 1878, when the Central Pacific Railroad located a station at this site. Tracy is located south of the project location. The railroad later moved its headquarters to Tracy from Lathrop, which is roughly 8 miles to the northeast. It was incorporated in 1910 and an irrigation district was formed a few years later (<http://www.ci.tracy.ca.us/about/history/>, accessed March 19, 2009).

## Previous Cultural Resources Survey Results

All project components of the MEP were subject to cultural resources inventory on March 18, 2009. That inventory included archival research, reconnaissance, and surface pedestrian survey. The area of potential effect (APE) for the MEP project was determined in accordance with the CEC *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC 2007) for assessing potential impacts to archaeological and architectural resources. On March 18, 2009, Aaron Fergusson, M.A., RPA performed a cultural resources pedestrian inventory of the MEP project site and associated facilities in order to identify prehistoric or historic cultural resources. The "project area" included the plant site and a temporary

laydown and/or parking area, transmission line and laydown area, natural gas pipeline, water line and laydown area, and access road.

On March 23, 2009, Jessica B. Feldman conducted a windshield survey of the built environment. In order to assess potential impacts to the historic built environment, CH2M HILL examined the MEP site and, in accordance with CEC requirements, parcels within one half mile out from the project site, laydown area and linear features.

## 2009 Archival Research

CH2M HILL commissioned a literature search of the MEP project area from the staff of the California Historical Resources Information System (CHRIS) Northwest Information Center using a definition of a one-mile buffer zone around the Project site and associated laydown and/or parking areas and a one-quarter mile buffer zone around the proposed linear facilities. The CHRIS literature and records review included a review of all recorded archaeological sites as well as all known cultural resource survey and excavation reports. The National Register of Historic Places (NHRP), the California Register of Historical Resources (CRHR), California Historical Landmarks, and California Points of Historical Interest, as well as historic maps, including a GLO plat map for T2S, R3E (1857), the 1878 Thompson & West Historical Atlas map of Alameda County, California, the 1916 *Byron* 7.5' USGS topographic map were all examined.

According to information available in the CHRIS files, there have been 23 previous cultural resource surveys conducted within one mile of this project area and proposed laydown areas (Table B-3). Four previous cultural resource surveys have covered the same areas as the proposed MEP project and laydown areas (marked with an asterisk \* in Table 3, resulting in complete coverage of all project components by previous surveys.

**TABLE B-3**

Authors, Dates, and CHRIS Catalog Number of Reports of Cultural Resources Reports of Surveys Near MEP

Archeo-Tec (1989)—S-18762	*Bard, James (2001)—S-24271
Bramlette et al (1990)—S-12800	Canaday et al (1991)—S-14712
Fong et al (1991)—S-14597	*Garaventa et al (1991)—S-13453
*Greenway, Gregory (1977)—S-5208	Holman, Miley (1982)—S-5862
Holman, Miley (1983)—S-6125	*Holman, Miley (1983)—S-6127
Holman, Miley (1984)—S-6502	Holman, Miley (1984)—S-7074
Holman, Miley (1984)—S-7075	Jensen & Associates (1986)—S-10509
Killam, William R. (1987)—S-9119	Killam, William S. (1988)—S-9995
Moratto et al. (1990)—S-12300	Moratto et al (1995)—S-23674
Peak, Melinda A. (2002)—S-26873	Price, Barry A. (1992)—S-16208
Ruckle, J.T. (1974)—S-8942	Slater and Holman (1982)—S-5657
Werner, Roger H. (1988)—S-11647	

\*Indicates project covered all or part of MEP. Source: California Historical Resources Inventory System, Northwest Information Center.

The record search indicated that there are eight previously recorded properties within a mile of the MEP project site and laydown areas (see Table B-4). Despite four previous surveys of the MEP project site and laydown areas dating back to 1977, no cultural resources

have been identified within any of the areas of direct impacts from MEP. Six of those properties are located well outside of the project area of potential effects, and the MEP project will have no effect on them. Two properties are within 3000 feet of the project area.

The Delta-Mendota Canal is located within the 1-mile search area. In 2005, in consultation with the SHPO, the Delta-Mendota was determined to be eligible for the NRHP under Criteria A and C. Also, a small section of the California Aqueduct is just within the boundary of the survey area; it does not meet the age criteria for evaluation for eligibility to the CRHR or the NRHP.

**TABLE B-4**  
Summary of Sites within One-Mile of the Project Area

Site	Description	NRHP/CRHR Status	Potential MEP Effect
P-01-10435	Delta Mendota Canal and Intake Channel (No. 27)	Determined Eligible in 2005	None
P-01-10436	Historic Jess Property	Not Evaluated	None
P-01-10437	Historic Clark Ranch	Not Evaluated	None
P-01-10438	Historic Griffith Property	Not Evaluated	None
P-01-10439	Historic Peterson Ranch	Not Evaluated	None
P-01-10442	Tracy Pumping Plant	Not Eligible	None
P-01-10445*	No Information (70 Canal?)	No Information	None
P-07-2547	Byron Bethany Irrigation District Main Canal (No. 9)	Not Evaluated	None

\*Site form P-01-10445 was supplied by NIC, but contained no information.

Notes:

CRHR = California Register of Historical Resources

NRHP = National Register of Historic Places

#### **MEPP-01-010436 Jess Property (No. 26)**

Recorded by PAR in 2001, the Jess Property was part of the C.M. McLaughlin landholdings in 1889, and part of the Crocker and Dillon holdings between 1900 and 1907. According to the DPR form, there were no buildings on the site in 1911 (confirmed by a review of the 1914 and 1916 historical topo maps), but by 1952 at least two structures were on the property. Historical aerial images from 1940 show the property had been developed by this time, and the two buildings are apparent on the 1968 historical topo map. The 2001 recordation did not apply the CRHR or NRHP criteria. Restricted access to the property impeded visual inspection of the buildings at this property in 2001.

#### **P-01-010437 Clark Ranch (No. 25)**

Also recorded by PAR in 2001, the Clark Ranch dates to 1942 and consists of four buildings – a house, barn, and two additional small buildings. No changes to the property or to the buildings appear to have taken place since it was recorded by PAR. The setting has not changed since that time. The house itself appears to be a Minimal Traditional style residence which may have been added to over the years, as it has an irregular footprint and



varying roof styles, and as noted by PAR, the barn has been converted from agricultural use. The 2001 recordation did not apply the CRHR or NRHP criteria.

### Previous Archaeological Field Survey

An archaeological survey of the proposed MEP site was conducted on March 18, 2009, by Aaron Fergusson, M.A., RPA, a CRS who meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation (USNPS, 1983). Using pedestrian transects spaced no more than 10 meters apart, Mr. Fergusson surveyed the project facilities and laydown areas, the proposed access road, the proposed gas line corridor, and the proposed transmission line corridor. As per the latest CEC *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007), the survey included a 200 foot minimum buffer around the project facilities and laydown areas and a 50-foot buffer on either side of the centerline around each linear corridor, resulting in a 100-foot wide buffer for the linear corridors. The proposed waterline corridor will be located along the edge of the pavement and within the right of way of Bruns Road. From the Byron Bethany Irrigation District facilities south to the project area the right of way is only five feet wide from the edge of the pavement to the edge of the right of way and is entirely road fill. Outside of the right of way is a privately owned, inaccessible, agricultural field. The only portions of the waterline corridor that was surveyed are the 1000 foot section from the northern terminus south to the Byron Bethany Irrigation District facilities, and the southern section where it leaves Bruns Road and follows the access road into the project area. The section along Bruns Road was not surveyed due to the high level of disturbance and the road base that completely covers the original ground surface and the inaccessible agricultural field outside the right of way.

The ground visibility within the proposed plant location and all project facilities south of Kelso Road was poor with less than 10 percent visibility throughout most of the area due to thick vegetation. This area is currently a cattle pasture, although a modern wind farm was located here previously, but is now demolished. Visible evidence of the former wind farm includes concrete tower foundations, concrete electrical box foundations with PVC conduit, and debris from broken/removed windmills. The PVC conduit in particular points to the degree of previous ground disturbance as these underground conduits connected the various windmills.

The transmission line and associated laydown area north of Kelso Road had much better ground visibility, at least 70 percent. This area contains a more dense cattle population and grazing and trampling of the area has cleared most of the vegetation. The water pipeline laydown area is located within the fenced perimeter of the new Byron Bethany Irrigation District Pump Control Center and Maintenance Yard. The laydown area is in the south eastern corner in an area that has been graded which is now used for storage and parking. Just to the north is a storm water retention basin. The 1000 foot water pipeline is within a recently disturbed corridor from the installation of another waterline to serve the Byron Bethany Irrigation District facility.

Given the local topography, distance to major stream drainages or other archaeologically sensitive features, and the scale and scope of previous ground disturbance in the area, archaeological sensitivity of the surface soils of the MEP site and appurtenant proposed facilities is considered low. The sensitivity of the underlying soils is considered moderate to



low, given that the possibility exists for intact cultural deposits to be present beneath the plow zone. The archaeological sensitivity is low to moderate because the site is located in an area that has been previously disturbed by agricultural use, construction and demolition of a wind farm, and because of the low density of previous finds in this general area, despite multiple previous surveys.

### Previous Architectural Survey

The historic architecture survey was conducted on March 23 2009, by Jessica B. Feldman, who meets the Secretary of the Interior's Professional Standards for architectural history. The survey was inclusive of the project site and the project linear facility routes, extending no less than one-half mile out from the proposed plant site and from the routes of all above-ground linear facilities, as per the CEC *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007).

The present built environment is a mix of residential and agricultural properties, dominated by a variety of utility facilities, such as the Tracy Substation and Tracy Pumping Station to the east along with the Delta-Mendota Canal, the California Aqueduct to the north, the Delta Substation and Pumping Station to the west. There are several wind farms dotting the hills to the west and south west of the Project. The Table Mountain-Tesla transmission line corridor crosses the survey area on the north and east, transmission lines from the PG&E Kelso Substation run along the east side of Bruns Road south of Kelso Road, and the Cottonwood and Tracy-Tesla transmission line corridors are further to the east, outside the study area.

The former Byron Cogen Plant, which was constructed in 1990, was previously located on the same parcel as the proposed temporary water tank site. To the north, across Kelso Road, is the PG&E Kelso Substation, which was constructed between 1982 and 1993. Within the survey area are several properties with residential buildings, particularly along Kelso Road to either side of Bruns Road. The remaining parcels are generally open fields, most undeveloped or fallow.

Buildings and structures that appeared to be more than 45 years of age were recorded during the survey of the built environment. Alameda and Contra Costa County assessor data was reviewed to establish building dates; in the absence of conclusive dates of construction, historical topo maps and aerial images were reviewed to establish general dates of construction. The 1914, 1916 and 1968 historical topo maps as well as the 1940, 1950, 1959 and 1965 historic aerial images were consulted. Based on these maps as well as the field survey, it was determined that three properties met the age criteria to be considered potential historical resources within one-half mile out from the MEP. The maps were included in Appendix 5.3C of the MEP Application for Certification.

A total of four sites were located within the one-half mile architectural survey area. Updated DPR forms for the Jess Property and Clark Ranch were previously prepared; new DPR forms for the Reese Property and the Aqueduct canal were previously prepared as well. None of these sites are actually located within the direct area of impact of MEP project facilities, including the proposed new water tank location.

### **Reese Property; Unnamed Farm at Christensen and Bruns Road**

This farm or ranch is located on the northwest side of the confluence of Christensen and Bruns Road, approximately 2500 feet to the southwest of the MEP project site. This property was mentioned in records received as part of the CHRIS archival research. The property was not formally evaluated but was noted in Site Record 6502 in 1984 (Holman 1984). The buildings and structures are now gone and only the ruins of a building and two tanks remain at this location (Holman 1984).

### **P-01-10436; Jess Property at 15547 Kelso Road**

The Jess Property, located at 15547 Kelso Road, was previously recorded in 2001, but not evaluated for California Register of Historical Resources (CRHR) or National Register of Historic Places (NRHP) eligibility. The 2001 recordation of the Jess Property did not include a description of the buildings at this address and conversations with the owners of the property have indicated that the residential building burned down around that time. As in 2001, access to the Jess Property was not received from the owners, but communication with the owners indicated that the buildings on the property have burned down and/or have fallen down due to neglect.

### **P-01-10437; Clark Ranch at 15685 Kelso Road**

Similarly, the Clark Ranch at 15685 Kelso Road, was recorded in 2001 but not evaluated for CRHR or NRHP eligibility. The Clark Ranch was recorded; no significant changes to the buildings previously recorded were noted during visual inspection of the property.

### **Aqueduct Canal**

A canal running between the California Aqueduct and the Delta-Mendota Canal was recorded, as it appears in the 1940 aerial image. It is located on several parcels to the northeast of the project site. It was an open dirt canal. The north end extends south from the California Aqueduct in Contra Costa County, crosses Bruns Road in Alameda County, and meanders in a southerly direction. It crosses Kelso Road west of the Clark Ranch, and then across the Jess Property to intersect with the Delta-Mendota Canal southeast of the project study area.

Although it is not shown on the 1968 Clifton Court Forebay Quad map, it is shown on the 1978 Clifton Court Forebay Quad map and is labeled "Aqueduct Canal." Research revealed no information about the history of this feature, or with whom it might be associated. It may not have been completed until after 1968. This resource does not appear to meet the CRHR or NRHP criteria.

No impacts to any of the four historic properties are expected as a result of the proposed water storage project. The Reese Property is located southwest of the MEP project, former laydown area and linear features; and the hilly area south and southeast of the MEP project area visually and physically separates the water storage tank and Reese properties. Furthermore, there are no resources remaining on the Reese Property. The Jess Property is located more than 2000 feet to the east and northeast of the MEP project site and between 1500 and 3000 feet from the transmission lines. The Jess Property lies south of the California Aqueduct, southeast of the PG&E Kelso Substation, west of the Tracy Pumping Station and Substation, as well as the Delta- Mendota Canal, northeast of the Bethany Reservoir and



between the Vacaville-Tesla and Cottonwood transmission lines. All of these utility structures post-date the buildings on this property. There are no known resources remaining on the Jess Property.

The Clark Ranch is located more than 3000 feet to the northeast of the project site, and 2,000 feet to the east of the MEP transmission line. The water storage tank site is partially obscured by landscape features as well as the topographical depression where the water storage tanks would be located. The Clark Ranch property lies south of the California Aqueduct, southeast of the PG&E Kelso Substation, west of the Tracy Pumping Station and Substation, as well as the Delta-Mendota Canal, northeast of the Bethany Reservoir and between the Vacaville-Tesla and Cottonwood transmission lines. All of these utility structures post-date the buildings on this property. The Aqueduct Canal is almost 1 mile west of the MEP project and more than 1 mile from the water storage tanks site, so it will not be impacted by the project.

### December 2014 Water Tank Survey

Michelle Kaye, Ph.D., RPA conducted an archaeological survey for the proposed MEP temporary water tank storage site on December 17, 2014. Dr. Kaye meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historical preservation (USNPS, 1983). Using pedestrian transects spaced no more than 5 meters apart, Dr. Kaye surveyed the approximately 1.5-acre former Byron Power Cogeneration Plant, located to the northeast of MEP, a 200-foot buffer surrounding its footprint, and the potential water line routes to the MEP security fence. Dr. Kaye conducted a survey of the ground surface, including an examination of all areas of disturbed soil to inspect the immediate subsurface for cultural materials or any evidence of previous human occupation. She examined soil around rodent holes for any evidence of color or texture change. Dr. Kaye took photographs (see Appendix A) and survey notes, and carried a handheld GPS unit (Garmin™ Oregon 600 GPS) to record location data. Dr. Kaye was unable to survey the retention basin on the northern end of the former Byron Power Cogeneration Plant because the water was several feet deep and dense Russian thistles (*Salsola tragus*) directly surrounded the basin. Weather conditions during the survey were cloudy with light drizzle, with a temperature of 56°F, and winds 5 mph from the west.

Dr. Kaye identified no visual indicators of surface or immediate subsurface cultural resources (i.e., exposed midden soils, lithics, obsidian, shell fragments, etc.) during the pedestrian survey. There are no known historic properties or unique archaeological resources within the proposed water tank project area.

The former Byron Power Cogeneration Plant measures approximately 330 feet long by 175 feet wide. The majority of the water tank site is fenced; however, the fence was unlocked for the survey. The 200-foot buffer surrounding the project footprint consists of single lane dirt/gravel roads leading toward and around MEP and non-irrigated grazing land. The proposed water line routes extend from near the southwest side of the former Byron Power Cogeneration Plant approximately 185 feet diagonally southwest across a dirt and gravel road, up a small hill, and into the fenced MEP site.

The ground visibility within the proposed project area and the buffer zone was fair to good in most areas with 65 percent visibility. Vegetation consists primarily of short non-native

annual grasses, gum plant (*Grindelia camporum*), and Russian thistles (*Salsola tragus*). However, a few areas contain large pools of water and/or dense vegetation, which hindered or prevented visibility. The area of the proposed water tank placement consists of disturbed sediment, including medium to fine grained sandy loam to clay mixed with base and aggregate rock, and shale. The surrounding buffer zone includes disturbed sediment, artificial fill, and agricultural soils. The area surrounding the former Byron Power Cogeneration Plant is currently cattle grazing land intermixed with seasonal wetlands and vernal pools. However, there are remnants of the land's former use as a wind farm and cogeneration plant seen in concrete platforms, concrete electrical box foundations, downed power poles, rebar, wood piles, PVC conduit, wire bundles, and other debris.

Based on the anticipated extent of the work associated with the water tank project, the local topography, the distance from major fresh water sources, the scope of previous disturbance, the lack of archaeological sensitivities of the surface soils, and the evidence collected during the literature review and pedestrian survey, the probability for encountering unexpected subsurface cultural resources is low. Artificial fill, agricultural soils, and disturbed sediment, which extend to a depth of approximately 3 feet, represent a low potential for intact cultural deposits. A low to moderate archaeological sensitivity exists for undifferentiated alluvium soil below this zone.

## 2015 Archival Research

In February 2015 CH2M HILL commissioned an updated literature search of the water tank project area from the staff of the California Historical Resources Information System (CHRIS) Northwest Information Center using a definition of a one-mile buffer zone around the storage tank site. Results are provided in Tables B-4 and B-5. The complete results will be submitted to CEC under confidential cover in a separate transmittal.

All three sites (P-01-011395, P-01-011504, and P-01-011505) are located at least 0.5 mile from the water tank site and none will be impacted in any way.

**TABLE B-4**

Authors, Dates, and CHRIS Catalog Number of Reports of Cultural Resources Reports of Surveys Near Water Tank Site  
Garcia and Associates (2010)— S-043685

**TABLE B-5**

Summary of Sites within One-Mile of the Project Area

Site	Description	NRHP/CRHR Status	Potential Effect
P-01-011395	Tracy-Telsa 230 kv Transmission Line	Unknown	None
P-01-011504	Historic/Light artifact scatter	Unknown	None
P-01-011505	Santucci Ditch;	Unknown	None

## Native American Consultation

A Sacred Lands File search and a Native American contacts list were requested from the Native American Heritage Commission (NAHC) on January 7, 2009. The NAHC responded



on February 5, 2009 with a list of Native Americans interested in consulting on development projects. At this time, no sacred sites are known to exist within the proposed water tank project area; however, Native American consultation with tribes and individuals provided by the NAHC was conducted for the MEP project. Letters describing the project and including maps of the project location were sent via email or fax as well as standard mail to all individuals or tribes provided by the NAHC inviting comments and concerns regarding this project on March 27, 2009. As of the time of printing this document, no responses have been received.

The NAHC record search of the Sacred Lands file did not indicate the presence of Native American cultural resources in the immediate project area. The record search conducted at the CHRIS Central Information Center also did not indicate the presence of Native American traditional cultural properties.

### **Local Historical Societies**

Three local historical societies were contacted on April 10, 2009 as part of the MEP licensing. No additional historical resources were identified. A summary of these contacts is provided as part of Appendix 5.3A of the MEP Application for Certification. The groups contacted are the East Contra Costa Historical Society and Museum, the Tracy Historical Museum and the Alameda County Historical Society. Alameda County Historical Society responded on April 14, 2009, to indicate they had no information to provide and suggested contacting the Amador Livermore Valley Historical Society in Pleasanton and the Livermore Heritage Guild. A request for information was sent to the Amador Livermore Valley Historical Society on April 28, 2009. On April 26, 2009, the Tracy Genealogical Society responded that they had no information and said they would forward the request to the Tracy Historical Museum. No other responses have been received at the time of this printing.

### **Recommendations**

The literature search and newly-conducted pedestrian inventory have shown no significant prehistoric or historic sites located within the MEP water tank area of potential effect. Therefore, the project is unlikely to have an adverse effect on significant historical or archaeological sites (that are eligible for listing in the NRHP or CRHR). Lastly, there are no known cemeteries in the project area or linear facilities (i.e., the water lines) that project construction might disturb.

It is unlikely, due to the extensive disturbance by construction equipment and dismantling of the wind farm that the water tank storage project would encounter buried intact cultural resources that have not previously been disturbed or destroyed in sediments near the ground surface. However, some limited potential does exist for intact cultural resources to be discovered in soils below the plow zone. Only minor grading of the former Byron Power Cogeneration Plant site is anticipated.

Although significant archaeological and historical sites were not found during the survey for MEP and the water storage tanks site, it is possible that subsurface construction could encounter buried archaeological remains. For this reason, the MEP conditions of certification (COC), which will apply here, include measures in the Cultural Resources Monitoring and Mitigation Plan (CRMMP) and COCs to mitigate any potential adverse impacts that could

occur if there were an inadvertent discovery of buried cultural resources. These measures include: (1) designation of an on-call cultural resources specialist (CRS) to investigate any cultural resources finds made during construction, (2) implementation of a construction worker training program, (3) monitoring during excavation, (4) procedures for halting construction in the event that there is an inadvertent discovery of archaeological deposits or human remains, (5) procedures for evaluating an inadvertent archaeological discovery, and (6) procedures to mitigate adverse impacts on any inadvertent archaeological discovery determined significant.

If human remains are found during construction, project officials are required by the California Health and Safety Code (Section 7050.5) to contact the Alameda County Coroner. If the Coroner determines that the find is Native American, he or she must contact the NAHC. The NAHC, as required by the Public Resources Code (Section 5097.98) determines and notifies the Most Likely Descendant with a request to inspect the burial and make recommendations for treatment or disposal.

The MEP COCs are sufficient to ensure that use of the temporary storage tank site will not result in a significant adverse impact to cultural resources. No additional COCs are required.

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## **Appendix A**

### **Representative Photographs**

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Photo Log: MEP water tank Number	Description	View facing
8940	View of site	NE
8949	View from entrance gate	NE
8956	Northwest end of project area	NE
8959	North end of project area	NE
8962	Northwest end of project area	W
8963	Trailer and project area to E	SE
8978	Proposed tank area	NW
8981	Eastern side of fenced area	N
8988	Wooden shelter and retention pond	NW
8995	Project area	S
9002	Retention Pond	N
9003	Project area	S
9011	Overview from NE corner	SW
9027	Overview of buffer zone	W
9032	View toward project area	SE
9035	View of project area	SW
9053	View of project area	N
9056	View of proposed water line routes	SW
9074	View of Project area	NE
9077	View of proposed water line routes	S



IMG\_8940



IMG\_8949



IMG\_8956



IMG\_8959



IMG\_8962



IMG\_8963





IMG\_8978



IMG\_8981



IMG\_8988



IMG\_8995



IMG\_9002



IMG\_9003





IMG\_9011



IMG\_9032



IMG\_9035



IMG\_9053



IMG\_9056



IMG\_9074



IMG\_9077