DOCKET
09-AFC-3
DATE RECD. NOV 29 2010

SOIL AND WATER RESOURCES

Testimony of Mark Lindley, PE, Rachel Cancienne, EIT, and Paul Marshall

SUMMARY OF CONCLUSIONS

This section of the Staff Assessment (SA) analyzes the potential effects on soil and water resources that would occur by construction and operation of the proposed Mariposa Energy Project (MEP). Based on its assessment of the proposed MEP, staff concludes the following:

- Implementation of Best Management Practices (BMPs) during MEP construction and operation in accordance with an effective Storm Water Pollution Prevention Plan (SWPPP) and a Drainage, Erosion and Sedimentation Control Plan (DESCP) would avoid significant adverse effects that could be caused by transport of sediments or contaminants from the MEP site and associated linear facilities by wind or water erosion.
- Stormwater runoff from the 10 acre site would not cause significant impacts with the implementation of the stormwater runoff swales and extended detention basin.
- The proposed fresh water supply for the project would not cause a significant adverse environmental impact on current or future users of the water supply ~~with the implementation of a mitigation fee for each acre-foot of fresh water used, and paid to a water conservation program that would reduce impacts to other users to less than significant levels~~.
- ~~With the inclusion of facility-specific water conservation measures and the implementation of a regional water conservation program, T~~the proposed use of a freshwater supply would be consistent with state water policy found in State Water Resources Control Board (SWRCB) Resolution 75-58, and the Energy Commission's 2003 Integrated Energy Policy Report (IEPR) water policy because there is no other economically feasible or environmentally desirable alternative.
- Consistent with the 2003 IEPR, Mariposa Energy, LLC has proposed the use of a zero liquid discharge (ZLD) system to manage wastewater at the MEP facility.
- Mariposa Energy, LLC has proposed the use of an alternative cooling technology which is environmentally desirable and economically feasible to help meet the requirements of the 2003 IEPR and SWRCB Resolution 75-58.
- The proposed project would be constructed to comply with 100-year flood requirements and would not exacerbate flood conditions in the vicinity of the project.

Staff concludes that MEP would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources and would comply with all applicable laws, ordinances, regulations and standards (LORS) if all of the recommended conditions of certification are adopted by the Commission and implemented by Mariposa Energy, LLC (Mariposa).

The Mariposa applicant has submitted a request to the U.S. Army Corps of Engineers (USACE) requesting a jurisdictional determination of Waters of the U.S. for several ephemeral streams and drainage areas that cross the proposed alignment of the project

linears. The USACE has not yet responded with their determination. Staff will incorporate this determination into the Supplemental Staff Assessment if the USACE makes a determination after the SA has been published.

INTRODUCTION

This section of the Staff Assessment (SA) presents an analysis of the potential impacts to soil and water resources from the construction and operation of the proposed MEP facility. This analysis specifically focuses on the potential for MEP to:

- cause accelerated wind or water erosion and sedimentation;
- exacerbate flood conditions in the vicinity of the project;
- adversely affect surface or groundwater supplies;
- degrade surface or groundwater quality; and
- comply with all applicable LORS and State policies.

Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impact and, as appropriate, recommends conditions of certification to ensure that any impacts are less than significant and the project complies with all applicable LORS and state policies.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

Soil and Water Resources Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

FEDERAL	
Clean Water Act/Water Pollution Control Act. P.L. 92- 500, 1972; amended by Water Quality Act of 1987, P.L. 100-4 (33 USC 466 et seq.); NPDES (CWA, Section 402)	The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. This includes regulation of storm water discharges during construction and operation of a facility normally addressed through a general National Pollutant Discharge Elimination System (NPDES) permit.
CWA Section 401	Section 401 of the CWA requires that any activity that may result in a discharge into a water body must be certified by the Regional Water Quality Control Board (RWQCB)
Resource Conservation and Recovery Act (RCRA) (40 CFR Part 260, et seq.)	RCRA seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
STATE	
California Constitution, Article X, Section 2	The State Constitution requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.

Porter Cologne Water Quality Control Act (PCWQCA) (Water Code §13000 et seq.)	PCWQCA requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These standards are typically applied to the proposed project through the Waste Discharge Requirements (WDR) permit. These regulations require that the RWQCB issue Waste Discharge Requirements specifying conditions regarding the construction, operation, monitoring and closure of waste disposal sites, including injection wells and evaporation ponds for waste disposal. WDRs are updated periodically to reflect changing technology standards and conditions.
SWRCB Res. 2009-0011 (Recycled Water Policy)	This policy supports and promotes the use of recycled water as a means to achieve sustainable local water supplies and reduction of greenhouse gases. This policy encourages the beneficial use of recycled water over disposal of recycled water. This policy states the following recycled water use goals: "Increase the use of recycled water over 2002 levels by at least one million acre-feet per year (AF/y) by 2020 and by at least two million AF/y by 2030; Increase the use of stormwater over use in 2007 by at least 500,000 AF/y by 2020 and by at least one million AF/y by 2030; Increase the amount of water conserved in urban and industrial uses by comparison to 2007 by at least 20 percent by 2020; and Included in these goals is the substitution of as much recycled water for potable water as possible by 2030."
Recycling Act of 1991 (Water Code § 13575 et esq.)	The Water Recycling Act of 1991 encourages the use of recycled water for certain uses and establishes standards for the development and implementation of recycled water programs.
Energy Commission Integrated Energy Policy Report (IEPR) 2003	Consistent with State Water Resources Control Board Policy 75-58 and the Warren–Alquist Act, the Energy Commission will approve the use of fresh water for cooling purposes by power plants it licenses only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound". "Additionally, the Energy Commission will require zero liquid discharge technologies unless such technologies are shown to be "environmentally undesirable" or "economically unsound".
State Water Resources Control Board (SWRCB) Policies: Resolution 75-58 & Resolution 88-63	The principal policy of the SWRCB that addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976, by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. Resolution 75-58 defines fresh inland waters as those "which are suitable for use as a source of domestic, municipal, or agricultural water supply and which provide habitat for fish and wildlife". Resolution 88-63 defines suitability of sources of drinking water. The total dissolved solids must not exceed 3,000 mg/L in order to be considered suitable, or potentially suitable, for municipal or domestic water supply.

LOCAL	
Alameda County Grading Ordinance (Alameda County Code (ACC), Chapter 15.36)	Chapter 15.36 regulates grading on private property within unincorporated areas of the county without permit. The Grading Ordinance seeks to avoid pollution of watercourses caused by runoff and to ensure that the intended use of the site is consistent with the county general plan.
Alameda County Stormwater Management and Discharge Control Ordinance (Alameda County Code (ACC), Chapter 13.08)	The purpose of Chapter 13.08 is to reduce the pollution of and enhance water quality in county receiving waters and the San Francisco Bay.
Contra Costa County General Plan	The General Plan implements standards for erosion control and provides requirements for erosion and sediment control plans in the county. It also encourages flood control and drainage guidelines for developing areas.
Contra Costa County Code	The County Code provides requirements for drainage plans and grading slope restrictions.
Contra Costa County, Division 1010, Drainage Ordinance	Contra Costa County Code Division 1010 conveys requirements for drainage construction including drainage permit.

SETTING

REGIONAL SETTING

Climate

The proposed MEP site has an arid to semiarid climate. Average annual rainfall at the MEP site is approximately 12.2 inches. Most of the precipitation in the area of the proposed site occurs between November and April, while the summer months are typically dry. **Soil and Water Resources Table 2** provides average historical rainfall from the nearby Tracy Pumping Plant weather station.

Soil and Water Resources Table 2
Average Rainfall near the Proposed Project Site (1955-2007)

Precipitation	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Average	12.20	0.62	1.60	1.93	2.62	2.15	1.59	0.84	0.41	0.11	0.03	0.06	0.24

Source: MEP 2009a

Surface Waters

The proposed MEP site would be located in the San Joaquin River Basin, about 10 miles south of the Sacramento-San Joaquin Delta. In addition to many sloughs, major waterways near the site include: the San Joaquin, Mokelumne, Stanislaus, Tuolumne, and Merced rivers. Runoff from the Sierra Nevada range supplies water to the major reservoirs of the San Joaquin Basin which eventually drain into the Delta.

The proposed MEP site would be located adjacent to primary water supply canals which import fresh surface water to the San Joaquin Basin via the State Water Project (SWP) and the Central Valley Project (CVP). The California Aqueduct (SWP) is adjacent to the

proposed MEP site. The Delta-Mendota Canal is less than 0.5 miles northeast of the proposed MEP site (MEP 2009a). These larger canals carry fresh water from the Sacramento and San Joaquin Rivers to a vast network of canals for both agricultural irrigation and industrial uses across the state.

Surface water runoff from the undeveloped project location flows overland and converges within man-made ditches. The site runoff eventually discharges into Italian Slough, located about 3.5 miles north of the proposed MEP site.

Groundwater

The proposed location for the MEP site is in the Central Valley aquifer system, which consists of post-Eocene continental rocks and deposits and contains most of the fresh water in the valley. Underlying the continental deposits are tertiary marine sediments that contain mostly saline water, except in certain areas where an influx of fresh water has flushed out the saline water.

The aquifer system in the San Joaquin Valley generally consists of an upper and a lower aquifer, separated by a thick clay layer (the Corcoran Clay member of the Tulare). These clay zones function as impermeable aquitards that restrict vertical and lateral movement of groundwater. The Corcoran Clay is silty, diatomaceous clay with low permeability and is one of the largest confining bodies in the region, underlying an area of approximately 5,000 square miles.

The Corcoran Clay is a competent barrier between the upper and the lower aquifers in the southern sections of the San Joaquin Valley; however, it becomes increasingly thin as it extends north toward the proposed MEP site. Where the Corcoran Clay disappears, the lower aquifer is no longer isolated from the upper aquifer. The regional groundwater flow can be affected by numerous lenses of fine-grained materials that are distributed throughout the aquifer, potentially leading to variably-sized perched water tables and areas of decreased permeability (MEP 2009a).

PROJECT, SITE, AND VICINITY DESCRIPTION

The proposed MEP facility would be located 5.5 miles southeast of Byron, CA on a 10-acre portion of a 158-acre parcel, known as the Lee Property in the northeast corner of Alameda County. This property is south of the Pacific Gas and Electric Company's (PG&E) Bethany Compressor Station and Kelso Substation. The Lee Property was formerly the site of a windmill farm. The MEP facility would be built between two small hills on the parcel.

The construction laydown area for proposed facility would be approximately 9.2 acres and would be adjacent to the east side of the project site. Additional laydown areas would be needed for the construction of linears (water supply pipeline, transmission line, and natural gas pipeline) for the proposed facility. The proposed water supply pipeline and laydown areas would extend north into Contra Costa County.

Water Supply

Byron-Bethany Irrigation District (BBID) would supply water for process water, safety showers, fire protection, service water, and domestic water for the MEP site via Canal 45. A new ~~6~~ 10 inch-diameter, 1.8 mile-long water supply pipeline [MRL1]would be built along the east side of Bruns Road from Canal 45 to the proposed project site. The pipeline would traverse the BBID property from the pump station to the BBID headquarters facility in Contra Costa County and travel south within County right-of-way (both Contra Costa County and Alameda County) and just outside the edge of the ~~beneath the~~ Bruns Road pavement ~~paved right-of-way~~ before following the MEP site access road to the proposed project site in Alameda County. Additional facilities to complement the new pipeline would include a concrete turnout structure and a small pump station at the canal bank, redundant vertical turbine pumps, pipe manifold and valving, pad mounted transformer, and an electrical cabinet with instrumentation.

Construction Water Supply

Prior to completion of the new water supply pipeline, water would be obtained from BBID Canal 45 via pumping into tanker trucks (CH2M 2010b). The water would be trucked about 1.3 miles to the proposed MEP site where it would be used for dust suppression, concrete washout, soil compaction, and hydrostatic testing. Approximately 2,500 gallons of water per day (gpd) would be required during the construction period.

Project Water Supply

Mariposa acknowledges that MEP would use a maximum of 187 acre-feet (AF) of fresh water per year for process water (CH2M 2009f). This volume represents the applicant engineering analysis of MEP's potential water usage associated with the maximum permitted operating schedule. Maximum use is based upon the continuous maximum permitted operation (4,000 hours per year with 300 startup and shutdown events) at the statistical average annual temperature at the project site (59^{o}F). Mariposa asserts a more realistic operating scenario would be 600 operating hours per year with 200 startup and shutdown events. In this case, MEP would use 34.8 AF per year (MEP 2009a).

Soil and Water Table 3
Water Consumption

WATER SERVICE/ USE	Average Use[1] (gpm)	Average Annual Use[2] (AFY)	Peak Annual Use[3] (AFY)
Construction			
Daily Construction Requirements	2,500 (gpd)		
Total Plant Makeup Water Usage Requirements			
Domestic Purposes: eye-wash stations, safety showers, drinking water, and sanitary facilities	0.33	0.05	0.26
Plant Processes: combustion turbine water injection for nitrogen oxides (NOx) control and combustion turbine compressor section wash water	159.0	26.3	130.2
Plant Process: Inlet air cooling for PC SPRINT combustion turbine generator (CTG)	77.0	8.5	56.7

TOTAL Plant Use	236.0	34.8	186.9
Zero Liquid Discharge – return flow to raw water storage tank	-1.4	-2.3	-2.3
Service Water/Fire Protection	-	-	-

Notes:
AFY = acre-feet per year; gpm = gallons per minute; gpd = gallons per day
[1]Average use based on average annual temperature of 59°F
[2]600 hours per year with 200 startup and shutdown events (8.7 AFY) at 59°F
[3]4,000 hours per year with 300 startup and shutdown events (13.0 AFY) at 59°F

Water Use and Quality

Most of the water supplied to MEP (99.8 percent) would be used for various plant processes. The incoming supply water from BBID Canal 45 would be treated by a truck-mounted ion exchange (IX) system, which would include: two cation resin vessels, three strong base anion resin vessels, and one mixed bed ion exchanger vessel. All demineralizer equipment would have offsite regeneration; therefore, there would be no demineralizer waste stream. Once treated, the water would be stored in a 380,000-gallon demineralized water storage tank (adequate for 27.5 hours of plant use) and be of suitable quality for the MEP turbines (see **Soil and Water Resources Table 4**). The demineralized water would be used for the water injection into the combustion zone of the turbine for nitrogen oxides (NO_x) control and the online water wash of the combustion turbine compressor (MEP 2009a). Additionally, during average operating conditions, approximately 77.0 gallons per minute (gpm) would be used for inlet air cooling in compressors of MEP's four PC Sprint (SPRay INTercooling) combustion turbine generator (CTG) (see **Soil and Water Resources Table 3**).

Soil and Water Resources Table 4
LM6000 Demineralized Water Purity Requirements

Parameter	Units	Value
Total Solids	ppm	5.0
Total Dissolved Solids	ppm	3.0
Silica as Silicon dioxide (SiO2)	ppm	0.1
Conductivity	micromhos/cm	< 0.1 @ 25°C
pH	Standard Units	6.5 - 7.5
Chloride	mg/L	0.5
Sulfate	mg/L	0.5

mg/L = milligrams per liter; ppm = parts per million
Source: MEP 2009a

The remaining 0.2 percent (0.332 gallons per minute) of incoming fresh water from Canal 45 would be used for domestic purposes such as eye-wash stations, safety showers, drinking water, and sanitary facilities. Mariposa states that the BBID raw water would be filtered through both a 500-micron bag filter and a 5-micron cartridge filter, and would then be injected with sodium hypochlorite for disinfection. The treated water would then be fed to a 1,000-gallon polyethylene chlorine contact tank providing a minimum 120 minute contact time. Sodium hypochlorite would be used to provide disinfection and prevent biofouling in the potable water system (MEP 2009a).

A combined service water/fire protection 520,000-gallon water storage tank would store raw supply water from BBID. Untreated supply water from BBID would be used for

general (nonpotable) needs such as landscaping, chiller fill and make-up, fire protection, and hose bibs (equipment and surface washdown).

Wastewater Collection, Treatment, Discharge and Disposal

The proposed MEP facility would have a zero liquid discharge (ZLD) system. The primary wastewater collection system would collect process wastewater and stormwater runoff from all plant equipment process contact areas. This water would be routed through sumps and an oil/water separator before treatment through an activated carbon filtration ZLD system. The truck-mounted ZLD system would include a walnut shell activated carbon vessel followed by a surge tank and 5 micron bag filters and pH adjustment if necessary. The treated ZLD reclaimed water (approximately 1.48 gpm in the winter and 1.29 gpm in the summer or approximately 2.3 AFY) would then be recycled to the raw water storage tank for plant process water usage.

The secondary wastewater collection system would collect sanitary wastewater from sinks, toilets, showers, and other sanitary facilities, and route the wastewater to an onsite septic tank prior to transport by a licensed sanitary waste management contractor to an offsite disposal facility. Mariposa estimates that the onsite septic system would receive approximately 478 gallons per day (MEP 2009a and CH2M 2009f).

General plant drains would collect containment area washdown, sample drain water, and facility equipment drainage. Water from these areas would be collected in a system of floor drains, hub drains, sumps, and piping and routed through an oil/water separator prior to ZLD treatment.

The non-oily oil/water separator effluent stream would pass through the truck-mounted ZLD treatment system before being sent to the 50,000-gallon wastewater tank and eventually recycled back to the 520,000-gallon raw water storage tank. Any oily waste collected in the oil/water separator would be transferred to 55-gallon drums and hauled offsite for proper disposal.

Wastewater from infrequent combustion turbine water washes and from the fuel filtration skid(s) would be collected in holding tanks or sumps. MEP would generate between 667 to 3,583 gallons of wastewater per month during turbine washing. The high value is based on the maximum permitted operating scenario (4,000 hours per year plus 300 start and stop cycles). Wastewater would be trucked offsite for disposal at an approved wastewater disposal facility, based on operating or regulatory compliance requirements (CH2M 2010b). MEP turbine wash water may require disposal at a Class I landfill (Kettleman Hills). Final disposal location determinations will be made for MEP based on waste profile analyses performed following wastewater generation during MEP operations.

Stormwater Runoff, Proposed Treatment, and Discharge

Since the proposed project site is undeveloped, existing conditions include no active stormwater management system. Stormwater generally seeps into the ground via percolation or sheet flows north into ephemeral drainages that converge into a single man-made linear channel. The channel eventually discharges into Italian Slough, located 3.5 miles north (downstream) of the project site.

The proposed project would utilize constructed swales (grass-lined ditches) to route upstream (off-site) stormwater runoff around the east and west sides of the site to prevent contamination. The proposed developed-site runoff would be managed with a series of inlets and storm drain pipes that would convey runoff to an onsite extended detention basin at the north end of the project site. The extended detention basin would be sized to capture the volume of runoff from a 100-year storm event. The detention basin would release the site stormwater runoff over a minimum 48-hour period into the constructed swale proposed along the western perimeter of the site. The swale would continue to flow in the northerly direction and join with flows from the eastern perimeter of the site. The combined ditch flow would pass through a proposed 36-inch diameter culvert and daylight north of the access road.

Areas with potential oil water contamination would be sited within containment to prevent mixing of oily water with stormwater flowing to the extended detention basin. Impervious areas on the proposed site would be limited to paved loop and equipment access roads and the equipment to operate the plant. Forty-four percent of the MEP site would have impervious surfaces for equipment siting and roads. Runoff would increase between pre- and post-development due to the proposed impervious structures and shortened drainage basin time of concentration on the proposed developed site; however, the extended detention basin outfall discharge rates would not be greater than pre-development site stormwater discharge rates (see **Soil and Water Resources Table 5**) (MEP 2009a).

Soil and Water Resources Table 5
Pre- and Post-development Runoff for the MEP Site

Source	Area (acres)	Peak Runoff (cfs) 2-year Event	Peak Runoff (cfs) 100-year Event
Pre-Development (Zone CM-5)	8.65	0.58	7.05
Post-Development Uncontrolled[a] (Zone S-1&2)	8.12[b]	5.4	17.8
Post-Development Discharge Rate[c]	8.65	0.58	6.58

cfs = cubic feet per second
[a]Post-development runoff rate to the extended detention basin
[b]Post-develoment acreage is shown less than pre-development because the detention pond surface acreage is not considered in the hydrologic routing model.
[c]Post-development Discharge from extended detention basin to natural drainage.
Source: MEP 2009a

Soil Resources

The soils at the proposed MEP site vary from finer soils formed in residuum to coarser soils formed in alluvium. They are medium to fine-grained with textures ranging from fine sandy loam to clay with moderately well drainage in the upland rolling portions of the project area to moderately well and somewhat poorly drained in the more level areas of the proposed project site (CH2M 2009c). The site has 0 to 30 percent slopes and existing vegetation in the form of pasture grasses. The erosion potential of these soils in the proposed construction and laydown areas would vary based on soil moisture and compaction, as well as the size of the soil particles; however, the sloping nature of the property suggests the soils would have a high water erosion potential and moderate wind erosion potential. However, since the proposed project area was previously the

site of a wind turbine development and has buried natural gas pipe lines that run through the area, it is possible that soil conditions may vary slightly from those listed in the USDA-NRCS soil survey.

The proposed linear route areas and construction laydown location overlay clay loams and fine sandy loams with 0 to 15 percent slopes. These soils may have a moderate to high potential for shrinking and swelling due to their clay content. These soils may not be suitable as a bearing surface for structures and pipelines. Additionally, these soils may not be suitable for backfilling in areas where post-construction soil movements could adversely affect linear features.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section provides a discussion of the potential direct, indirect, and cumulative impacts to soil and water resources that may result from construction, operation, and maintenance of the proposed MEP facility. While all projects would likely have impacts, the goal is to limit any adverse impacts to a less than significant or acceptable level, or when feasible, prevent any adverse impacts. Staff's analysis of potential impacts consists of a brief description of the potential impact, an analysis of the relevant facts, and application of the threshold criteria for significance to the facts. Mitigation measures may be necessary to reduce potentially significant impacts to a less than significant level. If mitigation is warranted, staff provides a summary of Mariposa's proposed mitigation and a discussion of the adequacy of the proposed mitigation. Where necessary, staff presents additional or alternative mitigation measures or recommends specific conditions of certification related to a potential impact and any required mitigation measures.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff evaluated the potential impacts to soil and water resources including the effects of construction and operation activities that could result in erosion of soils, the deposition of sediments into surface waters or the contamination of either groundwater or surface water. Staff also evaluated the potential of the project's proposed water use to cause a significant depletion or degradation of local and regional water resources.
To evaluate potential significant impacts to soil or water resources, staff assessed:

- If construction or operation would lead to accelerated wind or water erosion and sedimentation.
- If the project would exacerbate flood conditions in the vicinity of the project.
- If the project's water use would cause a substantial, or potentially substantial, adverse change in the quantity or quality of groundwater or surface water.
- If project construction or operation would lead to degradation of surface or groundwater quality.
- If the project would comply with all applicable LORS.

These criteria are based on the California Environmental Quality Act (CEQA) Guidelines and performance standards. The threshold of significance for project impacts is based

on the ability of the project to be built and operated without violating applicable erosion, sedimentation, flood, surface or groundwater quality, water supply, or wastewater discharge standards. The federal, state, and local LORS and policies presented in **Soil and Water Resources Table 1** represent the applicable standards used for the MEP analysis. These LORS support a comprehensive regulatory system, with adopted standards and established practices designed to prevent or minimize adverse impacts to soil and water resources. For those impacts that exceed standards or result in a significant adverse impact, conditions of certification may be necessary to ensure compliance with standards or reduce the impacts to a less than significant level.

Staff's analysis, determination of potential impacts, and evaluation of appropriate mitigation measures relies on estimates and information provided by Mariposa regarding the construction and operation of MEP. Applicable scientific, technical, and LORS/policy-related literature and expert opinion were also consulted in the development of staff's analysis.

DIRECT/INDIRECT IMPACTS AND MITIGATION

This direct and indirect impact and mitigation discussion is subdivided into impacts related to construction and those related to operation. For each potential impact evaluation, staff briefly describes the potential effect and applies the threshold criteria for significance to its analysis of the project. If mitigation is warranted, staff provides a summary of Mariposa's proposed mitigation and a discussion of the adequacy of the proposed mitigation. In the absence of Mariposa's proposed mitigation or if mitigation proposed by Mariposa is inadequate, staff mitigation measures are recommended. Staff also provides specific conditions of certification related to a potential impact and the required mitigation measures.

Construction Impacts and Mitigation

Construction of MEP would include soil excavation, grading, installation of utility connections (linears) and the use of water, primarily for dust suppression. Potential impacts to soils related to increased erosion or release of hazardous materials are possible during construction. "Low threat discharges" from hydrostatic testing could also result in minor water quality impacts. Potential stormwater impacts could result if increased runoff flow rates and volume discharges from the site were to increase flooding downstream. Water quality could be impacted by discharge of eroded sediments from the site, discharge of hazardous materials released during construction, or migration of any existing hazardous materials present in the subsurface soil and groundwater. Project water demand during construction could affect groundwater or surface water resources. Potential construction related impacts to soil, stormwater, and water quality or quantity, including the applicant's proposed mitigation measures and staff's proposed mitigation measures are discussed below.

Erosion Control and Stormwater Management

Construction activities for managing erosion and stormwater must be addressed to avoid potential adverse impacts to water quality and soil resources. Accelerated wind and water-induced erosion may result from earth-moving activities associated with construction of the proposed project. Alteration of the soil structure leaves soil particles

vulnerable to detachment and removal by wind or water. Soil erosion can cause the loss of topsoil and can increase the sediment load in surface receiving waters downstream of areas affected by construction activity. Increasing the amount of impervious surfaces would increase the amount of runoff and peak discharges. Runoff from stormwater can also convey contaminants to soil, groundwater, and surface water if hazardous materials and waste are not properly stored, handled, and disposed.
Construction activity would increase short-term soil erosion. With the implementation of Best Management Practices (BMPs) including stabilizing construction entrances, applying water for dust suppression, placement of silt fencing, berms, and revegetation as needed, erosion would be reduced to less than significant and water quality would not be adversely affected by runoff from the site.

Finished grade slopes would drain into one of two constructed swales routing upgradient stormwater around the site. To reestablish grass vegetation, finished grade slopes and swales would be hydroseeded with a native grass mixture, and mulched to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow. Controlled watering would be applied if seasonal rainfall is not sufficient. The entire area would be regularly monitored for signs of erosion; areas would be re-vegetated as necessary to maintain adequate soil protection (CH2M 2009f). Staff agrees that vegetating disturbed soil soon after construction is an effective stabilization measures for controlling erosion.

Staff recommends two conditions, **SOIL&WATER-1** and **SOIL&WATER-2,** which address mitigation measures designed to reduce any soil erosion and stormwater construction impacts to less than significant levels.

Condition of Certification **SOIL&WATER-1** would require the project owner to comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity, including the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) for Construction.

To qualify for the NPDES statewide General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit), prior to construction Mariposa would be required to develop a Construction SWPPP to prevent the offsite migration of sediment and other pollutants, and to reduce the effects of runoff from the laydown sites and linears to offsite areas. Successful implementation of the SWPPP would ensure that construction impacts to soil resources are mitigated to a less-than-significant level. SWPPP procedures include submitting a Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) and developing the SWPPP prior to the start of construction activities. The construction SWPPP would also be submitted to both the Alameda County Flood Control and Water Conservation District and Contra Costa County Grading Division for review.

Condition of Certification **SOIL&WATER-2** requires the project owner to obtain Compliance Project Manager (CPM) approval for a site-specific final DESCP that addresses all project elements. Compliance with the requirements of this condition would reduce potential soil erosion and stormwater quality impacts to less than significant for the construction phase of the project.

Temporary Erosion Control Measures

During construction of the MEP project, activities such as grading could potentially destroy habitat and increase rates of erosion during construction. Additionally, construction materials could contaminate runoff or groundwater if not properly stored and used. Mariposa would implement erosion and sediment control BMPs to follow the progress of grading and construction throughout the entire construction period (MEP 2009a).

Temporary erosion and sediment control measures would be implemented at the start of construction, and would be evaluated, inspected and maintained during construction. Mariposa proposes BMP measures to include silt fences, mulching, and revegetation. These measures would be removed from the site after the completion of construction or converted to permanent BMPs.

Disturbed areas would be stabilized with plastic covers, erosion control blankets, or mulch before rain events. In addition, linear sediment controls would be used along the toe of the slope, face of the slope and at the grade breaks of exposed slopes. Placement of linear sediment controls at grade breaks of exposed slopes would interrupt the length of the slope and reduce erosion by reducing runoff velocity.

Sediment barriers would be used to prevent water erosion by slowing runoff and trapping sediment. Sediment barriers include straw bales, sand bags, straw wattles, and silt fences. They would be placed downstream of disturbed areas, at the base of exposed slopes, and along streets and property lines below the disturbed area. Since the site would be constructed on rolling terrain, sediment barriers would also be placed along the entire site perimeter. Sediment barriers would be properly installed (staked and keyed), then removed or used as mulch after construction. Any soil stockpiles, including sediment barriers around the base of the stockpiles, would be stabilized and covered (MEP 2009a).

Non-active areas would be stabilized as soon as feasible after the cessation of construction activities and no later than 14 days after construction has ceased in that portion of the site. Staff believes these temporary erosion control measures, along with the specific locations where they would be used onsite, should be included in the final construction SWPPP and submitted to both the Alameda County Flood Control and Water Conservation District and Contra Costa County Grading Division prior to construction as specified in Condition of Certification **SOIL&WATER-1.**

Laydown Areas

Laydown areas are proposed during construction of the MEP site and its associated linears. Vehicle traffic and equipment staging associated with these areas would result in soil compaction. Soil compaction increases soil density by reducing soil pore space. This, in turn, exacerbates the ability of the soil to absorb precipitation and transmit gases for respiration of soil microfauna. Soil compaction can result in increased runoff, erosion, and sedimentation.

The project site laydown area would need to be graded prior to use; therefore, it would be covered with gravel to minimize soil erosion and allow for wet season use. Laydown areas associated with the linears would not require grading and would not utilize gravel covering. Heavy equipment in the laydown areas would be stored on dunnage (loose scrap material that provides ventilation) to protect it from ground moisture. Compaction beneath the laydown area would be mitigated by removing and stockpiling topsoil for later reuse and by deep ripping the subsoil after removing construction materials and gravel covering. Given the limited area over which permanent compaction would occur, it is considered that this impact would be less than significant. It is also assumed that soil loss would be negligible from the laydown areas once it is revegetated.

The highest potential for soil loss would occur immediately following grading or during the period following the end of construction. Mariposa has described the existing condition of the proposed laydown area as vegetated with non-irrigated grazing grasses and stated that this area would be returned to its current condition (MEP 2009a). With the implementation of Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-2**, staff believes that potentially significant impacts caused by erosion or storm water discharge during MEP construction would be mitigated.

Linear Areas

Linear features associated with the proposed MEP facility include water, natural gas, and transmission lines. Associated construction activities include grading for all linear features and trench excavation for underground pipelines. Linear elements would be installed in 4-foot wide trenches using a 10-foot construction corridor. Overhead transmission lines would utilize poles with a 4-ft by 4-ft footprint. The linear areas would include soils with 3 to 15 percent slopes along both right-of-ways and agricultural areas (CH2M 2009f). Mariposa has submitted a request to the U.S. Army Corps of Engineers (USACE) requesting a jurisdictional determination of Waters of the U.S. for several ephemeral streams and drainage areas that cross the proposed alignment of the project linears, including the alternative water supply pipeline to the Mountain House Community Services District Wastewater Treatment Plant. The USACE has not yet responded with their determination.

Mitigation efforts associated with linear areas would be similar to those for the laydown areas and project site. Graded areas would be graveled immediately following completion and silt fences would be installed to prevent runoff out of the linear construction areas. Staff believes the implementation of **SOIL&WATER-1** and **SOIL&WATER-2** would mitigate construction impacts in the linear areas. Per **SOIL&WATER-1**, the construction SWPPP should be submitted to the Contra Costa County Grading Inspector for comment and review of impacts specifically related to the water supply pipeline (Swartz 2010).

Water Supply

The primary use of water for construction is dust control, soil compaction, concrete washout, and pipeline/tank hydrostatic testing. Mariposa's source of their construction water is from BBID Canal 45 (CH2M 2010b). The raw surface water supplier, Byron Bethany Irrigation District (BBID), is a public agency operating under the California Water Code. BBID is a multi-county special district encompassing approximately

~~19~~30,000 acres, with lands in Alameda, Contra Costa and San Joaquin Counties and is the jurisdictional water purveyor in the area (CEC, 2003). The source of BBID's water supply for MEP would be pre-1914 water rights that were established by the Byron-Bethany Irrigation Company and ~~bought~~ acquired ~~by~~ with the formation of BBID in 1921 (pers. Comm. Rick Gilmore). Mariposa estimated the construction water use to be approximately 2,500 gallons per day which includes water for pipeline/tank hydrostatic testing. Assuming an anticipated construction period of eight to nine months, the total amount of water required for construction is between 600,000 and 675,000 gallons (1.8 to 2.1 acre-feet). Staff concludes that the project's construction water use is not likely to cause any adverse change in the availability of surface water and therefore considers any impact resulting from the project's construction water use to be less than significant.

~~BBID obtains their water supply (consisting of pre-1914 water rights) from the State Water Project (SWP) Harvey O. Banks Pumping Plant Intake Channel in the San Joaquin and Sacramento River Delta. BBID's water supply is not SWP water and is not subject to pumping restrictions placed on SWP operations. Because of pumping restrictions in the Delta, staff believes that other water users would be impacted by the use of fresh water for MEP construction. Staff proposes that MEP mitigate for construction water use through the implementation of a water conservation program.~~

~~Staff recommends in Condition of Certification **SOIL&WATER-4** that requires MEP to work with BBID (or secondarily, through Contra Costa Water District or Alameda Zone 9) to develop and implement a local water conservation program to mitigate for the use of fresh water for construction purposes. The establishment of this program is needed prior to site operations to ensure conservation efforts begin simultaneously with operational water use (CEC 2010q, CEC 2010r).~~

Groundwater

During construction, the MEP site would not directly impact groundwater resources with the implementation of Condition of Certification **SOIL&WATER-1.** The construction SWPPP would provide specific guidelines for protecting groundwater resources should groundwater be encountered during construction. Excavation dewatering water would be contained in portable tanks and sampled prior to disposal offsite.

Wastewater and Sanitary Waste

During the construction period, Mariposa states that all sanitary waste would be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal at an appropriate receiving facility (MEP 2009a). Equipment wash water would also be collected and disposed of offsite; therefore, there would be no impacts from disposal of sanitary wastewater. Staff recommends, as part of Condition of Certification **SOIL&WATER-1,** that Mariposa handle the wastewater from hydrostatic testing similar to the handling of the equipment wash water. **SOIL&WATER-1** requires that the construction SWPPP include a description of the handling, storing and disposal of all construction wastewater to ensure potential impacts related to construction wastewater are mitigated.

Operational Impacts and Mitigation

Operation of MEP could lead to potential impacts to soil, stormwater runoff, water quality, water supply, and wastewater treatment. Soils may be potentially impacted through erosion or the release of hazardous materials used in the operation of MEP. Stormwater runoff from the MEP site could result in potential impacts if increased runoff flow rates and volumes discharged from the site increase downstream flooding. Water quality could be impacted by discharge of eroded sediments from the MEP site, or discharge of hazardous materials released during operation. Water supply for plant processes, cooling, fire protection and landscape irrigation could lead to potential quantity or quality impacts to regional groundwater or surface water resources. Potential impacts to soil, stormwater, water quality, water supply, and wastewater related to the operation of MEP, including the applicant's proposed mitigation measures and staff's proposed mitigation measures, are discussed below.

Stormwater

Since the existing conditions site includes no active stormwater management system, the proposed MEP site would control runoff such that discharge rates from the site would remain comparable to pre-construction rates. Existing runoff from the rolling hills of the proposed site is in the form of sheetflow to the north into ephemeral drainages that converge into a single constructed linear channel. The channel eventually discharges into Italian Slough (3.5 miles from the project site). When complete, the project site would be partially covered with impervious surfaces, which would increase runoff (compared to existing conditions) during moderate and large storm events. The proposed facility would manage stormwater runoff with a series of inlets and storm drain pipes that would convey the runoff to a proposed onsite extended detention basin located at the north end of the site (MEP 2009a).

The proposed extended detention basin would be sized to contain the facility site 100-year storm event and would release the volume over a minimum 48-hour period, such that the peak discharge rate is similar to that of the pre-construction condition. The extended detention basin would discharge into the proposed northeasterly-aligned constructed swale. The swale would transition through a 36" diameter culvert and discharge offsite to the north into the ephemeral drainage areas. Staff believes that with the implementation of Conditions of Certification **SOIL&WATER-2** and **SOIL&WATER-3**, operational impacts on drainage patterns would be less than significant. **SOIL&WATER-2** requires the project owner to identify results of stormwater BMP monitoring and maintenance activities and **SOIL&WATER-3** requires that Mariposa comply with all requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity.

Water Supply

Mariposa stated that the MEP facility would use an average of 34.8 acre-feet of fresh water per year provided that the facility runs a projected 600 total hours per year. Alternatively, should increased water be needed, the proposed plant would use a maximum of 187 acre-feet per year during 4,000 hours of operation. BBID confirmed that they have the ability and can meet the MEP facility demand (MEP 2009a). Mariposa's proposes to obtain raw water from BBID via a proposed ~~6~~10-inch-diameter,

1.8-mile-long water supply pipeline [MRL2]planned for construction in or along the east side of Bruns Road from existing Canal 45 south to the plant site.

Mariposa considered other water supply options. Mariposa performed an analysis for recycled water alternatives to determine the economic and environmental feasibility of constructing those pipelines. They determined that the closest recycled water sources were the Mountain House Community Services District (MHCSD) Wastewater Treatment Plant (WWTP) and the City of Tracy WWTP.

The MHCSD WWTP is approximately 5.5 miles away and, while future effluent from this facility will potentially be sufficient to meet MEP's needs, the current effluent is not enough to meet the priority recycled water use rights for the planned Mountain House golf course. MHCSD WWTP recycled water was also previously allocated to the proposed East Altamont Energy Center (CEC, 2003) should it be constructed. The City of Tracy WWTP is 11.5 miles from the proposed site and has sufficient recycled water for potential use at MEP; however, the environmental impact and prohibitive cost associated with the pipeline discouraged this water supply source. See the **ALTERNATIVES** section for a complete analysis of these recycled water sources.

BBID has a legal entitlement pursuant to its pre-1914 water rights to divert water ~~receives raw water (based on pre-1914 water rights)~~ from the Sacramento-San Joaquin Delta. BBID's original diversion on Italian Slough, a tributary of Old River, was destroyed as part of the construction of the Harvey O.Banks Pumping Plant. DWR granted BBID permanent and perpetual use of the Banks Pumping Plant Intake Channel in replacement for BBID's original point of diversion. BBID currently diverts its pre-1914 water rights via its own pumping plants located on the Banking Pumping Plant Intake Channel. ~~via the State Water Project (SWP) Harvey O. Banks Pumping Plant Intake Channel. BBID's water supply is not SWP water. In drought years, while both the CVP and SWP limit allocations to irrigation districts throughout California, BBID services in the vicinity of MEP remain unaffected by means of pre-1914 water rights acquired by BBID in 1921 and an agreement with the California Department of Water Resources (DWR) for a consistent 50,000 AFY supply (pers. Comm.. Rick Gilmore). Staff is concerned that water supply for MEP through BBID's pre-1914 water rights could increase limitations for other Delta-source water users during drought years. Additionally, the Delta water supplies may be further curtailed in the future to address requirements to support endangered fisheries and other environmental needs.~~

Staff is recommending Condition of Certification **SOIL&WATER-4** to limit the MEP facility to maximum water use of 187 acre-feet per year. **SOIL&WATER-4** requires the project owner to install metering devices on all water supply pipelines and submit monthly water usage to confirm the site is in compliance with the annual water use limit. ~~Condition of Certification **SOIL&WATER-4** also requires Mariposa to fund a local water conservation program implemented by BBID (or secondarily Contra Costa Water District or Alameda Zone 7) to offset MEP's use of fresh water from the Sacramento-San Joaquin Delta.~~ The water rate structure to be established by BBID for the MEP will include a proportional water conservation fee sufficient to fund BBID's water conservation efforts. BBID has in place current and future improvement plans including irrigation ditch lining or replacement with modern piping systems, as well as, pump station upgrades that will significantly reduce losses to seepage, evaporation and

operational spills within the District. The water conservation fee component in MEP's water rate will be based on actual water used. Staff believes with the implementation of **SOIL&WATER-4** operation impacts on water supply will be less than significant. ~~BBID would need to identify specific projects that would be funded (in-part or wholly) by the water conservation fee, and would need to quantify the water savings resulting from the funded projects and the costs per acre-foot to determine the appropriate fee. Funding of current and future improvements within BBID as part of a water conservation program would offset water used by the plant during operations.~~

~~Alternatively, if BBID cannot develop a verifiable, cost effective water conservation program, the water conservation fee could be paid to local water agencies including the Contra Costa Water District or Alameda Zone 7. These agencies are currently developing plans to meet the water conservation goals of SBx7-7, a statewide 20% reduction in urban per capita water use by 2020.~~ [MRL3]

Wastewater and Sanitary Waste

Mariposa proposes two separate wastewater collections systems for the proposed MEP facility: one for industrial wastewater and one for sanitary wastewater. The industrial wastewater collection system would collect process wastewater and stormwater runoff from all of the plant equipment process areas and route it to sumps. The industrial wastewater would then flow to the onsite oil/water separator before treatment by the onsite, truck-mounted walnut shell activated carbon filtration ZLD system. The treated ZLD reclaim water then would be recycled to the raw water storage tank for plant process water usage. Once the activated carbon is sufficiently used, a fresh supply would be implemented and the contents of the "used" truck would be hauled offsite to a licensed disposal facility. Oily waste from the oil/water separator would be contained in 55-gallon drums and hauled offsite for proper disposal.

Additionally, approximately 478 gallons of sanitary wastewater from toilets, sinks, and showers would be routed to an onsite septic tank. The sanitary wastewater would then be transported offsite by a licensed hauler to a licensed facility. Staff is proposing **SOIL&WATER-5,** which requires the project owner to submit proof of proper wastewater disposal, in accordance with waste discharge requirements of the Clean Water Act (CWA).

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts consist of impacts that may occur as a result of the proposed project in combination with impacts from other past, present and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Temporary and permanent disturbances associated with construction of the proposed project would cause accelerated wind- and water-induced erosion. However, staff has concluded that the implementation of proposed mitigation measures, the SWPPP and the DESCP would ensure that the project would not contribute significantly to cumulative erosion and sedimentation impacts.

The industrial wastewater and contact stormwater from the MEP site would be routed to an onsite holding tank and hauled offsite for disposal at a licensed facility. All sanitary

waste water would be discharged into a septic tank then hauled offsite for disposal. Therefore, no wastewater-related cumulative impacts are expected. The stormwater discharge would be retained on site by the extended detention basin such that the outfall discharge rates would not be greater than pre-development conditions; therefore, MEP would not exacerbate flooding conditions in the area.

The Mariposa project would use about two acre-feet of fresh water for construction, assuming average daily use, during the entire eight to nine month construction period. MEP would use a maximum or peak of 187 AFY of fresh water supplied from the BBID, while averaging 34.8 AFY when operating at 600 hours annually with 200 startup and shutdown events in normal years. Staff does not consider the project's use of the BBID water in combination with other uses of this water to be a cumulatively significant impact.

COMPLIANCE WITH LORS

The Energy Commission's power plant certification process requires staff to review each of the proposed project's elements for compliance with LORS and state policies. Staff has reviewed the project elements and concludes that the proposed MEP project would comply with all applicable LORS addressing protection of water resources, storm water management, and erosion control, as well as drinking water, use of freshwater, and wastewater discharge requirements, as long as staff's proposed conditions of certification are adopted and implemented. Summary discussions of project compliance with significant LORS and policies are provided below.

STORMWATER

Clean Water Act

Staff has determined that MEP would satisfy the requirements of the National Pollutant Discharge Elimination System (NPDES) permit with the adoption of Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-3**. These conditions require the development and implementation of a Stormwater Control Plan in conjunction with the construction Storm Water Pollution Prevention Plan (**SOIL&WATER-1**) and the industrial Storm Water Pollution Prevention Plan (**SOIL&WATER-3**).

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Staff has concluded that MEP would satisfy the applicable requirements of the Porter-Cologne Water Quality Control Act and adequately protect the beneficial uses of waters of the state through implementation of federal, state, and local requirements for management of storm water discharges and pollution prevention and compliance with local grading and erosion control requirements, and compliance with local onsite wastewater treatment system (septic system) requirements.

SWRCB Policy 75-58 and Energy Commission—Integrated Energy Policy Report (IEPR)-Power Plant Water Use and Wastewater Discharge Policy

The California Energy Commission, under legislative mandate specified in the *2003 Integrated Energy Policy Report*, (policy) and State Water Resources Control Board Resolution 75-58, will approve the use of fresh water for cooling purposes by power plants it licenses only where alternative water supply sources and alternative cooling technologies are shown to be environmentally undesirable or economically unsound. The IEPR policy also requires the use of zero-liquid discharge (ZLD) technologies unless such technologies are shown to be "environmentally undesirable" or "economically unsound."

MEP would utilize ZLD technologies. The primary wastewater collection system would collect process wastewater and stormwater runoff from all plant equipment process areas. The collected wastewater and stormwater would then be routed to sumps followed by the onsite oil/water separator before treatment by the activated carbon filtration ZLD system. The treated ZLD reclaim water would then be recycled to the raw water storage tank for plant process water usage.

Additionally, MEP proposes to use an alternative cooling technology to reduce the amount of water required for plant operation: an air-cooled radiator would reject heat from the combustion turbine inlet air chiller refrigeration system. Staff concurs with Mariposa that the use of an air cooled radiator is an economically sound practice that provides environmental benefits from significantly reduced water use.

~~The fresh water would be provided by BBID which receives its water allocations for the MEP area from a pre-1914 water rights agreement (pers. Comm. Rick Gilmore). During periods of shortage while CVP and SWP users will receive reduced allocations, BBID will receive its entire 50,000 acre-feet entitlement. A condition of shortage results from over-drafting of the normal water supply, which may be precipitated by drought conditions. Fewer allocations during a condition of shortage would reduce impacts to other users. Fewer allocations could also reduce Delta ecosystem and water quality impacts caused by excessive withdrawals from the Delta.~~

Staff reviewed the East Altamont Energy Center (EAEC) (Docket No. 01-AFC-4), the Tesla Power Plant (Tesla PP) (Docket No. 01-AFC-21), and the GWF Tracy Combined Cycle Power Plant (GWF Tracy) (Docket No. 08-AFC-07) documents on the use and availability of recycled water supplies. These three facilities are planned in the vicinity of MEP. In the case of the EAEC, the Commission accepted the judgment of BBID that sufficient supplies of fresh water would be available to meet all district needs, including EAEC, without the use of recycled water. The Commission also noted that it is to the benefit of all parties to find a cost effective manner of utilizing the increasing amounts of recycled water that would result from development in the district.

Staff reviewed the recycled water issues at EAEC, Tesla PP, and GWF Tracy and investigated the current recycled water availability since these applications were reviewed by the Energy Commission. As the **ALTERNATIVES** section suggests, there are limited recycled water resources in the area. The Mountain House Community Services District Waste Water Treatment Plant (MHCSD WWTP), in San Joaquin

County, is the nearest potential source of recycled water for MEP (about 5.5 miles away) and is being built out in phases. The MHCSD WWTP is currently designed with a process daily flow of 3.0 million gallons per day (MGD); however, the average 2008 effluent was only 0.483 MGD. The total tertiary-treated water available from the MHCSD WWTP was 560 acre-feet. The City of Tracy WWTP plant has a much greater supply of recycled water; however, staff has concluded that the conveyance costs required for the11.5 mile-long pipeline would be an economically unsound alternative (see Alternatives section).

The project also proposes to use approximately 6 to 18 AFY of potable water for CTG water spray intercooling (SPRINT) that is integrated into the GE LM6000PC SPRINT combustion turbine. Staff considers the SPRINT technology water use to be power plant cooling because it uses water to cool the temperature of the air in the combustion turbine compressor to increase output of the unit, especially during warm or hot weather. In addition to intercooling the air in the compressor, an inlet air chiller with a refrigeration cycle is also used to lower the temperature at the engine's compressor inlet to increase the efficiency and output of the CTG.

Staff would consider the project to be substantially in compliance with the intent of the Energy Commission water use policy ~~with project implementation of facility-specific water conservation measures and development and implementation of a regional water conservation program that would conserve a volume of potable water equivalent to the volume used by the project for SPRINT intercooling. Staff, therefore, recommends~~with the adoption of Condition of Certification **SOIL&WATER-4** limiting MEP's water usage to 187 per year. The water rate structure to be established by BBID for the MEP will include a proportional water conservation fee sufficient to fund BBID's water conservation efforts. BBID has in place current and future improvement plans including irrigation ditch lining or replacement with modern piping systems, as well as, pump station upgrades that will significantly reduce losses to seepage, evaporation and operational spills within the District. MEP's participation in BBID's water conservation efforts will result in conservation of fresh water supplies. ~~requiring the project owner to fund a local water conservation program to offset the fresh water used throughout the MEP facility. The water conservation program would allow a local water agency such as BBID to implement improvements in its water distribution network resulting in conservation of local fresh water supplies sufficient equal to the water used at MEP.~~

In addition, the Energy Commission's water policy also seeks to protect water resources from power plant wastewater discharges. To that end, the water policy specifies that the Energy Commission will require zero liquid discharge technologies (for management of power plant wastewaters) unless such technologies are shown to be 'environmentally undesirable' or 'economically unsound.' MEP proposes to use a zero liquid discharge system where sanitary waste would be handled with an onsite septic tank and all contact stormwater and plant industrial wastewater would be routed to an onsite storage tank. All tanks would be hauled offsite and properly disposed. Therefore, staff finds that the wastewater management would be in compliance with the intent of the water policy because it eliminates the significant portion of process wastewater discharge from the facility.

LOCAL LORS

Staff concludes that the implementation of Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-2**, MEP would satisfy the applicable requirements of all local LORS. The Construction SWPPP and DESCP should contain all information relative to grading and erosion control in order to prevent discharge and pollution to downstream drainages in Alameda and Contra Costa Counties.

NOTEWORTHY PUBLIC BENEFITS

Neither the applicant nor staff has identified any noteworthy benefits to soil or water resources that would be provided by the project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No written public comments from agencies or the public (non-intervenors) were submitted in reference to Soil & Water Resources.

CONCLUSIONS

Based on its assessment of the proposed Mariposa Energy Project (MEP), staff concludes the following:

- Implementation of Best Management Practices (BMPs) during MEP construction and operation in accordance with an effective Storm Water Pollution Prevention Plan (SWPPP) and a Drainage, Erosion and Sedimentation Control Plan (DESCP) would avoid significant adverse effects that could be caused by transport of sediments or contaminants from the MEP site and associated linear facilities by wind or water erosion.
- Stormwater runoff from the 10 acre site would not cause significant impacts with the implementation of the stormwater runoff swales and extended detention basin.
- The proposed fresh water supply for the project would not cause a significant adverse environmental impact on current or future users of the water supply. ~~with the implementation of a mitigation fee for each acre-foot of fresh water used, and paid to a water conservation program that would reduce impacts to other users to less than significant levels.~~
- Wit~~h the inclusion of facility-specific water conservation measures and the implementation of a regional water conservation program, T~~the proposed use of a freshwater supply for inlet air cooling and other industrial uses would be consistent with state water policy found in State Water Resources Control Board (SWRCB) Resolution 75-58, and the Energy Commission's 2003 Integrated Energy Policy Report (IEPR) water policy because there is no other economically feasible or environmentally desirable alternative.
- Consistent with IEPR, Mariposa Energy, LLC has proposed the use of a zero liquid discharge (ZLD) system to manage wastewater at the MEP facility.

- Mariposa Energy, LLC has proposed the use of an alternative cooling technology which is environmentally desirable and economically feasible to help meet the requirements of the 2003 IEPR and SWRCB Resolution 75-58.
- The proposed project would be constructed to comply with 100-year flood requirements and would not exacerbate flood conditions in the vicinity of the project.

Staff concludes that MEP would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources and would comply with all applicable laws, ordinances, regulations and standards (LORS) if all of the recommended conditions of certification are adopted by the Commission and implemented by Mariposa Energy, LLC (Mariposa).

PROPOSED CONDITIONS OF CERTIFICATION

SOIL&WATER-1: The project owner shall comply with the requirements of the General National Pollutant Discharge Elimination System (NPDES) permit for discharges of storm water associated with Mariposa Energy Project (MEP) construction activity. In order to comply, the project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the entire proposed project site, laydown areas, and linear areas.

Verification: At least 60 days before construction begins, the project owner shall submit a copy of the construction SWPPP to the Alameda County Flood Control and Water Conservation District and the Contra Costa County Grading Division for review. At least 30 days before construction begins, the project owner shall submit copies to the Compliance Project Manager (CPM) of all correspondence between the project owner and the Central Valley Regional Water Quality Control Board (RWQCB) regarding the General NPDES permit for the discharge of storm water associated with construction activities. This information shall include copies of the Notice of Intent and the Notice of Termination sent to the State Water Resources Control Board for the project construction.

SOIL&WATER-2: Prior to site mobilization, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion, and Sedimentation Control Plan (DESCP) that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in offsite flooding potential, meet local requirements, and identify all monitoring and maintenance activities. Monitoring activities shall include routine measurement of the volume of accumulated sediment in the stormwater extended-detention basin. Maintenance activities must include removal of accumulated sediment from the extended-detention basin when an average depth of 0.5 feet of sediment has accumulated in the detention basin. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1**. The DESCP shall contain the following elements. All maps shall be presented at a legible scale no less than 1 inch = 200 feet.

- ***Vicinity Map*** – A map shall be provided indicating the location of all project elements with depictions of all significant geographic features to include watercourses, washes, irrigation and drainage canals, and sensitive areas.
- ***Site Delineation*** – The site and all project elements (linears and laydown areas) shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.
- ***Watercourses and Critical Areas*** – The DESCP shall show the location of all nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the construction site. Critical areas mapped by the USACE shall also be shown.
- ***Drainage*** – The DESCP shall include hydrologic calculations for onsite areas and offsite areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow. Provide hydraulic calculations to support the selection and sizing of the drainage network, retention facilities and best management practices (BMPs). Spot elevations shall be required where relatively flat conditions exist. The spot elevations and contours shall be extended off site for a minimum distance of 100 feet in flat terrain or to the limits of the offsite drainage basins.
- ***Clearing and Grading*** – The plan shall provide a delineation of all areas to be cleared of vegetation. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance or areas to be preserved shall be properly identified and delineated on the plan maps.
- ***Project Schedule*** – The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.
- ***Best Management Practices*** – The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction.

BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.

- ***Erosion Control Drawings*** – The erosion-control drawings and narrative shall be designed, stamped, and sealed by a professional engineer, a Certified Professional in Erosion and Sediment Control (CPESC), or a Certified Professional in Storm Water Quality (CPSWQ).

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to Alameda County for review and comment. A copy shall be submitted to the CPM no later than 60 days prior to the start of site mobilization for review and approval. The CPM shall consider comments received from Alameda County. During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of stormwater BMP monitoring and maintenance activities.

SOIL&WATER-3: The project owner shall comply with the requirements of the General NPDES permit for discharges of storm water associated with industrial activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of the site. The project owner shall ensure that only stormwater is discharged onto the site. The project owner shall comply with the requirements of the general NPDES permit for discharges of storm water associated with industrial activity.

Verification: At least 30 days prior to commercial operation, the project owner shall submit the MEP operational SWPPP to the CPM. Within 10 days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and the RWQCB about the general NPDES permit for discharge of storm water associated with industrial activity. This information shall include a copy of the notice of intent sent by the project owner to the State Water Resources Control Board. A letter from the RWQCB indicating that there is no requirement for a general NPDES permit for discharges of storm water associated with industrial activity would satisfy this condition.

SOIL&WATER-4: Water used for project operation for process, sanitary, and landscape irrigation purposes shall exclusively be raw surface water from Byron-Bethany Irrigation District (BBID). Pumping or purchasing groundwater is prohibited. Water use shall not exceed the annual water-use limit of 187 acre-feet per year. The project owner shall monitor and record the total water used on a monthly basis. For calculating the annual water use, the term “year” will correspond to the date established for the annual compliance report (ACR) submittal.

Prior to using raw surface water for process needs, the project owner shall install and maintain metering devices as part of the water supply and distribution systems to monitor and record, in gallons per day, the total volume(s) of water supplied to MEP from BBID. Those metering devices shall be operational for the life of the project.

For the first year of operation, the project owner shall prepare an annual Water Use Summary, which will include the monthly range and monthly average of daily raw surface water usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet. For subsequent years, the annual Water Use Summary shall also include the yearly range and yearly average water use by the project. The annual Water Use Summary shall be submitted to the CPM as part of the ACR.

The water rate structure to be established by BBID for the MEP will include a proportional water conservation fee sufficient to fund BBID's water conservation efforts. BBID has in place current and future improvement plans including irrigation ditch lining or replacement with modern piping systems, as well as, pump station upgrades that will significantly reduce losses to seepage, evaporation and operational spills within the District.

~~The project owner shall fund a local water conservation program to comply with Energy Commission Water Policy and mitigate for the volume of BBID water consumed annually (potable water for personnel consumption, eyewash stations, showers, and sanitary needs not included). The local water conservation program shall be developed by a local water agency to conserve a volume of water equivalent to the annual water use reported by MEP. BBID shall have the first priority to develop a water conservation program including the methods for conservation, verification of the volume of water conserved, and the water conservation fee (per acre-foot) to be charged to MEP. The Contra Costa Water District or Alameda Zone 9 shall have a second priority to develop an acceptable water conservation program including methods, verification, and fees. The water conservation program(s) shall be provided to the CPM for review and approval. An initial water conservation fee payment shall be made to the selected program to offset fresh water used for construction and initiate the water conservation program. Water conservation fees are not required for use of recycled water during construction or operation.~~

Verification - At least 60 days prior to commercial operation of MEP, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the water supply and distribution systems. When the metering devices are serviced, tested and calibrated, the project owner shall provide a report summarizing these activities in the next annual compliance report. The project owner, in the annual compliance report, shall provide a Water Use Summary that states the source and quantity of raw surface water used on a monthly basis and on an annual basis in units of acre-feet. Prior annual water use including yearly range and yearly average shall be reported in subsequent annual compliance reports (ACR).

~~Verification:~~

~~At least 30 days prior to construction, the project owner shall submit the water conservation program(s) by the selected local water agency(s) to the CPM for review and approval. The water conservation program shall include:~~

~~a. Identification of the methods intended to achieve water conservation, including how the total volume of water conserved in a given year will be measured or computed.~~

b. Verification that the water conservation methods that have been funded by MEP have been successfully implemented and that the intended water conservation has been achieved.

c. Water Conservation Fees required on a per acre foot basis shall be calculated based on the estimated costs to implement, maintain, and monitor the water conservation efforts. For longer return period projects, water conservation fees may be aggregated to support financing or matched by other sources.

d. Reporting to the Project Owner and the CEC on an annual basis to demonstrate that the water conservation program has resulted in a conservation of water equal to or greater than the total water use at MEP from the previous year. For longer return period projects, water conservation shall be allocated based on the portion of funding provided by MEP. Any methods of BBID's water conservation program that are permanent (i.e. methods that result in a permanent reduction of BBID's diversion from the Delta) will mitigate or partially mitigate for the MEP water use the year the conservation method was implemented and every year thereafter.

The project owner shall provide proof that the initial water conservation fee was paid to a CPM-approved water conservation program prior to site operations. Annual use payments shall be determined based upon the approved rate on per acre-foot of fresh water reported annually in the ACR. Annual use payments to a water conservation program, confirmed by the CPM, shall be made no later than 60 days following CPM approval of the ACR. The project owner shall provide data and a report to the CPM describing the water conservation program with estimates of the annual "calculated" water saved in acre-feet in the subsequent ACR.

Payments for longer return period capital improvements should be accounted for using standard engineering economic analysis. Water use at MEP should also be tracked in an annual water use account. Once a long return period project is implemented and water conservation begins, water conservation should also be tracked on an annual basis. Conserved water from MEP funded projects should be deducted from the MEP water use account on an annual basis. Payment history, project funding, and MEP water use and conservation accounting shall be documented in the ACR.

SOIL&WATER-5: The project owner shall not discharge wastewater, other than non-contact stormwater, and shall provide evidence that industrial wastewater and contact stormwater are being disposed of at an appropriately licensed facility.

Verification: The project owner shall provide evidence to the CPM of proper industrial wastewater disposal, via a licensed hauler to an appropriately licensed facility, in the annual compliance report.

REFERENCES

CEC 2003- CEC Commission Decision: East Altamont Energy Center. Docket No. 01-AFC-4.

CEC 2010q - California Energy Commission/V Geronimo (tn: 58011) Record of Conversation with Contra Costa Water District. re: water conservation. August 6, 2010

CEC 2010r - California Energy Commission/V Geronimo (tn: 58012) Record of Conversation with Alameda County Zone 7 Water Agency re: water conservation. August 6, 2010

CH2M 2009f- CH2M Hill / D. Urry (TN 54287). Data response Sets 1A and 1B, dated 11/30/2009. Submitted to CEC on 11/30/2009.

CH2M 2010b- CH2M Hill / D. Urry (TN 55375). Data response Sets 1C dated 2/12/2010 Submitted to CEC on 2/12/2010.

CH2M 2010d- CH2M Hill / D. Urry (TN 55797). Applicant's Supplement B Additional Laydown Area Analysis, dated 3/5/2010 Submitted to CEC on 3/8/2010.

Swartz 2010- Contra Costa County (CCC) / David Swartz, CCC Public Works Department. Pers. comm. 05/03/2010.

MEP 2009a- Mariposa Energy LLC / B. Buchynsky (TN 51974). Application for Certification for Mariposa Energy Project, dated 6/15/2009. Submitted to CEC on 6/15/2009.

Reclamation 2005- U.S. Bureau of Reclamation, Long Term Renewal Contract Between the United States and Byron-Bethany Irrigation District, Signed July 25, 2005.