MAMMOTH PACIFIC I REPLACEMENT PROJECT

DRAFT ENVIRONMENTAL IMPACT REPORT

California Clearinghouse Number 2011022020

July 2011

CEQA Lead Agency:

Mono County
P.O. Box 2415
Mammoth Lakes, California 93546

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P.O. Box 2415
Mammoth Lakes, California 93546

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ACRONYMS

The following acronyms have been used in this Draft EIR.

AAQS	Ambient Air Quality Standards
ACTM	Airborne Toxic Control Measure
aka	Also known as
AIRFA	American Indian Religious Freedom Act
AMSL	Above mean sea level
BACT	Best Available Control Technology
bhp	Brake horse power
BLM	U.S. Department of Interior, Bureau of Land Management
BMP	Best Management Practices
BP	Before the present
CAA	Clean Air Act
CalARP	California Accidental Release Program
CalEEMod	California Emission Estimator Model™ modeling software
Cal/EPA	California Environmental Protection Agency
CARB	California Air Resources Board
CCR	California Code of Regulations
CCS	Cryptocrystalline silicate
CD-4	Casa Diablo IV Geothermal Project
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon monoxide
CO_2	Carbon dioxide
CRHR	California Register of Historical Resources
CTR	California Toxics Rule
CUP	Conditional Use Permit
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
DHS	California Department of Health Services
DNA	Deoxyribonucleic acid
DPR	California Department of Parks and Recreation
EHD	Mono County Health Department, Environmental Health Division
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMF	Edge-modified flakes

EPA	Environmental Protection Agency
ERP	Emergency Response Plan
ESA	Endangered Species Act
FDC	Fire Department Connection
FEMA	Federal Emergency Management Agency
FPD	Fire Protection District
FTEE	Full-time equivalent employee
GBUAPCD	Great Basin Unified Air Pollution Control District
GBVAB	Great Basin Valleys Air Basin
GHG	Greenhouse Gases
GPS	Geographic Positioning System
H_2S	Hydrogen sulfide
HCBZ	Hot Creek Buffer Zone
HCP	Habitat Conservation Plan
HMBP	Hazardous Materials Business Plan
HRI	California State Historic Resources Inventory
IS	Initial Study
ITLU	Integrated Two Level Unit (one form of OEC technology)
KOP	Key Observation Point
kV	Kilovolt
LADWP	Los Angeles Department of Water and Power
Ldn	A measure of community noise
Leq	A measure of ambient noise
Lmax	The maximum instantaneous noise level experienced during a given period of time
Lmin	The minimum instantaneous noise level experienced during a given period of time
LUD	Land Use Designation
LVHAC	Long Valley Hydrologic Advisory Committee
M-1	Proposed M-1 Replacement Plant to the MP-I Project
MCCDD	Mono County Community Development Department
MCEED	Mono County Economic Development Department
MCPWD	Mono County Public Works Department
MP-I	Mammoth Pacific I Geothermal Project
MP-II	Mammoth Pacific II Geothermal Project
mph	Miles per hour
MPLP	Mammoth Pacific Limited Partnership
MSDS	Material Safety Data Sheet
MW	Megawatts (1,000 kilowatts)
n-Pentane	Normal Pentane (a five-carbon straight chain alkane hydrocarbon)
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCG	Noncondensible gas(es)
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen dioxide
NOI	Notice of Intent

NOP	Notice of Preparation
NO_x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	Ozone
OEC	Ormat Energy Converter (Ormat Technologies, Inc.® binary power plant technology)
OPR	Governor's Office of Planning and Research
OS	Open Space (a Mono County Land Use Designation)
OSHA	Occupational Safety and Health Administration
Pb	Lead
PHI	California Point of Historical Interest
PLES-I	Pacific Lighting Energy Systems I Geothermal Project
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in aerodynamic diameter
PM_{10}	Particulate matter less than or equal to 10 microns in aerodynamic diameter
PSM Program	Process Safety Management Program
RE	Resource Extraction (a Mono County Land Use Designation)
RM	Resource Management (a Mono County Land Use Designation)
RMP	Risk Management Plan
ROG	Reactive Organic Gases
RWQCB	California Regional Water Quality Control Board
SCE	Southern California Edison
SCH	State Clearinghouse
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_4	Sulfate(s)
SP	Shovel probe
SPCC Plan	Spill Prevention, Control and Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
TMDL	Total Maximum Daily Load
USC	U.S. Code
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of Interior, Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile organic compound
VRPs	Visibility reducing particles
VRU	Vapor recovery unit

SUMMARY

This environmental document is a Draft Environmental Impact Report (Draft EIR). The Draft EIR was prepared for the Mono County Economic Development Department to meet the requirements of the California Environmental Quality Act (CEQA). This Draft EIR describes the existing environment that would be affected by, and the environmental impacts which could result from, the proposed Mammoth Pacific I (MP–I) Replacement Project (Project) and alternatives to this Project (see Figure 1).

SUMMARY OF THE PROPOSED PROJECT

The proposed Mammoth Pacific I Replacement Project (Project) has been proposed by Mammoth Pacific L.P. (MPLP) to replace the aging Mammoth Pacific Unit I (MP–I) power plant with a new, more modern and efficient binary power plant (M–1) while maintaining the existing geothermal wellfield, pipeline system and ancillary facilities. The existing MP–I project is a commercial geothermal development project located near Casa Diablo Hot Springs in Mono County, California that has been in operating since 1984. The existing MP–I Project is one of three existing binary geothermal power plants (MP-I, MP-II and PLES-I) co-located in what is known as the Casa Diablo geothermal development complex (see Figure 2). The MP-I Project consists of a binary power plant with a design capacity of about 14 megawatts (MW), a geothermal wellfield, production and injection fluid pipelines, and ancillary facilities located approximately 1,200 feet northeast of the intersection of U.S. Highway 395 and California State Route 203 on 90 acres of private (fee) land owned by Ormat Nevada, Inc. (Ormat), the parent company of MPLP.

The M-1 replacement plant site would be located entirely on private land about 500 feet northeast of the existing MP-I power generation facilities and immediately adjacent to the existing MP-II power plant. The proposed M–1 replacement power plant would be capable of generating, on average, approximately 18.8 MW (net) of electricity from the same geothermal resources currently supplying the existing MP–I plant. During M–1 plant startup operations, the existing MP–I plant would continue to operate until the new M–1 plant becomes commercial, after which time MPLP would close and dismantle the old MP–I plant. The transition period during which both the MP–I and M–1 operations would overlap would be a period of up to two years from the date the M–1 plant begins startup operations.

SUMMARY OF THE PROJECT ALTERNATIVES

Multiple alternatives to the *Proposed Project* were considered for evaluation in this Draft EIR. In particular, alternative project locations were considered. The distance which geothermal fluid can be transported and still retain sufficient heat to be used to generate electrical power is a significant constraint to the area in which feasible alternative power plant locations can be sited. Since the geothermal resource is site specific, the search for alternative plant sites was restricted to a search of locations near the existing Casa Diablo geothermal development area. Steep terrain, earthquake faults, seasonal flooding and thermal features in the vicinity were also significant constraints to identifying suitable alternative plant locations. Three alternative power plant locations were eventually considered, but only one of these alternative locations provided the opportunity to possibly reduce the adverse effects of one or more of the identified potentially significant impacts of the Proposed Project. As such, only that one *Alternative Power Plant Location* was selected for detailed analysis in this Draft EIR.

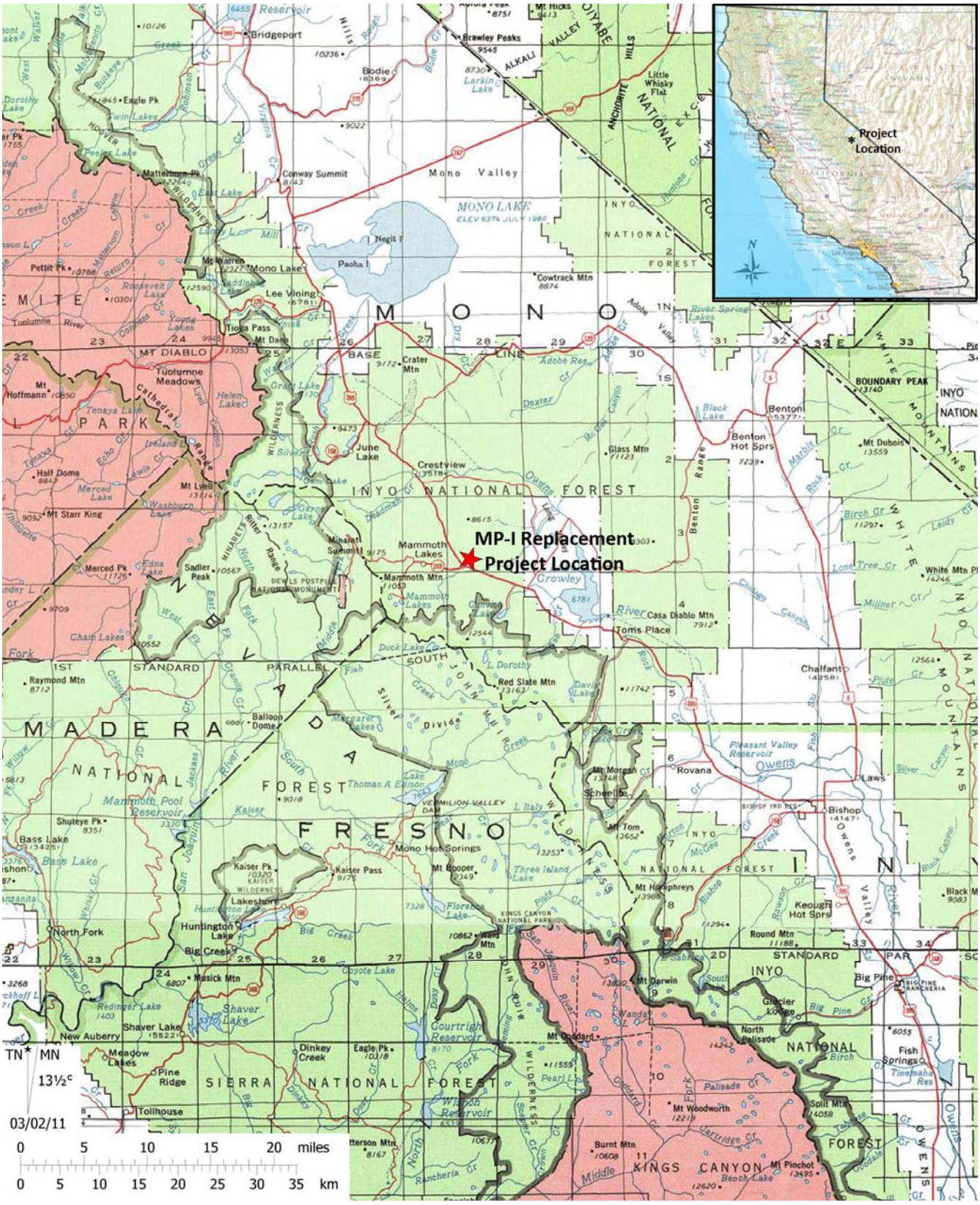

Figure 1: Project Location Map – Mammoth Pacific I Replacement Project Location

Figure 2: Existing Casa Diablo Geothermal Complex and Proposed M–1 Replacement Plant Site

A preliminary assessment was also undertaken to evaluate the feasibility of other possible Project Alternatives, including: (a) locating the replacement plant in the footprint of the existing plant; (b) locating a power plant site at another location on the existing site; and (c) constructing and operating a plant of smaller size with reduced capacity. In each case, these alternatives were determined to be either infeasible or conflicted with most of the objectives of the Project (see Section 2.2).

Two Project Alternatives are evaluated in detail in this Draft EIR. The first alternative is the construction and operation of a replacement plant similar to the one proposed for the M-1 replacement plant site, but it would be located about one-quarter mile north of the existing MP-I plant site. This *Alternative Power Plant Location* project alternative was selected because it would be potentially less visible to the public than the *Proposed Project*. The *Alternative Power Plant Location* would be located entirely on public land within the Inyo National Forest. As such, if this Project Alternative is chosen, the Project would require approvals from federal agencies and additional environmental assessment in conformance with the National Environmental Policy Act (NEPA).

The second alternative evaluated is the CEQA required *No Project Alternative* in which neither the *Proposed Project* nor the *Alternative Power Plant Location* alternatives would be approved, and the requested Conditional Use Permit for the proposed Mammoth Pacific I Replacement Project would be denied.

SUMMARY OF THE ASSESSMENT

An Initial Study of the potential environmental impacts of the *Proposed Project* was conducted on behalf of Mono County. The Initial Study was prepared by the Mono County Economic Development Department (MCEDD) and the Mono County Community Development Department (MCCDD). As a result of the Initial Study, and comments received from responsible/trustee agencies and the public during scoping for this Draft EIR, the following environmental resource topics were identified for detailed environmental assessment in the Draft EIR.

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise

The Draft EIR considers each of the Project Alternatives and evaluates the impacts that would occur during project construction, operation of the replacement M-1 plant, decommissioning of the existing MP-I power generation facilities, interim site restoration and end of Project site reclamation. The Draft EIR also provides an assessment of the cumulative effects of the *Proposed Project*, existing projects, and reasonably foreseeable projects identified by the MCEDD and the MCCDD.

The following tables provide a summary of the environmental protection measures adopted by the Applicant as part of the MP-I Replacement Project; the potentially significant impacts resulting from the Project and mitigation measures to reduce the adverse effects of the impacts; other adverse effects of the Project and measures recommended to reduce these adverse effects; and selected standards, codes and

permit requirements applicable to the Project. A separate table has been prepared for each Project Alternative, including: the *Proposed Project* (Table 1); the *Alternative Power Plant Location* (Table 2); and the *No Project Alternative* (Table 3). Each table is organized in the order of the respective environmental resource topics evaluated in detail in the Draft EIR.

It was determined that the *Proposed Project* would be the *Environmentally Superior Alternative* as defined by CEQA.

Table 1: *Proposed Project* Impacts, Mitigation and Compliance Summary

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
Aesthetics	1. Power plant lighting would be projected downward to mitigate nighttime visibility of the facilities. 2. An Outdoor Lighting Plan would be prepared and implemented for the M–1 plant site in conformance with the Mono County Dark Sky Regulations. 3. The M–1 facility structures would be painted in an earth–tone greenish color similar to the existing plants to help blend into the background. 4. The M-1 plant site would save a large pine tree in the southwest corner of the site to provide some visual screening of the plant site.	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to prepare and implement an Outdoor Lighting Plan in conformance with the Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23). 2. Applicant would be required to obtain a variance from the County in order to construct an aboveground electrical transmission line as part of the Project. 3. Applicant would be required to obtain approval for a height exception from the County under Section 04.110 (Building Heights) of the Mono County Code to exceed the 35-foot height limit for mechanical appurtenances.
Air Quality	1. An Authority to Construct permit for the new power plant would be obtained from the GBUAPCD. 2. Permits to Operate the diesel fueled emergency generator	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to establish procedures that ensure that neither geothermal exploration nor development will cause

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	and firewater pump generator would be obtained from the GBUAPCD. 3. A vapor recovery unit (VRU) would be used to capture motive fluid that could otherwise be released during plant maintenance. 4. The Applicant has also adopted the following measures to reduce fugitive dust emissions from the Project: • Restricting surface disturbance to the area within the proposed site grading plan; • Routine watering of disturbed surfaces and building materials; • Limiting maximum construction vehicle speeds to 20 miles per hour (mph); • Restricting construction activities during periods of high wind (i.e., greater than 25 mph); • Watering or covering all materials transported onto or off of the construction site; • Paving the plant			violations of state or federal ambient air quality standards or the rules and regulations of the GBUAPCD (Mono County Conservation/Open Space Element, Energy Resources, Goal 1, Objective G. <u>Policy 1</u>: Permit conditions shall require compliance with all requirements of the regional air pollution control district, and with all other applicable provisions of the Conservation/Open Space Element. *Action 1.1*: Air quality shall be monitored by a representative of the MCEDD, or the regional air pollution control district with jurisdiction. The costs of such monitoring shall be funded by the permit holder or project operator. 2. Applicant would be required to obtain permits to construct and operate each source of air emissions from the

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***Proposed Project*:**				
	maintenance road; and • Covering all unpaved plant site surfaces with gravel after final grading.			proposed power plant from the GBUAPCD.
Biological Resources	1. Baseline botanical and biological resource surveys of the Project site were undertaken. 2. The Project would implement all environmental protection measures to reduce the adverse effects of the Project on biological and botanical resources recommended in the baseline botanical and biological resources survey reports, including: a. <u>Noxious Weed Control</u> • All trucks and construction equipment, that are expected to be off existing roads, would be washed to remove dirt and plant parts prior to entering the project area. • All erosion control materials would be certified weed free. • Revegetate disturbed sites to minimize the impacts from cheatgrass. b. <u>Best Management Practices</u>	<u>Significant Impact</u>: MPLP is currently conducting the hydrologic and biological monitoring prescribed by Mono County General Plan, but existing permit requirements for such monitoring only exist under the MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings supporting the critical habitat of the Owens tui chub, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended.	<u>Adverse Effects</u>: An optional new interconnection transmission line may be constructed for the replacement plant that could be a collision or electrocution hazard to migratory birds. The potential affect of the optional short interconnection transmission line on birds would not be a significant impact under CEQA but the following measures are recommended to reduce the potential adverse effects of the Project. 1. Bio Measure 1: The optional interconnection transmission line shall be constructed with bird diverters to reduce the potential for bird collisions with the power line. 2. Bio Measure 2:The optional interconnection transmission line shall be constructed in conformance with guidance set forth in the	1. Applicant would be required to meet the Conservation/Open Space Element requirements for geothermal projects within the *Hot Creek Buffer Zone* and the *Hot Creek Deer Migration Zone*. Specifically, Objective B of Goal 1 under the Energy Resources section of the Conservation/Open Space Element states that *"Except for projects in the vicinity of Casa Diablo …" a proposed geothermal project within* [either zone] *… shall not be permitted … unless a finding is made that all identified environmental impacts of the proposed project are reduced to a less–than–significant levels by permit conditions."* 2. Objectives C through H of Goal 1 establish procedures and direction for addressing biologic and

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	• Do not allow uncontrolled off-site motorized vehicle use and dogs on site during construction especially during spring and fall migration. • Retain as many mature trees as possible. • Do not perform any unnecessary development, logging, or other activities that would disturb deer. c. <u>Cumulative Effects</u> • Prior to any spring and/or summer (April 15 – August 15) construction or maintenance activities, a qualified biologist should search any areas of suitable habitat for nesting activities. Nest sites would be protected with an appropriate buffer zone or construction and maintenance activities would occur outside the breeding period identified above. • Remove as little native vegetation as possible to minimize the impacts to nesting within the	1. Bio Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant. <u>Significance After Mitigation</u>: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.	*Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), as may amended or updated at the time of power line construction.	associated hydrologic impact mitigation and monitoring requirements from geothermal exploration and development. 3. The proposed M–1 replacement plant site is located within the existing Casa Diablo geothermal complex; and as such, Objective B would not be applicable to the Project, but Objectives C–H would be applicable.

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***Proposed Project*:**				
	Proposed Project area. • Revegetate new areas of disturbance not covered by the facility. Native species seeds should be used to provide additional native habitat for the wildlife species and to assist in the elimination or prevention of non-native plant species becoming the dominate plant species in what was originally native vegetation. • All project employees, contractors, and service personnel would be advised to neither harm nor harass wildlife in the project area. To avoid conflicts with domestic animals, unleashed domestic dogs and other domestic pets would not be allowed in the project area. • Any night light used in the project area would be shielded and directed directly at the work to minimize impacts to area wildlife.			

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***Proposed Project*:**				
Cultural Resources	1. Baseline cultural resource surveys of the Project site were undertaken. 2. The Applicant would implement all environmental protection measures to reduce the adverse effects of the Project on cultural resources recommended in the baseline cultural resources survey reports.	No significant impacts identified.	Adverse Effects: The archaeological investigation conducted at PLI-2 has found that the site does meet the requirements for inclusion on the California Register. Therefore, no further cultural resources management is recommended at the site. However, the following measure is required to reduce the potential for adverse effects of the *Proposed Project*. 1. Cultural Measure 1: In the unlikely event that human remains are encountered during the construction phase of the project, excavation activities shall be stopped and the County Coroner must be contacted. If the County Coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours and a Most Likely Descendant will be assigned to consult with the County to develop an agreement for the	

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***Proposed Project*:**				
			treatment and disposition of the remains.	
Geology and Soils	1. Applicant would implement those measures recommended in the report of the geotechnical investigation of the site to mitigate impacts due to geotechnical, soils and geologic constraints (see Appendix F). 2. All buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code adopted by Mono County.	No significant impacts identified.	No other measures prescribed.	1. All buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code
Hazards and Hazardous Materials	1. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 2. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. 3. The existing comprehensive	No significant impacts identified.	No other measures prescribed.	

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***Proposed Project*:**				
	program for hazardous material management and emergency response at the Casa Diablo geothermal complex would be expanded to include the M–1 plant site and operations, including: (a) the existing Spill Pollution Control and Countermeasure (SPCC) Plan; (b) the California Accidental Release Prevention (CalARP) Program; (c) the EPA Risk Management Plan (RMP); and (d) the OSHA Process Safety Management (PSM) Program to include the new M–1 plant. 4. The existing comprehensive program for fire prevention and suppression at the Casa Diablo geothermal complex would be amended and integrated to include the M–1 replacement plant facilities and operating procedures.			
Hydrology and Water Quality	1. An engineered grading plan would be prepared to incorporate measures to avoid or minimize erosion during Project construction and operations. 2. The grading plan would be submitted for review to the	Significant Impact: The existing MP-I Project began operations prior to the County's adoption of the hydrologic and biologic monitoring and remedial action program requirements for development within the Hot Creek Buffer Zone. Conformance	No other measures prescribed.	1. An engineered grading plan must be submitted and approved by the MCPWD prior to power plant site construction. 2. Applicant would be required to prepare and implement a Storm Water

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***Proposed Project*:**				
	Mono County Public Works Department (MCPWD) prior to implementation. 3. Best Management Practices (BMPs) identified in the grading and drainage plan would be adopted subject to approval by the MCPWD. The BMPs would include: placement of straw wattles and/or silt fencing along the perimeter of the site, and around topsoil stockpiles; and placement of silt fences in drainage swales at the exit point of the site. 4. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 5. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. 6. A Spill Pollution Control and Countermeasure (SPPC) Plan	with these program requirements provides an early warning of changes that could occur at the Hot Creek headsprings and a program of remedial actions that would be taken to prevent potential adverse effects on the Hot Creek Fish Hatchery if such changes are observed. However, the requirement to continue the monitoring and remedial action program only exists under the respective MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring and remedial action program for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings used for Hot Creek Fish Hatchery operations, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended.		Pollution Prevention Plan in conformance with the State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as may be amended).

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***Proposed Project*:**				
	would be prepared for the M-1 replacement plant site and integrated into the existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex.	1. Hydro Measure 1: The MP-I Project shall adopt the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D). Significance After Mitigation: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.		
Noise	1. All noisy construction activities would be limited to daylight hours. 2. Noise levels during construction activities would be kept to a minimum by equipping all on–site equipment with noise attenuation devices. 3. All project construction activities and normal operations would comply with applicable County noise requirements.	No significant impacts identified.	No other measures prescribed.	
Cumulative Effects	Not Applicable	No significant impacts identified.	Adverse Effects: Due to public concern that existing lighting at	1. Conformance with the Dark Sky Regulations

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***Proposed Project*:**				
			the Casa Diablo geothermal complex may be out of compliance with County regulations and brighter than necessary for safe operation of the facilities, the following measure is required to ensure that all exterior lighting at the complex is modified to achieve compliance with the County's Dark Sky Regulations: 1. Cumulative Aesthetics Measure 1: An outdoor lighting plan for the entire Casa Diablo geothermal complex, including the *Proposed Project*, the existing MP-II and PLES-I plants, and all related structures must be submitted for County review and approval in conjunction with the application for design review. This lighting plan must be in compliance with applicable provisions of Chapter 23, Dark Sky Regulations, of the Mono County Code.	(Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23).

Table 2: *Alternative Power Plant Location* Impacts, Mitigation and Compliance Summary

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
Aesthetics	1. Power plant lighting would be projected downward to mitigate nighttime visibility of the facilities. 2. An Outdoor Lighting Plan would be prepared and implemented for the M–1 plant site in conformance with the Mono County Dark Sky Regulations. 3. The M–1 facility structures would be painted in an earth–tone greenish color similar to the existing plants to help blend into the background. 4. The M-1 plant site would save a large pine tree in the southwest corner of the site to provide some visual screening of the plant site.	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to prepare and implement an Outdoor Lighting Plan in conformance with the Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23). 2. Applicant would be required to obtain a variance from the County in order to construct an aboveground electrical transmission line as part of the Project. 3. Applicant would be required to obtain approval for a height exception from the County under Section 04.110 (Building Heights) of the Mono County Code to exceed the 35-foot height limit for mechanical appurtenances.
Air Quality	1. An Authority to Construct permit for the new power plant would be obtained from the GBUAPCD. 2. Permits to Operate the diesel fueled emergency generator	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to establish procedures that ensure that neither geothermal exploration nor development will cause

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	and firewater pump generator would be obtained from the GBUAPCD. 3. A vapor recovery unit (VRU) would be used to capture motive fluid that could otherwise be released during plant maintenance. 4. The Applicant has also adopted the following measures to reduce fugitive dust emissions from the Project: • Restricting surface disturbance to the area within the proposed site grading plan; • Routine watering of disturbed surfaces and building materials; • Limiting maximum construction vehicle speeds to 20 miles per hour (mph); • Restricting construction activities during periods of high wind (i.e., greater than 25 mph); • Watering or covering all materials transported onto or off of the construction site; • Paving the plant maintenance road; and			violations of state or federal ambient air quality standards or the rules and regulations of the GBUAPCD (Mono County Conservation/Open Space Element, Energy Resources, Goal 1, Objective G. <u>Policy 1</u>: Permit conditions shall require compliance with all requirements of the regional air pollution control district, and with all other applicable provisions of the Conservation/Open Space Element. *Action 1.1*: Air quality shall be monitored by a representative of the MCEDD, or the regional air pollution control district with jurisdiction. The costs of such monitoring shall be funded by the permit holder or project operator. 2. Applicant would be required to obtain permits to construct and operate each source of air emissions from the proposed power plant from

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	• Covering all unpaved plant site surfaces with gravel after final grading.			the GBUAPCD.
Biological Resources	No baseline botanical or biological surveys of the *Alternative Power Plant Location* have been undertaken and would be required for comprehensive analysis of the Project Alternative. 1. The Project would implement all environmental protection measures to reduce the adverse effects of the Project on biological and botanical resources that may be provided in the recommended baseline botanical and biological resources surveys of the *Alternative Power Plant Location*, including the following anticipated recommendations from the surveys of the *Proposed Project* area: a. <u>Noxious Weed Control</u> • All trucks and construction equipment, that are expected to be off existing roads, would be washed to remove dirt and plant parts prior to entering the project area. • All erosion control	<u>Significant Impact</u>: From the information available, the impacts of plant operations on wildlife and habitat at the *Alternative Power Plant Location* would be very similar to those described for the proposed M-1 plant site. The potentially significant impact under CEQA on the Hot Creek headwater springs supporting the Owens tui chub critical habitat would be the same and the following measure is recommended. 1. Alt Bio Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the	<u>Adverse Effects</u>: The other identified biological resource impacts relative to the optional interconnection transmission line would not be considered significant, but to reduce the potential adverse effects of these impacts the two measures recommended for the *Proposed Project* are also recommended for development at the *Alternative Power Plant Location*, as follows. 1. Alt Bio Measure 1: The optional interconnection transmission line shall be constructed with bird diverters to reduce the potential for bird collisions with the power line. 2. Alt Bio Measure 2: The optional interconnection transmission line shall be constructed in conformance with guidance set forth in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), as	1. Applicant would be required to meet the Conservation/Open Space Element requirements for geothermal projects within the *Hot Creek Buffer Zone* and the *Hot Creek Deer Migration Zone*. Specifically, Objective B of Goal 1 under the Energy Resources section of the Conservation/Open Space Element states that *"Except for projects in the vicinity of Casa Diablo …" a proposed geothermal project within* [either zone] *… shall not be permitted … unless a finding is made that all identified environmental impacts of the proposed project are reduced to a less–than–significant levels by permit conditions."* 2. Objectives C through H of Goal 1 establish procedures and direction for addressing biologic and associated hydrologic impact mitigation and

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	materials would be certified weed free. • Revegetate disturbed sites to minimize the impacts from cheatgrass. b. <u>Best Management Practices</u> • Do not allow uncontrolled off-site motorized vehicle use and dogs on site during construction especially during spring and fall migration. • Retain as many mature trees as possible. • Do not perform any unnecessary development, logging, or other activities that would disturb deer. c. <u>Cumulative Effects</u> • Prior to any spring and/or summer (April 15 – August 15) construction or maintenance activities, a qualified biologist should search any areas of suitable habitat for nesting activities. Nest sites would be protected with an appropriate buffer zone or construction and maintenance activities would occur outside the	existing Conditional Use Permit for the MP-II Geothermal Power Plant. <u>Significance After Mitigation</u>: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.	may amended or updated at the time of power line construction. <u>Adverse Effects</u>: The alternative plant site is located on land administered by the Forest Service and approval from federal agencies would be required before development could occur at the *Alternative Power Plant Location*. It is recommended that the following measure be implemented prior to making a decision for development at the *Alternative Power Plant Location*. 3. Alt Bio Measure 3: Baseline botanical and biological surveys shall be conducted covering the *Alternative Power Plant Location* and surrounding lands, and the findings of these surveys shall be considered in the NEPA/CEQA environmental assessment required for the project prior to making a decision for development at the *Alternative Power Plant Location*.	monitoring requirements from geothermal exploration and development. 3. The proposed *Alternative Power Plant Location* is located within the vicinity of Casa Diablo; and as such, Objective B would not be applicable to the Project, but Objectives C–H would be applicable.

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	breeding period identified above. • Remove as little native vegetation as possible to minimize the impacts to nesting within the *Proposed Project* area. • Revegetate new areas of disturbance not covered by the facility. Native species seeds should be used to provide additional native habitat for the wildlife species and to assist in the elimination or prevention of non-native plant species becoming the dominate plant species in what was originally native vegetation. • All project employees, contractors, and service personnel would be advised to neither harm nor harass wildlife in the project area. To avoid conflicts with domestic animals, unleashed domestic dogs and other domestic pets would not be allowed in the project area. • Any night light used in			

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	the project area would be shielded and directed directly at the work to minimize impacts to area wildlife.			
Cultural Resources	1. A preliminary baseline cultural resource survey of the *Alternative Power Plant Location* site was completed. 2. It is presumed that the Applicant would implement all environmental protection measures to reduce the adverse effects of the Project at the *Alternative Power Plant Location* on cultural resources recommended in the existing and recommended baseline cultural resources survey reports.	No significant impacts identified.	Adverse Effects: No further cultural resources management is recommended at the site. However, it is recommended that the following measures be implemented at the *Alternative Power Plant Location* to reduce the potential adverse effects of the Project. 1. Alt Cultural Measure 1: Detailed cultural resources documentation shall be conducted covering the *Alternative Power Plant Location*, including a records search at the EIC as well as at the Inyo National Forest headquarters to determine if any sites have been previously recorded. Any cultural resources on federal land that may be affected by development at the *Alternative Power Plant Location* must be evaluated for listing eligibility on the National	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			Register of Historic Places. 2. Alt Cultural Measure 2: In the unlikely event that human remains are encountered during the construction phase of the project, excavation activities shall be stopped and the County Coroner must be contacted. If the County Coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours and a Most Likely Descendant will be assigned to consult with the County to develop an agreement for the treatment and disposition of the remains.	
Geology and Soils	1. Applicant would implement those measures recommended in the report of the geotechnical investigation of the site to mitigate impacts due to geotechnical, soils and geologic constraints. 2. All buildings and structures would be constructed to meet applicable earthquake safety	No significant impacts identified.	Adverse Effects: A preliminary geotechnical investigation would be necessary in order to assess the geological characteristics of the *Alternative Power Plant Location*; however, conditions are not expected to be significantly different from those at the proposed M-1 plant	1. All buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	codes and the 2010 Uniform Building Code adopted by Mono County.		site. One advantage of the *Alternative Power Plant Location* is that it is farther removed from the active geothermal vents at the Casa Diablo complex and should thus provide a somewhat less hazardous construction area than the proposed M-1 site. The following measures would be necessary for development of the Project at the *Alternative Power Plant Location*: 1. Alt Geology Measure 1: Prior to issuance of building permits and grading activities, a design level geotechnical report shall be prepared and all recommendations in the report shall be adhered to. The design-level geotechnical report shall evaluate the potential for localized soil and slope instability by performing supplemental subsurface exploration as necessary (to evaluate the thickness, in place density, fines content of the underlying loose to medium soil and gradation), laboratory	

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***Alternative Power Plant Location*:**				
			testing, and engineering analysis. 2. Alt Geology Measure 2: Implement all recommendations contained within the design level geotechnical report, including those pertaining to site preparation, excavation, fill placement and compaction; foundations; concrete slabs-on-grade; pavement design; lateral earth pressures and resistance; and surface drainage control. 3. Alt Geology Measure 3: The final grading, drainage, and foundation plans and specifications shall be prepared and/or reviewed and approved by a Registered Engineer(s) and Registered Engineering Geologist. In addition, upon completion of construction activities, the project applicant shall provide a final statement to the County indicating whether the work was performed in accordance with project plans and	

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***Alternative Power Plant Location*:**				
			specifications and with the recommendations of the Registered Engineer(s) and Registered Engineering Geologist. 4. Alt Geology Measure 4: Clay soils shall be removed from beneath structural areas such that those soils would be covered by at least five feet of structural fill beneath footings, slabs, and concrete pavements. It must be emphasized that as clay soils extend to considerable depth, they cannot be completely removed from structural areas and some differential movement shall be anticipated. Any over-excavation shall be backfilled with structural fill to footing grade, or subgrade for pavements and slabs. Clays to be left in place and covered with fill shall be moisture-conditioned to 2 to 4 percent over optimum for a minimum depth of 12 inches. Periodic surface wetting, or other methods	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			must maintain the high moisture content, until the surface is covered by at least one lift of fill. 5. Alt Geology Measure 5: Plant structures shall not be located over or within approximately 50 feet of active geothermal steam vents. Laydown and road areas may be built over these areas, with the provision of adequate drainage/vent blankets. Areas of high ground temperature may also result in areas of future geothermal venting and shall be avoided as much as possible.	
Hazards and Hazardous Materials	1. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 2. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills,	Significant Impact: Unlike the existing MP–I power plant site or the proposed M–1 replacement plant site, the *Alternative Power Plant Location* would be located within a relatively dense Jeffrey Pine forested area. The constructed alternative power plant site would be surrounded by flammable vegetation. A wildland fire would have the potential to burn close to the *Alternative Power Plant Location* making it more difficult to defend against	No other measures prescribed.	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	would be instituted and maintained. 3. The existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex would be expanded to include the M–1 plant site and operations, including: (a) the existing Spill Pollution Control and Countermeasure (SPCC) Plan; (b) the California Accidental Release Prevention (CalARP) Program; (c) the EPA Risk Management Plan (RMP); and (d) the OSHA Process Safety Management (PSM) Program to include the new M–1 plant. 4. The existing comprehensive program for fire prevention and suppression at the Casa Diablo geothermal complex would be amended and integrated to include the M–1 replacement plant facilities and operating procedures. 5. Used oil generated during operations would be managed in accordance with California used oil and hazardous waste regulations.	the fire and would thereby have the potential to adversely affect workers and facilities on the site. The construction and operation of the M–1 facilities on the *Alternative Power Plant Location* could expose people or structures to a substantial risk of loss, injury or death involving wildland fires. This potential impact is considered above the threshold of significance under CEQA. The following mitigation measure is recommended. 1. Alt HazMat Mitigation Measure 1: A defensive fire fuel break shall be constructed and maintained around the *Alternative Power Plant Location* in conformance with Forest Service and Mono County standards to provide an acceptable wildland fire protection safeguard. <u>Significance After Mitigation</u>: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.		
Hydrology and	1. An engineered grading plan	<u>Significant Impact</u>: As described	<u>Adverse Effects</u>: Impacts to	1. An engineered grading

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
Water Quality	would be prepared to incorporate measures to avoid or minimize erosion during Project construction and operations. 2. The grading plan would be submitted for review to the MCPWD prior to implementation. 3. Best Management Practices (BMPs) identified in the grading and drainage plan would be adopted subject to approval by the MCPWD. The BMPs would include: placement of straw wattles and/or silt fencing along the perimeter of the site, and around topsoil stockpiles; and placement of silt fences in drainage swales at the exit point of the site. 4. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 5. A system of pressure and flow sensing devices and regular	for the *Proposed Project*, MPLP and USGS are currently conducting the hydrologic and biological monitoring prescribed by Mono County General Plan via their participation in the LVHAC. However, the requirement to continue the monitoring and remedial action program only exists under the respective MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings used for Hot Creek Fish Hatchery operations, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended for the *Alternative Power Plant Location*.	hydrology and water quality resulting from construction of the M-1 plant at the *Alternative Power Plant Location* would not be expected to be substantively different from those associated with the proposed M-1 replacement plant site. However, geotechnical surveys and a grading plan have not been prepared for the *Alternative Power Plant Location*. In order to ensure no adverse effects the following measure must be implemented if the County intends to select the *Alternative Power Plant Location*. 1. Alt Hydro Measure 1: Baseline drainage surveys shall be conducted covering the *Alternative Power Plant Location* and surrounding lands, and the findings of these surveys shall be considered prior to making a decision for development at the *Alternative Power Plant Location*.	plan must be submitted and approved by the MCPWD prior to power plant site construction. 2. Applicant would be required to submit a Notice of Intent (NOI) and prepare and implement a Storm Water Pollution Prevention Plan in conformance with the State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as may be amended).

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. 6. A Spill Pollution Control and Countermeasure (SPPC) Plan would be prepared for the M-1 replacement plant site at the *Alternative Power Plant Location* and integrated into the existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex. 7. During power plant construction, portable chemical sanitary facilities would be used by all construction personnel; and maintained by a local contractor. 8. Solid waste materials (trash) would be routinely collected and deposited at an authorized landfill by a disposal contractor.	1. Alt Hydro Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant. <u>Significance After Mitigation</u>: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.		
Noise	1. All noisy construction activities would be limited to daylight hours. 2. Noise levels during construction activities would be kept to a minimum by	No significant impacts identified.	No other measures prescribed.	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	equipping all on–site equipment with noise attenuation devices. 3. All project construction activities and normal operations would comply with applicable County noise requirements.			
Cumulative Effects	Not Applicable	No significant impacts identified.	Adverse Effects: Due to public concern that existing lighting at the Casa Diablo geothermal complex may be out of compliance with County regulations and brighter than necessary for safe operation of the facilities, the following measure is required to ensure that all exterior lighting at the complex is modified to achieve compliance with the County's Dark Sky Regulations: 2. Cumulative Aesthetics Measure 1: An outdoor lighting plan for the entire Casa Diablo geothermal complex, including the *Proposed Project*, the existing MP-II and PLES-I plants, and all related structures must be submitted for County review and approval in conjunction with the	2. Conformance with the Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23).

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			application for design review. This lighting plan must be in compliance with applicable provisions of Chapter 23, Dark Sky Regulations, of the Mono County Code.	

Table 3: *No Project Alternative* Impacts, Mitigation and Compliance Summary

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***No Project Alternative*:**				
Aesthetics	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Air Quality	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Biological Resources	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Cultural Resources	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Geology and Soils	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Hazards and Hazardous Materials	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Hydrology and Water Quality	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Noise	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Cumulative Effects	Not Applicable	No significant impacts identified.	None identified	Not Applicable

1 INTRODUCTION

This assessment is a Draft Environmental Impact Report (Draft EIR) that was prepared to meet the requirements of the California Environmental Quality Act (CEQA; Public Resources Code 21000–21178.1). This Draft EIR describes the existing environment that would be affected by, and the environmental impacts which could result from the proposed Mammoth Pacific I (MP–I) Replacement Project and the alternatives described in Chapter 2 of this Draft EIR.

1.1 OVERVIEW OF THE PROPOSED PROJECT

The existing Mammoth Pacific Unit I (MP–I) project is a commercial geothermal development project operated by Mammoth Pacific L.P. (MPLP) and located near Casa Diablo Hot Springs in Mono County, California (see Figure 1). The existing MP–I project consists of a binary power plant with a design capacity of about 14 megawatts (MW), a geothermal wellfield, production and injection fluid pipelines, and ancillary facilities that have been operating since 1984. The existing MP–I power plant site is located approximately 1,200 feet northeast of the intersection of U.S. Highway 395 and California State Route 203 on 90 acres of private (fee) land owned by Ormat Nevada, Inc. (Ormat), the parent company of MPLP (see Figure 2).

The proposed Mammoth Pacific I Replacement Project (Project) has been proposed by MPLP (Applicant) to replace the aging MP–I power plant with a new, more modern and efficient binary power plant (M–1) while maintaining the existing geothermal wellfield, pipeline system and ancillary facilities. The proposed M–1 replacement power plant would be capable of generating, on average, approximately 18.8 MW (net) of electricity from the same geothermal resources currently supplying the existing MP–I plant. This represents about a 34 percent increase in the net electricity generation from the same geothermal resources currently being utilized for the existing MP–I facility. During M–1 plant startup operations, the existing MP–I plant would continue to operate until the new M–1 plant becomes commercial, after which time MPLP would close and dismantle the old MP–I plant. The transition period during which both the MP–I and M–1 operations would overlap would be a period of up to two years from the date the M–1 plant begins startup operations.

1.2 OBJECTIVES OF THE PROPOSED PROJECT AND THE EIR

The Project is a proposal by MPLP to decommission the existing MP–I power plant and to construct, operate, maintain and eventually decommission the M–1 replacement plant. The following describes the key participants and their roles in the development, analysis, and decisions related to the Project.

1.2.1 Mammoth Pacific, L.P.

MPLP's objectives for the Project are to continue to generate electricity within the MP–I project area from the production and commercial utilization of the geothermal resources currently utilized by the aging MP–I plant. MPLP's specific objectives for the Project are (a) to optimize the amount of electrical energy that can be generated from the available geothermal resources; (b) to replace the existing MP–I plant with a new, more modern and efficient binary power plant; and (c) to ensure continuous power generation and maximize utilization of the geothermal resource. MPLP has filed the required applications for a

Conditional Use Permit (CUP) and needed variances with Mono County for the Project. Approval of the CUP and variances would grant MPLP the right to construct and operate the new M–1 plant; to temporarily continue to operate the existing MP–I plant with the M–1 plant during the commissioning period; and to decommission the MP–I plant after the replacement M–1 plant is fully operational. In addition, MPLP has submitted a Reclamation Plan for the Project which must be approved by Mono County; and to actually commence construction of the new M–1 replacement plant, MPLP would also need to submit applications for and obtain approval, as necessary, from other responsible agencies for discretionary permit(s) and from Mono County for approval of grading and building permits required for construction.

1.2.2 Mono County

Mono County is the lead agency for compliance with CEQA for the Project. MPLP has filed the required permit application with Mono County to obtain approval for the construction and operation of the proposed M–1 replacement plant within the Project area. The objectives of Mono County for preparing this EIR are to comply with the requirements of CEQA and to evaluate the potential environmental impacts of the *Proposed Project* consistent with the requirements of CEQA and the County General Plan. Policy 8 of the Land Use Element of the General Plan provides the following direction:

> *Regulate geothermal development and other energy development projects in a manner consistent with the Energy Resources Policies in the Conservation/Open Space Element*. [Action 8.5]

The following relevant goals, objectives, and policies for Energy Resources are set forth in the Conservation/Open Space Element of the General Plan.

> *Goal 1: Establish a regulatory process with respect to both geothermal exploration and development that ensures that permitted projects are carried out with minimal or no adverse environmental impacts.*
>
> *Goal 2: Permit the productive and beneficial development of alternative energy resources, including geothermal resources, consistent with the objectives of Goal I and national and local interests.*
>
> *Objective A*
> *Provided that the environment is protected in the manner required by the policies and actions of Goal I of this section of the Conservation/Open Space Element, County policy shall ensure the orderly and sound economic development of geothermal resources under the appropriate circumstances.*
>
> > *Policy 1: Decisions on applications for geothermal development permits may take into account evidence of national needs for alternative energy development.*
> >
> > *Policy 2: Decisions on applications for geothermal development permits should be relatively more favorable during times of scarcities of other energy sources.*
> >
> > > *Action 2.1: Applicants for permits for geothermal exploration and development may be required to submit information showing the benefits of geothermal energy during the proposed period of geothermal*

operations. Benefit may be established by showing a contract for the sale of geothermal power to a utility engaged in the business of providing electrical power to the general public.

Policy 3: Mono County's geothermal resources shall be managed in a manner that assures reasonable economic benefits to the citizens and businesses of the county.

Action 3.1: Applicants for permits for geothermal development shall be required to submit information showing the economic benefits or detriments of the proposed development during the proposed period of operation.

Action 3.2: Decisions on applications for development permits should not be made in the absence of information showing the economic benefit or detriment of such development to the citizens and businesses of Mono County, including impacts on natural resources.

Action 3.3: Geothermal development permits should not be granted in the absence of a reasonable showing of economic benefit to the community, unless findings are made that there are overriding state or national energy needs.

Conformance with the direction provided by these General Plan goals, objectives and policies are also County objectives for the Project and the EIR. In order for the Project to conform to General Plan requirements, the Applicant has also applied for the following variances (see Section 2.1.8).

1. An Overhead Power Line Variance (needed for an optional, approximately 500-foot, 115 kV interconnection transmission line connecting the Project substation with an existing SCE transmission line); and
2. Development Standards Chapter 15 Resource Extraction Designation – Variance (needed to allow the construction of process equipment or facilities within 100 feet of an exterior property line; and to allow geothermal development to occur within 500 feet of a surface watercourse in the Hot Creek Buffer Zone).

The Draft EIR would be used as a decision–making tool to assist Mono County in its determination whether to approve, modify or deny the *Proposed Project* activities within its jurisdiction.

1.3 CASA DIABLO GEOTHERMAL PROJECTS

The proposed MP–I Replacement Project would be located among the other existing geothermal projects which comprise the Casa Diablo geothermal complex. The following paragraphs provide descriptions of the existing MP–I project and the other MPLP geothermal projects at Casa Diablo. The environmental documents previously prepared for each of these MPLP projects are incorporated by reference into this Draft EIR, as follows.

- *PLES I Geothermal Development Project, Final Environmental Impact Statement and Supplemental Environmental Impact Report*. (BLM, USFS and GBUAPCD 1989).

- *Environmental Assessment, Upper Basalt Geothermal Exploration Project*. (BLM and USFS 2005).
- *Environmental Assessment, Basalt Canyon Slim Hole and Geothermal Well Exploration Projects*. (BLM and USFS 2001).
- *Basalt Canyon Geothermal Pipeline Project, Environmental Assessment and Draft Environmental Impact Report*. (BLM, USFS and Mono County 2005).
- *Mammoth Pacific Geothermal Development Project: Units II and III, Draft Environmental Impact Report and Environmental Assessment.* (CMEMD and BLM 1987a).
- *Mammoth Pacific Geothermal Development Project: Units II and III, Final Environmental Impact Report and Environmental Assessment.* (CMEMD and BLM 1987b).

Summaries of the relevant information from these documents are provided in this Draft EIR where applicable.

Mammoth Pacific Unit I Project (MP–I): As discussed in Section 1.1, the MP–I project is an existing geothermal electric generating facility with a design capacity of 14 MW (nominal), a geothermal wellfield, production and injection fluid pipelines and ancillary facilities. It is located on the western parcel (APN 037 050 005) of the 90 acres of private (fee) land owned by Ormat (see Figure 2). It commenced operation in 1984. MPLP currently refers to the MP–I plant site as "G1," and this alternate name reference appears in some of the literature used during this assessment.

Mammoth Pacific Unit II Project (MP–II): The MP–II project is an existing 15 MW geothermal electric generating facility and production and injection well field. The MP–II power plant site is located on the eastern parcel (APN 037 050 002) of the 90 acres of private (fee) land owned by an Ormat (see Figure 2). The MP–II power plant is located approximately 1,200 feet east–northeast of the MP–I power plant. The MP–II project commenced operation in 1990 (CMEMD and BLM 1987a, and CMEMD and BLM 1987b). The geothermal production and injection well fields for the MP–I and MP–II projects have been integrated by MPLP. Thus, geothermal fluid produced from essentially any of the available production wells can be conveyed to either of the two plants. Spent (cooled) geothermal fluid discharged from either of the two plants can also be injected into any of the available injection wells. MPLP currently refers to the MP–II plant site as "G2," and this alternate name reference appears in some of the literature used during this assessment.

PLES Unit I Project (PLES–I): The existing 15 MW PLES–I Project is the third Casa Diablo power plant which is located immediately south of the MP–II project power plant (see Figure 2). It includes a geothermal electric generating facility which is a "twin" to the MP–II project power plant. It also commenced operation in 1990 (BLM, USFS and GBUAPCD 1989). The PLES–I power plant and associated geothermal production and injection wells are located entirely on a portion of MPLP's Federal Geothermal Lease CA–11667 on public lands located within, and managed by, Inyo National Forest. MPLP currently refers to the PLES–I plant site as "G3," and this alternate name reference appears in some of the literature used during this assessment.

1.4 RELATIONSHIP TO STATUTES, REGULATIONS AND OTHER PLANS

The proposed M–1 replacement power plant site would be located on the eastern parcel of the 90 acres of private (fee) land owned by Ormat. No Project activities are proposed on public lands, and no known discretionary approvals are required from any federal agencies for the proposed MP–I Replacement Project. As such, the environmental assessment of the Project is subject to CEQA only and no National Environmental Policy Act (NEPA) assessment is needed. However, one Project Alternative evaluated in

this Draft EIR would be located on public land administered by the U.S. Forest Service (see Section 2.2.1). If that Project Alternative is selected for the proposed MP–I Replacement Project location, then an environmental assessment in conformance with NEPA would be required prior to any federal agency decision on the Project.

1.4.1 County of Mono General Plan

County direction for energy resource exploration and development, including geothermal energy development projects, is provided in the Energy Resources section of the Conservation/Open Space Element of the General Plan. In addition, permitted uses and development standards for different land use designations (zones) relevant to geothermal development projects are provided in the Land Use Element of the General Plan.

The existing Casa Diablo geothermal complex is comprised of both private land owned by MPLP and public land administered by the USFS. The western parcel of the private lands on which the existing MP–I facilities are located has a Land Use Designation (LUD) of "Resource Management" (RM). The LUD of the private land on the eastern parcel of the Casa Diablo geothermal complex on which the new replacement M–1 plant would be located is "Resource Extraction" (RE). The offsite private lands in the Project vicinity are designated as "Open Space." Most of the public land in the Project vicinity is designated Resource Management (see Figure 3).

The General Plan notes that the RM designation is intended "to recognize and maintain a wide variety of values in the lands outside existing communities," including "geothermal or mineral resources." "Mining and geothermal exploratory projects" are explicitly "uses permitted subject to use permit" within the RM designation, and other "similar" uses may also be permitted uses. The existing MP–I project power plant and well field are located on both private and public land with a RM LUD. The existing MP–I plant site decommissioning activities that are proposed as part of the Project would be conducted on private land with a LUD of RM.

The "Open Space" (OS) LUD "is intended to protect and retain open space," and "may be valuable for mineral resources." "Mineral exploration activities (including geothermal exploration activities)" are explicitly "uses permitted subject to use permit" within the "Open Space" designation, and other "similar" uses may also be permitted uses. The RE LUD "is intended to provide for protection of the environment and resource extraction activities." "Exploring, drilling, and development of geothermal resources" are explicitly "uses permitted subject to use permit" within the RE designation, and other "similar" uses may also be permitted uses. The M–1 replacement plant site construction, *Proposed Project* operations, and eventual decommissioning of the M–1 power plant would be conducted on private land with a LUD of RE.

1.4.1 Town of Mammoth Lakes General Plan

The Town of Mammoth Lakes was incorporated in August 1984. It includes within its approximately 16,000–acre town boundaries the Mammoth Mountain Ski Area and the Lakes Basin. Only approximately 2,500 acres of this area is private land – the rest is land administered by the U.S. Forest Service as part of the Inyo National Forest. The approximately 80,000–acre "Planning Area" for the Town of Mammoth Lakes includes additional areas of Inyo National Forest (and some private land) where existing or proposed facilities have a direct relationship to the current Town boundaries. The *Proposed Project* area is not located within the Town boundaries but it is located within the Town of Mammoth Lakes "Planning Area." The Town has no specific agency jurisdiction over the Project area, but it has an interest in development or activities in the Project area which may impact the Town.

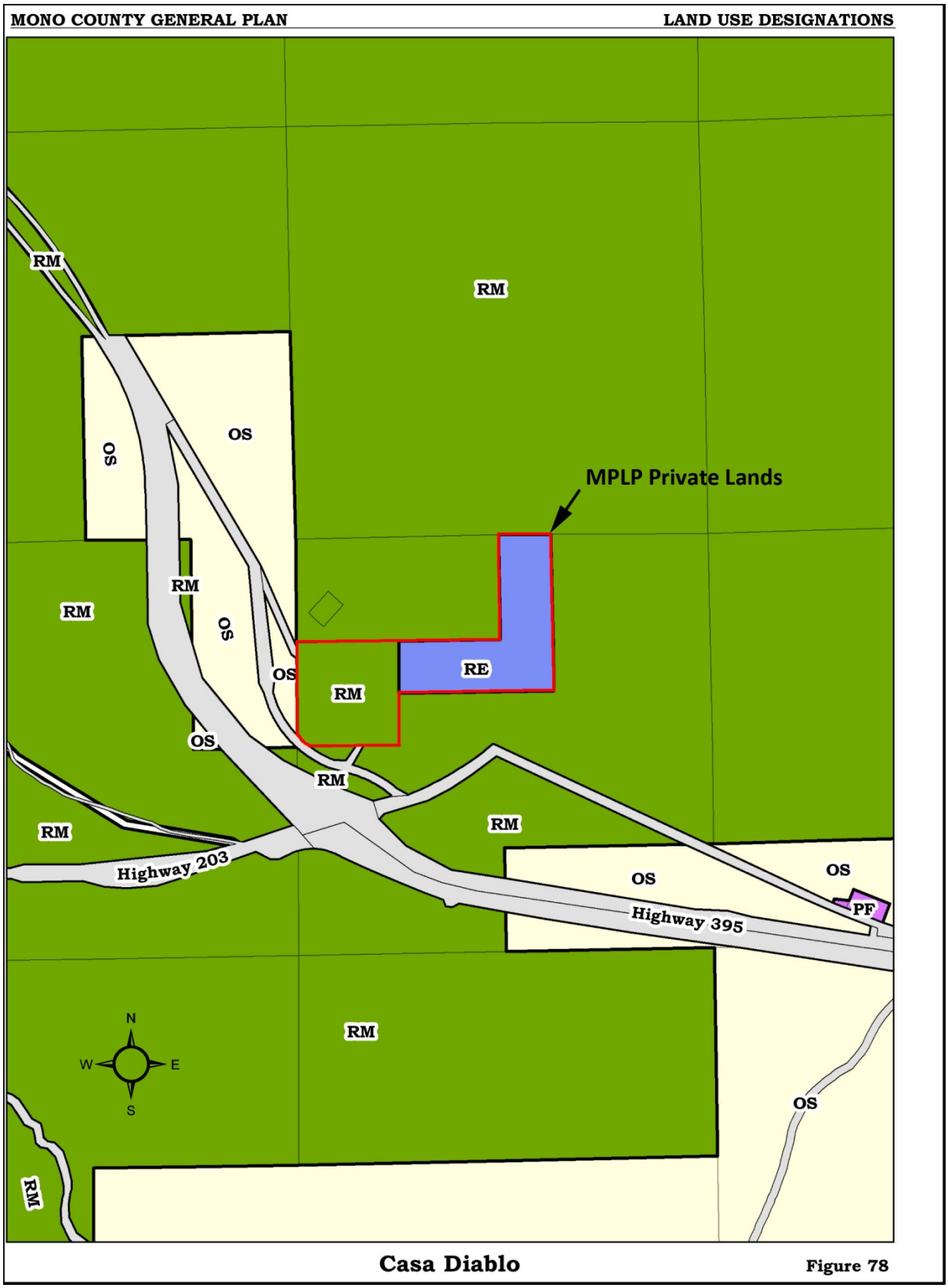

Figure 3: Mono County Land Use Designations in the Vicinity of the MP–I Replacement Project

1.4.2 Agency Required Permits

Mono County is the CEQA lead agency. The Mono County Economic Development Department is the local agency responsible for geothermal energy generation projects in the County. The Mono County Community Development Department, Planning Division is the local agency responsible for land use planning and authorizations on the private lands which may be disturbed within the Project area. Activities proposed on the private lands within the Project area by MPLP are subject to the approval of a Conditional Use Permit by the Mono County Planning Commission. Any required variances to General Plan for proposed activities on the private lands and a Reclamation Plan must also be approved by the County. Ministerial building permits for construction of some aspects of the Project would be issued, as required, by the Building Division of the Mono County Community Development Department.

The California State Water Resources Control Board (SWRCB) is the state agency responsible for protecting the quality of surface and ground waters in the state. MPLP would be required to submit to the SWRCB a Notice of Intent (NOI) to comply with the terms of the general permit to discharge storm water associated with construction activity.

The Great Basin Unified Air Pollution Control District (GBUAPCD) is the state/local agency responsible for regulating stationary (non–vehicular) sources of air pollution in Mono, Inyo and Alpine counties. MPLP would be required to obtain permit approvals from the GBUAPCD to operate the new M–1 replacement power plant.

The California Department of Fish and Game (CDFG) is the state agency principally responsible for the protection and conservation of the fish and wildlife resources of the state. Any activities proposed by MPLP which would divert or obstruct the natural flow or change the bed, channel or bank of any stream requires notification and negotiation of a Streambed Alteration Agreement with the CDFG to protect these resources. No *Proposed Project* activities have been currently identified for which a Streambed Alteration Agreement would be required.

1.5 CEQA DOCUMENT

1.5.1 Conformance with CEQA

This Draft EIR was prepared in conformance with CEQA statutes (Public Resources Code § 21000 *et seq*) and CEQA Guidelines (14 CCR § 15000 *et seq*). A third party consultant team, CAJA Environmental Services LLC and Environmental Management Associates, Inc. (CAJA/EMA), was retained to prepare the CEQA document under the direction of Mono County.

1.5.2 Public Scoping

Following receipt of an application for a Conditional Use Permit for the Project from MPLP, the Mono County prepared an Initial Study of the potential environmental effects of the Project (see Appendix B), filed a Notice of Preparation (NOP) of this Draft EIR with the California State Clearinghouse and Planning Unit within the Governor's Office of Planning and Research (OPR) and distributed public notice of their intent to prepare an EIR for the *Proposed Project*. The notice was published in local newspapers on or about February 4, 2011. It was also distributed to responsible and trustee agencies and interested members of the public identified on the Mono County interested party list. A public scoping meeting for the Project site was conducted on Thursday, February 17, 2011 with Mono County agency representatives and MPLP in attendance to answer questions. Mono County requested that written comments on the MP–

I Replacement Project be received by March 7, 2011. Mono County received a total of two written comment letters on the Project following the public notice. Written comments were received from the following parties.

- California Regional Water Quality Control Board, Lahontan Region, Victorville, California
- California Department of Fish and Game, Bishop Field Office, California

Copies of these letters are on file with the Mono County Economic Development Department in Mammoth Lakes.

1.5.3 Identified Issues and Concerns

The following potential environmental issues and concerns were identified at the public scoping meeting and subsequent correspondence about of the Project.

- **Aesthetics**
  - Identify the types of lighting, fixtures, shielded, wattages, etc.
  - Will additional steam fumaroles appear
  - How will night lighting be addressed
  - Will existing lighting on MP–2 plant be addressed
  - Address the visibility of the new transmission line
  - What will be the visual impact of the new substation/switchyard
  - What will be the appearance of two plants (MP–I and M–1) operating for up to two years at the same time
  - What will be the use and appearance of the reclaimed site
  - What will structures look like – more cooling structures
  - Address steam emissions – leaks
  - How will the new plant be screened and will any landscaping be required
  - Will the new plant be the same color as the larger plant
  - What will be the bulk/mass of the new plant compared to the current plant (height, length and width)
- **Agriculture and Forestry**
  - None identified
- **Air Quality**
  - Will there be emission plumes from the new plant
  - What will the emissions of n–pentane from the new plant be compared to isobutane emissions from the existing plant – will they be greater or less
  - Will the replacement project violate any Air Pollution Plans
  - How will the n–pentane be transported and stored (FPD)
  - Will fugitive emission increase with the new plant Will any air quality standards be exceeded
- **Biological Resources**
  - What will be the impacts on biological resources including mule deer (see written concerns of the CDFG)
  - Address cumulative impacts on biological resources
- **Cultural Resources**
  - None identified
- **Geology/Geologic Hazards**
  - Will there be an increase in brine use? Will there be brine increased use when both M–1 and MP–I are operating at the same time

  - What effects could occur from seismic activity; seismic effects of isobutane or n–pentane or mixed together especially in a large earthquake (e.g., 7.0 magnitude)
  - Will plants be designed to withstand earthquakes
- **Greenhouse Gas Emissions**
  - Is any of the n–pentane going to affect GHG, even though it is not identified as a specific GHG concern
- **Hazards and Hazardous Materials**
  - What are the differences between the isobutane and n–pentane; more or less reactive/volatile
  - Address the decommissioning of the isobutane at the old site
  - Will additional isobutane and/or n–pentane be needed
  - Containment and transportation of isobutane and n–pentane through communities
- **Hydrology/Water Quality**
  - Will there be new domestic wells or new septic systems
  - How much water use will the new plant have relative to existing plant
  - What is water source for construction use and other purposes
- **Land Use/Planning**
  - What will the site be used for after site reclamation
- **Mineral Resources**
  - None identified
- **Noise**
  - Evaluate noise levels of operation with one plant and with two plants operating and /or all four plants
- **Population/Housing**
  - Construction employees – construction, duration
    - Can a preference for local workers be encouraged over outside workers
- **Public Services**
  - None identified
- **Recreation**
  - Address impacts on walking, exercising, uses (dog walking, etc) in project vicinity
- **Transportation/Traffic**
  - Address construction traffic
- **Utilities/Services Systems**
  - Address demands on utilities, public services and wastes during construction and operations
- **Cumulative Impacts**
  - Address concerns about cumulative impacts including the proposed CD–4 project

2 PROPOSED PROJECT AND ALTERNATIVES

2.1 PROPOSED PROJECT

Mammoth Pacific, LP (MPLP) has proposed the Mammoth Pacific I Replacement Project (Project). The Project includes the decommissioning of the existing MP–I power plant; and the construction, operation, maintenance, and eventual decommissioning of the M–1 replacement plant.

2.1.1 Project Overview

MPLP operates the existing Casa Diablo geothermal development complex northeast of the intersection of Highway 395 and State Route 203, and located about 2.5 miles east of the Town of Mammoth Lakes in Mono County, California (see Figure 1). The Casa Diablo geothermal development complex is comprised of three existing power plant facilities, including MP–I, MP–II and PLES–I. The MP–I and MP–II plants are located on private land and the PLES–I plant is located on adjacent public land administered by the U.S. Forest Service. MPLP proposes to replace the aging Mammoth Pacific I (MP–I) geothermal power plant with a more modern and efficient plant using advanced technology. The replacement plant would be called "M–1."

Project Location and Access

The existing MP–I and the replacement M–1 plants are located on two adjacent parcels of private land owned by MPLP. The replacement M–1 plant would be built approximately 500 feet northeast of the existing MP–I plant. The approximate location and layout of the new M–1 plant is shown on Figure 2. Existing, above ground geothermal production and injection fluid pipelines used by the existing Casa Diablo geothermal development cross the proposed M–1 plant site. These pipelines would be rerouted around the proposed M–1 plant site prior to plant site grading. Site grading for the new M–1 plant site and associated activities would disturb approximately 5.65 acres of land. The existing entrances to the MPLP geothermal complex would provide access to the new M–1 plant site.

Project Design and Power Generation Technology

The M–1 replacement plant would utilize Ormat Energy Converter (OEC) technology. An OEC is proprietary modular binary geothermal power generation equipment. OEC technology utilizes an organic Rankine cycle. A Rankine cycle is a thermodynamic process wherein heat is added to a "motive fluid" (a liquid that vaporizes at relatively low temperature) at a constant pressure, the liquid is vaporized and is then expanded in a vapor turbine which drives a generator thereby producing electricity. The spent vapor flows to a cooling unit where it is condensed back to a liquid completing the cycle.

The specific OEC technology proposed for the M–1 plant would be an Integrated Two Level Unit (ITLU). The ITLU provides two levels of heat extraction from the geothermal fluid in series with a higher temperature and pressure unit, Level 1, and lower temperature and pressure unit, Level 2. The OEC technology is used to extract heat energy from geothermal fluid and transfer it to the motive fluid. Geothermal fluids are produced from production wells either by artesian flow or by pumping. Once delivered to the power plant, the heat in the geothermal fluid is transferred to the motive fluid in multiple–stage, non–contact heat exchangers. The geothermal heat vaporizes the motive fluid which then turns a

binary turbine. The vaporized motive fluid exits the turbine and is condensed in an air–cooled condenser system that uses large fans to pull a cooling air stream over the tubes carrying the motive fluid. The condensed motive fluid is then pumped back to the heat exchangers for re–heating and vaporization, completing the closed cycle. The cooled geothermal fluid from the heat exchangers is pumped under pressure to the geothermal injection wells (see Figure 4).

The existing MP–I plant uses isobutane as the binary motive fluid. The new M–1 plant would use normal pentane (n–pentane) as the binary motive fluid. Bulk quantities of n–pentane would be stored in pressure vessels and bulk storage containers on the M–1 power plant site. Numerous engineering, fire–control and safety measures would be integrated into the Project to prevent releases of n–pentane, to avert or control fires, and to respond to other emergencies.

The estimated average design electric generation capacity of the M–1 plant would be approximately 18.8 MW (net). No new geothermal wells would be constructed for the replacement plant; it would use the same geothermal fluid from the existing geothermal wells that currently supply MP–I. The total brine flow for the MPLP complex would not increase beyond what is currently permitted. Existing geothermal pipelines would be used for the replacement project and, except for interconnection pipelines located entirely on the replacement plant site, no new geothermal production or injection fluid pipelines to or from the M–1 plant site are proposed (see Section 2.1.5).

The M–1 plant motive fluid vapor condensate would be cooled in tube condensers by a dry air cooling system that would be more efficient than the aging cooling system used by the existing MP–I plant.

All of the proposed new replacement plant facilities would be located on the same private parcel of land (APN 037 050 002) on which the existing MP–II plant is currently located.

M–1 Plant Startup, Transition and Operations

During M–1 plant startup operations, the existing MP–I plant would continue to operate until the new M-1 plant becomes commercial; after which, MPLP would close and dismantle the old MP–I plant. The transition period during which both MP–I and M–1 operations would overlap may be up to two years from the date that the M–1 plant begins startup operations. Thereafter, the MP–I power plant facilities would be removed from the site; plant foundations and above ground pipeline would be removed; and a retention pond on the MP–I site would be removed. The site would be graded and the pad would be covered with gravel to provide an all weather surface for continuing MPLP use of the site for equipment and material storage.

2.1.2 Replacement Plant Construction and Commissioning

The relative location of the proposed M–1 power plant site that would be constructed within the existing Casa Diablo geothermal complex is provided as Figure 2.

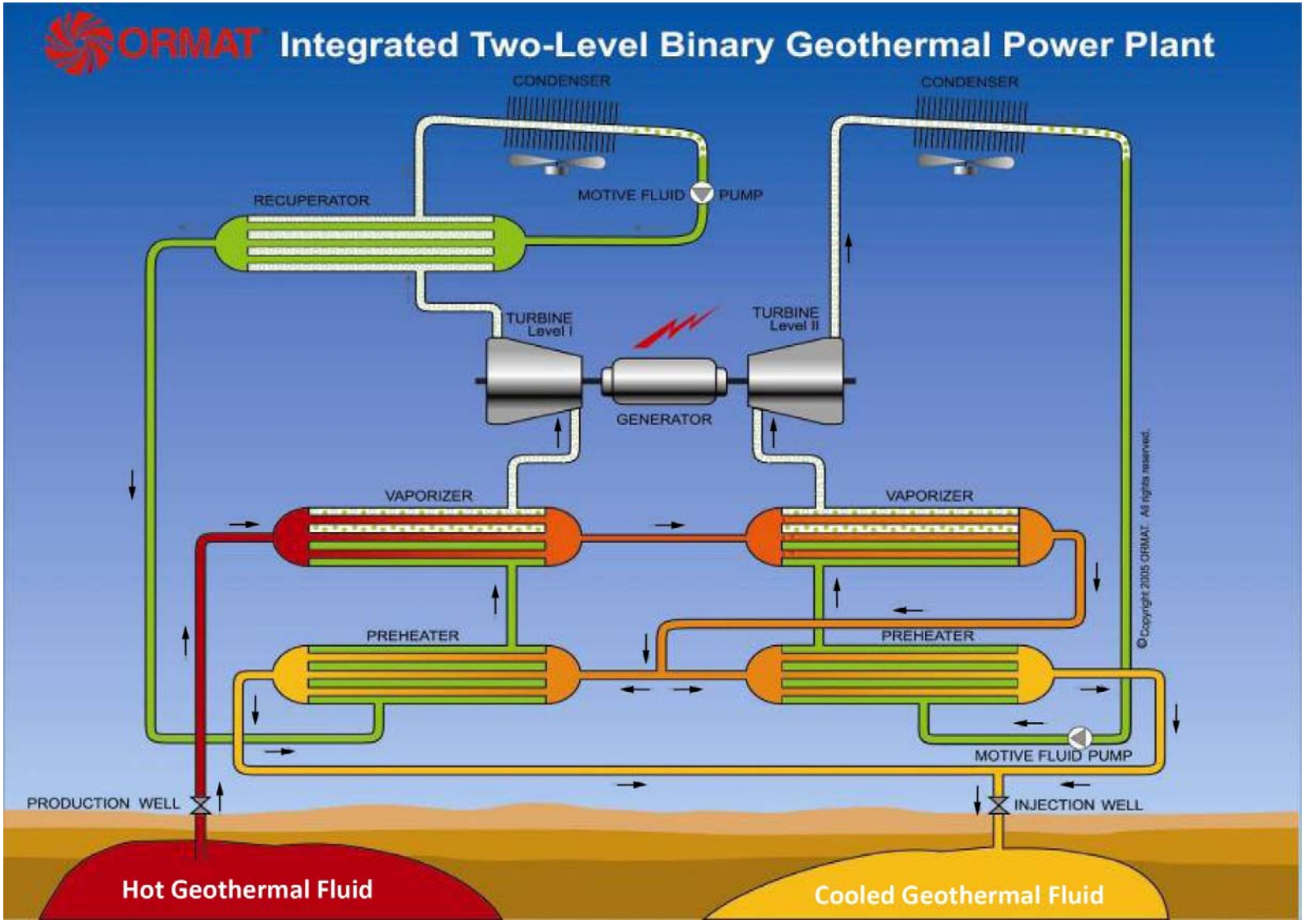

Figure 4: Simplified Flow Diagram of an Ormat® Integrated Two–Level Binary Power Plant

Site Access and Roads

All equipment would be brought to the project site on trucks. The power plant construction site would be accessed from U.S. Highway 395 and State Route 203. North and south Highway 395 off ramps onto State Route 203 are located less than one–quarter mile southwest of the Project site. Access to the Project site would be via State Route 203 east to Antelope Springs Road, then north to Cutoff Road, then east to the existing paved access to the replacement plant site off of the Old Highway Road (see Figure 2). Substation Road and Old Highway Road would be used as emergency access roads and lead to a locked gate that can be opened by emergency responders. The existing onsite access road is paved with asphalt. The upper pad on which the new substation would be constructed is located adjacent to the existing onsite access road. A new paved access road would be constructed from the onsite access road to the lower pad on which the M–1 plant would be constructed. Paved access roads would also be constructed along the north, south and west sides of the new M–1 plant site (see Figure 5).

Grading and Surface Disturbance

The M–1 plant site would be constructed on two pads. The larger lower pad would be graded to accommodate the OEC unit, heat exchangers, air–cooled condenser system, piping, firewater storage tank, mechanical building and an electrical shelter. The projected elevation of the lower pad is 7,295 feet above mean sea level (MSL). The smaller upper pad would be graded to an elevation of 7,307 feet above mean sea level to accommodate the M–1 substation. The upper pad elevation is approximately the same elevation as the existing access road. A total of approximately 5.65 acres of surface would be disturbed during site grading including a short driveway from the existing access road and cut–and–fill areas and a soil stockpile area that would be outside of the fenced plant site (see Figure 5).

Grading of the plant site would proceed after the initial project survey and final plant layout have been completed. Prior to grading of the site, some site clearing and tree removal would take place. Topsoil would be stockpiled to aid in revegetation. The plant would be built to balance cuts and fills to the extent feasible. Excess excavated material not required as fill would be disposed of or stockpiled. All equipment and building foundations would bear on native soil or structural fill.

Compaction of the soils would be in accordance with the recommendations in the report of the geotechnical survey conducted on the site and civil engineering design. All disturbed lands not required for plant operations would be revegetated upon completion of construction. Gravel surfacing would be placed on the two plant site pads after final grading. Grading design would be based on local topography as shown on topographic maps.

Project Facilities

The general arrangement of facilities on the proposed M–1 power plant site is provided as Figure 6.

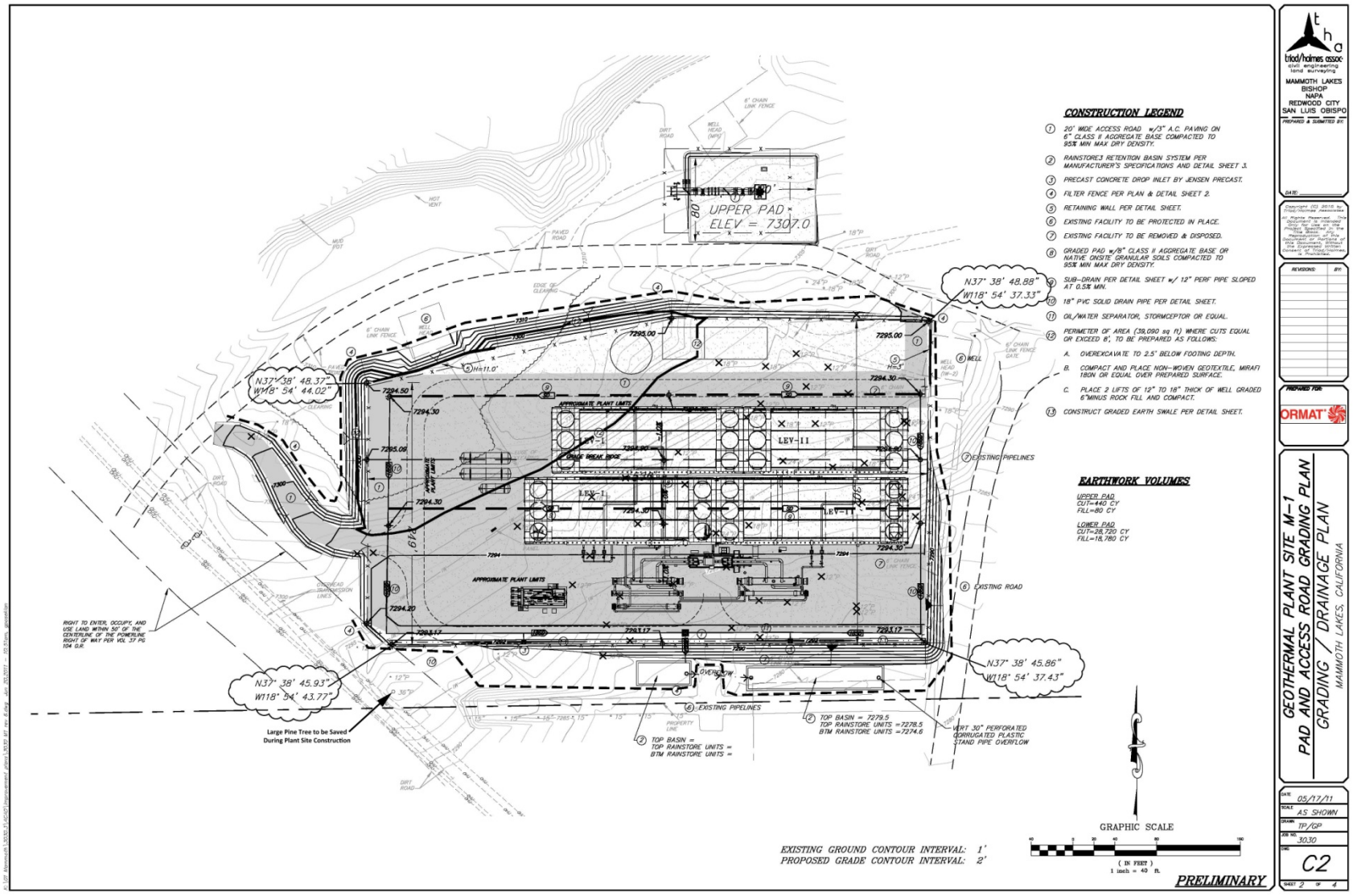

Figure 5: Preliminary Proposed M–1 Plant Site Grading/Drainage Plan

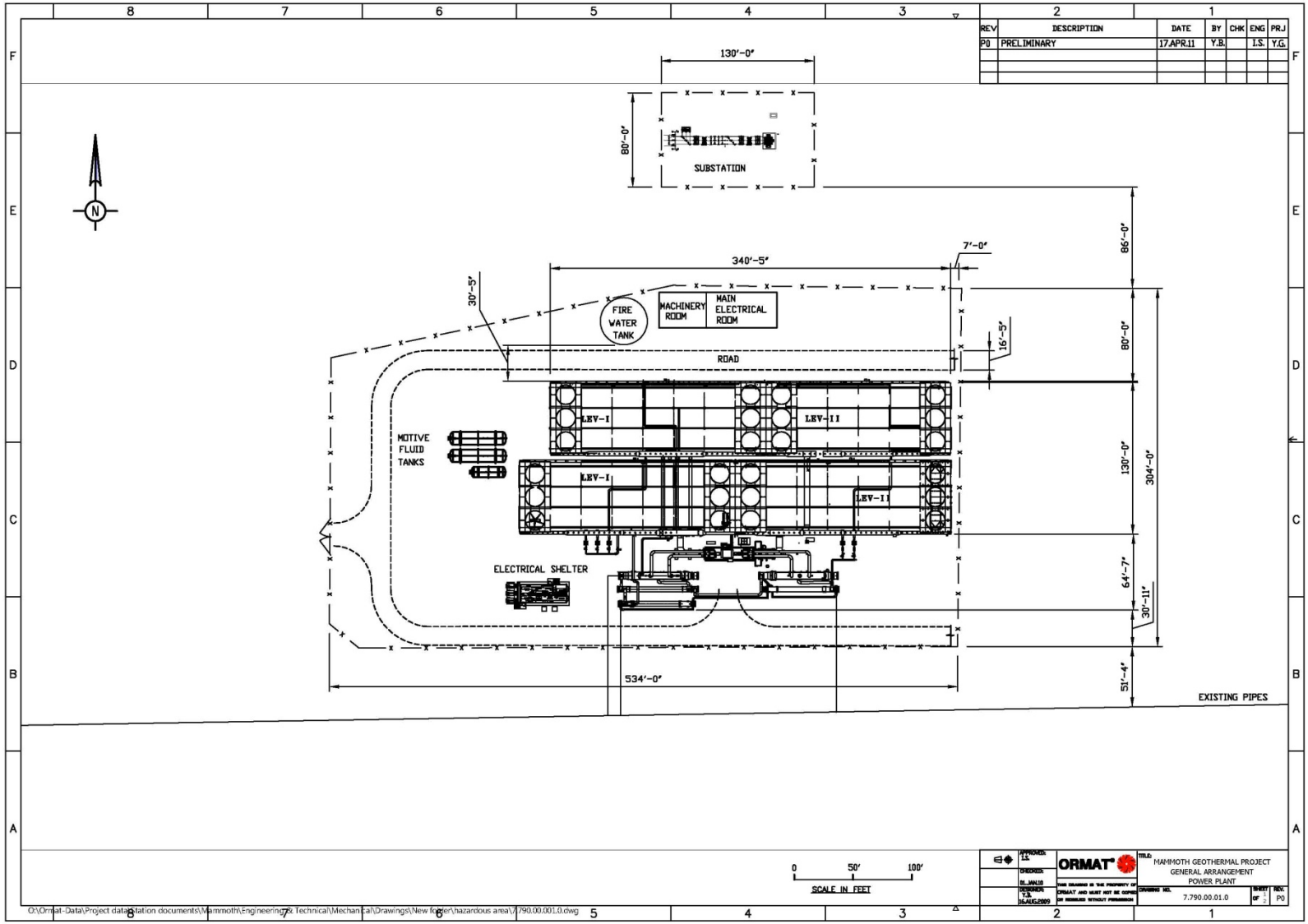

Figure 6: General Arrangement of Proposed M–1 Power Plant Facilities

The proposed ITLU OEC facilities would be comprised of a vaporizer, turbines, generators, air–cooled condensers, preheater, pumps, OEC water separator and piping. A series of ITLU OEC layout drawings showing dimensions of the primary power generation facilities is provided as Figure 7, Figure 8, and Figure 9. A fire water storage tank, electrical shelter, motive fluid storage tanks, machinery room and main electrical room would be located on the power plant site, the larger (5.08 acres) lower pad. An electrical substation would be located on a separate smaller (0.23 acres) upper pad north of the power plant site. The general arrangement of the proposed M–1 facilities is shown on Figure 6. All buildings, insulation jacketing, and visible structures would be painted to blend with the existing environment in order to minimize the visual impacts in the area.

No new geothermal well pads or geothermal production or injection wells would be drilled or constructed as part of the MP–I Replacement Project. The new M–1 replacement plant would use the same geothermal fluid from the existing wells that currently supply the existing MP–I plant.

Transmission Interconnection

A new substation would be constructed on a separate pad on the north side of the M–1 plant site. Two options for interconnection with the existing Southern California Edison (SCE) distributions system are being considered. The first option would be a 33.5 kilovolt (kV) interconnection transmission line which would be placed in a conduit on the ground or buried below ground. The interconnection transmission line would deliver energy from the new substation on the M–1 site to the existing SCE Casa Diablo substation using the existing MPLP power line. The second option would be the construction of an approximately 500–foot, aboveground 115–kV interconnection transmission line that would be routed from the M–1 substation to the existing SCE 115–kV transmission line that passes adjacent to the proposed M–1 power plant site. The new aboveground 115–kV interconnection line would require two or three new onsite power poles and would be connected to the existing SCE 115–kV power line on an existing SCE power pole (see Figure 10). If the Applicant decides to pursue the overhead transmission line option, then an application for a variance would need to be submitted to Mono County to allow for construction of an aboveground transmission line in a scenic highway corridor and additional environmental review would be required for approval of the variance application.

Construction Work Force, Traffic and Schedule

Construction would begin when all necessary Project approvals for construction have been obtained. The average construction work force on site at any given time would range from 10–20 workers during low activity periods to 40–60 workers during high activity periods. Due to possible overlap in construction work tasks, an estimated peak construction work force of up to 80 workers could be on site periodically during high construction activity periods. Construction would occur over an approximately 13–month period as shown in Figure 11. The construction schedule illustrated is representative only and assumes site construction would begin in September 2011 and end in October 2012.

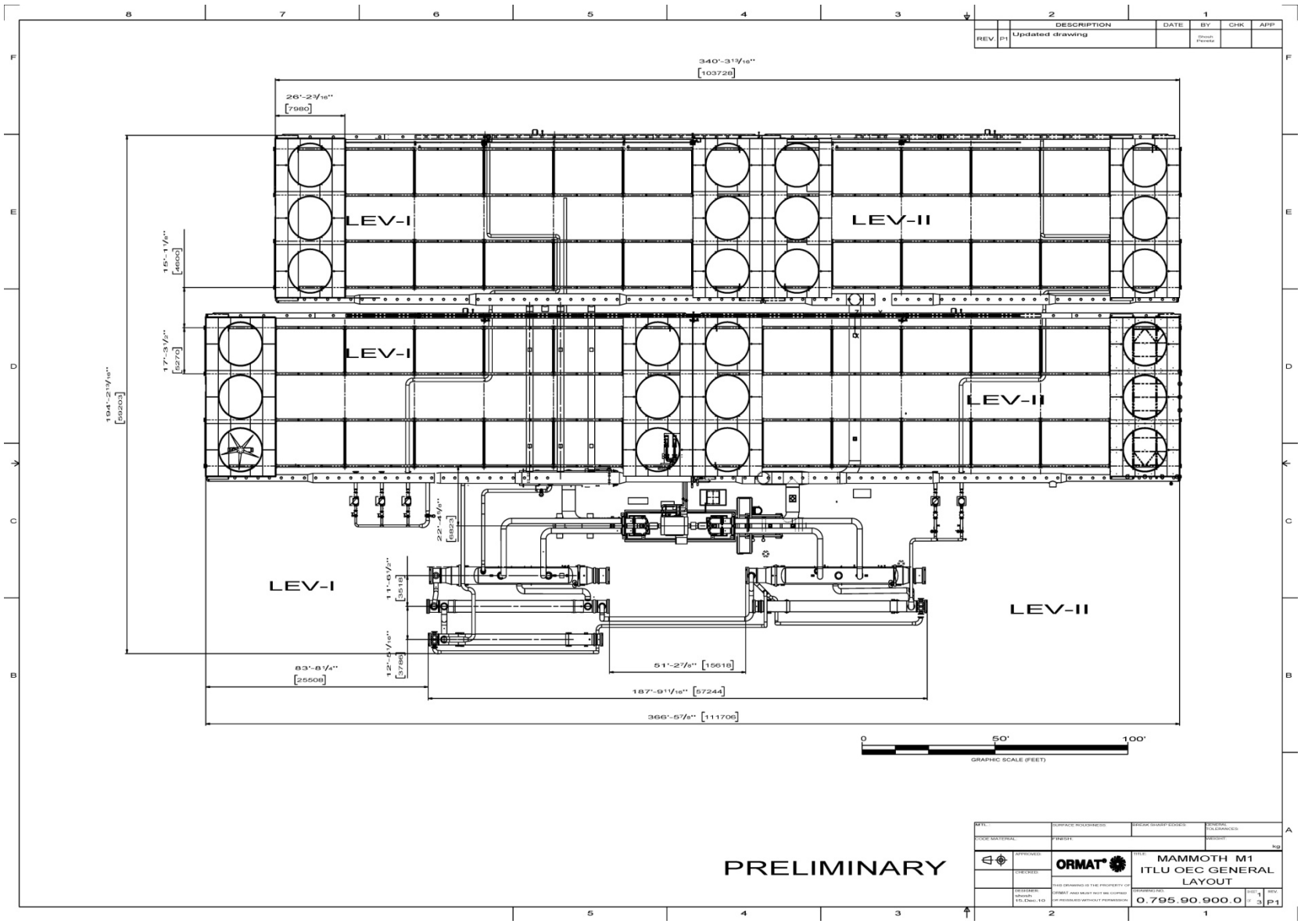

Figure 7: Plan View of the Proposed M–1 Replacement Plant ITLU OEC Facilities

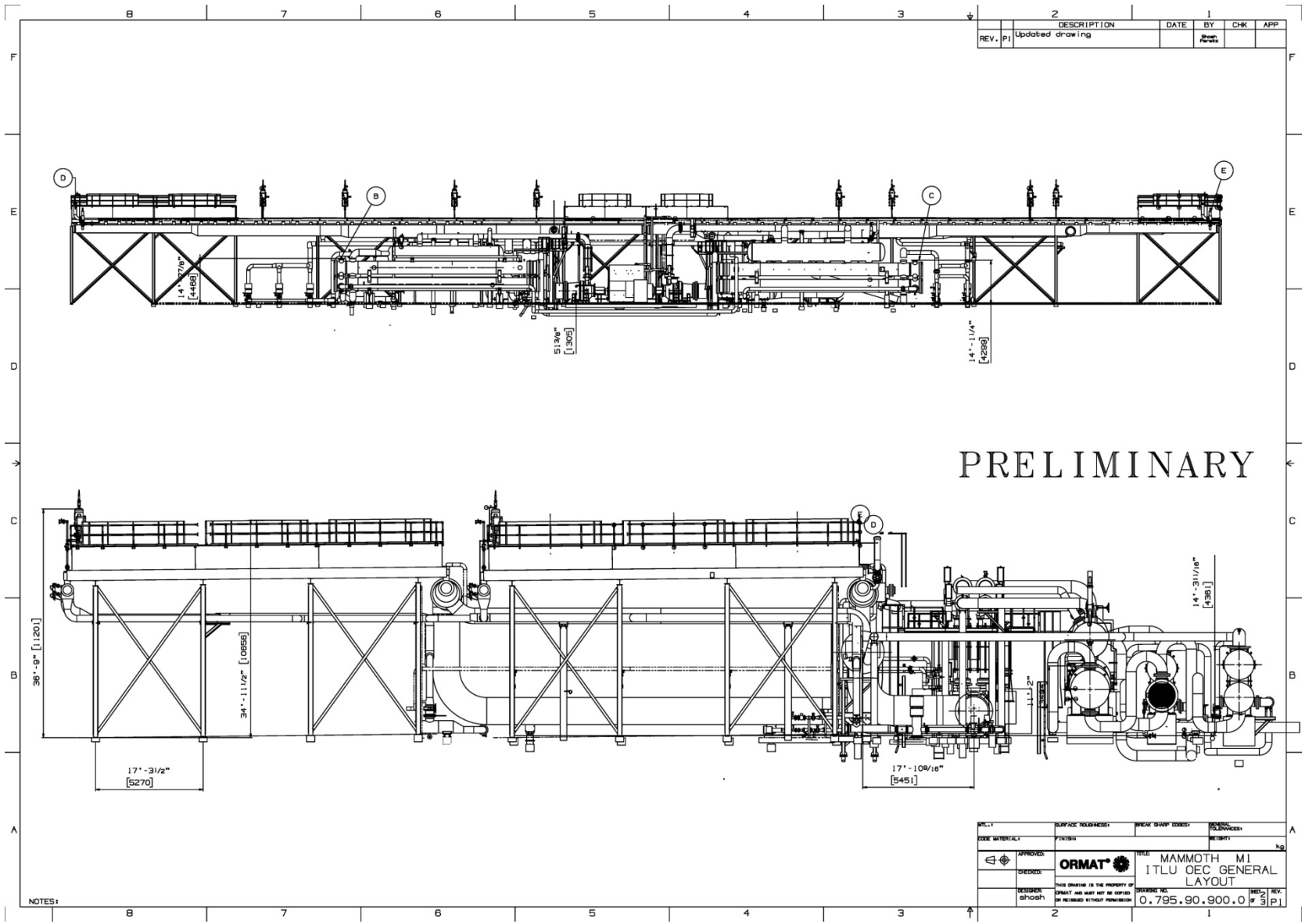

Figure 8: Elevation View of the Proposed M–1 Replacement Plant ITLU OEC Facilities

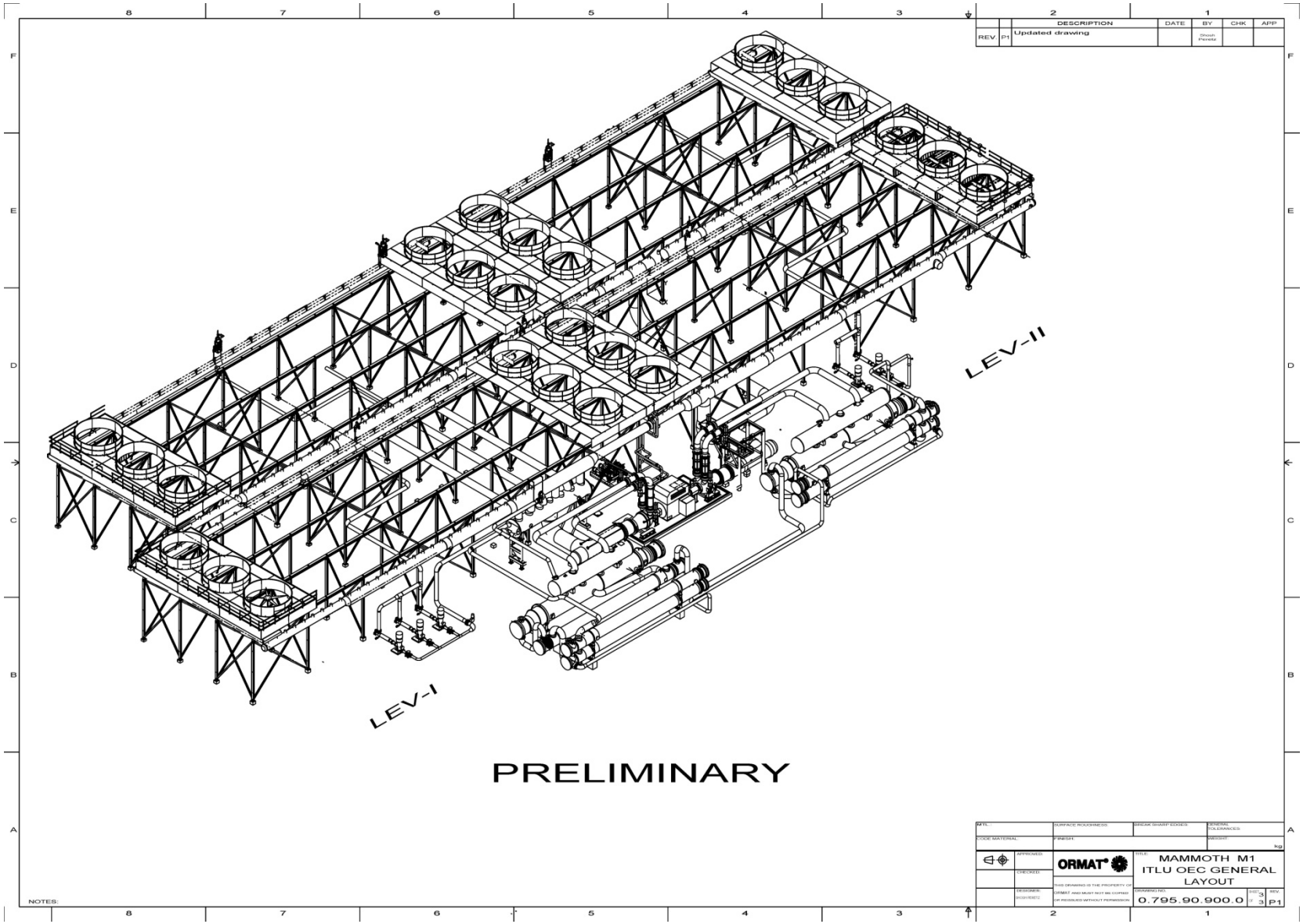

Figure 9: Three-Dimensional View of the Proposed M–1 Replacement Plant ITLU Facilities

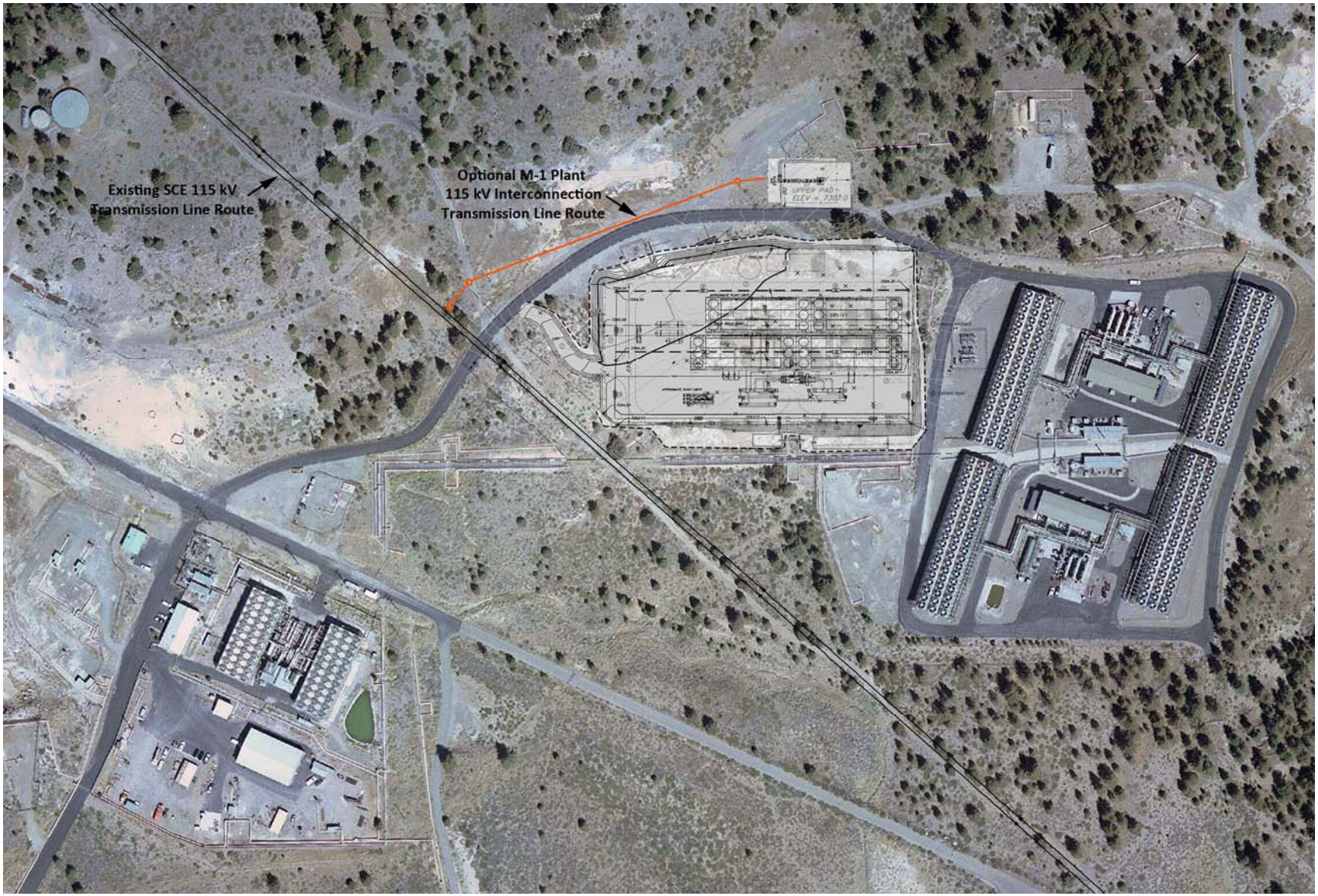

Figure 10: Proposed Route of the M–1 Plant 115 kV Interconnection Transmission Line Option

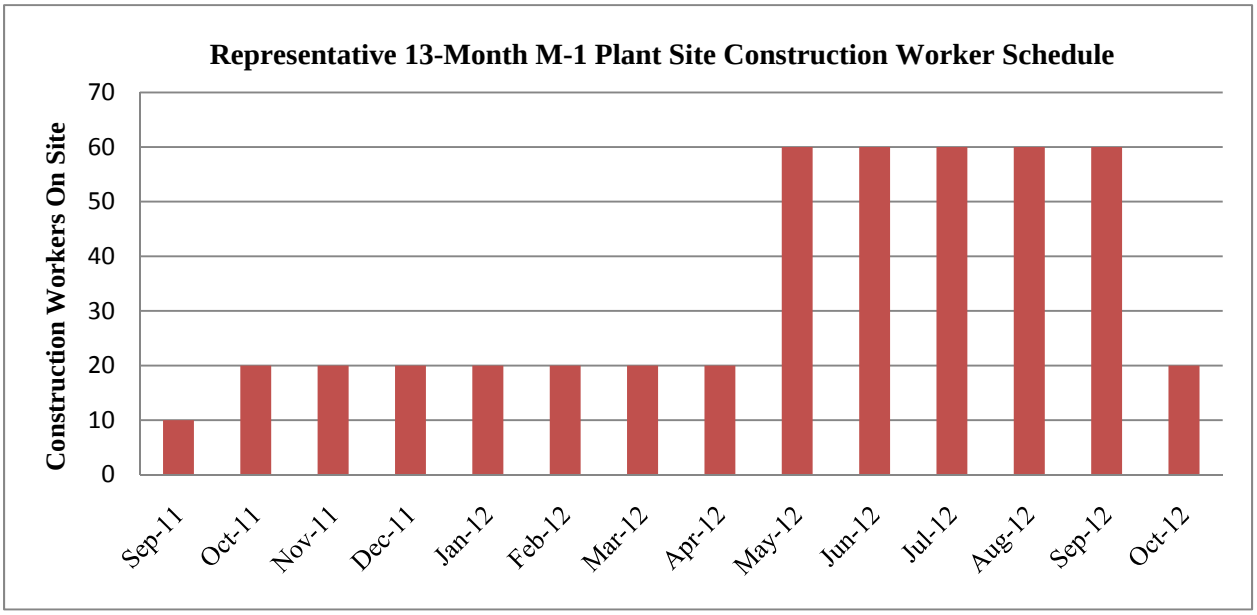

Figure 11: Representative 13–Month M–1 Plant Site Construction Worker Schedule

It is estimated that about 30% of the construction work force would be local. The remaining 70% of the construction work force would come from out of the area and would seek housing in local hotels or rental apartments and houses in both the greater Mammoth Lakes and Bishop vicinities.

Construction worker vehicles would be parked both near the plant site entrance (about 50%) and on the proposed plant site itself (about 50%). On average three (3), 40–foot delivery trucks would be expected to transport material to or from the site during the construction period. In addition, four (4), 60–foot trucks per day would deliver materials to the site over an approximate 10–day period early in the construction period; and an estimated ten (10), 40–foot trucks per day would deliver or remove materials from the site over an approximately 8–week period sometime during mid–construction.

Construction Water and Wastes

Civil contractors would supply construction water from the Town of Mammoth Lakes. Concrete would be supplied to the plant site ready–mixed with water. An estimated 20,000 gallons per day (g/d) of water would be used for dust control, 10,000 g/d for portable sanitation facilities, and 5,000 g/d for miscellaneous potable water needs.

The construction and operation of the project would generate both nonhazardous and hazardous wastes. Inert solid waste from construction activities may include lumber, excess concrete, metal, glass scrap, and empty nonhazardous containers. Management of these wastes would be the responsibility of the construction contractor(s). Typical management practices required for non–hazardous waste management include recycling when possible, proper storage of waste and debris to prevent wind dispersion, and weekly pickup and disposal of wastes to local landfills. The total amount of solid waste to be generated by construction activities would be less than that typically generated for normal commercial construction which is estimated to be between 1.5 and 2.5 pounds per square foot of the affected surface at large commercial construction sites (California Integrated Waste Management Board 2002). The waste generation for typical commercial construction is considered a worst case estimate of the waste that

would actually be generated by the proposed Project construction activities. A Construction Waste Management Plan would be prepared for the Project in conformance with California Green Building Code requirements (24 CCR Part 11, Chapter 5, Division 5.408.2 *et seq*).

During power plant construction, portable chemical sanitary facilities would be used by all construction personnel. These facilities would be maintained by a local contractor. Solid waste materials (trash) would be routinely collected and deposited at an authorized landfill by a disposal contractor. Used oil generated during construction would be managed in accordance with California used oil and hazardous waste regulations. MPLP would ensure that any generated wastes, liquid or solid, would be disposed of in compliance with all appropriate local, state, and federal regulations.

2.1.3 Pipeline Route, Design and Construction

Two aboveground interconnection pipelines (each about 110 feet long) on the M–1 plant site would be used to deliver hot geothermal fluid from an existing offsite production fluid pipeline to the OEC Unit on the plant site and to return cool geothermal fluid to an existing offsite injection fluid pipeline. Except for the new interconnection production and injection fluid pipelines on the M-1 replacement plant site itself, no new pipeline would be constructed to transport geothermal fluid to or from the new M-1 plant site (see Section 2.1.5). The Project would tap into the existing 16–inch geothermal fluid pipelines crossing immediately south of the plant site to bring geothermal fluid from the production wellfield to the new M-1 Replacement Project OEC and to transport the injection fluid stream to the injection wellfield after heat is extracted from the geothermal fluid.

2.1.4 Existing Plant Demolition

MPLP would close and decommission the MP–I power generation facilities after the new M–1 plant becomes commercial. Only the MP–I power generation facilities would be decommissioned. The existing plant control room, warehouse and shop building, firewater pump house, storage areas, and ancillary facilities located adjacent to the MP–I power generation facilities would remain on site (see Figure 12). Decommissioning of the MP–I power generation facilities would occur after M–1 replacement plant construction, commissioning, testing, and acceptance by the customer, Southern California Edison. This commercialization process may take up to a maximum of two years from the date that the M–1 plant begins startup operations. Both the MP–I plant and the M–1 plant may be operating concurrently during this period. Once the MP–I plant is taken off line, it would be decommissioned.

Demolition Work Force, Traffic and Schedule

An estimated ten to forty (10–40) workers would be on–site during demolition of the existing MP–I plant. Approximately five (5), 40–foot trucks per day would transport demolition materials off–site. Demolition is expected to occur over an approximately 90–day period beginning sometime after the up to two year period from the date that the M–1 Replacement Project begins startup operations.

Site demolition and restoration activities on the existing MP–I site would occur over an approximately 3-month period. The site demolition and restoration activities would begin once the MP-I plant is taken off line, or as soon as practical subject to seasonal constraints for conducting the site restoration work. Five to ten (5-10) workers would be on–site during site restoration activities and about three (3) trucks per day would deliver granular site restoration materials to the site over an approximately 2–week period during the site restoration activities.

Figure 12: MP-I Project Plant Facilities and Areas that Would Not be Decommissioned

Decommissioning and Demolition Wastes

One of the first tasks of the decommissioning process would be the evacuation of isobutane from the MP-I plant system. The proposed plan would transfer the isobutane from the MP–I plant through the existing cross–tie to the MP–II and PLES–I plants. This evacuation process would take one to two weeks. There would be no new temporary or permanent storage of the MP–I isobutane on site. It would be entirely transferred to the two existing plants that still use isobutane. If for some reason there is insufficient capacity in the MP–II/PLES–I system, any extra isobutane inventory would be evacuated into a transfer vessel and transported to Ormat's Steamboat plant in Reno, Nevada as this plant also uses isobutane. There would be no isobutane that would be sent offsite for disposal.

Any wastes, liquid or solid, generated during decommissioning activities would be disposed of in compliance with all appropriate local, state, and federal regulations.

2.1.5 Replacement Plant Operations and Maintenance

Plant and well field operations would be integrated via a computer link to the existing MP–I site power plant control room.

The proposed power plant can be described as having three interdependent operating systems: (a) the geothermal fluid system; (b) the motive fluid system and fire suppression; and (c) the cooling system. These systems are described below.

Geothermal Fluid System

The geothermal fluid system would be a closed loop system. The geothermal fluids from the production wells would be transported to the power plant site through the existing production pipeline system and would flow through the level 1 and level 2 vaporizers and preheaters of the OEC unit, transferring the heat to the motive fluid through the OEC's shell and tube heat exchangers. The cooled or spent geothermal brine would then be transported to the geothermal brine injection system without coming into contact with the atmosphere, again through the existing injection pipeline system to the injection wells. The existing Casa Diablo geothermal complex pipeline system would deliver the geothermal fluid to and from the proposed M–1 plant site. The existing pipeline system passes immediately south of the proposed M–1 plant site. The proposed M–1 OEC unit would be connected to/from the existing geothermal complex pipelines via new, above ground, production and injection fluid connection pipelines which would be constructed on the M–1 plant site. Each of the two proposed plant site interconnection pipelines would be about 110 feet in length.

Motive Fluid System

The vaporized motive fluid, normal pentane (n–pentane), from the level 1 and level 2 vaporizers would turn the level 1 and level 2 turbines which would together turn a common generator producing electricity that would be delivered to the substation and transferred to the interconnection transmission line. The vaporized n–pentane would then be condensed in an air–cooled tube condenser and returned to the preheaters and vaporizers to repeat the cycle. The motive fluid would be a closed–loop system, with no significant, routine release or discharge of motive fluid. The normal pentane (n–pentane) motive fluid system includes the n–pentane side of the OEC unit, an n–pentane vapor vessel, and an OEC vapor recovery unit (VRU) on the OEC condenser. A vapor recovery unit would be used during major

maintenance activities on the OEC unit. The OEC unit contains approximately 250,000 pounds of motive fluid (in the vaporizers, preheaters, condensers and piping). In the OEC, the motive fluid system is designed as a closed–loop. Minor fugitive leaks from the valves, connections, seals, and tubes would occur. The n–pentane from these leaks would be released to the atmosphere or would leak into the geothermal lines. A water separator system consisting of a knockout tank to separate water from n–pentane would be connected to the cycle pump suction and discharge lines. Plant operators would frequently inspect the OEC unit for indication of leaks and for visual signs of fugitive emissions.

Normal pentane leak detectors would be utilized throughout the facility and would be continuously monitored. Any noncondensible gases in fluid which may leak into the motive fluid system would eventually collect in the OEC condenser and reduce the efficiency of the OEC unit. In order to remove these noncondensible gases, the OEC condenser would have a small VRU. The OEC VRU would consist of two chambers and a set of isolation valves. Operation of the OEC VRU would be controlled by the power plant computer control system, which would start the OEC VRU noncondensible gas "purge" sequence whenever the efficiency of the OEC Unit falls below a set point. During "purging," nearly all of the n–pentane vapors in the OEC VRU would be condensed into liquid n–pentane and returned to the OEC unit, while any noncondensible gases, together with a very small quantity of n–pentane vapors, would be discharged to the atmosphere.

Some major maintenance activities require that at least a portion of an OEC unit be cleared of motive fluid liquid and vapors prior to performing the maintenance activities. To control and minimize motive fluid emissions during these maintenance activities, the liquid n–pentane would be drained from the section of the OEC Unit (preheater, vaporizer or condenser) to be maintained or repaired and transferred to another portion of the OEC unit, the motive fluid storage tank, or another OEC unit. A pump would then be used to evacuate and compress most of the remaining n–pentane vapors, returning the n–pentane liquid to the OEC unit. Those n–pentane vapors which do not condense would be released through the motive fluid VRU, which would adsorb nearly all of the remaining n–pentane vapors.

Cooling System

The M–1 Replacement Project would use an air cooling system. The air cooling system proposed consists of air–cooled condensers including bundles, motive fluid distribution manifolds, fans, motors, and supporting steel. The condenser would be a horizontal air–cooled heat exchanger, which contains 28 bays. Each bay has three fans driven by electric motors through a speed–reducing belt drive. Fan blades would be made of aluminum assembled on a shaft, which would be supported by bearings mounted on the condenser frame.

The motive fluid vapor condensate would be cooled in tube condensers by dry cooling similar to the existing MPLP plants, but the new system would be more efficient and would have fewer valves and flanges and therefore a reduced potential for fugitive emissions of the motive fluid than the existing MP–I plant. Binary power plants such as the proposed OEC unit are closed loop systems such that all the geothermal fluid produced from the geothermal reservoir would be injected back into the geothermal reservoir. The proposed air–cooled binary system is different from the cooling tower system typically used for a geothermal flash power plant where the condensed geothermal steam is used for cooling water. Flash plants are more frequently used in areas where the geothermal resource has a higher temperature than the more moderate temperature geothermal resource produced near Casa Diablo.

Operations Work Force, Traffic and Schedule

The existing MPLP staff (23 employees) would continue to operate the replacement M–1 plant. No new operational staff would be needed for the M–1 plant. No new worker commuting traffic would result from the Project. There are currently approximately five to ten (5–10) deliveries/vendors per day to the Casa Diablo geothermal complex and this would not change with the proposed M–1 Replacement Plant. The plant would run 24 hours per day, 7 days per week.

Hazardous Materials

The existing MP–I plant uses isobutane and a variety of lubricants, primarily turbine oil. The new M–1 plant would use n–pentane as the motive fluid instead of isobutane, but it would use the same or similar amounts of the same types of lubricants.

The existing MP–I plant stores approximately 125,000 gallons of isobutane on the site. A projected total of 100,000 gallons of n–pentane would typically be stored on the M–1 site within the OEC unit (70,000 gallons) and pressure storage vessels (30,000 gallons). During the transition period following startup of the M–1 replacement when both the existing MP–I plant and the M–1 plant are each operating, both the existing amount of isobutane used for MP–I operations and the proposed amount of n–pentane that would be used for the M–1 plant would be stored in the Project area. The isobutane would be removed from the MP–I plant site when the M–1 plant becomes fully commercial – projected to be after the up to two year period from the date that M–1 plant begins startup operations. The isobutane would be transferred to either the MP–II/PLES–I plant sites as makeup motive fluid for those facilities, or transferred as makeup motive fluid to Ormat facilities operating in Nevada.

MPLP has developed an integrated program that is intended to meet the requirements of the California Accidental Release Prevention (CalARP) Program, the EPA Risk Management Plan (RMP), and OSHA Process Safety Management (PSM) Program for all three existing plants. Prior to delivery of n–pentane, MPLP would revise and update this program to reflect the new M–1 plant.

The working pressure of the OEC unit with n–pentane would be lower than for the existing isobutane system at the MP–I plant and this would contribute to reduced leak potential and increased safety.

MPLP expects that there would be much less lubricating oil used for the M–1 replacement plant because the new OEC equipment would be more leak–resistant and more efficient, and it would have fewer moving parts than the existing equipment. MPLP indicates that the turbine oil proposed for the M–1 plant would not be considered hazardous according to OSHA criteria.

The M–1 replacement power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties or nearby waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. MPLP would revise its existing Spill Prevention, Control and Countermeasure (SPCC) Plan, in conformance with 40 CFR 112, to include the new M–1 plant.

MPLP would update its Emergency Response Plan (ERP) which addresses possible emergencies (well blow–outs, major fluid spills, earthquakes, etc.). There would be at least one employee “on call” at all times (i.e., available to respond to an emergency by reaching the facility within a short period of time) with the responsibility of coordinating all emergency response measures. The “on call” emergency

coordinator would be familiar with the ERP and would have the authority to commit the resources needed to carry out the contingency plan.

MPLP would also update its Hazardous Materials Business Plan (HMBP), which would be prepared and submitted to Mono County Environmental Health, as the Certified Unified Program Agency (CUPA) for Mono County.

All hazardous materials, including the n–pentane, lubricants, and the small quantities of paints, cleaning supplies, compressed gases and similar materials would be stored and handled in conformance with multiple federal and state hazardous materials management requirements to prevent potential adverse effects and any public exposure that could result from using these materials on site.

Fire Prevention and Suppression

Bulk quantities of the binary working fluid, n–pentane, would be stored in pressure vessels and bulk storage containers on the power plant site. Numerous engineering, fire–control and safety measures would be integrated into the Project to prevent releases of n–pentane, prevent fires, and to respond to and control fires and other emergencies. Some of the fire prevention, detection, and control systems that would be included in the design of the M–1 plant include the following:

- Safeguards inherent to the design of the power plant would include relief valves, manual and automatic shutoffs, interlocks, vents, and check valves.
- MPLP would revise its ERP and RMP/CalARP programs to incorporate the M–1 replacement plant design, as described above.
- MPLP staff would continue to receive training on the ERP and the RMP/CalARP programs to help become aware of hazards, prevent incidents, and what to do if an emergency incident should occur.
- The fire and n–pentane detection systems, as well as fire fighting system, would comply with National Fire Protection Association standards.
- Normal pentane–specific vapor sensors and flame detectors would be placed at strategic locations around the around the turbine, motive fluid pumps, and motive fluid storage tank and these would be connected to the power plant computer control system to quickly alert the plant operators to any such potentially hazardous situations. The existing control room itself would not need to be modified, but there would be new controls and monitors for the new plant and once the old plant is dismantled all its related equipment would be removed.
- An automatic water deluge sprinkler system would be installed on the n–pentane storage vessels (which contain n–pentane in liquid phase) that would automatically activate when a flame detector is activated. The water would be dispensed through a deluge valve that would be automatically opened by the operation of a flame detection system.
- Water nozzles/monitors would be placed at the power plant site to be used to minimize the risk of a fire spreading should one start within the power plant. MPLP would not install or use an automated system because of the operator discretion required to prevent the spread of a flammable liquid fire.
- MPLP advised that for fires involving leaks of flammable gases such as n–pentane, many experts agree that the best method of extinguishment is to isolate the source of the fuel. Refer to the following excerpt from a Material Safety Data Sheet (MSDS) for n–pentane:

> *The only safe way to extinguish an n–pentane fire is to stop the flow. Cylinders exposed to fire may rupture with violent force. Keep cylinders cool by applying*

> *water from a maximum possible distance with a water spray. Avoid spreading burning liquid with water used for cooling.*

- Therefore, automatic fire suppression systems on equipment containing n–pentane would not be used. Instead, manual and automatic shutoffs, interlocks, vents, and check valves, would be the first line of prevention and defense in the event of a fire emergency.
- All manned/occupied buildings would have an approved automatic fire suppression system as required by code.
- The water–based fire protection system would include a new fire water storage tank (approximately 340,000 gallons) and a diesel–powered (approximately 400 brake horsepower) fire water pump.
- Treated geothermal fluid would be the source of water stored in the fire water storage tank.
- The electrical systems would utilize an FM–200® waterless fire suppression system.
- There would be a single or multiple (Siamese) fire department connection (FDC) next to the fire water skid (in the fire equipment building). The sign on the FDC would state:

  > *In the event that there is a failure of the diesel pump, the fire department can connect to this FDC and pump water through it, maintaining pressure in the fire protection header. In addition every hydrant has a dedicated valve for fire department tie–in.*

- Fire suppression equipment and tools at the site would include the fire suppression system noted above, fire extinguishers, tools, and mobile equipment.

Representatives of the local Long Valley Fire Protection District would be invited to visit and inspect an existing geothermal facility similar to the proposed M–1 plant to facilitate their assessment of the proposed fire prevention and suppression system. The existing facility is located near Reno, Nevada, and has a fire protection system similar to the system proposed for the M–1 plant.

Operational Emissions

Unlike steam flash technology geothermal power plants, the proposed binary plant circulates geothermal fluid through heat exchangers in a closed system that does not expose the geothermal fluid to the atmosphere. As a result, there would be no emissions of noncondensible gases (e.g., carbon dioxide, methane or hydrogen sulfide) from the geothermal fluid. The OEC binary technology proposed for the Project results in a facility with no visible emissions and no consumptive use of geothermal or motive fluids (other than minor losses of motive fluid via fugitive emissions).

Fugitive VOC Emissions: The M–1 Replacement Plant would use n–pentane as the motive fluid. Normal pentane is volatile organic compound (VOC) and is considered an ozone precursor (i.e., it would contribute to the atmospheric production of ozone if released into the atmosphere). The circulating motive fluid cycle from vaporization in the heat exchanger, expansion through the vapor turbine, condensation in the air cooled condensers, and return to the heat exchanger storage vessel is a closed loop and there are no routine emissions of the motive fluid to the atmosphere. However, fugitive leaks of the motive fluid from pipes, seals, flanges, and valves would occur. Ormat estimates a maximum emission rate of 205 pounds per day of n–pentane would occur from fugitive leaks from the single OEC unit proposed. A permit for Authority to Construct and Permit to Operate would be obtained from the GBUAPCD addressing the fugitive emissions of n–pentane.

The project VOC emissions from M–1 plant would be less than those from the existing, up to 500 lbs/day of losses of isobutane from the aging MP–I plant. The working pressure of the OEC with n–pentane would be lower than the existing MP–I system working pressure with isobutane which contributes to the reduced motive fluid leakage projected for the M–1 plant.

Motive Fluid Maintenance: Normal pentane emissions occurring during major OEC unit maintenance activities would be controlled and minimized by evacuating and compressing the n–pentane vapors, returning the n–pentane liquid to the OEC unit, and releasing the n–pentane vapors which do not condense through the Vapor Recovery Unit (VRU) which would adsorb nearly all of the remaining n-pentane vapors. The OEC VRUs at other facilities similar to the OEC unit proposed for the M–1 plant have demonstrated better than 95% efficiency in controlling and recovering n–pentane emissions during normal operations.

Cooling System: The air cooling system proposed for the M–1 plant would have no routine emissions of noncondensible gases or motive fluid other than the potential fugitive VOC emissions leaks described above.

Emergency Generators: A diesel-powered [approximately 800 brake horse power (bhp)] emergency generator would be installed on the M-1 plant site to provide emergency backup power to critical plant functions in the event of a power outage. Similarly, a diesel-powered 400 bhp firewater pump generator would be installed to provide power to the firewater pump during fire emergencies. Typical internal combustion engine emissions would be released to the atmosphere during the regular maintenance and testing operations of the generators (less than 50 hours per year for each generator) and for periods when the generators may be operating during unscheduled power outages or fire emergencies.

Operational Discharges

There would be no offsite surface discharges from the M–1 plant site operations. Sanitary waste discharges would continue to be handled at the existing sanitation facilities on the MP–I site.

The power plant site would drain to a stormwater retention basin constructed in the southeast corner of the plant site and to a subsurface basin located in the southwest portion of the site to prevent offsite discharge of storm water. Storm water on the plant site would be intercepted by trench drains. The trench drains would empty into storm drain pipes located on the east and west sides of the plant site which would discharge into the storm water retention facilities on the south side of the plant site. After a rain event the water would be left for evaporation. The stormwater retention basin would include subsurface pipe and rock for storage of runoff up to a 20–year storm event (i.e., 1” of rainfall).

Operational Wastes

Typical waste streams from the current MP–I plant operations include used oil, oil debris, waste aerosols, used antifreeze and waste grease. These existing waste streams would not change and the quantities of waste could only decrease with the proposed M–1 Replacement Plant as it uses less oil and would be subject to less maintenance. No increase in waste generated is anticipated during the period when both the existing MP-I plant and the M-1 plant would be operating at overlapping diminished capacities. Used oil generated during operations would be managed in accordance with California used oil and hazardous waste regulations. Any generated wastes, liquid or solid, would be disposed of in compliance with all appropriate local, state, and federal regulations.

2.1.6 Interim Site Restoration and End of Project Site Reclamation

The expected life of the proposed M–1 power plant is a nominal 30 years. At the end of plant operations the MP–I Project facilities and area of operations, including the proposed M–1 power plant site and the existing MP–I geothermal wellfield and pipeline system would be subject to site restoration.

An interim site Reclamation Plan for the decommissioning of the MP-I plant site was prepared on behalf of MPLP (Triad/Holmes 2010). This plan covers removal of the existing structures, minor grading of the plant site, stabilization and revegetation of disturbed areas, and gravel surfacing of the pad for continued use of the decommissioned MP-I plant site as a storage yard (see Section 2.1.4). The plan is undergoing review by Mono County.

A more comprehensive Reclamation Plan was prepared on behalf of MPLP and submitted to Mono County for consideration which addresses removal of all project facilities and site restoration at the end of the project life for those portions of the Casa Diablo geothermal development complex (MP-I, MP-II and the M-1 plant site) located on private land (Triad/Holmes 2011). The proposed Reclamation Plan covers restoration of the area affected by the geothermal projects to a natural appearing condition consistent with Mono County site reclamation requirements. It is noted that the Casa Diablo area was impacted by earlier development prior to the existing geothermal projects.

2.1.7 Environmental Protection Measures Adopted by the Project

The Project includes measures designed by MPLP to protect the environment and reduce or prevent potential environmental impacts. These include measures to prevent fire and spills and to protect public health and safety. Measures also were proposed to minimize soil erosion and noise; and any adverse effects on air quality, wildlife and vegetation, cultural resources, and visual resources. MPLP earlier designed the existing MP–I, MP–II and PLES–I projects to minimize the potential for unexpected upset conditions. This includes actions to be taken to protect the environment and the public in the unlikely event that geothermal fluid is released or a project related hazard is created. The environmental protection measures proposed by MPLP are summarized below and presented in Appendix A.

Surface and Ground Water Quality Protection

MPLP would submit a Notice of Intent to comply with California's construction stormwater requirements for plant construction. After construction, the power plant site would drain to a retention basin located in the south-central portion of the site. Overflow from this basin would drain via pipeline to a second stormwater retention basin located in the southeast corner of the plant site (see Figure 5). The basin would include subsurface pipe and rock for storage of runoff from a 20–year storm event.

Storm water would be intercepted by trench drains (rock filled trenches with a drain pipe on the bottom of the trench) which would drain the site to the east and west. The drains would flow into storm drain pipes located on the easterly and westerly portions of the pad which would drain to the south into the storm water retention facilities. After a rain event the water would be left in the basins for evaporation.

Air Quality Protection

MPLP would obtain an Authority to Construct permit for the new power plant from the Great Basin Unified Air Pollution Control District (GBUAPCD). A vapor recovery unit (VRU) would be used to

capture motive fluid that could otherwise be released during plant maintenance. The new plant would have fewer fugitive air emissions than the existing plant.

The Project would also incorporate measures to control fugitive dust generation during construction, including: (a) selection of the plant site and plant design to minimize grading; (b) limiting land disturbance to areas identified on the grading and site plans; (c) watering of disturbed surfaces and building materials to prevent excessive dust; (d) limiting the on–site construction vehicle maximum speed limit to 15 miles per hour (mph); (e) ceasing clearing, grading, earth moving, and excavation activities during periods of high wind (i.e., averaging greater than 25 mph); (f) watering or securely covering all materials transported on or off the site; (g) paving with asphalt the plant maintenance road around the plant site; and (h) covering all unpaved plant site surfaces with gravel after final grading.

Prevention of Noise

All noisy construction activities would be limited to daylight hours. Noise levels during construction activities would be kept to a minimum by equipping all on–site equipment with noise attenuation devices. The new plant would operate with less noise than the existing plant. All project construction activities and normal operations would comply with applicable County noise requirements.

Geotechnical and Geologic Hazards

The Project would be subject to all measures recommended in the report of the geotechnical investigation of the site to mitigate impacts due to geotechnical/soils/geologic constraints. All buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code adopted by Mono County.

Protection of Fish, Wildlife, and Botanical Resources

Baseline biological and botanical surveys of the Project site were conducted. The Project would be subject to all environmental protection measures to reduce the adverse effects of the Project on biological and botanical resources recommended in the survey reports.

Protection of Cultural Resources

Baseline cultural resource surveys of the Project site were conducted. The Project would be subject to all environmental protection measures to reduce the adverse effects of the Project on cultural resources recommended in the survey reports.

Prevention of Soil Erosion

A civil engineer was retained to prepare a grading plan to incorporate measures to avoid or minimize erosion during Project construction and operations. The grading plan would be submitted for review to the Mono County Public Works Department (MCPWD) prior to implementation. The Project would be subject to the Best Management Practices (BMPs) identified in the grading and drainage plan as approved by the MCPWD. BMPs that would be adopted to reduce soil erosion during construction include placement of straw wattles and/or silt fencing along the perimeter of the site, and around topsoil stockpiles; and placement of silt fences in drainage swales at the exit point of the site.

BMPs would be implemented during post–construction including the use of erosion control blankets and hydroseeding of slopes created by grading outside of the plant site. The plant site would include the placement of ¾" rock placed in all areas that are not covered by pavement or structural concrete. The rock filled trench drains and the retention facilities would provide desiltation of storm water runoff.

Prevention of Spills

The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. A Spill Prevention, Control and Countermeasure (SPPC) Plan would be prepared for the M–1 replacement plant site and integrated into the existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex.

Visual Resources

Power plant lighting would be projected downward to mitigate nighttime visibility of the facilities. An Outdoor Lighting Plan would be prepared and implemented for the M–1 plant site in conformance with the Mono County Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23). The M–1 facility structures would be painted flat dark green approved by the County, similar to the existing plants, to help blend into the background. The proposed plant site was designed to save a large pine tree in the southwest corner of the site to provide some visual screening of the plant site (see Figure 13).

Waste Disposal

During power plant construction, portable chemical sanitary facilities would be used by all construction personnel. These facilities would be maintained by a local contractor. Solid waste materials (trash) would be routinely collected and deposited at an authorized landfill by a disposal contractor. Used oil generated during operations would be managed in accordance with California used oil and hazardous waste regulations.

Hazardous Materials

The existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex would be expanded to include the M–1 plant site and operations. This would include revising: (a) the existing SPCC Plan; (b) the California Accidental Release Prevention (CalARP) Program; (c) the EPA Risk Management Plan (RMP); and (d) the OSHA Process Safety Management (PSM) Program to include the new M–1 plant.

Fire Prevention and Suppression

The existing comprehensive program for fire prevention and suppression at the Casa Diablo geothermal complex would be amended and integrated to include the M–1 replacement plant facilities and operating procedures.

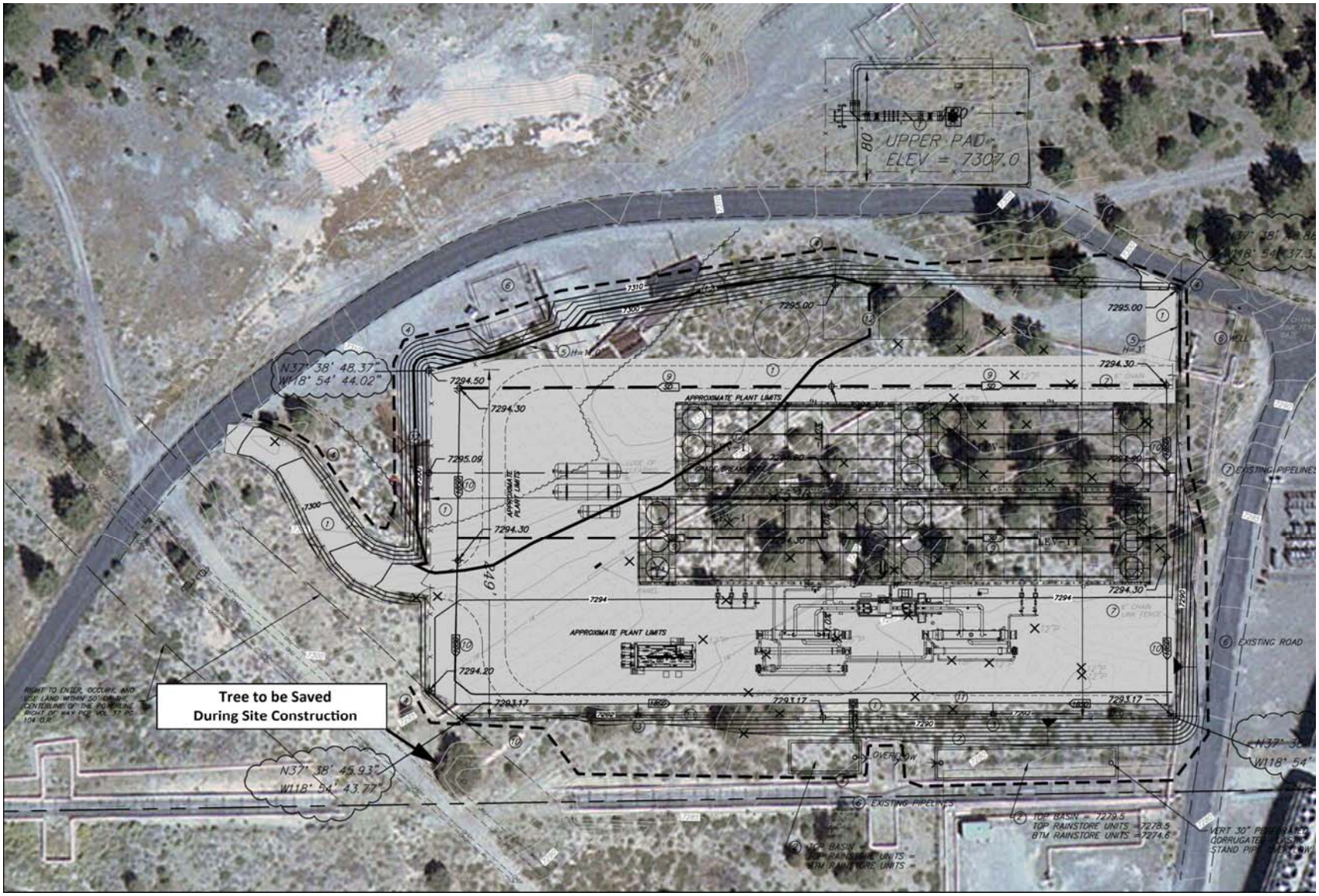

Figure 13: Pine Tree Near the Southwest Corner of M-1 Plant Site to be Saved During Site Construction

2.1.8 Exceptions Required for County Approval of the Project

A. The *Proposed Project* is subject to Mono County making the necessary findings to approve a Conditional Use Permit for the following components as outlined below:

1. **Proposed Project; and**
2. **Facility Height**

The *Proposed Project* would require Mono County to make one or more exceptions or variances to their General Plan requirements for approval of the Project as proposed (see Section 1.4.2). Specifically, the County would need to address the following Project features.

Facility Height Exception

The maximum height of mechanical appurtenances on the proposed air-cooled condenser system would extend approximately five feet above the approximately 35-foot tall condenser units (see Figure 8). As such, the total height of these facilities would exceed the applicable height limitation of 35 feet and would need to be permitted subject to [Community Development] Director review for approval or a Conditional Use Permit.

It should be noted that while a height greater than 35 feet can be permitted by Director Review and approval, the additional height would be considered a part of the Conditional Use Permit for the MP-I Replacement Project.

Applicable Mono County General Plan Requirements:

Land Use Element
VI. Land Development Regulations
General Provisions
Chapter 01 – Introductory Provisions
01.060 - Land Use Designations
B. No building shall be erected, reconstructed or structurally altered to exceed in height the limit allowed by these regulations for the particular land use designation assigned by the County to the parcel of land on which such building is located, except as provided in Section 04.110 of these Land Development Regulations.
Chapter 02 – Definitions
02.580 Height of building
"Height of building" means the vertical distance from the average level of the highest and lowest point of that portion of the building site covered by the building to the topmost point of the building, but excluding certain features as specified in Section 04.110 as set forth in subsection A and B of that section. All height shall be calculated from the natural or finished grade, whichever is more restrictive.

Development Standards
Chapter 04 – General

04.110 Building height.
A. All buildings and structures hereinafter designed or erected, or existing buildings which may be reconstructed, altered, moved or enlarged, shall have a height no greater than 35 feet from grade measured from any point of the building. All heights shall be calculated from the natural grade or finished grade, whichever is more restrictive.
E. Exceptions to the Height Limitations.
2. Director Review: The following uses shall be permitted at a height greater than 35 feet subject to Director Review and approval: chimneys, silos, cupolas, flag poles, wind generation towers, monuments, natural gas storage holders, radio and other towers, water tanks, church steeples and similar structures and mechanical appurtenances that are permitted in a designation. In cases where the additional height might result in substantial detrimental effects on the enjoyment and use of surrounding properties, a Use Permit will be required but shall not exceed 60 feet.

B. The *Proposed Project* is subject to Mono County making the necessary findings to approve a variance for the following exceptions as outlined below:

1. **Overhead Power Lines; and**
2. **Setbacks**

Overhead Power Line Variance

An optional aboveground interconnection transmission line would extend from the proposed M-1 plant substation to an existing SCE transmission line (see Figure 10). The *Proposed Project* is located within a scenic highway corridor and a variance must be obtained for approval of an overhead utility line installation. If the Applicant chooses to pursue the overhead transmission line option, then an application for a variance would need to be submitted to Mono County to allow for construction of an aboveground transmission line in a scenic highway corridor and additional environmental review would be required for approval of the variance application.

Applicable Mono County General Plan Requirements:

Conservation/Open Space Element
Visual Resources
Goal: Protect and enhance the visual resources and landscapes of Mono County.
Objective C
Policy 3: Proposed transmission and distribution lines shall be designed and sited to minimize impacts to natural and visual resources.
Action 3.1: Install utilities underground in conformity to Mono County Code.
Action 3.3: Install new utility lines underground within scenic highway corridors, unless a variance is granted for overhead installation.
Action 3.8: Enforce the policies in the Energy section of the Conservation/Open Space Element pertaining to the siting and design of transmission lines and fluid conveyance pipelines.

Development Standards Chapter 15 Resource Extraction Designation – Variance

Chapter 15 – Resource Extraction Designation has been established to allow for conditional development of on-site resources, including energy-related resources. Section 15.070 B Setbacks list the requirements

for facility siting. The *Proposed Project* does not meet the required setbacks and a variance must be obtained for approval of the facility and infrastructure.

Applicable Mono County General Plan Requirements:

Development Standards Chapter 15 – Resource Extraction Designation
15.070 B Development Standards - Setbacks
The following minimum development standards shall apply to all projects in the Resource Extraction Designation unless amended through the "Specific Plan" process. Other standards or conditions identified during the Use Permit process may also apply.
15.070 B. Setbacks.
1. No processing equipment or facilities shall be located and no resource development shall occur within the following minimum horizontal setbacks:
b. One hundred (100) feet from any exterior property line.
d. No geothermal development located within the Hot Creek Buffer Zone shall occur within 500 feet on either side of a surface watercourse (as indicated by a solid or broken blue line on U.S. Geological Survey 7.5 or 15-minute series topographic maps).

It should be noted that while Chapter 15 setback standards apply to all projects, these setbacks may be amended through a Specific Plan or Variance process. The Applicant is requesting a variance from Chapter 15 setback requirements.

2.2 PROJECT ALTERNATIVES

CEQA requires consideration of a reasonable range of alternatives to, or to the location of, the Proposed Project. Alternatives must be potentially feasible and must attain most of the basic Project objectives (as described in Section 1.2). Alternatives should also avoid or substantially lessen one or more of the potentially significant effects of the Proposed Project (CEQA Guidelines; 14 CCR 15126.6).

The range of alternatives required is governed by a "rule of reason," which means that only those feasible alternatives necessary to permit a reasoned choice need to be considered. Reasonable alternatives are those that are practical or feasible based on technical, economic and other considerations. Analysis of the "no project" alternative is specifically required, as is a discussion of those alternatives considered but rejected as not feasible.

2.2.1 Alternative Power Plant Location

Alternative Location Selection Process

The development of the proposed M–1 facilities at another power plant site in proximity to the existing Casa Diablo geothermal complex was considered as a possible Project Alternative. No suitable alternative power plant site could be identified on the existing MP–I/MP–II private lands owned by Ormat, the parent company of MPLP, other than the *Proposed Project* M–1 plant site (see discussion of alternatives considered, but rejected as not feasible, in Section 2.2.3).

Due to the existence of public roads, steep slopes, Alquist–Priolo earthquake fault zones (CDMG 1982), seasonal waters and marshes, and thermal features and soils in the vicinity of the *Proposed Project*, many areas in the vicinity were determined to be unsuitable for power plant site development (see Figure 14).

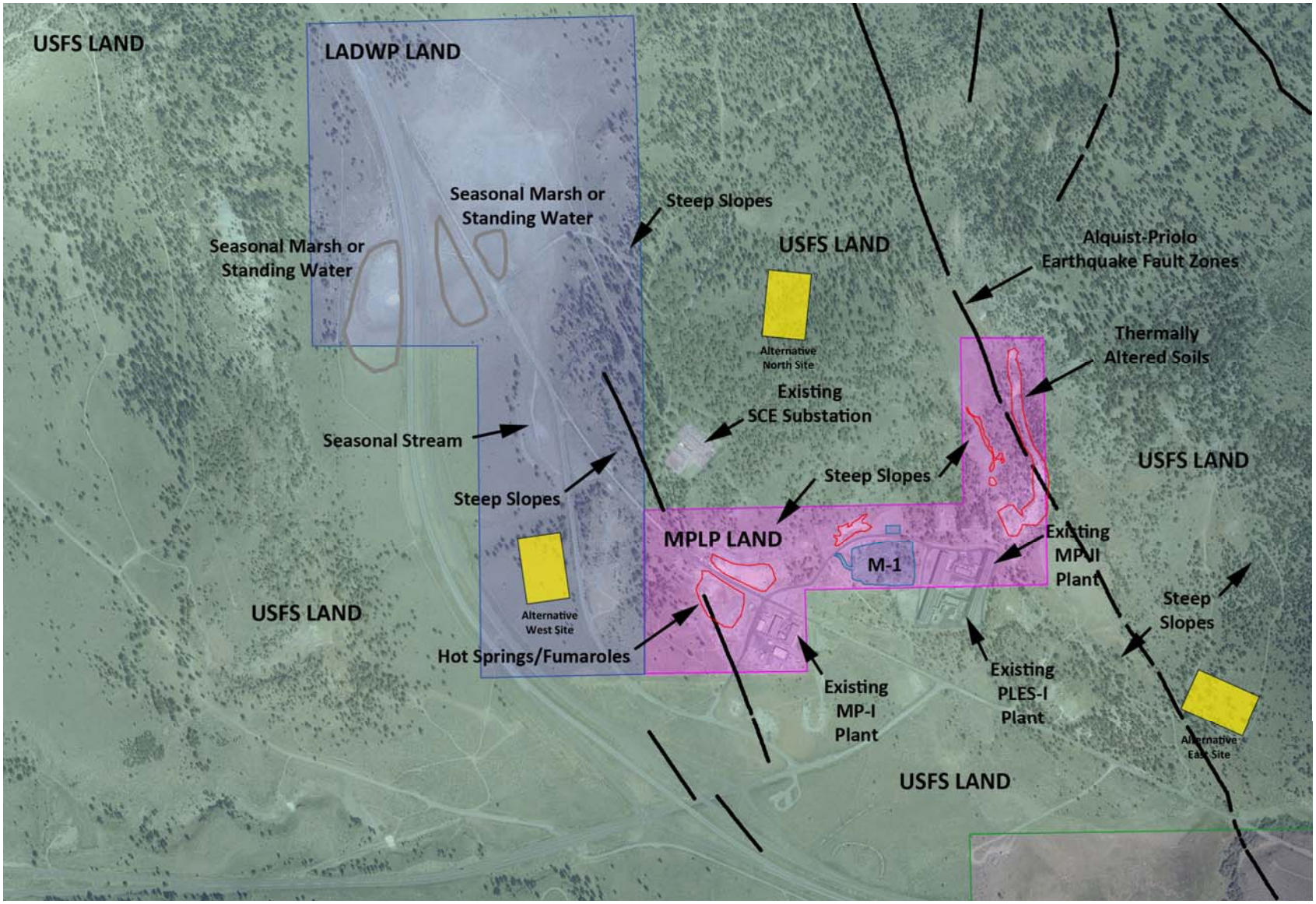

Figure 14: Proposed M–1 Replacement Project Alternative Plant Siting Constraints Map

Three representative offsite power plant locations were considered. These included power plant locations on neighboring private and public lands in close enough proximity to the *Proposed Project* to be within suitable distances which would allow the produced geothermal fluid to be transported by pipeline to the respective plant sites before cooling. In addition, the selection process considered the relative potential for significant impacts that could result from the Project that were identified in the Initial Study prepared by the County and/or in comments received from agencies and the public during scoping for the EIR. The two potentially significant impacts from the Project that were identified by the screening analysis included:

Aesthetics:	Determine if the Project could substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a scenic highway corridor; and
Biological Resources:	Determine if the Project could in combination with existing and reasonably foreseeable projects have a potentially significant cumulative impact on biological resources including mule deer.

The first of the prospective alternative plant sites (West Site) considered would be located on neighboring land west of the MP–I plant site owned by the Los Angeles Department of Water and Power (LADWP) (see Figure 14). The LADWP property is bisected by scenic Highway 395 and County roads and any feasible power plant location on this property would be highly visible to the public from the roadways. In addition, the West Site land is not under geothermal lease to MPLP and it is unclear that MPLP could secure control or access to the LADWP property for geothermal development.

The second of the prospective alternative plant sites (East Site) considered would be located east of the MP–II plant site on neighboring public land administered by the U.S. Forest Service (USFS). The East Site land is located on a step of the adjacent hillside on public land under geothermal lease to MPLP (see Figure 14). The elevated location of this plant site would make a power plant at this site highly visible to the public from Highway 395 and State Route 203. Substantial cut and fill would be required to construct a power plant pad on the East Site. The East Site is also under consideration as an alternative power plant site location for the proposed CD–4 geothermal development project (see discussion in Section 5.1.3).

Preliminary environmental assessment suggests that neither of the first two possible offsite locations appear to either avoid or substantially lessen any potentially significant impact of the *Proposed Project* or to provide any environmental advantages over the *Proposed Project*. The alternative sites are each located in Jeffrey Pine and sagebrush community habitat similar to the proposed M–1 replacement site and would be expected to support similar biological resources, including mule deer. The outward expansion of geothermal development that would occur if either of these offsite locations were developed would enlarge the existing footprint of the Casa Diablo geothermal complex with the potential for relatively greater cumulative impacts on biological resources than the *Proposed Project* because no geothermal operations currently occur in the West Site or East Site locations but they do occur in the area of the proposed M–1 plant site. A power plant constructed on either the West Site or East Site would also be more visible to the public than the *Proposed Project*.

The third of the prospective alternative plant sites (North Site) considered would be located on neighboring public land north of the MP–I plant site under geothermal lease to MPLP which is also administered by the USFS. Based on a preliminary assessment of siting constraints on the neighboring lands, a potentially suitable power plant site was identified approximately 2,000 feet north of the existing

MP–I plant site (see Figure 14). As the North Site is located on public land, approval of a geothermal power plant development at this location would also require a NEPA environmental assessment before a federal agency decision could be made on the project. The North site is located in relatively undisturbed Jeffrey pine forest with sagebrush understory which provides habitat for many species, including mule deer. The potential for adverse site specific and cumulative effects on wildlife if the North Site location is developed would be similar to, and could possibly exceed, those that would occur on the proposed M–1 plant site. However, the North Site location provides an opportunity to avoid or substantially lessen the visibility of the *Proposed Project*. As such, this site was selected as the most reasonable of the prospective alternative plant sites identified for assessment in the EIR as an *Alternative Power Plant Location*.

Alternative Location Project Description

The selected *Alternative Power Plant Location* would be on public land administered by the USFS located north of the existing SCE substation and east of the proposed Casa Diablo IV Geothermal Development Project (CD–4) power plant site (see discussion in Section 5.1.3). It is assumed that the *Alternative Power Plant Location* would be constructed within an approximately 5.65-acre footprint essentially the same as that described for the *Proposed Project*. An approximately 600–foot interconnection transmission line would need to be constructed from the alternative plant site to the existing SCE substation. In addition, new production and injection fluid pipelines would need to be constructed to the alternative plant site. The new pipelines would be assumed to parallel the pipeline route of the proposed CD–4 Project from the existing MP–I plant site to the alternative plant site – a distance of about one mile (see Figure 15). The construction, MP–I decommissioning, operations, and eventual site reclamation of the *Alternative Power Plant Location* geothermal development would be essentially the same as those activities described for the *Proposed Project* with only minor site–specific adjustments. Approval for development on the *Alternative Power Plant Location* would require NEPA review and approval from federal agencies.

No other reasonable alternatives to the Project which could feasibly meet and attain most of the basic Project objectives, and which would avoid or substantially lessen one or more of the potentially significant effects of the *Proposed Project* were identified (see Section 2.2.3).

2.2.2 No Project Alternative

The No Project Alternative would occur if the proposed Mammoth Pacific I Replacement Project was not approved. The environmental effects which could occur from the *Proposed Project* or the *Alternative Power Plant Location* would not occur. The previously approved geothermal development projects described in Section 1.3 would not be affected by selection of the No Project Alternative. Activities associated with these other projects would be able to continue. The existing MP–I power plant would not be replaced. The more efficient conversion of the available geothermal heat energy to electrical energy afforded by the proposed modern technology and equipment would not be realized. The aging MP–I power plant would be expected to continue to operate as long as repair and restoration of the facility remains economically practical.

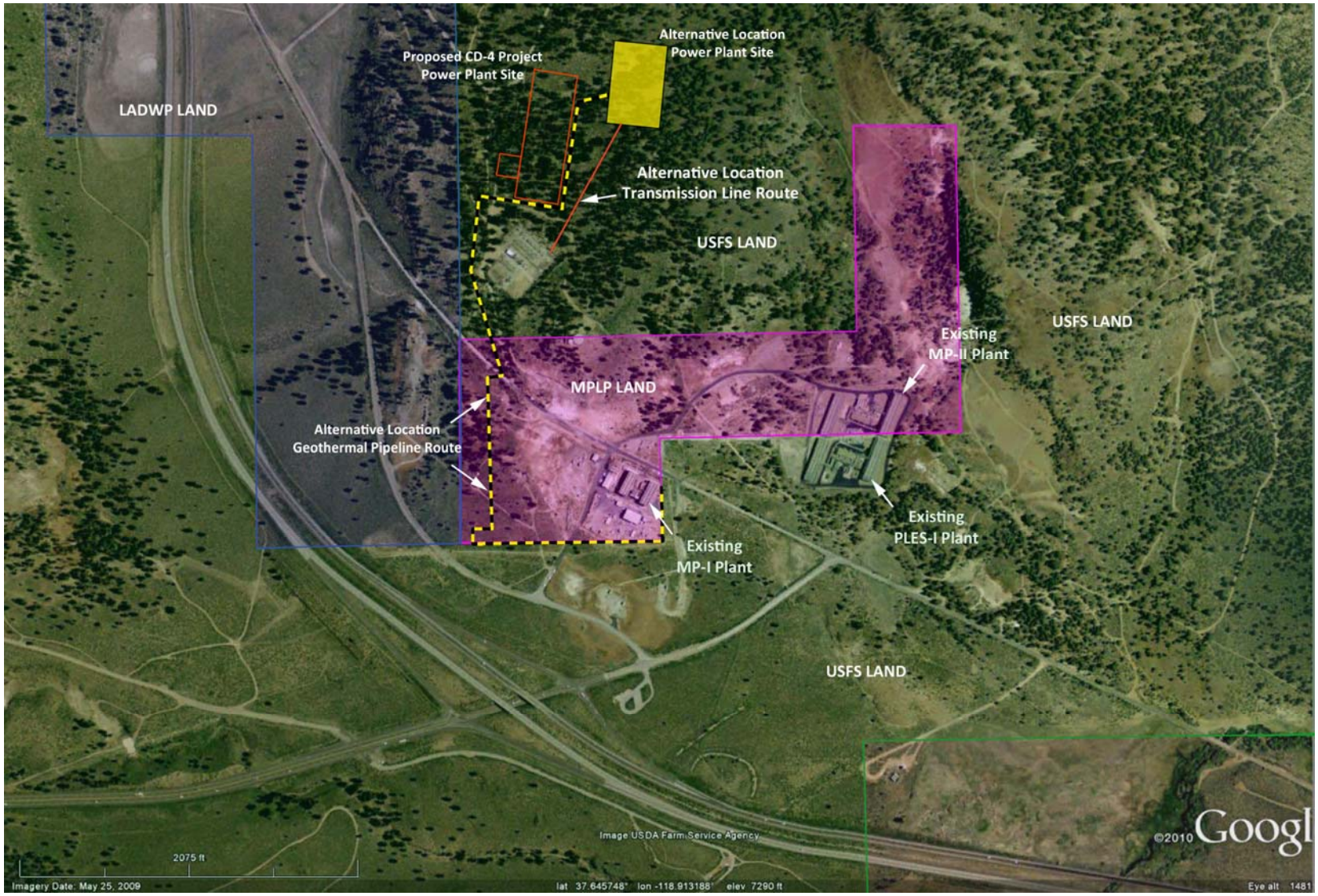

Figure 15: *Alternative Power Plant Location* (North Site) to the *Proposed Project*

2.2.3 Alternatives Rejected as Not Potentially Feasible

A series of additional possible alternatives to the *Proposed Project* were considered. Each of the identified possible alternatives was evaluated to determine if the alternative was potentially feasible. In determining feasibility the following guidance from the CEQA Guidelines Section 15126.6(f)(1) was utilized:

> *Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries…, and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site…*

Feasibility factors associated with geothermal energy development include, (a) geothermal resources are site specific and development can only occur in locations where suitable geothermal resources naturally exist; and (b) produced geothermal fluids cannot be transported long distances before cooling to below temperatures that would prevent conversion of the geothermal heat energy to electrical energy. As such, a geothermal power plant must be located in close proximity to the geothermal production wells which would support the power plant.

Replacement Plant on the Existing MP–I Plant Site

Use of the existing MP–I power plant site for the construction of the proposed replacement M–1 power plant was considered as a possible Project Alternative. However, the modern cooling system and OEC technology proposed for the replacement plant which is needed to efficiently utilize the available geothermal resources would not fit in the existing MP–I site footprint. Based on the space available on the MP–I plant site after the MP–I power plant facilities are removed, it is estimated that only one–half of the proposed M–1 replacement plant facilities could fit in the vacated area (see Figure 16). Using this estimate, then only a proportional 50% of the projected electricity output (about 9.4 MW (net)) from the proposed M–1 replacement plant could be generated on the MP–I plant site using the same modern cooling system and OEC technology proposed for the M–1 replacement plant. The reduced scale replacement plant on the existing M–1 plant site would use only about one–half of the existing geothermal resource currently available to the MP–I power plant.

In addition to the reduced electrical energy output and inefficient use of the available geothermal resources that would result from the *Replacement Plant on the Existing MP–I Plant Site* alternative, it is noted that the Project applicant is required to continue to provide electrical energy to SCE under the terms of the existing MP–I power sales agreement. This could not be accomplished if the existing MP–I plant were to be demolished before construction of the replacement power plant. It is estimated that about two years would be required to demolish the existing MP–I power plant facilities, construct the replacement plant facilities, and bring the replacement plant on line generating power. As such, no electrical energy would be generated from the MP–I project for about two years. In addition, MPLP would need to renegotiate the terms of the existing power sales agreement with SCE or find an acceptable new energy purchaser for the energy generated from the replacement project adding uncertainty as to the economic feasibility of *Replacement Plant on the Existing MP–I Plant Site* alternative.

Figure 16: Representative Reduced–Capacity Plant Facility Arrangement on the MP–I Site

These potentially limiting conditions would not meet most of the basic project objectives. Objectives that would not be met include (a) Applicant's objectives of to *optimize the amount of electrical energy that can be generated from the available geothermal resources*; and to *ensure continuous power generation and maximize utilization of the geothermal resource* …: and (b) the County goals, policies and objectives to *permit the productive and beneficial development of alternative energy resources, including geothermal resources*; and to *ensure the orderly and sound economic development of geothermal resources...* (see Section 1.2). As such, the *Replacement Plant on the Existing MP–I Plant Site* Alternative was eliminated from detailed consideration as not potentially feasible.

Alternative Onsite Plant Location

Construction and operation of the replacement M–1 power plant at another location within the private lands owned by Ormat in the vicinity of the Casa Diablo geothermal complex was considered as a possible Project Alternative. However, the only private lands available in the vicinity of the MP–I project that are owned by Ormat, the parent company of MPLP, are the 90 acres of private lands on which the MP–I and MP–II power plants currently exist. Except for the proposed M–1 replacement plant site, the remaining portions of the 90 acres of private land which are not already utilized for geothermal operations are unsuitable as a potential power plant site due to either steep slopes, Alquist–Priolo Earthquake Zone faults, or thermal soils that exist on the other available land (see Figure 14). As such, the *Alternative Onsite Plant Location* Alternative was eliminated from detailed consideration as not potentially feasible.

Replacement Plant with a Reduced–Capacity

Construction and operation of a replacement power plant with a reduced electrical generating capacity as compared to the proposed M–1 replacement power plant was considered as a possible Project Alternative. A reduced capacity power plant could be constructed on the proposed M–1 plant site with a smaller footprint than the *Proposed Project*. The size of the plant site would be somewhat proportional to the reduced power generation capacity. However, the air condensers, the tallest power generation facilities, would still be constructed to the same height, making these reduced–capacity plant facilities similarly visible from the same offsite locations as the *Proposed Project*. The reduced–capacity plant facilities would still require the same access, ancillary buildings, substation, and interconnection transmission line as the *Proposed Project*. The number of construction workers could be slightly reduced, but the site construction would still occur over roughly the same 13–month period as the *Proposed Project*.

The smaller footprint required for a reduced–capacity plant would provide the opportunity to locate and orient facilities on the plant site in a manner that may save some of the pine trees and associated habitat on the site. However, because the M–1 power plant site is located adjacent to the existing MP–II and PLES–I power plant sites and just 500 feet northeast of the existing MP–I facilities, the additional habitat that might be saved as a result of the smaller footprint is already indirectly disturbed by the neighboring geothermal operations and would not result in a substantive difference between the *Proposed Project* and the reduced–capacity plant with respect to the availability of suitable habitat to support biological resources in the Project vicinity.

The proposed air cooling system for the Project must be exposed on all sides to allow for the continuous circulating air flow needed for efficient operation. As such, vegetation cannot occupy the areas adjacent to the proposed facilities. In addition, the key observation points visible to the general public are all located south and southwest of the proposed M-1 replacement plant site; while, most of the existing mature pine trees that might provide additional screening of the power plant facilities are located on the north side of the proposed M-1 plant site. As such, construction of a reduced-capacity plant on either the

north side or the south side of the proposed M-1 plant site would still allow most of the plant facilities to be visible from the key observation points located to the south and southwest. Based on this assessment, a reduced–capacity plant would not provide any substantive plant visibility advantages over the *Proposed Project*. In addition, a replacement plant that was smaller in size than the proposed M–1 plant would not fully utilize the available MP–I geothermal resources and would result in reduced electrical energy output.

The *Replacement Plant with a Reduced–Capacity* Alternative would not substantively lessen either of the identified potentially significant environmental impacts of concern (i.e., visibility of the power plant facilities and/or potential cumulative effects of the Project on biological resources). In addition to offering no substantive environmental advantages, the reduced electrical energy output that would result from a reduced–capacity plant would not meet most of the basic project objectives. Objectives that would not be met include (a) Applicant's objectives of to *optimize the amount of electrical energy that can be generated from the available geothermal resources*; and to *ensure continuous power generation and maximize utilization of the geothermal resource …*: and (b) the County goals, policies and objectives to *permit the productive and beneficial development of alternative energy resources, including geothermal resources*; and to *ensure the orderly and sound economic development of geothermal resources...* (see Section 1.2). As such, the *Replacement Plant with a Reduced–Capacity* Alternative was eliminated from detailed consideration.

2.2.4 Environmentally Superior Alternative

Section 15126.6 of CEQA requires an EIR to identify the "environmentally superior" alternative. If the "environmentally superior" alternative is the "no project" alternative, the EIR must also identify an "environmentally superior" alternative among the other alternatives.

The Draft EIR provides an assessment of the environmental impacts of each of the Project Alternatives. The *Alternative Power Plant Location* project alternative would result in very similar impacts to those identified for the *Proposed Project*. However, in addition the *Alternative Power Plant Location* project site would require construction of approximately one mile of new geothermal pipeline corridor resulting in greater impacts on biological resources and more construction related air emissions. The location of the alternative plant site would be within a Jeffrey Pine forested area and would be susceptible to greater potential wildland fire hazard which was determined to be a potentially significant impact. The alternative power plant site would be less visible from major roadways than the *Proposed Project*, but neither of these visual impacts was determined to be significant.

Based on the analysis provided in this Draft EIR, the *Proposed Project* is considered the "environmentally superior" alternative.

3 IMPACTS DETERMINED NOT TO BE SIGNIFICANT

3.1 Initial Study

An Initial Study (IS) was prepared for the Project in February 2011 (see Appendix B). A Notice of Preparation (NOP) was prepared by the County and was distributed to the State Clearinghouse, Office of Planning and Research, responsible agencies, and other interested parties on February 4, 2011, in compliance with Section 15082 of the CEQA Guidelines. The NOP for the Draft EIR was circulated until March 4, 2011. Written responses received with respect to the NOP are presented in Appendix B. In addition, a public scoping meeting was held on February 17, 2011 to obtain the public's initial views about environmental issues that should be evaluated in the Draft EIR in connection with the Project. Appendix B contains a summary of the comments provided to the County during the public scoping meeting.

3.2 Regulatory Framework

Section 15128 of the CEQA Guidelines states that:

> *An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR.*

3.3 Initial Study Determinations

Based on the analysis provided in the IS and the input received in response to the NOP and public scoping session, the County has determined that implementation of the MP–I Replacement Project would not result in significant impacts to the environmental resource topics described below. As such, these topics are not evaluated in detail in this EIR.

As identified below, it has been determined that there is no substantial evidence that the Project would cause significant environmental effects in the following areas:

- Agriculture and Forestry Resources
- Greenhouse Gas Emissions
- Land Use/Planning
- Mineral Resources
- Population/Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities/Service Systems

Therefore, no further environmental review of these issues is necessary. For further analysis of each issue, see the Initial Study that was prepared for the NOP, which is contained in Appendix B. These analyses are also summarized below.

Through the scoping process described above, the County also determined that the Project may have potential adverse impacts on the environment with respect to: Aesthetics; Air Quality; Biological Resources; Cultural Resources; Geology/Soils; Hazards and Hazardous Materials; Hydrology and Water Quality; and Noise. Analyses of these issues, and the Mandatory Findings of Significance, are not addressed in the summaries below, as each issue is analyzed in greater detail in Sections 4.2 through 4.9 of this Draft EIR.

3.3.1 Agriculture and Forestry Resources

The Project would not result in the conversion of either designated farmland to non–agricultural use or forest land to non–forest use because there is no agricultural land or forest land located on the Project site. The Project would not conflict with existing zoning for agricultural use or forest use because the Project site is not zoned for agricultural use or forest use. No Williamson Act contracts for farmland preservation cover any portion of the Project site. For these reasons, the Initial Study determined that the Project would have no impact on agricultural or forestry resources.

Because the Project would not result in significant adverse agricultural or forestry resource environmental impacts, no further analysis of this issue is required in this Draft EIR.

3.3.2 Greenhouse Gas Emissions

The Project consists of the replacement of an existing geothermal power plant (MP–I) with a new geothermal power plant (M–1). Neither the existing nor the proposed geothermal power plants generate greenhouse gas emissions as a direct result of energy production at the site as no fossil fuels are combusted during the power generation process. However, short–term construction activities and long-term operation of the *Proposed Project* would result in the generation of small amounts of both indirect and direct greenhouse gas emissions, largely from vehicles accessing the site and in use on the site. Long-term greenhouse gas emissions would be approximately the same as compared to existing conditions at the project site and, therefore would not represent a significant impact to the environment.

The Project would not change the use of the site compared to existing conditions. Therefore, the Project would not create any conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Thus, no impact would occur.

It has been generally demonstrated that substantially fewer greenhouse gases are released during the generation of electricity from geothermal power plant technologies than from electricity generated by conventional fossil fuel combustion technologies (see Table 4).

The estimates provided in Table 4 include the CO_2 emissions from geothermal power plants using all forms of existing geothermal development technologies including dry-steam and flashed-steam technologies. These technologies release noncondensible gases (NCG), including carbon dioxide, entrained in the geothermal fluid to the atmosphere. While some NCG may be released from the existing MP-I Project wellfield during well drilling and testing, the binary technology proposed for the MP-I Replacement Project is not expected to release NCG to the atmosphere during normal power plant operations.

Table 4: General Comparison of Geothermal and Fossil Fuel CO_2 Emissions[a]

	Geothermal[b]	Coal	Petroleum	Natural Gas
Emissions (lbs CO_2/kW-hr)	0.020	2.095	1.969	1.321

[a] The geothermal emissions include weighted average values for all geothermal capacity, including binary power plants that do not typically emit CO_2.
[b] Emissions of CO_2 from geothermal power plants predominantly result from releases of noncondensible gases entrained in the geothermal fluid with negligible amounts from fuel combustion sources.
Source: Bloomfield *et al*. 2003. *Geothermal Energy Reduces Greenhouse Gases*. Geothermal Resources Council Bulletin: March/April 2003.

The MP-I Replacement Project would increase the amount of electrical power generated by the MP-I Project from 14 MW (net) to about 18.8 MW (net). Conservatively using the comparison to fossil fuels for all types of geothermal generating facilities provided in Table 4, the approximately 4.8 MW of additional electrical energy generated from the MP-I Replacement power plant would offset at least 15.8 metric tons per year of CO_2 emissions when compared to the CO_2 emissions from a natural gas fueled power plant. The GHG emission offset would be proportionally greater when compared to other fossil fuel power plants. This offset of GHG emissions from conventional fossil fuel combustion sources relative to a geothermal plant would be an environmental benefit of the Project.

Because potential environmental impacts have been evaluated with respect to greenhouse gas emissions, and the Project would not result in significant adverse greenhouse gas emissions impacts, no further analysis of this issue is required in this Draft EIR.

3.3.3 Land Use/Planning

The Project site is not located within an established community and consists primarily of the replacement of an existing geothermal power facility. Therefore, the *Proposed Project* would not physically divide an established community.

The project site is designated Resource Extraction (RE) in the Mono County General Plan. The RE land use designation specifically allows for the exploration, drilling, and development of geothermal resources under a Conditional Use Permit. The following approvals are required from Mono County:

- A Conditional Use Permit for the M-1 replacement plant;
- A Variance for overhead utilities within a scenic highway corridor (if necessary), setback reductions from property line(s), and setback reductions from streams designated by a blue line on USGS topographic maps; and
- A Reclamation Plan.

If the appropriate findings are made and the Project is ultimately approved, the Project would be consistent with the Mono County General Plan.

The *Proposed Project* would not alter the use of the site. Relevant potential environmental impacts resulting from the project will be addressed in other sections of this EIR, including potential conflicts with other adopted plans, policies, or regulations governing the specific environmental issue categories being evaluated.

Because potential environmental impacts have been evaluated with respect to land use planning and the Project would not result in significant adverse land use planning impacts, no further analysis of this issue is required in this Draft EIR.

3.3.4 Mineral Resources

The Project site is not known to be the likely source for any mineral resources of value to the region, residents, or the State. The Project site is not located within a locally important mineral resource recovery area delineated on a local general plan, specific plan, or other land use plan. Furthermore, as the site is currently developed with a geothermal power generation facility, the Project would not substantially alter its status with respect to the availability of mineral resources.

The Project site is located within a locally important geothermal resource area as referenced in the Land Use Element of the Mono County General Plan (Objective C, Policy 4). No other important mineral resource recovery areas that include the project site are delineated in the General Plan or any other land use plan. Because the project site is currently developed with a geothermal power generation facility, the Project would not substantially alter its status with respect to the availability of this resource. Thus, this impact would be less than significant.

Because potential environmental impacts have been evaluated with respect to mineral resources, and the Project would not result in significant adverse mineral resource environmental impacts, no further analysis of this issue is required in this Draft EIR.

3.3.5 Population/Housing

The Project consists of the replacement of an existing geothermal power plant (MP–I) with a new geothermal power plant (M–1). The *Proposed Project* would not induce direct population growth as no new homes or businesses would be added to the site, nor would new employees be generated upon project completion. Although a peak work force of up to 80 construction workers may be working on the plant site at any given time during construction, the temporary nature of the work would make it highly unlikely that potential employees would choose to relocate to the area from outside the region. The Applicant estimates that about 30 percent of the construction work force would be local. In addition, very limited construction activity would occur during the winter months when temporary, local housing availability may be more limited due to winter tourism in the region. Thus, the Project would not contribute to substantial population growth either directly or indirectly, nor would the Project displace existing housing or people.

Chapter 15.40 Housing Mitigation Requirements of the Mono County Code requires the payment of fees, affordable units and/or deed restricted second units housing when developing residential, commercial and/or industrial projects. This project is a replacement of the existing MP-1 plant with a new more efficient power plant M-1. The Project would not require any new employees. Section 15.40.040 Mitigation Requirements for Nonresidential Projects C. 1. states:

> *C. Special Fees and Exemptions. The following nonresidential development projects are exempt from the housing mitigation requirements set forth in this chapter:*
>
> *1. Nonresidential projects that, in total, will produce less than one FTEE in any five-year period;*

"Full-time equivalent employee (FTEE)" means a full-time employee or combination of part-time employees whose work constitutes a total of two thousand eighty hours of annual employment generated by residential and nonresidential development. In general, a full-time employee employed for an entire year equals one FTEE, a full-time employee employed on a seasonal basis equals one-half FTEE, and a part-time employee employed on an annual basis equals one-half FTEE. When an "employee generation calculation" results in seasonal or part-time employees, those employees shall be combined to form FTEEs.

Because potential environmental impacts have been evaluated with respect to population and housing, and the Project would not result in significant adverse population and housing environmental impacts, no further analysis of this issue is required in this Draft EIR.

3.3.6 Public Services

The Project would replace the existing MP–I geothermal power generation facility with the new M–1 facility. Although the new M–1 plant site would cover a larger physical footprint than the existing MP–I plant site, smaller quantities of flammable “motive fluid” materials would be stored on site and there is the potential for a modest decrease in the need for fire protection or emergency planning services from implementation of the Project. These proposed changes would not trigger the need for any new or expanded fire protection, police protection, or emergency response services when compared to existing uses of the site (Personal Communication – Fred Stump, Chief, Long Valley FPD; May 10, 2011).

The Project would not add any additional employees to the site as a result of the plant replacement and, thus, no potential school students would be generated through implementation of the Project. No impact to the Mammoth Unified School District would result from the Project. Additionally, because the Project would not add employees to the site, no additional demand for parks, libraries, snow removal, or other public services would be created by the replacement of the existing plant.

Because potential environmental impacts have been evaluated with respect to public services, and the Project would not result in significant adverse public service environmental impacts, no further analysis of this issue is required in this Draft EIR.

3.3.7 Recreation

The Project would not add any additional employees to the site as a result of the plant replacement and, thus, no additional demand for or use of regional parks or other recreational areas such as the Inyo National Forest would be created by the replacement of the existing plant. The Project would not contribute to the deterioration of recreational facilities within the Mammoth Lakes region as it would not trigger an increase in usage of such facilities by Project employees or visitors. The Project does not include any recreational facilities, but would not require the construction or expansion of any such facilities because it would not increase the number of employees and/or visitors to the region when compared to existing uses of the site.

Because potential environmental impacts have been evaluated with respect to recreation, and the Project would not result in significant adverse recreation environmental impacts, no further analysis of this issue is required in this Draft EIR.

3.3.8 Transportation/Traffic

The Project would replace the existing MP–I geothermal power generation facility with the new M–1 facility. The land uses at the project site would remain the same as under existing conditions. No additional employees would be added as a result of the plant replacement and, thus, no additional long–term vehicle traffic to or from the project site would be created by the replacement of the existing plant and no long–term impact to the existing roadway circulation system in the area would result. Short–term construction traffic would increase in the immediate vicinity of the site, although the traffic volumes expected to be associated with Project construction would be light and existing volume–to–capacity ratios at the U.S. Highway 395/SR 203 interchange are sufficient to accommodate this small temporary increase.

The Project would not change either the type or the intensity of use of the site. Thus, the Project would not conflict with policies or standards contained in the Mono County General Plan Circulation Element/Regional Transportation Plan. The replacement M–1 plant would reach a maximum height of approximately 40 feet above the excavated ground surface on–site. Given that the Project site is approximately 2.75 miles from the Mammoth Yosemite Airport, the height of the replacement M–1 plant would not result in any changes to air traffic patterns.

The Project would not change road patterns or site access in the vicinity of the site, nor would it introduce any new land uses that could create incompatibilities in terms of roadway utilization by vehicles. Because the Project would not change the existing land use at the site, it would not result in inadequate emergency access nor would it create a conflict with adopted plans, policies, or programs pertaining to public transit, bicycle use, or pedestrian facilities.

Because potential environmental impacts have been evaluated with respect to transportation and traffic, and the Project would not result in significant adverse transportation and traffic environmental impacts, no further analysis of this issue is required in this Draft EIR.

3.3.9 Utilities/Service Systems

The Project would replace the existing MP–I geothermal power generation facility with the new M–1 facility. The land uses at the Project site would remain the same as under existing conditions. No additional employees would be added as a result of the plant replacement and, thus, no additional long–term consumptive water demand, wastewater generation, or solid waste generation would result from Project implementation when compared to existing conditions.

The Project site is located in a rural area of unincorporated Mono County that is not served by a municipal wastewater collection, conveyance, and treatment system. However, no additional wastewater would be generated by the Project as no new wastewater–generating facilities would be built and all construction personnel would use portable chemical sanitary facilities. No additional water consumption at the site would occur with operation of the *Proposed Project*. Similarly, water necessary for construction of the Project would be drawn from water tanks delivered to the construction area by private contractor. Construction of the *Proposed Project* may temporarily increase the demand for potable water at the Project site. However, this water would be supplied to the site via water tanks or water trucks by private construction contractors and would have a less than significant impact on existing water supply entitlements and resources. No new or expanded permanent water delivery infrastructure would be required by the Project. The site does not currently drain to an off–site storm drainage system, nor would

it do so following Project construction. No permanent off–site stormwater drainage infrastructure would be required by the Project.

The Project would remove the existing MP–I power plant from the site. The process of removing the existing plant following construction of the replacement M–1 replacement plant would generate a considerable amount of solid waste material, much of which would be recycled. Although a small portion of this material could be sent to local or regional landfills, this would represent a small fraction of the existing landfill waste stream being sent to the Benton Crossing Landfill, which is located within Mono County. According to the California Integrated Waste Management Board, the landfill has a remaining capacity of 1.7 million cubic yards of compacted waste and is anticipated to have the capacity to accommodate the region's waste generation and disposal needs for the next 20 years. This would therefore be considered a less than significant impact. The construction and operation of the *Proposed Project* would be required to adhere to all applicable federal, State, and local statues and regulations related to solid waste.

Because potential environmental impacts have been evaluated with respect to utilities and service system, and the Project would not result in significant adverse utility or service system environmental impacts, no further analysis of this issue is required in this Draft EIR.

4 ENVIRONMENTAL ASSESSMENT OF THE PROPOSED PROJECT AND ALTERNATIVES

4.1 INTRODUCTION

This Chapter is divided into sections, one for each environmental resource topic being evaluated. The following environmental resource topics were identified for detailed environmental assessment in this Draft EIR.

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise

Each of these resource sections has subsections for the Regulatory Framework; the Existing Environment; and the Environmental Impacts of the *Proposed Project*, the *Alternative Power Plant Location*, and the *No Project Alternative*.

The Regulatory Framework subsections describe the important regulations, policies, guidelines and standards which guide agency decisions. The Existing Environment subsections describe the environmental setting, or existing conditions, for each resource in and around the Project area. The Environmental Impacts subsections describe the potential adverse effects of the *Proposed Project* and Alternatives. Any recommended measures to reduce these adverse impacts also are presented in the Environmental Impacts subsections. The cumulative effects of the Project are evaluated in Chapter 5.

CEQA requires an EIR to identify the significant environmental effects of a project. An EIR will typically present criteria, also known as "thresholds of significance," which are specifically used to determine whether or not an adverse impact is significant under CEQA. An EIR must also describe feasible mitigation measures which could minimize each significant adverse impact.

Feasible mitigation measures which could minimize adverse impacts determined significant under CEQA are specifically identified in this Draft EIR as "*mitigation measures*." This Draft EIR also states whether the adverse impact determined significant under CEQA remains significant after implementation of the mitigation measures(s). Feasible measures which could minimize adverse effects which are not determined significant under CEQA are identified in this Draft EIR only as "*measures*."

4.2 AESTHETICS

This section addresses the subject of aesthetics with respect to the Mammoth Pacific I Replacement Project ("Project") and includes a description of existing visual conditions and an evaluation of potential aesthetic effects associated with implementing the Project. Computer-generated visual simulations illustrating "before" and conceptual "after" visual conditions at the Project site as seen from four key observation points in the vicinity of the site are presented as part of the analysis. Digitized photographs and computer modeling and rendering techniques were used to prepare the simulation images.

In addition, this section addresses the subjects of nighttime illumination, daytime glare, and the effects of shade/shadow from *Proposed Project* structures. The analysis presented in this section is based in part on the *Supporting Narrative to MP-1 Replacement Plant Visual Simulations*, a Technical Memorandum prepared by Cardno ENTRIX, May 16, 2011. This memorandum is located in Appendix D to this Draft EIR.

4.2.1 Regulatory Framework

The Project site is located in rural unincorporated Mono County approximately two miles to the east of the incorporated Town of Mammoth Lakes. Mammoth Lakes is a recreation resort community located in the Eastern Sierra and contains a plethora of mountain meadows, creeks, mountain vistas, forests, and wildlife. Visitors enjoy fishing, skiing, snowboarding, hiking, camping, bicycling, and other recreational pursuits throughout the year.

Federal Level Policies/Programs

National Scenic Byways Program: The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. The U.S. Secretary of Transportation recognizes certain roads as All- American Roads or National Scenic Byways based on one or more archeological, cultural, historic, natural, recreational and scenic qualities. The segment of U.S. Highway 395 that runs past the Project site on the west and south is currently under consideration for inclusion in the National Scenic Byway Program as a National Byway known as the Eastern Sierra National Byway (National Scenic Byways 2011). Designation as a National Byway triggers a requirement to develop a Corridor Management Plan that has as its aim the preservation and interpretation of the scenic resources along the route for visitors. This plan is currently under preparation. The erection of new outdoor advertising signage along designated National Byways is prohibited unless such signage is in conformance with 23 USC 131(c).

State Level Policies/Programs

California Scenic Highway Program: The segment of U.S. Highway 395 near the Project site is also designated as a California Scenic Highway. The purpose of California's Scenic Highway Program is to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. When a local agency nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. The agency is also required to adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. For Mono County, these ordinances make up the scenic corridor protection program described in further detail below. This program does not preclude development, but seeks to encourage quality development that does not degrade the scenic value of the

corridor. Caltrans monitors officially designated scenic highways at least every five years, and Scenic Highway designation can be revoked if the local government ceases to enforce its protection program.

Mono County

Mono County General Plan: The Land Use Element and the Conservation/Open Space Element of the Mono County General Plan (2010) contain goals, objectives, and policies protecting the County's natural resources and ensuring that the design of the built environment is compatible with its natural setting. The policies contained in the Land Use Element of the General Plan that pertain to visual resources as they relate to the features of the *Proposed Project* are presented in Table 5, and the Conservation/Open Space Element in Table 6.

Table 5: General Plan Policies in the Land Use Element – Aesthetics/Visual Resources

LAND USE ELEMENT
Countywide Policies
Objective A: Accommodate future growth in a manner that preserves and protects the area's scenic, agricultural, natural, cultural and recreational resources and that is consistent with the capacities of public facilities and services. Policy 5: Regulate future development in a manner that minimizes visual impacts to the natural environment, to community areas, and to cultural resources and recreational areas. Action 5.1: Implement the Visual Resource policies in the Conservation/Open Space Element.
Mammoth Vicinity Policies
Objective A: Maintain and enhance scenic resources in the Mammoth vicinity. Policy 1: Future development activity in the Mammoth vicinity shall avoid potential significant visual impacts or mitigate impacts to a level of non- significance, unless a statement of overriding considerations is made through the EIR process. Action 1.1: Future development projects with the potential to have a substantial, demonstrable negative aesthetic effect shall provide a visual impact analysis prior to project approval. Examples of a substantial, demonstrable negative aesthetic effect include: a. Reflective materials; b. Excessive height and/or bulk; c. Standardized designs which are utilized to promote specific commercial activities and which are not in harmony with the community atmosphere; and d. Architectural designs and features which are incongruous to the community or area and/or which significantly detract from the natural attractiveness of the community or its surroundings. The analysis shall: a. be funded by the applicant; b. be prepared by a qualified person under the direction of Mono County; c. assess the visual environment in the general project vicinity; d. describe the impacts of the proposed development upon views and scenic qualities within the project site and on surrounding areas; and e. recommend project alternatives or measures to avoid or mitigate visual impacts. Mitigation measures shall be included in the project plans and specifications and shall be made a

LAND USE ELEMENT	
condition of approval for the project. Policy 2: Future development shall be sited and designed in a manner that preserves the scenic vistas presently viewed from U.S. 395. Action 2.4: Require any expansion of existing visually offensive land uses within the U.S. 395 viewshed to be adequately landscaped or otherwise screened. Policy 3: Restore visually degraded areas when possible. Action 3.1: Work with agencies and organizations owning or managing existing uses in the U.S. 395 viewshed to mitigate the adverse visual impacts of those uses; e.g., by painting, landscaping, or otherwise screening the use. Action 3.2: Investigate the potential of relocating existing visually incompatible uses in the U.S. 395 viewshed. Objective C: Preserve and enhance natural resources in the Mammoth vicinity. Policy 4: Regulate geothermal and mining and reclamation activities in the Mammoth vicinity in a manner that retains the scenic, recreational, and environmental integrity of the Mammoth vicinity. Action 4.1: All geothermal, mining and reclamation activities shall comply with the policies of the county's Conservation/Open Space Element and the county's Reclamation Ordinance.	
Land Development Regulations (County Zoning Ordinance)	
Building Heights (04.110)	A. All buildings and structures hereinafter designed or erected, or existing buildings which may be reconstructed, altered, moved or enlarged, shall have a height no greater than 35 feet from grade measured from any point of the building. All heights shall be calculated from the natural grade or finished grade, whichever is more restrictive. E.1.a. Public utility exceptions. Poles for public utilities shall be allowed in all designations to a height greater than that permitted for buildings in the designation but shall not exceed 60 feet. E.2. Director Review: The following uses shall be permitted at a height greater than 35 feet subject to Director Review and approval: chimneys, silos, cupolas, flag poles, wind generation towers, monuments, natural gas storage holders, radio and other towers, water tanks, church steeples and similar structures and mechanical appurtenances that are permitted in a designation. In cases where the additional height might result in substantial detrimental effects on the enjoyment and use of surrounding properties, a Use Permit will be required but shall not exceed 60 feet.
Standards – State Scenic Highway 395 (08.040)	New development outside communities visible from State Scenic Highway 395 shall be additionally restricted by the following standards: A. The natural topography of a site shall be maintained to the fullest extent possible. Earthwork, grading and vegetative removals shall be minimized. Existing access roads shall be utilized whenever possible. Existing trees and native ground cover should be protected. All site disturbances shall be revegetated and maintained with plants that blend with the surrounding natural environment, preferably local native plants. B. New structures shall be situated on the property where, to the extent feasible, they will be at least visible from the state scenic highway. Structures shall be clustered when possible,

LAND USE ELEMENT	
	leaving remaining areas in a natural state, or landscaped to be compatible with the scenic quality of the area. D. Roofs visible from State Scenic Highway 395 shall be a dull finish and in dark muted colors. E. Vertical surfaces of structures should not contrast and shall blend with the natural surroundings. Dark or neutral colors found in immediate surroundings are strongly encouraged for vertical surfaces and structures. F. Light sources in exterior lighting fixtures shall be shielded, down-directed and not visible from State Scenic Highway 395. G. Fencing and screening shall not contrast in color, shape and materials with the natural surroundings. The use of landscaping to screen utility areas and trash containers is strongly recommended.
Development Standards (RE Designation) (15.070)	C. Visual Impacts. 1. Siting. All resource development projects shall be sited, designed and operated to minimize impacts to the surrounding visual environment, in conformance to applicable provisions of this General Plan and the Mono County Code. The Conservation/Open Element contains policies relating to the siting of various types of energy resource projects. 2. Screening. Screening shall be required for uses which are contiguous to any residential or commercial district or use, for uses in scenic highway corridors or important visual areas, and for uses with an identified significant visual impact. Screening may be achieved through the use of siting, landscaping, fencing, contour grading, constructed berms and/or other appropriate measures. If landscaping is chosen as a method of screening, a landscape plan shall be submitted as part of the Use Permit application (see 15.59, Landscape Plan Requirements). 3. Lighting. Exterior lighting shall be shielded and indirect and shall be minimized to that necessary for security and safety. 4. Materials and Colors. Materials for structures, fences, etc. should harmonize with the natural surroundings, whenever possible. Materials should be non-reflective or should be painted with a matte finish. Colors for structures, fences, etc. should blend into the natural surroundings.
General Requirements (Dark Sky Regulations) (23.050)	The following general standards apply to all non-exempt outdoor lighting fixtures: A. Nuisance prevention. All outdoor lighting fixtures shall be designed, located, installed, aimed downward or toward structures, retrofitted if necessary, and maintained in order to prevent glare, light trespass, and light pollution. C. Lighting Levels. Outdoor lighting installations shall be designed to avoid harsh contrasts in lighting levels between the project site and the adjacent properties. The Mono County Planning Commission may, by resolution, adopt standards for maximum or minimum lighting levels for various land use areas and for public streets, sidewalks, or trails, as developed by the Community Development and Public Works departments. D. Lamp Types. Metal halide or high-pressure sodium lamps are preferred for all new commercial and industrial area lighting (parking lot and yard lights) and street lighting installed after the effective date of this chapter due to good color rendering and good energy efficiency. Low-pressure sodium lamps and mercury vapor lamps are not permitted. Low wattage incandescent, LEDs or compact fluorescent lamps are preferred for residential

LAND USE ELEMENT	
	lighting. E. Fixture Types. All new outdoor lighting shall use full cutoff luminaires with the light source downcast and fully shielded with no light emitted above the horizontal plane, with the following exceptions: 1. Fixtures that have a maximum output of 100 lumens (equivalent to one 10- watt incandescent bulb) or less, regardless of the number of bulbs, may be left unshielded provided the bulb surfaces are obscured from off-site visibility with a semi-translucent or frosted glass that has an opaque top to prevent the light from shining directly up. However, partial or full shielding is preferred to control light output in all situations. 2. Fixtures that have a maximum output of 600 lumens (equivalent to one 40- watt incandescent bulb) or less shall be partially or totally shielded using a solid or semi-translucent barrier, provided that the lamp is not visible from off site, no direct glare is produced and the fixture has an opaque top to keep light from shining directly up; e.g., a low output-style wall pack. 3. Floodlights that do not meet the definition of "full cutoff" may be used if permanently directed downward, if no light is projected above the horizontal plane, and if and fitted with external shielding to prevent glare and off-site light trespass. Unshielded floodlights are prohibited.
Outdoor Lighting Plans (Dark Sky Regulations) (23.060)	A. An outdoor lighting plan shall be submitted in conjunction with an application for design review approval; a conditional use permit; subdivision approval; or, a building permit exceeding 15% of existing structure value or any addition(s) of gross floor area, seating capacity, or parking spaces (either with a single addition or cumulative additions). An outdoor lighting plan is required for all new outdoor lighting installations on commercial (includes multi-family residential project of four or more units), industrial, public and institutional properties. The Community Development Director may request outdoor lighting plans from applicants for other types of projects due to project location, size, or proposed use, as necessary. An outdoor lighting plan shall include at least the following: 1. Manufacturer specification sheets, cut-sheets, or other manufacturer- provided information for all proposed outdoor lighting fixtures to show fixture diagrams and light output levels; 2. The proposed location, mounting height, and aiming point of all outdoor lighting fixtures (a site plan is preferred); and 3. If building elevations are proposed for illumination, drawings for all relevant building elevations showing the fixtures, the portions of the elevations to be illuminated, the illuminance level of the elevations, and the aiming point for any remote light fixture. B. If needed to review the proposed outdoor lighting fixture installation, the Community Development Director may require additional information following the initial outdoor lighting plan submittal, including but not limited to a written narrative to demonstrate the objectives of the lighting, Photometric data, Color Rendering Index (CRI) of all lamps and other descriptive information on the fixtures, computer-generated photometric grid showing footcandle readings every 10 feet within the property or site and 10 feet beyond the property lines (an iso-footcandle contour line-style plan may be acceptable), and/or landscaping information to describe potential screening.
Prohibitions (Dark Sky Regulations) (23.070)	A. The installation of any new fixture not in conformance to this chapter is prohibited after the effective date of this chapter. B. No outdoor lighting fixtures shall be installed, aimed, or directed to produce light that

LAND USE ELEMENT	
	spills over into neighboring properties or the public right of way. Light trespass is prohibited. C. No outdoor lighting fixture may be installed or maintained in such a manner to cause glare visible from off site. D. No outdoor lighting fixture may be operated in such a manner as to constitute a hazard or danger to persons, or to safe vehicular travel. E. Blinking, flashing, moving, revolving, scintillating, flickering, changing-intensity, and changing-color lights and internally illuminated signs are prohibited. F. The installation of new mercury vapor and/or low-pressure sodium lamps is prohibited. G. Search lights, laser source lights, or any similar high-intensity light is prohibited except in emergencies by police and fire personnel or at their direction, or for approved temporary lighting under a special event permit issued by the Community Development Director. H. Streetlights shall be down directed with complete horizontal shielding of the reflective surface and no higher than 17 feet from the bottom of the shielded fixture surface with a maximum 150-watt lamp. Greater height may be granted by the Community Development Director for safety or adopted minimum highway standards.
Source: Mono County General Plan (2010).	

Table 6: General Plan Policies in the Conservation/Open Space Element – Aesthetics/Visual Resources

CONSERVATION/OPEN SPACE ELEMENT
Visual Resources
Objective A: Maintain and enhance visual resources in the county. Policy 3: Preserve the visual identity of areas outside communities. Action 3.1: Concentrate future development in or adjacent to existing communities. Policy 5: Restore visually degraded areas when possible. Action 5.2: Work with existing uses to mitigate the adverse visual impacts of those uses; e.g., by painting, landscaping, or otherwise screening the use. Action 5.5: Require the restoration of disturbed sites following construction, but prior to issuance of a Certificate of Occupancy. Objective C: Ensure that development is visually compatible with the surrounding community, adjacent cultural resources, and/or natural environment. Policy 1: Future development projects shall avoid potential significant visual impacts or mitigate impacts to a level of non-significance, unless a statement of overriding considerations is made through the EIR process. Action 1.1: Future development projects with the potential to have a substantial, demonstrable negative aesthetic effect shall provide a visual impact analysis prior to project approval. Examples

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of a substantial, demonstrable negative aesthetic effect include:

a. Reflective materials;

b. Excessive height and/or bulk;

c. Standardized designs that are utilized to promote specific commercial activities and that are not in harmony with the community atmosphere;

d. Architectural designs and features that are incongruous to the community or area and/or that significantly detract from the natural attractiveness of the community or its surroundings;

e. Dust or steam plumes; and

f. Excessive night lighting.

The analysis shall:

a. be funded by the applicant;

b. be prepared by a qualified person under the direction of Mono County;

c. assess the visual environment in the general project vicinity;

d. describe the impacts of the proposed development upon views and scenic qualities within the project site and on surrounding areas; and

e. recommend project alternatives or measures to avoid or mitigate visual impacts.

Mitigation measures shall be included in the project plans and specifications and shall be made a condition of approval for the project.

Policy 2: Future development shall be sited and designed to be in scale and compatible with the surrounding community and/or natural environment.

Action 2.1: Develop design guidelines for residential, commercial, and industrial development projects. At a minimum, the following development standards shall apply:

a. Projects should not dominate the natural environment, and should complement existing community character; the scale, design, and siting of a project should be appropriate for the setting;

b. Building mass should be varied and should be appropriate for the surrounding community or area. Facades in commercial districts should be varied;

c. Project siting and structural design should be sensitive to the climate, topography, and lighting of the surrounding environment;

d. The design, color, and building materials for structures, fences, and signs shall be compatible with the natural environment and/or surrounding community;

e. Visually offensive land uses shall be adequately screened through the use of landscaping, fencing,

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contour grading, or other appropriate measures;

f. The visual impacts of parking areas shall be minimized through the use of landscaping, covered parking, siting that screens the parking from view, or other appropriate measures.

g. Signs shall comply with the county's Sign Ordinance;

h. Standardized commercial structures, design, and materials shall not be allowed (e.g., a "McDonald's" shall be designed with materials and finishes that harmonize with the surrounding area);

i. Industrial areas shall be as compact as possible.

j. Exterior lighting shall be shielded and indirect and shall be minimized to that necessary for security and safety;

k. All new utilities shall be installed underground, in conformity to applicable provisions of the Mono County General Plan;

l. Existing roads shall be utilized whenever possible. Construction of new roads should be avoided except where essential for health and safety;

m. Earthwork, grading, and vegetative removals shall be minimized;

n. All site disturbances shall be revegetated with a mix of indigenous species native to the site (based upon a pre-project species survey). A landscaping plan shall be submitted and approved for all projects.

Action 2.8: Require any expansion of existing visually offensive land uses within scenic highway corridors to be adequately landscaped or otherwise screened.

Policy 3: Proposed transmission and distribution lines shall be designed and sited to minimize impacts to natural and visual resources.

Action 3.1: Install utilities underground in conformity to the Mono County Code.

Action 3.3*:* Install new utility lines underground within scenic highway corridors, unless a variance is granted for overhead installation.

Action 3.4*:* Pursue the establishment of underground utility districts within scenic highway corridors as a mechanism to place existing overhead lines underground.

Action 3.6*:* Require that overhead utility lines proposed within a scenic highway corridor be located in the least conspicuous manner possible.

Action 3.7*:* Use existing utility corridors and common poles wherever possible.

Action 3.8: Enforce the policies in the Energy section of the Conservation/Open Space Element pertaining to the siting and design of transmission lines and fluid conveyance pipelines.

The Town of Mammoth Lakes General Plan (2007) includes State-mandated elements that govern all residential, commercial and industrial development on private property over a 20-year planning horizon. The plan contains policies and objectives for Land Use, Transportation and Circulation, Housing, Conservation and Open Space, Safety, Noise, and Parks and Recreation elements. Since the MP-I Replacement Project is not located within the Town, the General Plan policies do not apply directly to the Project.

4.2.2 Existing Environment

Regional Visual Character

The region's visual character is dramatic and is one of the primary attractions for visitors to the Mammoth Lakes area. The snow capped peaks of the Sierra Nevada rise abruptly to the west from a base elevation of 7,500 feet. The rugged topography, forest landscapes and water features of the region provide visual resources of particular scenic value. Surrounding lands consist mostly of open space and Inyo National Forest Land. Topographically, the area is generally sloping with intermittent hills. The valley in which Mammoth Lakes is located is a major low-lying reentrant feature of the eastern front of the Sierra Nevada. Vegetation in the region varies, but in the Project area consists mainly of low-level sagebrush and bitterbrush, and conifer forest. The eastern slopes of the Sierra Nevada range are located to the west. The water of streams, lakes, seeps and springs, and snowfields are attractive elements common in landscapes visible from public viewpoints in the area.

Local Visual Character

The Project is located within Long Valley on the eastern flanks of the Sierra Nevada. The Project area is situated within the Long Valley caldera at the southern base of a volcanic resurgent dome in a transitional zone encompassing both sagebrush and conifer forest. The proposed M–1 replacement plant site is mildly sloping with elevations ranging from about 7,280 feet in the southeast to 7,310 feet in the northwest. Temperatures in the area typically range from below freezing in the winter to the mid–90's in the summer. The average annual maximum temperature is about 57°F and average annual minimum temperature is about 29°F with annual precipitation totaling about 23 inches as measured at the Mammoth Lakes, Ranger Station located about three miles west of the existing MP–I plant site (Western Regional Climate Center 2011).

The study area for this analysis consists of the Casa Diablo area and its surrounding lands, the Town of Mammoth Lakes, and the U.S. Highway 395 and State Route 203 corridors (see Figure 1 and Figure 2). The MP-I Replacement Project site is located in an area known as Casa Diablo Springs, approximately 0.5 mile northeast of the intersection of U.S. Highway 395 and State Route 203. The Casa Diablo area is located within a topographically low area (relative to the surrounding mountains) known as Long Valley. Three existing geothermal power plants are located in the immediate vicinity of the *Proposed Project*. The plants are located in a low-lying area at the western front of steep hills. Several natural thermal ground areas (fumaroles, hot or steaming ground, etc.) that emit steam plumes of various heights exist on and around the Project site. The plumes from these natural features are visible from U.S. Highway 395 and other areas and are most prominent under cold weather conditions and certain lighting conditions.

Mammoth/Hot Creek is located approximately 0.6 mile south and southeast of the Project site and is considered an area of high scenic quality. The Town of Mammoth Lakes is approximately two miles west of the Project site, and the Mammoth Mountain Ski Area is approximately 4 miles to the west. Both the Town and the ski area are considered areas of high scenic quality and both offer significant scenic vistas.

However, the Project site cannot be seen from the Town or the ski area. The visual character of the study area generally consists of mountain valley landscape of prominent hills bordered by mountains. The study area is sparsely populated except for the nearby Town of Mammoth Lakes, the Mammoth Yosemite Airport, and a few scattered buildings and residences. There are no residences or designated scenic overlooks with foreground or middleground views of the site. The site is visible in the background from the informational kiosk located on the east side of the U.S. Highway 395/State Route 203 interchange.

A small, unnamed stream flows through the MP–I Project area between the existing MP–I plant site and the proposed M–1 plant site. The stream has historically intercepted flow from the hot springs in the Casa Diablo area and the drainage empties into a marshy area near Mammoth Creek about 0.6 mile southeast of the existing MP–I plant site. No other streams or surface waters are located within the Project area, nor are there any cold springs, seeps or wet swales. Isolated hot springs, fumaroles and thermal soils exist in the Project vicinity.

Project Site Visibility and Visual Character

As described in Section 1.3, the Casa Diablo geothermal development complex is comprised of three existing power plant facilities, including MP-I, MP-II and PLES-I. The MP-I and MP-II plants are located on private land and the PLES-I plant is located on adjacent public land administered by the U.S. Forest Service. The project site for the proposed MP-I replacement project consists of the existing MP-I plant site as well as an adjacent area of land within the larger Casa Diablo complex located approximately 500 feet to the east of the MP-I facility. This adjacent area is currently undeveloped, although it has been disturbed due to the surrounding geothermal resource development.

U.S. Highway 395 is a well-traveled route, as it is the primary roadway leading to and from the popular Mammoth Lakes area. The portion of the highway in the Project study area was designated a State of California Scenic Highway in 1971 by Caltrans (Caltrans 2011). U.S. Highway 395 is a major linear feature in the study area and provides views of Long Valley and the surrounding mountain ranges. The existing visual setting along U.S. Highway 395 is composed mainly of expansive views of the Sierra Nevada and Long Valley. The Casa Diablo general area is highly visible from U.S. Highway 395 due to its proximity. The area between U.S. Highway 395 and the Project site is characterized by low hills covered with a patchwork of open land dotted with sagebrush and bitterbrush and tall, more densely growing pine trees. Depending on the vantage point, the terrain and vegetation potentially block the view of the existing power plants at the Casa Diablo complex.

Drivers travelling southbound along U.S. Highway 395 near the MP-I Replacement Project area would be able to view the Project area immediately to the left when crossing the State Route 203 overpass. The primary views travelling south on U.S. Highway 395 in this area are of Mammoth Mountain and the Sierra Nevada to the west, the broad open expanse of Long Valley to the south, and hills of the Mammoth Lakes Valley to the east. Drivers travelling northbound on U.S. Highway 395 would have views of the Sierra Nevada to the west, and Long Valley in the eastern foreground. Rolling hills and trees intermittently block the MP-I Replacement Project area from both directions on U.S. Highway 395. Very few man-made structures are visible within the U.S. Highway 395 corridor. Other than the existing power plants, other visible structures include: the Mammoth Yosemite Airport, an abandoned sheriff's station, a dog kennel and sledding operation (Mammoth Dog teams), the old elementary school, a green church, Sierra Nevada Research Labs, the Sierra Quarry, and power lines paralleling the southwestern side of U.S. Highway 395.

Drivers leaving the Town of Mammoth Lakes heading eastbound on State Route 203 would intermittently be able to view the MP-I Replacement Project site. Hills and trees obstruct the view of the Casa Diablo area for much of the eastbound travel route from Mammoth Lakes. As Route 203 descends in elevation as it approaches the U.S. Highway 395 underpass, the higher elevation of Route 203 increases the visibility of the MP-I Replacement facilities and the site, but the view is in the middleground. MP-I Replacement facilities are most visible in middleground views before the underpass. Westbound travelers on Route 203 have no view of the site, as it is behind them. In general, the views of the entire Casa Diablo area are mostly experienced by travelers on U.S. Highway 395 and eastbound Route 203 and can be seen for up to 1.2 minutes. Some forms of recreation in the area (biking, hiking, driving for the purpose of scenic viewing) have longer duration views. These views are predominantly middleground or background views. Due to the limited access to the power plants, close-in views are restricted to the public viewing area and kiosk (created to educate the public about geothermal power production) and local roads of travel.

From the east-facing slopes of the Mammoth Mountain Ski Area, natural fumaroles created at Casa Diablo Springs can also be seen as part of the overall background. From this distance, the existing geothermal plants cannot be seen by the naked eye. The current geothermal plants and facilities currently produce minimal glare in the area because they are painted and designed in a manner that minimizes reflection. Lighting at the facilities is minimal and is not noticeable during daytime hours. When the lights are on at night, they are intended to provide just enough light to allow for the safety of those working at the plants as is required by compliance with Chapter 23 of the Mono County Code (Dark Sky Regulations). However, the public has expressed concerns that existing lighting at the Casa Diablo geothermal complex may be out of compliance with County regulations and brighter than necessary for safe operation of the facilities.

Key Observation Points

Key observation points (KOPs) are locations selected to be representative of critical locations from which the Project would be seen. A review of baseline Project data including Project documentation and site background information was conducted to gain familiarity with the existing landscape, visual resource issues of concern, viewer sensitivity, distance, and the characteristics of the *Proposed Project*. The review was followed by a site visit, conducted in February 2011, to determine which viewpoints offered the best visibility for the analysis. Seventeen viewpoints were visited for this purpose. These viewpoints were within 1.25 miles of the *Proposed Project* and chosen based on their potential to offer views from public areas. Because distances beyond 1.25 miles would render any view of the *Proposed Project* indistinguishable with the existing plant, potential viewpoints outside of this radius were not considered.

From these seventeen viewpoints, four viewpoints were selected for analysis in this Draft EIR. These points, shown in Figure 17 were chosen based upon proximity to the *Proposed Project* site and public use such as highways and recreational trails. Each of these points was visited in the field and analyzed to determine if the Project site could be seen and if so, to what extent. KOP selection is intended to identify those locations which best represent overall views of the *Proposed Project* as seen from public places. The KOPs are generally selected for two reasons: 1) the location provides representative views of the landscape along a specific route segment or in a general region of interest; and/or 2) the viewpoint effectively captures the presence or absence of a potentially significant Project effect in that location. The KOPs are typically established in locations that provide high visibility to relatively large numbers of viewers and/or sensitive viewing locations such as residential areas, recreation areas, and vista points.

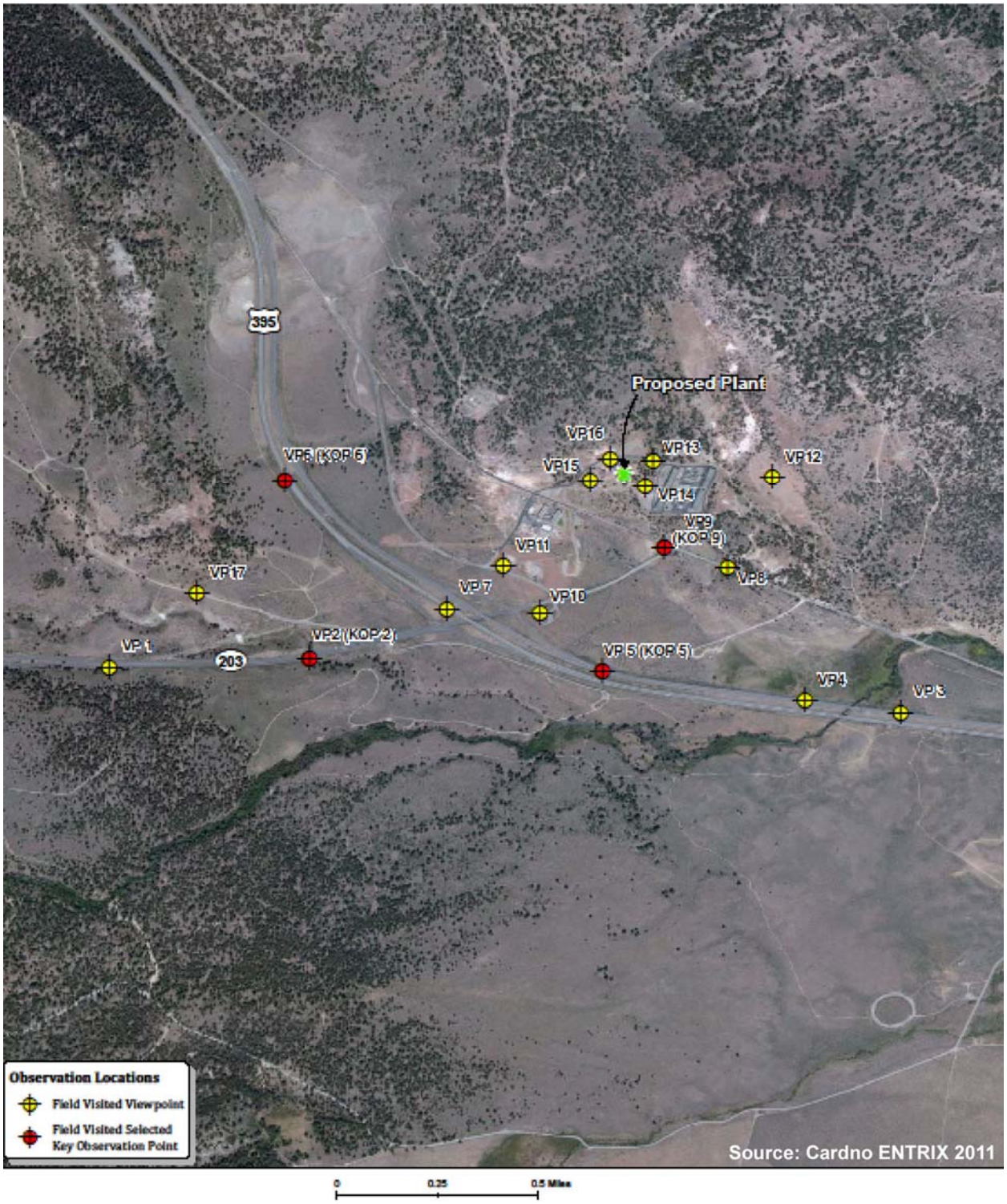

Figure 17: Initial View Points and Selected Key Observation Points

While it is not possible to represent every view toward the Project, the KOPs identified are representative of typical views with potential for visual effects generated by the *Proposed Project* and they facilitate review and discussion. As the following discussion shows, KOPs chosen are representative of key sensitive viewer types, key sensitive viewer locations and/or key visual simulation locations. A description of each initial viewpoint as shown in Figure 17, including the subsequent KOPs selected from those points, is described in Table 7.

Table 7: Initial Viewpoints Evaluated for Visual Impact Analysis

KOP No.	Viewing Location	Project Site Visibility			Comments	Viewpoint Representation
		None	Some	Open		
Highways						
1	SR 203 E/B		✓		Project site can be partially seen from SR 203 approximately 0.7 mile from the intersection with U.S. Highway 395. Terrain and trees would obscure most of the proposed plant with the exception of the very top of the structure.	KOP 2 is closer to the proposed plant and offers a better view.
2	SR 203 E/B		✓		Project site can be partially seen from SR 203 approximately 0.25 mile east of the intersection with U.S. Highway 395. Terrain and trees would obscure most of the proposed plant with the exception of the very top of the structure.	Selected KOP
3	U.S. Highway 395 N/B	✓			Located approximately 0.9 mile from the intersection with SR 203. Terrain and vegetation would obscure the view of the *Proposed Project*.	KOP 5 is closer to the proposed plant and offers a less obstructed view.
4	U.S. Highway 395 N/B		✓		Located approximately 0.6 mile east of the intersection with SR 203. Terrain and trees would obscure most of the proposed plant with the exception of the very top of the structure.	KOP 5 is closer to the proposed plant and offers a less obstructed view.
5	U.S. Highway 395 N/B		✓		Located approximately 0.25 mile from the intersection with SR 203. Terrain and trees would obscure the lower half of the proposed plant.	Selected KOP
6	U.S. Highway 395 S/B		✓		Located approximately 0.65 mile northwest of the intersection with SR 203. Terrain and trees would obscure most of the proposed plant with the exception of the very top of the structure.	Selected KOP
7	U.S. Highway 395 S/B		✓		Located at the intersection with SR 203. Terrain and trees would obscure the lower half of the proposed plant.	KOP 9 offers a less obstructed view of the plant from the same viewing angle.
Trails and Recreational Areas						
8	Old Highway		✓		Located at a recreational turnout approximately 0.15 mile from the intersection with the road becoming SR 203. Terrain and trees would obscure most of the proposed plant with the exception of the very top of the structure.	KOP 9 offers a less obstructed view.

KOP No.	Viewing Location	Project Site Visibility			Comments	Viewpoint Representation
		None	Some	Open		
9	Old Highway		✓		Located at the intersection with the road becoming SR 203. Terrain and trees would obscure the lower half of the structure.	Selected KOP
10	Informational Kiosk			✓	Located immediately east of the intersection of SR 203 and U.S. Highway 395. Terrain and trees would obscure only the bottom portions of the structure.	This viewpoint was created for public education on geothermal energy.
11	Antelope Springs Road			✓	Located on Antelope Springs Road just west of the *Proposed Project* site. Terrain and trees would obscure only the bottom portions of the structure.	This viewpoint is the entrance to the geothermal plant, and as with KOP 10, visitors are expecting if not wanting to see the plant.
12	Eastern hillside			✓	Located on a hillside east of the *Proposed Project* site. The existing plant would obscure only the bottom portions of the structure.	This viewpoint offers minimal public access and was primarily used for establishing height comparisons for visual simulations.
17	Sawmill Road		✓		Located on Sawmill Road approximately 0.4 mile from the intersection with SR 203. Terrain and trees would obscure most of the proposed plant with the exception of the very top of the structure.	KOP 2 is closer to the proposed plant and offers a better view.
No Public Access – For Simulation Purposes Only						
13	NE corner, Project Site			✓	Viewpoint chosen for simulation analysis purposes only. No public access.	
14	SE corner, Project Site			✓	Viewpoint chosen for simulation analysis purposes only. No public access.	
15	SW corner, Project Site			✓	Viewpoint chosen for simulation analysis purposes only. No public access.	
16	NW corner, Project Site			✓	Viewpoint chosen for simulation analysis purposes only. No public access.	
Source: Cardno ENTRIX, 2011.						

As noted in Table 7, the following KOPs were selected because they represent the Project's greatest visual impact on the surrounding area:

- Key Observation Point 2 - SR 203 (KOP 2): This KOP is available to travelers from the Town of Mammoth Lakes. Travelers facing east view the mountains cradling the Project site and the valley to the south. Views of the Project site are partially obstructed by terrain and vegetation. Figure 18 provides a photograph from KOP 2 toward the project site.

- Key Observation Point 5: U.S. Highway 395 Northbound (KOP 5): This KOP is available travelers to the Town of Mammoth Lakes and points further north. Travelers facing north view

the surrounding mountains. Views of the Project site are partially obstructed by terrain and vegetation. Figure 19 provides a photograph from KOP 5 toward the project site.

- Key Observation Point 6: U.S. Highway 395 Southbound (KOP 6): This KOP is available to travelers to the Town of Mammoth Lakes and points further south. Travelers facing south view the surrounding mountains and the valley below. Views of the Project site are partially obstructed by terrain and vegetation. Figure 20 provides a photograph from KOP 6 toward the project site.

Key Observation Point 9: Old Highway 395 (KOP 9): Located at the intersection of Old Highway and the terminal road for SR 203, this KOP is available to local recreationists who come to the area for hiking, dog walking and other various outdoor activities. This area has much lower traffic than the points on the highway since few out of town visitors stop here. At this point, visitors are within a shallow depression with views of the mountains to the east, west and south and the existing geothermal plants to the north. The natural steam plumes can be seen behind the plant's administrative offices. Views of the Project site are partially to fully obstructed by existing vegetation. Figure 21 provides a photograph from KOP 9 toward the project site.

Shading and Shadows

The issue of shade and shadow addresses the blockage of direct sunlight by on-site buildings, which affect adjacent properties. Shading is an important environmental issue because it may impact the users or occupants of certain land uses, including routinely useable outdoor spaces associated with residential, recreational, or institutional (e.g., schools, convalescent homes) land uses; commercial uses such as pedestrian-oriented outdoor spaces or restaurants with outdoor eating areas; nurseries; and existing solar collectors. In the Mammoth Lakes area, shading is also an important safety issue. In winter conditions snow and ice buildup are more likely to occur in shaded areas creating hazardous conditions (i.e., black ice) especially in locations where there are sloping roads and driveways. Shadow lengths are dependent on the height and size of the building from which it is cast and the angle of the sun. The angle of the sun varies with respect to the rotation of the earth (i.e., time of day) and elliptical orbit (i.e., change in seasons). The longest shadows are cast during the winter months and the shortest shadows are cast during the summer months.

The area around the Project site was surveyed for shadow sensitive uses in February 2011. There are no adjacent shadow-sensitive uses surrounding the Project site.

4.2.3 Environmental Impacts

CEQA Significance Criteria

Pursuant to Appendix G of the CEQA Guidelines, the following effects on visual resources could be considered significant under CEQA if the project would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Figure 18: Existing View from Key Observation Point 2 (KOP 2)

Figure 19: Existing View from Key Observation Point 5 (KOP 5)

Figure 20: Existing View from Key Observation Point 6 (KOP 6)

Figure 21: Existing View from Key Observation Point 9 (KOP 9)

Environmental Impacts of the Proposed Project

Under the *Proposed Project*, MPLP would replace the aging MP-I geothermal power plant with a more modern and efficient plant using advanced technology. The replacement plant would be called "M-1." The existing MP-I and the replacement M-1 plants are located on two adjacent parcels of private land owned by MPLP. The replacement M-1 plant would be built approximately 500 feet northeast of the existing MP-I plant. The approximate location and layout of the new M-1 plant is shown on Figure 2 of this Draft EIR.

Construction Activities:

Site grading and construction activities would directly disturb a total of approximately 5.65 acres of land, resulting in the removal of all vegetation from the proposed M-1 plant site. Existing, aboveground geothermal production and injection fluid pipelines used by the existing Casa Diablo geothermal development cross the proposed M-1 plant site and would be rerouted around the proposed M-1 plant site prior to plant site grading. The existing entrances to the MPLP geothermal complex would provide access to the new M-1 plant site.

Grading of the plant site would proceed after the initial project survey and plant layout has been established. Prior to grading of the site, site clearing and tree removal would take place. Topsoil would be stockpiled to aid in revegetation. The plant would be built to balance cuts and fills to the extent feasible. Excess excavated material not required as fill would be disposed of or stockpiled. All disturbed lands not required for plant operations would be revegetated upon completion of construction. Gravel surfacing of the unpaved portions of the two plant site pads would be placed after final grading of the site.

During the M-1 construction phase of the project, activity would be concentrated at the proposed M-1 site with minimal changes occurring to the existing MP-I facility. Visual impacts generated during the construction period are expected to be of a lesser, shorter-term nature than impacts associated with ongoing operation of the completed M-1 plant and would primarily consist of materials stockpiles, construction/grading equipment, and infrastructure development. Due both to their short-term nature and the lack of any residences or businesses with permanent visual exposure to the site, these impacts are considered to be less than significant.

Replacement Plant Operations:

The M-1 plant facilities would generally be similar to the existing facilities in appearance and visual impact. No new geothermal well pads or geothermal production or injection wells would be drilled or constructed as part of the MP-I Replacement Project. A new substation would be constructed on a separate pad on the north side of the M-1 plant site. Interconnection with the existing Southern California Edison (SCE) distributions system would be accomplished via a 33.5 kilovolt (kV) interconnection transmission line that would be placed in a conduit on the ground or buried below ground, thus eliminating any potential visual impact. The interconnection transmission line would deliver energy from the new substation on the M-1 site to the existing SCE Casa Diablo substation using the existing MPLP power line. If, prior to construction, the Applicant opts to revise the project to replace this proposed ground level or belowground interconnection with an aboveground line due to environmental and/or safety concerns, a variance and potential additional environmental review would be required from the County.

With the exception of several purge systems on cooling towers that are necessary for the efficient functioning of the geothermal production facility, the proposed M-1 plant would be consistent with the County's general 35-foot height limitation. The purge systems would extend small portions of the plant to a height of approximately 40 feet. The purge systems are 'mechanical appurtenances' and as such are permitted height exceptions, subject to Director Review or Conditional Use Permit, in this district pursuant to Section 04.110 E.2 of the General Plan. These appurtenances would be nearly completely obscured by vegetation and the super-structure of the main plant and would be colored to blend with the existing background.

Site restoration activities on the existing MP-I site would occur over an approximately 90-day period that is expected to begin approximately two years after commissioning of the new M-1 plant.

Decommissioning Activities:

When the M-1 replacement plant begins startup operations, the existing MP-I plant operations would be reduced proportionally as geothermal fluid supporting the facility is incrementally moved from the existing plant to the new plant. This transition may take up to two years during which the two plants would both be operating at reduced capacity. Subsequently, there would be an additional 3-month period during which demolition and site restoration activities would be occurring on the MP-I plant site while the M-1 plant is in full operation. Human activity would be visible at both plant sites during this period and the two plants would be visible from certain vantage points during this temporary transition period.

However, the incrementally increased visual impact that would occur during decommissioning would not be greater than that resulting during site construction. This impact to off-site observers from decommissioning activities would be short term and temporary. When the decommissioning activities are complete, the overall visual setting of the geothermal facilities at Casa Diablo would return to a close approximation of existing conditions.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County.

Other Project Features:

As part of the *Proposed Project*, power plant lighting would be projected downward to mitigate nighttime visibility of the facilities. An Outdoor Lighting Plan would be prepared and implemented for the M-1 plant site in conformance with the Mono County Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23). The M-1 facility structures would be painted in flat dark green color, approved by the County, similar to the existing plants to help blend into the background. Additionally, the proposed plant site was designed to save a large pine tree in the southwest corner of the site to provide some visual screening of the site (shown on Figure 13).

Designated Scenic Highways and KOPs:

The analysis of project impacts with respect to existing available views from the KOPs described previously considers the following visual traits: visual quality, viewer sensitivity, and viewer exposure. Visual quality is a measure of the overall impression or appeal of an area or existing view as determined

by the particular landscape characteristics. These visual traits were applied to each of the four KOPs based on site work and review of maps and literature. Based on these results, three additional visual traits were evaluated for each site. Vividness is the visual power or memorability of landscape components as they combine in distinctive visual patterns. Intactness is the visual integrity of the natural and built landscape and its freedom from encroaching elements; intactness can be present in well-kept urban and rural landscapes, as well as in natural settings. Unity is the visual coherence and compositional harmony of the landscape considered as a whole; this trait frequently attests to the careful design of individual human-constructed components in the landscape. These three visual traits describe how the form, line, color, and texture of a Project interact with surrounding elements of the natural and built landscapes when added to a view.

Table 8 summarizes the results of the visual trait assessment for Project implementation based on site work and review of maps, photographs, and literature.

Table 8: Visual Traits at Key Observation Points

No.	Viewing Location	Vividness	Intactness	Unity
Existing Conditions at Project Site				
2	SR 203 E/B	High	High	High
5	U.S. Highway 395 N/B	High	High	High
6	U.S. Highway 395 S/B	High	High	High
9	Old Highway	Moderate	Moderate	Moderate
Project Site following Project Implementation				
2	SR 203 E/B	High	High	High
5	U.S. Highway 395 N/B	High	Moderate	Moderate
6	U.S. Highway 395 S/B	High	Moderate	Moderate
9	Old Highway	Moderate	Moderate	Moderate
Source: Cardno ENTRIX, 2011.				

Each KOP was analyzed by the similarities and contrast from the existing environment using the four most used visual criteria: form, line, color and texture. Viewer sensitivity is defined both as the viewer's concern for scenic quality and the viewer's response to change in the visual resources that compose the view. The quality of an individual's views is subjective, based in large part on their goals. Viewers visit locations with certain expectations about what they will experience. For instance, people visiting a sports park in the city would expect to view multiple sport fields with larger trees on the outskirts, surrounded by the roads, lights, and other structures of the city. People visiting a restricted and remote wildlife area would expect to view a largely undisturbed and intact landscape. Therefore, viewer sensitivity to changes in the existing environment is directly related to their expectations.

Viewer exposure is typically assessed by measuring the number of viewers exposed to the resource change, type of viewer activity, duration of their view, speed at which the viewer moves, and position of the viewer. In addition, some KOPs represent views a motorist might experience while driving along U.S. Highway 395 or Route 203. Generally, speeds on these highways range from 55 to 65 miles per hour (mph). In this regard, the KOPs should be considered in terms of the duration for which each view of the Project would be sustained. High trees and some topographic features intermittently block the view for most of that length of highway. However, the site could be seen from the highways intermittently for up

to 1.4 miles. At 65 mph, the worst-case scenario would be that the site could be intermittently seen in between the landscape and vegetation for up to 1.2 minutes by travelers staring in the direction of the site.

Below is a description of the visual characteristics of the project site as they would appear following implementation of the MP-I Replacement Project.

- KOP 2: KOP 2 is located on Route 203, 0.25 mile west of the intersection with U.S. Highway 395. Simulations for KOP 2 show that the proposed MP-I Replacement plant would not be visible. As shown in Figure 22, the existing terrain, including the overpass bridge from U.S. Highway 395, completely obscures the view of the proposed plant. Because the structure would not be seen from this viewpoint, there would be no impact on the existing visual environment and no mitigation measures would be required.

- KOP 5: KOP 5, located on U.S. Highway 395 approximately 0.3 mile south of the intersection with Route 203, was selected to represent the typical view of a motorist driving northbound on U.S. Highway 395. This viewpoint is approximately 0.3 mile from the proposed M-1 replacement plant site. From KOP 5, views toward the proposed MP-I Replacement plant would be 75 to 90 percent obscured by the existing terrain and vegetation in the foreground, as shown on Figure 23. The structural massing would be choppy and irregular, similar to both the surrounding environment and the existing structures. The short, choppy but perpendicular and regular lines would moderately contrast with the vegetation's diagonal lines and the landscape's smoother rolling lines. The M-1 facility structures would be painted in flat dark green color, approved by the County, similar to the existing plants to help blend into the background. The proposed plant would blend with the existing plants and the vegetation, though it would contrast with the patches of barren terrain in the foreground. The skyline would remain the same for viewers because the structure would be low in their field of vision. The regular dappled texture created by the proposed plant's cooling towers would be similar to the existing vegetation, but would contrast with the landscape's smoother but more irregular lines. Although the line, color and texture contrast would be mostly obscured by the existing environment, a viewer looking off toward the site from within a vehicle would be able to see these changes intermittently for up to 1.2 minutes. Even so, the *Proposed Project* would not significantly alter the existing view available to motorists traveling north on U.S. Highway 395 and thus would not represent a significant aesthetic impact. The impact would be less than significant and no mitigation measures would be required.

- KOP 6: KOP 6 is located on U.S. Highway 395, 0.25 mile north of the intersection with Route 203. Simulations for KOP 6 show that the proposed M-1 replacement plant would be visible from a distance, although it would be 75 to 90 percent obscured by the existing terrain and vegetation, as shown on Figure 24. The structural massing would be choppy and irregular, similar to both the surrounding environment and the existing structures. The short, choppy but perpendicular and regular lines would moderately contrast with the vegetation's diagonal lines and the landscapes smoother rolling lines. The facility would be painted the same approved color, a darker green called Geothermal Green, as the existing plants. The proposed plant would blend with the existing plants and the vegetation, though it would contrast with the patches of barren terrain in the foreground. The skyline would remain the same for viewers because the structure would be low in their field of vision. The regular dappled texture created by the proposed plant's cooling towers would be similar to the existing vegetation, but would contrast with the landscape's smoother but more irregular lines. Although the line, color and texture contrast would be mostly obscured by the existing environment, a viewer looking off toward the site from within a vehicle would be able to see these changes intermittently for up to 1.2 minutes. Even so, the *Proposed Project*

would not significantly alter the existing view available to motorists traveling south on U.S. Highway 395 and thus would not represent a significant aesthetic impact. The impact would be less than significant and no mitigation measures would be required.

- KOP 9: KOP 9 is located on Old Highway at the intersection with the terminal road for Route 203, 0.15 mile southeast of the proposed site. Simulations for KOP 9 show that the proposed MP-I Replacement plant would be only partially visible through existing vegetation, as shown on Figure 25. The structural massing would be choppy and irregular, similar to the surrounding vegetation. The short, choppy but perpendicular and regular lines would moderately contrast with the vegetation's diagonal lines. The facility would be painted the same approved color, a darker green called Geothermal Green, as the existing plants. The proposed plant would blend with the existing plants and the vegetation. The massing, lines, color and texture would be very similar to the existing structure to the north. Because the new structure would replace the structure to the north, the visitor's views would not change to a great degree. Although there is high viewer sensitivity in this area, the change in views would be small enough so as to not alter the viewer's perception of the area. Therefore, the visual impact would be less than significant and no mitigation measures would be required.

As noted above in the analysis of views from KOPs 5 and 6, project impacts to views from a designated scenic highway (U.S. Highway 395) would be less than significant.

Consistency with Visual Resources Policies:

Adopted Mono County policies with respect to visual resources are presented in Table 5 and Table 6 above. The MP-I Replacement Project would have the following impacts with respect to consistency with these relevant adopted policies in the Mono County General Plan:

- Objective A, Policy 1 (Land Use Element – Mammoth Vicinity): As demonstrated in the analysis presented in this Draft EIR, the project would avoid significant visual impacts and would thus be *consistent* with this policy.

- Objective A, Policy 2 (Land Use Element – Mammoth Vicinity): As demonstrated in the analysis presented in this Draft EIR, the project would preserve scenic vistas presently available from U.S. Highway 395 in the project vicinity. Therefore, the project would be *consistent* with this policy.

- Objective C, Policy 4, Action 4.1 (Land Use Element – Mammoth Vicinity): As shown in this analysis, the project would comply with the adopted policies in the Conservation/Open Space Element of the General Plan as well as with the applicable requirements of the Reclamation Ordinance, as described in Section 1 of this Draft EIR. Thus, the project would be *consistent* with this policy.

- Objective A, Policy 3, Action 3.1 (Conservation/Open Space Element – Visual Resources): The project would be developed in the midst of an existing geothermal power generation complex and less than 3 miles from the center of the Town of Mammoth Lakes. Thus, the project would be *consistent* with the policy of concentrating new development in or adjacent to existing communities.

Figure 22: Simulated Project View from Key Observation Point 2 (KOP 2)

Figure 23: Simulated Project View from Key Observation Point 5 (KOP 5)

Figure 24: Simulated Project View from Key Observation Point 6 (KOP 6)

Figure 25: Simulated Project View from Key Observation Point 9 (KOP 9)

- Objective A, Policy 5, Action 5.5 (Conservation/Open Space Element – Visual Resources): The project would include restoration of all areas disturbed during construction located outside the footprint of the proposed structures to be developed as part of the project. Thus, the project would be *consistent* with this policy.

- Objective C, Policy 1, Action 1.1 (Conservation/Open Space Element – Visual Resources): Through the analysis presented in this section, the project is *consistent* with this policy requiring that projects having the potential to create a significant adverse visual impact undergo a visual assessment and analysis prior to project approval.

- Objective C, Policy 2, Action 2.1 (Conservation/Open Space Element – Visual Resources): The project would be *consistent* with each of the applicable development standards listed under this policy.

- Objective C, Policy 2, Action 2.8 (Conservation/Open Space Element – Visual Resources): The project design includes screening elements to minimize its visibility to travelers on the designated scenic highway located a short distance to the west and south of the site. In addition, the interconnection transmission line is proposed to be located at ground level or belowground. Thus, the project would be *consistent* with this policy.

- Objective C, Policy 3, Actions 3.1-3.8 (Conservation/Open Space Element – Visual Resources): As noted above, the project's interconnection transmission line is proposed to be located at ground level or belowground. Thus, the project would be *consistent* with this policy.

Mono County development regulations with relevance to visual resources are also presented in Table 5 and Table 6 above. The MP-I Replacement Project would have the following impacts with respect to consistency with these relevant regulations in the Land Use Element of the Mono County General Plan:

- Building Heights: Although the proposed M-1 geothermal plant would have a maximum height of approximately 35 feet above the excavated ground level, the purge tanks on top of the air cooling towers (see Figure 8) would extend to approximately 40 feet above ground level. This would exceed the permitted maximum height of 35 feet; however, Mono County regulations allow for exceptions in the cases of mechanical appurtenances. The purge tanks on top of the condensers qualify as "mechanical appurtenances" and would thus qualify for the height exception, subject to a Director Review/Conditional Use Permit. Thus, the project would be in compliance with County building height regulations.

- Scenic Highway U.S. Highway 395 Standards: As noted previously, the project site plan is designed to maintain the natural topography to the fullest extent possible, minimize earthwork/grading and the removal of vegetation, utilize existing access roads, revegetate the site following construction, cluster new structures, paint all structures visible from U.S. Highway 395 to minimize visibility and blend with the natural surroundings, shield and down-direct all exterior light sources, and utilize landscaping to screen development on-site. Thus, the project would be in compliance with these regulations.

- RE Land Use Designation (LUD) Development Standards: The project would be sited, designed and operated to minimize impacts to the surrounding visual environment; would utilize visual screening through the use of siting, landscaping, fencing, contour grading, constructed berms and/or other appropriate measures; would minimize, shield and down-direct all exterior lighting;

and would utilize materials for structures, fences, etc. that harmonize with the natural surroundings, whenever possible. Thus, the project would be in compliance with these regulations.

- Dark Sky Regulations: The Project Applicant would be required to submit an Outdoor Lighting Plan that demonstrates compliance with the County's Dark Sky Regulations as part of the Building Permit submittal. Thus, the project would be in compliance with the requirements of these regulations.

Other Light/Glare and Shade/Shadow Impacts:

Due to the relatively remote location of the project site, there are no light sensitive or shadow-sensitive land uses located in proximity to the proposed MP-I Replacement Project site. Project design features and compliance with applicable regulations would ensure that impacts related to light and glare would be less than significant and no mitigation measures are required.

Environmental Impacts of the Alternative Power Plant Location

The *Alternative Power Plant Location* is located on Federal land administered by the USFS north of the existing SCE substation and east of the proposed Casa Diablo IV Geothermal Development Project (CD-4) power plant site in what is now a Jeffrey pine forest. This site is approximately 2,000 feet to the north of the existing MP-I plant.

Construction Activities:

Plant site grading activities for the *Alternative Power Plant Location* plant site would disturb a total of 5.65 acres of land similar to the proposed plant. However, the alternative plant site is located entirely within Jeffrey Pine Forest plant community. There has been minimal recent surface disturbance of the alternative plant site. As a result, the amount of vegetative and tree removal associated with preparing the alternative plant site for project construction would be significantly greater than with the *Proposed Project* site. Additionally, because the alternative plant site is more distant from the existing geothermal development at Casa Diablo than the proposed M-1 plant, there is less existing disturbance and less of a human imprint in the immediate area. This would have the effect of amplifying the visibility of the construction site to passers-by in the vicinity as it would not be partially obscured by the presence of the existing geothermal plants and associated facilities.

An approximately 600-foot interconnection transmission line would need to be constructed from the alternative plant site to the existing SCE substation. In addition, new production and injection fluid pipelines would need to be constructed to the alternative plant site. These linear facilities could be more visible to travelers on U.S. Highway 395 than the alternative plant site itself, which would be largely screened by intervening topography and forest from potential viewers along the designated scenic highway. Although it is not likely that visual impacts associated with construction activities at the *Alternative Power Plant Location* would be significant, they would almost certainly be greater than those associated with the proposed M-1 site primarily due to the longer linear corridors needed for the transmission line and pipelines.

Replacement Plant Operations:

Following construction of the replacement plant at the *Alternative Power Plant Location*, the visual impacts of the facility as they would be experienced at the four selected KOPs would be somewhat different in comparison to those resulting from construction of the plant at the proposed M-1 location. Given the greater distance of the alternative plant site from both U.S. Highway 395 and SR 203 and the presence of intervening topography and forest area that would serve to screen the site from most available vantage points along either highway, it is likely that the plant would be only minimally visible from KOP 6 available to travelers heading south on U.S. Highway 395, north of the interchange with SR 203. The plant could also be visible from KOP 2 available to travelers heading east on SR 203 out of Mammoth Lakes. However, the presence of the embankment supporting U.S. Highway 395 across the middleground view from this location would likely obscure most of the project linear features from sight, if not the plant itself as well. The alternative plant site would not be visible from either KOP 9 or KOP 5, although portions of the linear features may be partially visible from these locations.

It is assumed that similar design features to those of the *Proposed Project* would be included in the *Alternative Power Plant Location* project, many of which would effectively reduce the visibility and visual prominence of the structures to potential viewers in the vicinity. Thus, it is not anticipated that the visual impacts associated with the alternative plant site would be significant; however, a complete visual simulation analysis of the *Alternative Power Plant Location* would be required for consistency with adopted County policies and development regulations prior to project approval if the County ultimately selects this alternative. In addition, the alternative plant site is located on land administered by the Forest Service and approval from federal agencies would be required before development could occur at the *Alternative Power Plant Location*.

Decommissioning Activities:

The visual impacts associated with decommissioning activities occurring from development at the *Alternative Power Plant Location* would be similar to those described for the *Proposed Project*. Because of the distance between the *Alternative Power Plant Location* and the existing MP-I plant site, there would be less of a cumulative visual effect during the transition period, but the impact from the two individual plant sites would expand the visual impression of geothermal power generation infrastructure development over a larger area. This could give passers-by the impression that the amount of development is greater than in actuality simply due to the areal extent of the visual imprint. Nonetheless, such impacts are not anticipated to rise to the level of a significant impact and could be likely mitigated via application of additional screening measures beyond those that would be included as project design features.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the alternative plant site and the *Alternative Power Plant Location* geothermal pipeline corridor would be restored to a natural appearing condition consistent with the site restoration requirements of the USFS.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative the existing MP–I power plant would continue to operate. There would be no new plant site construction and there would be no new or altered visual or aesthetic impact in the existing Casa Diablo geothermal development area.

4.3 AIR QUALITY

4.3.1 Regulatory Framework

Federal and state laws set standards for the quality of the ambient air. The local air quality agency is responsible for regulating air quality and air pollutant emissions.

Federal and State Ambient Air Quality Standards

Both the federal and California state governments have established ambient air quality standards (AAQSs) to protect public health and welfare. National AAQSs have been established for seven pollutants. These are known as "criteria" pollutants because the standards satisfy "criteria" specified in the federal Clean Air Act. The seven criteria air pollutants are:

- ozone (O_3);
- carbon monoxide (CO);
- nitrogen dioxide (NO_2);
- sulfur dioxide (SO_2);
- particulate matter less than or equal to 10 microns in diameter (PM_{10});
- particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$) and
- lead (Pb).

California has established ambient air quality standards for these same seven air pollutants, plus sulfates (SO_4), visibility reducing particles (VRPs), vinyl chloride and hydrogen sulfide (H_2S).

Engine emissions from cars, truck and construction vehicles also are controlled by state and federal laws and regulations. These limit the amount of air pollution each vehicle may emit.

The Clean Air Act (CAA) established the principal framework for national, State, and local efforts to protect air quality in the United States (42 USC §§ 7401−7642). Under the CAA, the United States Environmental Protection Agency (EPA) has set standards known as National Ambient Air Quality Standards (NAAQS) for six pollutants considered to be key indicators of air quality, namely carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and two categories of particulate matter (PM_{10} and $PM_{2.5}$). National primary ambient air quality standards define levels of air quality, with an adequate margin of safety, which sets limits to protect the public health, including the health of sensitive populations such as asthmatics, children, and the elderly. National secondary ambient air quality standards define levels of air quality judged necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The EPA is also responsible for ensuring that these air quality standards are met or attained in cooperation with State, Tribal, and local governments through national strategies to control pollutant emissions from automobiles, factories, and other sources.

As delegated by the EPA, the State of California is responsible for protecting California's air quality. The California Environmental Protection Agency (Cal/EPA) was created in 1991 by a Governor's Executive Order. Six Boards under this "umbrella" are responsible for the protection of human health and the environment and the coordinated deployment of state resources. The California Air Resources Board (CARB) is responsible for interpreting and implementing those statutes pertaining to the control of air pollution. The CARB regulations are contained in Titles 13 (Motor Vehicles) and 17 (Public Health) of the California Code of Regulations. The CARB gathers air quality data for the State of California, ensures the quality of these data, designs and implements air models, sets ambient air quality standards for the

state, compiles the state's emissions inventory, and performs air quality and emissions inventory special studies. The CARB is responsible for monitoring the regulatory activity of California's 35 local air districts, which are responsible for promulgating rules and regulations for stationary sources. The Great Basin Unified Air Pollution Control District (GBUAPCD) is the local air district for the MP-I Project area. The Federal and State of California ambient air quality standards are provided in Appendix E.

California is divided geographically into 15 air basins for the purpose of managing the air resources of the state on a regional basis, and each air basin generally has similar meteorological and geographic conditions throughout. The MP-I Replacement Project area is located in the Great Basin Valleys Air Basin (GBVAB) which encompasses Mono, Inyo and Alpine Counties.

Areas with air quality that exceed adopted air quality standards are designated as "nonattainment" areas for the relevant air pollutants. Under Federal regulations, nonattainment areas are sometimes further classified by degree (marginal, moderate, serious, severe, and extreme for ozone, and moderate and serious for carbon monoxide and PM_{10}) or status ("nonattainment-transitional"). Areas that comply with air quality standards are designated as "attainment" areas for the relevant air pollutants. "Unclassified" areas are those with insufficient air quality monitoring data to support a designation of attainment or nonattainment, but are generally presumed to comply with the ambient air quality standard. State implementation plans (SIPs) must be prepared by States for areas designated as federal nonattainment areas to demonstrate how the area will come into attainment of the exceeded federal ambient air quality standard. CARB has made similar State designations.

The Project area is located in the Mammoth Lakes Air Quality Planning Area of the GBVAB which is a Federal nonattainment-moderate area for 24-hour particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}). The area is either an unclassified or attainment area for all other Federal criteria air pollutants. The Project area is also located within State designated nonattainment areas for both PM_{10} and ozone, and it is either an unclassified or attainment area for all other State criteria air pollutants.

Mono County

Direction Specific to Geothermal Exploration and Development: The Conservation/Open Space Element of the Mono County General Plan indicates that the MP–I Replacement Project area is within the *Hot Creek Buffer Zone* (Mono County 2010). Objective B of Goal 1 under the Energy Resources section of the Conservation/Open Space Element states that *"Except for projects in the vicinity of Casa Diablo …" a proposed geothermal project within the Hot Creek Buffer Zone … shall not be permitted … unless a finding is made that all identified environmental impacts of the proposed project are reduced to a less–than–significant levels by permit conditions."* Objective G of Goal 1 establishes requirements to prevent violations of state or federal air quality standards or the rules and regulations of the Great Basin Unified Air Pollutions Control District (GBUAPCD). The proposed M-1 replacement plant site is located within the existing Casa Diablo geothermal complex; and as such, Objective B would not be applicable to the Project, but Objective G would be applicable (see Table 9).

Table 9: Conservation/Open Space Element, Energy Resources, Goal 1 – Applicable Objectives

Mono County General Plan, Conservation/Open Space Element, Energy Resources Goal 1 Objectives Applicable to Air Quality
Goal 1: Establish a regulatory process with respect to both geothermal exploration and development that ensures that permitted projects are carried out with minimal or no adverse environmental impacts. **Objective G** The permit holder shall establish procedures that ensure that neither geothermal exploration nor development will cause violations of state or federal ambient air quality standards or the rules and regulations of the Great Basin Unified Air Pollution Control District (GBUAPCD). Policy 1: Permit conditions shall require compliance with all requirements of the regional air pollution control district, and with all other applicable provisions of the Conservation/Open Space Element. *Action 1.1*: Air quality shall be monitored by a representative of the MCEDD, or the regional air pollution control district with jurisdiction. The costs of such monitoring shall be funded by the permit holder or project operator.

Great Basin Unified Air Pollution Control District

The Great Basin Unified Air Pollution Control District (GBUAPCD) is responsible for regulating air quality and air pollutant emissions from stationary sources (not vehicles) in the Project area. It does this by limiting the emission of criteria air pollutants, air pollutants which can react in the air to create criteria air pollutants (known as "precursors"), and toxic air pollutants. Projects which may emit air pollutants or their precursors are required by GBUAPCD regulations to apply for, receive and comply with the conditions of air quality permits. The *Proposed Project* would be required to obtain an Authority to Construct permit from the GBUAPCD for a binary geothermal power plant unit. The Project would also be required to obtain separate Permits to Operate for each piece of fuel burning stationary equipment that would be operated on the site (e.g., diesel-fueled emergency generator and firewater pump generator). These permits would limit the allowable air emissions that can be released by the respective project facilities during construction and operations.

4.3.2 Existing Environment

The Project is located in Mono County. The climate of Mono County is characterized by harsh winters and temperate summers. Winter storms carry moisture over the Sierra crest alternating with periods of dry clear weather. The regional weather pattern in summer provides prolonged periods of fair weather with occasional thunderstorms (Mono County 2001). Temperatures in the area typically range from below freezing in the winter to the mid–90's in the summer. The average annual maximum temperature is about 57°F and average annual minimum temperature is about 29°F with annual precipitation totaling about 23 inches as measured at the Mammoth Lakes, Ranger Station located about three miles west of the existing MP–I plant site (Western Regional Climate Center 2011). Precipitation is highly variable in the County due to the orographic influence of the Sierras and rain shadow effects. The lower elevation of the Sierra Crest near Mammoth Mountain allows up to 25 inches of rainfall near the headwaters of Hot Creek.

The Casa Diablo geothermal complex is located in the Great Basin Valleys air basin. Each air basin is designated either as "attainment," "non-attainment" or "unclassified." This status depends on whether the air basin meets (that is, "attains") each air quality standard. Air quality in this basin has been federally designated as "attainment" for ozone, carbon monoxide, nitrogen dioxide and lead. Air quality in the air sub-basin around the Town of Mammoth Lakes (which includes all of the Project area) has been federally

designated as "non-attainment" for PM_{10}. The elevated PM_{10} levels are largely attributed to smoke from wood stoves and fireplaces, but temporary air pollution is also attributed to construction phases of local development activities. The state has designated the sub-basin (or basin) as "non-attainment" for ozone and PM_{10}. The basin has been designated "attainment" or "unclassified" by the state for all other air pollutants.

The GBUAPCD monitors air quality in the region. The nearest monitoring station to the Project area is the Mammoth Lakes – Gateway HC monitoring station. Air basin monitoring information for ozone and Mammoth Lakes monitoring information for PM_{10} is provided in Table 10. The air quality relative to other air pollutants in the air basin is presumed to be good and there is negligible available monitoring information for other air pollutants in the Project vicinity.

Table 10: Selected Air Quality Monitoring Information for the Great Basin Valleys Air Basin

Pollutant/Standard	2004	2005	2006	2007	2008	2009	Monitoring Station
Ozone:							Death Valley
# Days>1-hour>0.09 ppm (state std.)	0	1	0	3	1	1	
Max 1-hour Concentration (ppm)	0.086	0.105	0.092	0.107	0.098	0.098	
# Days>8-hour>0.07 ppm (state std.)	28	47	33	36	21	4	
Max 8-hour Concentration (ppm)	0.082	0.102	0.089	0.095	0.095	0.086	
# Days>8-hour>0.075 ppm (federal std.)	9	24	9	18	5	2	
Max 8-hour Concentration (ppm)	0.081	0.101	0.088	0.094	0.094	0.086	
3-year Average Fourth Highest 8-hour (ppm)	0.079	0.085	0.082	0.085	0.077	0.070	
PM_{10}[a]							Mammoth Lakes Gateway - HC
# Days>24-hour>50 µg/m^3 (state std.)	3	6	3	1	6	5	
# Days>24-hour>150 µg/m^3 (federal std.)	0	0	0	0	0	0	
Maximum 24-hour observation (µg/m^3) (state)	73.0	70.0	65.0	56.0	79.0	97.0	
Maximum 24-hour observation (µg/m^3) (federal)	86.0	85.0	78.0	67.0	138.0	118.0	
Annual Average (state)	19.6	19.4	16.7	14.5	18.8	16.0	

Source: California Air Resources Board. 2011. Select 8 Summary: Choose Statistics, Years, & Areas. Searched June 2, 2011. [http://www.arb.ca.gov/adam/select8/sc8start.php]
[a] Particulate matter equal to or less than 10 microns in aerodynamic diameter

The existing MP-I binary power plant unit operates under permit from the GBUAPCD. MPLP reports that fugitive emissions of the currently utilized motive fluid, isobutane, from the existing MP-I power plant total up to about 500 pounds per day. Isobutane is a volatile organic compound (VOC) and is considered to be a precursor to the formation of ozone, a criteria air pollutant, in the atmosphere.

4.3.3 Environmental Impacts

CEQA Significance Criteria

Pursuant to Appendix G of the CEQA Guidelines, the following effects on air quality could be considered significant under CEQA if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan;

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non–attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Environmental Impacts of the Proposed Project

Construction Activities:

The principal emissions that would occur during site construction would be fugitive dust (particulate matter) associated with site grading and travel on unpaved roads; and tailpipe emissions from construction equipment, truck deliveries to the site, and construction workers commuting to and from the construction site. A total of approximately 5.65 acres of land would be disturbed during plant site grading.

The Applicant advised that the proposed M-1 power plant site was selected, in part, because it was relatively flat and would minimize grading requirements and associated fugitive dust. The Applicant has also adopted as part of the Project the following measures to reduce emissions of fugitive dust.

- Restricting surface disturbance to the area within the proposed site grading plan;
- Routine watering of disturbed surfaces and building materials;
- Limiting maximum construction vehicle speeds to 20 miles per hour (mph);
- Restricting construction activities during periods of high wind (i.e., greater than 25 mph);
- Watering or covering all materials transported onto or off of the construction site;
- Paving the plant maintenance road; and
- Covering all unpaved plant site surfaces with gravel after final grading.

These measures would minimize fugitive dust emissions during site construction activities. The California Emissions Estimator Model™ (CalEEMod) air modeling software was used to estimate the mitigated air emissions that would occur from the proposed M-1 power plant site construction activities (ENVIRON 2011). The model estimates particulate matter (PM_{10}) emissions from fugitive dust and mobile sources. It also estimates other criteria air pollutant emissions from mobile sources including construction equipment, truck deliveries, and construction workers commuting to and from the construction site (see Table 11).

Table 11: Projected M-1 Plant Site Mitigated Annual Construction Air Emissions

Source	ROG[b] (tons/year)	NO_x (tons/year)	CO (tons/year)	SO_2 (tons/year)	PM_{10} Total (tons/year)
Site Construction 2011[a]	0.42	3.15	1.88	0.00	0.81
Site Construction 2012[a]	4.11	7.53	5.34	0.01	2.04

Model: CalEEMod (ENVIRON 2011)
[a] Assumes power plant construction begins September 2011and ends October 2012 and assumes the maximum number of construction workers on site at any time is 80 workers.
[b] Reactive organic gases (ROG) are non-methane organic compound emissions that are assumed to be precursors to the formation of secondary photochemical oxidant air pollutants in the atmosphere, including ozone. The more current federal term is volatile organic compounds (VOC).

The plant site construction air emissions would be short term and temporary and the mitigated construction emissions would not result in a significant CEQA impact.

Replacement Plant Operations:

The proposed MP-I replacement plant would be an air-cooled, binary power plant in which both the geothermal fluid and the motive fluid (n-pentane) would be contained in closed systems with no operational emission sources. The project design eliminates emissions of noncondensible gases (carbon dioxide, hydrogen sulfide, etc.) from the geothermal fluid and cooling tower emissions typical of geothermal flash power plants. Geothermal power plants do not burn fossil fuels so there would be no combustion emissions typical of coal, oil or natural gas fired power plants.

There would be no change in the existing MP-I wellfield operations and no new geothermal well drilling or testing operations would be associated with MP-I Replacement Project. As such, there would be no increased potential for the release of noncondensible gases, including hydrogen sulfide gas, from the geothermal fluid to the atmosphere, and there would be no increase in the potential for objectionable odors that could affect a substantial number of people from the Project.

Motive Fluid Emissions: The existing MP-I power plant uses isobutane as the motive fluid. Both isobutane and n-pentane are VOC and both are considered to be air contaminants. Based on motive fluid inventory records at similar facilities to those proposed by the Project, the Applicant has estimated that up to 205 pounds per day of fugitive n-pentane emissions would occur from very tiny leaks of n-pentane through valves, flanges, seals, and other connections which would be released to the atmosphere. Air leaked into the n-pentane condensers would be captured in the proposed OEC Unit vapor recovery units (VRU). Some n-pentane vapors would be discharged to the atmosphere from the OEC Unit VRU and from maintenance VRU during OEC Unit maintenance activities. After abatement the annual potential fugitive emissions of n-pentane from the Project would be about 37.4 tons based on the estimated daily losses. This would represent about a 60 percent decrease in fugitive VOC emissions from the MP-I Project as the aging MP-I plant has fugitive losses of up to 500 pounds per day (91.3 tons per year) of isobutane.

According to GBUACD regulations, new stationary sources of emissions which would result in a net increase in emissions of 250 or more pounds per day of any air pollutant or precursor (excepting carbon monoxide or particulate matter) must meet Best Available Control Technology (BACT) and Mitigation Requirements (GBUAPCD Rule 209-A Section D). The fugitive losses of n-pentane would not exceed the regulatory threshold requiring BACT.

Major stationary sources are subject to the requirements of Title V of the Federal Clean Air Act Amendments of 1990. GBUAPCD Rule 218.B.7 defines a "major source" as a stationary source which has the potential to emit air contaminants in quantities equal to or exceeding the lesser of any listed thresholds, the most relevant of which is 100 tons per year of any regulated air pollutant. The fugitive losses of n-pentane would not exceed the regulatory threshold of a major source.

The *Proposed Project*: (a) would not conflict with or obstruct implementation of any applicable air quality plan; (b) would not violate any air quality standard or contribute substantially to an existing or projected air quality violation; or (c) would not expose sensitive receptors to substantial pollutant concentrations. Given these criteria the projected fugitive n-pentane emissions from the M-1 replacement plant operations would not be a significant air quality impact under CEQA.

Emergency Generators: The M-1 replacement plant would install an 800 brake horse power (bhp) diesel-fueled emergency generator to provide backup power for critical plant control systems in the event of a power outage. Similarly, the plant would install a 400 bhp diesel-fueled firewater pump generator to provide power to the firewater pump in the event of a fire emergency. Manufacturer's recommendation for testing and maintenance of the emergency generators would be followed allowing up to the limit of 50 hours per year for maintenance and/or testing purposes (40 CFR Part 89). Diesel combustion emissions would occur during the intermittent testing and potential emergency use of these engines. The specific equipment manufacturer and models of the engines that would be used on the plant site are not available for detailed assessment prior to final facility engineering. The reported specifications for the proposed stationary diesel engines would meet the required EPA Tier 3 and the CARB Airborne Toxic Control Measure (ACTM) standards. Permits to Operate the respective engines would be obtained from the GBUAPCD. Given the maximum engine power of the respective emergency generators and their conformance with applicable regulatory requirements, the combustion emissions resulting from the intermittent operation of these emergency generators would not be a significant CEQA impact.

No other sources of air emissions were identified from proposed M-1 plant operations.

Decommissioning Activities:

MP-I plant decommissioning would occur after the M-1 plant goes into full operation. It is assumed that some diesel-fueled construction equipment (e.g., cranes, front loaders, bulldozers, forklifts, etc.) would be used during facility dismantling and demolition and during the regrading of the plant site. The surface of the site would subsequently be covered with gravel. The air emissions that would occur during plant decommissioning would be similar to those occurring during site construction and similar mitigation measures to minimize fugitive dust would be employed. The interim site reclamation plan prepared for the plant decommissioning indicates the demolition of structures covering about 0.76 acres of the site and site grading and gravel cover restoration would be over about 1.6 acres.

Similar to the methodology used to estimate emissions from site construction, CalEEMod software was used to estimate the mitigated air emissions that would occur from the proposed MP-I plant site decommissioning activities (see Table 12).

Table 12: Projected MP-I Plant Site Demolition and Site Grading Emissions

Source	ROG[b]	NO_x	CO	SO_2	PM_{10}
	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
Site Demolition 2013[a]	0.19	1.36	0.82	0.00	0.17

Model: CalEEMod (ENVIRON 2011)
[a] Assumes a three-month MP-I plant decommissioning period occurring in the spring/summer of 2013.
[b] Reactive organic gases (ROG) are non-methane organic compound emissions that are assumed to be precursors to the formation of secondary photochemical oxidant air pollutants in the atmosphere, including ozone. The more current federal term is volatile organic compounds (VOC).

The MP-I plant decommissioning air emissions would be short term and temporary and the mitigated demolition and site grading emissions would not result in a significant CEQA impact.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County. After site restoration measures are implemented there would be no further Project-related air emissions.

Environmental Impacts of the Alternative Power Plant Location

Plant site grading activities for the *Alternative Power Plant Location* plant site would disturb a total of 5.65 acres of land similar to the proposed plant site. It is assumed that the access road to the existing SCE substation located near the *Alternative Power Plant Location* plant site would be utilized and no additional access road construction would be required. As such, the air emissions projected for site grading and construction activities on the alternative plant site would be essentially the same as those for the *Proposed Project*. However, the construction of approximately one mile of new geothermal pipeline corridor (about 10 feet wide) would disturb about 1.2 acres of additional surface. A total area of surface disturbance of 6.85 acres was entered into the CalEEMod assessment of site construction emissions for the *Alternative Power Plant Location* (see Table 13).

Table 13: Projected Alternative Plant Site Mitigated Annual Construction Air Emissions

Source	ROG[b]	NO_x	CO	SO_2	PM_{10}
	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
Site Construction 2011[a]	0.42	3.15	1.88	0.00	0.81
Site Construction 2012[a]	4.74	7.61	5.42	0.01	1.24

Model: CalEEMod (ENVIRON 2011)
[a] Assumes power plant construction begins September 2011and ends October 2012 and assumes the maximum number of construction workers on site at any time is 80 workers.
[b] Reactive organic gases (ROG) are non-methane organic compound emissions that are assumed to be precursors to the formation of secondary photochemical oxidant air pollutants in the atmosphere, including ozone. The more current federal term is volatile organic compounds (VOC).

The *Alternative Power Plant Location* plant site construction air emissions would be slightly greater than the construction-related emissions for the *Proposed Project*, but these emissions would be short term and

temporary and the mitigated construction emissions at the *Alternative Power Plant Location* plant site would not result in a significant CEQA impact.

There would be no substantive difference in the emissions from the *Alternative Power Plant Location* alternative during replacement plant operations, decommissioning activities, or site restoration from those that would occur from the *Proposed Project*.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative the existing MP–I power plant would continue to operate. There would be no air pollutant emissions from new plant site construction. The fugitive emissions of isobutane from the existing MP-I power plant would continue to be released and the projected net reduction in VOC emissions from the MP-I Project resulting from the construction and operation of new modern facilities would not occur. The emissions from the aging MP–I power plant operations would be expected to continue as long as repair and restoration of the facility remains economically practical. The air emissions associated with decommissioning of the MP-I power plant would be delayed until the MP-I operations are discontinued and end of project site reclamation activities are undertaken.

4.4 BIOLOGICAL RESOURCES

4.4.1 Regulatory Framework

Federal Protection for Sensitive Wildlife, Special Status Plant Species and Habitats

The federal Endangered Species Act of 1973 (ESA) provides a framework for the protection of plant and animal species that are at risk of becoming extinct. It is administered by the U.S. Fish and Wildlife Service (USFWS). Section 7 of the ESA requires each federal agency to consult with the USFWS about projects that may adversely affect species listed as threatened or endangered under the ESA ("listed species"). Habitat critical to these listed species may also be separately designated under the ESA. Section 10(a)(1)(B) of the ESA allows for take of a threatened or endangered species incidental to development activities once a Habitat Conservation Plan (HCP) has been prepared to the satisfaction of the USFWS.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 USC 701–718h) prohibits the killing of any migratory birds without a permit. Any activity which contributes to unnatural migratory bird mortality could be prosecuted under this act. With few exceptions, most birds are considered migratory under this act.

California State Protection for Sensitive Plant Species and Habitats

The California Endangered Species Act of 1984 (CESA) provides a framework for the listing and protection of wildlife species determined to be threatened or endangered in California.

The California Department of Fish and Game (CDFG) maintains the California Natural Diversity Database (CNDDB). The CNDDB is a computerized inventory of information on the general location and status of California's rare and threatened animals, plants, and natural biological communities. CDFG also has designated certain vertebrate species as "species of special concern." Because of declining population levels, limited ranges, and/or continuing threats, these species are believed to be vulnerable to extinction.

Section 1602 of the California Fish and Game Code requires an entity to notify CDFG regarding any proposed activity within a stream or river channel. This includes activities which may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake. CDFG may determine that the proposed activity would not substantially adversely affect an existing fish or wildlife resource. If not, the proposed activity may not be undertaken until the entity and CDFG enter into an agreement. The agreement would include reasonable measures necessary to protect the existing fish or wildlife resource.

Mono County

Direction Specific to Geothermal Exploration and Development: The Conservation/Open Space Element of the Mono County General Plan indicates that the MP–I Replacement Project area is within the *Hot Creek Buffer Zone* and the *Hot Creek Deer Migration Zone* (Mono County 2010). Objective B of Goal 1 under the Energy Resources section of the Conservation/Open Space Element states that *"Except for projects in the vicinity of Casa Diablo …" a proposed geothermal project within* [either zone] *… shall not be permitted … unless a finding is made that all identified environmental impacts of the proposed project are reduced to a less–than–significant levels by permit conditions."* Objectives C and D of Goal 1 establish procedures and direction for addressing biologic and associated hydrologic impact mitigation and monitoring requirements from geothermal exploration and development. Objective E of Goal 1 establishes policy with respect to impacts on mule deer migration zones. The proposed M–1 replacement plant site is located within the existing Casa Diablo geothermal complex; and as such, Objective B would not be applicable to the Project, but Objectives C, D and E would be applicable (see Table 14).

Table 14: Conservation/Open Space Element, Energy Resources, Goal 1 – Applicable Objectives

Mono County General Plan, Conservation/Open Space Element, Energy Resources Goal 1 Objectives Applicable to Biological Resources
Goal 1: Establish a regulatory process with respect to both geothermal exploration and development that ensures that permitted projects are carried out with minimal or no adverse environmental impacts. **Objective C** Establish procedures that assure that the cumulative impacts of geothermal and other projects on hydrologic and biologic resources are mitigated to less-than-significant levels. Policy 1: Geothermal development projects shall be phased so that the operational impacts of a permitted project can be assessed before a subsequent project is permitted within an area that may be affected by the permitted project. *Action 1.1*: After a permit for geothermal development has been issued by Mono County, no subsequent application for a permit for geothermal development within an area that may be affected by the permitted project shall be accepted until hydrologic and biologic monitoring data relating to the permitted development has been collected for a period of not less than two years. If an area in which a new permit for geothermal development is sought has been previously developed and hydrologic and biologic monitoring data has been collected in the area for in excess of two years, it shall be not less than six months before the new application is accepted. *Action 1.2*: Geothermal exploration and development operations shall be monitored, and the monitoring data shall be evaluated by the Mono County Economic Development Department (MCEDD) and the Long Valley Hydrologic Advisory Committee (LVHAC), or other appropriate regional hydrologic committees, and CDFG. The purpose of the monitoring is to determine whether there are or may be adverse hydrologic or biologic impacts. The data and evaluations, to the extent they are not proprietary, shall become a part of the record of any proceeding to consider subsequent geothermal exploration or development permit applications within the Hot Creek Buffer Zone, the deer migration zones, or any other regions that may be

Mono County General Plan, Conservation/Open Space Element, Energy Resources Goal 1 Objectives Applicable to Biological Resources

affected by the existing projects.

Action 1.3: Prior to the issuance of any permit for either geothermal exploration or development within the Hot Creek Buffer Zone, the MCEDD shall prepare a written analysis of the cumulative hydrologic and biologic impacts of the proposed project and other development projects of any kind or nature that may individually or cumulatively affect springs, streams, fumaroles, or significant biologic resources within the zone. The analysis shall be a part of the record.

Action 1.4: Except for projects in the vicinity of Casa Diablo and associated monitoring or mitigation wells or other facilities, and notwithstanding the provisions of CEQA or the County guidelines, where there is credible scientific evidence contained in the foregoing cumulative impact analysis that shows that the project for which a permit is sought, taken together with other development and development projects, may substantially adversely affect springs, streams, or fumaroles within the Hot Creek Buffer Zone, the permit shall not be granted.

Objective D

The permit holder shall establish data collection for hydrologic and biologic mitigation and monitoring programs to serve as the basis for assuring protection of hydrologic and biologic resources and water quality and quantity. These programs shall be approved by the MCEDD, after consultation with the LVHAC or another appropriate regional hydrologic advisory committee, and the CDFG, prior to implementation.

Policy 1: Geothermal exploration and development projects shall be sited, carried out and maintained by the permit holder in a manner that best protects hydrologic resources and water quality and quantity.

Action 1.1: During the permit processing period, the applicant for a geothermal development permit shall submit draft hydrologic and biologic monitoring plans to the MCEDD. The plans and proposed mitigation measures, as modified and as accepted by the County or its officers, boards and commissions, shall be approved as part of the initial use permit conditions, if a permit is granted.

The operator under a geothermal development permit shall implement the hydrologic resource monitoring plan to monitor baseline conditions and detect changes in the existing hydrothermal reservoir pressures and shallow aquifer water levels, as well as the discharge (flow) rate and temperatures of selected thermal springs in the project area, if any exist.

Action 1.2: The monitoring plans shall include a formula to calculate the appropriate portion of costs to be repaid to the County by the permit holder in the event that the County expends monies to collect baseline data for the plans.

Action 1.3: Upon the basis of relevant scientific evidence and the recommendation of the LVHAC or another appropriate hydrologic review committee, the monitoring plans may be amended during operations upon prior written approval of the MCEDD or the Planning Commission.

Action 1.4: The hydrologic and biologic resource monitoring plans shall include:

a. A schedule for periodically collecting and submitting data to the MCEDD;
b. A schedule for preparing a periodic monitoring report to the MCEDD; and
c. Provisions for periodic review and assessment of the monitoring data by qualified consultants.

Action 1.5: The applicant for a geothermal development permit shall prepare a baseline data report to be included as part of the hydrologic and biologic resource monitoring plans that identifies all significant hydrologic and biologic baseline information available for the project area. Permit conditions shall require that the permit holder or operator continually collect and submit production data to the MCEDD. The frequency and manner of data collection must be approved by the MCEDD, after consultation with the LVHAC or another appropriate hydrologic advisory committee, and the California Department of Fish and Game.

Action 1.6: If scientific evidence indicates that geothermal exploration or development is significantly threatening, or causing, pressure or temperature changes to springs, streams or fumaroles within the areas of the Hot Creek Gorge or Hot Creek Hatchery that are beyond the

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natural variations determined through baseline data collection, the permit holder MCEDD, including, but not limited to, the following:

a. Drilling and monitoring new observation wells, or otherwise amending the hydrologic resource monitoring plan;

b. Reorienting existing exploration, production or injection operations, or any of them, to increase or decrease hydrologic reservoir temperatures or pressures at the appropriate locations;

c. Injecting hot geothermal fluid from the production area directly into injection wells at the appropriate locations to compensate for pressure or temperature changes in the direction of Hot Creek Gorge springs and Hot Creek Hatchery springs, if either group of springs has been shown to be adversely affected by the permit holder's operations;

d. Drilling new injection wells in the vicinity of the project area and injecting hot geothermal fluid from the production area to compensate for temperature and pressure decreases in the direction of Hot Creek Gorge springs and Hot Creek Hatchery springs, if either group of springs has been shown to be adversely affected by project operations; and

e. Curtailing or entirely discontinuing geothermal operations.

Action 1.7: In order to minimize hydrothermal reservoir pressure declines, and provided the conditions do not conflict with regulations of the California Division of Oil and Gas, development permit conditions shall require the reinjection of substantially all extracted geothermal fluids. Incidental uses of the produced geothermal fluids (i.e., well drilling, well testing, emergency fire water makeup) are exempted from this injection requirement.

Action 1.8: The permit holder shall prepare and submit to the MCEDD, prior to commencement of construction, a detailed blowout contingency plan, which includes a description of blowout prevention equipment required during drilling. Sufficient cold water shall be stored by the permit holder at each well site to quench the well should a blowout occur during drilling. Water used for this purpose shall not be extracted from surface water sources in a manner that would harm aquatic vertebrate species dependent upon the surface water source. The plan shall provide for regular maintenance and testing of equipment. It shall be approved by the MCEDD prior to operations as condition of the permit.

Action 1.9: If biologic monitoring indicates that permitted geothermal exploration, development and operations, or any of them, have significant adverse effects, then the County shall take such action as is necessary to reduce the effects to less-than-significant levels, including curtailing or entirely discontinuing geothermal operations.

Action 1.10: Binary working fluids shall be air cooled.

Action 1.11: The consumptive use of surface water and groundwater, consistent with the reasonable needs (as determined by the MCEDD) of project operations and personnel, shall not decrease the natural flow of surface waters or the perennial yield of groundwater.

Action 1.12: Appropriate measures shall be taken to confine fluid spills. The capacity of the containment facilities shall be equal to at least twice the volume of the entire fluid contents of the facility, including pipeline capacity and the amount that would flow until automatic shutdown devices would stop the flow.

Action 1.13: No geothermal development located within the Hot Creek Buffer Zone shall occur within 500 feet on either side of a surface watercourse (as indicated by a solid or broken blue line on U.S. Geological Survey 7.5- or 15-minute series topographic maps).

Action 1.14: Permit conditions for both geothermal exploration and development shall assure that required reclamation is completed within one year after a project is completed. Reclamation plans shall contain provisions that assure the protection of springs, streams, and fumaroles from erosion, sediment transport, and similar adverse effects. Plan provisions shall also assure that project sites are restored as closely as reasonably possible to natural conditions, as determined by the MCEDD, in consultation with the Visual Review Committee.

Action 1.15: All geothermal permit applications, environmental documentation and proposed project conditions shall be referred to the appropriate hydrologic advisory committee and the

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California Department of Fish and Game (CDFG) prior to final action on the permit applications.

Action 1.16: The County shall cooperate with the CDFG in promptly referring documentation on proposed geothermal projects to it.

Action 1.17: Permits for both geothermal exploration and development shall incorporate by reference and require compliance with all applicable rules and regulations of other governmental agencies meant to protect the environment, including the CDFG, the California Division of Oil and Gas, the Lahontan Regional Water Quality Control Board, and the Great Basin Unified Air Pollution Control Board.

Action 1.18: All geothermal pipelines potentially visible in scenic highway corridors or important visual areas shall be obscured from view by fences, natural terrain, vegetation, or constructed berms, or they shall be placed in stabilized or lined trenches.

Objective E

Permit conditions for geothermal exploration or development projects shall minimize impacts on deer migration within the deer migration zones identified in this element.

Policy 1: Deer are an important natural, biological, and recreational resource. Geothermal exploration, development and operations shall be undertaken in a manner that minimizes or prevents adverse effects on deer population and migration within the deer migration zones.

Action 1.1: All policies and actions applicable to geothermal development generally that do not conflict with policies specifically applicable to deer migration zones shall be enforced by appropriate permit conditions.

Action 1.2: Development may be prevented in any part of a deer migration zone upon a finding that it will interfere with adopted regulations of the California Department of Fish and Game and the goals of the CDFG deer herd management plans.

Action 1.3: The County shall cooperate with the CDFG in devising conditions meant to carry out this policy.

4.4.2 Existing Environment

The Project is located within Long Valley on the eastern flanks of the Sierra Nevada. The Project area is situated within the Long Valley caldera at the southern base of a volcanic resurgent dome in a transitional zone encompassing both sagebrush and conifer forest. The proposed M–1 replacement plant site is mildly sloping with elevations ranging from about 7,280 feet in the southeast to 7,310 feet in the northwest. Temperatures in the area typically range from below freezing in the winter to the mid–90's in the summer. The average annual maximum temperature is about 57°F and average annual minimum temperature is about 29°F with annual precipitation totaling about 23 inches as measured at the Mammoth Lakes, Ranger Station located about three miles west of the existing MP–I plant site (Western Regional Climate Center 2011).

A small, unnamed stream flows through the MP–I Project area between the existing MP–I plant site and the proposed M–1 plant site. The stream has historically intercepted flow from the hot springs in the Casa Diablo area and the drainage empties into a marshy area near Mammoth Creek about 0.6 miles southeast of the existing MP– I plant site. No other streams or surface waters are located within the Project area, nor are there any cold springs, seeps or wet swales, which would provide habitat for riparian or aquatic species. Mammoth/Hot Creek is located approximately 0.6 miles south and southeast of the proposed M-1 plant site. Isolated hot springs, fumaroles and thermal soils exist in the Project vicinity.

Plant Communities

Plant communities which occur in the Project vicinity were documented during botanical surveys of a study area which overlap the proposed M–1 replacement plant site (Paulus 2009). Human activities and naturally occurring, near–surface thermal features have disturbed and altered the plant communities in the study area. The plant communities observed on the proposed M–1 plant site included: Jeffrey Pine Forest (*Pinus Jeffreyi–Pinus monophylla* alliance), Big Sagebrush Scrub (*Artemisia tridentata–Purshia tridentata* alliance), and Wright's Buckwheat Dwarf Scrub (*Eriogonum wrightii* alliance). In some areas, forest and scrub plants have been removed by mechanical disturbance from human activity over the past years. Vegetation in these "mechanically disturbed" areas has been replaced by introduced herbs and grasses and includes patches that could be classified as Introduced Perennial Grassland. Other "mechanically disturbed" areas are totally devegetated. Some areas in the vicinity of the M–1 plant site have become unsuitable for scrub or forest species due to surface geothermal features including hot springs, thermally altered soils and fumarolic activity which appear to change over time. These "thermally disturbed" areas are now dominantly occupied by shallow–rooted and non–native annual species or Wright's Buckwheat Dwarf Scrub (*Eriogonum wrightii* var. *subscaposum*).

No rare plant communities were identified within the botanical survey study area. The CNDDB inventory conducted for the Project identified the Mono Pumice Flats and Water Birch Riparian Scrub sensitive plant communities as occurring in the Project vicinity. The nearest known Mono Pumice Flats sensitive plant community occurs 2.5 miles north of the MP–I Project area at Smoky Bear Flat (Paulus 2001b). No occurrences of the Mono Pumice Flat community exist in the Project area (Taylor and Buckberg 1987). The nearest reported occurrence of Water Birch Riparian Scrub exists along Convict Creek located approximately 5.2 miles southeast of the MP–I Project area (Town of Mammoth Lakes 2007). No Water Birch Riparian Scrub sensitive plant community has been identified on or near the MP–I Project area.

It was noted that the warm habitats near fumaroles have encouraged colonization by several unusual species and support the regionally rare plant community Wright's Buckwheat Dwarf Scrub. Wright's buckwheat is not a rare plant and can be found in lower frequency in Big Sagebrush Scrub throughout the study area. However, the occurrence of nearly pure stands of Wright's buckwheat may be a rare combination of native plants confined to fumarole field margins (Paulus 2009).

The observed plant communities were mapped and classified using the CDFG naming system (2003) and cross referenced to the system being adopted at that time (CDFG 2007). The classification methodology used is generally consistent with changing CDFG guidance for utilizing the current Natural Communities List (CDFG 2010a). The mapped plant communities on the proposed M-1 plant site are shown on Figure 26.

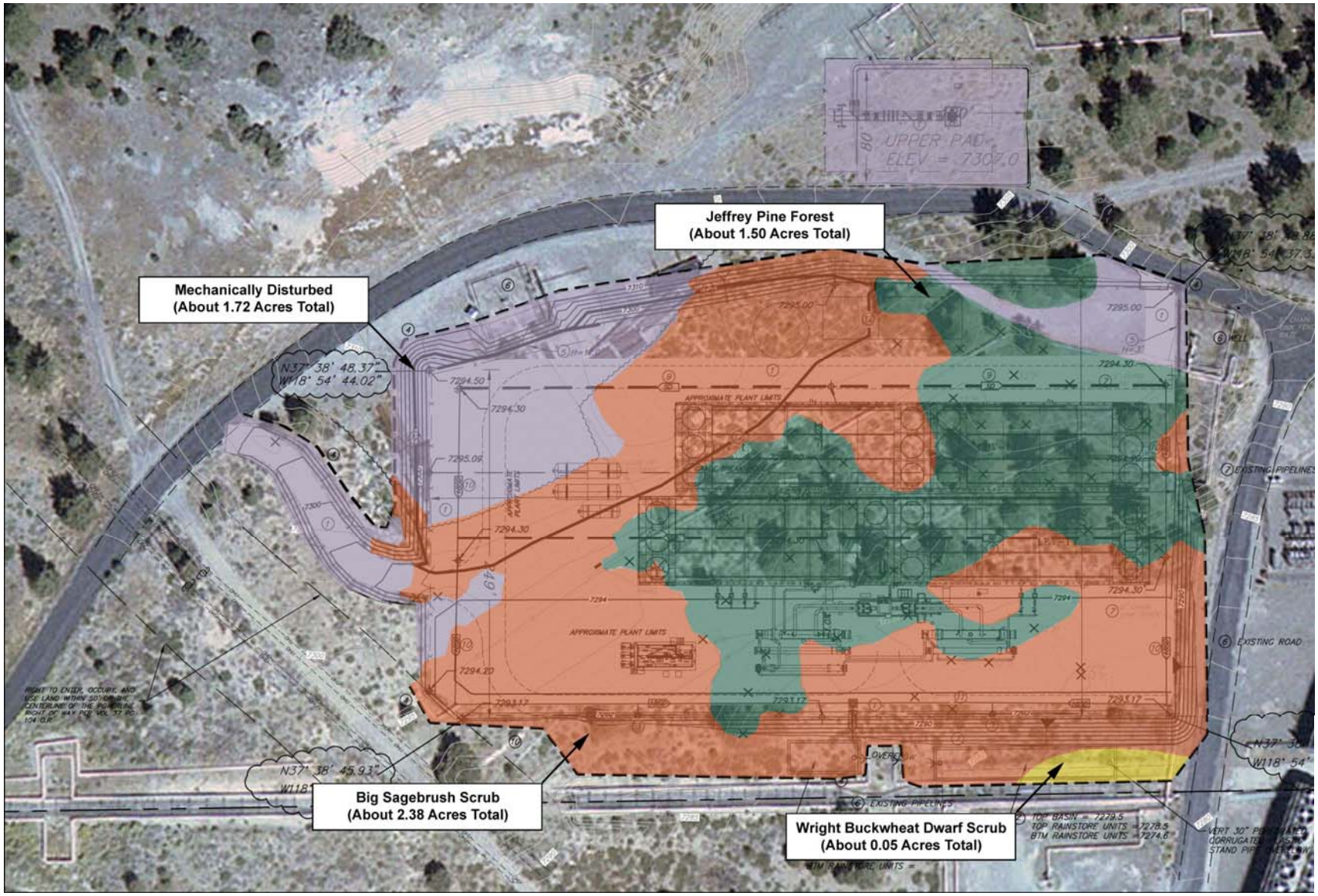

Figure 26: Plant Communities Mapped on the M–1 Plant Site Grading Plan (After Paulus 2009)

Special Status Plant Species

A literature search was conducted to identify special status plant species having some potential to occur in the Project vicinity and which were either listed under the federal ESA or the CESA, or which were identified on CDFG CNDDB, CNPS or USFS lists as "sensitive" species. The search determined that no plants listed under the federal ESA, and only one herbaceous perennial plant listed as "rare" under the CESA (Mono milkvetch [*Astragalus monoensis*]) could potentially occur in the study area. Five other herbaceous perennial plant species were identified from the CDFG CNDDB, CNPS, or USFS as having special status under one or more of the identified special status plant lists (see Table 15). Botanical field surveys were undertaken in June 2008 during a period when each of the six identified special status plant species would be expected to be blooming, preparing to bloom, or setting fruit and would be recognizable during the survey (Paulus 2009). The field surveys were conducted in a study area which included the proposed M–1 plant site and most of the contiguous private land east and north of the plant site owned by MPLP. A total of 91 plant species were observed in the study area during the surveys.

None of the identified special status plant species that could potentially occur in the study area were observed during the botanical surveys. The absence of seasonal to perennial moist habitats generally reduces the potential for populations of scalloped moonwort, subalpine fireweed, or Robbins pondweed to occur within the study area. No members of the genus *Epilobium* were found within the small, relatively wet areas on or near the study area as would be expected if subalpine fireweed was present on the site. Similarly, no members of the genus *Lupinos*, including Mono Lake lupine, were found during the botanical survey. A population of widely scattered pine fritillary individuals were identified north of the botanical study area under shaded trees in Jeffrey Pine Forest, but after careful searching for pine fritillary, none was observed anywhere within the study area.

General Wildlife and Habitat

The Project area and immediate Project vicinity is principally comprised of two wildlife habitats, Jeffrey pine and sagebrush. Jeffrey pine habitat occurs in a variety of settings throughout its range (500' to 9,500' AMSL depending on latitude) and is not restricted by aspect or slope. Its distribution covers extensive areas in California, Oregon, and Nevada. Sagebrush habitat occupies dry slopes and flats over a wide range of middle and higher elevations (1,600' to 10,500' AMSL). Sagebrush habitat is found throughout the western states, but its distribution in California is limited to a discontinuous strip along portions of the eastern and northeastern borders of California (CDFG 1988, as updated). In the Project vicinity the boundaries between the two habitat types are often indistinct. Increasing elements of Sagebrush habitat occur at the edge of the Jeffrey pine habitat. To provide some approximation of the magnitude of these habitat types occurring in the Project vicinity, aerial photography analysis was used to estimate the amounts of Jeffrey pine and sagebrush habitat occurring in the Long Valley caldera. All of the existing and proposed Casa Diablo geothermal development would be located in the caldera. While the boundaries of these habitats in the caldera are not clearly distinct, it was estimated that there are approximately 44 square miles of Jeffrey pine habitat and 77 square miles of sagebrush habitat within the caldera (see Figure 27).

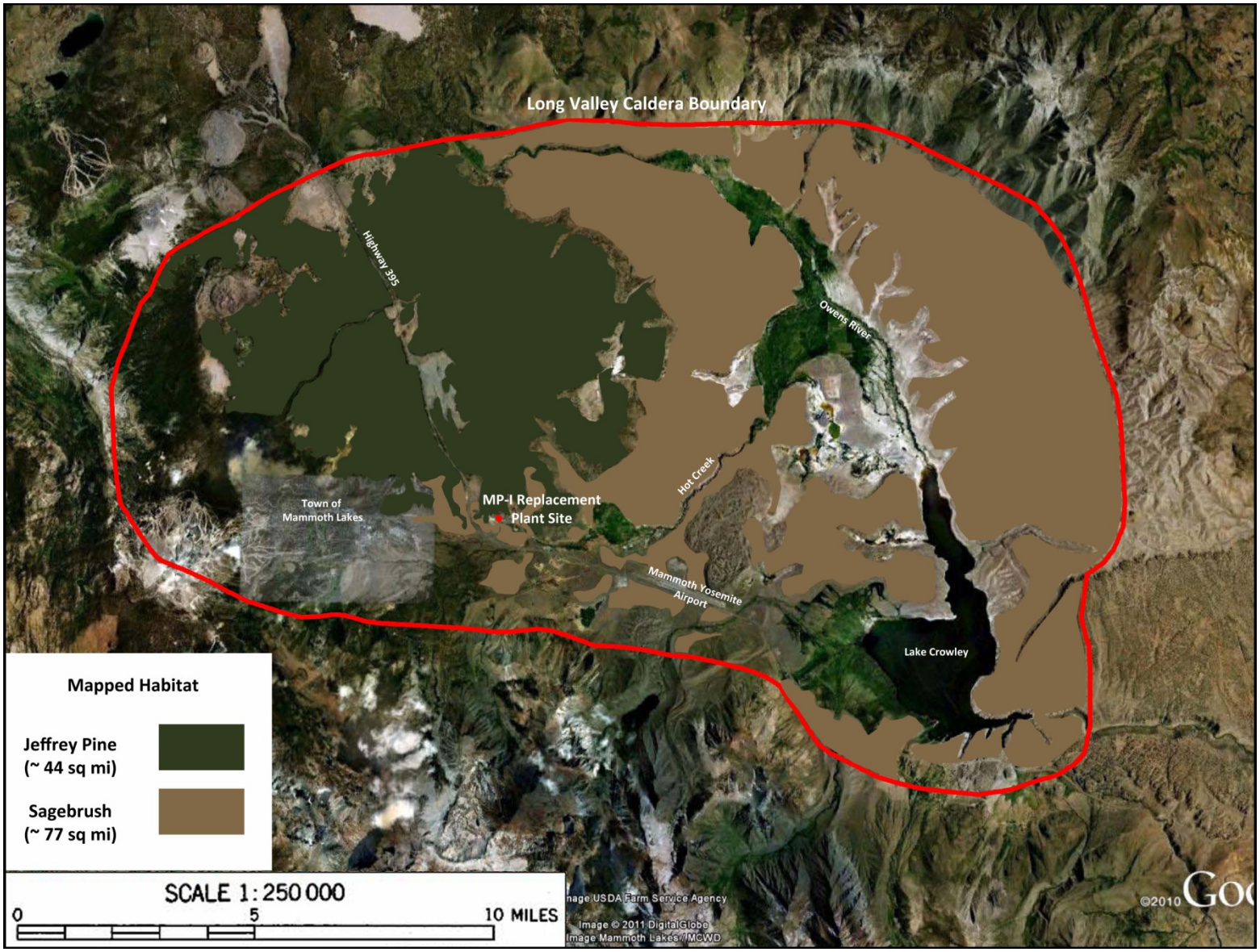

Figure 27: Aerial Map of Jeffrey Pine and Sagebrush Habitat Occurrence in the Long Valley Caldera

Table 15: Special Status Plant Species Potentially Occurring in the Study Area

Scientific Name Common Name Life Form	Rank or Status[1]					Habitat	Flowering Period
	USFWS	CDFG	USFS	CNPS	CNDDB		
Astragalus monoensis[2] Mono milkvetch	NL	R	S	1B	S2.2	Open pumice soils	June–August
Botrychium crenulatum scalloped moonwort	NL	NL	S	2.2	S2.2	Open forest, meadow	Fertile June–July
Epilobium howellii subalpine fireweed	NL	NL	S	1B.3	S2.3	Meadows and wet margins	July–August
Fritillaria pinetorum pine fritillary	NL	NL	NL	4.3	S3.3	Scrub forest slopes	May–July
Lupinus duranii Mono Lake lupine	NL	NL	S	1B.2	S2.2	Open scrub, pumice	May–July
Potamogeton robbinsii Robbins pondweed	NL	NL	NL	2.3	S2.3?	Deep water, lakes	July–August

Source: Adapted from Paulus 2009

1. Rank or status, by agency:

USFWS: U.S. Fish and Wildlife Service status under the Endangered Species Act (CDFG, 2008c)
NL – Not Listed

CDFG: California Department of Fish and Game listings under the Native Plant Protection Act and The California Endangered Species Act (CDFG, 2008c).
R – Rare

USFS: U.S. Forest Service, Inyo National Forest, Bishop Office (2006a, 2006b)
S – Sensitive List, October 2006

CNPS: California Native Plant Society listings (CNPS, 2001, 2008)
1B – Rare and endangered in California and elsewhere;
2 – Rare, threatened or endangered in California, but more common elsewhere;
4 – Plants of limited distribution in California – Watch list species
"Threat Code" extensions:
#.1 is Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat); #.2 is Fairly endangered in California (20–80% of occurrences threatened); #.3 is Not very endangered in California (< 20% of occurrences threatened or no current threats known.

CNDDB: California Natural Diversity Data Base rankings by the CDFG (CDFG, 2008b)
S2 is 6–20 occurrences or 1,000–3,000 individuals or 2,000–10,000 acres
S3 is 21–100 occurrences or 3,000–10,000 individuals or 10,000–50,000 acres
"Threat Numbers" follow decimal:
#.1 – very threatened; #.2 – threatened; #.3 – no threat currently known; and ? indicates CNDDB uncertainty in status

2. Syn. *Astragalus monoensis* var. *monoensis*

The Project area has been affected by a substantial number of human activities. These include highways, roads, transmission lines, and geothermal development. Although undeveloped habitat in the Project area retains much of its natural character, these human activities affect both the quality of the wildlife habitat and the ability for wildlife to use this habitat.

Evidence of wildlife species on and near the proposed M–1 plant site has been compiled from multiple biological resource investigations that have been conducted for geothermal exploration and development activities on and near the Project site (Santos and Reed 2011a; Paulus 200l; Taylor and Buckberg 1987). Species known to occur in the area include mule deer, jackrabbits, ground squirrels, least chipmunks, kangaroo rats, wood rats and lizard species. Bird species known to occur in the area include Clark's

nutcracker, mountain chickadee, pygmy nuthatch, black–billed magpie, gray flycatcher, pinyon jay, sage thrasher, common raven, sparrows and hawk species.

Special Status Wildlife Species

For the purpose of this assessment, special status wildlife species are those species listed by the USFWS under the federal ESA or by the CDFG under the CESA. Special status wildlife species also include those species identified as "species of special concern" by the CDFG. Table 16 lists all of the special status wildlife species known to occur in the Project vicinity as identified through a search of the CNDDB database for special status species within the area defined by the nine USGS 7.5–minute topographic quadrangle maps centered on the "Old Mammoth" quadrangle in which the MP–I Replacement Project is located. In addition to the identified special status species, the CDFG specifically requested that the EIR address the potential impacts of the Project on mule deer (*Odocoileus hemionus* spp. *hemionus*).

A tabular summary of the CNDDB inventory plant, wildlife, and habitat occurrences in the Project vicinity by USGS topographic quadrangle is provided as Appendix C. Brief species accounts for each of the identified special status wildlife species are provided in Section 4.4.3 together with an assessment of the potential adverse effects of the *Proposed Project* on each of the respective species of interest.

4.4.3 Environmental Impacts

Pursuant to Appendix G of the CEQA Guidelines, the following effects on wildlife resources could be considered significant under CEQA if the project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act, through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Table 16: Special Status Wildlife Species Potentially Occurring in the Project Vicinity

Common Name	Scientific Name	ESA Status	CESA Status	CDFG Status
California wolverine	*Gulo gulo*	Candidate	Threatened	FP
gray–headed pika	*Ochotona princeps schisticeps*	None	None	*
great gray owl	*Strix nebulosa*	None	Endangered	*
greater sage–grouse	*Centrocercus urophasianus*	Candidate	None	SSC
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*	Threatened	None	*
long–eared myotis	*Myotis evotis*	None	None	*
Mount Lyell shrew	*Sorex lyelli*	None	None	SSC
northern goshawk	*Accipiter gentilis*	None	None	SSC
Owens speckled dace	*Rhinichthys osculus ssp. 2*	None	None	SSC
Owens tui chub	*Siphateles bicolor snyderi*	Endangered	Endangered	*
Pacific fisher	*Martes pennanti (pacifica) DPS*	Candidate	None	SSC
Paiute cutthroat trout	*Oncorhynchus clarkii seleniris*	Threatened	None	*
prairie falcon	*Falco mexicanus*	None	None	WL
Sierra marten	*Martes americana sierrae*	None	None	*
Sierra Nevada mountain beaver	*Aplodontia rufa californica*	None	None	SSC
Sierra Nevada red fox	*Vulpes vulpes necator*	None	Threatened	*
Sierra Nevada yellow–legged frog	*Rana sierrae*	Candidate	Candidate Endangered	SSC
silver–haired bat	*Lasionycteris noctivagans*	None	None	*
Swainson's hawk	*Buteo swainsoni*	None	Threatened	*
travertine band–thigh diving beetle	*Hygrotus fontinalis*	None	None	*
western white–tailed jackrabbit	*Lepus townsendii townsendii*	None	None	SSC
willow flycatcher	*Empidonax traillii*	None	Endangered	*
Yosemite toad	*Anaxyrus canorus*	Candidate	None	SSC
Yuma myotis	*Myotis yumanensis*	None	None	*

Source: CNDDB Nine Quadrangle Inventory Report Centered on the USGS "Old Mammoth" Topographic Map Quadrangle; (CNDDB Inventory Conducted on May 19, 2011).
* Identified as "special animals" that the CNDDB is interested in tracking regardless of their legal or protection status. The CDFG considers the taxa on this list to be those of greatest conservation need (CDFG 2011).
CNDDB Status Abbreviations:
FP ≡ Fully Protected
SSC ≡ Species of Special Concern
WL ≡ Watch List

Environmental Impacts of the Proposed Project

Potential Effects on Special Status Species:

The following brief special status species descriptions were abstracted from the California Wildlife Habitat Relationship System (CWHRS) life history accounts reported to have been originally published by the CDFG (Zeiner et al. eds. 1988–1990), California bird species accounts (Shuford and Gardali eds. 2008), and supplemented by other available information.

California wolverine (*Gulo gulo*): California wolverine is a scarce resident of the Sierra Nevada. In the southern Sierra it occurs at elevations from 6,400 feet to 10,800 feet. Habitats used in the southern Sierra include red fir, mixed conifer, lodgepole, subalpine conifer, alpine dwarf–shrub, barren, and probably wet meadows, montane chaparral and Jeffrey pine. Wolverines have large home ranges and are reported to frequently travel long distances. Wolverines prefer areas with low human disturbance and low road density. A wolverine was photographed in the Tahoe National Forest in 2008. DNA analysis of the animal's scat determined that it was related to wolverines found in the Rocky Mountain and not historic California populations (USFS 2008). An earlier confirmed California wolverine spotting was reported to have occurred in Lee Vining Canyon, located about 24 miles northwest of the Project area (Nature Conservancy 1999).

There is a small potential that California wolverine could pass through the Project area but proximity to existing human disturbance suggests the Project area would not be preferred habitat.

Gray–headed pika (*Ochotona princeps schisticeps*): The gray–headed pika, the Yosemite pika, and Mt. Whitney pika are the subspecies of American pika (*Ochotona princeps*) that occur in California. All subspecies of pika in California have been synonymized under *Ochotona princeps schisticeps* (CDFG 2011). Pikas inhabit rocky and talus areas that provide ample crevices and gaps for denning, nesting, and hiding. Pikas are most often found at the interface of talus and meadow or subalpine shrub habitats for foraging. Pikas are generalist herbivores and most of their water requirement is met through foraging. Global warming is reported to be the gravest threat to the long–term survival of the American pika in California (Center for Biological Diversity 2007).

The *Proposed Project* area does not provide talus or rock outcrop habitat with adjacent meadows or subalpine shrub habitat for the regional subspecies of American pika. As such, development of the M-1 plant site or the alternative plant site would have negligible potential for adverse effects on Gray–headed pika.

Great gray owl (*Strix nebulosa*): Great gray owl occurs in dense mixed conifer and red fir stands bordering meadows. Foraging habitat generally includes open grassy areas such as bogs or selective clear–cuts. Primary prey species are small mammals such as voles, gophers, shrews, mice, chipmunks, and frogs. In the Sierra Nevada Range, great gray owls are found in the subalpine and montane forest zones. Great gray owls have been reported to be both nonmigratory and nomadic. Movements are influenced by prey availability. In high snow environments, owls may disperse to lower elevations. Nest sites include old hawk and raven stick–built nests, depressions on broken–topped snags and stumps, or dwarf–mistletoe platforms. Special status species maps provided in the Mono County Master Environmental Assessment identify gray owl habitat about four miles southwest of the Project site (Mono County 2001).

There is no mixed conifer or red fir stands bordering meadows that would provide suitable nesting or foraging habitat near the Project area As such, the *Proposed Project* would have negligible potential for adverse effects on Great gray owl.

Greater sage–grouse (*Centrocercus urophasianus*): Greater sage-grouse (hereinafter sage-grouse) are found on the sage-steppe habitats from southern Saskatchewan to southern Colorado and west to California, primarily in areas dominated by sagebrush (*Artemesia* spp.), forbs, and grasses. Optimum sage grouse habitats are generally characterized as mature sagebrush stands with dense understory of native perennial grasses and native forbs. It is an uncommon resident of northeastern California and ranges from

the Oregon border to northern Inyo County. The most stable populations of sage grouse are located in Lassen and Mono Counties.

Sage-grouse is found in greatest abundance in a combination of sagebrush, perennial grassland or wet meadow, and water. Bitterbrush and alkali desert are commonly present. Sage–grouse are dependent on sagebrush for both food and cover year round. The species is a communal breeder so relatively large patches of habitat are needed with a threshold of about 100 acres as the minimum needed for low suitability and 1,000 acres or more as a patch size with high suitability. The species needs open to dense sagebrush with herbaceous vegetation between bushes. Closed vegetation provides cover and more open sagebrush provides good nesting habitat. Sage-grouse forage on shrubs (principally sagebrush), forbs and terrestrial insects (CDFG and CIWTG 2007).

In 2010, the USFWS recognized the sage-grouse in the Mono Basin (Bi-State population) as a distinct population segment of Greater sage-grouse that warrants potential listing as threatened or endangered under the ESA (Federal Register Vol. 75, No. 55 13910-14014; March 23, 2010). The Project area is located within the South Mono Population Management Unit (PMU), which occupies 280,492 acres with an estimated sage-grouse population of 906-1,012 individuals in the year 2009.

Sage–grouse utilize strutting grounds (leks) within or adjacent to nesting habitat during courtship. The nearest known active leks and nesting habitat occurs about three miles east of the *Proposed Project* area in suitable habitat located north of the Mammoth Yosemite Airport. The Big Sagebrush Scrub plant community found on and adjacent to the proposed M-1 replacement plant site is potential sage–grouse habitat, but the patch size is too small to be suitable for strutting grounds or nesting habitat. There is negligible sage-grouse habitat in the alternative plant site location.

Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*): In California the Lahontan cutthroat is found in high mountain meadow streams at elevations over 6,000 feet. Optimal habitat is characterized by clear cold water and relatively stable summer water temperatures with an average maximum summer temperature of less than 72°F. Cover is an important habitat component as Lahontan cutthroat trout occupy areas with overhanging banks, vegetation, or woody debris, and within stream cover is important for juvenile survival (USFWS 1995).

There are no streams suitable for Lahontan cutthroat trout in the Project area or that would be affected by the *Proposed Project*.

Long–eared myotis (*Myotis evotis*): Long–eared myotis is a bat species found in nearly all brush, woodland, and forest habitats in California, from sea level to at least 9,000 feet. Coniferous woodlands and forests may be preferred habitat. It typically forages over rivers, streams, and ponds within the forest–woodland environment. During summer, it roosts singly or in small groups in a wide variety of structures, including cavities in snags, under loose bark, stumps, buildings, rock crevices, and caves. Long–eared myotis feeds on spiders, flies, beetles, and moths caught in flight. During winter, it is believed to hibernate primarily in caves and abandoned mines.

There is potential roosting habitat for long–eared myotis in nearby forest and portions of the *Proposed Project* area could be used for foraging habitat. Given the vast range of potential long-eared myotis roosting and foraging habitat, the *Proposed Project* would have negligible impact on the species.

Mount Lyell shrew (*Sorex lyelli*): Current information about the distribution, status and habitat association for Mount Lyell shrew is very limited, but it is not reported to be of local concern to CDFG in the Mammoth Lakes area at this time.

This species is found in high elevation riparian areas in the southern mountains of the Sierra Nevada. Mount Lyell shrew habitat consists of wetland communities, near streams. It occurs in grassy areas and in sagebrush steppe, with scattered pinyon pine woodlands and localized forests of white fir, Jeffrey pine, and lodgepole pine at elevations ranging from 6,900 to 10,000 feet above sea level.

Mt. Lyell shrew has been found in a few locations around Mt. Lyell near Yosemite National Park. This species was reported to occur in the Project region (Old Mammoth area) in 1914. More recent occurrences of the Mount Lyell shrew were reported in the Sweetwater Mountains near Bridgeport at an elevation of 8,200 feet.

There is no riparian habitat within the MP–I Project area and little potential habitat for Mount Lyell shrew on the M–1 plant site or alternative plant site.

Mule deer (*Odocoileus hemionus* spp. *hemionus*): Mule deer is an important game species and is both a common yearlong resident and seasonal migrant in the Casa Diablo Springs area. Mule deer both browse and graze and prefer to forage on the tender new growth of various shrubs, many forbs and a few grasses. In the eastern Sierra, mule deer typically migrate downslope in the winter to areas with less snow and migrate to higher elevations as snow melts to summer range.

Deer present in the Casa Diablo Hot Springs area are predominantly from the Round Valley herd (formerly known as the Sherwin Grade/Buttermilk herd). CDFG's Management Plan for the Sherwin Grade Deer Herd (Thomas 1985a) identifies the herd boundary as extending from northern Inyo County in the southeast to just north of State Route 203 in the northwest. The winter range of the Round Valley herd is primarily located north of Pine Creek in Inyo County and extends into southern Mono County about 20 miles southeast of the Project area. The Management Plan indicates that the major migratory corridor for the herd from the winter range follows the toe of the eastern Sierra slope north from Round Valley to just south of the Town of Mammoth Lakes. Deer moving within this corridor diverge to cross the Sierra crest over McGee, Hopkins, Solitude, Mammoth, and San Joaquin passes into eastern Fresno and Madera Counties (Thomas 1985a). The Management Plan also identifies the Mammoth Creek area as part of the herd's summer range. Seasonal habitats such as migration routes, holding areas, and fawning sites are not as well defined in the Management Plan as winter range (see Figure 28).

A second deer herd also exists in the general vicinity of the Casa Diablo Hot Springs area. The Casa Diablo herd has winter range about 20 miles east of the Project area and west of U.S. Highway 6 from Casa Diablo Mountain north toward Antelope Mountain and east into Nevada (Thomas 1985b). The migratory holding areas and summer range for the Casa Diablo herd are generally 6 to 12 miles north and west of the Project area (Jones & Stokes 1999).

Studies identify important deer holding areas for the Round Valley herd in the area south of U.S. Highway 395 and generally between Tobacco Flats on the east and Mammoth and Sherwin Creeks on the west (Sherwin holding area); and for the Casa Diablo herd at Owens Ranch, near the June Lake Loop road, and near the mouth of Bohler Canyon (Taylor 1988; Taylor 1996). In these holding areas, migrating deer concentrate and forage until mountain passes are free of snow. Some deer are also known to remain and summer in the holding areas (Taylor 1996; Kerns 2003a). Some reports depict part of the Project area as being the northern-most edge of the Sherwin holding area.

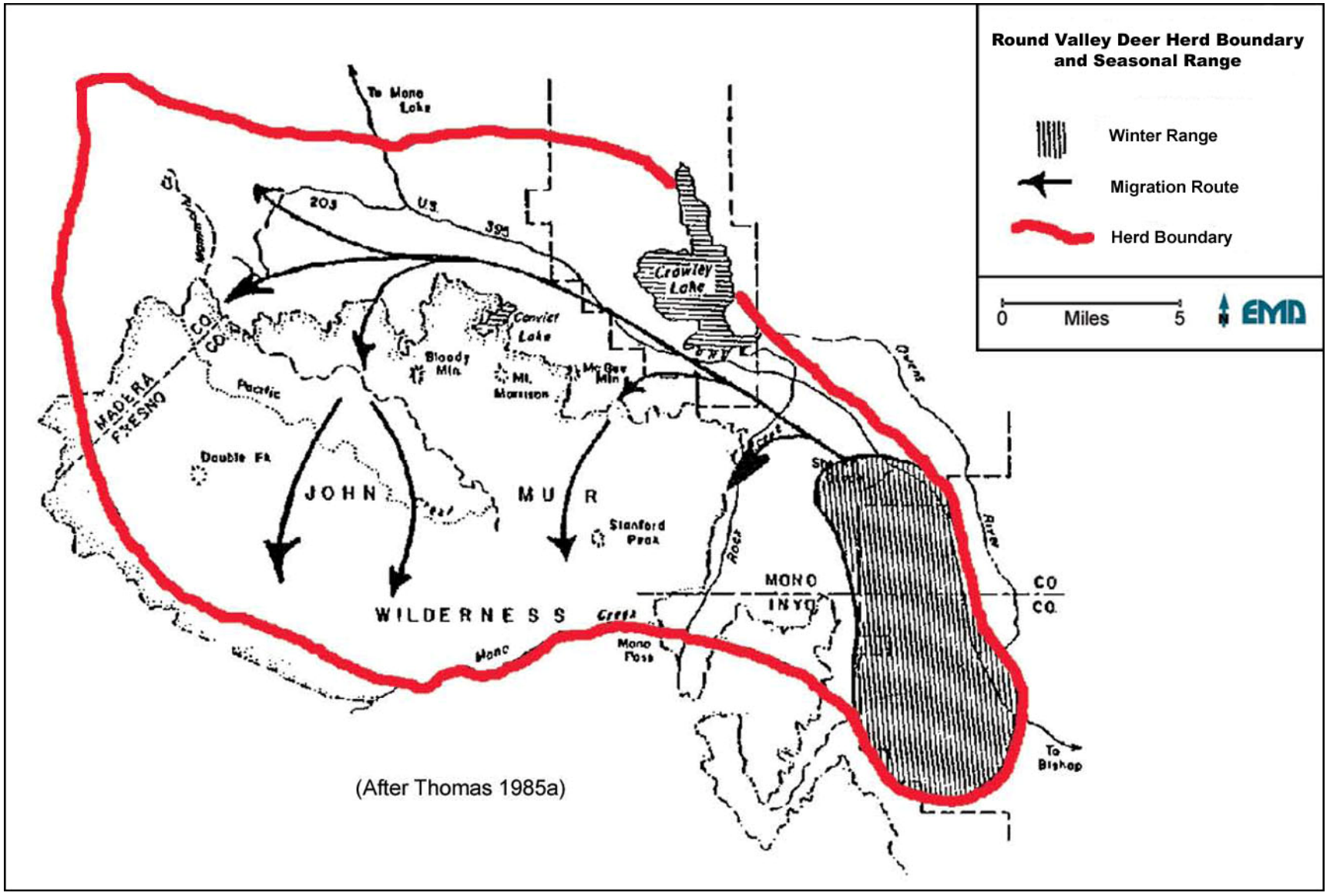

Figure 28: Round Valley Deer Herd Boundary and Seasonal Range (After Thomas 1985a)

Deer herd population estimates from 1984-1985 put the number of deer that delayed migration in the Sherwin holding area at 3,500-4,000 deer. Total Round Valley herd population was reported as high as 6,000 in 1985 and to have dropped to fewer than 1,000 in 1991 due to the lack of winter forage (Personal Communication with Dr. Vernon Bleich, CDFG Reported in USFS, 1995). The CDFG more recently estimated the Round Valley herd population over the four-year period of 1997 through 2000 as being constant at around 2,200 to 2,300 individuals (Personal Communication, 2001, Dr. Vernon Bleich, CDFG, Reported in Quad Knof, 2004). That number of deer would approximate the population goal for habitat management of 2,300-2,400 deer in the herd stated in the CDFG Management Plan (Thomas 1985a).

In studies undertaken during the spring and fall of 1987 and 1988 for expansion of the Casa Diablo geothermal development by the addition of the MP-II and PLES-I power plant projects, it was determined that deer were using the Casa Diablo area, and moving in a north/south direction through the area depending on the time of year. There were no well-defined deer trails, with deer movement through the area characterized as being in a dispersed manner. It was postulated that deer from the Round Valley herd, and possibly the Casa Diablo herd, utilized the area around the operating MP-I geothermal power plant site (Kucera 1987a, 1987b, 1987c and 1988). Deer continue to be observed around the existing Casa Diablo geothermal complex and wellfield, and chance sightings of deer are being recorded by the plant operator. These records show seasonal deer activity around the Casa Diablo geothermal development that is consistent with observed deer movement in the general area, as described below (MPLP 2004).

Radio-telemetry information from both the Round Valley and the Casa Diablo herds indicates that each herd utilizes different migratory routes from their respective winter ranges to summer ranges. There is no indication from the telemetry data that the two herds intermingle, use the same migration routes, or use the same winter ranges. Rather, the deer show an affinity for the established migratory routes of their respective herds (Taylor 1988 1996). The Casa Diablo herd migratory movement is typically east to west about 6 to 7 miles northwest of both the Project area (Jones & Stokes 1999).

Radio-telemetry and photo points were used in 1995 to track the movement of the Round Valley herd from their winter range to summer ranges. Consistent with the migratory pattern earlier discussed in the CDFG's Herd Management Plan (Thomas 1985a), the telemetry data indicates that there was substantial deer movement in the spring of the year from the Round Valley winter range, generally north along a corridor west of Highway 395 and east of the Sierra range to drainages leading west over the Sierra crest to summer ranges in the high country. This migration corridor lies along the toe of the east- and north-facing slopes of the Sierra Range, west and south of U.S. Highway 395 and State Route 203 (see Figure 28). The deer move north from the winter range in Inyo County following receding snow and the emergence of forbs. Deer tend to concentrate on the Sherwin holding area awaiting summit passes to open prior to continuing their migration to summer range. The Sherwin holding area is considered a critical component to the Round Valley deer herd life cycle as the area provides an abundance of high quality forage that is generally not available in the herd's winter range. The nutritional benefits of the forage enable the deer to recover from over-winter weight loss, and it provides energy needed by pregnant does for fawning and growth (USFS 1995).

In the 1995 study, a total of 106 deer from the Round Valley Herd were radio-collared. Seven radio-collared deer migrated from the winter range to the south, 98 deer migrated to the north, and one deer remained on the winter range throughout the summer. Of the 98 radio-collared deer that migrated north from the winter range, 93 deer delayed their migration on the Sherwin holding area, south of State Route 203. The other five deer delayed at other holding areas further south and east along the migration corridor between Hilton Creek and Tobacco Flat. Deer herd composition counts in the holding areas

conducted during the study support the telemetry observations. Of the 93 deer which delayed migration in the Sherwin holding area, 29 deer remained within the holding area through the summer. The other 64 deer migrated through the area to summer ranges at higher elevations. The report states that deer stay in the holding area until snow receded from the higher elevation passes and then moved through the Mammoth, Solitude, and Duck passes to the western side of the Sierra crest (see Figure 29). Photo points in the Solitude pass area found that deer typically moved in the early morning and evening hours. All 500 of the radio-collared deer observations were south or west of State Route 203 or U.S. Highway 395 in May of 1995, and in June, 430 of 433 observations, or more than 99 percent of the radio-collared deer telemetry locations, were observed to be south of State Route 203 and west of U.S. Highway 395 (Taylor, 1996).

A mule deer tracking survey was recently conducted in the vicinity of the proposed Casa Diablo IV Geothermal Development Project (CD-4) which was intended to include a survey of the unpaved roads near the proposed CD-4 power plant site located about one-quarter mile north of the existing MP-I plant site (Santos and Reed 2011b). Due to the proximity of the *Alternative Power Plant Location* to the CD-4 power plant site, the survey was also intended to cover the *Alternative Power Plant Location* for the subject MP-I Replacement Plant Project. Unfortunately, poor road conditions near the proposed CD-4 power plant site/*Alternative Power Plant Location* prohibited completion of the tracking survey in this portion of the survey area by the methodology proposed. The tracking survey did provide supplemental evidence that a relatively small proportion (< 0.07 percent) of the Round Valley deer herd appear use the area west of Highway 395 and north of State Route 203 as a holding area pending their migration to summer range.

The available information suggests that only a small number (less than 1 percent) of the Round Valley Herd use the Casa Diablo area as a holding area during their seasonal migrations. Resident mule deer, including does with fawns, do occur within the existing MP-I Project area. The *Proposed Project* would remove 5.65 acres of additional habitat in the Casa Diablo geothermal development complex area. However, based on the historic and existing surface disturbance on the M-1 plant site and the proximity of the plant site to continuing noise and human disturbance from the other existing geothermal power plants located adjacent to the proposed plant site, the adverse effects on mule deer resulting from the loss of this habitat would be less than significant.

No new geothermal pipeline corridors would be constructed for the Project to deliver fluids to or from the M-1 replacement plant site that could impede deer movement through the area. When site construction is completed, the noise levels from the M-1 replacement plant would be slightly lower than the noise from the existing MP-I plant, and there would be no increase in human disturbance because there would not be any additional project employees. As such, the adverse indirect effects on mule deer from the M-1 plant operations would be less than significant.

Northern goshawk (*Accipiter gentilis*): Northern goshawk habitat consists of older–age mixed coniferous and deciduous forests. Large trees are required for nesting. Closed canopy of greater than 40 percent is necessary for protection and thermal cover, and forest openings are required for maneuverability below the canopy. Nests are usually on north slopes, near water, in red fir, lodgepole pine, Jeffery pine, or aspen. Special status species maps provided in the Mono County Master Environmental Assessment identify goshawk habitat about four miles northwest of the Project site (Mono County 2001).

There is no potentially suitable nesting habitat for goshawks within the M–1 replacement plant site. Potentially suitable nesting habitat could occur in the Jeffrey Pine forest habitat located about one–quarter mile north of the M–1 plant site near and within the alternative plant site. The proposed M–1 plant site could occasionally be flown over while foraging.

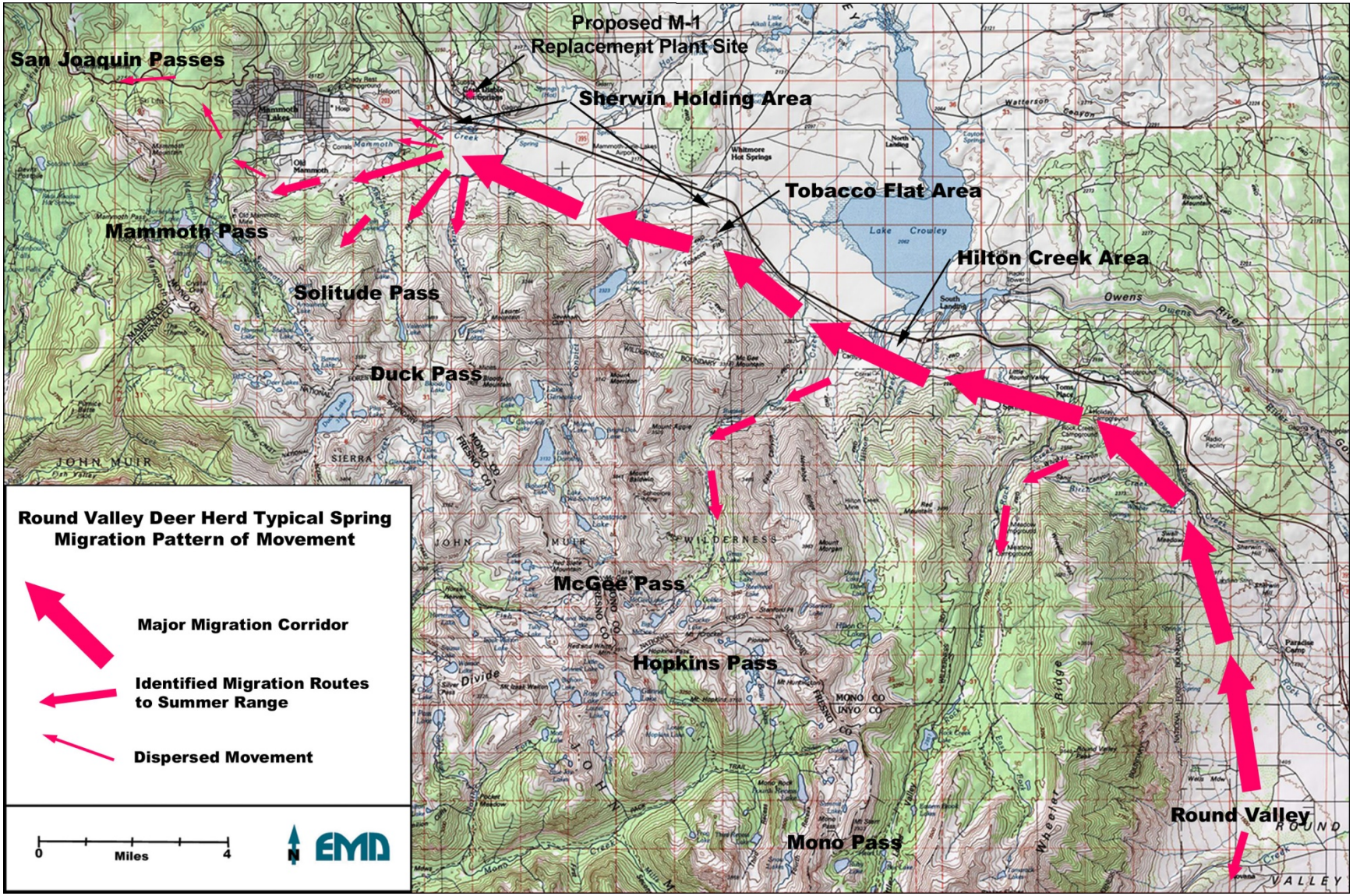

Figure 29: Round Valley Deer Herd Typical Spring Migration Pattern of Movement

Owens speckled dace (*Rhinichthys osculus ssp. 2 Subspecies*): Speckled dace from the Owens Basin is a fish species known to occupy a variety of habitats ranging from small coldwater streams and hot spring systems to 29°C. Owens speckled dace are highly variable and vary significantly in many distinguishing physical characteristics. Long Valley speckled dace populations occur in Whitmore Spring and Little Alkali Lake and differ enough to be considered separate subspecies (Moyle et al. 1995). Special status species maps provided in the Mono County Master Environmental Assessment identify speckled dace habitat about three miles southeast of the Project site (Mono County 2001).

There is no habitat for Owens speckled dace in the Project area.

Owens tui chub (*Siphateles bicolor snyderi*): The Owens tui chub is a subspecies of several cyprinids found throughout the Great Basin and Pacific Ocean drainages. The remaining genetically pure Owens tui chub populations only exist in habitats that are isolated from non–native fish. Isolation is necessary to protect the Owens tui chub from predatory fish such as largemouth bass and brown trout. It is also necessary to prevent interbreeding and hybridization of the Owens tui chub with another subspecies, the Lahontan tui chub (Chen and May 2003).

Native Owens tui chub populations occur in the AB springs and the CD springs of the Hot Creek State Fish Hatchery. A second population occurs in the uppermost reach of the Owens River Gorge (Upper Owens Gorge). Transplants from the CD springs and Upper Owens Gorge were transferred to the former Owens Valley Native Fishes Sanctuary in Fish Slough, and progeny of these transplants exist in a waterfowl impoundment in Little Hot Creek. Other remnant populations were reported to occur on lands owned by the Los Angeles Department of Water and Power (LADWP), Cabin Bar Ranch, Mule Spring, and Sotcher Lake (Chen and May 2003).

The headwater springs of Hot Creek occur in the Long Valley Caldera near the Hot Creek State Fish Hatchery located approximately three miles east of the Project area. There have been historic concerns that cumulative geothermal development in Long Valley may directly affect the subsurface hydrology associated with these springs. The Owens tui chub and the designated critical aquatic habitat supported by these springs has the potential to be affected by changes in spring flow rate, temperature, or chemistry that could potentially result from changes to groundwater production, long–term geothermal fluid production or other factors in the Long Valley Caldera (Thomas 2005).

The existing geothermal development at Casa Diablo is operating under a stipulated Owens tui chub monitoring and remedial action program intended to protect the Owens tui chub critical habitat supported by the Hot Creek headsprings. The program was initially adopted in 1990 as set forth in Stipulation No. 1 of the Bureau of Land Management approval of the Plans of Operation for Development, Injection and Utilization for the then proposed PLES-I Geothermal Project, but the program also considered the MP–I and MP–II projects.

The monitoring program is coordinated by the Long Valley Hydrologic Advisory Committee (LVHAC). The monitoring data is routinely evaluated by the Mono County Economic Development Department (MCEDD), the LVHAC and CDFG (Mono County General Plan, Energy Resources, Goal 1, Objectives C and D). To date, there have been no substantive changes observed in the Hot Creek headsprings monitoring data that have been attributed to geothermal development in the Long Valley caldera. The LVHAC will continue to conduct the hydrologic and biologic monitoring activities (Personal Communication – Dan Lyster, Director, MCEDD; June 22, 2011).

Pacific fisher (*Martes pennanti (pacifica) DPS*): Pacific fisher is recognized as a distinct population segment (DPS) of fisher. It is a late–successional forest obligate species. Fisher habitat is not limited to distinct forest types, but rather is characterized by complex and diverse physical forest structure with high canopy closure that provides diversity in prey populations. Fishers utilize forest habitats with multiple horizontal and vertical features created by varying tree sizes, understory layers, openings, dead and downed wood, and overhead cover that lead to a high diversity of prey populations. Pacific fishers occur in two populations in California, one in northwestern California and a smaller population in the Southern Sierra. There have been no confirmed recent sightings of fisher in the central Sierra (CDFG 2010b). Special status species maps provided in the Mono County Master Environmental Assessment identify fisher habitat about six miles west of the Project site (Mono County 2001).

There are no structurally complex late successional forests in the Project vicinity and no large diameter logs that would provide suitable Pacific fisher potential hunting or denning habitat for Pacific fisher in the *Proposed Project* area.

Paiute cutthroat trout (*Oncorhynchus clarkii seleniris*): Paiute cutthroat trout is a subspecies of cutthroat trout that is native to an extremely limited, 9.5 mile section of stream habitat in Silver King Creek watershed in the Toiyabe National Forest, Alpine County, California. Paiute cutthroat trout prefer cool, well–oxygenated, low gradient streams with moderate current flowing through meadow areas and lakes (USFWS 2004). Special status species maps provided in the Mono County Master Environmental Assessment identify Mammoth Creek as Paiute cutthroat trout habitat (Mono County 2001).

There are no streams suitable for Paiute cutthroat trout in the Project area or that would be affected by the *Proposed Project*.

Prairie falcon (*Falco mexicanus*): Prairie falcon is found in a variety of habitats including annual grasslands to alpine meadows, but associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. It uses cliffs for nesting and open areas for foraging. Prairie falcon preys mostly on birds, ranging in size from songbirds to small geese. Special status species maps provided in the Mono County Master Environmental Assessment identify prairie falcon habitat about 11-12 miles northeast, northwest and southeast of the Project site (Mono County 2001).

There is no suitable nesting habitat in the Project vicinity. Sagebrush scrub habitat on and near the Project area could provide foraging habitat for the prairie falcon.

Sierra marten (*Martes americana sierra*): Sierra marten occupy late–successional stands of mesic conifers with closed canopies and complex structures. Marten are known to occur on the eastern slopes of the Sierra Nevada (Kucera et al. 1995). The sites most often used by marten on the Inyo National Forest were reported to be lodgepole pine, Jeffrey pine and red fir. East side Sierra habitats are closely connected to riparian or more mesic red fir sites. Large trees, snags and logs are used by marten for denning cover. Small clearings, rocky outcrops, and talus slopes are used by marten for foraging habitat.

There are no late successional mesic conifer stands within the Project area that would provide habitat for Sierra marten. No sightings of marten have been reported within the Project vicinity.

Sierra Nevada mountain beaver (*Aplodontia rufa californica*): Mountain beaver are found throughout the Cascade, Klamath and Sierra Nevada ranges, but the Sierra Nevada mountain beaver subspecies is uncommon throughout its range (CDFG 1989). Their typical habitat in the Sierra Nevada is montane riparian habitat occupying mountain streams with dense deciduous vegetation (CDFG 1988–1990). They

are known to inhabit Mammoth Creek and adjacent riparian habitats and are reported to occur on the Valentine Eastern Sierra Reserve near the Town of Mammoth Lakes.

There is no mountain stream habitat suitable for Mountain beaver in the Project area.

Sierra Nevada red fox (*Vulpes vulpes necator*): The Sierra Nevada red fox is restricted to subalpine habitats above 5,000 feet in the Sierra Nevada and Cascade mountain ranges of California (Perrine et al. 2010). The current range and distribution is unknown with the only known current population in the vicinity of Lassen Peak (CDFG 2007). The Sierra Nevada red fox preferred habitat is characterized as red fir and lodgepole pine forests from 5,000 feet to 8,400 feet (CDFG 1978). Dens are located in rock areas with dense vegetation**.**

A sighting of a female Sierra Nevada red fox was reported in the Humboldt–Toiyabe National Forest in August 2010 and two additional foxes were photographed in the Stanislaus National Forest 2–4 miles from the initial sighting (Perrine et al. 2010 and USFS 2010). Prior to the 2010 sighting the last verified sighting of red fox in the Sierra Nevada was in 1991 near Tioga Pass. Special status species maps provided in the Mono County Master Environmental Assessment identify red fox habitat about seven miles northwest of the Project site (Mono County 2001).

There is no preferred habitat for Sierra red fox within the Project area. There are no lodgepole or red fir pine forests with dense understory and rock areas for denning in close proximity to the Project area.

Sierra Nevada yellow–legged frog (*Rana sierra*): Sierra Nevada yellow–legged frog is associated with streams, lakes and ponds in montane riparian, lodgepole pine, subalpine conifer and wet meadow habitats. During winter, adults hibernate beneath ice–covered streams, lakes and ponds.

There is no riparian or permanent aquatic habitat within the Project area and no potential habitat for Sierra Nevada yellow–legged frog.

Silver–haired bat (*Lasionycteris noctivagans*): Silver–haired bats are common throughout California but erratic in abundance. This species needs drinking water and feeds less than 20 feet above forest streams, ponds, and open bushy areas. The bat migrates to hibernation sites. The species has a high dependence on snags.

The absence of snags and open water limits the habitat suitability for silver–haired bat within the Project area.

Swainson's hawk (*Buteo swainsoni*): Swainson’s hawks are associated with open grasslands with scattered trees and shrubs for nesting and foraging. In California, the Swainson’s hawk nesting distribution includes Great Basin sage–steppe communities and associated agricultural valleys in extreme northeastern California, isolated valleys in the Sierra Nevada in Mono and Inyo Counties, the Sacramento and San Joaquin valleys, and at least one known isolated breeding site in the Mojave Desert. Swainson’s hawk nest in a wide variety of tree species and forage in grasslands, irrigated pastures, and open grain or alfalfa fields close to nesting sites (Woodbridge 1998). Special status species maps provided in the Mono County Master Environmental Assessment identify Swainson’s hawk habitat about 15 miles northwest of the Project site (Mono County 2001).

Swainson's hawks are unlikely residents of the Mammoth Lakes area, but they are long distance migrants and could fly over the Project area. There is no nesting or foraging habitat for Swainson's hawk in the Project area.

Travertine band–thigh diving beetle (*Hygrotus fontinalis*): Travertine Hot Springs is located one mile south of Bridgeport, California and east of Highway 395. Travertine Hot Springs is the type of locality in which the Travertine band-thigh diving beetle species occurs. Little is known of the life cycle or habits of the beetle. The beetle occurs in the runoff pools from the hot springs of the limestone outcrop. The location of discovery for this beetle was a pool containing cool water at the base of the main limestone ridge which was observed to produce a flow of thermal water on the west side. In 1963 this pool was severely altered when a channel was cut from the main limestone ridge to the pool which greatly increased water temperature and killed beetles occupying the pool. Before alteration the discovery pool had a muddy soft bottom with a flocculent deposit which was easily roiled. Beetles were common throughout the pool. Beetles were also found in the sedge–covered overflow pools a few meters west of the main limestone ridge (BLM 1995).

There is negligible information available about the distribution or habitat of the Travertine band–thigh diving beetle. Special status species maps provided in the Mono County Master Environmental Assessment identify beetle habitat about six miles east of the Project site (Mono County 2001). There are hot springs located within the MP–I Project area but no limestone outcrops are known to exist in Project vicinity. There are no hot springs or suitable aquatic habitat for the Travertine band-thigh diving beetle within the MP–I replacement plant site or the alternative plant site.

Western white–tailed jackrabbit (*Lepus townsendii townsendii*): The western white-tailed jackrabbit is an uncommon resident of the eastern slope of the Sierra. Its preferred habitats are sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grasslands; and it uses low sagebrush, wet meadows and early successional stages of various conifer habitats. It moves to higher areas in the summer and to lower elevations in the winter, particularly sagebrush covered eastern slopes.

Mono County is at the western and southern most limits of the distribution for white-tailed jackrabbit. Two historic sightings of white–tailed jackrabbit were reported near Lake Mary in 1951 and south of Casa Diablo Hot Springs in 1955. No recent sightings have been reported within the vicinity of the MP-I Project. The white-tailed jackrabbit is currently identified as a resident small game species that is open statewide for hunting with no closed season or bag limits (14 CCR §309).

Portions of the *Proposed Project* area may provide suitable habitat for white–tailed jackrabbit.

Willow flycatcher (*Empidonax traillii*): Willow flycatcher inhabit wet meadow and montane riparian habitats at 2,000 feet to 8,000 feet in the Sierra Nevada and Cascade ranges, most often occurring in broad, open river valleys or large mountain meadows with lush growth of shrubby willows. There is potential willow flycatcher habitat along Mammoth Creek upstream of the Highway 395 and upstream from the Creek's intersection with Minaret Road.

There is no willow flycatcher habitat in the existing MP–I Project area or on the proposed or alternative M–1 plant sites.

Yosemite toad (*Anaxyrus canorus*): Yosemite toad is found in wet mountain meadows and seasonal ponds associated with lodgepole pine and subalpine conifer forests. Quiet pools in alpine meadows provide optimum habitat. Meadows with willow vegetation are also used. Special status species maps

provided in the Mono County Master Environmental Assessment identify Yosemite toad habitat about eight miles south of the Project site (Mono County 2001).

There are no mountain meadows or seasonal pond habitat within the *Proposed Project* area and no potential habitat for Yosemite toad.

Yuma myotis (*Myotis yumanensis*): Yuma myotis is a common and widespread bat species in California, usually found near ponds, streams, or other sources of open water in open forests and woodlands. Their primary prey includes water–borne insects such as caddisflies and midges, as well as moths, flies, termites, and ants. Yuma myotis require free water for drinking. Roost sites include buildings, mines, caves, or crevices.

Yuma myotis could forage in the *Proposed Project* area, but the absence of open water limits the habitat suitability for Yuma myotis.

Construction Activities:

Site grading and construction activities would directly disturb a total of approximately 5.65 acres of land. The surface disturbance would effectively remove the plant communities and associated wildlife habitat currently occupying the proposed M–1 replacement plant site over the life of the Project (see Table 17 and Figure 26).

Table 17: Plant Communities Directly Affected by MP–I Replacement Plant Site Construction

Plant Community Name	Acreage Disturbed
Jeffrey Pine Forest	1.50 Acres
Big Sagebrush Scrub	2.38 Acres
Wright Buckwheat Dwarf Scrub	0.05 Acres
Disturbed	1.72 Acres
Total Acreage Disturbed	**5.65 Acres**

Both Jeffrey Pine Forest and Big Sagebrush Scrub plant communities are locally very common and the existing habitat on the site has been impacted by the existing Casa Diablo geothermal operations and other historic human activity. The Wright Buckwheat Scrub community is unusual in the region but Wright buckwheat is a relatively common species within the sagebrush habitat in the Project vicinity. The relatively small losses of these plant communities and associated habitat relative to the remaining similar habitat in the Project vicinity and region would have negligible direct impact on the local species dependent on the respective plant communities and wildlife habitat.

Human activity and noise occurring during site construction would also indirectly impact wildlife offsite within visual or audible distances of the construction activities. The indirect impact on offsite wildlife from construction activities would be short term and temporary. Because of the existing geothermal development at Casa Diablo, species intolerant of human activity would not be expected to currently occur near the development, so these species would not be affected by the *Proposed Project*.

Replacement Plant Operations:

The M-1 plant facilities would generally be similar to the existing facilities in appearance and impact on wildlife. The approximately 5.65 acres of wildlife habitat lost during construction of the M-1 plant site would continue for the nominal 30 years of projected power plant life. This is an unavoidable impact of the *Proposed Project*. However, the relatively small loss of wildlife habitat relative to the remaining similar Jeffery pine and sagebrush habitat in the Project vicinity and the region (see Figure 27) would have negligible direct impact on the local species dependent on the respective habitat.

The proposed MP–I Replacement Project proposes to utilize the same geothermal resources currently being utilized by the existing MP–I power plant. No new geothermal wells are proposed and the geothermal fluid production rate would be approximately the same as for the existing MP-I plant operations. Similarly, no new groundwater production wells are proposed for the Project. As such, no new potential for impact on the Hot Creek headsprings habitat of the Owens tui chub would result from the Project.

Subsequent to the approval of the existing Conditional Use Permit for the MP-I Project, the County adopted hydrologic and biological monitoring and remedial action program requirements for development within the Hot Creek buffer zone. Conformance with these program requirements provides an early warning of changes that could occur at the Hot Creek headsprings and a program of remedial actions that would be taken to prevent potential adverse effects on the Owens tui chub critical habitat if such changes are observed. Similar monitoring and remedial action requirements were adopted by the plant operator at the time of the approval of the PLES-I plant, and MPLP subsequently adopted the County requirements at the time of approval of a MP-II wellfield expansion project.

MPLP is currently conducting the hydrologic and biological monitoring prescribed by Mono County General Plan, but existing permit requirements for such monitoring only exist under the MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings supporting the critical habitat of the Owens tui chub, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended.[1]

> **Bio Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant.**

The adoption of the prescribed hydrologic and biologic monitoring and mitigation measure program by the MP-I Project would reduce the potential adverse effects of this potential impact on the Owens tui chub critical habitat to below the level of significance.

[1] Recommended *Bio Mitigation Measure 1* is worded exactly the same as *Hydro Mitigation Measure 1* provided to mitigate a different potential impact discussed in Chapter 4.8.3, Hydrology and Water Quality, Environmental Impacts.

An optional new interconnection transmission line may be constructed for the replacement plant that could be a collision or electrocution hazard to migratory birds. The potential affect of the optional short interconnection transmission line on birds would not be a significant impact under CEQA but the following measures are recommended to reduce the potential adverse effects of the Project.

Bio Measure 1: The optional interconnection transmission line shall be constructed with bird diverters to reduce the potential for bird collisions with the power line.

Bio Measure 2: The optional interconnection transmission line shall be constructed in conformance with guidance set forth in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), as may amended or updated at the time of power line construction.

The M-1 replacement plant would operate at lower noise levels than the existing MP-I plant. At the end of site construction and decommissioning activities, wildlife species tolerant of periodic human activity would be expected to return to the MP–I Project vicinity after the M–1 replacement plant begins commercial operations. Based on the lower operating noise level there would be no significant noise impact on wildlife as a result of the replacement plant.

Decommissioning Activities:

When the M-1 replacement plant begins startup operations, the existing MP-I plant operations would be reduced proportionally as geothermal fluid supporting the facility is incrementally moved from the existing plant to the new plant. This transition may take up to two years during which the two plants would both be operating at reduced capacity. Subsequently, there would be an additional 3-month period during which demolition and site restoration activities would be occurring on the MP-I plant site while the M-1 plant is in full operation. Human activity and noise would be occurring from both plant sites during this period and the combined sources of noise and disturbance could further affect sensitive wildlife species which might be making use of neighboring habitat.

The incrementally increased noise and disturbance that would occur during decommissioning would not be greater than that resulting during site construction. The indirect impact on offsite wildlife from decommissioning activities would be short term and temporary. Because of the existing geothermal development at Casa Diablo and the new disturbance that would be created during the proposed replacement plant construction activities, species intolerant of human activity would not be expected to be occupying areas near the development during this period and would be unlikely to be affected by the continuing noise and disturbance. Most tolerant wildlife species would be expected to return to habitat on neighboring properties when noise and disturbance from decommissioning activities has concluded.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County. After successful implementation of reclamation plan requirements, noxious weeds would be removed from the site and successional natural plant communities would return over time. Local wildlife would also re-occupy the restored habitat.

Environmental Impacts of the Alternative Power Plant Location

There have been no site specific baseline botanical or wildlife surveys conducted of the *Alternative Power Plant Location*, but aerial photograph assessment and available information on neighboring habitat suggests the entire site is within Jeffrey Pine Forest with an average tree canopy of approximately 50%. Jeffrey pine would be expected to account for more than 80% of tree canopy cover and would provide dense shading with minimal shrubby understory.

Construction Activities:

Plant site grading activities for the *Alternative Power Plant Location* plant site would disturb a total of 5.65 acres of land similar to the proposed plant. The alternative plant site is located entirely within Jeffrey Pine Forest plant community. There has been minimal recent surface disturbance of the alternative plant site. An additional approximately 1.2 acres of land would be disturbed for the new geothermal pipeline required to deliver geothermal fluid to and from the wellfield to the alternative plant site. About one-half of the land has been previously mechanically disturbed (0.6 acres) and the second half of the pipeline surface disturbance would occur in Jeffrey Pine Forest plant community (0.6 acres). The alternative plant site grading and facility construction activities would eliminate the vegetation and wildlife habitat from the affected area.

The adverse effects of removing 6.25 acres of Jeffrey Pine Forest and 0.6 acres of mechanically disturbed habitat on wildlife of the area would not be considered a significant impact under CEQA because the habitat is common and widespread locally in the Project vicinity and throughout the region.

Human activity and noise occurring during site construction would also indirectly impact wildlife offsite within visual or audible distances of the construction activities. The indirect impact on offsite wildlife from construction activities would be short term and temporary. Because the alternative plant site is more distant from the existing geothermal development at Casa Diablo than the proposed M-1 plant, there is less existing impact on species intolerant of human activity. These species would be expected to leave the vicinity of the alternative plant site during construction resulting in a greater indirect impact on wildlife than construction at the proposed plant site. However, because of the relative abundance of comparable habitat in the Project vicinity this indirect impact would not be significant under CEQA.

Replacement Plant Operations:

From the information available, the impacts of plant operations on wildlife and habitat at the *Alternative Power Plant Location* would be very similar to those described for the proposed M-1 plant site. The potentially significant impact under CEQA on the Hot Creek headwater springs supporting the Owens tui chub critical habitat would be the same and the following measure is recommended.[2]

> **Alt Bio Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions**

[2] Recommended *Alt Bio Mitigation Measure 1* is worded exactly the same as *Alt Hydro Mitigation Measure 1* provided to mitigate a different potential impact discussed in Chapter 4.8.3, Hydrology and Water Quality, Environmental Impacts.

addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant.

The adoption of the prescribed hydrologic and biologic monitoring and mitigation measure program by the MP-I Project would reduce the potential adverse effects of this potential impact on the Owens tui chub critical habitat to below the level of significance.

The other identified biological resource impacts relative to the optional interconnection transmission line would not be considered significant, but to reduce the potential adverse effects of these impacts the two measures recommended for the *Proposed Project* (i.e., Bio Measures 1 and 2) are also recommended for development at the *Alternative Power Plant Location*, as follows.

Alt Bio Measure 1: The optional interconnection transmission line shall be constructed with bird diverters to reduce the potential for bird collisions with the power line.

Alt Bio Measure 2: The optional interconnection transmission line shall be constructed in conformance with guidance set forth in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), as may amended or updated at the time of power line construction.

No baseline botanical or biological surveys of the *Alternative Power Plant Location* have been undertaken and would be required for comprehensive analysis of the Project Alternative. In addition, the alternative plant site is located on land administered by the Forest Service and approval from federal agencies would be required before development could occur at the *Alternative Power Plant Location*. It is recommended that the following measure be implemented prior to making a decision for development at the *Alternative Power Plant Location*.

Alt Bio Measure 3: Baseline botanical and biological surveys shall be conducted covering the *Alternative Power Plant Location* and surrounding lands, and the findings of these surveys shall be considered in the NEPA/CEQA environmental assessment required for the project prior to making a decision for development at the *Alternative Power Plant Location*.

Decommissioning Activities:

The indirect impacts on wildlife associated with decommissioning activities occurring from development at the *Alternative Power Plant Location* would be similar to those described for the *Proposed Project*. Because of the greater distance between the *Alternative Power Plant Location* and the existing Casa Diablo geothermal development, the noise and disturbance from the two locations would have less of an additive effect on wildlife occupying habitat near the existing development area during the transition period. However, the noise and disturbance from the two areas of development would indirectly impact wildlife over a larger area. Most human tolerant wildlife species would be expected to return to habitat on neighboring properties when noise and disturbance from decommissioning activities have concluded.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed from the alternative plant site and the site would be restored to a natural appearing condition consistent with the site restoration requirements of the USFS. After successful implementation of site restoration requirements, noxious weeds would be removed from the site and successional natural plant communities would return

over time. The pre-existing Jeffrey Pine Forest habitat would be unlikely to be re-established, but local wildlife would re-occupy the restored habitat.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative the existing MP–I power plant would continue to operate. There would be no new plant site construction and there would be no new impacts on the existing plant communities or wildlife habitat in the existing Casa Diablo geothermal development area.

4.5 CULTURAL RESOURCES

The information and analysis in this section are based primarily on the findings of cultural resource investigations of the Project area conducted by qualified archaeologists familiar with the Project vicinity (Pacific Legacy 2009 and 2010).

4.5.1 Regulatory Framework

Federal Laws and Guidance

The National Historic Preservation Act of 1966 (NHPA) requires that federal agencies consider the preservation of cultural resources in their decisions and activities. The regulations implementing Section 106 of NHPA require federal agencies to identify cultural properties that meet the criteria for listing on the National Register of Historic Places (NRHP). These regulations also require that federal agencies give the Advisory Council on Historic Preservation the chance to comment on any actions or decisions which may affect resources eligible for the NRHP.

NHPA, the American Indian Religious Freedom Act (AIRFA) and Executive Order 13007 require federal agencies to consider Native American concerns in their land-use decisions and to grant access to Native American groups for religious observations, where possible. The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) requires consultation with appropriate Indian tribes prior to the excavation of human remains or cultural items on federal lands.

California Environmental Quality Act

CEQA Guidelines (Section 15064.5) contains specific guidance for determining the significance of impacts to archeological and historical resources. Any project that may cause a substantial adverse change in the significance of an "historical resource" is a project that may have a significant effect on the environment. "Historical resources" include resources listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the California Register of Historical Resources. Historical resources include, but are not limited to, any objects, buildings, structures, sites, areas, places, records, or manuscripts that are historically or archaeologically significant, or are significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California as defined at Public Resource Code 5020.1(j). Under CEQA Guidelines, an impact is considered significant if a project will have an effect that may change the significance of the resource (Public Resources Code Section 21084.1).

Actions that would change the significance of a historical resource include demolition, replacement, substantial alteration, and relocation of historic properties. Before the level of significance of impacts can be determined and mitigation measures developed, the significance of historical resources must be

determined. Section 15064.5 of the CEQA Guidelines defines the criteria for listing on the California Register of Historical Resources (CRHR). A resource is eligible for listing if it:

- is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- is associated with the lives of persons important in the past;
- embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
- has yielded, or may be likely to yield, information important in prehistory or history.

Public Resources Code 5020 and 5024

California Public Resources Code 5020 and 5024 provide additional regulations related to the CRHR eligibility:

- Properties that are listed in or eligible for listing in the National Register of Historic Places are considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (Public Resources Code section 5024.1(d)(1)).
- The resource is included in a local register of historic resources, as defined in Sec. 5020.1(k) of the Public Resources Code, or is identified as significant in a historical resources survey that meets the requirements of Section 5024.1(g) of the Public Resources Code (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant).
- The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record.
- The lead agency determines that the resource may be a historical resource as defined in Public Resources Code sec. 5020.1(j) or 5024.1.

4.5.2 Existing Environment

The project site is located near the eastern base of the Sierra Nevada near the Town of Mammoth Lakes in Mono County, and within the Basin-Range geologic province of the Great Basin. The project site is located at the western periphery of Long Valley near the base of Mammoth Mountain, a volcanic formation that achieved its present size approximately 370,000 years ago. Mammoth/Hot Creek is the major drainage for the area.

The region is generally characterized by dramatic elevation changes, although elevations within the site itself fall within a relatively narrow range (7,292 to 7,305 feet above mean sea level). The geophysical nature of the region is inexorably linked to the formation of the Sierra Nevada. The regional topography can be attributed primarily to underlying magma chambers, a topic of current geologic research interest. The Long Valley Caldera has an active hydrothermal system that includes hot springs, fumaroles (steam vents), and mineral deposits. Hot springs exist primarily in the eastern half of the caldera where land-surface elevations are relatively low; fumaroles exist primarily in the western half where elevations are higher. Mineral deposits from thermal activity are found on an uplifted area called the resurgent dome, at Little Hot Creek springs, Hot Creek Gorge, and other locations in the south and east moats of the caldera.

Prehistoric Conditions

In addition to playing a major role in topographic formation, volcanic activity may have intermittently rendered portions of the region uninhabitable either directly, as the result of ash fall or lava flow, or indirectly through its affects on local environments (e.g., by changing drainage patterns, topography, and soil chemistry). Volcanic episodes, coupled with hydrographic phenomena, have resulted in the formation of numerous hot springs and geyser resources, many of which were used by prehistoric inhabitants of the area. It is probable that the deposition of pumiceous tephra associated with volcanic activity has concealed a significant number of archaeological sites in the region.

For more than 50 years researchers have attempted to reconstruct prehistoric environments in western North America in attempts to understand diachronic changes in resource availability. Researchers have proposed environmental explanations for the fluctuations in population densities and material culture that are evident in the archaeological record of the region. The present climate of the study region is similar in many ways to climates found throughout much of the western Great Basin. The mean annual temperature in the study area is about 36 degrees C. Central-eastern summers, which are warm and dry, are accented by frequent convectional thunderstorms that contribute little substantial rainfall. The bulk of the region's annual precipitation comes in the form of snow from frontal winter storms that sweep over the Sierra Nevada. The territory immediately south and west of Long Valley experiences a pronounced rain shadow effect due to the high elevation of the adjacent mountains. The little direct precipitation that evades the western slopes of the Sierra Nevada falls primarily on or near the eastern slopes, with increasing desiccation to the east. Mammoth Pass serves as a funnel for winter storms crossing the Sierra, affording western Long Valley with more snowfall than either Mono Basin to the north or Owens Valley to the south. However, an orographic effect renders the entire study region reliant on Sierran snowmelt runoff and springs for life-sustaining water.

A considerable body of paleoclimatic data has been accumulated to date. The general paleoclimatic trends in the western Great Basin can be summarized in the following sequence:

- A cool, dry late Pleistocene
- A relatively cool, moist early Holocene (Hilgard glacial advance) with probable short-term warm intervals (perhaps 10,500-8,500 before present [BP])
- The onset of a mild mid-Holocene macroclimatic system (Hypsithermal/Altithermal) ca. 8,300-6,000 BP
- A brief, cool-moist interval ca. 6,000-5,300 BP
- Resumption of a generally warm, dry climatic regime ca. 5,300-3,400 BP
- A significant shift (Neoglaciation/Medithermal) toward cool, moist climate ca. 3,400-2,200 BP (Recess Peak glacial advance)
- Warm-moist then warm-dry climatic conditions after 2,200 BP, with a cooling trend more-or-less dominant after 1,700 BP
- A brief period of cool, moist climate ca. 1,100-950 BP (unnamed glacial advance between Recess Peak and Matthes)
- A possibly severe drought ca. 950-750 BP
- Unusually cold temperatures after 750 BP that correlate with the Matthes glacial advance ca. 750-200 BP, although mean annual precipitation may have been lower than during the Recess Peak advance
- Another possibly severe drought ca. 200-130 BP
- Generally cool, relatively moist climatic patterns over the last century or so with a short period of mild climate ca. A.D. 1930-1960.

The project site is located within an ethnographically known border zone that may have been used by various Paiute groups. The Long Valley caldera is bordered by the Mono Lake Paiute to the north, the Owens Lake Paiute to the south, the Monache and southern Sierra Miwok to the west, and the Paiute of Benton and Round Valley to the east. Boundaries between the Owens Valley and Mono Lake Paiute groups have been drawn to include the headwaters of the Owens River, placing Long Valley within Owens Valley Paiute territory and, alternately, to lie between Round Valley and Long Valley, placing Long Valley in Mono Lake Paiute territory. Research has indicated that group boundaries were likely fluid, promoting inter-group relations. Although the presence of ethnographic villages in Long Valley has not been reported, a sub-dialect for the region was recorded in the 1950s and its speakers were considered by the Owens Valley Paiute as being of the Mono Lake group. The language of the Northern Paiute groups has been identified as the Plateau Shoshonean branch of Shoshonean languages. Distinctive dialects have been distinguished in the Owens Valley and Mono Basin areas.

In terms of the sociopolitical organization of regional groups, fundamental differences between the Owens Valley Paiute and the Mono Lake Paiute have been cited by researchers. The Mono Lake Paiute exhibited what has been termed a "Desert Culture" strategy, depending largely on flexibility of movement to critical, seasonally available resources. To accommodate such movement, independent family groups constituted the settlement unit for much of the year, with larger groups of individuals aggregating in lowland villages during the winter season. In contrast, the Owens Valley Paiute exhibited what has been referred to as a "Desert Village" strategy. They formed distinct districts comprised of one or more relatively autonomous village with seasonal, task-oriented sites (e.g., pinyon camps, temporary hunting or seed gathering localities). The villages, which were comprised of several related families and had populations ranging from 25 to 250 individuals, were occupied year-round. Individual family activities were restricted and political power was vested in hereditary headmen who planned communal gatherings and annual festivals. Researchers have suggested that if an autochthonous group resided in Long Valley, it would have resembled the Mono Lake Paiute in terms of settlement patterns and sociopolitical organization, rather than the Valley Paiute.

The lack of ethnographic detail specific to the inhabitants of Long Valley prompts discussion of the Mono Basin and Owens Valley peoples, as it is probable that their subsistence patterns were similar, if not linked. The subsistence patterns of these groups, like those of other Great Basin groups, were adapted to the exploitation of seasonally available plant and animal resources which necessitated movement to resource areas in what has been termed the seasonal round. During the spring, small family groups traveled to the canyons near the western shore of Mono Lake, to the headwaters of the Owens River and to Hot Creek to harvest greens, roots and bulbs. Forays were also made to hunt deer as they migrated from their lowland winter range east of the Benton Range to their summer range in the Sierra Nevada. During the early summer season, small groups of people traveled to the meadows at the foot of the Sierra Nevada and Bodie Hills where they established temporary base camps. Subsistence activities at these base camps focused on the collection and processing of plants such as wild rye, rice grass, sunflower, and desert peach. High elevations and a short growing season make it unlikely that the Long Valley people increased plant resource productivity through either irrigation or incipient cultivation as the Owens Valley groups did. Later during the summer months as the Sierra passes opened, trans-Sierran expeditions were made for social and trade purposes as well as to hunt deer and mountain sheep. During the late summer of alternating years, both the Owens Valley Paiute and the Mono Lake Paiute collected Pandora moth larvae from Jeffrey Pine forests in Long Valley. Communal rabbit and antelope drives took place during the fall and nuts were harvested in the pinyon groves along Glass Mountain Ridge and elsewhere. During years of abundant pinyon nuts, some small groups settled into winter camps near the lower margins of the groves. When the fall harvests were completed, emphasis shifted to social activities such as feasting, gambling and round dancing.

Regional Archaeology

Aboriginal use of Long Valley, like that of many parts of the western Great Basin, appears to have extended from at least 7,000 BP to the time of Euroamerican contact. The archaeological record for the area reflects marked changes in technology, settlement-subsistence patterns and trade relationships throughout this period of time. The discussion below summarizes some of the previous studies that have been undertaken close to the project site.

Previous Investigations: The first major archaeological study near the project area was the 1960s excavation of CA-MNO- 382, the Mammoth Junction site, by the University of California, Los Angeles. Site CA-MNO 382 was originally recorded as a rock shelter with eight to ten bedrock mortars associated with an obsidian quarry with flaked stone debitage, knives, and projectile points. Archaeological salvage excavations at CA-MNO-382 were conducted prior to the construction of the new four-lane alignment of US 395 in the mid-1960s. Excavation of the site over two field seasons produced a large and varied artifact assemblage that included a variety of flaked stone tools consisting of projectile points (e.g., Elko, Eastgate, Humboldt, and Desert Side-notched varieties), bifaces or knives, scrapers, drills, cores, hammerstones, groundstone, and beads (steatite, bone, glass). It was concluded that the site was a composite site where quarrying, manufacturing, hunting, traveling, and summer residence took place.

In 1981, the Inyo National Forest conducted a small test excavation at CA-MNO-819, at Big Springs Campground just north of Lookout Mountain in Long Valley. A single one meter-square unit excavated to 1.5 meters yielded 50,000 obsidian flakes and 47 formal tools and fragments. This site is interpreted as reflecting repeated short-term occupations by small groups of people involved in both the procurement and processing of seasonal resources and the production of stone tools and blanks for use and exchange.

In 1990, data recovery was conducted at four sites (CA-MNO-574, -833, -577, and -578) located along US 395 in Long Valley. All four of the sites contained dense deposits of obsidian tool manufacturing debris and surface *piagi* rings were discovered at CA-MNO-578. Site CA-MNO-578 was also unique in that it had evidence of occupation extending from approximately 6,400 to 200 BP, with peak use between 3,500 to 2,300 BP and a possible second peak at 500 BP The other sites were similar to other Long Valley stone working sites and appear to have been used from approximately 2500 to 500 BP

Excavations of 23 sites along a transmission corridor traversing eastern Mono Valley, Long Valley, and northern Owens Valley in 1990 are unique for the large faunal assemblage recovered (23,360 bones/bone fragments) and long cultural record spanning approximately 10,000 years. Several of the sites are reported as general forager encampments that were occupied on one or more occasions. Flaked-stone tool manufacture appears to have been the dominant activity at six of the sites, with two of the sites focusing on specific subsistence resources (pine nut collection and antelope exploitation) and one of the sites an artiodactyl kill and butchering site.

Another archaeological investigation close to the project site was conducted for the California Department of Transportation along US 395 in 2003. Three sites, CA-MNO-382, -3231, and -3232 were subject to Phase II archaeological testing that found an artifact assemblage that was dominated by flaked stone (mostly debitage with some formed tools such as bifaces and projectile points) with few other artifact types (e.g. groundstone). Technological flaked stone analysis indicated that the sites functioned as obsidian biface production workshops associated with the Casa Diablo obsidian source. Diagnostic artifacts and obsidian hydration data indicate that the sites date from 1,200 B.C. to A.D. 1800 (Newberry through Marana Periods).

Most recently, Pacific Legacy conducted archaeological investigations at CA-MNO-559/628/449 for a geotechnical study conducted for preliminary siting of the MPLP geothermal project (including both the MP-I Replacement Project and the CD-4 Project) in 2009. Site CA-MNO-559/628/449 is a large multi-component site consisting of low and high density flake stone scatters, bifacial tool manufacturing areas, groundstone, a bedrock mortar outcrop, and historic refuse scatters and a dismantled cabin. Archaeological testing focused on the northern periphery of the site that resulted in the identification of a low density deposit of obsidian debitage representing 4,000 years or more of intermittent and low-intensity land use reflecting occasional flaked stone tool manufacture, primarily biface manufacture, from obsidian likely quarried at Obsidian Hill, located less than a half mile southeast.

Archaeological Chronology: The prevailing chronology for the eastern Sierra posits 7,500 years of human occupation throughout the Holocene in the region. This conventional sequence divides the archaeological record into various cultural units as follows: early Holocene (pre 7,500 BP); mid-Holocene (7,500 to 3,150 BP), which includes Lake Mojave and Little Lake periods; Newberry (3,150-1,350 BP); Haiwee (1,350-650 BP); and Marana (650-100 BP). This chronology, with minor revisions as described below, was based on archaeological research primarily to the south of Long Valley.

Early Holocene (pre-7,500 BP)

Only a few, scattered sites represent early-Holocene occupation of central-eastern California. Various fluted and non-fluted, concave-base points similar to Clovis points characterize early Holocene assemblages. Hydration measurements on artifacts from the Komodo site in Long Valley suggest that they are at least 8,000 years old. Early Holocene populations were small, mobile groups moving throughout large territories as evidenced in part by a wide variety of tool stone materials acquired from distance sources. A paucity of milling equipment implies minimal reliance on seed resources.

Mid-Holocene (7,500-3,150 BP)

Mid-Holocene sites are more common and widespread than those that precede it, and are marked by split-stem Little Lake and Pinto Series projectile points as well as an increase in milling equipment. Tools and faunal remains suggest that a broad-based subsistence strategy that included plant processing was practiced during this time. At the Stahl Site, a large artifact assemblage associated with house structures, hearths, and storage features suggest long-term residential occupation or a frequently used campsite rather than a more transient hunting camp.

Newberry Period (3,150-1,350 BP)

The subsequent Newberry Period is marked by a variety of point types that include Elko Series, Humboldt Concave-base, Gypsum Contracting-stem, as well as milling assemblages. The beginning of the period is marked by a continuation of small, mobile groups moving throughout large territories, but by the late Newberry (2,000-1,350 BP), the settlement-subsistence strategy involved regularized seasonal movements. A wide variety of tool stone material from distant sources during this period implies wide-ranging mobility or a higher degree of sedentism and greater emphasis on logistic mobility. Increased obsidian exchange is evidenced by greater quarry projection and biface manufacture at several eastern California sources. Studies indicate that plant resources were large contributors to the diet and settlement was occupied more intensively.

Haiwee (1,350-650 BP)

Haiwee components are widespread but are best documented by the Rose Spring site (CA-INY- 372). Rose Spring Corner-notched and Eastgate projectile points that indicate the introduction of bow and arrow technology in the region characterize this period. During the Haiwee Period there is increased settlement centralization, subsistence intensification, and sociopolitical complexity. More expedient technologies such as flake-based tools become common and groundstone tools are less formally shaped. Large, semi-permanent, seasonal habitation sites in different ecological zones typify the settlement pattern. Hunting remains economically important, but becomes part of a system in which lower ranked resources such as acorns and freshwater shellfish are utilized. The presence of ceramics and *Olivella* shell beads suggests a trans-Sierran exchange network.

Marana (650-100 BP)

Marana Period assemblages include Cottonwood Triangular, small leaf-shaped and Desert side-notched projectile points, and Owens Valley Brownware (OVB) pottery. This time period exhibits a continuation of trends from the earlier Haiwee Period. Significant changes include increased use of local environments, particularly riparian and lacustrine areas, and a widened diet breadth. First observations of fresh water shellfish, intensive use of piñon and acorn crops, and longer-term residential use of alpine settings occur.

Historical Background

The discovery of the Comstock Lode silver mine in 1858, east of Lake Tahoe, changed the landscape of the eastern Sierra Nevada. Prospectors from the gold fields on the west side of the Sierra Nevada flooded east to the Comstock. Rich gold and silver discoveries at Aurora and Bodie in 1859 enticed more miners to seek their fortunes. Four prospectors found a promising quartz outcrop 24 miles south of Mono Lake when they were searching for the Lost Cement Mine in 1877. The following year, General George Dodge of Civil War and Union Pacific Railroad fame bought the group of claims and organized the Mammoth Mining Company from which the town would later take its name.

A short-lived rush to the Mammoth gold mines followed the news that Mammoth Mining Company was making four tunnels into Mineral Hill and constructing a tramway and 20-stamp mill for the largest gold strike outside of Virginia City. Over a thousand people flocked to Mammoth City the summer of 1878 and perhaps 1,500 the next. The riches and the bonanza never materialized and the Mammoth Mining Company shut down its mill in 1880.

In the 1890s a different breed of pioneer discovered Mammoth Lakes. They were looking for riches that lay in the enjoyment of the Eastern Sierra. Fishing, hunting, photography, camping, hiking, and horseback riding drew summer visitors to Mammoth. Soon after came the businesses to support them. From the seasonal businesses and tourist industry the Village of Old Mammoth was born. A hotel, store, garage, bakery, and post office were established, known as Mammoth Camp. Tent camps were set up along the Mammoth Creek or in the nearby forest. Many of the visitors were families coming Bishop for the summer and others arrived from Los Angeles. Eventually the summer visitors built cabins along the creek and in the Lakes Basin. Although long known as a summer mountain retreat, Mammoth Lakes became a winter destination with the construction of the first ski lift in Mono County in the 1930s.

Early skiing was considered an adventure sport practiced by rugged individualists. Mobile tow- ropes carried skiers to the top of Mammoth Mountain. The U.S. Forest Service put Mammoth Mountain up for bid. Dave McCoy got the bid and went on to develop the Mammoth Mountain Ski Area. The first chairlift

was built in 1955, and subsequent development has made it one of the largest ski resorts in the country. In August 1984, the unincorporated village officially became the Town of Mammoth Lakes. Today the Town of Mammoth Lakes is home to over 7,000 year-round residents. The population grows to nearly 35,000 inhabitants on a busy weekend. Surrounded by Forest Service and Bureau of Land Management public lands, Mammoth Lakes is limited in its ability to expand beyond the original town site of approximately 2,500 acres.

Project Site Investigation

The archaeological investigation conducted at the project site was designed to document the basic characteristics of the site structure and composition (size, depth, distribution of artifacts, etc.) of PLI-2; and to assess the nature of the subsurface deposit. Fieldwork included an intensive surface inspection of the area, site recording, excavation of shovel probes, and in-field lithic analysis.

The archaeological investigation initiated with an intensive surface inspection of the two previously recorded prehistoric sites (PLI-1 and PLI-2), which resulted in combining the two sites into one large site (PLI-2). Artifacts were pin-flagged to determine the horizontal extent. Surface cultural constituents were analyzed in the field and recorded on lithic analysis forms. Mapping of site boundaries and artifact locations was accomplished with a Geographic Positioning System (GPS) unit with sub-meter accuracy. The site was recorded on California Department of Parks and Recreation (DPR) 523 forms. Site overviews were taken with a digital camera and recorded on a photo log.

Subsurface investigations at the site involved the excavation of shovel probes (SPs) measuring 50 cm by 50 cm that were placed throughout the site as well as outside of the established site boundaries. Each SP was excavated in increments of 20 cm using hand tools (shovels and hand trowels). The SPs were excavated to sterile soils (i.e., indicated by a significant lack of cultural material and/or stratigraphic changes). All excavated soils were passed through 1/8-inch mesh screens. Excavated soil was screened on plastic tarps placed next to each excavation unit to facilitate backfilling and to minimize disturbing the natural ground surface. Cultural constituents were collected for each level, analyzed in the field, documented, and reburied. The location of each SP was mapped with a GPS unit. All SPs were refilled after completion and the area restored to previous conditions. Results of each SP excavation were documented on shovel probe forms that noted the depth, soil characteristics, and cultural constituents for each level. Digital photos of SP profiles were taken to document soils and unit characteristics.

The distribution of the SPs covered the entire project site as well as areas outside of the defined site boundaries in order to assist in boundary definition. Shovel probe placement was predicted on vegetation (e.g. sagebrush and Jeffrey Pines) as well as areas that contained surface materials. Additionally, shovel probes were placed in areas that had no surface cultural materials. These were excavated to determine whether there were buried cultural deposits. In total 39 SPs were excavated for a total of 2.45 cubic meters of excavated soil.

In-field analysis of lithics was conducted on the flaked stone tools and debitage found on the surface and through subsurface investigation. The flaked stone analysis was geared towards identifying the kinds of lithic reduction represented. Three tool types were identified in the artifact assemblage: bifaces, edge-modified flakes, and cores. Bifaces are flaked stone tools that are relatively ovate in shape, but pointed at one or both ends, with lenticular cross-sections at their greatest width. Bifaces differ from projectile points in that they have no distinct hafting elements, such as notches or a stem, for attachment to dart or arrow shaft. Edge-modified flakes (EMF) include reduction flakes, which have been intentionally modified by percussion or pressure, as well as flakes with less invasive microflake edge

modifications produced by use. Therefore, EMFs are often flake tools, but pressure biface manufacture failures are also common. Cores are masses of tool stone from which usable flakes were removed by percussion. Core types can include multidirectional, bifacial, unidirectional, and bipolar. Each type describes the flake scar patterning that reflects the technique used for producing flakes. Bipolar cores were struck while resting on an anvil, removing thin straight flakes from opposite directions at the same time.

Debitage is the waste flakes produced by percussion and pressure reduction techniques during flaked stone tool manufacture. The assumption behind technological analysis is that distinct reduction activities produce distinct debitage assemblages. The relative proportions of these flake types provide clues to the techniques and stages of tool manufacture, and to the kinds of tools being made. The following flake types were found in the lithic analysis at the project site:

- Cortical – a flake with cortex, generally covering over 25 percent of its dorsal surface.
- Simple Interior – a non-cortical flake with three or fewer negative flake scars on its dorsal surface, not counting platform preparation scars.
- Complex Interior – a non-cortical flake with three or more negative flake scars on its dorsal surface, not counting platform preparation scars.
- Biface Thinning – an often slightly curved flake with a simple or complex bifacial platform and a few dorsal flake scars which emanate generally from the flake's platform.
- Pressure – the first pressure flakes removed from a flake blank or early stage biface show few to no dorsal flake scars, depending on the morphology of the worked surface. Notching pressure flakes result from notching a projectile point.
- Simple Interior Fragments – fragments of simple interior flakes.
- Complex Interior Fragments – fragments of complex interior flakes, biface thinning flakes, pressure flakes and platform preparation/pressure flakes.
- Shatter – angular fragments of tool stone without typical flake attributes. Shatter includes fragments and pot lids from unintentional thermal alteration.

All of the debitage recorded from subsurface excavation was recovered in 1/8-inch screen. The archaeological investigation resulted in the detailed recording of a prehistoric lithic scatter designated with temporary number PLI-2. An intensive surface inspection, site mapping, and recording of the entire site was conducted. Subsurface investigation of the site was accomplished with excavation of shovel probes. The following presents the results of the surface survey and subsurface investigations.

Results of Surface Investigation: Surface inspection resulted in the identification of a single prehistoric site characterized as a sparse, dispersed lithic scatter that measures 208 m (east-west) by 62 m (north-south). Although two lithic scatters, PLI-1 and PLI-2, were identified in the original 2009 survey, the 2010 surface inspection discovered sufficient flaked stone debitage between the two locations to combine them into one site, now designated PLI-2. PLI-2 is located on a relatively flat area with slight elevation changes. The eastern half of the site is within a stand of Jeffery Pine, while the entire site has an understory of sagebrush, rabbitbrush, bitter-brush, Great Basin rye, buckwheat, and cheatgrass. Impacts to the site include the construction of a several pipelines and infrastructure related to the geothermal facilities, as well as a transmission line access road.

Determination of the horizontal extent of the site was based on the distribution of artifacts. Site boundary determination was made difficult by two factors: (1) modern disturbances that include the construction of a fence and geothermal plant to the east, and (2) low ground visibility in the northeast portion of the site. The excavation of shovel probes in this portion of the site aided in determining the site boundary. The

southern site boundary corresponds to the southern extent of the survey parcel; however, the site extends outside of the project area on to Federal U.S. Forest Service administered lands. The site was not recorded outside of the project area.

A total of four tools that include one obsidian biface fragment, one chert edge-modified flake, and two cores were documented at the site. None of the tools are temporally diagnostic. In addition to the tools, 167 pieces of obsidian flaked stone debitage were documented. Biface 1 is a middle stage dark grey obsidian end fragment that was likely manufactured from a large flake. EMF 1 is a dark red banded chert flake with unifacial microchipping along one margin of a 1/2 inch simple interior flake fragment. Core 1 is a light pinkish gray travertine-like material. Random flaking is evident with at least three flake removals. No evidence of use wear or polish is present. Core 2 is a black and gray banded opaque obsidian with numerous inclusions. This is a unidirectional core with at least three flake removals. Possible use wear is noted along one margin.

In addition to the tools, 167 pieces of obsidian flaked stone debitage were documented. Of the 167 flakes, 162 (97 percent) are obsidian, four (2.4 percent) are cryptocrystalline silicate (CCS), and one (less than one percent) is basalt. The majority of the flakes fall within the 1/2 inch size category with lesser quantities of one inch flakes, 1/4 inch, two inch, and a single 1/8-inch flake. Sixty-four (38 percent) of the diagnostic flakes are simple interior, 21 (13 percent) are cortical flakes, 20 (12 percent) are complex interior, five (three percent) are bifacial thinning flakes, and three (two percent) are pressure flakes. Fifty of the flakes are fragments. There are also four pieces of shatter. The relatively high frequency of cortical flakes and large, simple interior flakes reflects early stage stone tool manufacture, and the handful of biface thinning flakes suggests that much of that manufacture involved the production of bifaces. Such early stage manufacture is not surprising given the close proximity of obsidian quarries to PLI-2.

Results of Subsurface Investigation: A total of 39 SPs, all measuring 50 cm by 50 cm, were excavated throughout the site resulting in the excavation of 2.45 cubic meters of soils. Soils were fairly uniform throughout the site; and are a brown sand with 30 percent rounded and sub-rounded gravel inclusions. Many of the SPs contained roots from the surrounding vegetation (sage brush and Jeffery pine trees). The first 10 cm was loose sand. Below the loose sand was semi-compact to compact sand. In some areas thick layers of mineralized clay were encountered. There were no identifiable soil changes in SP profiles. Slightly more than half of the units (56 percent) were positive for cultural materials while 17 (44 percent) were negative. Eighteen of these positive SPs (82 percent) had five or less total flakes, two SPs (9 percent) had six to ten flakes, one SP (4.5 percent) had eleven flakes, and one unit (4.5 percent) had 51 flakes (46 percent of the 111 total), which was encountered in SP 6 located in the southeast portion of the site. The majority of the SP units were excavated to 20 cm below the surface because the unit was either completely negative for cultural materials or contained only a few pieces of debitage. One SP was only dug to 15 cm below the surface due to extremely compact, disturbed soil. Four SPs were excavated to 40 cm below the surface, while three SPs were excavated to depths of 55, 65, and 70 cm below the surface. Based on the SP excavation the archaeological deposit appears to be fairly shallow with the majority of the cultural materials found on the surface and in upper 40 cm of the site. Flakes found in lower depths are likely caused by bioturbation (e.g. roots, rodents) and freeze-thaw processes. Evidence of disturbance was found throughout the site with modern debris found in the 0-20 level in several units.

All cultural constituents observed in SP excavation are flaked stone debitage. No flaked or ground stone tools, or diagnostic artifacts were encountered during excavation. A total of 111 pieces of debitage were found during SP excavation. With the exception of one rhyolite flake, all of the cultural material observed in the excavation units is obsidian. Approximately 75 percent of the flaked stone debitage is 1/4 inch or smaller; 57 are ¼ inch flakes and 26 are 1/8 inch flakes. Larger flake sizes contribute lesser amounts, 22 are 1/2 inch flakes, and six are 1 inch in size. Many of the flakes are broken. The general size profile of

the debitage assemblage shows few large flakes over 1 inch in diameter, but large flakes typically comprise a small fraction of debitage. The majority of the debitage is simple interior flakes. Complex interior flakes total 13 while there are five cortical flakes, two pressure flakes, one biface thinning flake, and one notching flake. The non-diagnostic flakes in the assemblage include simple interior flake fragments and complex interior flake fragments.

The flaked stone debitage from both surface survey and subsurface excavation includes 278 pieces of debitage. The majority of the toolstone is obsidian, with four CCS, one basalt, and one rhyolite also found. The overall size of the flakes is relatively large with 57 percent of the assemblage 1/2 inch or greater. Smaller flake sizes of 1/4 inch and 1/8 inch make up 43 percent of the assemblage. Sixty-three percent of the lithic assemblage is comprised of diagnostic flakes. The diagnostic flakes include simple interior flakes (37 percent), complex interior flakes (12 percent), cortical flakes (9 percent), biface thinning (2 percent), pressure (2 percent), and notching (<1 percent). The flake fragments are represented by simple interior flake fragments (30 percent), complex interior flake fragments (5 percent), shatter (1 percent), and cortical flake fragments (1 percent). Visual characteristics of the obsidian observed at PLI-2 were similar to much of the obsidian found at the local source localities of Obsidian Hill and Sawmill Ridge of the Casa Diablo obsidian source field. Obsidian Hill, in particular, is only a short stroll from PLI-2 (a few hundred meters), and contains a considerable amount of obsidian with white phenocrysts. Non-local sources such as those from Fish Springs, Bodie, Truman, Mt. Hicks, and Mono Glass Mountain were not identified in the sample.

Due to the limited quantity of flaked stone debitage at any particular location within PLI-2, a robust and reliable sample of flakes for obsidian hydration was not available. Furthermore, a meaningful analysis of the reduction sequence at the site is difficult, given the low density and wide distribution of flakes that likely represent many individual stone tool manufacturing episodes, potentially spread over several millennia. Based on the flake types identified, it appears that the site is a near quarry reduction location where early reduction from percussion of either biface blanks or core flakes occurred. Minimal evidence of biface thinning is also present.

4.5.3 Environmental Impacts

CEQA Significance Criteria

Pursuant to Appendix G of the CEQA Guidelines, the following effects on cultural resources could be considered significant under CEQA if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

No paleontological resources or human remains have been identified within the Project area.

Environmental Impacts of the Proposed Project

As described in detail above, the archaeological investigation conducted at the project site revealed one low density, dispersed lithic scatter measuring 208 m (east-west) by 62 m (north-south). The cultural assemblage for the site includes one obsidian biface fragment, one chert edge-modified flake, two cores (one obsidian and one CCS/travertine), and 278 stone flakes (debitage). The flaked stone debitage is primarly obsidian with trace amounts of CCS, basalt, and rhyolite. The majority of the obsidian likely derived from nearby source localities such as Obsidian Hill and Sawmill Ridge. The small amount of the flaked stone debitage precludes any meaningful technological analysis. All that can be concluded from the scattered, low-density remains at PLI-2 is that the site is a near quarry reduction location where early reduction by percussion flaking of either biface blanks or cores occurred. Scatters of obsidian flakes and broken bifaces are ubiquitous across the landscape within and surrounding the resurgent dome that includes Lookout Mountain, Obsidian Hill, and Sawmill Ridge within the Casa Diablo obsidian source field. The use of the obsidian quarries, transport of obsidian from those quarries, and use of nearby stoneworking camps, all of which occurred over several millennia, have littered the landscape with obsidian debitage, and the remains at PLI-2 are considered low-density "background noise" in this obsidian-rich landscape. Meaningful archaeological information may be obtained at more abundant and discrete locations of stoneworking that are likely to represent more intensive, and in some cases time-specific, stone tool manufacturing episodes.

With respect to the CRHR listing criteria, the following conclusions were reached based upon the investigation of the project site and the cultural materials recovered:

- **CRHR Criterion A:** Site PLI-2 is not associated with events that have made a significant contribution to California's history and cultural heritage.
- **CRHR Criterion B:** There is no evidence that PLI-2 is associated with the lives of persons important to the past. The site is not part of the ethnographic record.
- **CRHR Criterion C:** Site PLI-2 does not meet the requirements of Criterion C as having distinctive characteristics of a type, period, region, or method of construction, representing the work of an important creative individual, or possessing high artistic values. This site is not unique and similar sites of this type are found throughout the region.
- **CRHR Criterion D:** Archaeological data from PLI-2 do not have the information necessary to obtain a better understanding of the prehistory in Long Valley, due to the limited quantity and variety of artifacts. Aside from the obsidian debitage and biface fragment that could be used in obsidian hydration and sourcing studies, the lack of materials for cross-dating and limited variety of artifacts renders the site of little scientific value. Even in the unlikely instance that obsidian hydration analysis might find the site to date to a single time period, little could be said concerning the nature of obsidian tool procurement or production during that period, based on the scant remains at PLI-2.

Based on archaeological background research and field investigation, the potential of PLI-2 to yield data important to an understanding of prehistory appears to be limited. Additional investigation or excavation at PLI-2 would likely produce the same types of materials (e.g. more obsidian debitage), and is unlikely to expand upon the limited picture of prehistoric activities that took place at that location. Therefore, Site PLI-2 does not meet any of the CRHR criteria of significance established at Section 15064.5 of the CEQA Guidelines.

The western portion of the project site is currently developed with the existing MP-I geothermal plant and associated infrastructure. This facility was constructed in 1984 and is therefore not eligible for

identification as a California Point of Historical Interest (PHI) or California Historical Landmark (CHL), or for listing in the California Register of Historic Resources (CRHR), National Register of Historic Places (NRHP), or California State Historic Resources Inventory (HRI).

Construction Activities:

The archaeological investigation conducted at PLI-2 has found that the site does meet the requirements for inclusion on the California Register. Therefore, no further cultural resources management is recommended at the site. However, the following measure is required to reduce the potential for adverse effects of the *Proposed Project*.

> **Cultural Measure 1: In the unlikely event that human remains are encountered during the construction phase of the project, excavation activities shall be stopped and the County Coroner must be contacted. If the County Coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours and a Most Likely Descendant will be assigned to consult with the County to develop an agreement for the treatment and disposition of the remains.**

Replacement Plant Operations:

No impact to cultural resources would occur as a result of ongoing operation of the *Proposed Project*.

Decommissioning Activities:

No impact to cultural resources would occur as a result of decommissioning of the existing MP-I plant and conversion of the pad to a storage area.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County. No impact to cultural resources would occur as a result of site restoration.

Environmental Impacts of the Alternative Power Plant Location

Pacific Legacy undertook preliminary field investigation of the *Alternative Power Plant Location* in 2009. As described in Section 2.2.1 of this Draft EIR, the *Alternative Power Plant Location* is located on public land administered by the USFS and would be adjacent to Antelope Spring Road and north of the existing SCE substation. Four items were identified within the parcel: PLI-11 consists of an historic trash scatter consisting of 25 plus items including sanitary cans, paint cans, logging choker cable, barrel hoops and clear glass fragments located in a 10 m radius likely representing 1950s-60s logging debris; PLI-12 is a prospect pit measuring 4 feet in diameter and 1-2 feet deep; PLI-13 is a contemporary geothermal well feature; and PLI-14 is a contemporary mining claim marker of a metal post with an aluminum tag. This site contains a few historical period cultural resources that are most likely not significant. Additional recording would be necessary to fully document these sites, but no excavation would be expected to be necessary.

A records search at the Eastern Information Center of the California Historical Resources Information System at the University of California Riverside as well as a records search at the Inyo National Forest

headquarters at Bishop would need to be conducted to determine if any of these sites have been previously recorded. Any cultural resources on federal land that may be affected by the project constructed at the *Alternative Power Plant Location* must be evaluated to determine whether those resources are eligible for the National Register of Historic Places.

Construction Activities:

It is recommended that the following measures be implemented at the *Alternative Power Plant Location* to reduce the potential adverse effects of the Project.

> **Alt Cultural Measure 1: Detailed cultural resources documentation shall be conducted covering the *Alternative Power Plant Location,* including a records search at the EIC as well as at the Inyo National Forest headquarters to determine if any sites have been previously recorded. Any cultural resources on federal land that may be affected by development at the *Alternative Power Plant Location* must be evaluated for listing eligibility on the National Register of Historic Places.**
>
> **Alt Cultural Measure 2: In the unlikely event that human remains are encountered during the construction phase of the project, excavation activities shall be stopped and the County Coroner must be contacted. If the County Coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours and a Most Likely Descendant will be assigned to consult with the County to develop an agreement for the treatment and disposition of the remains.**

Replacement Plant Operations:

No impact to cultural resources would occur as a result of ongoing operation of the *Proposed Project* at the *Alternative Power Plant Location*.

Decommissioning Activities:

No impact to cultural resources would occur as a result of decommissioning of the existing MP-I plant and conversion of the pad to a storage area.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed from the alternative plant site and the *Alternative Power Plant Location* geothermal pipeline corridor, and the site would be restored to a natural appearing condition consistent with the site restoration requirements of the USFS. No impacts to cultural resources would occur as a result of the site restoration.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative the existing MP–I power plant would continue to operate. There would be no new plant site construction and there would be no impact on cultural resources in the existing Casa Diablo geothermal development area.

4.6 GEOLOGY AND SOILS

The information and analysis in this section is based primarily on the following report, which is provided as Appendix F of this Draft EIR:

- Black Eagle Consulting, Inc. 2011. *Preliminary Geotechnical Investigation, M-1 Replacement Power Plant on the Magma Lease, Central Site, Mono County, California*. Prepared for Ormat, Inc. (March 2011).

The document referenced above is the report of preliminary geotechnical investigation of an alternative CD-4 project power plant site. The site location map shows that the area of investigation includes the western portion of M-1 replacement plant site, but it does not cover the entire M-1 site where facilities are currently proposed. However, the investigation did include regional geologic information, general site geology and general geotechnical information that is applicable to the entire Project site.

Site Exploration and Testing Methodology

Site exploration consisted of five test pits, six fault trenches, 13 boreholes, and shear-wave velocity and resistivity surveys. The maximum depth of exploration was 55 feet below the existing ground surface. Fault trench locations and orientations were selected to expose any potential subsurface faulting beneath the proposed M-1 plant footprint and to allow examination of alteration horizons with distance from the geothermal vents. Samples of each significant soil type were analyzed to determine their in situ moisture content, grain size distribution, and plasticity index.

4.6.1 Regulatory Framework

State of California

The Alquist-Priolo Earthquake Fault Zoning Act (1972) prohibits the location of most structures for human occupancy across the traces of active faults. The State Geologist (Chief of the California Division of Mine and Geology) is required to identify "earthquake fault zones" along known active faults in California. Counties and cities must withhold development permits for human occupancy projects within these zones unless geologic studies demonstrate that there would be no problems.

Mono County

Mono County has recently adopted the 2010 "Uniform Building Code" for building requirements. Among other elements, this code dictates the design and construction standards applicable to resist seismic shaking.

4.6.2 Existing Environment

The site lies on the north edge of Long Valley between elevations 7,290 and 7,375 feet. Long Valley is approximately 2 miles wide at this location, with Mammoth/Hot Creek located approximately 3/4 mile south of the site. The site is at the base of a moderately-sloped hill which climbs to a maximum elevation of approximately 7,500 feet about 2,000 feet north of the site. There are steam vents with intermittent hot spring/mud pot activity along the base of this hillside to the north of the proposed M-1 plant site. Several individual two-foot-diameter pipes run across the site to geothermal supply and re-injection wells. A brine re-injection well is present near the center of the site and would be abandoned prior to plant construction.

An aboveground SCE electric transmission line crosses the site from northwest to southeast. The northern and southern edges of the site are vegetated with sagebrush and moderately-spaced mature pine trees that are 12 to 18 inches in diameter. The central portion of the site includes areas substantially devoid of vegetation due to prior laydown use and/or geothermal heat close to the steam vents.

Average hillside gradients on the north edge of the site range from 2:1 to 2.5:1 and slope to the southwest, south, and southeast. Near-vertical geothermally-altered bedrock outcrops, steeper slopes, and steep funnel-like craters and are located at the toe of the slope in the active geothermal vent area to the north of the proposed M-1 plant site. The alluvial terrain on the lower portion of the site slopes about 5 percent towards the south and southeast.

Regional Geology

Casa Diablo Hot Springs lies at the southern end of the Medial Graben/Resurgent Dome Complex of the Long Valley Caldera along the eastern front of the central Sierra Nevada. The Sierra Nevada has risen within the past several million years by uplift with normal faulting along the eastern front. South of Long Valley at approximately two miles south of the site, the Hilton Creek fault is a major component of the Sierra eastern escarpment, with 3,500 feet of vertical offset observed on that fault at the mouth of McGee Creek. North of Long Valley, starting about six miles northwest of the site, the Hartley Springs fault shows 1,450 feet of offset of Tertiary andesite, with total observed uplift of the Sierra of approximately 2,000 feet relative to the Great Basin to the east.

Within the Long Valley Caldera floor, there are numerous, north to northwest, trending faults which are roughly parallel to the adjacent fault systems to the north and south, some of which run within several hundred feet of the M-1 plant site. However, there is relatively little offset on the intra-caldera faults, possibly due to cataclysmic fracturing of basement rock or the continued presence of magma at depth. The offset observed directly north and south of the caldera may instead result in more gradual range uplift across the caldera or may result in vertical displacement concentrated along the western caldera boundary.

The Long Valley Caldera formed due to violent volcanic eruption and subsequent collapse of a magma chamber approximately 730,000 years before present, to form an elliptical depression 10.5 miles long north-south and 20 miles wide east-west. Thick sequences of Bishop Tuff, as thick as 600 feet on the southeast flank towards Bishop, and up to 5,000 feet thick within the collapsed caldera, resulted from this eruptive event. Since its collapse, the caldera has been subject to numerous eruptive sequences, estimated to have occurred from 700,000 to 600,000 years, and at approximately 500,000, 300,000, and 100,000 years before present. The hills on the north side of Mammoth/Hot Creek immediately southeast of the plant site are mapped as flows and domes of Pleistocene age rhyolite and massive rhyolitic tuff (650,000 to 730,000 years before present) which erupted from the early caldera floor. These hills may be present today partly from their original deposition and eruption, or possibly partly from more recent upwarping or fault-bounded uplift above a volcanic resurgent dome. More recent basalt lava flows dated as having been deposited between 60,000 and 150,000 years before present have been mapped in Long Valley along length of Mammoth/Hot Creek including the Casa Diablo Hot Springs site.

Volcanism has continued in the project vicinity to the current time, primarily along the Inyo-Craters/Mono Craters volcanic chain north of the Caldera, which started erupting 40,000 years before present and has had eruptions as recently as 300 to 500 years before present. A swarm of earthquakes occurred in the 1980s and 1990s under the south side of the caldera in the vicinity of the town of Mammoth Lakes resulting from apparent resurgence of magma under the caldera. Earthquakes in May 1980 included surface rupture on faults through the Casa Diablo site. Seismological interpretation

suggests that during one 1989 earthquake swarm under Mammoth Mountain, a dike of magma extended to within approximately 2.5 miles of the ground surface.

Soils

The lower, gently sloped portions of the site are mapped as Quaternary older alluvium, consisting of stream deposits including Pleistocene glacial outwash and related periglacial sediments. During the Pleistocene, formation of a large lake within the caldera also influenced sediment deposition. The lake level reached a maximum elevation of about 7,600 feet about 650,000 years ago. The lake level gradually fell, was about 7,200 feet (e.g. below the site elevation) by about 280,000 years before present, and the lake drained completely before the present day. During site exploration, alluvial deposits that are inter-fingered with thin volcanic flows or zones of large volcanic boulders (which may be part of the flows from 60,000 to 150,000 years before present) were encountered, but no lacustrine (lake derived) deposits were observed. Throughout the project site, both bedrock and all but the most recent alluvial deposits have been hydrothermally altered.

A fill pad approximately 15 feet thick was constructed around the brine recirculation well in the middle of the site, which consists of materials similar to natural alluvium. Site investigation revealed the site surface is composed of two to 18.5 feet of loose to medium dense alluvium. This alluvium consists primarily of well-graded sand with silt and gravel, clayey sand, and clayey sand with gravel that typically includes from five to 30 percent non-plastic to medium plasticity fines and five to 25 percent gravel. Some cobbles and boulders were present. Due to the absence of hydrothermal alteration, these deposits are most likely materials that have washed onto the site from upslope of the geothermal area since previous periods of heightened geothermal activity had ceased.

Towards the southern portion of the site, the bottom two to four feet of the alluvial layer include variable concentrations of near-horizontal thin stringers of white to yellow silica cementation interspersed with 1/- to 1/4-inch-thick layers of unaltered alluvium. This silica rich zone excavates as well-graded sand and gravel. Surficial alluvium overlies hydrothermally-altered alluvium and bedrock which consist primarily of lean to fat clays, elastic silts or clayey sands. The clays are highly variable in color from white and gray to bright red, yellow, or blue-green and are described as medium to very high in plasticity. Occasional pockets or thin, laterally discontinuous layers of gravel-sized, less-altered country rock are present within the lean clay formation. Depending on location, the clay alteration horizons overlie highly-altered volcanic tuff and basalt. The tuff beds are white, gray, or pink; very soft to rarely moderately hard; and very severely to completely altered to sandy lean clay. Basalt, where it is recognizable as such, is generally gray or white with common reddish brown mottling, medium hard, with common small green inclusions and greenish layers.

Explorations within approximately 100 feet of the east-northeast/west-southwest line of active hydrothermal vents were found to be hot even at shallow depths. Groundwater was present at 14 to 17 feet in depth closest to the vent, and became deeper or was not encountered in borings to the south. Groundwater was encountered uphill from the hydrothermal vents at 25.5 feet depth.

Geologic Hazards

The site lies within an area that includes a major geothermal resource with active steam vents and seasonal hot springs or mud pots. A number of geologic hazards are inherent in areas in and around geothermal activity. Steam, warm seeps, high temperatures, minor voids, and soft spots in subsurface soils are common in geothermal areas. Hydrothermal vents may produce steam and seepage by

condensation. Surface subsidence, voids, or soft spots may occur due to ongoing or past erosion and discharge of mineral- or sediment-laden water or circulation and percolation of these fluids within the vent systems. Although corrosive soils and heavy metals are common in geothermal areas, neither of these hazards exists at the project site. Gases from vents may be hazardous with prolonged exposure to high concentrations. Hazardous gases may be heavier than surrounding air and settle into excavations or trenches. Ground shaking from off-site earthquakes can result in renewal or shifting of subsurface geothermal plumbing, producing hot spots and steam vents in areas that were previously innocuous. Small steam explosions can result if shallow ground water or surface water comes in contact with superheated ground.

Seismicity and Ground Motion: Much of the western United States is a region of moderate to intense seismicity related to movement of crustal masses (plate tectonics). By far, the most active regions, outside of Alaska, are in the vicinity of the San Andreas Fault system of California. The MP-I Replacement project site lies within an area with a high potential for strong earthquake shaking. The Project area is subject to both seismic activity, due to normal faulting along the margin of the Basin and Range Geomorphic Province, and also due to volcanic tectonism within the Long Valley Caldera.

A survey of known earthquake sources in the project area was performed and a listing of earthquake source zones, their distance, and maximum credible magnitude is presented in Table 18 for sources within 80 miles of the site. Where faults are closely spaced and result from related types of movements, they are categorized by zones or systems rather than by individual fault names.

The intent of Alquist-Priolo Act described previously is to limit the hazards of fault surface rupture to occupied structures. Active faults are those with evidence of displacement within the past 11,000 years (Holocene time). Those faults with evidence of displacement during Pleistocene time (11,000 to 2,000,000 years before present) are generally considered potentially active. In 1974, the California Geological Survey (CGS) began establishing special study zones (SSZ) on the basis of known active faults termed Earthquake Fault Zone (EFZ). Starting in 1976, the CGS initiated the Fault Evaluation and Zoning Program to study faults identified in the Alquist-Priolo Act as "sufficiently active and well defined" to be considered for further evaluation. The subsequent Fault Evaluation Reports (FER) summarized data on fault location, age of activity, orientation and probable magnitude of displacement.

The inter-caldera segment of the north to northwest/south to southeast trending Hartley Springs fault is mapped as an active fault within 0.1 mile northeast of the proposed project site. Approximately 3 inches of offset was documented on this fault during the May 1980 earthquakes. A short north to northwest/south to southeast trending unnamed fault is located 0.1 mile west of the site crossing Old Highway 395 approximately next to the CD-4 plant, which is also indicated to have had activity in these earthquakes. Multiple related faults are present within two miles north and west of the project site, which were also observed to have minor slumping or offset during these earthquakes. None of these faults have Alquist-Priolo zones that extend into the project site. The next closest major fault is the Hilton Creek fault, approximately two miles south of the site, which extends south from the edge of Long Valley.

Table 18: Maximum Credible Earthquake Sources in the Project Area

Fault Name, Zone or System	Approximate Distance from Project Site (miles)	Estimated Maximum Earthquake Event		
		Maximum Earthquake Magnitude (Mw)	Peak Site Acceleration (g)	Estimated Site Intensity (Modified Mercali Scale)
Hartley Springs	0.1	6.6	0.46	X
Hilton Creek	2.1	6.7	0.43	X
Round Valley	11.6	7.0	0.22	VIII
Mono Lake	21.5	6.6	0.11	VII
Western Nevada Zone 2	23.2	7.3	0.12	VII
Fish Slough	23.5	6.6	0.10	VII
Western Nevada Zone 3	26.5	7.3	0.11	VII
Western Nevada Zone 1	26.7	7.3	0.11	VII
White Mountains	28.5	7.4	0.11	VII
Western Nevada Zone 4	34.7	7.3	0.09	VII
Robinson Creek	40.1	6.4	0.06	VI
Death Valley (N. of Cucamongo)	40.8	7.2	0.08	VII
Owens Valley	43.4	7.6	0.09	VII
Western Nevada Zone 5	45.2	7.3	0.07	VII
Birch Creek	47.8	6.4	0.05	VI
Foothills Fault System 3	49.9	6.5	0.06	VI
Deep Springs	50.2	6.6	0.06	VI
Foothills Fault System 2	58.7	6.5	0.05	VI
Independence	63.4	7.1	0.06	VI
Antelope Valley	65.5	6.7	0.05	VI
Foothills Fault System 1	66.0	6.5	0.04	VI
Death Valley (Northern Segment)	72.4	7.4	0.05	VI
Hunter Valley – Saline Valley	73.2	7.2	0.05	VI

Source: Black Eagle Consulting, Inc., 2010.

A west to southwest/east to northeast-trending fault running along the change in grade near the northern edge of the site was mapped in 1988. This fault is inferred from relative uplift of the hillside to the north and the line of geothermal vents at the base of the slope, but is otherwise concealed. A fault trench investigation was conducted at the time at the northeast edge of the project site. This fault trench encountered evidence of past geothermal upwelling about 60 feet north of the geothermal well location, but no sign of ground rupture was observed at this location. In the current investigation, fault trenching encountered no evidence of surface rupture where the fault is most likely to cross the site. The steam vent directly north of the Ormat, Inc. office (just north of the existing MP-I plant) is assumed to be a manifestation along the same fault zone. Since the deposits in the site vicinity are Pleistocene in age, this fault may be a potentially active fault, but is not likely to be Holocene in age due to lack of observed subsurface deformation. Based on the geologic map, the possible fault crossing the north edge of the site is Late Quaternary to Quaternary Active. Since no near-surface deformation was found in trenching, no further fault evaluation is required and no building setbacks are considered necessary.

Liquefaction: Liquefaction is a nearly complete loss of soil shear strength that can occur, during a seismic event, as cyclic shear stresses cause excessive pore water pressure between the soil grains. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) lying below the groundwater table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur.

Liquefaction analysis performed for the project site used an assumed earthquake magnitude of 6.7, which could be generated by rupture of the Hartley Springs or Hilton Creek faults, located within two miles of the site.

Soil samples from the site consisting of silts and clays with greater than 50 percent fines and stiff to hard clayey sands are not liquefiable. In addition, since the samples from below the groundwater table at the site had a plasticity index greater than 18 (the upper limit that is subject to potential liquefaction), they were judged to be non-liquefiable. Therefore, liquefaction potential at the project site is considered to be negligible.

Volcanism: The pattern of volcanic activity over the past several thousand years suggests that there is a probability of eruption of one percent in any given year (return period of 100 years) in the Long Valley/Inyo Craters/Mono Craters area. For comparison, the 2007 *California Building Code* design earthquake ground motion has a probability of 0.04 percent in any given year (return period of 2,450 years). The probability of an eruption in the Long Valley/Inyo Crater/Mono Craters is comparable to the probability of eruption of a major volcano in the Cascade Mountains or a magnitude 8 earthquake somewhere on the San Andreas Fault in western California (an event similar to the 1906 San Francisco earthquake). The Inyo Crater/Mono Craters, at closest 6 miles north of the site, are considered the most likely location of future eruptions.

Based on existing volcanic features in the Long Valley/Inyo Crater/Mono Craters vicinity, possible volcanic eruptions could include, in the following sequence: steam explosions, pyroclastic activity (ash flows and ash falls) and pyroclastic surges, and relatively non-explosive extrusion of lava domes. Steam explosions result when magma initially surges toward to the ground surface and encounters the shallow ground water table. The superheated ground water can cause explosion craters covering acres in area, as exhibited by the Punch Bowl, visible off of U.S. 395 about one mile south of June Lake Loop Road. These explosions can launch large blocks of rock and smaller fragments hundreds of feet into the air, leaving deep pits. Ash falls generally endanger property more than human lives. Ash endangers human health primarily by its effect on respiratory systems. Large rock fragments thrown from the vent by explosions can endanger people and property as far as six miles from a source vent. Hot rock fragments can also start forest fires. A lesser hazard exists from toxic gases that may accompany the ash, primarily close to the vent. Fine ash is also projected several miles up into the atmosphere, where it is carried for hundreds of miles downwind and falls with decreasing particle size and volume at greater distances from the vent. Based on eruptions at South Deadman Creek dome 600 years before present, thickness of ash fall due to a small to moderate-sized volcanic eruption could be several feet thick if the vent were two to four miles directly upwind from the site, but would be only several inches for a more distant eruption or for a more favorable wind direction. Susceptibility to ash fall would depend on the prevailing wind at the time of an eruption. Thick accumulations of ash can cause roofs to collapse, but this problem would not likely be an issue for the project. However, even a light coating of ash can seriously disrupt communications and electrical transmission equipment.

If an eruption occurs during winter, ash falls can cause rapid melting of snow, which combined with ash can result in serious flooding or mudflows. The location of the project site on higher ground within the periphery of Long Valley would considerably reduce risk of flooding due to volcanic snowmelt.

Explosive volcanic eruptions may also produce pyroclastic flows, heated clouds of superheated ash that can sweep over the ground at greater than 100 miles an hour, destroying everything in their path. Recent eruptions in the Mono-Inyo Chain have produced narrow, tongue-like pyroclastic flows that have extended more than five miles from a vent. Lastly, relatively mild surface eruptions have resulted in lava domes or flows such as seen six to 10 miles northwest of the site. The lava domes vary from fluid to viscous lava and are generally less than several thousand feet in diameter. These eruptions are highly destructive to property, but rarely travel faster than a person can walk and thus would not represent a significant threat to human life.

Floodplain: The Federal Emergency Management Agency (FEMA) has identified the site as lying in unshaded Zone X, or outside the limits of a 500-year flood plain.

Other Geologic Hazards: A high potential for dust generation is present if grading is performed in dry weather. Excavations deeper than three to four feet in the area of existing steam vents will encounter hot soil and potentially cause formation of new geothermal vents. Steep bedrock outcrops above the geothermal vent area have had and will continue to have infrequent rock falls due to natural weathering processes (such as freeze-thaw) or seismic events.

4.6.3 Environmental Impacts

CEQA Significance Criteria

Appendix G to the CEQA Guidelines provides that an impact on geology and soils or mineral resources could be considered significant under CEQA if the Project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist–Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
    - Strong seismic ground shaking;
    - Seismic–related ground failure, including liquefaction; or
    - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on– or off–site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18–1–B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater;
- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally–important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

No areas subject to substantial risk of landslides have been identified within the Project area.

The Project would not produce any wastewater that would require the use of septic tanks or alternative wastewater disposal systems.

Project Design Factors

The project as proposed would include the following features/measures pertaining to geology and soils:

- The project applicant would implement measures recommended by the geotechnical engineering firm to mitigate impacts due to geotechnical/soils/geologic constraints.
- All project buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code adopted by Mono County.
- A civil engineer has been hired by the project applicant to prepare a grading plan to identify measures to avoid or minimize erosion; this grading plan would be reviewed by County Public Works prior to implementation. The project applicant would implement Best Management Practices (BMPs) identified in this grading and drainage plan for approval by the Mono County Department of Public Works.
- Some of the BMPs that would be implemented to reduce soil erosion during construction would include the placement of straw wattles and/or silt fencing along the perimeter of the site, and around topsoil stockpiles. Also silt fences would be placed in drainage swales at the exit point of the site.

BMPs to be implemented during post-construction include hydroseeding of all areas disturbed by grading outside of the pad. The pad area would include the placement of ¾" rock placed in all areas that are not covered by pavement or structural concrete.

Environmental Impacts of the Proposed Project

Construction Activities:

As noted, trenching at the project site encountered no evidence of ground rupture in the subsurface where a fault would be most likely to cross the site. Since no deformation was found in trenching, no further fault evaluation is required and no building setbacks are considered necessary. Therefore, project impacts related to fault rupture would be less than significant and no mitigation measures are required.

Strong Seismic Ground Shaking: The project site is located in the Long Valley caldera along the geomorphic boundary between the Great Basin and Sierra Nevada, which is a seismically active area. Thus, the project site could experience strong ground shaking during a seismic event. Pursuant to existing law and applicable regulations, design and construction of the *Proposed Project* would be required to incorporate measures to ensure state-of-the-art seismic protection. These measures include compliance with the seismic design criteria and other relevant provisions of the Mono County *California Building Code (CBC)*, the County's building permit requirements, and site-specific engineering recommendations based upon the recommendations of a licensed engineer and a geotechnical report approved by the Mono County Community Development Department.

Mapping by the U.S. Geological Survey indicates that there is a two percent probability that a bedrock ground acceleration of 0.77g would be exceeded in any 50-year interval at the project site. Including the effects of potential attenuation and using the procedures recommended by the International Building Code, a peak ground acceleration of 0.52g is appropriate for use in analysis of this site. Results of the earthquake slope deformation analyses indicate that deep-seated movements associated with the deeper

clay layers can result in moderate surface displacements during a design-level earthquake on either the closest fault to the site (Hartley Springs Fault) or a more distant major fault. These movements would likely extend 50 to 100 feet back from the crest of slope, with both lateral and settlement components.

While there can be no absolute guarantees when considering acts of nature such as earthquakes, the design criteria of the 2010 *CBC* would be implemented. The intent of the *CBC* is to protect building occupants from catastrophic failure that would be life threatening. There is no *CBC* requirement that structures of this type remain serviceable after a major earthquake, at this site or in any other area subject to intense ground shaking. Therefore, conformance with current *CBC* requirements would reduce the potential for structures on the project site to sustain catastrophic damage during an earthquake. Impacts related to life and safety from ground shaking would be less than significant; no mitigation measures, beyond structural design in accordance with the 2010 *CBC*, are required.

Liquefaction and Soil Instabilities: As discussed previously, geotechnical investigation at the project site indicates that the potential for liquefaction is negligible.

The site is underlain by soft to stiff, hydrothermally altered clays and low-density granular soils which are moderately weak and compressible. These deposits have significant settlement potential. Per the geotechnical report, compressible soils would be mitigated by five to 15 feet of fill or over-excavation and replacement with compacted structural fill, in order to avoid excessive settlement under foundations.

Pursuant to existing law and applicable regulations, design and construction of the *Proposed Project* would be required to incorporate measures to protect against geologic instability risks. These measures include compliance with the 2010 *CBC*, the County's building permit requirements, and site-specific engineering recommendations based upon the recommendations of a licensed geologist and engineer and a geotechnical report approved by the Mono County Community Development Department. Impacts would be less than significant and no mitigation measures are required.

Expansive Soils: Expansive soils contain clay minerals that attract and absorb water. The soils swell when subjected to moisture, causing structural problems through differential movement. Severely expansive clay soils are common on the site under the near-surface soil layers. Per the geotechnical support, any expansive clays that are exposed in cut and identified during grading must be removed beneath structural areas such that those soils would be covered by at least 2.5 feet of structural fill beneath footings, slabs, and concrete pavements. Any over-excavation should be backfilled with structural fill to footing grade, or subgrade for pavements and slabs. Clays to be left in place and covered with fill would be moisture-conditioned to two to four percent over optimum for a minimum depth of 12 inches. Often, the clays will be too wet, requiring stabilization. Impacts would be less than significant and no mitigation measures are required.

Geothermal Ventilation: Active geothermal areas are located adjacent to the north edge of the proposed M-1 plant site. Construction would involve grading, excavation, and fill placement on geothermally heated areas. The site has been located and adjusted to minimize geothermal hazards during grading. The majority of the excavation for the current site configuration would remove fill placed during well pad construction and is, therefore, of little risk. Per the geotechnical report, trench excavations should be routinely checked for temperature, adequate atmosphere for worker safety, and work in trenches in the active geothermal areas should be minimized wherever possible. Impacts would be less than significant and no mitigation measures are required.

Volcanic Activity: A small to moderate volcanic eruption could occur somewhere along the Mono-Inyo Craters volcanic chain producing pyroclastic flows and surges as well as volcanic ash and pumice fallout that could significantly impact the project site. This risk is present throughout the surrounding area and represents the current condition under which the existing MP-I geothermal plant is operating at the project site. Additionally, replacement of the existing MP-I plant with the proposed M-1 plant would not increase the number of employees at the site and thus would not result in the presence of more people at the site who could be affected by future volcanic activity in the region. Thus, the project would have no impact and no mitigation is required.

Soil Erosion: Construction of the proposed project would increase the amount of exposed soil on the project site, which could lead to increased soil erosion and/or topsoil loss for the duration of construction activities. The undeveloped portion of the project site is currently characterized, in part, by exposed soil within disturbed areas. Dust potential at the site would be moderate during dry periods. Temporary (during construction) and permanent (after construction) erosion control would be required for all disturbed areas. The contractor shall prevent dust from being generated during construction in compliance with all applicable city, county, state, and federal regulations. Additionally, erosion and loss of topsoil is possible surrounding the structures if left unprotected during the snowmelt season. Without proper implementation of erosion control measures during construction and operation of the project, the site could sustain soil erosion and loss of topsoil.

With implementation of the proposed grading plan and erosion control BMPs (see discussion above under Project Design Factors), project impacts with respect to soil erosion and loss of topsoil at the site would be less than significant and no mitigation is required.

Following project construction, both the new M-1 plant and a new gravel equipment storage pad on the site of the existing MP-I plant would occupy the site, which would be essentially graded flat. This being the case, opportunities for long-term soil erosion and/or topsoil loss from the site would be more limited following project construction than under existing conditions and impacts resulting from long-term project operation would be less than significant and no mitigation is required.

Replacement Plant Operations:

No impact to geology and soils would occur as a result of ongoing operation of the *Proposed Project*.

Decommissioning Activities:

Once facilities have been removed from the existing MP-I plant site, minor grading to shape the existing pad to slope to the southeast and backfill of the existing retention pond would be completed. The pad, upon completion of regrading, would be covered with gravel to provide an all weather pervious surface for vehicles. This gravel surface would reduce erosion and runoff through percolation of rainfall and snowmelt. Grading of the existing slope on the west and south sides of the MP-I plant site would be extended down to the reshaped pad. The majority of the existing slope on the west and south would be disturbed during removal of the fire suppression mains. Final slopes would not exceed 2:1. The slopes would be revegetated and protected with an erosion control blanket.

Stable topographic surface and drainage conditions would be established to control erosion, prevent sedimentation, and to blend with the surrounding landscape. Silt fencing or straw wattles would control surface runoff and drainage until the gravel has been placed on the pad and new vegetation has developed to a point of controlling erosion. Erosion control methods would be designed to handle runoff from not

less than the 20-year/1-hour intensity storm event. Seeding of disturbed areas would be completed using native seeds collected, if possible, from within the immediate vicinity of the project area. If this is not possible due to poor seed availability, seeds from the following ecological subsections or sections would be acceptable: Eastern Slopes Subsection of the Sierra Nevada Section or Mono Section. If availability still presents a problem, the seed mix may be modified in consultation with the Forest Service. Planting would be done during the most favorable part of the year to establish vegetation.

With implementation of the above-described project features, no significant impact to geology and soils would result from decommissioning and removal from the site of the existing MP-I plant and no mitigation is required.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County. No new geologic hazards would be introduced to the site and soils would be protected by the site restoration measures implemented.

Environmental Impacts of the Alternative Power Plant Location

As described in Section 1 of this Draft EIR, the *Alternative Power Plant Location* is located on Federal USFS land adjacent to Antelope Spring Road and north of the existing substation. A preliminary geotechnical investigation would be necessary in order to assess the geological characteristics of the *Alternative Power Plant Location*; however, conditions are not expected to be significantly different from those at the proposed M-1 plant site. One advantage of the *Alternative Power Plant Location* is that it is farther removed from the active geothermal vents at the Casa Diablo complex and would thus provide a somewhat less hazardous construction area than the proposed M-1 site.

Construction Activities:

The following measures would be necessary for development of the Project at the *Alternative Power Plant Location*:

> **Alt Geology Measure 1: Prior to issuance of building permits and grading activities, a design level geotechnical report shall be prepared and all recommendations in the report shall be adhered to. The design-level geotechnical report shall evaluate the potential for localized soil and slope instability by performing supplemental subsurface exploration as necessary (to evaluate the thickness, in place density, fines content of the underlying loose to medium soil and gradation), laboratory testing, and engineering analysis.**
>
> **Alt Geology Measure 2: Implement all recommendations contained within the design level geotechnical report, including those pertaining to site preparation, excavation, fill placement and compaction; foundations; concrete slabs-on-grade; pavement design; lateral earth pressures and resistance; and surface drainage control.**
>
> **Alt Geology Measure 3: The final grading, drainage, and foundation plans and specifications shall be prepared and/or reviewed and approved by a Registered Engineer(s) and Registered Engineering Geologist. In addition, upon completion of construction activities, the project applicant shall provide a final statement to the County indicating**

whether the work was performed in accordance with project plans and specifications and with the recommendations of the Registered Engineer(s) and Registered Engineering Geologist.

Alt Geology Measure 4: Clay soils shall be removed from beneath structural areas such that those soils would be covered by at least five feet of structural fill beneath footings, slabs, and concrete pavements. It must be emphasized that as clay soils extend to considerable depth, they cannot be completely removed from structural areas and some differential movement shall be anticipated. Any over-excavation shall be backfilled with structural fill to footing grade, or subgrade for pavements and slabs. Clays to be left in place and covered with fill shall be moisture-conditioned to 2 to 4 percent over optimum for a minimum depth of 12 inches. Periodic surface wetting, or other methods must maintain the high moisture content, until the surface is covered by at least one lift of fill.

Alt Geology Measure 5: Plant structures shall not be located over or within approximately 50 feet of active geothermal steam vents. Laydown and road areas may be built over these areas, with the provision of adequate drainage/vent blankets. Areas of high ground temperature may also result in areas of future geothermal venting and shall be avoided as much as possible.

Replacement Plant Operations:

No impact to geology and soils would occur as a result of M-1 replacement plant operations at the *Alternative Power Plant Location*.

Decommissioning Activities:

As noted previously, with implementation of the project design features, no impact to geology and soils would occur as a result of decommissioning and removal from the site of the existing MP-I power generation facilities and conversion of the pad to a storage area.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed from the alternative plant site and *Alternative Power Plant Location* geothermal pipeline corridor, and the site would be restored to a natural appearing condition consistent with the site restoration requirements of the USFS. No new geologic hazards would be introduced to the site and soils would be protected by the site restoration measures implemented.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative the existing MP–I power plant would continue to operate. There would be no new plant site construction and there would be no impact on geology and soils in the existing Casa Diablo geothermal development area.

4.7 HAZARDS AND HAZARDOUS MATERIALS

4.7.1 Regulatory Framework

The State of California implements state and federal laws and regulations for the management of hazardous materials and wastes. Mono County policies applicable to the Project area focus on the prevention and control of wildfires.

State of California

Primary responsibility for the management of hazardous materials and wastes in the State of California lies with the California Environmental Protection Agency and the Department of Toxic Substances Control. Worker safety with respect to hazardous substances is overseen by the California Occupational Safety and Health Administration.

Mono County

The Mono County General Plan Safety Element contains policies which require new construction to comply with minimum wildland fire safe standards and to mitigate fire hazards through the environmental and project review process. The Hazardous Waste Element of the Mono County General Plan contains a policy which requires that hazardous waste generated in Mono County to be properly collected, recycled and disposed.

The Environmental Health Division (EHD) of the Mono County Health Department is the local Certified Unified Program Agency (CUPA) responsible for implementing statewide requirements for the Hazardous Materials Business Plan (HMBP) program. All businesses in the County that handle hazardous materials in reportable quantities must submit an HMBP to the EHD and maintain the HMBP current with the agency. The HMPB must provide hazardous materials inventory information, storage location information, a consolidated contingency plan and other information relevant to hazardous materials related emergency response.

Town of Mammoth Lakes

The Town of Mammoth Lakes has developed an area–wide emergency evacuation plan. Mammoth Scenic Loop Road (Forest Road 3S23), located about five miles west of the Project area, and State Route 203, terminating southwest of the Project area, are the major evacuation routes for area residents.

Long Valley Fire Protection District

The Casa Diablo geothermal complex is located within the boundaries of the Long Valley Fire Protection District (FPD). The Long Valley FPD services the Crowley Lake communities and travelers along Highway 395, as well as business and industrial uses at the Casa Diablo geothermal complex, Mammoth Yosemite Airport, and Sierra Business Park (Mono County Local Agency Formation Commission 2009). The Long Valley FPD would be the first emergency responder to the Casa Diablo geothermal complex; however, the Long Valley FPD has an automatic aid agreement with the Mammoth Lakes FPD which obligates the Mammoth Lakes Fire Department to provide assistance if they are available.

4.7.2 Existing Environment

The immediate vicinity around the existing Casa Diablo geothermal complex is rural in character. The Project area is near the intersection of U.S. Highway 395 and State Route 203, the primary travel junction to and from the Town of Mammoth Lakes and the Old Highway/Substation Road crosses through the Casa Diablo geothermal development. An existing SCE substation is located about one–quarter mile north of the MP–I plant site and, except for roadways and power lines, there is no other visible development within one mile of the geothermal complex. Health and safety issues focus on the potential hazards of the geothermal fluid, fire hazard, and hazardous materials and waste.

Geothermal Fluids

The geothermal fluids produced for the Project would be the same as those produced from the Casa Diablo geothermal wells supporting the existing MP–I power plant and those that issue from the natural hot springs in the region. These geothermal fluids contain low concentrations of several chemical components which could be harmful to human health in large doses. These chemical components include arsenic, antimony, mercury and other heavy metals. The geothermal fluids also contain very small concentrations of hydrogen sulfide, a toxic gas which smells like rotten eggs. Geothermal fluid pumped from geothermal wells is also very hot and under high pressures. The geothermal fluid production and injection pipeline network supporting the existing MP–I power plant would not change with the *Proposed Project*.

Fire Hazards

Wildland Fire Hazard: The Project's location next to National Forest lands with flammable forest vegetation makes it susceptible to wildland fire, particularly during the summer fire season and during periods of prolonged drought. Wildland fires in the National Forest are primarily attributed to either lightning strikes or human activity.

Structural Fire Hazard: Large quantities of flammable motive fluid (approximately 125,000 gallons of isobutane) are stored at the existing MP–I plant site and large quantities of motive fluid (100,000 gallons of n–pentane) would also be stored at the proposed M–1 plant site. The onsite presence of these flammable fluids constitutes a fire hazard to the fluid containment vessels and associated structures. As shown in Table 19, isobutane and n–pentane each have fire hazard properties. The physical state (liquid or gas) of these substances, if released, could vary depending on the ambient conditions which exist at the plant sites during different seasons of the year.

Hazardous Materials and Wastes

Hazardous materials are currently used and stored at the existing MP–I plant site, warehouse/shop and fire water pump buildings, and storage yard. These include bulk quantities of the motive fluid, isobutane; and moderate quantities (drum size) of lubricants, primarily turbine oil, and smaller quantities (less than 5-gallon size) of paints, cleaning supplies, compressed gases and similar cleaning and maintenance materials. Bulk quantities (up to 500–gallon tanks) of diesel fuel and gasoline are also stored on the site.

Table 19: Selected Physical and Fire Hazard Properties of Isobutane and n–Pentane

Physical Characteristics	Isobutane (Existing MP–I Plant)		n–Pentane (Proposed M–1 Plant)	
Formula	C_4H_{10}		C_5H_{12}	
Physical State	Flammable Gas (at STP)[a]		Class IA Flammable Liquid (at STP)[a]	
Physical Description	Colorless gas with gasoline–like or natural gas odor		Colorless liquid with gasoline–like odor	
Flammability Limits	LEL[b] 1.6%	UEL[c] 8.4%	LEL[b] 1.5%	UEL[c] 7.8%
Boiling Point	Liquid below 11°F @ 1 atm		Gas above 97°F @ 1 atm	
Freezing Point	Liquid above –255°F @ 1 atm		Liquid above –202°F @ 1 atm	
Relative Density (water = 1)	0.5572 (when liquid)		0.6262	

Source: CDC – NIOSH Pocket Guide to Chemical Hazards:
isobutane [http://www.cdc.gov/niosh/npg/npgd0350.html]
n–Pentane [http://www.cdc.gov/niosh/npg/npgd0486.html]

[a] STP ≡ (Standard Temperature and Pressure) is considered to be 32°F and 1 atmosphere (atm) at sea level.

[b] LEL (Lower Explosive Limit) is the lowest concentration (percentage) of a gas or vapor in air capable of producing a flash fire in the presence of an ignition source.

[c] UEL (Upper Explosive Limit) is the highest concentration (percentage) of a gas or vapor in air capable of producing a flash fire in the presence of an ignition source.

A comprehensive inventory of the hazardous materials and the maximum amounts stored for the entire Casa Diablo geothermal complex was provided in a HMBP submitted to the Mono County EHD. These records indicate that the combined maximum volume of petroleum and mineral oil products stored on the MP-I plant site is about 10,000 gallons. These products are predominantly stored in either the MP-I oil storage area or in the MP-I turbine and transformer units. The maximum daily quantities waste oil and potentially hazardous waste that may be stored on site for the entire Casa Diablo geothermal complex total about: (a) waste oil – 3,000 gallons; (b) oily solid waste – 4,000 pounds; and (c) geothermal scale – 550 pounds.

4.7.3 Environmental Impacts

The Conditional Use Permit application prepared by MPLP for the M–1 Replacement Plant advises that an existing integrated program of hazardous material contingency and emergency plans prepared for the Casa Diablo geothermal complex would be updated to include the proposed M–1 plant facilities and operations. The Applicant identified the following integrated program components:

- Hazardous Materials Business Plan (HMBP);
- California Accidental Release Prevention (CalARP) Program;
- EPA Spill Prevention, Control and Countermeasure (SPCC) Plan;
- EPA Risk Management Plan (RMP); and
- OSHA Process Safety Management (PSM) Program.

The following analysis assumes that the Project would comply with all of these plans. The following analysis also assumes that the Project would comply with all applicable county, state and federal laws, regulations and directives concerning health and safety.

CEQA Significance Criteria

Pursuant to Appendix G of the CEQA Guidelines, the following effects on health and safety could be considered significant under CEQA if the project would:

- Create a substantial hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a substantial hazard the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one–quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;
- Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evaluation plan; or
- Expose people or structures to a substantial risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

The Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed school. The nearest school, Mammoth Elementary, is located about 2.6 miles west the proposed M–1 plant site.

The Project area is not located on a site which is included on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5 (EDR 2003).

The Project area is not located within two miles of a public airport or a private airstrip.

The Project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evaluation plan. None of the Mono County or Town of Mammoth Lakes evacuation routes are within the Project area.

Environmental Impacts of the Proposed Project

Geothermal Fluid Releases:

Geothermal fluid is currently delivered to the existing MP–I power plant site via a network of production pipelines from the wellfield, and a network of injection fluid pipelines transport the cooled geothermal fluid back to the wellfield for subsurface injection into the geothermal reservoir. These same pipelines would deliver geothermal fluid to and from the proposed M–1 replacement plant site. As such, there would be no new risk of geothermal fluid releases associated with the *Proposed Project*.

Fire Hazards:

Wildland Fire Hazard: Project activities would create a risk of wildland fires. Construction and decommissioning requires the extensive use of welding and metal cutting equipment. Construction vehicles would be driving directly over or adjacent to vegetation, which also increases the chance of accidental fires from hot exhaust pipes contacting the vegetation.

The Project has proposed several measures to minimize the risk of fire (see Appendix A), including equipping all construction and maintenance equipment with exhaust spark arresters and fire extinguishers, parking personal vehicles and vehicles not in use during construction only in cleared areas, limiting smoking to designated areas, and acquiring required special permits for welding or other similar activities.

The wildland fire hazard impact is considered below the level of significance under CEQA as it would not expose people or structures to a substantial risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands from current levels. No additional wildland fire mitigation measures are required.

Structural Fire Hazard: Leaks or releases of the flammable motive fluid, n–pentane, which would be stored on the M–1 replacement plant site, could result in a fire in the presence of an ignition source. During the, up to two–year, startup period when both the existing MP–I plant and M–1 replacement plant may be operating, large quantities of MP–I motive fluid, isobutane, would also continue to be stored at the MP–I plant site. As such, the risk of a structural fire associated with flammable motive fluid handling and storage would be slightly increased during the startup period due to the presence of large quantities of motive fluid at two operating plant sites during transition startup period.

The temporary slight increased risk of structural fire hazard impact during the startup period is considered below the level of significance under CEQA as it would not substantially increase the risk or the intensity of a structural fire.

After the startup period, when the isobutane is removed from the MP–I plant site, the risk of a structural fire associated with storage of flammable motive fluid would be slightly reduced. This is due, in part, to the lower working pressure under which the n–pentane would be stored reducing the risk of a release which might catch fire. The M–1 plant would store a lower volume of n–pentane (100,000 gallons) compared to the amount of isobutane (125,000 gallons) currently stored at the MP–I site. In addition, the potential for motive fluid leaks from pipes, seals, and flanges is projected to be much smaller at the M–1 replacement plant due to fewer moving parts, new equipment, fewer connections and a lower operating pressure.

The Long Valley FPD fire chief was contacted, and he advised that he was familiar with the MPLP Conditional Use Permit application for the M–1 Replacement Plant (Personal Communication – Fred Stump, Chief, Long Valley FPD; May 10, 2011). In summary, the fire chief perceives that there would be less fire hazard associated with proposed M–1 plant than the existing MP–I plant for the following reasons:

1. Motive Fluid Change – The n–pentane motive fluid proposed would be a more manageable motive fluid under the operating conditions at Casa Diablo than the existing isobutane.
2. Reduced Volume – The conversion from isobutane to n–pentane would result in a lower volume of flammable substance on site.

3. Design Improvements – The proposed binary plant would be pre–plumbed to include fire suppression and alarm systems.
4. Early Detection – The modern fire detection system would allow earlier detection of any fire or safety issue allowing more timely response.
5. Plant Relocation – The proposed M–1 plant site would be further isolated from the Highway 395 and State Route 203 intersection than the existing MP–I plant site.
6. Fire Protection System – The M–1 plant improvements would upgrade and integrate the fire protection system devices, including water storage, fire hydrants, and pre–stage fire monitors.
7. Control Room Isolation – The proposed M–1 plant site would be much further removed than the MP–I plant from the geothermal complex control room allowing the control room to be better protected in an emergency.
8. Fire Pump Building Access – There would be less potential for a fire event to prevent access to the existing fire pump building and fire suppression facilities with the decommissioning of the MP–I plant.

MPLP has adopted a comprehensive fire prevention and protection program as part of the Project (see Appendix A).

The structural fire hazard during operations impact is considered below the level of significance under CEQA as it would not increase the risk or the intensity of a structural fire and the Project would not create a substantial hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The reduced structural fire hazard of the M–1 replacement plant project compared to the existing MP–I plant is considered to be a beneficial impact of the Project. No additional structural fire hazard mitigation measures are required.

Hazardous Materials and Wastes:

In addition to the flammable motive fluid stored and circulated at the binary plants during operations, small (less than 5–gallon size) to moderate (drum size) quantities of hazardous materials would be transported to and used on site during Project construction, operations and decommissioning. These would include lubricants, hydraulic fluids, and compressed gases. Bulk quantities of gasoline and diesel fuels (up to 500–gallon above ground tanks) would also be stored and used on the site. The proposed construction and decommissioning activities would be temporary and relatively short–term.

During M–1 replacement plant operations gasoline and diesel fuels, lubricants, hydraulic fluids, compressed gases and other hazardous materials which might be used by the Project would continue to be stored at the existing MP–I storage yard and maintenance building. Turbine and transformer oils would continue to be stored within the proposed M–1 replacement plant turbines and transformers. The other hazardous materials would include various maintenance and cleaning supplies (paints, oils, solvents, and cleaning compounds). No new sources of hazardous waste are expected to be generated by the M–1 plant operations that are not currently generated by the existing MP–I plant operations, and the total volumes of oil, hazardous materials and hazardous waste used and generated by the MP-I Replacement Project are not expected to change. The existing HMBP prepared for the MP–I facility would be updated to include the M–1 replacement plant.

The transport, storage, and handling of these hazardous materials would represent a small but continuing potential for adverse effects from spills into the environment. There also would be a small continuing potential for public safety–related impacts due to the transport of hazardous chemicals to the Project site via public highways and access roads.

MPLP has adopted a comprehensive hazardous material management and emergency response program for the existing Casa Diablo geothermal complex that would be revised to include the proposed M–1 plant site and operations.

The potential for hazardous materials and waste impact is considered to be below the level of significance under CEQA as the *Proposed Project* would not create a substantial hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; and the *Proposed Project* would not create a substantial hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.. No mitigation measures are required.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County. All hazardous substances would be removed from the site and there would be no potential for structural fires. After site restoration activities are completed, the wildland fire potential of the restored site would be similar to the pre-project wildland fire potential of the area.

Environmental Impacts of the Alternative Power Plant Location

Geothermal Fluid Releases:

Approximately one mile of new geothermal production pipeline would be required to transport hot geothermal fluid from the existing MP–I production fluid pipeline network to the *Alternative Power Plant Location*. Similarly, an additional one mile of new geothermal injection pipeline would be required to transport the cooled injection fluid from the *Alternative Power Plant Location* to the existing MP–I injection fluid pipeline network. These approximately two miles of new geothermal fluid pipelines represents a small increased risk of a spill or release of geothermal fluid. The new pipelines would be insulated to prevent thermal contact burns and constructed to the same engineering standards as the existing facilities. Topographically a large geothermal spill from the alternative power plant site pipelines would flow into the same hydrologic drainage as the Casa Diablo geothermal complex and would be provided with the same spill containment controls as the existing facility to prevent spills from traveling downstream toward Mammoth Creek.

The impact of the new geothermal pipelines is considered below the level of significance of CEQA as there would be negligible increased risk of release of geothermal fluid and minimal potential for public contact with the geothermal fluid or hot pipeline. No additional mitigation measures are needed.

Fire Hazards:

Wildland Fire Hazard: Unlike the existing MP–I power plant site or the proposed M–1 replacement plant site, the *Alternative Power Plant Location* would be located within a relatively dense Jeffrey Pine forested area. The constructed alternative power plant site would be surrounded by flammable vegetation. A wildland fire would have the potential to burn close to the *Alternative Power Plant Location* making it more difficult to defend against the fire and would thereby have the potential to adversely affect workers and facilities on the site. The construction and operation of the M–1 facilities on the *Alternative Power Plant Location* could expose people or structures to a substantial risk of loss, injury or death involving

wildland fires. This potential impact is considered above the threshold of significance under CEQA. The following mitigation measure is recommended.

> **Alt HazMat Mitigation Measure 1: A defensive fire fuel break shall be constructed and maintained around the *Alternative Power Plant Location* in conformance with Forest Service and Mono County standards to provide an acceptable wildland fire protection safeguard.**

Implementation of the mitigation measure would reduce the adverse effects of the impact to below the level of CEQA significance.

Structural Fire Hazard: The potential for structural fire hazard on the *Alternative Power Plant Location* is considered to be the same as for the *Proposed Project*. This impact is considered below the level of significance under CEQA as it would not increase the risk or the intensity of a structural fire and the *Alternative Power Plant Location* would not create a substantial hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The reduced structural fire hazard of the M–1 facilities on the *Alternative Power Plant Location* compared to the existing MP–I plant is considered to be a beneficial impact of the *Alternative Power Plant Location*. No additional structural fire hazard mitigation measures are required.

Hazardous Materials and Waste:

The hazardous materials and wastes stored and used on the *Alternative Power Plant Location* would be essentially the same as those described for the *Proposed Project*.

The potential for hazardous materials and waste impact at the *Alternative Power Plant Location* is considered to be below the level of significance under CEQA as it would not create a substantial hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; and the *Alternative Power Plant Location* would not create a substantial hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. No mitigation measures are required.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed from the alternative plant site and the site would be restored to a natural appearing condition consistent with the site restoration requirements of the USFS. All hazardous substances would be removed from the site and there would be no potential for structural fires. After site restoration activities are completed, the wildland fire potential of the restored *Alternative Power Plant Location* would be similar to the pre-project wildland fire potential of the area.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative the existing MP–I power plant would continue to operate. There would be no change in the potential for impacts from potential geothermal fluid spills, fire hazards, or hazardous materials and waste used and generated by the existing MP–I Project. The beneficial impact of reducing the potential motive fluid fire hazard associated with the improved fire prevention, suppression and detection devices proposed; reduced volume of motive fluid stored; and plant relocation fire hazard benefits afforded by the moving the power plant to either the *Proposed Project* M–1 plant site or the *Alternative Power Plant Location* would not be realized.

4.8 HYDROLOGY AND WATER QUALITY

This section provides a description of the surface water and groundwater resources on the *Proposed Project* site, information on regulations that serve to protect these resources, an assessment of the potential impacts of the *Proposed Project* on these resources, and recommended measures to mitigate potentially significant impacts on these resources. The information and analysis in this section (except where footnoted otherwise or described below) is based in part on the *Geothermal Plant Site M-1 Grading and Drainage Plan* prepared by Triad/Holmes Associates (Revised June 16, 2011), which is presented in Figure 6 of Chapter 2.

4.8.1 Regulatory Framework

Federal and State Water Quality Programs

NPDES Permits and Related Requirements: The 1972 amendments to the Federal Water Pollution Control Act, later referred to as the Clean Water Act (CWA), prohibit the discharge of any pollutant to navigable waters of the United States from a point source unless the discharge is authorized by a National Pollution Discharge Elimination System (NPDES) Permit. There are no point source discharges at the Project site. While the original CWA focused on point source discharges (defined pipes and outfalls), stormwater discharges were added to the scope of the law by Congress in 1987. The United States Environmental Protection Agency (U.S. EPA) adopted final regulations that established Phase I stormwater discharge control requirements for the NPDES program in 1990. These regulations required large municipalities and specific types of industrial sites to obtain stormwater discharge permits under the NPDES program. In addition, these regulations required that stormwater discharge permits be issued to large construction activities consisting of five acres or more of land.

In 2003, the Phase II NPDES program requirements took effect, regulating nonpoint source discharges from all construction sites one acre or more in size and expanding the permit requirements to smaller municipalities. In California, the NPDES program is administered by the State Water Resources Control Board (SWRCB) through the nine Regional Water Control Boards (RWQCBs). The Project site is located within the jurisdiction of the Lahontan RWQCB. Because the Project site is not served by a municipal stormwater drainage system, it is not subject to the Phase II NPDES program's municipal stormwater regulations. However, the construction activities component of the Phase II NPDES program does apply to construction sites that disturb one acre or more, including the Project site.

In 2010, the SWRCB adopted the revised General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ; NPDES No. CAS000002; effective July 1, 2010) which is "...required for all stormwater discharges associated with construction activity where clearing, grading, and excavation results in a land disturbance of one or more acres." Since the Project would fall within these criteria, this Project must be covered under the General Permit. In order to be covered under the General Permit, the project applicant must submit a Notice of Intent (NOI) to the SWRCB.

The General Permit requires all owners of land where construction activities occur (i.e., dischargers) to:

- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the nation;
- Develop and implement a Stormwater Pollution Prevention Plan (SWPPP); and
- Perform inspections of stormwater pollution prevention measures (control practices).

The General Permit authorizes the discharge of stormwater associated with construction activity from construction sites. However, it prohibits the discharge of materials other than stormwater and all discharges that contain hazardous substances in excess of reportable quantities established at Title 40 Code of Federal Regulations Sections 117.3 or 302.4 unless a separate NPDES permit has been issued to regulate those discharges.

The General Permit requires development and implementation of a SWPPP, emphasizing Best Management Practices (BMPs), which are defined as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States." The SWPPP has two major objectives:

- To help identify the sources of sediment and other pollutants that affect the quality of stormwater discharges; and
- To describe and ensure the implementation of practices to reduce sediment and other pollutants in stormwater discharges.

In addition, dischargers are required to conduct inspections before and after storm events and to annually certify that they are in compliance with the General Permit.

Water Quality Standards and TMDLs: The CWA requires states to adopt water quality standards for water bodies and to have those standards approved by the U.S. EPA. Water quality standards consist of designated beneficial uses for a particular water body (e.g., wildlife habitat, agricultural supply, and fishing) and water quality criteria necessary to support those uses. Water quality criteria are expressed either in the form of set numeric concentrations or levels of constituents, such as lead, suspended sediment, and fecal coliform bacteria, or narrative statements that describe the quality of water necessary to support a particular beneficial use. In 2000, U.S. EPA established numeric water quality criteria for certain toxic constituents in California receiving waters with human health or aquatic life designated uses in the form of the California Toxics Rule (CTR).[3]

The Lahontan RWQCB adopted the Water Quality Control Plan (Basin Plan) for the Lahontan Region in 1994. The Basin Plan has since been amended numerous times. The Basin Plan designates the beneficial uses of receiving waters, including Mammoth Creek to which the Project site is tributary, and specifies both narrative and numerical water quality objectives for these receiving waters. Water quality objectives, as defined by the California Water Code Section 13050(h), are the "limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses or the prevention of nuisance within a specific area." Because these standards are applicable to receiving waters, they do not apply directly to stormwater runoff from the Project site. Table 1 lists the designated beneficial uses for Mammoth Creek and its tributary streams as described in the Basin Plan.

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop lists of impaired waters. Impaired waters are those particular waterbodies whose beneficial uses are being compromised by poor water quality. The law requires that these jurisdictions establish priority rankings for these impaired waters and develop Total Maximum Daily Loads (TMDLs) for the impairing pollutant(s) affecting each impaired waterbody. A TMDL is an estimate of the total load of each pollutant that a waterbody can receive from point, nonpoint, and natural sources without exceeding water quality standards. Once established, a TMDL allocates pollutant loadings among current and future point and nonpoint pollutant sources discharging to the waterbody.

[3] Title 40 Code of Federal Regulations Section 131.38.

Table 20: Designated Beneficial Uses of Mammoth Creek

Beneficial Use	Designated Beneficial Use
MUN – Municipal and Domestic Supply	Existing or Potential
AGR – Agricultural Supply	Existing or Potential
FRSH – Freshwater Replenishment	Existing or Potential
COMM – Commercial and Sport Fishing	Existing or Potential
GWR – Groundwater Recharge	Existing or Potential
REC1 – Water Contact Recreation	Existing or Potential
REC2 – Non-Contact Water Recreation	Existing or Potential
COLD – Cold Freshwater Habitat	Existing or Potential
RARE – Rare, Threatened, or Endangered Species	Existing or Potential
MIGR – Migration of Aquatic Organisms	Existing or Potential
SPWN – Spawning, Reproduction, and Development	Existing or Potential
WILD – Wildlife Habitat	Existing or Potential
Source: Water Quality Control Plan, Lahontan Region; California Regional Water Quality Control Board, Lahontan Region, 1994.	

As discussed in more detail below, a single unnamed drainage channel crosses the existing MP-I Project area south of the proposed M-1 plant site. Additionally, in high runoff years, rainfall/snowmelt from the site may reach Mammoth Creek via surface sheet flow to other ephemeral tributary drainage courses in the vicinity. The segment of Mammoth Creek from US 395 downstream to the Hot Creek Fish Hatchery (where Mammoth Creek becomes Hot Creek) is not identified as impaired in the 2010 Section 303(d) list of water quality impaired stream segments. The only TMDL-related work that is currently being undertaken by the RWQCB in the vicinity of the Mammoth Basin is the development of a nutrient TMDL for Crowley Lake, a reservoir on the Owens River downstream of the Mammoth Creek/Hot Creek confluence. However, the sources of these elevated nutrients are considered to most likely consist of pastures utilized for the grazing of cattle and located well downstream of the Project site.

Additional Federal and State Regulations: Storm runoff from the Project site and discharges of runoff into and/or encroachment upon natural drainages, wetlands, and/or flood plains are subject to the requirements of the federal CWA and associated regulations, the State Porter-Cologne Water Quality Control Act and associated regulations, and to requirements established by the U.S. EPA, SWRCB, RWQCB, and Mono County.[4] In addition, intrusions into jurisdictional areas are subject to the requirements of the CWA (Section 404/401 permitting) and Sections 1600-1607 of the State Fish and Game Code (the "Streambed Alteration Agreement Act"), and to the respective requirements established by the U.S. Army Corps of Engineers (Corps) and California Department of Fish and Game (CDFG) to administer these programs.

Section 401 of the CWA requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until certification required by Section 401 has been granted. Further, no license or permit may be issued if certification has been denied. Section 401 water quality certification is normally provided with coverage under the General Permit for construction activities.

[4] Federal CWA is at Chapter 33, United States Code, Sec. 1251 et seq.; Porter-Cologne Water Quality Control Act is at California Water Code, Sec. 13000 et seq.

In addition to the designation of beneficial uses and the establishment of applicable water quality standards and criteria, the RWQCB Basin Plan also sets forth a series of land development guidelines intended to afford water quality protection for surface and groundwater. Although not mandatory, adoption of these guidelines by individual counties and municipalities within the Lahontan Region is recommended.

Mono County Hydrology/Water Quality Policies

Direction Specific to Geothermal Exploration and Development: The Conservation/Open Space Element of the Mono County General Plan indicates that the MP–I Replacement Project area is within the *Hot Creek Buffer Zone* (Mono County 2010). Objective B of Goal 1 under the Energy Resources section of the Conservation/Open Space Element states that *"Except for projects in the vicinity of Casa Diablo …" a proposed geothermal project within the Hot Creek Buffer Zone … shall not be permitted … unless a finding is made that all identified environmental impacts of the proposed project are reduced to a less–than–significant levels by permit conditions."* Objectives C and D of Goal 1 establish procedures and direction for addressing biologic and associated hydrologic impact mitigation and monitoring requirements from geothermal exploration and development. The proposed M-1 replacement plant site is located within the existing Casa Diablo geothermal complex; and as such, Objective B would not be applicable to the Project, but Objectives C and D would be applicable (see Table 21).

Table 21: Conservation/Open Space Element, Energy Resources, Goal 1 – Applicable Objectives

Mono County General Plan, Conservation/Open Space Element, Energy Resources Goal 1 Objectives Applicable to Hydrology and Water Quality
Goal 1: Establish a regulatory process with respect to both geothermal exploration and development that ensures that permitted projects are carried out with minimal or no adverse environmental impacts. **Objective C** Establish procedures that assure that the cumulative impacts of geothermal and other projects on hydrologic and biologic resources are mitigated to less-than-significant levels. Policy 1: Geothermal development projects shall be phased so that the operational impacts of a permitted project can be assessed before a subsequent project is permitted within an area that may be affected by the permitted project. *Action 1.1*: After a permit for geothermal development has been issued by Mono County, no subsequent application for a permit for geothermal development within an area that may be affected by the permitted project shall be accepted until hydrologic and biologic monitoring data relating to the permitted development has been collected for a period of not less than two years. If an area in which a new permit for geothermal development is sought has been previously developed and hydrologic and biologic monitoring data has been collected in the area for in excess of two years, it shall be not less than six months before the new application is accepted. *Action 1.2*: Geothermal exploration and development operations shall be monitored, and the monitoring data shall be evaluated by the Mono County Economic Development Department (MCEDD) and the Long Valley Hydrologic Advisory Committee (LVHAC), or other appropriate regional hydrologic committees, and CDFG. The purpose of the monitoring is to determine whether there are or may be adverse hydrologic or biologic impacts. The data and evaluations, to the extent they are not proprietary, shall become a part of the record of any proceeding to consider subsequent geothermal exploration or development permit applications within the Hot Creek Buffer Zone, the deer migration zones, or any other regions that may be affected by the existing projects. *Action 1.3*: Prior to the issuance of any permit for either geothermal exploration or development within the Hot Creek Buffer Zone, the MCEDD shall prepare a written analysis of

Mono County General Plan, Conservation/Open Space Element, Energy Resources Goal 1 Objectives Applicable to Hydrology and Water Quality

the cumulative hydrologic and biologic impacts of the proposed project and other development projects of any kind or nature that may individually or cumulatively affect springs, streams, fumaroles, or significant biologic resources within the zone. The analysis shall be a part of the record.

Action 1.4: Except for projects in the vicinity of Casa Diablo and associated monitoring or mitigation wells or other facilities, and notwithstanding the provisions of CEQA or the County guidelines, where there is credible scientific evidence contained in the foregoing cumulative impact analysis that shows that the project for which a permit is sought, taken together with other development and development projects, may substantially adversely affect springs, streams, or fumaroles within the Hot Creek Buffer Zone, the permit shall not be granted.

Objective D

The permit holder shall establish data collection for hydrologic and biologic mitigation and monitoring programs to serve as the basis for assuring protection of hydrologic and biologic resources and water quality and quantity. These programs shall be approved by the MCEDD, after consultation with the LVHAC or another appropriate regional hydrologic advisory committee, and the CDFG, prior to implementation.

Policy 1: Geothermal exploration and development projects shall be sited, carried out and maintained by the permit holder in a manner that best protects hydrologic resources and water quality and quantity.

Action 1.1: During the permit processing period, the applicant for a geothermal development permit shall submit draft hydrologic and biologic monitoring plans to the MCEDD. The plans and proposed mitigation measures, as modified and as accepted by the County or its officers, boards and commissions, shall be approved as part of the initial use permit conditions, if a permit is granted.

The operator under a geothermal development permit shall implement the hydrologic resource monitoring plan to monitor baseline conditions and detect changes in the existing hydrothermal reservoir pressures and shallow aquifer water levels, as well as the discharge (flow) rate and temperatures of selected thermal springs in the project area, if any exist.

Action 1.2: The monitoring plans shall include a formula to calculate the appropriate portion of costs to be repaid to the County by the permit holder in the event that the County expends monies to collect baseline data for the plans.

Action 1.3: Upon the basis of relevant scientific evidence and the recommendation of the LVHAC or another appropriate hydrologic review committee, the monitoring plans may be amended during operations upon prior written approval of the MCEDD or the Planning Commission.

Action 1.4: The hydrologic and biologic resource monitoring plans shall include:

a. A schedule for periodically collecting and submitting data to the MCEDD;
b. A schedule for preparing a periodic monitoring report to the MCEDD; and
c. Provisions for periodic review and assessment of the monitoring data by qualified consultants.

Action 1.5: The applicant for a geothermal development permit shall prepare a baseline data report to be included as part of the hydrologic and biologic resource monitoring plans that identifies all significant hydrologic and biologic baseline information available for the project area. Permit conditions shall require that the permit holder or operator continually collect and submit production data to the MCEDD. The frequency and manner of data collection must be approved by the MCEDD, after consultation with the LVHAC or another appropriate hydrologic advisory committee, and the California Department of Fish and Game.

Action 1.6: If scientific evidence indicates that geothermal exploration or development is significantly threatening, or causing, pressure or temperature changes to springs, streams or fumaroles within the areas of the Hot Creek Gorge or Hot Creek Hatchery that are beyond the natural variations determined through baseline data collection, the permit holder MCEDD, including, but not limited to, the following:

a. Drilling and monitoring new observation wells, or otherwise amending the

Mono County General Plan, Conservation/Open Space Element, Energy Resources Goal 1 Objectives Applicable to Hydrology and Water Quality

hydrologic resource monitoring plan;

b. Reorienting existing exploration, production or injection operations, or any of them, to increase or decrease hydrologic reservoir temperatures or pressures at the appropriate locations;

c. Injecting hot geothermal fluid from the production area directly into injection wells at the appropriate locations to compensate for pressure or temperature changes in the direction of Hot Creek Gorge springs and Hot Creek Hatchery springs, if either group of springs has been shown to be adversely affected by the permit holder's operations;

d. Drilling new injection wells in the vicinity of the project area and injecting hot geothermal fluid from the production area to compensate for temperature and pressure decreases in the direction of Hot Creek Gorge springs and Hot Creek Hatchery springs, if either group of springs has been shown to be adversely affected by project operations; and

e. Curtailing or entirely discontinuing geothermal operations.

Action 1.7: In order to minimize hydrothermal reservoir pressure declines, and provided the conditions do not conflict with regulations of the California Division of Oil and Gas, development permit conditions shall require the reinjection of substantially all extracted geothermal fluids. Incidental uses of the produced geothermal fluids (i.e., well drilling, well testing, emergency fire water makeup) are exempted from this injection requirement.

Action 1.8: The permit holder shall prepare and submit to the MCEDD, prior to commencement of construction, a detailed blowout contingency plan, which includes a description of blowout prevention equipment required during drilling. Sufficient cold water shall be stored by the permit holder at each well site to quench the well should a blowout occur during drilling. Water used for this purpose shall not be extracted from surface water sources in a manner that would harm aquatic vertebrate species dependent upon the surface water source. The plan shall provide for regular maintenance and testing of equipment. It shall be approved by the MCEDD prior to operations as condition of the permit.

Action 1.9: If biologic monitoring indicates that permitted geothermal exploration, development and operations, or any of them, have significant adverse effects, then the County shall take such action as is necessary to reduce the effects to less-than-significant levels, including curtailing or entirely discontinuing geothermal operations.

Action 1.10: Binary working fluids shall be air cooled.

Action 1.11: The consumptive use of surface water and groundwater, consistent with the reasonable needs (as determined by the MCEDD) of project operations and personnel, shall not decrease the natural flow of surface waters or the perennial yield of groundwater.

Action 1.12: Appropriate measures shall be taken to confine fluid spills. The capacity of the containment facilities shall be equal to at least twice the volume of the entire fluid contents of the facility, including pipeline capacity and the amount that would flow until automatic shutdown devices would stop the flow.

Action 1.13: No geothermal development located within the Hot Creek Buffer Zone shall occur within 500 feet on either side of a surface watercourse (as indicated by a solid or broken blue line on U.S. Geological Survey 7.5- or 15-minute series topographic maps).

Action 1.14: Permit conditions for both geothermal exploration and development shall assure that required reclamation is completed within one year after a project is completed. Reclamation plans shall contain provisions that assure the protection of springs, streams, and fumaroles from erosion, sediment transport, and similar adverse effects. Plan provisions shall also assure that project sites are restored as closely as reasonably possible to natural conditions, as determined by the MCEDD, in consultation with the Visual Review Committee.

Action 1.15: All geothermal permit applications, environmental documentation and proposed project conditions shall be referred to the appropriate hydrologic advisory committee and the California Department of Fish and Game (CDFG) prior to final action on the permit applications.

Action 1.16: The County shall cooperate with the CDFG in promptly referring documentation

Mono County General Plan, Conservation/Open Space Element, Energy Resources Goal 1 Objectives Applicable to Hydrology and Water Quality	
	on proposed geothermal projects to it. *Action 1.17*: Permits for both geothermal exploration and development shall incorporate by reference and require compliance with all applicable rules and regulations of other governmental agencies meant to protect the environment, including the CDFG, the California Division of Oil and Gas, the Lahontan Regional Water Quality Control Board, and the Great Basin Unified Air Pollution Control Board. *Action 1.18*: All geothermal pipelines potentially visible in scenic highway corridors or important visual areas shall be obscured from view by fences, natural terrain, vegetation, or constructed berms, or they shall be placed in stabilized or lined trenches.

Goal 2 under the Water Resources and Water Quality section of the Conservation/Open Space Element contains additional Objectives (A and B) that establish policies to prevent the contamination of surface water and groundwater, including the establishment of erosion control, recharge zone protection, and stormwater management procedures through the County Grading Ordinance (Mono County Code Chapter 13.08) as well as other sections of the County Code.

4.8.2 Existing Environment

The Project is located within Long Valley on the eastern flanks of the Sierra Nevada. The Project area is situated within the Long Valley caldera at the southern base of a volcanic resurgent dome in a transitional zone encompassing both sagebrush and conifer forest. The proposed M-1 replacement plant site is mildly sloping with elevations ranging from about 7,280 feet in the southeast to 7,310 feet in the northwest. Temperatures in the area typically range from below freezing in the winter to the mid–90's in the summer. The average annual maximum temperature is about 57°F and average annual minimum temperature is about 29°F with annual precipitation totaling about 23 inches as measured at the Mammoth Lakes, Ranger Station located about three miles west of the existing MP–I plant site (Western Regional Climate Center 2011).

Surface Waters

The project site is located within the 71-square mile Mammoth Basin, a drainage area on the eastern slope of the Sierra Nevada that is tributary to the Great Basin, a large hydrologic/geographic region encompassing portions of California, Nevada, Utah, Idaho, and Oregon. Drainage to the Great Basin does not reach the ocean but instead evaporates or percolates to groundwater in a series of "sinks" or lakes.

The Mammoth Basin (Basin) delivers surface and groundwater to Mammoth Creek/Hot Creek, which is tributary to the Owens River. Mammoth Creek and Hot Creek are different names for the same stream with the division in nomenclature occurring at the Hot Creek Fish Hatchery located approximately two miles southeast of the project site. The Owens River ultimately terminates at Owens Lake, a dry "sink"/evaporation basin located at the southern end of the Owens Valley, approximately 125 miles southeast of the project area. The watershed boundaries of the Mammoth Basin consist of the Mammoth Crest divide on the Sierra Nevada crest to the west and south, the Dry Creek drainage divide on the north, and the Convict Creek drainage divide on the east. The general trend of the Basin is to the southeast, with elevations ranging from approximately 11,600 feet on the Mammoth Crest to approximately 7,000 feet at

the confluence of Hot Creek and the Owens River. The total flow length of the Mammoth Creek/Hot Creek drainage is approximately 18 miles.[5]

The Mammoth Basin includes a system of lakes and interconnecting surface streams in its upper elevations, all of which are eventually tributary either by surface flow or underground flow to Mammoth Creek. A total of five sub-watersheds are tributary to Mammoth Creek: the Lake Mary Basin, Old Mammoth, Murphy Gulch, Sherwin Creek, and Casa Diablo, the last of which contains the project site.[6] A small, unnamed stream flows through the project site area between the existing MP–I plant site and the proposed M–1 plant site. The stream has historically intercepted flow from the hot springs in the Casa Diablo area and the drainage empties into a marshy area near Mammoth Creek about 0.6 mile southeast of the existing MP-I plant site. No other streams or surface waters are located within the Project area, nor are there any cold springs, seeps or wet swales. Mammoth Creek is located approximately 0.6 mile south and southeast of the proposed M-1 plant site. Isolated hot springs, fumaroles and thermal soils exist in the Project vicinity.

Ground Waters

Groundwater in the Long Valley caldera consists of both shallow, cold ground water and deeper geothermal waters. Evidence suggests that both begin as snowmelt and stream infiltration near the western edges of the caldera near San Joaquin Ridge and Mammoth Mountain (Sorey 2005). Shallow groundwater is also recharged in the caldera from the south and northeast, although these are not associated with any geothermal sources.

Most of the infiltrating water from the west enters the shallow, cold groundwater systems in the Dry Creek drainage to the west and north, and the Mammoth Creek drainage to the south, of the Project area. However, some of this water moves down along fault conduits to much greater depths, into the rocks beneath the caldera's volcanic fill.

Cold Ground Waters

At the project site, shallow groundwater was encountered in one test boring at 15 feet in depth below ground surface, but groundwater was not encountered anywhere else to the maximum depth of exploration.

Geothermal Fluids

The geothermal fluids produced for the Project would be the same as those produced from the Casa Diablo geothermal wells supporting the existing MP-I power plant. As noted above, these fluids reside in the deeper groundwater aquifer underlying Long Valley. Geothermal fluid pumped from geothermal wells is very hot and under high pressures. The geothermal fluid production and injection pipeline network supporting the existing MP-I power plant would not change with the *Proposed Project*. The deeper geothermal groundwater lies approximately 450 feet below the ground surface at the site.

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[5] *Town of Mammoth Lakes Storm Drain Master Plan Update (90% Draft), January 17, 2005, Page 2.*

[6] *Ibid, Page 5.*

Jurisdictional Waters

There are no waters, wetlands, or riparian habitat areas on the project site that qualify as jurisdictional resources with respect to the Corps or the CDFG.

4.8.3 Environmental Impacts

CEQA Significance Criteria

Appendix G to the CEQA Guidelines provides that an impact on hydrology or water quality could be considered significant under CEQA if the Project would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level.
- Substantially alter the existing drainage pattern of the site or area (including alteration of the course of a stream or river) in a manner that would result in substantial erosion or siltation on-site or off-site.
- Substantially alter the existing drainage pattern of the site or area or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-site or off-site.
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

The Project site is not located within a 100-year or 500-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, nor does the Project include housing. In addition, no dams or levees are located on or in proximity to the Project site. Seiches are standing waves created by seismically induced ground shaking (or volcanic eruptions or explosions) that occur in large, freestanding bodies of water. A tsunami is a series of waves that are caused by earthquakes that occur on the seafloor or in coastal areas. The Project site is sufficiently far removed from such large bodies of water that it would not be subject to inundation by seiche or tsunami. The Project area is moderately sloping and does not contain any steep hillside terrain; therefore, there is no potential for the Project site to be inundated by a mudflow. The small Project site would not create or contribute substantial surface runoff to either an existing or proposed off-site stormwater drainage system.

Environmental Impacts of the Proposed Project

Surface Water Quality:

A significant impact may occur if the project discharges water that does not meet the quality standards of agencies that regulate surface water quality (in this case, the Lahontan RWQCB). Significant impacts could occur if the Project does not comply with all applicable regulations with regard to surface water

quality as governed by the State Water Resources Control Board (SWRCB). As proposed, the Project would comply with all applicable regulations.

Construction Activities:

The M-1 plant site would be constructed on two pads. The larger lower pad would be graded to accommodate the OEC unit, heat exchangers, air-cooled condenser system, piping and an electrical room. The smaller upper pad would be graded to accommodate the substation. Grading of the plant site would proceed after the initial project survey and plant layout has been established. Prior to grading of the site, some site clearing and tree removal would take place. Topsoil would be stockpiled to aid in revegetation. The plant would be built to balance cuts and fills to the extent feasible. Excess excavated material not required as fill would be disposed of or stockpiled. Compaction of the soils would be in accordance with the recommendations in the report of the geotechnical survey conducted on the site and civil engineering design. All disturbed lands not required for plant operations would be revegetated upon completion of construction. Gravel surfacing would be placed after final grading of the site. Grading design would be based on local topography as shown on topographic maps.

Three general sources of potential short-term, construction-related stormwater pollution associated with the *Proposed Project* are: (1) the handling, storage, and disposal of construction materials containing pollutants; (2) the maintenance and operation of construction equipment; and (3) earth moving activities which, when not controlled, may generate soil erosion and transportation, via storm runoff or mechanical equipment. Poorly maintained vehicles and heavy equipment leaking fuel, oil, antifreeze, or other fluids on the construction site are also common sources of stormwater pollution and soil contamination. Generally, routine safety precautions for handling and storing construction materials may effectively mitigate the potential pollution of stormwater by these materials. These same types of common sense, "good housekeeping" procedures can be extended to non-hazardous stormwater pollutants such as sawdust, concrete washout, and other solid wastes.

In addition, grading activities can greatly increase erosion processes, leading to sediment loading to storm runoff. Two general strategies are recommended to prevent construction silt from entering runoff. First, erosion control procedures should be implemented for those areas that must be exposed. Secondly, the area should be secured to control off-site migration of pollutants. The area of disturbance for this project is greater than one acre; therefore the project is subject to the requirements of the NPDES General Permit for construction activities. Pursuant to these requirements, a Notice of Intent under the General Permit must be submitted to the SWRCB and a SWPPP must be prepared prior to the start of ground-disturbing activities and implemented throughout the construction period.

Specific BMPs to be implemented on the project site would be identified in detail in the SWPPP to be prepared for the project. However, the grading plan for the project incorporates measures to avoid or minimize erosion during project construction and operations. The grading plan would be submitted for review to the Mono County Public Works Department (MCPWD) prior to implementation. As shown on the grading plan, BMPs that would be adopted to reduce soil erosion during construction include placement of straw wattles and/or silt fencing along the perimeter of the site and around topsoil stockpiles; and placement of silt fences in drainage swales at the point where runoff exits the site. Other measures such as berms, fiber rolls, or erosion control blankets would be utilized as necessary. In addition, the site would implement erosion control BMPs prior to the beginning of the wet winter season, which includes the stabilization of all exposed soil surfaces with adequate erosion control measures.

Under the terms of the General Permit and the SWPPP to be prepared for project construction, construction activities associated with all proposed development within the project site would be subject to inspection, which must occur on a routine basis for all stormwater pollution prevention measures and control practices being used at the site as well as both before and after storm events.

The SWPPP prepared for construction of the project must also address hazardous materials storage and use, erosion and sedimentation control, and spill prevention and response. The required implementation of the BMPs in the project's SWPPP would ensure that project construction activities would not cause the violation of any water quality standards within Mammoth Creek. Thus, the Project would be considered to have a less than significant impact on the ability of Mammoth Creek to maintain applicable water quality standards.

Replacement Plant Operations:

The M-1 replacement power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties or nearby waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. The project applicant would revise its existing Spill Pollution Control and Countermeasure (SPCC) Plan, in conformance with 40 CFR 112, to include the new M-1 plant. As described below, there would be no off-site surface discharges from the M-1 plant site operations. Sanitary waste discharges would continue to be handled at the existing sanitation facilities on the MP-I site.

Upon completion, the M-1 power plant site would drain to stormwater retention basin constructed in the south-central and southeast corner of the plant site to prevent all off-site discharge of stormwater. Rainfall runoff on the plant site would be intercepted by trench drains (rock filled trenches with a drain pipe on the bottom of the trench) that would empty into storm drain pipes located on the on the easterly and westerly portions of the pad which would drain to the south into the storm water retention facilities. After a rain event the water would either be left for evaporation and/or discharged after inspection. The stormwater retention facilities would include subsurface pipe and rock for storage of runoff up to a 20-year storm event (i.e., one inch of rainfall), which is the design standard for Mono County. Stormwater would only leave the site in an uncontrolled manner if this rainfall intensity were to be exceeded.

After construction is completed, erosion control BMPs would be implemented at the M-1 site including the use of erosion control blankets and hydroseeding of slopes created by grading outside of the plant site. The plant site would include the placement of ¾-inch rock placed in all areas that are not covered by pavement or structural concrete. The rock filled trench drains and the retention facilities would provide desiltation of stormwater runoff.

Other activities associated with operation of the project would generate substances that could degrade the quality of stormwater runoff. The deposition of certain chemicals by cars in the parking areas and the internal roadway surfaces could have the potential to contribute metals, oil and grease, solvents, phosphates, hydrocarbons, and suspended solids to runoff from the site. However, implementation of the project would not increase the number of employees or visitors to the site, nor would it change existing operations around the office area and parking lot. Thus, the project would not alter the existing potential for these pollutants to enter stormwater runoff at the site.

The project's proposed stormwater management infrastructure, including the above-described erosion and spill control measures, would ensure that pollutants from the M-1 plant site are not discharged to stormwater and that project impacts with respect to receiving water quality would be less than significant.

Decommissioning Activities:

Removal of the existing MP-I power generation facilities following the up to two-year transition process would create a gravel storage pad on the site of the current facility. The SWPPP prepared for project construction activities would contain specific BMPs designed to prevent pollutants, including erosion, from the existing MP-I site from entering stormwater runoff to the maximum extent feasible. Following establishment of the storage area, precipitation onto the site would be allowed to infiltrate. Implementation of the SPCC Plan and erosion control measures on all exposed soil areas would ensure that any spills or other material discharges at the storage area would be prevented from reaching off-site areas via stormwater transport. Thus, impacts on receiving water quality associated with decommissioning of the existing MP-I plant and development of the storage area would be less than significant.

Geothermal Fluid and Ground Water Depletion or Recharge:

A significant impact may occur if a project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

The project site is currently partly developed with the existing MP-I plant and, as such, contains impervious surfaces that convey runoff away from the site. However, the *Proposed Project* has the potential to increase the amount of impervious surface area on the site due to construction of the M-1 plant site and conversion of the existing MP-I plant site to a storage area. This would increase the percentage of runoff that would be directed to on-site drainage infrastructure and then away from the site. Because the site does not drain to a storm drain system, runoff from the site would continue to infiltrate into the soil once it is directed into on-site stormwater treatment BMPs. Following removal of the existing MP-I plant, a large area of permeable gravel capable of infiltrating runoff would also be created on the site. Thus, construction of the *Proposed Project* would not interfere with or reduce the overall amount of groundwater recharge at the site and would thus represent a less than significant impact.

The proposed M-1 replacement plant would continue to use both high and moderate temperature geothermal resources to extract heat energy from geothermal fluid. No new geothermal wells would be constructed for the replacement plant; instead, it would utilize the same geothermal fluid from the existing geothermal wells that currently supply the existing MP-I power plant. The total brine flow would not increase beyond what is currently utilized. Similarly, the total flow would not increase during the up to two-year overlap period when both plants are being operated since neither plant would be operated to full capacity. Because the new M-1 plant would also consist of a closed loop geothermal system, the cold geothermal fluid would be returned to the geothermal reservoir via the geothermal injection wells essentially replacing the produced hot geothermal fluid circulated through the binary power plant facilities (see Figure 4). No net impact would occur to the geothermal reservoir or cold groundwater levels or supplies. Similarly, because the M-1 power generation facilities would use the same geothermal resources currently being utilized by the existing MP–I power generation facilities, no new geothermal wells are being proposed, and the geothermal fluid production rate would be approximately the same as for the existing MP-I plant operations.

Conceptual models of the geothermal fluid and cold groundwater systems suggest that changes in these systems could affect downstream spring temperature, chemistry and/or flow rates (see Figure 30). The Hot Creek headsprings are located near the Hot Creek Fish Hatchery operated by the CDFG. These headsprings have a thermal component and the spring water is used by the hatchery to provide optimal temperatures for rearing trout. Changes in the temperature, water quality or flow rate of the headsprings could adversely affect the Hot Creek Fish Hatchery operations.

The existing geothermal development at Casa Diablo is operating under a stipulated hydrologic and biologic monitoring and remedial action program intended to protect the Hot Creek headsprings. The program was initially adopted in 1990 as set forth in Stipulation No. 1 of the Bureau of Land Management approval of the Plans of Operation for Development, Injection and Utilization for the then proposed PLES-I Geothermal Project, but the program also considered the MP–I and MP–II projects.

The monitoring program is coordinated by the Long Valley Hydrologic Advisory Committee (LVHAC). MPLP and the USGS are currently conducting the hydrologic and biologic monitoring prescribed by the Mono County General Plan via their participation in the LVHAC. Monitoring locations may change with time as conditions and available information dictate (see Figure 31), but representative monitoring data continues to be routinely evaluated by the Mono County Economic Development Department (MCEDD), the LVHAC and CDFG (Mono County General Plan, Energy Resources, Goal 1, Objectives C and D). To date, there have been no substantive changes observed in the Hot Creek headsprings monitoring data that have been attributed to geothermal development in the Long Valley caldera. The LVHAC will continue to conduct the hydrologic and biologic monitoring activities (Personal Communication – Dan Lyster, Director, MCEDD; June 22, 2011).

The existing MP-I Project began operations prior to the County's adoption of the hydrologic and biologic monitoring and remedial action program requirements for development within the Hot Creek Buffer Zone. Conformance with these program requirements provides an early warning of changes that could occur at the Hot Creek headsprings and a program of remedial actions that would be taken to prevent potential adverse effects on the Hot Creek Fish Hatchery if such changes are observed. However, the requirement to continue the monitoring and remedial action program only exists under the respective MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring and remedial action program for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings used for Hot Creek Fish Hatchery operations, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended.[7]

> **Hydro Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant.**

[7] Recommended *Hydro Mitigation Measure 1* is worded exactly the same as *Bio Mitigation Measure 1* provided to mitigate a different potential impact discussed in Chapter 4.4.3, Biological Resources, Environmental Impacts.

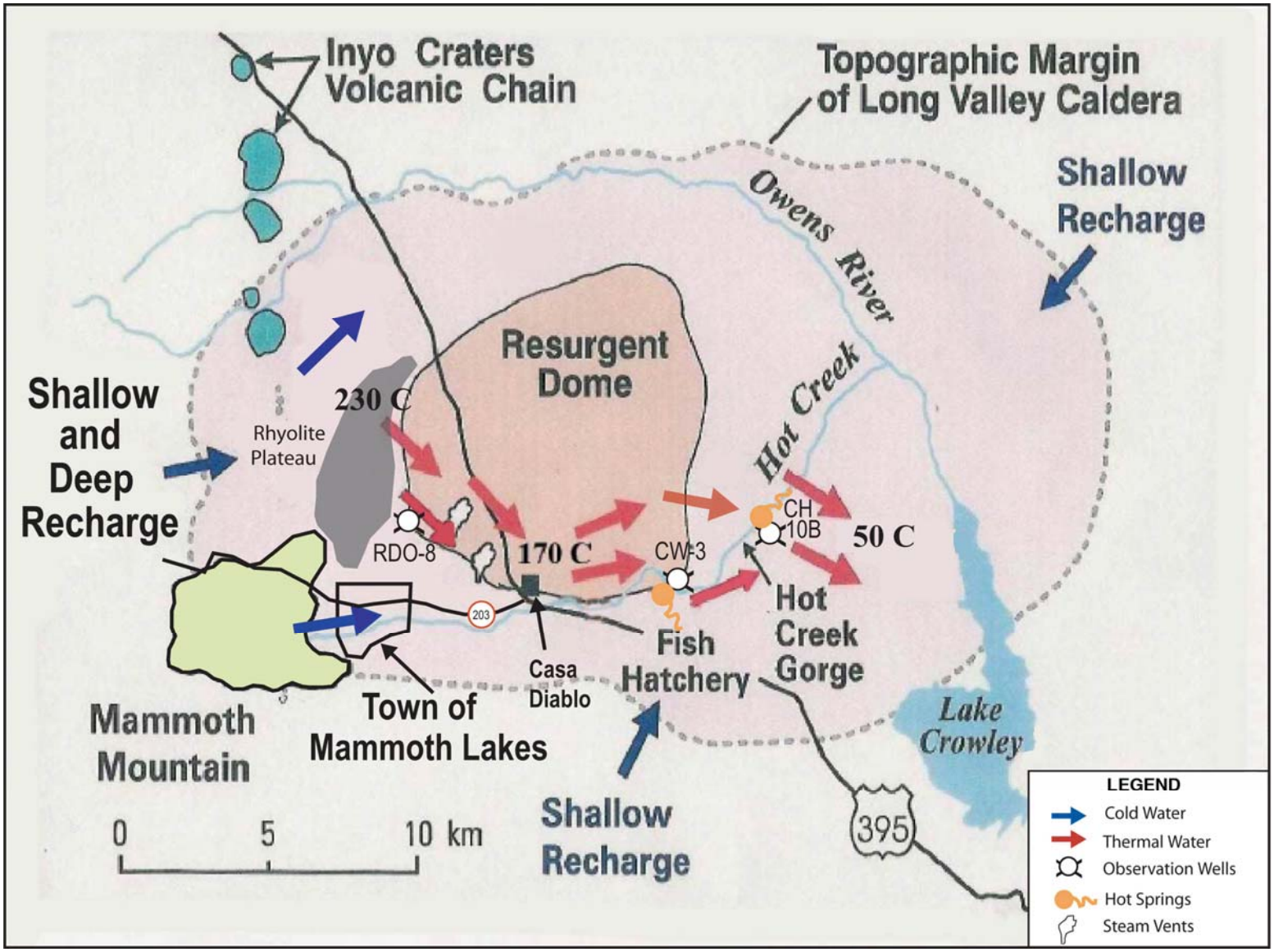

Figure 30: Conceptual Hydrology Model of the Long Valley Caldera (After Sorey 2005)

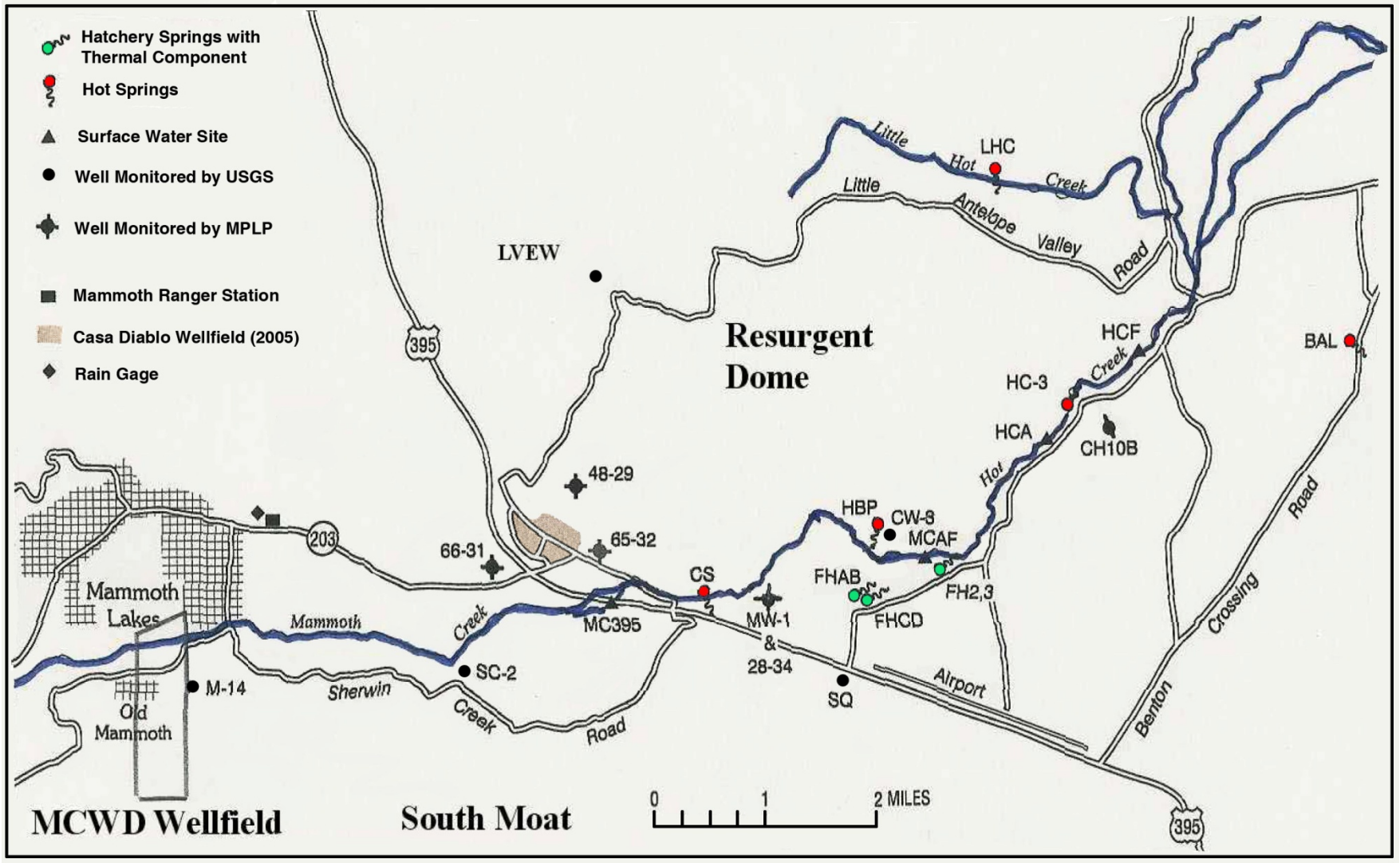

Figure 31: Representative Hydrologic Monitoring Sites in the Long Valley Caldera (After Sorey 2005)

The adoption of the prescribed monitoring and mitigation measure program by the MP-I Project would reduce the potential adverse effects of this impact on the Hot Creek headwater springs and the Hot Creek Fish Hatchery operations to below the level of significance.

Alteration of Drainage Patterns:

A significant impact may occur if a project would substantially alter existing drainage patterns on a site such that a substantial amount of erosion, siltation, or flooding could result.

As noted previously, the project site is currently partially developed and, as such, contains impervious surfaces that convey runoff away from the site. However, the *Proposed Project* has the potential to increase the amount of impervious surface on the site as well as the amount of runoff that would be directed either off-site or to on-site stormwater treatment BMPs. Following removal of the existing MP-I plant, a large area of permeable gravel capable of infiltrating runoff would also be created on the site. The only natural drainage channel on the site crosses in the area between the existing MP-I plant and the proposed M-1 site and would not be directly altered by implementation of the project.

As discussed above, the required implementation of the BMPs in the project's construction SWPPP would ensure that project construction activities would not cause substantial erosion or siltation on- or off-site. Activities associated with the operation of the project are not considered likely to substantially increase on- or off-site erosion or siltation due to the post-construction implementation of erosion control measures. Nonetheless, the proposed installation of permanent stormwater retention facilities would reduce project-generated erosion and siltation impacts. Thus, the project would have a less than significant impact in terms of increasing on- or off-site erosion, siltation or flooding through the alteration of existing drainage patterns.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County. There would be no continuing use of geothermal fluid or other water for the Project. After site restoration measures are implemented the surface drainage would be returned to approximate pre-Project conditions.

Environmental Impacts of the Alternative Power Plant Location

The selected *Alternative Power Plant Location* would be located north of the existing SCE substation and east of the proposed Casa Diablo IV Geothermal Development Project (CD-4) power plant site (see discussion in Section 2.2.1). An approximately 600-foot interconnection transmission line would need to be constructed from the alternative plant site to the existing SCE substation. In addition, new production and injection fluid pipelines would need to be constructed to the alternative plant site. The construction, MP-I decommissioning, operations, and eventual site reclamation of the *Alternative Power Plant Location* geothermal development would be essentially the same as those activities described for the *Proposed Project* with only minor site-specific adjustments.

There have been no site-specific drainage studies of the *Alternative Power Plant Location.* However, aerial photograph assessment and topographic map review has not identified the presence of any existing natural drainage channels or streams on the site.

Construction Activities:

Impacts to hydrology and water quality resulting from construction of the M-1 plant at the *Alternative Power Plant Location* would not be expected to be substantively different from those associated with the proposed M-1 replacement plant site. However, geotechnical surveys and a grading plan have not been prepared for the *Alternative Power Plant Location*. In order to ensure no adverse effects the following measure must be implemented if the County intends to select the *Alternative Power Plant Location*.

> **Alt Hydro Measure 1: Baseline drainage surveys shall be conducted covering the *Alternative Power Plant Location* and surrounding lands, and the findings of these surveys shall be considered prior to making a decision for development at the *Alternative Power Plant Location*.**

In addition, the alternative plant site is located on land administered by the Forest Service and approval from federal agencies would be required before development could occur at the *Alternative Power Plant Location*.

Replacement Plant Operations:

As described for the *Proposed Project*, MPLP and USGS are currently conducting the hydrologic and biological monitoring prescribed by Mono County General Plan via their participation in the LVHAC. However, the requirement to continue the monitoring and remedial action program only exists under the respective MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings used for Hot Creek Fish Hatchery operations, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended for the *Alternative Power Plant Location*.[8]

> **Alt Hydro Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant.**

The adoption of the prescribed monitoring and mitigation measure program by the MP-I Project would reduce the potential adverse effects of this impact on the Hot Creek headwater springs and the Hot Creek Fish Hatchery operations to below the level of significance.

[8] Recommended *Alt Hydro Mitigation Measure 1* is worded exactly the same as *Alt Bio Mitigation Measure 1* provided to mitigate a different potential impact discussed in Chapter 4.4.3, Biological Resources, Environmental Impacts.

Decommissioning Activities:

As noted previously, with implementation of the project design features, impacts to hydrology or water quality resulting from the decommissioning and removal from the site of the existing MP-I plant and conversion of the pad to a storage area would be less than significant.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the site restoration requirements of the USFS. There would be no continuing use of geothermal fluid or other water for the Project. After site restoration measures are implemented the surface drainage on the alternative plant site and the *Alternative Power Plant Location* geothermal pipeline corridor would be returned to approximate pre-Project conditions.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative the existing MP–I power plant would continue to operate. There would be no new plant site construction and there would be no new impacts on hydrology or water quality in the existing Casa Diablo geothermal development area.

4.9 NOISE

This section analyzes the potential for adverse impacts on Project area noise levels resulting from implementation of the Project. Information used in the following analysis is drawn from the Project description, the Noise Evaluation prepared for the Project (see Appendix G) and the *Mono County General Plan* ("General Plan").

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel ("dB"). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale ("dBA") provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Noise meters produce readings in dBA.

Each 10-dBA increase in the level of a continuous noise is a ten-fold increase in sound energy, but is judged by a listener as only a doubling of loudness. For example, 60 dBA is judged to be about twice as loud as 50 dBA and four times as loud as 40 dBA. Each 3 dBA increase in sound is a doubling of sound energy, such as doubling the amount of traffic on a street, but is judged as only about a 20 percent increase in loudness, and is a just-noticeable difference to most people. Increases in average noise of about 5 dBA or are more noticeable to most people, and is the level required before any noticeable change in community response would be expected. A 10 dBA change would almost certainly cause an adverse change in community response.

Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a

major highway. Table 22, Representative Environmental Noise Levels, illustrates representative noise levels in the environment.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The Leq is a measure of ambient noise, while the Ldn and Community Noise Equivalent Level ("CNEL") are measures of community noise. Each is applicable to this analysis and defined as follows:

- Ambient noise ("Leq"), the equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the Leq of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- Community Noise ("Ldn"), the Day-Night Average Level, is a 24-hour average Leq with a ten dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24 hour Leq would result in a measurement of 66.4 dBA Ldn.
- CNEL, the Community Noise Equivalent Level, is a 24-hour average Leq with a five dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a ten dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24 hour Leq would result in a measurement of 66.7 dBA CNEL.
- Lmin, the minimum instantaneous noise level experienced during a given period of time.
- Lmax, the maximum instantaneous noise level experienced during a given period of time.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60–70 dBA range, and high above 70 dBA. Noise levels greater than 85 dBA can cause temporary or permanent hearing loss. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet suburban residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate level noise environments are urban residential or semi-commercial areas (typically 55–60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with more noisy urban residential or residential-commercial areas (60–75 dBA) or dense urban or industrial areas (65–80 dBA).

When evaluating changes in 24-hour community noise levels, a difference of three dBA is a barely perceptible increase to most people. A five dBA increase is readily noticeable, while a difference of ten dBA would be perceived as a doubling of loudness.

Noise levels from a particular source decline as distance to the receptor increases. Other factors, such as the weather and reflecting or shielding, also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about three dBA at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., the area between the source and receptor is earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to

7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about five dBA, while a solid wall or berm reduces noise levels by five to ten dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer homes is generally 30 dBA or more.

Table 22: Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 100 feet		
	100	
Gas Lawnmower at 3 feet		
	90	
		Food Blender at 3 feet
Diesel Truck going 50 mph at 50 feet	80	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Area during Daytime	50	Dishwasher in Next Room
Quiet Urban Area during Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	30	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation, 1998.

Groundborne vibration is sound radiated through the ground, and is an oscillatory motion that can be described in terms of the displacement, velocity, or acceleration. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. Sources of groundborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides, etc.), or manmade causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous, such as factory machinery, traffic, trains, and most construction vibrations (with the

exception of pile driving, blasting, and some other types of construction/demolition), or transient, such as explosions.[9] Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible.

4.9.1 Regulatory Framework

Federal

There are no Federal noise regulations applicable to the Project or Project site.

State

The California Department of Health Services ("DHS"), Office of Noise Control, has published the Guidelines for Noise and Land Use Compatibility, which recommend guidelines for local governments to use when setting standards for human exposure to noise and preparing noise elements for general plans. These guidelines are summarized in Table 23, Noise and Land Use Compatibility Criteria. It should be noted that application of these guidelines to development projects is not mandated by the DHS; however, each jurisdiction is required to consider the Noise and Land Use Compatibility Criteria when developing its general plan noise element and when determining acceptable noise levels within its community.

As shown in Table 23 residential land uses and other noise sensitive receptors generally should be located in areas where outdoor ambient noise levels do not exceed 65 to 70 dBA (Ldn or CNEL). For single-family, duplex, and mobile homes, an exterior noise level up to 60 dBA (Ldn or CNEL) is considered to be a "normally acceptable" noise level, which is based on the assumption that any buildings involved are of normal construction that would not require special noise insulation. For multi-family homes, motels, and hotels, an exterior noise level up to 65 dBA (Ldn or CNEL) is considered to be a "normally acceptable" noise level. Between these noise values and 70 dBA (Ldn or CNEL), exterior noise levels for these land uses would be considered to be "conditionally acceptable," where construction should only occur after a detailed analysis of the noise reduction requirements is made and needed noise attenuation features are included in the Project. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. For commercial uses, exterior noise levels up to 70 dBA (Ldn or CNEL) are considered to be a "normally acceptable" noise level, while exterior noise levels up to 77 dBA (Ldn or CNEL) are considered to be a "conditionally acceptable" noise level.

[9] *California Department of Transportation, Transportation Related Earthborne Vibrations, Technical Advisory Number TAV-02-01-R9601, February 20, 2002.*

Table 23: Noise and Land Use Compatibility Criteria

Land Use	Community Noise Exposure (L_{dn} or CNEL, dB)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Single-family, Duplex, Mobile Homes	50 - 60	55 - 70	70 - 75	above 70
Multi-Family Homes	50 - 65	60 - 70	70 - 75	above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 - 70	60 - 70	70 - 80	above 80
Transient Lodging – Motels, Hotels	50 - 65	60 - 70	70 - 80	above 80
Auditoriums, Concert Halls, Amphitheaters	—	50 - 70	—	above 65
Sports Arena, Outdoor Spectator Sports	—	50 - 75	—	above 70
Playgrounds, Neighborhood Parks	50 - 70	—	67 - 75	above 72
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 - 75	—	70 - 80	above 80
Office Buildings, Business and Professional Commercial	50 - 70	67 - 77	above 75	—
Industrial, Manufacturing, Utilities, Agriculture	50 - 75	70 - 80	above 75	—

Notes:
1 Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
2 Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
3 Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4 Clearly Unacceptable: New construction or development should generally not be undertaken.

Source: Office of Noise Control, California Department of Health Services (DHS).

Mono County

Mono County is the local agency responsible for adopting and implementing policies as they relate to noise levels and their affect on land uses within its jurisdiction. The Noise Element of the Mono County General Plan identifies goals and policies to attain and maintain acceptable noise levels within the county (County of Mono Planning Department 2010). Chapter 10.16 (Noise Regulation) of the Mono County Code sets noise standards for different types of land uses and also prohibits noise that would exceed these standards on other property within the County. Both acceptable and unacceptable noise levels associated with construction activities and exterior noise levels at various land use zones have been defined and quantified.

Exterior Noise Limits: Section 10.16.070 of the County Noise Ordinance establishes exterior noise limits for various land use categories. These exterior noise limits are shown in Table 24, Mono County Exterior Noise Limits. According to Section 10.16.070 of the County Noise Ordinance, noise levels measured on properties other than those containing the noise source are not allowed to exceed:

1) The noise standard for that land use identified in Table 24 for a cumulative period of more than thirty minutes in any hour; or
2) The noise standard plus five decibels for a cumulative period of more than fifteen minutes in any hour; or
3) The noise standard plus ten decibels for a cumulative period of more than five minutes in any hour; or
4) The noise standard plus fifteen decibels for a cumulative period of more than one minute in any hour; or
5) The noise standard plus twenty decibels or the maximum measured ambient level, for any period of time.

In addition, if the existing exterior ambient noise level exceeds the permissible level within the noise limit categories, the allowable noise exposure standard is increased in five dBA increments in each category as appropriate to encompass or reflect the ambient noise level. Furthermore, in the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category would be increased to reflect the maximum ambient noise level.

Table 24: Mono County Exterior Noise Limits

Receiving Land Use	Time Period	Noise Zone Classification[1] Maximum Noise Levels (dBA) (Levels Not to Be Exceeded More Than Thirty Minutes in Any Hour)		
		Rural/ Suburban	Suburban	Urban
One and Two Family Residential	10 p.m. to 7 a.m.	40	45	50
	7 a.m. to 10 p.m.	50	55	60
Multiple Dwelling Residential/Public Space	10 p.m. to 7 a.m.	45	50	55
	7 a.m. to 10 p.m.	50	55	60
Limited Commercial/Some Multiple Dwellings	10 p.m. to 7 a.m.	55	—	—
	7 a.m. to 10 p.m.	60	—	—
Commercial	10 p.m. to 7 a.m.	60	—	—
	7 a.m. to 10 p.m.	65	—	—
Light Industrial	Anytime	70	—	—
Heavy Industrial	Anytime	75	—	—

Notes:
[1] The classification of different areas of the community in terms of environmental noise zones shall be determined by the noise control officer, based upon assessment of community noise survey data. Additional area classification should be used as appropriate to reflect both lower and higher existing ambient levels than those shown. Industrial noise limits are intended primarily for use at the boundary of industrial zones rather than for noise reduction within the zone.

Source: Mono County Noise Ordinance, Chapter 10.16.070 Mono County Code.

Interior Noise Limits: Section 10.16.080 of the County Noise Ordinance establishes interior noise limits for multi-family residential dwellings. According to Section 10.16.080 of the County Noise Ordinance, interior noise levels resulting from outside sources within residential units shall not exceed 45 dBA for a cumulative period more than five minutes in any hour between 7 a.m. and 10 p.m., and 35 dBA for a cumulative period of more than five minutes in any hour between 10 p.m. and 7 a.m. In addition, interior noise levels may not exceed:

1) The noise standards plus five decibels for a cumulative period of more than one minute in any hour; or
2) The noise standard plus ten decibels or the maximum measured ambient, for any period of time.

Furthermore, if the existing interior ambient noise level exceeds the permissible level within the noise limit categories, the allowable noise exposure standard is increased in five dBA increments in each category as appropriate to encompass or reflect the ambient noise level.

Construction Noise Limits: According to Section 10.16.090 of the County Noise Ordinance, construction activities are permitted between the hours of 7 a.m. and 7 p.m., Monday through Friday. Construction activities are only permitted on weekends and holidays if they do not produce noise that crosses a residential or commercial property line. Exemptions are allowed for emergency work by public service utilities or variance granted by the Planning Commission.

The County has established noise standards for construction activity in Section 10.16.090 of the County Noise Ordinance. These standards are shown in Table 25, Mono County Construction Noise Standards. As shown below in the Table 25, the County has established maximum exterior noise levels during permitted work hours from the operation of equipment used in construction, drilling, repair, alteration, or demolition work. All mobile and stationary internal-combustion powered equipment and machinery are also required to be equipped with suitable exhaust and air-intake silencers in proper working order. Compliance with the County construction noise standards is dependent upon technical and economic feasibility.

Table 25: Mono County Construction Noise Standards

Construction Equipment[1]	Maximum Noise Levels			
	Type I Areas Single-Family Residential	Type II Areas Multi-Family Residential	Type III Areas Semi-Residential Commercial	Business Properties
Mobile Equipment[2]				
Daily, except Sundays and legal holidays; 7 a.m. to 7 p.m.	75 dBA	80 dBA	85 dBA	—
Daily, 7 p.m. to 7 a.m. and all day Sunday and legal holidays	60 dBA	65 dBA	70 dBA	—
Daily, including Sunday and legal holidays; All hours	—	—	—	85 dBA
Stationary Equipment[3]				
Daily, except Sundays and legal holidays; 7 a.m. to 7 p.m.	60 dBA	65 dBA	70 dBA	—
Daily, 7 p.m. to 7 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA	—
Daily, including Sunday and legal holidays, All hours	—	—	—	75 dBA

Notes:
[1] All mobile or stationary internal combustion engine-powered equipment or machinery shall be equipped with suitable exhaust and air intake silencers in proper working order.
[2] Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment.
[3] Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of ten days or more) of stationary equipment.

Source: Mono County Noise Ordinance, Chapter 10.16.090, Mono County Code.

In addition to the above standards, the operation of any device that creates a vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet (forty-six meters) from the source if on a public space or public right-of-way is prohibited. Other prohibitions or limitations pertain to alarms, domesticated animals, loudspeakers, and other noise sources.

4.9.2 Existing Environment

Occupants in such land uses as schools, hospitals, housing, religious, educational, convalescent, and medical facilities are more sensitive to noise than commercial, agricultural, and industrial uses. Sensitive receptors include, but are not limited to, residences, schools, hospitals, parks and office buildings. The Project site is located in a rural environment and there are no sensitive receptors in the site vicinity. The closest noise-sensitive concentrated land use is Sherwin Creek Campground, located approximately 1.5 miles to the southwest. Chance Ranch is the closest residence, approximately 1.5 miles to the east. Hot Creek Hatchery residences are located about three miles to the east-southeast. The John Muir Wilderness Area is located about 2.5 miles to the south of the project site. A Mono County office building is located approximately 1.25 miles to the east. Dispersed recreation use occurs within one mile of the project site on lands in the Inyo National Forest, though some of this recreation is itself noise-generating such as the use of off-road vehicles, all terrain vehicles, motorcycles, and target shooting. Pedestrian uses such as dog

walking and snowshoeing along the public roadways in the vicinity of the site (primarily Substation Road/Old Highway) are also a common occurrence.

Three existing geothermal power plants are located on or adjacent to the Project site: MP-I (the plant to be replaced), MP-II and PLES-I. These facilities comprise the predominant sources of existing noise on the Project site. Traffic from U.S. Highway 395 is not audible on the Project site due both to the distance and the more prominent noise from the existing plants. There are occasionally off-road vehicles (four wheel drive vehicles, all terrain vehicles, motorcycles/dirt bikes, and snowmobiles) recreating in the area that generate fairly high noise levels in their vicinities. There is also a target shooting range located to the northeast of the geothermal complex as well as other recreational (and illegal) target shooting in the area, which generate loud and intermittent noise levels. Woodcutting activities also are periodic sources of noise in the area. Aircraft noise is audible intermittently from aircraft approaching and departing the Mammoth Yosemite Airport, located approximately 2.75 miles southeast of the Project site.

In 1987, Environmental Science Associates (ESA) measured 24-hour ambient noise levels at the Casa Diablo Geothermal Resource Area, which includes the Project site. These measurements were taken after the MP-I plant was built and operating but before the other two adjacent geothermal power plants, PLES-I and MP-II, were built. Noise levels were measured at 75-76 dBA at a distance of 150 feet from the plant (though not specified if this was from the plant boundary or from the center of the plant). ESA characterized the noise as a continuous high-level hum.

Noise levels were measured again on January 28, 2011, using a calibrated Metrosonics db-308 Sound Analyzer. The weather was clear and calm during the noise measurements. It was confirmed that all three plants were operating at normal operation. One of the measurement locations (Point 4) is in the same general area as the 1987 measurement (east of the MP-I plant), and was measured at 68 dBA, which is less than the 1987 measurement. Measurements were also taken just north of the MP-I plant (Point 3), on the proposed M-1 plant site (Point 5; which, being adjacent to MP-II and PLES-I, primarily receives noise from those plants), and then a point about 460 feet south of PLES-I (Point 2, at intersection of State Route 203 and Old Highway 395) and one farther field location near the entrance to the kiosk/parking area off State Route 203 (Point 1). Figure 32, Noise Monitoring Locations and Levels, shows the monitoring locations and the resulting noise levels. The noise at the kiosk/parking area (Point 1) was primarily comprised of traffic noise from U.S. Highway 395 and State Route 203 and was largely unaffected by noise from the plants.

To aid with comparing the noise levels at designated distances, noise attenuation equations were used to derive the noise levels at 150 feet and 400 feet respectively, from the center of the MP-I plant using the average of the two monitoring locations near MP-I.

- 150 feet from center of MP-I plant: 75.5 dBA
- 400 feet from center of MP-I plant: 67.0 dBA

The noise calculations use the simple and usually conservative assumption of hemispherical attenuation of sound with distance and a reduction of 6 dBA per doubling of the distance.

4.9.3 Environmental Impacts

The "loudness" of a sound is less the farther the listener is away from the source of the sound. A generally conservative estimate of the rate of sound "loudness" reduction is 6 dBA for each doubling of the distance

from the noise source. For example, if the sound level at 100 feet from a source is 66 dBA, at 200 feet the noise level would be about 60 dBA. At 400 feet the noise level would be about 54 dBA, and so on.

Many factors can also affect the rate at which the loudness of the sound is reduced with distance. These include topography, ground surface, vegetation, wind direction, air turbulence, humidity and temperature. Soft, natural ground surfaces and vegetation, particularly trees, can substantially reduce the loudness of the noise reduction with distance. A dense planting of trees with shrubs below the trees can produce an additional noise reduction of 3-5 dBA per 100 feet of distance from the sound source (Harris and Dines 1997). However, for this analysis the conservative 6 dBA noise reduction for each doubling of the distance from the source was used.

CEQA Significance Criteria

Pursuant to Appendix G of the CEQA Guidelines, the following effects from noise could be considered significant under CEQA if the project would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project; or
- A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

The Project site is located approximately 2.75 miles northwest of the public Mammoth Yosemite Airport. However, the project would involve the replacement of an existing geothermal power plant with a similar facility approximately 500 feet to the northeast of the existing MP-I plant, with no anticipated increase in the number of on-site employees. Neither the existing MP-I facility or the replacement M-1 plant, nor the two operating simultaneously during the temporary transition period, would expose workers at the project site to excessive noise levels generated by routine operation of the airport. The project site is not located within the vicinity of a private airstrip. Therefore, the *Proposed Project* would not expose persons to excessive noise levels associated with a private airstrip. No further analysis of these issues is required.

The State *CEQA Guidelines* do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial." As discussed previously in this section, a noise level increase of three dBA is barely perceptible to most people, a five dBA increase is readily noticeable, and a difference of ten dBA would be perceived as a doubling of loudness. Based on this information, if the existing noise environment at the sensitive land use exceeds the County's exterior noise limits as shown in Table 24, an increase in Ldn noise levels of three dBA or greater resulting from the Project would be considered a significant impact. However, if the existing noise environment at the sensitive land use is at or below the County's exterior noise limits, an increase in Ldn noise levels of five dBA or greater resulting from the Project would be considered significant.

Environmental Impacts of the Proposed Project

Construction Activities:

Construction noise levels were estimated by data published by the United States Environmental Protection Agency. Potential noise levels are identified for off-site locations that are sensitive to noise, including existing residences.

Construction of the proposed M-1 power plant would involve the short-term use of heavy equipment such as backhoes, cranes, loaders, dozers, graders, excavators, compressors, generators, and various trucks for mobilizing crew, transporting construction material and debris, line work, and site watering. This would be temporary and only occur during the actual construction and drilling operations. The Project would not generate substantial groundborne vibration or noise, and so would not expose persons to excessive groundborne vibration or groundborne noise levels.

Short-term increases in noise levels within the immediate project vicinity would result from construction activities. The U.S. EPA has compiled data regarding the noise generating characteristics of specific types of construction equipment and typical construction activities. These data are presented in Table 26, Noise Ranges of Typical Construction Equipment, and Table 27, Typical Outdoor Construction Noise Levels. These noise levels would diminish rapidly with distance from the construction site at a rate of approximately six dBA per doubling of distance. For example, a noise level of 84 dBA Leq measured at 50 feet from the noise source to the receptor would reduce to 78 dBA Leq at 100 feet from the source to the receptor, and reduce by another six dBA Leq to 72 dBA Leq at 200 feet from the source to the receptor.

During construction, two basic types of activities would be expected to occur and generate noise. The first activity would involve the preparation, excavation, and grading of the Project site to accommodate the building foundations for the new M-1 plant. Grading of the site would require approximately 28,864 cubic yards of cut and 18,900 cubic yards of fill. This would require several daily truck trips (inbound and outbound) to haul the excess material to an off-site location. The second activity that would generate noise during construction would involve the physical construction and finishing of the new M-1 plant. The third activity that would generate noise during construction would involve the physical removal of the existing MP-I plant and transformation of the existing plant site into a storage pad. Overall, construction activities within the Project site are anticipated to occur over a 3-year period. No pile driving activities would be required for the Project.

Table 26: Noise Ranges of Typical Construction Equipment

Construction Equipment	Noise Levels in dBA Leq at 50 feet[1]
Front Loader	73–86
Trucks	82–95
Cranes (moveable)	75–88
Cranes (derrick)	86–89
Vibrator	68–82
Saws	72–82
Pneumatic Impact Equipment	83–88
Jackhammers	81–98
Pumps	68–72
Generators	71–83
Compressors	75–87
Concrete Mixers	75–88
Concrete Pumps	81–85
Back Hoe	73–95
Pile Driving (peaks)[2]	95–107
Tractor	77–98
Scraper/Grader	80–93
Paver	85–88

Notes:
[1] Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.
[2] Pile drivers are not anticipated to be used during any phase of construction of the *Proposed Project*.
Source: U.S. EPA 1971.

Table 27: Typical Outdoor Construction Noise Levels

Construction Phase	Noise Levels at 50 Feet with Mufflers (dBA Leq)	Noise Levels at 60 Feet with Mufflers (dBA Leq)	Noise Levels at 100 Feet with Mufflers (dBA Leq)	Noise Levels at 200 Feet with Mufflers (dBA Leq)
Ground Clearing	82	80	76	70
Excavation, Grading	86	84	80	74
Foundations	77	75	71	65
Structural	83	81	77	71
Finishing	86	84	80	74

Source: U.S. EPA, 1971.

As shown in Table 27, typical outdoor noise levels at noise-sensitive receptors 50 feet from the noise source could range from 77 dBA to 86 dBA Leq, without implementation of noise reduction measures. The noisiest pieces of equipment which would be anticipated to be used during the Project's development would include front loaders and backhoes, which can produce maximum noise levels of approximately 86

and 95 dBA at 50 feet with implementation of the required feasible noise reduction control measures. Construction equipment would not include pile drivers. As with all construction equipment, these noise levels would diminish rapidly with distance from the construction site at a rate of approximately six dBA per doubling of distance.

The nearest sensitive receptor to the Project site is the Mono County office building located approximately 1.25 miles to the east. All other sensitive receptors are at least 1.5 miles removed from the site. Due to the amount of intervening terrain between the site and these sensitive receptors and the fact that noise attenuates at approximately six dBA per doubling of distance, it is not likely that construction noise would be audible at these locations.

As discussed previously, under Section 10.16.90 of the County Noise Ordinance, the County has established noise standards for construction activity (see Table 25). Again, given the distance from the site to the nearest sensitive receptors (both residential and business), construction noise emanating from the Project site would likely not be audible at these locations and certainly would be in compliance with the applicable noise standards in the County Noise Ordinance. Furthermore, all mobile and stationary internal-combustion powered equipment and machinery are required to be equipped with suitable exhaust and air-intake silencers in proper working order under the County Noise Ordinance.

Construction activities would comply with the applicable requirements of the Mono County Noise Ordinance. Construction noise impacts would be *less than significant* due to the short-term nature of this noise, the distance to applicable land uses, and due to compliance with all requirements of the Mono County Noise Regulations.

No mitigation measures are necessary as the Project would have a less than significant impact with respect to construction noise.

The Project would have a less than significant impact with respect to construction noise.

Replacement Plant Operations:

Upon completion of the Project, noise at the Project site would primarily be generated by the new M-1 geothermal power plant. The Project would not increase the amount of vehicular traffic on the surrounding roadways; thus, no vehicular noise impacts are expected to occur. As discussed previously, the County has established exterior noise standards for different land uses. As indicated in the County Noise Ordinance, noise levels at each land use may not exceed the exterior noise standard plus 20 dBA for any period of time (maximum noise level).

As described in Section 2.1, the Project consists of the replacement of the existing MP-I geothermal power generating facility with a new facility (referred to as M-1) approximately 600 to 700 feet to the east. In the 25-plus years since the existing MP-I plant was designed and constructed, the state of the technology has improved with respect to noise generation. In general, the on-going operation of the new power plant would be less noisy than the temporary construction activities. However, the noise generated by the power plant would, as is the case under existing conditions, be constant and steady rather than episodic and fluctuating.

The principal noise sources at the new M-1 facility would be turbine operations and noise generated from the fans in the air condensers. For this analysis, noise levels measured at various distances from the Galena-3 geothermal power plant located near Reno, Nevada have been used to be representative for the

proposed M-1 plant. The Galena-3 plant is relatively new with similar technology and equipment as is being proposed for the M-1 plant; however, noise levels from Galena-3 would be higher than for M-1 noise because Galena-3 is rated at 6.5 megawatts (MW) more than M-1 (26.5 vs. 20.0 MW gross) is planned for and thus has more cooling fans than M-1 (108 fans on Galena-3 vs. an estimated 81 fans on M-1). Therefore, using the measured Galena-3 noise levels would be representative but conservative (worse-case) and the actual noise levels from M-1 would be expected to be lower.

Using the conservative (high) noise levels from Galena-3, the replacement M-1 plant is estimated to generate an ambient noise level of approximately 71.5 dBA at 150 feet and 62 dBA at 400 feet from the center of the plant. These exterior noise levels compare to 75.5 dBA and 67.0 dBA at the same respective distances from the existing MP-I plant. Therefore, the new plant would be approximately 4-5 dBA quieter than the existing plant, which would represent an audible decrease. Therefore, there is a beneficial impact to noise from the *Proposed Project*.

As noted previously, the nearest sensitive receptor to the Project site is the Mono County office building located approximately 1.25 miles to the east. All other sensitive receptors are at least 1.5 miles removed from the site. Due to the amount of intervening terrain between the site and these sensitive receptors and the fact that noise attenuates at approximately six dBA per doubling of distance, it is not likely that M-1 plant operational noise would be audible at these locations.

As discussed previously, under Section 10.16.90 of the County Noise Ordinance, the County has established standards for exterior noise (see Table 24). Again, given the distance from the site to the nearest sensitive receptors (both residential and business), M-1 plant noise emanating from the Project site would not likely be audible at these locations and would certainly be in compliance with the applicable noise standards in the County Noise Ordinance.

The Mono County General Plan's Noise Element contains policies that are applicable to the *Proposed Project*:

> Objective C: Avoid the juxtaposition of potentially noise-incompatible land uses.
>
> *Policy 3*: *Avoid the development of significant noise-generating land uses adjacent to noise-sensitive land uses such as schools, hospitals, residential and wilderness areas.*
>
> > *Action 3.2:* Locate noise-intensive uses on the periphery of community areas.
> >
> > *Action 3.3:* Require sufficient buffers between noise-intensive uses and noise-sensitive uses.

The Project site is not located adjacent to noise-sensitive land uses and is located on the periphery of the Mammoth Lakes community area. Buffers of at least 1.25 miles are located between the Project site and noise-sensitive uses. Thus, the Project would be consistent with the applicable policies of the Mono County General Plan.

Long-term operational noise impacts would be *less than significant* due to the distance between the proposed M-1 plant and the nearest residential and commercial land uses, and due to compliance with all requirements of the Mono County Noise Regulations and consistency with Mono County noise policies.

No mitigation measures are necessary, as the Project would have a less than significant impact with respect to long-term operational noise.

The Project would have a less than significant impact with respect to long-term operational noise and would actually reduce the amount of noise currently being generated at the Project site.

Decommissioning Activities:

There would be a transition decommissioning period of up to 24 months during which both plants (MP-I and M-1) would be operating simultaneously. In order to evaluate the noise from both plants operating at the same time, a noise receptor point was selected about midway between the center of the two plants - approximately 500 feet from the center of each plant site. The noise level from MP-I alone is calculated to be 65.0 dBA at this point, and the noise level from M-1 alone would be 62.6 dBA at this point, a difference of 2.4 dBA. Using standard decibel addition tables (based on log rhythmic additions), the combination of two noise sources that are 2.4 dBA apart in magnitude would yield an incremental increase of 1.97 dBA. The resulting noise levels experienced at the point on the Project site located midway between the centers of the two plants would be approximately 67 dBA. The difference between each of the plants operating without the other and the two plants operating together would be imperceptible.

The contribution of additional noise from the existing off-site MP-II and PLES-I power plants would also not be perceptible at this location because the predominant noise sources would be from MP-I and M-1 so the noise from the two other existing plants would not be audibly perceptible due to their distance farther to the east.

The existing noise level measured at Point 2 on Figure 32 (the intersection of SR 203 and Old Highway 395) with the existing MP-I, MP-II, and PLES-I plants operating is 65.3 dBA, which is primarily comprised of noise from PLES-I, the closest of the three plants to this location. Following Project completion, the estimated noise from M-1 at this point would be 56.6 dBA. The difference between these two noise levels is 8.7 dBA, which would result in an increase of about 0.53 dBA over existing noise levels, which is an imperceptible noise increase. This noise level accounts for noise from all four plants operating at the same time because the existing ambient noise measurement already includes the three existing plants operating simultaneously.

As noted previously, the nearest sensitive receptor to the Project site is the Mono County office building located approximately 1.25 miles to the east. All other sensitive receptors are at least 1.5 miles removed from the site. Due to the amount of intervening terrain between the site and these sensitive receptors and the fact that noise attenuates at approximately six dBA per doubling of distance, it is not likely that operational noise from the existing MP-I and proposed M-1 plants operating simultaneously would be audible at these locations.

Figure 32: Noise Monitoring Locations and Levels (Ormat 2011a)

As discussed previously, under Section 10.16.90 of the County Noise Ordinance, the County has established standards for exterior noise (see Table 24). Again, given the distance from the site to the nearest sensitive receptors (both residential and business), the combination of MP-I and M-1 plant noise emanating from the Project site would not likely be audible at these locations and would certainly be in compliance with the applicable noise standards in the County Noise Ordinance.

Long-term operational noise impacts would be *less than significant* due to the distance between the Project site and the nearest residential and commercial land uses, the temporary duration of the period in which the two plants would be operating simultaneously, and due to compliance with all requirements of the Mono County Noise Regulations.

No mitigation measures are necessary, as the Project would have a less than significant impact with respect to noise associated with the decommissioning period.

The Project would have a less than significant impact with respect to noise associated with the decommissioning period.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed and the site would be restored to a natural appearing condition consistent with the Reclamation Plan requirements approved by Mono County. There would be no continuing noise impact from the Project after the site is restored.

Environmental Impacts of the Alternative Power Plant Location

The selected *Alternative Power Plant Location* would be located north of the existing SCE substation and east of the proposed Casa Diablo IV Geothermal Development Project (CD-4) power plant site (see discussion in Chapter 2.2.1). An approximately 600-foot interconnection transmission line would need to be constructed from the alternative plant site to the existing SCE substation. In addition, new production and injection fluid pipelines would need to be constructed to the alternative plant site. The construction, MP-I decommissioning, operations, and eventual site reclamation of the *Alternative Power Plant Location* geothermal development would be essentially the same as those activities described for the *Proposed Project* with only minor site-specific adjustments.

Construction Activities:

Noise impacts from development of the proposed M-1 plant at the *Alternative Power Plant Location* would be substantially the same as at the proposed site. As with all construction equipment, noise levels would diminish rapidly with distance from the construction site at a rate of approximately six dBA per doubling of distance. Because the alternative site is farther removed from existing off-site noise receptors, it is likely that noise from construction activities would be experienced by fewer people even though the amount of noise generated would be the same as at the proposed site. Construction of the new transmission line and pipeline to the alternative site would create some minor additional noise that would not be associated with placement of the M-1 plant at the proposed site.

Construction activities at the *Alternative Power Plant Location* would comply with the applicable requirements of the Mono County Noise Ordinance. Construction noise impacts would be *less than significant* due to the short-term nature of this noise, the distance to applicable land uses, and due to compliance with all requirements of the Mono County Noise Regulations.

No mitigation measures are necessary as development of the project at the *Alternative Power Plant Location* would have a less than significant impact with respect to construction noise.

Development of the Project at the *Alternative Power Plant Location* would have a less than significant impact with respect to construction noise.

Replacement Plant Operations:

Noise impacts from operation of the proposed M-1 plant at the *Alternative Power Plant Location* would be identical to those resulting from operation of the plant at the proposed site in terms of noise generation from the plant itself. The new plant would be approximately 4-5 dBA quieter than the existing plant, which would represent an audible decrease.

The nearest sensitive receptor to the Project site is the Mono County office building located approximately 1.7 miles to the east. All other sensitive receptors are at least 1.8 miles removed from the site. Due to the amount of intervening terrain between the site and these sensitive receptors and the fact that noise attenuates at approximately six dBA per doubling of distance, it is not likely that M-1 plant operational noise from the *Alternative Power Plant Location* would be audible at these locations.

As discussed previously, under Section 10.16.90 of the County Noise Ordinance, the County has established standards for exterior noise (see Table 24). Again, given the distance from the site to the nearest sensitive receptors (both residential and business), M-1 plant noise emanating from the *Alternative Power Plant Location* would not likely be audible at these locations and would certainly be in compliance with the applicable noise standards in the County Noise Ordinance.

The *Alternative Power Plant Location* is not located adjacent to noise-sensitive land uses and is located on the periphery of the Mammoth Lakes community area. Buffers of at least 1.4 miles are located between the alternative site and noise-sensitive uses. Thus, the Project would be consistent with the applicable policies of the Mono County General Plan.

Placement of the proposed M-1 plant at the *Alternative Power Plant Location* would introduce a new source of noise to a site that currently does not produce noise and experiences minimal noise. Thus, development of the new plant at this site would effectively expand the noise footprint in the general vicinity of the Casa Diablo geothermal complex in a manner that use of the proposed M-1 site would not.

Long-term operational noise impacts would be *less than significant* due to the distance between the *Alternative Power Plant Location* and the nearest residential and commercial land uses, and due to compliance with all requirements of the Mono County Noise Regulations and consistency with Mono County noise policies.

No mitigation measures are necessary, as development of the project at the *Alternative Power Plant Location* would have a less than significant impact with respect to long-term operational noise.

Development of the project at the *Alternative Power Plant Location* would have a less than significant impact with respect to long-term operational noise and would actually reduce the amount of noise currently being generated at the Project site.

Decommissioning Activities:

The *Alternative Power Plant Location* is located approximately 2,000 feet north of the proposed M-1 plant site. At this distance, noise attenuation would be such that there would be virtually no combined noise associated with operation of the existing MP-I plant in concert with the new plant audible at any given location. Noise generated at the existing MP-I plant would be less than under existing operational conditions as the plant would not be operated at current levels during the up to two-year transitional period. Thus, the dominant noise source in the area would be the existing PLES-I and MP-II plants, which would continue to operate as under existing conditions.

As noted above, placement of the proposed M-1 plant at the *Alternative Power Plant Location* would introduce a new source of noise to a site that currently does not produce noise and experiences minimal noise. Thus, development of the new plant at this site would effectively expand the noise footprint in the general vicinity of the Casa Diablo geothermal complex in a manner that use of the proposed M-1 site would not.

Noise impacts during the decommissioning period would be *less than significant* due to the distance between the *Alternative Power Plant Location* and the existing MP-I plant, and due to compliance with all requirements of the Mono County Noise Regulations and consistency with Mono County noise policies.

No mitigation measures are necessary, as development of the project at the *Alternative Power Plant Location* would have a less than significant impact with respect to noise during the decommissioning period.

Development of the project at the *Alternative Power Plant Location* would have a less than significant impact with respect to noise generated during the decommissioning period and would actually slightly reduce the amount of noise that would be experienced at the off-site monitoring locations.

Site Reclamation:

At the end of the Project life, all M-1 replacement plant facilities would be removed from the alternative plant site and the *Alternative Power Plant Location* geothermal pipeline corridor, and the site would be restored to a natural appearing condition consistent with the site restoration requirements of the USFS. There would be no continuing noise impact from the Project after the site is restored.

Environmental Impacts of the No Project Alternative

Under the No Project Alternative, the existing MP–I power plant would continue to operate. There would be no new plant site construction and there would be no new noise impacts in the existing Casa Diablo geothermal development area.

5 CUMULATIVE EFFECTS

CEQA requires consideration of cumulative impacts for a proposed action or project. CEQA Guidelines (Section 15355) provide a definition of cumulative impact.

> *Cumulative impact refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.*
>
> > *(a) The individual effects may be changes resulting from a single project or a number of separate projects; and*
> >
> > *(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.*

CEQA Guidelines Section 15130(a) states that:

> *An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable …*
>
> And
>
> *"Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.* [CEQA Guidelines Section 15065(a)(3)]

CEQA Guidelines Section 15130(b) identifies the alternative elements needed for an adequate discussion of significant cumulative impacts. The following elements, as set forth in Section 15130(b)(1)(A), were used for this cumulative impact assessment.

> *A list of past, present, and reasonably foreseeable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency*

5.1 EXISTING, PROPOSED, AND REASONABLY FORESEEABLE PROBABLE FUTURE PROJECTS

The existing proposed and reasonably foreseeable probable future projects evaluated in this cumulative effects assessment are all geothermal development projects in and near Casa Diablo Hot Springs.

5.1.1 Existing Casa Diablo Geothermal Development Projects

The three existing geothermal development projects include the Mammoth Pacific I Project (MP-I, aka G1); the Mammoth Pacific II Project (MP-II, aka G2); and the PLES-I Project (aka G3). These projects are all owned by Ormat and they are all operated by MPLP. The projects were briefly described

in Section 1.3, and they are collectively referred to as the existing Casa Diablo geothermal development complex.

The power generation facilities of the existing Casa Diablo geothermal development projects are located on adjoining private land and federal geothermal leases east of U.S. Highway 395 (see Figure 2). The original geothermal wellfield for the projects was located east of the Highway but was expanded by the Basalt Canyon (BLM, USFS and Mono County 2005; BLM and USFS 2001) and Upper Basalt (BLM and USFS 2005) geothermal well and pipeline projects to include locations west of the Highway (see Figure 33). The project wellfield and power plant facilities are interconnected by geothermal pipelines located on both private land owned by Ormat and geothermal leases of public land, administered by the BLM and USFS, and issued to Ormat.

Each of these binary power generation plants uses isobutane as the motive fluid to turn the turbines after being heated by the geothermal fluid. The projects emit few air pollutants. Fugitive isobutane is emitted from seals and flanges and other connections of the respective binary system containment systems.

The geothermal fluid is circulated through the respective binary plants in a closed system which prevents the emission of any of the geothermal gasses. All of the produced geothermal fluid is typically injected into the geothermal injection reservoir.

The existing air–cooled power plants consume a small amount of non–potable water for plant needs, such as landscaping and washing. This water is produced from a shallow, warm ground water well located near the MP-I power plant.

The projects are operated out of a single control room located adjacent to the existing MP-I power generation facilities; but the projects were independently approved and are permitted by different agencies (MP-I and MP-II by Mono County, and PLES-I by the BLM/USFS).

5.1.2 MP-I Replacement Project Changes to the Existing Casa Diablo Projects

The subject MP-I Replacement Project would result in the construction and operation of new power generation facilities affecting approximately 5.65 acres of land located between the existing MP-I and MP-II plant sites, and it would subsequently result in the removal of the existing MP-I power generating facilities from the MP-I power plant site. Those ancillary facilities within the MP-I Project area which are shared by all of the Casa Diablo geothermal development projects would remain. The ancillary facilities that would remain include the control room, warehouse/machine shop building, firewater pump house, and storage yard.

After removal of the existing MP-I power generation facilities, that portion of the MP-I power plant site would be graded and compacted, covered with gravel, and used as an additional storage area for the Casa Diablo geothermal development projects.

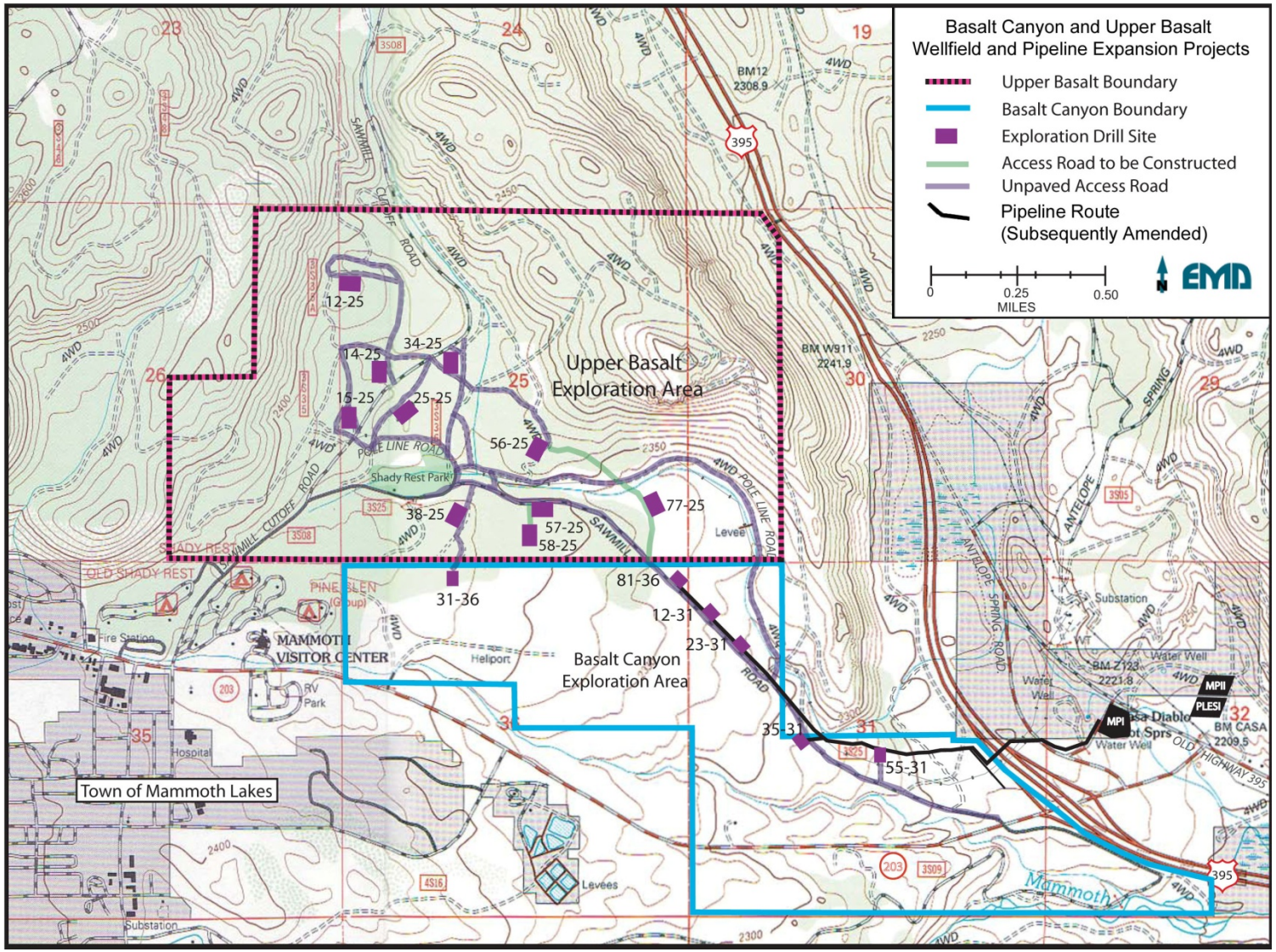

Figure 33: Approved Geothermal Wellfield and Pipeline Expansion Projects West of U.S. Highway 395

5.1.3 Proposed CD-4 Geothermal Development Project

The proposed Casa Diablo IV (CD–4) geothermal development project would be a new 33 MW (net) geothermal binary power plant and associated geothermal wellfield and pipeline system. The CD-4 power plant site would be located about one-quarter-mile north of the existing MP-I plant site on a federal geothermal lease. The CD-4 project would utilize geothermal resources produced from new or existing geothermal wells located within the earlier approved Basalt Canyon and Upper Basalt wellfield expansion area of the existing Casa Diablo geothermal wellfield (see Figure 33 and Figure 34). The CD-4 Project would include the following (BLM, USFS and GBUAPCD 2011):

- A new 33 MW geothermal power plant comprised of two binary generating units, turbines, condensers, reverse osmosis water treatment plant, pumps, piping, ancillary equipment, and an underground electric transmission line to interconnect to the neighboring SCE substation.
- Up to 16 geothermal resource wells (2 existing and 14 proposed) over the life of the project drilled to a depth of 1,500 to 2,500 feet below ground surface. Each well facility would be located on an approximately 0.4-acre well pad and include a small pump building.
- Pipelines to bring the geothermal brine to the power plant and to take cooled brine to the injection wells (a distance of approximately 4 miles).

The CD-4 Project may also include an optional evaporative assist cooling system that would be used to supplement the proposed air cooling system during the summer months (Ormat 2011b). The system would transport recycled water from the Mammoth Community Water District (MCWD) treatment plant via new pipeline a distance of about 2.5 miles and treat the water using a proposed reverse osmosis water treatment plant on the CD-4 power plant site.

5.2 EVALUATION OF POTENTIAL CUMULATIVE EFFECTS

The locations of the existing and proposed geothermal projects evaluated in this cumulative effects assessment are shown on Figure 35. A summary of the status of the projects considered in this cumulative impact assessment is provided below (Table 28).

Table 28: Summary and Status of Past, Present and Reasonably Foreseeable Probable Future Projects

Project	Project Status	Surface Area
Existing Casa Diablo Geothermal Development Complex (MP-I, MP-II and PLES-I and Including Expanded Wellfield)	**Approved** MP-I Began Operations in 1984 MP-II Began Operations in 1990 PLES-I Began Operations in 1990 Basalt Canyon Wellfield Expansion in 2002 Basalt Canyon Geothermal Pipeline in 2005 Upper Basalt Wellfield Expansion in 2005	About 29.2 acres
Subject MP-I Replacement Project	**Proposed** If Approved, Could Begin Construction in late-2011	About 5.7 acres
CD–4 Geothermal Development Project	**Proposed** If Approved, Could Begin Construction in 2012	About 26.8 acres
	Total:	**About 61.7 Acres**

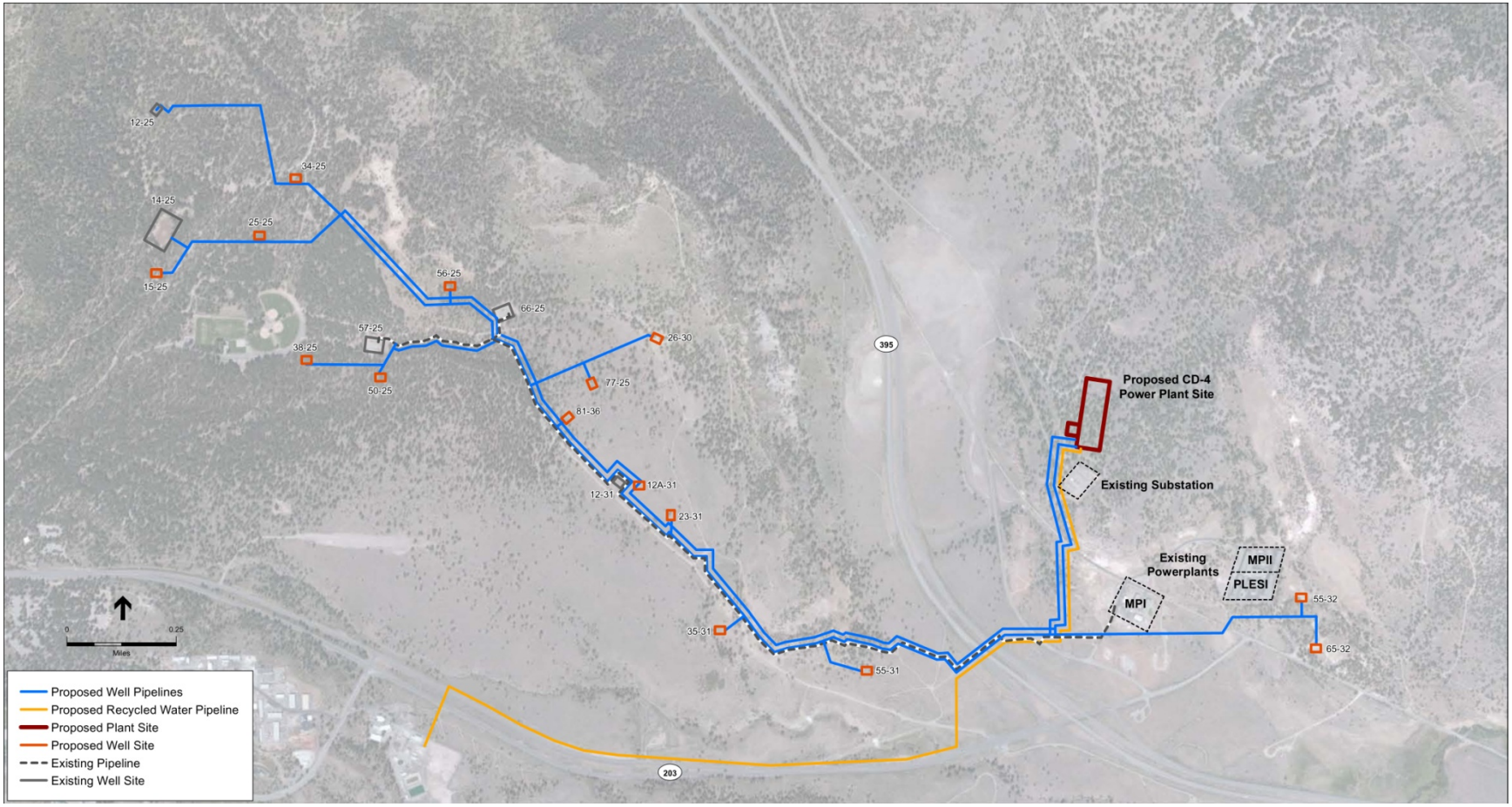

Figure 34: Proposed CD-4 Geothermal Power Plant Site and Wellfield (after Ormat 2010)

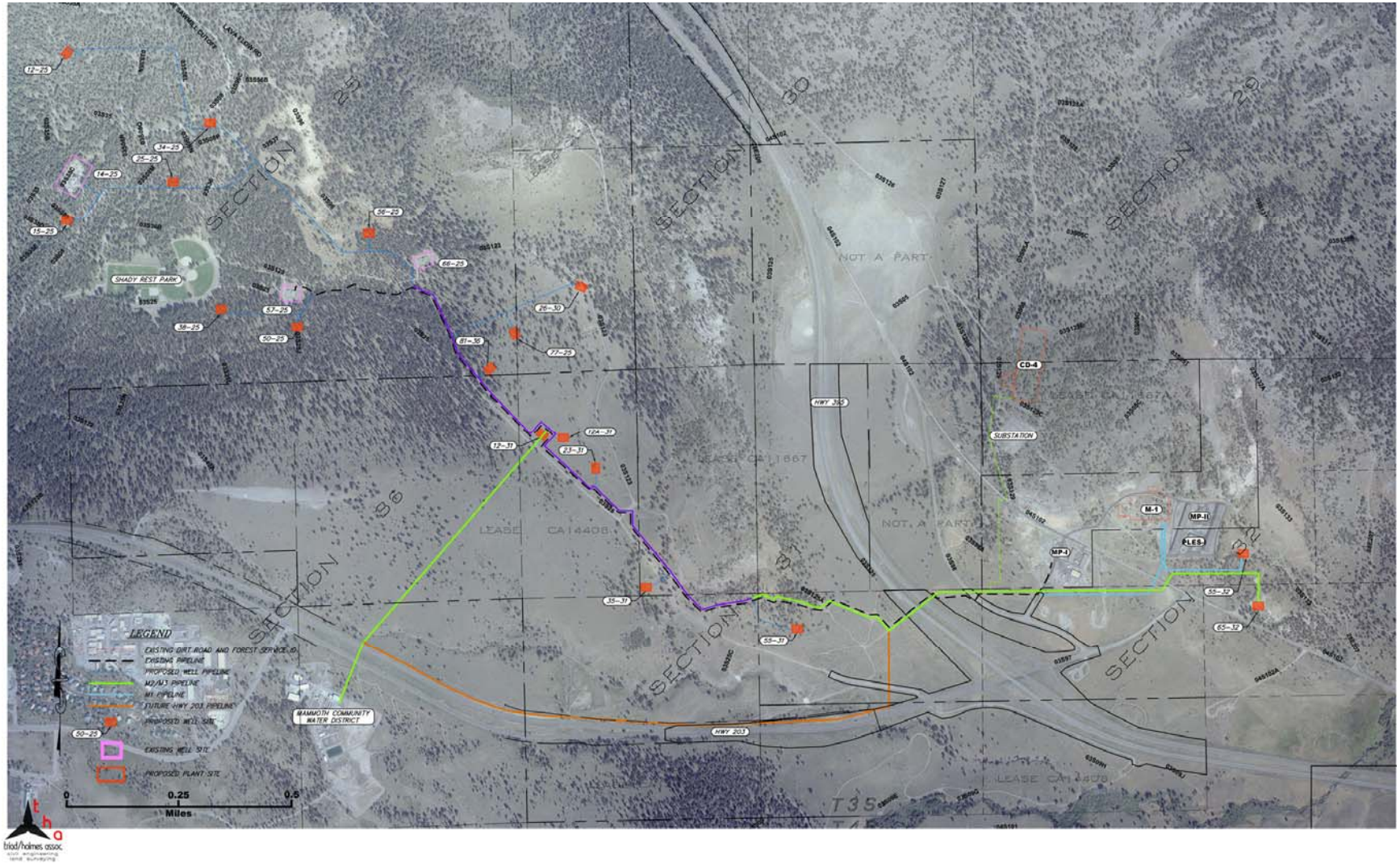

Figure 35: Existing, Proposed and Reasonably Foreseeable Project Facilities (after Triad/Holmes 2010)

While the listed projects are identified as five separate geothermal energy development projects, the proposed MP-I replacement plant would replace the existing MP-I power generation facilities; and each of the five projects would, at least initially, be owned by the same entity, Ormat, and operated by the same entity, MPLP. The identified projects would also share a common geothermal wellfield and would be operated out of a common control room located on the existing MP-I project site.

A cumulative impact consists of an impact which is created as a result of the combination of the Project together with other projects causing related impacts. CEQA directs that an EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

The geographical area of analysis for cumulative effects may vary, depending on the resource or resource issue being analyzed. Some potential impacts, such as geologic hazards and noise, may be cumulative only within or near the project sites. Others potential impacts, such as surface water quality, may be additive over the Mammoth Creek watershed. Cumulative impacts to migratory wildlife, such as deer, are possible over larger areas of similar habitat. The analyses which follow identify the geographical area over which the identified Project impacts may be combined with impacts of the cumulative projects.

5.2.1 Aesthetics

Area of Aesthetics Cumulative Effects Analysis

The cumulative effects area of analysis for aesthetics includes the viewshed within which the existing MP-I plant and the proposed M-1 site are visible from off-site, publicly accessible vantage points.

Cumulative Effects on Aesthetics

The cumulative visual effect of the existing Casa Diablo geothermal complex facilities and infrastructure and the proposed MP-I Replacement Project has been evaluated in Section 4.2, Aesthetics. However, due to public concern that existing lighting at the Casa Diablo geothermal complex may be out of compliance with County regulations and brighter than necessary for safe operation of the facilities, the following measure is required to ensure that all exterior lighting at the complex is modified to achieve compliance with the County's Dark Sky Regulations:

> **Cumulative Aesthetics Measure 1: An outdoor lighting plan for the entire Casa Diablo geothermal complex, including the *Proposed Project,* the existing MP-II and PLES-I plants, and all related structures must be submitted for County review and approval in conjunction with the application for design review. This lighting plan must be in compliance with applicable provisions of Chapter 23, Dark Sky Regulations, of the Mono County Code.**

The proposed CD-4 geothermal development project, as described above, would consist of a new 33 MW geothermal power plant to be constructed approximately one-quarter mile north of the existing MP-I plant and proposed M-1 location. Due to intervening topography and vegetation, these three sites would not be visible together from any of the Key Observation Points (KOPs) described in Section 4.2, Aesthetics. Two of the three sites (proposed CD-4 and proposed M-1) may be partially visible from KOP 6 but views of each site would be largely obscured by both topography and vegetation. To the extent that the proposed CD-4 plant would be visible from any of these viewpoints, the visual impact on the viewer would consist of a broadening of the existing footprint of geothermal power generation infrastructure in the Casa Diablo area rather than the introduction of a foreign and unexpected new element to the visual context.

Although the proposed CD-4 transmission lines would be placed underground, some of the pipelines that would connect the new plant to the existing network of geothermal wells and pipelines in the vicinity of the MP-I plant and proposed M-1 site would necessarily be located aboveground. These additional pipelines would be partially visible from two of the KOPs, (KOPs 6 and 9). However, when viewed from these locations, the CD-4 pipelines would be virtually indistinguishable from both the existing pipelines located in this area and the proposed pipelines to be built as part of the MP-I Replacement Project. As with the CD-4 plant itself, the cumulative visual effect of these pipelines on the viewer would consist of a minor intensification of the existing footprint of geothermal power generation infrastructure at the Casa Diablo complex rather than the introduction of a foreign and unexpected new element to the visual context.

Therefore, visual effects associated with existing, proposed, and reasonably foreseeable projects in the vicinity of the project site would not be cumulatively significant.

5.2.2 Air Quality

Area of Cumulative Air Quality Effects Analysis

The cumulative effects area of analysis for air quality includes the Great Basin Valleys air basin with respect to ambient air quality and the air sub-basin around the Town of Mammoth Lakes with respect to designated attainment/nonattainment status.

Cumulative Air Quality Effects

Each of the projects evaluated in this cumulative effects analysis is located in the Town of Mammoth lakes sub-basin of the Great Basin Valleys (GBV) air basin. The GBV air basin is a federal nonattainment area for PM_{10} , and the Mammoth Lakes sub-basin is a state non-attainment area for ozone and PM_{10}.

Particulate matter (PM_{10}), predominantly from fugitive dust, would occur during site construction activities at the proposed power plant sites, the access roads and well pads. Fuel combustion engine emissions would be released from heavy equipment engines during construction activities and from drill rig engines during well drilling activities. Construction and drilling activities would be intermittent, short-term and temporary. Each project would be subject to the fugitive dust and fuel combustion emission limitations of the GBUAPD rules and regulations. The cumulative air emissions from construction would have negligible impact on the regional air basin or local sub-basin attainment status. The adverse effects of the air emissions resulting from construction and well drilling activities would not be cumulatively significant.

Each of the existing and proposed projects would utilize binary geothermal technology from which there would be no air emissions during typical power generation activities. Operational fugitive dust emissions would occur from travel on unpaved access roads in the wellfield. There would also be testing and maintenance operation of the diesel-fueled emergency generators and firewater pump engines on the respective project sites (up to 50 hours per year) and periodic operations of the respective emergency generators and firewater pumps during unscheduled power outages and emergency operations. Each of the operational sources of emissions would be intermittent, short-term and temporary. The adverse effects of the air emissions resulting from operational activities of the projects would not be cumulatively significant.

The estimated motive fluid emissions that would occur from the proposed 33 MW CD-4 plant would be about 512 pounds per day (Personal Communication – Ron Leiken, Environmental/Regulatory Affairs Administrator, Ormat Nevada, Inc.; July 5, 2011). That amount would exceed the 250 pounds per day regulatory threshold for BACT of the GBUAPCD, and it is presumed that the CD-4 project would be required to meet Best Available Control Technology (BACT) and Mitigation Requirements (GBUAPCD Rule 209-A Section D). These mitigated fugitive emissions combined with the fugitive motive fluid emissions from the operating MP-II and PLES-I projects would total approximately 1,336 pounds per day (244 tons per year) of combined fugitive emissions of n-pentane and isobutane from the projects. While cumulatively considerable, these combined fugitive emissions would not conflict with or obstruct implementation of any applicable air quality plan; violate any air quality standard or contribute substantially to an existing or projected air quality violation; or expose sensitive receptors to substantial pollutant concentrations. As such, the adverse effects of the fugitive motive fluid air emissions would not be cumulatively significant.

5.2.3 Biological Resources

Area of Cumulative Biological Resource Effects Analysis

The area of cumulative effects on plant communities and wildlife habitat would be the combined areas of surface disturbance (about 61.7 acres) of the respective cumulative effects projects. Indirect cumulative effects would also occur to wildlife and habitat on neighboring properties for those species intolerant of human activity. Indirect cumulative impacts could also result from accidental system upsets affecting neighboring properties including those from potential geothermal fluid spills, spills of hazardous materials or petroleum hydrocarbons, and fire.

Cumulative Effects on Biological Resources

The estimated proportion of plant communities directly impacted by the combined projects is about 55 percent Big Sagebrush Scrub, 45 percent Jeffrey Pine Forest, 7 percent mechanically or thermally disturbed areas, and 3 percent of miscellaneous other plant communities. Both Jeffrey Pine Forest and Big Sagebrush Scrub plant communities are common throughout the region (see Figure 27), and the direct loss of about 28 acres and 34 acres, respectively, of these plant communities would not be cumulatively significant. Similarly, the direct loss of the wildlife habitat provided by these plant communities would not be cumulatively significant.

Indirect cumulative impacts on wildlife are more difficult to quantify. It is presumed that most species intolerant of human activity would move away from the disturbance caused by the respective projects, but this assessment presumes that there is adequate unaffected habitat available for these species on lands more distant from the respective project sites. Because sensitive species are intolerant of human activity, they lose habitat disproportionate to the direct habitat loss of more tolerant species.

Four of the existing or proposed project power plant sites are co-located in the area already impacted by the Casa Diablo geothermal development, and the indirect impact on sensitive wildlife species would not substantively differ from the existing conditions after construction of the M-1 replacement plant site is completed. The proposed CD-4 project power plant site is located approximately one-quarter mile north of the existing development within Jeffrey Pine Forest with good wildlife habitat qualities. This locality is somewhat affected by human activity as it is near the existing SCE substation and Antelope Springs Road. Sensitive wildlife species may already avoid the area, but a biological survey of the area would be required to determine if any sensitive species occupy the area. The potential adverse effects on wildlife from development of the CD-4 power plant site would be project specific and evaluated during the

NEPA/CEQA environmental assessment proposed for that project. The combined impact from the other four projects, including the proposed MP-I Replacement Project, on sensitive wildlife species would not be considerable, and as such, the adverse effects on sensitive wildlife species would not be cumulatively significant.

Mule deer are yearlong residents in and around the existing Casa Diablo geothermal development area. The proposed M-1 plant operations would be similar to the existing MP-I plant operations and after site construction and decommissioning of the MP-I power generation facilities, the proposed M-1 replacement plant operations would result in minimal cumulative adverse effects on resident mule deer and on mule deer migration or movement through the Casa Diablo area. The potential adverse effects on mule deer from development of the CD-4 power plant site would be project specific and evaluated during the NEPA/CEQA environmental assessment proposed for that project. The combined impact from the other four projects, including the proposed MP-I Replacement Project, on mule deer would not be considerable, and as such, the adverse effects on mule deer would not be cumulatively significant.

5.2.4 Cultural Resources

Area of Cumulative Cultural Resource Effects Analysis

The area of cumulative effects on cultural resources would be the combined area of surface disturbance (about 61.7 acres) of the respective cumulative effects projects.

Cumulative Effects on Cultural Resources

Cultural resources of the sites and area to be impacted by the proposed CD-4 geothermal development project have been evaluated as part of several NEPA/CEQA documents, particularly the Upper Basalt Canyon EA and the Basalt Canyon EA/EIR for the proposed wellfield and pipeline route, and in the cultural resource surveys performed for the proposed CD-4 plant. Construction of that portion of the proposed pipeline along the north side of Sawmill Road would not disturb any cultural resources. An intensive archaeological survey of the Project area east of U.S. Highway 395 conducted during the environmental review process for the MP-II and PLES-I plants also found no cultural resource sites within the proposed path of the pipeline.

A records search was conducted at the Inyo National Forest and the Eastern Information Center at the University of California, Riverside for previous cultural resource surveys of the federal lands under geothermal lease to MPLP. Based on this records search, all of the Project area has been previously surveyed for cultural resources. Although some of these cultural resource surveys are old, they indicate a relatively low density of identified cultural resources in that portion of the Project area not specifically surveyed for the previous MPLP projects, and thus the likelihood that all important cultural resources can be avoided by Project surface disturbing activities.

A records search for the Upper Basalt Geothermal Exploration identified 17 archaeological sites (i.e., seven prehistoric sites and 10 historic sites) within the Project boundaries. The seven prehistoric sites are located in areas that are not expected to be affected by CD-4 project activities. However, the seven historic sites, (CA-MNO-621, -623, -624, -836, -841, -842, -843, -844, -845, and -846) are either near proposed drill sites or in or near alignments of proposed road improvements and/or construction. The search report recommends that the historic sites that could be affected be relocated in the field and that drill sites and road improvement/construction activities avoid these identified sites.

MPLP has proposed, as part of the CD-4 project, that all areas proposed for disturbance, including drill sites or new access roads, be surveyed prior to disturbance by an archeologist acceptable to the BLM/USFS, and that any areas that contain cultural resources of significance would be avoided, or the potential for impacts mitigated in a manner acceptable to the BLM/USFS. Further, MPLP has committed, as part of the CD-4 project, that if previously unrecorded cultural resources are encountered during grading or other surface-disturbing activities, all grading or other surface- disturbing activities at the location of the discovery would cease, and the BLM/USFS notified. Grading or other surface-disturbing activities would not recommence at the location of the discovery until the identified cultural resource(s) have been assessed and any necessary mitigation actions taken and approved by the BLM/USFS. Based on these CD-4 project commitments, the adverse effects of the CD-4 project on cultural resources are considered to be minor, and no mitigation measures are required.

Given that the MP-I Replacement Project would not have any adverse effect on cultural resources, the effects associated with existing, proposed, and reasonably foreseeable projects in the vicinity of the project site on cultural resources would not be cumulatively significant.

5.2.5 Geology and Soils

Area of Cumulative Geology and Soils Effects Analysis

The area of cumulative effects on geology and soils would be the combined area of surface disturbance (about 61.7 acres) of the respective cumulative effects projects.

Cumulative Effects on Geology and Soils

Impacts associated with soils and geologic hazards tend to be site-specific for each project site being evaluated. Implementation of the proposed CD-4 geothermal development project would disturb approximately 11 acres of land. The methods of grading, cut, and fill to be used for the CD-4 project are substantially similar to those planned for the MP-I Replacement Project and described in Section 4.6, Geology and Soils. The CD-4 plant site and pipeline routes are not located within an Alquist-Priolo earthquake fault zone, nor are they located on unstable ground subject to liquefaction. It is expected that the CD-4 project would not cause substantial new areas or expansions of thermal ground in the Casa Diablo or Basalt Canyon areas. The CD-4 project does not involve high-pressure injection of cold water into hot dry rock to induce rock fracturing and thus would not be expected to induce seismicity because the project is designed to balance geothermal reservoir pressures, not increase pressure or induce rock fracture. No significant adverse impact on geology and soils is anticipated from development of the CD-4 project. Thus, effects on geology and soils that are associated with existing, proposed, and reasonably foreseeable projects in the vicinity of the project site would not be cumulatively significant.

5.2.6 Hazards and Hazardous Materials

Area of Cumulative Hazards and Hazardous Materials Effects Analysis

The cumulative effects area of analysis for hazards and hazardous materials includes the combined areas of the cumulative effects project sites and those offsite areas which could be affected by spills of geothermal fluid, hazardous materials or petroleum products; and areas which could be reasonably affected by a fire originating on the respective project sites.

Cumulative Hazards and Hazardous Materials Effects

The existing and proposed geothermal projects share a single wellfield. No new geothermal pipelines are proposed for the MP-I Replacement Project but approximately four miles of new geothermal pipeline would be constructed for the proposed CD-4 project. Much of this pipeline would be placed parallel to the existing pipeline within the same pipeline corridor from the wellfield located west of Highway 395 and north of State Route 203 to the existing Casa Diablo project area. New geothermal pipeline would then be routed along existing access roads to the proposed CD-4 plant site. The new pipeline would be engineered and maintained to prevent leaks and releases of geothermal fluid similar to the existing pipeline. There have been no reports of major geothermal fluid spills from the existing Casa Diablo geothermal projects after more than 25 years of operations. The new CD-4 pipeline would also be located upgradient of the existing Casa Diablo geothermal fluid spill containment system. As such, the existing geothermal fluid spill containment system would also provide containment protection for potential spills of geothermal fluid from the CD-4 project pipeline from reaching Mammoth Creek. The adverse effects from potential geothermal fluid spill events would be less than cumulatively significant.

Large quantities of motive fluid used for the binary power generation facilities would be stored at each project's power plant site. Smaller quantities of fuels, turbine oil, lubricants, and other hazardous materials and petroleum hydrocarbons would also stored at each of the power plant sites. MPLP has prepared a comprehensive hazardous materials management program which covers each of the existing Casa Diablo projects, and MPLP proposes to amend the program to include the proposed M-1 replacement plant site. It is also presumed that MPLP would amend the program to include the proposed CD-4 power plant site. The comprehensive hazardous materials management program is reported to meet all federal, state and local requirements for safely managing the hazardous materials and petroleum hydrocarbons stored on the respective project sites and for responding to any spills or upset conditions. Implementation and maintenance of the hazardous materials management program would reduce the potential for adverse effects from hazardous material and petroleum hydrocarbon spills and system upsets from the projects to less than cumulatively significant.

The potential for both structural fires at the existing and proposed projects and wildland fires potentially impacting the respective project sites is unavoidable. The storage of large quantities of flammable gas/liquid motive fluids also increases the potential fire hazard danger at these project sites. Numerous engineering, fire–control and safety measures would be integrated into the respective projects to prevent releases of motive fluids, prevent fires, and to respond to and control fires and other emergencies. The motive fluid storage vessels would be protected by automatic water deluge sprinkler systems and water nozzles/monitors would be placed at the respective power plant sites to minimize the risk of fires spreading. New water storage tanks would be used for the water-based fire protection systems of the two proposed projects. MPLP proposes to revise its Emergency Response Plan (ERP) to include the proposed M-1 plant site, and it is presumed that MPLP would also change the ERP to integrate the CD-4 project into the plan if that project is approved. The potential for a structural fire increases with number of individual projects, but with proposed safeguards the adverse effects from structural fires from the projects is less than cumulatively significant.

The existing projects and proposed M-1 plant site would be located within the existing Casa Diablo geothermal development area which is intersected by existing public and private roadways, areas previously impacted by human activity and areas of limited vegetation due to thermal soils. The Casa Diablo development area is also near the intersection of Highway 395 and State Route 203. As such, wildland fires would be readily accessible to firefighters.

The proposed CD-4 plant site is located in a somewhat more remote location one quarter mile north of the existing Casa Diablo development area within a Jeffrey Pine forested area (see Figure 34). As described for the MP-I *Alternative Power Plant Location* (see Section 4.7.3), the entire CD-4 site is surrounded by flammable vegetation. A wildland fire would have the potential to burn close to the CD-4 plant site making it more difficult to defend against the fire and would thereby have the potential to adversely affect workers and facilities on the site. The construction and operation of a binary geothermal power plant on the proposed CD-4 plant site could expose people or structures to a substantial risk of loss, injury or death involving wildland fires.

The potential for adverse effects during the proposed power generation operations on the CD-4 power plant site from a wildland fire would be project specific and would be evaluated during the NEPA/CEQA environmental assessment proposed for that project. The combined potential wildland fire impact from the other four projects, including the proposed MP-I Replacement Project, would not be considerable, and as such, the potential adverse effects from wildland fire would not be cumulatively significant.

5.2.7 Hydrology and Water Quality

Area of Cumulative Hydrology and Water Quality Effects Analysis

The area of cumulative effects on hydrology and water quality would be the combined area of surface disturbance (about 61.7 acres) as well as the surface drainage area, the subsurface geothermal system that each of the cumulative effects projects would be tributary to and would draw from, and the regional hydrology of Long Valley. Indirect cumulative impacts could also result from accidental system upsets affecting neighboring properties including those from potential geothermal fluid spills, spills of hazardous materials or petroleum hydrocarbons, and fire.

Cumulative Effects on Hydrology and Water Quality

The CD-4 geothermal development project would be subject to similar requirements with respect to stormwater management as the MP-I Replacement Project, although the CD-4 project would be located on Federal land and thus would be subject to USFS regulations. The CD-4 project would include similar features to those incorporated into the MP-I Replacement Project with respect to erosion control practices, stormwater capture/retention/infiltration, spill containment and emergency response, and construction site stormwater management/pollution control. The CD-4 plant would be a closed-loop, binary plant, meaning that no surface water or groundwater would be used for cooling and no discharges to surface water would occur from normal plant operation. However, the CD-4 Project is proposing an optional evaporative assist cooling system unique to this project and the treated reclaimed water from the MCWD used for cooling would need to be evaluated as a project-specific impact and not a cumulative impact. Only small amounts of water are used by the projects during site construction for fugitive dust control, for drilling operations, and for access road dust control during plant operations. The water use by the combined projects for dust control and drilling operations is not considerable. Thus, effects on water resources that are associated with existing, proposed, and reasonably foreseeable projects in the vicinity of the project site would not be cumulatively significant.

The M-I Replacement Project would continue to use both high and moderate temperature geothermal resources to extract heat energy from geothermal fluid. No new geothermal wells would be constructed for the replacement plant; instead, it would utilize the same geothermal fluid from the existing geothermal wells that currently supply the existing MP-I power plant. The proposed CD-4 project would utilize these same geothermal resources but would include the drilling of up to 14 new wells. During the NEPA/CEQA

process for the Basalt Canyon pipeline project, there were concerns that production of geothermal fluid from the wells in the Basalt Canyon area and injection of that fluid into the Casa Diablo injection reservoir through existing geothermal injection wells could alter the pressures and temperatures of these geothermal reservoirs. There were also concerns that these geothermal reservoir changes may adversely affect other hydrothermal features in the general vicinity (such as Hot Creek headsprings near the Hot Creek Fish Hatchery and the Hot Creek Gorge springs).

Modeling of the effects of the pipeline project presented in the EA/EIR (BLM, USFS and Mono County 2005) determined that there would be no substantial adverse effects on the pressures or temperatures of the Casa Diablo production and injection reservoirs, and no changes to the geothermal reservoir and thermal features further east, or the groundwater aquifer in the Mammoth Lakes area. MPLP has also committed to produce and operate the Project geothermal production wells in conformance with the ongoing hydrologic monitoring and remedial action program required by Mono County Conditional Use Permit OIE 02-86 for the MP-II plant at Casa Diablo. These requirements were designed, in part, to prevent, or mitigate, potential hydrothermal impacts to the Hot Creek headsprings supporting the Owens tui chub critical habitat and the Hot Creek Hatchery, and the Hot Creek Gorge springs from geothermal operations conducted on federal geothermal leases in the Mono-Long Valley region.

In the over 20 years of monitoring from the date the existing projects began operations, there have been no substantive changes observed in the Hot Creek headsprings monitoring data that have been attributed to geothermal development in the Long Valley caldera and the County, through the LVHAC, plans to continue the hydrologic and biologic monitoring activities. It is presumed that the Mono County hydrologic and biologic monitoring and remedial mitigation program would also be a requirement of the CD-4 project if it is approved. Based on these considerations, it is not expected that the CD-4 project, in conjunction with the MP-I Replacement Project and the existing geothermal projects, would produce cumulatively significant effects on either the geothermal or coldwater systems or the regional hydrology of Long Valley.

5.2.8 Noise

Area of Cumulative Noise Effects Analysis

The area of cumulative effects resulting from noise would be the area in which noise generated by construction or operation of the CD-4 geothermal development project, the existing geothermal power production facilities at Casa Diablo, and the proposed MP-I Replacement Project would be audible to off-site residents, workers, or visitors.

Cumulative Noise Effects

Construction activities and operation of the CD-4 geothermal development project would be required to comply with applicable BLM, USFS, Mono County, and Town of Mammoth Lakes regulations governing the generation of noise. The CD-4 plant site is located approximately 2,000 feet north of the proposed M-1 plant and the existing MP-I, MP-II, and PLES-I plants. At this distance, noise attenuation would be such that there would be virtually no combined noise associated with operation of the CD-4 plant and the existing plants in concert with the proposed M-1 plant audible at any given location. In addition, the CD-4 plant would be located farther from sensitive receptors than the M-1 plant, which itself would be at least 1.25 miles from the closest sensitive receptor. Although other components of the CD-4 project, such as new well sites, would be located substantially closer to sensitive noise receptors in the Inyo National

Forest (e.g., campgrounds) and the Town of Mammoth Lakes (Shady Rest Park), these locations are much farther removed from the M-1 plant site and no cumulative noise effect would occur in these areas.

Development of the proposed CD-4 plant would introduce a new source of noise to a site that currently does not produce noise and experiences minimal noise. Thus, development of this project in conjunction with the MP-I Replacement Project would effectively expand the noise footprint in the general vicinity of the Casa Diablo geothermal complex beyond that which currently exists. However, this would not be considered a cumulatively considerable impact because the M-1 plant would actually reduce noise levels as compared to existing conditions. The expansion of the noise footprint in the area would thus be solely attributable to the CD-4 project.

Thus, noise effects resulting from existing, proposed, and reasonably foreseeable projects in the vicinity of the project site would not be cumulatively significant.

6 OTHER REQUIRED CONSIDERATIONS

6.1 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126.2(c) of the CEQA Guidelines requires an EIR to discuss the significant irreversible environmental changes which would be caused by the Project should it be implemented. It states that "Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."

Section 15127(c) of the CEQA Guidelines (Limitations on Discussion of Environmental Impact) clarifies this requirement by stating that "The information required by Section 15126.2(c) concerning irreversible changes need be included only in EIRs prepared in connection with any of the following activities, none of which are applicable to the subject MP-I Replacement Project.

(a) The adoption, amendment, or enactment of a plan, policy, or ordinance of a public agency;

(b) The adoption by a Local Agency Formation Commission of a resolution making determinations; or

(c) A project which will be subject to the requirement for preparing an environmental impact statement pursuant to the requirements of the National Environmental Policy Act of 1969, 42 USC 4321–4347.

The geothermal resource itself is considered a renewable resource, such that its production, the extraction of its heat and its injection is not a commitment of a nonrenewable resource. This would not be a significant irreversible environmental change.

The Project has an estimated life of 30 years. As stated in Section 2.1.6, at the end of the replacement plant operations the M–1 plant would be decommissioned, residual n–pentane would be removed and recycled, facilities would be dismantled. While not part of the proposed M-1 plant, the existing MP-I Project wells would be plugged and abandoned as required by applicable CDOGGR and BLM regulations. All above ground equipment, including the geothermal pipelines and supports, would be removed. MPLP would then implement site restoration activities to restore surface grades and revegetate cleared areas in conformance Mono County requirements and their Reclamation Plan. Therefore, this would not be a significant irreversible environmental change.

Large spills of hazardous materials or geothermal fluids to the environment are very unlikely for many reasons. The potential for any significant damage to the environment, particularly water quality, is also very unlikely because of the measures in place to reduce the size and severity of any discharge should it occur. These include the existing Spill Prevention, Control and Countermeasure (SPCC) Plan prepared for the Casa Diablo geothermal development that would be amended to include the *Proposed Project*, and the

existing emergency spill containment basin located down gradient of the Casa Diablo geothermal development. Therefore, this would not result in a significant irreversible environmental change.

6.2 GROWTH–INDUCING IMPACT

Section 15126.2(d) of the CEQA Guidelines requires an EIR to discuss the growth–inducing impact of the Project. This section of the CEQA Guidelines directs that the EIR should:

> *"Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth …. Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."*

As specifically discussed in Section 2.1.5, because no new permanent workers would be hired, the Project would not induce substantial population growth in an area. Neither does the Project provide any infrastructure which would indirectly induce substantial population growth. The Project would replace the existing MP–I power generation structure at the Casa Diablo geothermal development, which could extend the life of the MP-I Project and the availability of the electrical energy it produces. The improved efficiency and modern technology of the proposed M-1 replacement plant would result in the generation of more electrical energy than the existing MP-I power plant, but the M-1 plant would not utilize more geothermal fluid than the existing plant. The additional electrical energy produced from the Project would be expected to offset electrical energy demand currently produced from a mix of electrical energy generation sources, including fossil fuel combustion sources, but it would not create new demand for electrical energy and would not induce growth.

6.3 SIGNIFICANT UNAVOIDABLE IMPACTS

Section 15126.2(b) of the State *CEQA Guidelines* requires that an EIR describe any significant impacts which cannot be avoided. Specifically, Section 15126.2(b) states:

> "*Describe any significant impacts, including those which can be mitigated but not reduced to a level of insignificance. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reason why the project is being proposed, notwithstanding their effect, should be described."*

Based on the analysis contained in this EIR, implementation of the MP-I Replacement Project would not result in significant unavoidable environmental impacts.

7 IMPACTS, MITIGATION AND COMPLIANCE SUMMARY

This chapter of the Draft EIR provides a summary of all the measures that are intended to reduce the potential adverse effects of the *Proposed Project* and the respective Project Alternatives evaluated in this assessment. These measures include:

1. Environmental protection measures proposed by the Applicant as part of the Project for the resource topics evaluated in the Draft EIR;
2. Mitigation measures recommended in the Draft EIR to reduce the adverse effects of the potentially significant impacts of the Project and/or the Project Alternatives;
3. Other measures recommended in the Draft EIR to reduce the adverse effects of the Project and/or the Project Alternatives; and
4. Compliance measures required by Mono County and other agencies with responsibility for issuing one or more discretionary permits for the Project and/or the Project Alternatives.

Where mitigation measures are recommended to reduce the adverse effects of potentially significant impacts from the *Proposed Project* or the Project Alternatives, a statement is also provided as to whether or not the mitigation measure recommended would reduce the adverse effects of the impact to below the level of significance under CEQA.

These recommended measures would be amended, as necessary, as a result of comments received from responsible and trustee agencies and the general public during the public review of this Draft EIR. The measures would be drafted into the format of a comprehensive Mitigation Monitoring and Reporting Program (MMRP), in conformance with California Public Resources Code §21081.6, and the MMRP would be submitted for consideration as part of the Mono County deliberations concerning the *Proposed Project*.

If adopted, the MMRP would become part of the Conditional Use Permit issued by the County for the Project.

The purpose of the MMRP would be to ensure that the mitigation measures identified in the EIR to mitigate the potentially significant environmental effects of the Project are properly carried out.

The following tables summarize the measures proposed to eliminate, avoid, or reduce the potential adverse effects of the Mammoth Pacific I Replacement Project and the Project Alternatives detailed in this Draft EIR. The tables also provide applicable, but not necessarily comprehensive, uniform code requirements, Mono County compliance standards, and discretionary permits required by other responsible agencies for the Project. Separate tables are provided for the *Proposed Project* (Table 29); *Alternative Power Plant Location* (Table 30); and the *No Project Alternative* (Table 31).

Table 29: *Proposed Project* Impacts, Mitigation and Compliance Summary

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
Aesthetics	1. Power plant lighting would be projected downward to mitigate nighttime visibility of the facilities. 2. An Outdoor Lighting Plan would be prepared and implemented for the M–1 plant site in conformance with the Mono County Dark Sky Regulations. 3. The M–1 facility structures would be painted in an earth–tone greenish color similar to the existing plants to help blend into the background. 4. The M-1 plant site would save a large pine tree in the southwest corner of the site to provide some visual screening of the plant site.	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to prepare and implement an Outdoor Lighting Plan in conformance with the Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23). 2. Applicant would be required to obtain a variance from the County in order to construct an aboveground electrical transmission line as part of the Project. 3. Applicant would be required to obtain approval for a height exception from the County under Section 04.110 (Building Heights) of the Mono County Code to exceed the 35-foot height limit for mechanical appurtenances.
Air Quality	1. An Authority to Construct permit for the new power plant would be obtained from the GBUAPCD. 2. Permits to Operate the diesel fueled emergency generator	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to establish procedures that ensure that neither geothermal exploration nor development will cause

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	and firewater pump generator would be obtained from the GBUAPCD. 3. A vapor recovery unit (VRU) would be used to capture motive fluid that could otherwise be released during plant maintenance. 4. The Applicant has also adopted the following measures to reduce fugitive dust emissions from the Project: • Restricting surface disturbance to the area within the proposed site grading plan; • Routine watering of disturbed surfaces and building materials; • Limiting maximum construction vehicle speeds to 20 miles per hour (mph); • Restricting construction activities during periods of high wind (i.e., greater than 25 mph); • Watering or covering all materials transported onto or off of the construction site; • Paving the plant			violations of state or federal ambient air quality standards or the rules and regulations of the GBUAPCD (Mono County Conservation/Open Space Element, Energy Resources, Goal 1, Objective G. <u>Policy 1</u>: Permit conditions shall require compliance with all requirements of the regional air pollution control district, and with all other applicable provisions of the Conservation/Open Space Element. *Action 1.1*: Air quality shall be monitored by a representative of the MCEDD, or the regional air pollution control district with jurisdiction. The costs of such monitoring shall be funded by the permit holder or project operator. 2. Applicant would be required to obtain permits to construct and operate each source of air emissions from the

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	maintenance road; and • Covering all unpaved plant site surfaces with gravel after final grading.			proposed power plant from the GBUAPCD.
Biological Resources	1. Baseline botanical and biological resource surveys of the Project site were undertaken. 2. The Project would implement all environmental protection measures to reduce the adverse effects of the Project on biological and botanical resources recommended in the baseline botanical and biological resources survey reports, including: d. <u>Noxious Weed Control</u> • All trucks and construction equipment, that are expected to be off existing roads, would be washed to remove dirt and plant parts prior to entering the project area. • All erosion control materials would be certified weed free. • Revegetate disturbed sites to minimize the impacts from cheatgrass. e. <u>Best Management Practices</u>	<u>Significant Impact</u>: MPLP is currently conducting the hydrologic and biological monitoring prescribed by Mono County General Plan, but existing permit requirements for such monitoring only exist under the MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings supporting the critical habitat of the Owens tui chub, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended.	<u>Adverse Effects</u>: An optional new interconnection transmission line may be constructed for the replacement plant that could be a collision or electrocution hazard to migratory birds. The potential affect of the optional short interconnection transmission line on birds would not be a significant impact under CEQA but the following measures are recommended to reduce the potential adverse effects of the Project. 1. Bio Measure 1: The optional interconnection transmission line shall be constructed with bird diverters to reduce the potential for bird collisions with the power line. 2. Bio Measure 2:The optional interconnection transmission line shall be constructed in conformance with guidance set forth in the	1. Applicant would be required to meet the Conservation/Open Space Element requirements for geothermal projects within the *Hot Creek Buffer Zone* and the *Hot Creek Deer Migration Zone*. Specifically, Objective B of Goal 1 under the Energy Resources section of the Conservation/Open Space Element states that *"Except for projects in the vicinity of Casa Diablo …" a proposed geothermal project within* [either zone] *… shall not be permitted … unless a finding is made that all identified environmental impacts of the proposed project are reduced to a less–than–significant levels by permit conditions."* 2. Objectives C through H of Goal 1 establish procedures and direction for addressing biologic and

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	• Do not allow uncontrolled off-site motorized vehicle use and dogs on site during construction especially during spring and fall migration. • Retain as many mature trees as possible. • Do not perform any unnecessary development, logging, or other activities that would disturb deer. f. <u>Cumulative Effects</u> • Prior to any spring and/or summer (April 15 – August 15) construction or maintenance activities, a qualified biologist should search any areas of suitable habitat for nesting activities. Nest sites would be protected with an appropriate buffer zone or construction and maintenance activities would occur outside the breeding period identified above. • Remove as little native vegetation as possible to minimize the impacts to nesting within the	1. Bio Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant. <u>Significance After Mitigation</u>: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.	*Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), as may amended or updated at the time of power line construction.	associated hydrologic impact mitigation and monitoring requirements from geothermal exploration and development. 3. The proposed M–1 replacement plant site is located within the existing Casa Diablo geothermal complex; and as such, Objective B would not be applicable to the Project, but Objectives C–H would be applicable.

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	Proposed Project area. • Revegetate new areas of disturbance not covered by the facility. Native species seeds should be used to provide additional native habitat for the wildlife species and to assist in the elimination or prevention of non-native plant species becoming the dominate plant species in what was originally native vegetation. • All project employees, contractors, and service personnel would be advised to neither harm nor harass wildlife in the project area. To avoid conflicts with domestic animals, unleashed domestic dogs and other domestic pets would not be allowed in the project area. • Any night light used in the project area would be shielded and directed directly at the work to minimize impacts to area wildlife.			

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
Cultural Resources	1. Baseline cultural resource surveys of the Project site were undertaken. 2. The Applicant would implement all environmental protection measures to reduce the adverse effects of the Project on cultural resources recommended in the baseline cultural resources survey reports.	No significant impacts identified.	Adverse Effects: The archaeological investigation conducted at PLI-2 has found that the site does meet the requirements for inclusion on the California Register. Therefore, no further cultural resources management is recommended at the site. However, the following measure is required to reduce the potential for adverse effects of the *Proposed Project*. 1. Cultural Measure 1: In the unlikely event that human remains are encountered during the construction phase of the project, excavation activities shall be stopped and the County Coroner must be contacted. If the County Coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours and a Most Likely Descendant will be assigned to consult with the County to develop an agreement for the	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
			treatment and disposition of the remains.	
Geology and Soils	1. Applicant would implement those measures recommended in the report of the geotechnical investigation of the site to mitigate impacts due to geotechnical, soils and geologic constraints (see Appendix F). 2. All buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code adopted by Mono County.	No significant impacts identified.	No other measures prescribed.	1. All buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code
Hazards and Hazardous Materials	1. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 2. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. 3. The existing comprehensive	No significant impacts identified.	No other measures prescribed.	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	program for hazardous material management and emergency response at the Casa Diablo geothermal complex would be expanded to include the M–1 plant site and operations, including: (a) the existing Spill Pollution Control and Countermeasure (SPCC) Plan; (b) the California Accidental Release Prevention (CalARP) Program; (c) the EPA Risk Management Plan (RMP); and (d) the OSHA Process Safety Management (PSM) Program to include the new M–1 plant. 4. The existing comprehensive program for fire prevention and suppression at the Casa Diablo geothermal complex would be amended and integrated to include the M–1 replacement plant facilities and operating procedures.			
Hydrology and Water Quality	1. An engineered grading plan would be prepared to incorporate measures to avoid or minimize erosion during Project construction and operations. 2. The grading plan would be submitted for review to the	Significant Impact: The existing MP-I Project began operations prior to the County's adoption of the hydrologic and biologic monitoring and remedial action program requirements for development within the Hot Creek Buffer Zone. Conformance	No other measures prescribed.	1. An engineered grading plan must be submitted and approved by the MCPWD prior to power plant site construction. 2. Applicant would be required to prepare and implement a Storm Water

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	Mono County Public Works Department (MCPWD) prior to implementation. 3. Best Management Practices (BMPs) identified in the grading and drainage plan would be adopted subject to approval by the MCPWD. The BMPs would include: placement of straw wattles and/or silt fencing along the perimeter of the site, and around topsoil stockpiles; and placement of silt fences in drainage swales at the exit point of the site. 4. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 5. A system of pressure and flow sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. 6. A Spill Pollution Control and Countermeasure (SPPC) Plan	with these program requirements provides an early warning of changes that could occur at the Hot Creek headsprings and a program of remedial actions that would be taken to prevent potential adverse effects on the Hot Creek Fish Hatchery if such changes are observed. However, the requirement to continue the monitoring and remedial action program only exists under the respective MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring and remedial action program for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings used for Hot Creek Fish Hatchery operations, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended.		Pollution Prevention Plan in conformance with the State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as may be amended).

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
	would be prepared for the M-1 replacement plant site and integrated into the existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex.	1. Hydro Measure 1: The MP-I Project shall adopt the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D). Significance After Mitigation: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.		
Noise	1. All noisy construction activities would be limited to daylight hours. 2. Noise levels during construction activities would be kept to a minimum by equipping all on–site equipment with noise attenuation devices. 3. All project construction activities and normal operations would comply with applicable County noise requirements.	No significant impacts identified.	No other measures prescribed.	
Cumulative Effects	Not Applicable	No significant impacts identified.	Adverse Effects: Due to public concern that existing lighting at	1. Conformance with the Dark Sky Regulations

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Proposed Project*:**				
			the Casa Diablo geothermal complex may be out of compliance with County regulations and brighter than necessary for safe operation of the facilities, the following measure is required to ensure that all exterior lighting at the complex is modified to achieve compliance with the County's Dark Sky Regulations: 1. Cumulative Aesthetics Measure 1: An outdoor lighting plan for the entire Casa Diablo geothermal complex, including the *Proposed Project*, the existing MP-II and PLES-I plants, and all related structures must be submitted for County review and approval in conjunction with the application for design review. This lighting plan must be in compliance with applicable provisions of Chapter 23, Dark Sky Regulations, of the Mono County Code.	(Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23).

Table 30: *Alternative Power Plant Location* Impacts, Mitigation and Compliance Summary

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
Aesthetics	1. Power plant lighting would be projected downward to mitigate nighttime visibility of the facilities. 2. An Outdoor Lighting Plan would be prepared and implemented for the M–1 plant site in conformance with the Mono County Dark Sky Regulations. 3. The M–1 facility structures would be painted in an earth–tone greenish color similar to the existing plants to help blend into the background. 4. The M-1 plant site would save a large pine tree in the southwest corner of the site to provide some visual screening of the plant site.	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to prepare and implement an Outdoor Lighting Plan in conformance with the Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23). 4. Applicant would be required to obtain a variance from the County in order to construct an aboveground electrical transmission line as part of the Project. 5. Applicant would be required to obtain approval for a height exception from the County under Section 04.110 (Building Heights) of the Mono County Code to exceed the 35-foot height limit for mechanical appurtenances.
Air Quality	1. An Authority to Construct permit for the new power plant would be obtained from the GBUAPCD. 5. Permits to Operate the diesel fueled emergency generator	No significant impacts identified.	No other measures prescribed.	1. Applicant would be required to establish procedures that ensure that neither geothermal exploration nor development will cause

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	and firewater pump generator would be obtained from the GBUAPCD. 6. A vapor recovery unit (VRU) would be used to capture motive fluid that could otherwise be released during plant maintenance. 7. The Applicant has also adopted the following measures to reduce fugitive dust emissions from the Project: • Restricting surface disturbance to the area within the proposed site grading plan; • Routine watering of disturbed surfaces and building materials; • Limiting maximum construction vehicle speeds to 20 miles per hour (mph); • Restricting construction activities during periods of high wind (i.e., greater than 25 mph); • Watering or covering all materials transported onto or off of the construction site; • Paving the plant maintenance road; and			violations of state or federal ambient air quality standards or the rules and regulations of the GBUAPCD (Mono County Conservation/Open Space Element, Energy Resources, Goal 1, Objective G. <u>Policy 1</u>: Permit conditions shall require compliance with all requirements of the regional air pollution control district, and with all other applicable provisions of the Conservation/Open Space Element. *Action 1.1*: Air quality shall be monitored by a representative of the MCEDD, or the regional air pollution control district with jurisdiction. The costs of such monitoring shall be funded by the permit holder or project operator. 3. Applicant would be required to obtain permits to construct and operate each source of air emissions from the proposed power plant from

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	• Covering all unpaved plant site surfaces with gravel after final grading.			the GBUAPCD.
Biological Resources	No baseline botanical or biological surveys of the *Alternative Power Plant Location* have been undertaken and would be required for comprehensive analysis of the Project Alternative. 1. The Project would implement all environmental protection measures to reduce the adverse effects of the Project on biological and botanical resources that may be provided in the recommended baseline botanical and biological resources surveys of the *Alternative Power Plant Location*, including the following anticipated recommendations from the surveys of the *Proposed Project* area: d. <u>Noxious Weed Control</u> • All trucks and construction equipment, that are expected to be off existing roads, would be washed to remove dirt and plant parts prior to entering the project area. • All erosion control	<u>Significant Impact</u>: From the information available, the impacts of plant operations on wildlife and habitat at the *Alternative Power Plant Location* would be very similar to those described for the proposed M-1 plant site. The potentially significant impact under CEQA on the Hot Creek headwater springs supporting the Owens tui chub critical habitat would be the same and the following measure is recommended. 1. Alt Bio Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the	<u>Adverse Effects</u>: The other identified biological resource impacts relative to the optional interconnection transmission line would not be considered significant, but to reduce the potential adverse effects of these impacts the two measures recommended for the *Proposed Project* are also recommended for development at the *Alternative Power Plant Location*, as follows. 1. Alt Bio Measure 1: The optional interconnection transmission line shall be constructed with bird diverters to reduce the potential for bird collisions with the power line. 4. Alt Bio Measure 2: The optional interconnection transmission line shall be constructed in conformance with guidance set forth in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), as	1. Applicant would be required to meet the Conservation/Open Space Element requirements for geothermal projects within the *Hot Creek Buffer Zone* and the *Hot Creek Deer Migration Zone*. Specifically, Objective B of Goal 1 under the Energy Resources section of the Conservation/Open Space Element states that *"Except for projects in the vicinity of Casa Diablo …" a proposed geothermal project within* [either zone] *… shall not be permitted … unless a finding is made that all identified environmental impacts of the proposed project are reduced to a less–than–significant levels by permit conditions."* 4. Objectives C through H of Goal 1 establish procedures and direction for addressing biologic and associated hydrologic impact mitigation and

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	materials would be certified weed free. • Revegetate disturbed sites to minimize the impacts from cheatgrass. e. <u>Best Management Practices</u> • Do not allow uncontrolled off-site motorized vehicle use and dogs on site during construction especially during spring and fall migration. • Retain as many mature trees as possible. • Do not perform any unnecessary development, logging, or other activities that would disturb deer. f. <u>Cumulative Effects</u> • Prior to any spring and/or summer (April 15 – August 15) construction or maintenance activities, a qualified biologist should search any areas of suitable habitat for nesting activities. Nest sites would be protected with an appropriate buffer zone or construction and maintenance activities would occur outside the	existing Conditional Use Permit for the MP-II Geothermal Power Plant. <u>Significance After Mitigation</u>: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.	may amended or updated at the time of power line construction. <u>Adverse Effects</u>: The alternative plant site is located on land administered by the Forest Service and approval from federal agencies would be required before development could occur at the *Alternative Power Plant Location*. It is recommended that the following measure be implemented prior to making a decision for development at the *Alternative Power Plant Location*. 5. Alt Bio Measure 3: Baseline botanical and biological surveys shall be conducted covering the *Alternative Power Plant Location* and surrounding lands, and the findings of these surveys shall be considered in the NEPA/CEQA environmental assessment required for the project prior to making a decision for development at the *Alternative Power Plant Location*.	monitoring requirements from geothermal exploration and development. 5. The proposed *Alternative Power Plant Location* is located within the vicinity of Casa Diablo; and as such, Objective B would not be applicable to the Project, but Objectives C–H would be applicable.

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	breeding period identified above. • Remove as little native vegetation as possible to minimize the impacts to nesting within the *Proposed Project* area. • Revegetate new areas of disturbance not covered by the facility. Native species seeds should be used to provide additional native habitat for the wildlife species and to assist in the elimination or prevention of non-native plant species becoming the dominate plant species in what was originally native vegetation. • All project employees, contractors, and service personnel would be advised to neither harm nor harass wildlife in the project area. To avoid conflicts with domestic animals, unleashed domestic dogs and other domestic pets would not be allowed in the project area. • Any night light used in			

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	the project area would be shielded and directed directly at the work to minimize impacts to area wildlife.			
Cultural Resources	1. A preliminary baseline cultural resource survey of the *Alternative Power Plant Location* site was completed. 3. It is presumed that the Applicant would implement all environmental protection measures to reduce the adverse effects of the Project at the *Alternative Power Plant Location* on cultural resources recommended in the existing and recommended baseline cultural resources survey reports.	No significant impacts identified.	Adverse Effects: No further cultural resources management is recommended at the site. However, it is recommended that the following measures be implemented at the *Alternative Power Plant Location* to reduce the potential adverse effects of the Project. 1. Alt Cultural Measure 1: Detailed cultural resources documentation shall be conducted covering the *Alternative Power Plant Location*, including a records search at the EIC as well as at the Inyo National Forest headquarters to determine if any sites have been previously recorded. Any cultural resources on federal land that may be affected by development at the *Alternative Power Plant Location* must be evaluated for listing eligibility on the National	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			Register of Historic Places. 3. Alt Cultural Measure 2: In the unlikely event that human remains are encountered during the construction phase of the project, excavation activities shall be stopped and the County Coroner must be contacted. If the County Coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours and a Most Likely Descendant will be assigned to consult with the County to develop an agreement for the treatment and disposition of the remains.	
Geology and Soils	1. Applicant would implement those measures recommended in the report of the geotechnical investigation of the site to mitigate impacts due to geotechnical, soils and geologic constraints. 3. All buildings and structures would be constructed to meet	No significant impacts identified.	Adverse Effects: A preliminary geotechnical investigation would be necessary in order to assess the geological characteristics of the *Alternative Power Plant Location*; however, conditions are not expected to be significantly different from	1. All buildings and structures would be constructed to meet applicable earthquake safety codes and the 2010 Uniform Building Code

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	applicable earthquake safety codes and the 2010 Uniform Building Code adopted by Mono County.		those at the proposed M-1 plant site. One advantage of the *Alternative Power Plant Location* is that it is farther removed from the active geothermal vents at the Casa Diablo complex and should thus provide a somewhat less hazardous construction area than the proposed M-1 site. The following measures would be necessary for development of the Project at the *Alternative Power Plant Location*: 1. Alt Geology Measure 1: Prior to issuance of building permits and grading activities, a design level geotechnical report shall be prepared and all recommendations in the report shall be adhered to. The design-level geotechnical report shall evaluate the potential for localized soil and slope instability by performing supplemental subsurface exploration as necessary (to evaluate the thickness, in place density, fines content of the underlying loose to medium soil and	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			gradation), laboratory testing, and engineering analysis. 2. Alt Geology Measure 2: Implement all recommendations contained within the design level geotechnical report, including those pertaining to site preparation, excavation, fill placement and compaction; foundations; concrete slabs-on-grade; pavement design; lateral earth pressures and resistance; and surface drainage control. 3. Alt Geology Measure 3: The final grading, drainage, and foundation plans and specifications shall be prepared and/or reviewed and approved by a Registered Engineer(s) and Registered Engineering Geologist. In addition, upon completion of construction activities, the project applicant shall provide a final statement to the County indicating whether the work was performed in accordance	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			with project plans and specifications and with the recommendations of the Registered Engineer(s) and Registered Engineering Geologist. 4. Alt Geology Measure 4: Clay soils shall be removed from beneath structural areas such that those soils would be covered by at least five feet of structural fill beneath footings, slabs, and concrete pavements. It must be emphasized that as clay soils extend to considerable depth, they cannot be completely removed from structural areas and some differential movement shall be anticipated. Any over-excavation shall be backfilled with structural fill to footing grade, or subgrade for pavements and slabs. Clays to be left in place and covered with fill shall be moisture-conditioned to 2 to 4 percent over optimum for a minimum depth of 12 inches. Periodic surface	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			wetting, or other methods must maintain the high moisture content, until the surface is covered by at least one lift of fill. 5. Alt Geology Measure 5: Plant structures shall not be located over or within approximately 50 feet of active geothermal steam vents. Laydown and road areas may be built over these areas, with the provision of adequate drainage/vent blankets. Areas of high ground temperature may also result in areas of future geothermal venting and shall be avoided as much as possible.	
Hazards and Hazardous Materials	1. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 2. A system of pressure and flow sensing devices and regular inspection of all lines, capable	Significant Impact: Unlike the existing MP–I power plant site or the proposed M–1 replacement plant site, the *Alternative Power Plant Location* would be located within a relatively dense Jeffrey Pine forested area. The constructed alternative power plant site would be surrounded by flammable vegetation. A wildland fire would have the potential to burn close to the *Alternative Power Plant Location* making it	No other measures prescribed.	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	of detecting leaks and spills, would be instituted and maintained. 3. The existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex would be expanded to include the M–1 plant site and operations, including: (a) the existing Spill Pollution Control and Countermeasure (SPCC) Plan; (b) the California Accidental Release Prevention (CalARP) Program; (c) the EPA Risk Management Plan (RMP); and (d) the OSHA Process Safety Management (PSM) Program to include the new M–1 plant. 4. The existing comprehensive program for fire prevention and suppression at the Casa Diablo geothermal complex would be amended and integrated to include the M–1 replacement plant facilities and operating procedures. 5. Used oil generated during operations would be managed in accordance with California used oil and hazardous waste regulations.	more difficult to defend against the fire and would thereby have the potential to adversely affect workers and facilities on the site. The construction and operation of the M–1 facilities on the *Alternative Power Plant Location* could expose people or structures to a substantial risk of loss, injury or death involving wildland fires. This potential impact is considered above the threshold of significance under CEQA. The following mitigation measure is recommended. 1. Alt HazMat Mitigation Measure 1: A defensive fire fuel break shall be constructed and maintained around the *Alternative Power Plant Location* in conformance with Forest Service and Mono County standards to provide an acceptable wildland fire protection safeguard. <u>Significance After Mitigation</u>: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.		

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
Hydrology and Water Quality	1. An engineered grading plan would be prepared to incorporate measures to avoid or minimize erosion during Project construction and operations. 2. The grading plan would be submitted for review to the MCPWD prior to implementation. 3. Best Management Practices (BMPs) identified in the grading and drainage plan would be adopted subject to approval by the MCPWD. The BMPs would include: placement of straw wattles and/or silt fencing along the perimeter of the site, and around topsoil stockpiles; and placement of silt fences in drainage swales at the exit point of the site. 4. The power plant site would be designed and constructed to prevent spills from leaving the site and endangering adjacent properties and waterways, and to prevent runoff from any source being channeled or directed in an unnatural way so as to cause erosion, siltation, or other detriments. 5. A system of pressure and flow	Significant Impact: As described for the *Proposed Project*, MPLP and USGS are currently conducting the hydrologic and biological monitoring prescribed by Mono County General Plan via their participation in the LVHAC. However, the requirement to continue the monitoring and remedial action program only exists under the respective MP-II and PLES-I project approvals. Should these two projects be abandoned prior to the abandonment of the MP-I Project, then there would be no permit requirement to continue the prescribed monitoring for what could be an extended MP-I project life. Should the extended geothermal resource production and injection activities from the MP-I Project result in changes in the temperature, flow rate or quality of the Hot Creek headsprings used for Hot Creek Fish Hatchery operations, then this could be a potentially significant impact under CEQA. The following mitigation measure is recommended for the *Alternative Power Plant Location*.	Adverse Effects: Impacts to hydrology and water quality resulting from construction of the M-1 plant at the *Alternative Power Plant Location* would not be expected to be substantively different from those associated with the proposed M-1 replacement plant site. However, geotechnical surveys and a grading plan have not been prepared for the *Alternative Power Plant Location*. In order to ensure no adverse effects the following measure must be implemented if the County intends to select the *Alternative Power Plant Location*. 1. Alt Hydro Measure 1: Baseline drainage surveys shall be conducted covering the *Alternative Power Plant Location* and surrounding lands, and the findings of these surveys shall be considered prior to making a decision for development at the *Alternative Power Plant Location*.	1. An engineered grading plan must be submitted and approved by the MCPWD prior to power plant site construction. 3. Applicant would be required to submit a Notice of Intent (NOI) and prepare and implement a Storm Water Pollution Prevention Plan in conformance with the State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as may be amended).

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	sensing devices and regular inspection of all lines, capable of detecting leaks and spills, would be instituted and maintained. 6. A Spill Pollution Control and Countermeasure (SPPC) Plan would be prepared for the M-1 replacement plant site at the *Alternative Power Plant Location* and integrated into the existing comprehensive program for hazardous material management and emergency response at the Casa Diablo geothermal complex. 7. During power plant construction, portable chemical sanitary facilities would be used by all construction personnel; and maintained by a local contractor. 8. Solid waste materials (trash) would be routinely collected and deposited at an authorized landfill by a disposal contractor.	1. Alt Hydro Mitigation Measure 1: The MP-I Project shall be subject to the hydrologic and biologic monitoring and remedial action program requirements set forth in the Mono County General Plan (Mono County General Plan, Conservation/Open Space Element, Energy Resources, Goal 1, Objectives C and D), including compliance with conditions addressing hydrologic monitoring and remediation contained in the existing Conditional Use Permit for the MP-II Geothermal Power Plant. Significance After Mitigation: The mitigation measure would reduce the potential adverse effects of this impact to below the level of CEQA significance.		
Noise	1. All noisy construction activities would be limited to daylight hours. 4. Noise levels during construction activities would	No significant impacts identified.	No other measures prescribed.	

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
	be kept to a minimum by equipping all on–site equipment with noise attenuation devices. 5. All project construction activities and normal operations would comply with applicable County noise requirements.			
Cumulative Effects	Not Applicable	No significant impacts identified.	Adverse Effects: Due to public concern that existing lighting at the Casa Diablo geothermal complex may be out of compliance with County regulations and brighter than necessary for safe operation of the facilities, the following measure is required to ensure that all exterior lighting at the complex is modified to achieve compliance with the County's Dark Sky Regulations: 1. Cumulative Aesthetics Measure 1: An outdoor lighting plan for the entire Casa Diablo geothermal complex, including the *Proposed Project*, the existing MP-II and PLES-I plants, and all related structures must be submitted for County review and approval in	1. Conformance with the Dark Sky Regulations (Mono County General Plan, Land Use Element, Land Development Regulations, Chapter 23).

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***Alternative Power Plant Location*:**				
			conjunction with the application for design review. This lighting plan must be in compliance with applicable provisions of Chapter 23, Dark Sky Regulations, of the Mono County Code.	

Table 31: *No Project Alternative* Impacts, Mitigation and Compliance Summary

Environmental Resource Topics	Environmental Protection Measures Incorporated into the Project	Significant Environmental Impacts and Measures Prescribed by the Draft EIR to Mitigate the Impacts	Other Adverse Effects and Measures Prescribed by the Draft EIR to Reduce the Adverse Effects of the Project	Mono County Compliance Standards and Conformance with and Other Agency Requirements
***No Project Alternative*:**				
Aesthetics	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Air Quality	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Biological Resources	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Cultural Resources	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Geology and Soils	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Hazards and Hazardous Materials	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Hydrology and Water Quality	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Noise	Not Applicable	No significant impacts identified.	None identified	Not Applicable
Cumulative Effects	Not Applicable	No significant impacts identified.	None identified	Not Applicable

8 LIST OF PREPARERS AND ORGANIZATIONS CONSULTED

The names, titles and affiliations of the persons contributing to, or providing information used in, the preparation to this EIR are identified below by organization name.

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Scott Burns	Director	Community Development Department
Gerry Le Francois	Principal Planner	Community Development Department
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8.2 DRAFT EIR CONSULTANT

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Chris Joseph	CAJA Principal	Education: Master of Arts in Administration in Environmental Management, University of California at Riverside; Bachelor of Arts in Geography, California State University at Northridge. Experience: Over 30 years of experience in providing environmental impact assessment and land use planning strategy services to a broad spectrum of public and private sector clients; owner and President of CAJA Environmental Services, LLC.
Heather T. Altman	Senior Environmental Specialist	Education: Master of Science in Environmental Management, University of San Francisco; Bachelor of Science in Environmental Science, University of California at Riverside. Experience: Over 10 years experience in the preparation of environmental impact assessments, environmental impact reports (EIRs) and Initial Studies (ISs) in compliance with CEQA and environmental assessments (EAs) in compliance with NEPA.
Erin Wielenga	Environmental Specialist	Education: Bachelor of Science in Biology and minor in Environmental Studies from the California State University of Chico. Experience: Experience in the preparation of air quality assessments and permit services, including emission inventory and air quality dispersion modeling.

8.3 APPLICANT AND APPLICANT'S CONSULTANTS

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8.4 ORGANIZATIONS AND PERSONS CONSULTED

Fred Stump	Chief	Long Valley Fire Protection District
Wendy Campbell	Biologist	California Department of Fish and Game
Tm Taylor	Wildlife Biologist	California Department of Fish and Game
Steve Parmenter	Senior Biologist	California Department of Fish and Game
Duane Ono	Deputy Air Pollution Control Officer	Great Basin Air Pollution Control District

9 REFERENCES

9.1 General References

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