



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

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JUL 11 2005

### To All Interested Parties:

The Bureau of Land Management (BLM), Mono County and the Forest Service are seeking comments on a combined Draft Environmental Impact Report (EIR) and Environmental Assessment (EA), evaluating the potential environmental effects of a geothermal resource pipeline project proposed by Mammoth Pacific, L.P. (MPLP). The project is located on portions of private and federal geothermal resource leases, CA-11667, CA-11672, CA-14407 and CA 14408, located west and east of U.S. Highway 395 and north of State Route 203, near the Town of Mammoth Lakes in Mono County, California. The eastern portion of the Project area contains private lands under geothermal lease to MPLP. The Draft EIR was prepared to meet the requirements of the California Environmental Quality Act (CEQA; Public Resources Code 21000-21178.1) for the private lands administered by Mono County. This Draft EIR/EA provides a detailed description of the Project, describes the Project's environmental setting, assesses the potential environmental effects of the Project, and presents mitigation measures to reduce these environmental effects. The pipeline is also to be constructed on Federal geothermal leases, leased to the proponent and administered by the BLM. Under the Geothermal Steam Act, the BLM has federal authority for all geothermal production, drilling and utilization on federal lands. The BLM coordinated closely with the Forest Service, which has surface resource authority, to prepare the environmental document. The BLM is the lead agency responsible for reviewing and authorizing the proposed action in compliance with the National Environmental Policy Act (NEPA).

The proposal, entitled the Basalt Canyon Geothermal Pipeline Project, is to construct, operate, maintain and ultimately decommission a pipeline to deliver approximately 3,600 gallons per minute (GPM) of geothermal fluid through a new pipeline to two existing MPLP geothermal power plants located east of the Town of Mammoth Lakes in Mono County, California. This pipeline would carry geothermal fluid from two geothermal exploration wells that would be drilled, completed and tested as part of the previously approved Basalt Canyon Geothermal Exploration Project and/or Upper Basalt Geothermal Exploration Project.

The text of this Draft EIR/EA is available for review on the Inyo National Forest web site (<http://www.fs.fed.us/r5/inyo/>). Limited copies of the Draft EIR/EA are also available for review at the BLM Bishop Field Office and the Forest Service White Mountain Ranger District, 798 North Main Street, Bishop CA, 93514. The Draft EIR/EA is also available for review at the Mammoth Public Library, 960 Forest Trail (P.O. Box 1120), Mammoth Lakes, CA 93546.

This Draft EIR/EA is being distributed for a 45-day review and comment period. Comments are required to be received by September 6, 2005. Comments should be addressed to:

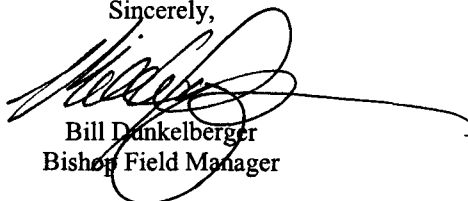
#### Basalt Geothermal Exploration Project

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or  
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Responses will be prepared to address any issues raised. Comments and responses will be considered in the decision on the Project. Questions on the Project or Draft EIR/EA should be directed to project managers Dan Lyster, Mono County at 760 924-1705, Cheryl Seath, BLM at 760-872-5024 or Lynn Oliver, Forest Service at 760-873-2424.

Sincerely,



Bill Dunkelberger  
Bishop Field Manager



**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

**BLM EA Number: CA-017-05-051  
California Clearinghouse Number 2003092101**

**June 2005**

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**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

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**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

## **SUMMARY**

This environmental document is a joint Environmental Assessment/Draft Environmental Impact Report (EA/Draft EIR). The EA was prepared for the U.S. Bureau of Land Management, Bishop Field Office, and the U.S. Forest Service, Inyo National Forest, to meet the requirements of the National Environmental Policy Act (NEPA). The Draft EIR was prepared for Mono County Energy Management Department to meet the requirements of the California Environmental Quality Act (CEQA). This EA/Draft EIR describes the existing environment that would be affected by, and the environmental consequences which could result from, the proposed Basalt Canyon Geothermal Pipeline Project and alternatives to this project.

The applicant, Mammoth Pacific, L.P. (MPLP), has proposed to construct, operate, maintain and, following the expected 30-year life, decommission the Basalt Canyon Geothermal Pipeline Project ("Project" or "Proposed Action"). This Project is designed to deliver approximately 3,600 gallons per minute (gpm) of geothermal fluid through a new pipeline to two existing MPLP geothermal power plants located east of the Town of Mammoth Lakes in Mono County, California (see Figure S1). The geothermal fluid would be produced from two geothermal exploration wells that would be drilled, completed and tested as part of the previously approved geothermal exploration projects. All of the sixteen previously approved exploration well drill sites are located west of U.S. Highway 395 and north of California State Route 203. All Project activities would be conducted within a 1,660-acre Project area, as shown in Figure S1.

The exact route of the pipeline cannot be determined until it is known which two wells would be connected to the pipeline. The pipeline would follow a defined route in the eastern portion of the Project area because the five approved drill sites located there lie along a single line to the power plants. In the western portion of the Project area the other eleven approved drill sites are irregularly spaced, and a single pipeline route cannot be determined. The western portion of the pipeline route would be located within an approximately one-half mile wide pipeline corridor area. Within this pipeline corridor area MPLP would select a final, specific pipeline route once MPLP determined which of the western drill sites would be connected to the pipeline. The length of the final pipeline route would vary depending on which wells were connected to the pipeline. The shortest Project pipeline route would be approximately 4,970 feet (0.94 miles) long. The longest pipeline route likely would be approximately 17,620 feet (3.34 miles) long.

The proposed pipeline would consist of nominal 16-inch diameter insulated, welded-steel pipe. It would be constructed above ground on low piers or underground where necessary to cross under existing roads. Each of the two wells would be equipped with a downhole pump powered by a surface electric motor. Electrical power and control cables for the two wells would either be installed in above-ground conduits placed on the pipeline supports or buried along and adjacent to the pipeline.

The geothermal fluid would be delivered by the pipeline to the existing MPLP Mammoth Pacific Unit I (MP I) and Mammoth Pacific Unit II (MP II) geothermal power plants. These power plants are located on MPLP's private geothermal lease in the Casa Diablo area east of U.S. Highway 395 (see Figure S2). Once the useable heat in the geothermal fluid was extracted by the power plants, the geothermal fluid would be injected into the geothermal reservoir at Casa Diablo through the existing MP I and MP II geothermal injection wells.

The geothermal exploration wells, and most of the proposed pipeline, would be located within the Inyo National Forest on Federal Geothermal Leases CA-11667, CA-11672, CA-14407 and CA-14408. These leases are located within portions of Sections 30, 31 and 32 of Township 3 South (T3S), Range 28 East (R28E) and Sections 25, 26 and 36 of T3S, R27E, MDB&M (see Figure S2). Only the eastern portion of the Project area contains private lands, within Sections 31 and 32 of T3S, R28E. These consist of 80 acres of private (fee) land owned by the City of Los Angeles and 90 acres of private (fee) land under geothermal lease to MPLP.

Five environmental issues were identified through a review of the written comments and concerns voiced during formal scoping and preliminary agency review of the Project.

- The proposed pipeline route would cross areas near U.S. Highway 395 and California State Route 203 that have been designated with a visual quality objective (VQO) of "Retention" by the Inyo National Forest. U.S. Highway 395 is also a California Scenic Highway and State Route 203 is a County Scenic Highway. The construction of the pipeline through these areas adjacent to these scenic highways could affect the visual character of the area and may have the potential to result in a significant impact.
- Production of geothermal fluid from the two 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. These geothermal reservoir changes may adversely affect other hydrothermal features (such as Hot Creek Fish Hatchery springs and Hot Creek springs). They may also influence or adversely affect the local or regional shallow, fresh groundwater system.
- Changes to the geothermal reservoir(s) from Project operations could adversely affect the Hot Creek Fish Hatchery springs. This could alter the listed critical habitat of the endangered Owens tui chub, which is dependent on the flow of these springs.
- Mule deer are known to use the Project area as summer range, and possibly as a migration corridor and fawning habitat. Project construction activities and/or the placement of Project facilities may have the potential to adversely affect mule deer use of the Project area. Existing site-specific and region-wide information should be used to analyze the potential effects of the Project on mule deer herd populations, migration, fawning habitat, and summer range.
- The Project is located within the Sherwin/Deadman Sheep and Goat Grazing Allotment of the Inyo National Forest. Project facilities could either directly (through removal of vegetation) or indirectly (by preventing or restricting the movement of sheep through the allotment) reduce the availability of grazing land throughout the life of the Project. The Project could also introduce cheat grass or other noxious weeds into new areas of the allotment that could also adversely impact grazing.

Computer modeling of the effects of the Project determined that there would be no substantial changes in the pressures in the Casa Diablo geothermal reservoir, and no changes to the geothermal reservoir further

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east. Therefore, there is no expectation that the Project would adversely affect hydrothermal features (such as the Hot Creek Fish Hatchery springs or the Hot Creek Gorge springs).

No potable (drinking quality) ground water is known to exist in the Project area. The existing Mammoth Community Water District ground water production wells are located over one mile, and up gradient, from the closest Project facilities. There is also no current evidence to suggest that the relatively shallow ground water well production zone is hydraulically connected with the deeper geothermal reservoir. Therefore, production of the geothermal fluids by the Project are not expected to adversely affect the ground water well field, either by depleting the aquifer or by drawing in lower quality waters.

Because no changes in the pressures in the geothermal reservoir east of Casa Diablo were predicted by the computer model, the Project is not expected to adversely affect the temperature, flow or chemistry of the Hot Creek Fish Hatchery springs. Therefore, the Project Biological Assessment concluded that the Project would have no adverse direct or indirect effects on the Owens tui chub or the designated critical habitat at the Hot Creek Fish Hatchery springs.

There is a relatively even dispersion of deer in the Project area throughout the spring, summer and fall months. Deer appear to use the Project area as summer range, and no significant numbers of deer are seasonally migrating through the Project area. Less than 8 acres of mule deer summer range would be physically disturbed by the Project. Noise, traffic and associated disturbances could increase the amount of summer habitat avoided by deer during the two to three months of construction. Substantial comparable habitat is immediately available in the area. The pipeline would not be a physical obstruction to deer. Adult deer could easily go over the top of the pipeline, and there would be multiple opportunities for juvenile deer to cross over the pipeline at below-ground crossings of existing roadways and under the pipeline.

At most less than 8 acres of livestock forage would be temporarily lost through construction of the Project. All but about 1 acre of this lost forage would be restored within a few years following reclamation of construction disturbance. This reduction in forage is a negligible percentage of the capable acres within the allotment. The above-ground pipeline would present a barrier to the movement of the foraging sheep. However, the road under-crossings should provide sufficient opportunity for the sheep to be moved to the other side of the pipeline as necessary.

The Project has committed to comply with the noxious weed measures approved for the exploration well projects which substantially limit the potential for the spread of noxious weeds specifically as a result of the Project. However, there was still a high potential for weed spread beyond the existing conditions. The impact of the Proposed Action from noxious weeds was considered moderate but below the level of significance under CEQA.

The visual impact of those sections of the pipeline visible from the adjacent scenic highways was found significant under CEQA because the pipeline would substantially degrade the existing visual character or quality of the site and may have a substantial adverse effect on a scenic vista. The pipeline would create a view inconsistent with the USFS “visual quality objective” (VQO) of “retention” prescribed for this part of the Project area, but which would be consistent with a VQO of “partial retention.” The view of the pipeline from these sections of the designated scenic highways also would be inconsistent with the Mono County objective to have pipelines in the scenic corridors obscured from view.

Implementation of the following mitigation measures would reduce the adverse effects of the impact to below the CEQA level of significance by altering the texture of the pipeline to match the character of the site and obscuring the view of the pipeline to reduce the adverse effect on the scenic vista. Implementation of these same mitigation measures also would meet the designated “retention” VQO, although it would remain visible from both scenic highways.

*VIS Mitigation Measure 6:* The pipeline segments to be constructed on Inyo National Forest managed-land in areas with the VQO of “retention” and visible from State Route 203 and/or U.S. Highway 395 shall use textured pipeline cladding and shall be colored with a color or colors (approved by the authorized officer) to blend with the area so that the pipeline generally repeats the color and texture of the characteristic landscape.

*VIS Mitigation Measure 7:* Following completion of construction, the Permittee shall prepare, submit for approval by the authorized officer, and implement a landscape plan to plant native trees and shrub vegetation at select locations on Inyo National Forest-managed land to further screen from view those portions of the pipeline which may be visible from State Route 203 and/or U.S. Highway 395 to ensure that the pipeline is at least subordinate to the visual strength of the characteristic landscape.

*VIS Mitigation Measure 8:* Following completion of construction, the Permittee shall prepare, obtain the approval of the Mono County and other required parties, and implement a landscape plan to plant native trees and shrub vegetation at select locations on private land to further screen from view those portions of the pipeline which may be visible from U.S. Highway 395 to ensure that the pipeline is generally obscured from view.

The Alternative Pipeline Route was developed as an alternative to the Proposed Action to eliminate the visual impact of the pipeline from State Route 203. By crossing U.S. Highway 395 about 0.3 miles north of where the Proposed Action pipeline route would cross U.S. Highway 395 the pipeline would not be visible from State Route 203 (see Figure S1). The pipeline also would cross U.S. Highway 395 in a drainage swale which would reduce the length of pipeline visible from U.S. Highway 395. This also would reduce the length of U.S. Highway 395 from which the pipeline would be visible.

The impact of the Alternative Pipeline Route was also considered significant under CEQA because it also would substantially degrade the existing visual character or quality of the site and may have a substantial adverse effect on a scenic vista. The Alternative Pipeline Route also would create a view inconsistent with the USFS VQO of “retention” prescribed for this part of the Project area, but which also would be consistent with a VQO of “partial retention.” The view of the pipeline from U.S. Highway 395 also would be inconsistent with the Mono County objective to have pipelines in the scenic corridors obscured from view.

Implementation of the mitigation measures proposed for this impact under the Proposed Action, and implementation of the following mitigation measure, would reduce the adverse effects of the impact to below the CEQA level of significance by altering the texture of the pipeline to match the character of the site and obscuring the view of the pipeline to reduce the adverse effect on the scenic vista. Implementation of these same mitigation measures also would meet the designated “retention” VQO, although it would remain visible from both scenic highways.

*VIS Mitigation Measure 9A:* The Alternative Pipeline Route pipeline segments to be constructed on private land within the scenic highway corridor along U.S. Highway 395 where visible shall use textured pipeline cladding and shall be colored with a color or colors selected (with the concurrence of Mono County) to ensure that the color and structure material are compatible with the natural setting.

The mitigation measures identified above reduce the significant impacts to visual resources of both the Proposed Action and the Alternative Pipeline Route alternative to below the level of significance under CEQA. There would be no residual significant effects from either alternative. The Alternative Pipeline Route alternative is considered the “environmentally superior” alternative under CEQA because it eliminates the visual impact of the Proposed Action pipeline from State Route 203 and reduces the visual impact of the Proposed Action pipeline from U.S. Highway 395. However, portions of the Alternative Pipeline Route would be constructed within the riparian conservation area designated by the USFS along the drainage from Basalt Canyon to Casa Diablo. It also would require the pipeline cross over land owned by the City of Los Angeles which is not leased to or controlled by MPLP (see Figure S2).



Figure S1: Basalt Canyon Geothermal Pipeline Project Area

- ▬ Project Area Boundary
- Drill Site
- Pipeline Corridor
- Proposed Action Pipeline Route
- Alternative Pipeline Route
- ( - - - Northern Path)
- ( ····· Southern Path)

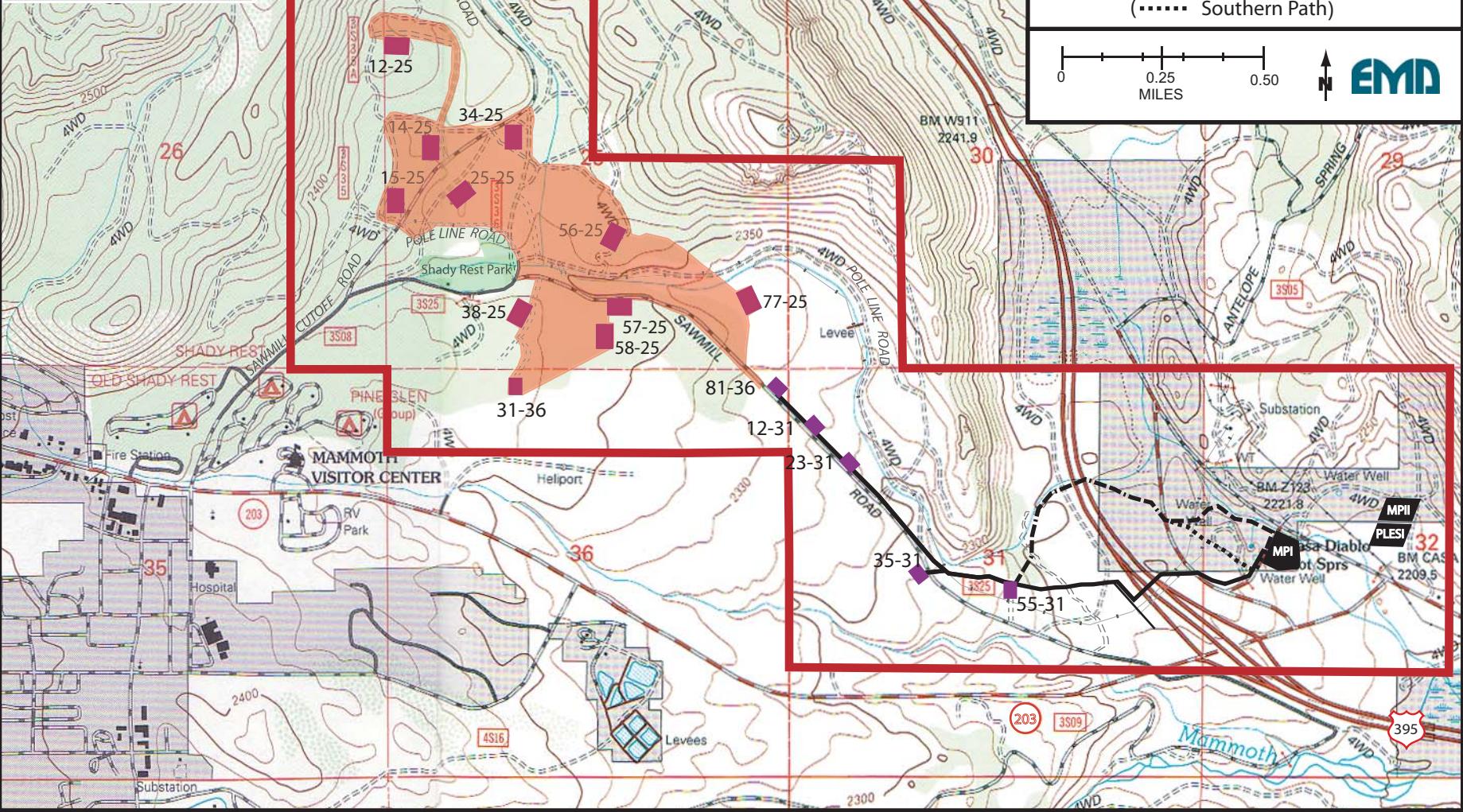
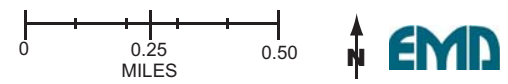
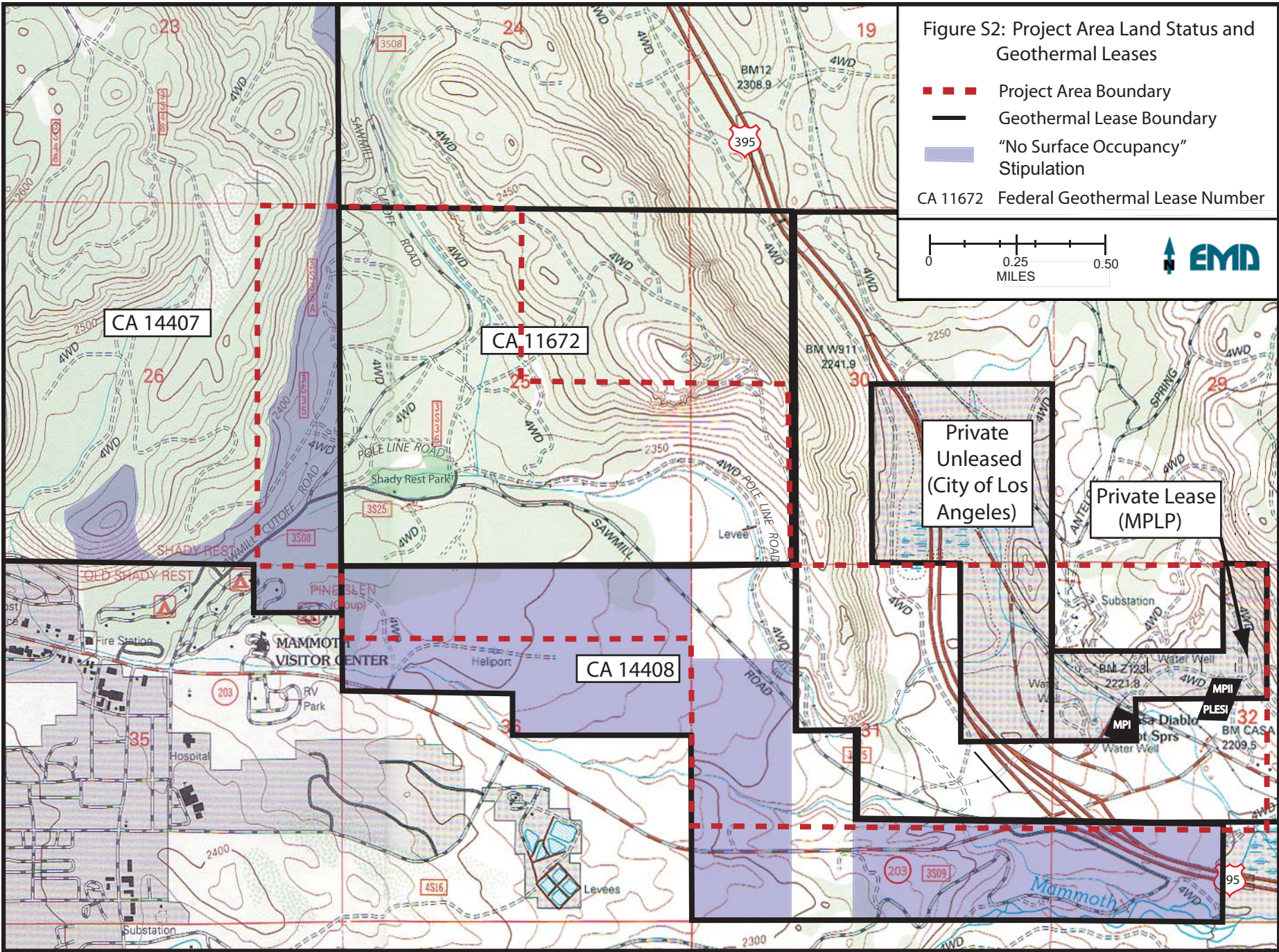




Figure S2: Project Area Land Status and Geothermal Leases

- Project Area Boundary
  - Geothermal Lease Boundary
  - "No Surface Occupancy" Stipulation
- CA 11672 Federal Geothermal Lease Number



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**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

## **1 INTRODUCTION**

This environmental document is a joint Environmental Assessment/Draft Environmental Impact Report (EA/Draft EIR). The EA was prepared to meet the requirements of the National Environmental Policy Act (NEPA; 42 USC 4321 *et seq.*). The Draft EIR was prepared to meet the requirements of the California Environmental Quality Act (CEQA; Public Resources Code 21000-21178.1). This EA/Draft EIR describes the existing environment that would be affected by, and the environmental consequences which could result from the proposed Basalt Canyon Geothermal Pipeline Project and the alternatives described in Chapter 2 of this EA/Draft EIR.

### **1.1 OVERVIEW OF THE PROPOSED ACTION**

Mammoth Pacific, L.P. (MPLP) has proposed to construct, operate, maintain and, following the expected 30-year life, decommission the Basalt Canyon Geothermal Pipeline Project ("Project" or "Proposed Action"). This Project is designed to deliver approximately 3,600 gallons per minute (gpm) of geothermal fluid through a new pipeline to two existing MPLP geothermal power plants located east of the Town of Mammoth Lakes in Mono County, California (see Figure 1). The geothermal fluid would be produced from two geothermal exploration wells that would be drilled, completed and tested as part of the previously approved Basalt Canyon Geothermal Exploration Project and/or Upper Basalt Geothermal Exploration Project (see Section 1.3). All of the approved exploration well drill sites are located west of U.S. Highway 395 and north of California State Route 203. All Project activities would be conducted within a 1,660-acre Project area, as shown in Figure 1.

The exact route of the pipeline cannot be determined until it is known which two wells would be connected to the pipeline. MPLP has proposed that the pipeline would follow a defined route in the eastern portion of the Project area because the five of the sixteen previously approved drill sites located there lie along a single line to the power plants. However, in the western portion of the Project area the other eleven approved drill sites are irregularly spaced, and a single pipeline route cannot be determined. MPLP has proposed that the western portion of the pipeline route would be located within an approximately one-half mile wide pipeline corridor area. Within this pipeline corridor area MPLP would select a final, specific pipeline route once MPLP determined which of the western drill sites, if any, would be connected to the pipeline. The length of the final pipeline route would vary depending on which wells were connected to the pipeline. The shortest Project pipeline route would be approximately 4,970 feet (0.94 miles) long. The longest pipeline route likely would be approximately 17,620 feet (3.34 miles) long. A detailed description of the routing of the pipeline is provided in Appendix A and summarized in Section 2.1.2 of this EA/Draft EIR.

The proposed pipeline would consist of nominal 16-inch diameter insulated, welded-steel pipe. It would be constructed above ground on low piers or underground where necessary to cross under existing roads. Each of the two wells would be equipped with a downhole pump powered by a surface electric motor.

Electrical power and control cables for the two wells would either be installed in above-ground conduits placed on the pipeline supports or buried along and adjacent to the pipeline. The geothermal fluid would be delivered by the pipeline to the existing MPLP Mammoth Pacific Unit I (MP I) and Mammoth Pacific Unit II (MP II) geothermal power plants. These power plants are located on MPLP's private geothermal lease in the Casa Diablo area east of U.S. Highway 395 (see Figure 2 and Section 1.3). Once the useable heat in the geothermal fluid was extracted by the power plants, the geothermal fluid would be injected into the geothermal reservoir at Casa Diablo through the existing MP I and MP II geothermal injection wells.

The geothermal exploration wells, and most of the proposed pipeline, would be located within the Inyo National Forest on Federal Geothermal Leases CA-11667, CA-11672, CA-14407 and CA-14408. These leases are located within portions of Sections 30, 31 and 32 of Township 3 South (T3S), Range 28 East (R28E) and Sections 25, 26 and 36 of T3S, R27E, MDB&M (see Figure 2). Only the eastern portion of the Project area contains private lands, within Sections 31 and 32 of T3S, R28E. These consist of 80 acres of private (fee) land owned by the City of Los Angeles and 90 acres of private (fee) land under geothermal lease to MPLP.

### **1.2 OBJECTIVES AND PURPOSE AND NEED FOR THE PROPOSED ACTION**

The Project is a proposal by MPLP to construct, operate, maintain and eventually decommission a pipeline from two wells located northeast of the Town of Mammoth Lakes, California to the MP I and MP II geothermal power plants. The pipeline would move geothermal fluid from the wells to these existing power plants to generate electric power.

As geothermal wells age they typically produce less and/or cooler geothermal fluid as a result of scale in the reservoir, cold water breakthrough, reservoir cooling or other mechanisms. Currently, the MP I and MP II project production wells are producing both less and cooler geothermal fluid than they did in the first years they operated. As a result, the MP I and MP II power plants currently produce less electrical energy than they were designed and permitted to produce. New wells are needed to supply additional, hotter geothermal fluid to these power plants to restore their electrical output back up to the original design and operating capacity. The Basalt Canyon Geothermal Pipeline Project is designed to supply this additional, hotter geothermal fluid to these two power plants.

The following describes the key participants and their roles in the development, analysis, and decisions related to the Project.

#### *Mammoth-Pacific, L.P.*

Federal geothermal leases require that the lessee explore the leased lands until there is production of geothermal resources in commercial quantities. MPLP's purpose and need for the Project is to produce and commercially utilize the geothermal resources under those portions of the federal geothermal leases within the Project area. MPLP's specific objectives for the Project are to construct and operate a pipeline to deliver the geothermal resources produced from the wells drilled within the Project area to the existing

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MP I and MP II power plants for use and injection. MPLP has filed the required Utilization Plan (MPLP 2005) with the Bureau of Land Management (BLM) for the Project. Approval of the Utilization Plan would grant MPLP the right to operate the geothermal wells and construct and operate the geothermal fluid pipeline on the federal geothermal leases within the Project area. However, to actually commence construction MPLP would need to submit and obtain BLM approval of a facility construction permit and/or geothermal sundry notice.

### Bureau of Land Management

BLM has the responsibility to manage operations on lands leased for geothermal resources under the terms of the Geothermal Steam Act of 1970 and its implementing regulations. BLM must respond to a Plan of Operation for drilling or a Utilization Plan for resource utilization submitted by a geothermal lessee and either approve or deny the plan. BLM's purpose in preparing this EA is to comply with the requirements of NEPA to evaluate the potential environmental consequences of the Proposed Action and its decisions related to the actions proposed by MPLP. Consistent with requirements of NEPA, this EA would serve as a decision-making tool to assist BLM in its decision to approve, modify or reject the proposed actions.

### U.S. Forest Service, Inyo National Forest

The U.S. Forest Service (USFS), Inyo National Forest is the surface management agency responsible for the public lands within the Project area. The Geothermal Steam Act of 1970 and its implementing regulations require that BLM consult with the agency which manages the surface lands of a geothermal lease before approving any operations proposed on that lease. USFS is acting as a cooperating agency with the BLM in the preparation of this EA. USFS's purpose is to comply with the requirements of the Geothermal Steam Act to participate as the surface management agency in the BLM consultation process. USFS must also comply with the NEPA requirements to review and comment on matters which address or relate to its areas of legal jurisdiction and/or area of special expertise. Consistent with requirements of NEPA, this EA also would serve as a decision-making tool to assist the USFS in its consultation capacity with the BLM.

### Mono County

Mono County is the lead agency for compliance with CEQA for the Project. MPLP has filed the required permit applications with Mono County to obtain approval for the construction and operation of the proposed geothermal fluid pipeline on private lands within the Project area. The objectives of Mono County for preparing this Draft EIR are to comply with the requirements of CEQA to evaluate the potential environmental impacts of the proposed Project. Consistent with the requirements of CEQA, 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 Project activities within its jurisdiction.

## 1.3 RELATED MPLP GEOTHERMAL PROJECTS

The two geothermal exploration wells produced for the Project would be drilled, completed and tested under the previously approved Basalt Canyon Geothermal Exploration Project and/or Upper Basalt Geothermal Exploration Project. The Project pipeline would deliver the geothermal fluid produced from these two geothermal wells to the existing MP I and MP II geothermal power plants. The following

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## **Basalt Canyon Geothermal Pipeline Project EA/Draft EIR**

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paragraphs provide descriptions of these and the other MPLP geothermal projects in the Project area. The environmental documents previously prepared for each of these MPLP projects are incorporated by reference into this EA/Draft EIR. Summaries of the relevant information from these documents are provided in this EA/Draft EIR where applicable.

### *Mammoth Pacific Unit I and Mammoth Pacific Unit II Project (CMEMD and BLM 1987a, and CMEMD and BLM 1987b)*

The MP I project is an existing 10 megawatt (MW) geothermal electric generating facility and production and injection well field. It is located on a 90-acre parcel of private (fee) land leased to MPLP approximately 1,200 feet northeast of the intersection of U.S. Highway 395 and California State Route 203 in the Casa Diablo area of Mono County, California (see Figure 1). It commenced operation in 1984. The MP II project is an existing 15 MW geothermal electric generating facility and production and injection well field located on the same 90-acre parcel of private land leased to MPLP. 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. 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 eight private land 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 five private land injection wells.

The geothermal fluid to be produced from the two Basalt Canyon Geothermal Pipeline Project wells for the MP I and MP II power plants would be hotter than the geothermal fluid originally produced from the Casa Diablo wells for these projects because they are closer to the source of the geothermal fluid. MPLP anticipates that approximately 1,800 gallons per minute (gpm) of the geothermal fluid currently produced for the MP I and MP II projects from the Casa Diablo well field would not be delivered to the power plants. This would be accomplished by shutting in and/or throttling back one or more of the existing MP I and MP II Casa Diablo wells. Implementation of the Proposed Action would return electrical production from these two power plants to design levels even though less geothermal fluid would be used by the power plants than anticipated under the original design.

### *PLES Unit I Project (BLM, USFS and GBUAPCD 1989)*

The 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 1). It includes a geothermal electric generating facility which is a “twin” to the MP II project power plant. It also commenced operation in 1990. 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. The PLES I geothermal production and injection well fields have not been integrated with the MP I and MP II projects geothermal well fields. MPLP does not intend to have the PLES I Project receive geothermal fluid produced from the Basalt Canyon Geothermal Pipeline Project.

### *Casa Diablo Geothermal Project Exploratory Core Hole Program (BLM and USFS 1992)*

The eastern portion of the Project area was evaluated in an environmental assessment prepared for the BLM and USFS in July of 1992 for the Casa Diablo Geothermal Project Exploratory Core Hole Program. This program proposed the drilling of up to four exploratory core holes on lands immediately east and

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west of U.S. Highway 395 in the vicinity of State Route 203, in Sections 29, 30 and 31, T3S, R28E, MDB&M. The EA concluded that the proposed exploratory program would have no unavoidable adverse effects provided that 12 mitigation measures were implemented as outlined in the EA. Two core holes (designated 66-31 and 38-32 – see Figure 1) were subsequently drilled and are currently monitored under the approved Plan of Operation.

### Basalt Canyon Geothermal Exploration Project (BLM and USFS 2001)

In March 2002 MPLP received approval from the BLM and USFS to conduct the Basalt Canyon Slim Hole Project and the Basalt Canyon Geothermal Well Exploration Project (together the Basalt Canyon Geothermal Exploration Project). The project area consists of portions of Section 36, T2S, R27E and portions of Sections 31 and 32, T3S, R28E, MDB&M (Figure 3). These lands include portions of Federal Geothermal Leases CA-11667 and CA-14408 (see Figure 2). The Basalt Canyon Geothermal Exploration Project consists of the drilling, sampling and monitoring of up to five small diameter ("slim") holes from six sites within the area of the project (see Figure 3). It also includes the drilling, completing, and flow testing of up to two large-diameter geothermal exploration wells from these same six drill sites. As of June 2005, one of the approved small diameter holes (designated Slim Hole 12-31 – see Figure 1) had been drilled. MPLP is proposing that one or both of the large-diameter geothermal exploration wells to be drilled under this project could be used to produce geothermal fluid for the Project pipeline.

### Upper Basalt Geothermal Exploration Project (USDI, BLM 2005)

In January 2005 MPLP received approval from the BLM and USFS for an additional geothermal exploration project called the Upper Basalt Geothermal Exploration Project. The area for this project consists of Section 25 and portions of Section 26, T3S, R27E and portions of Section 30, T3S, R28E, MDB&M (see Figure 3). This includes portions of Federal Geothermal Leases CA-11672 and CA-14407 (see Figure 2). The Upper Basalt Geothermal Exploration Project consists of the drilling, sampling and monitoring of up to five small diameter ("slim") holes from ten sites within the area of the project (see Figure 3). It also includes the drilling, completing, and flow testing of up to four large-diameter geothermal exploration wells from these same ten drill sites. As of June 2005, none of the approved small diameter holes or large-diameter geothermal exploration wells had been drilled. MPLP is proposing that up to two of the large-diameter geothermal exploration wells to be drilled under this project could be used to produce geothermal fluid for the Project pipeline.

## **1.4 RELATIONSHIP TO STATUTES, REGULATIONS AND OTHER PLANS**

### **1.4.1 Geothermal Steam Act and Implementing Regulations**

The proposed Project would be conducted in large part on lands which were leased by the United States of America to MPLP under the Geothermal Steam Act of 1970 ("Act"). Geothermal leases convey the "exclusive right and privilege to drill for, extract, produce, remove, utilize, sell, and dispose of geothermal steam and associated geothermal resources" on these leased lands. To maintain this right, the lessee must "diligently explore the leased lands for geothermal resources until there is production in commercial quantities" applicable to each of these leases. The lessee must pay annual rentals to the federal government, and has to expend increasing dollars until the production of geothermal resources in commercial quantities is achieved.

The Act gives the Secretary of the Interior the responsibility and authority to manage geothermal operations on lands leased for geothermal resource development by the United States of America. The Secretary has delegated this authority to the Bureau of Land Management ("BLM"). All operations conducted on the geothermal lease by the geothermal lessee are subject to the approval of the BLM.

Under the regulations adopted to implement the Act (43 CFR 3200 *et. seq.*), the BLM must review a Plan of Operation for drilling or a Utilization Plan for resource utilization operations ("Plan") submitted by a geothermal lessee. The BLM would approve the Plan if it complies with the following.

- The Act.
- The regulations adopted to implement the Act.
- Other directives issued by the BLM (Geothermal Resource Operational (GRO) Orders, Notices to Lessees, etc.).
- Special stipulations applicable to the leases.
- Other applicable laws and regulations.

### 1.4.2 MPLP Geothermal Leases and Lease Stipulations

In 1973 the Department of Interior produced a Final Environmental Impact Statement (EIS) which analyzed the potential impacts of geothermal leasing, including exploration and development drilling and power plant development, under the Geothermal Steam Act. This EIS specifically analyzed leasing, exploration and development of areas within Mono-Long Valley (USDI 1973). In 1979 the USFS completed the "Mammoth-Mono Planning Unit Land Management Plan" and associated EIS. The USFS decision provided for leasing, exploration, and possible development and utilization of geothermal resources within the Mono-Long Valley Known Geothermal Resource Area (KGRA), including the Project area.

In 1980 the USFS completed an EA and issued a Decision Notice which approved geothermal leasing within portions of the KGRA. In 1981 the USFS completed a Supplement to the EA and issued a revised Decision Notice for this same area (USDA Forest Service, Inyo National Forest 1981). The 1981 Decision Notice documented that the leases would be issued to include exploration and development of the geothermal resources. It also clarified the environmental issues of concern and revised the special lease stipulations to be attached to the leases from this area, which became known as "Lease Block 1." Within the Project area, Geothermal Leases CA-11667 and CA-11672 (see Figure 2), issued in early 1982 following a competitive bid process, were part of "Lease Block 1." The special stipulations attached to these two leases do not contain any site-specific conditions. However, they do reference "environmental concern maps" from the EA which the special stipulations state "should be reviewed by the lessee as guides when developing plans of operation." The issues of concern identified in the EA for those portions of Geothermal Leases CA-11667 and CA-11672 within the Project area include protection of the following resources.

- Visual resources along U.S. Highway 395, State Route 203, and Sawmill Cutoff Road.
- Recreation resources around the current location of Shady Rest Park.
- Timber resources at the northern end of Geothermal Lease CA-11672.
- Watershed resources along Rhyolite Ridge.
- Social and economic resources for the entire area west of U.S. Highway 395.

## Basalt Canyon Geothermal Pipeline Project EA/Draft EIR

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In 1982 the USFS completed a new EA for the area generally north and west of Lease Block 1, which became known as "Lease Block 2" (USDI BLM 1982). This EA focuses on the potential impacts from geothermal resource exploration which would follow leasing. A competitive lease sale was held for this area in 1983. However, in 1984, before the leases were issued, the USFS and BLM prepared a Supplemented EA to specifically assess the effects of geothermal resource development and production, including power plant construction and operation, especially on water quality and quantity, recreation and visual resources (USDA and USDI 1984). Within the Project area, Geothermal Leases CA-14407 and CA-14408 were issued as part of Lease Block 2 in early 1985. These leases contain a special stipulation which states that "No surface disturbing activities will be permitted in the No Surface Occupancy areas shown on Map 5, attached, unless the lessee can demonstrate through an appropriate plan of operation or permit application that no unacceptable environmental impacts will occur from the proposed operations." These "no surface occupancy" areas, which cover most of Geothermal Leases CA-14407 and CA-14408 within the Project area, are shown in Figure 2. Map 5 (and Maps 2, 3 and 4, which provide the information compiled into the restrictions shown on Map 5) provided in the Lease Block 2 Supplemented EA was reviewed for this EA/Draft EIR. It is believed that these "no surface occupancy" restrictions were adopted based on the following issues:

- The existing and potential concentrated and dispersed recreational use over essentially all of these two leases within the Project area (Map 2).
- The "critical visual zones" (both foreground and middle ground) along U.S. Highway 395, State Route 203 and Sawmill Cutoff Road covering much of these two leases within the Project area (Map 3).

The potential effects of the Proposed Action and alternatives on these resources are analyzed in the Recreation (Section 3.10) and Visual Resources (Section 3.5) sections, respectively, of this EA/Draft EIR.

These environmental documents previously prepared for the geothermal leasing decisions are incorporated by reference into this EA/Draft EIR and listed in the list of references (Chapter 7). Summaries of the relevant information from these documents are provided in this EA/Draft EIR where applicable.

### **1.4.3 Inyo National Forest Land and Resource Management Plan**

Except for the eastern end of the pipeline, the Project is located entirely on publicly owned land administered by the USFS as part of the Inyo National Forest. Land uses within the Inyo National Forest are governed by the 1988 Inyo National Forest "Land and Resource Management Plan" (LRMP). The LRMP (USDA, Forest Service, Inyo National Forest 1988) provides integrated, multiple resource management direction for all Forest resources for the plan period. The Forest-wide Standards and Guidelines set the minimum resource conditions that would be maintained throughout the forest. The Management Area Direction provides general direction for the management of areas whose boundaries are defined with reference to its unique characteristics.

The LRMP includes the following Standards and Guidelines for General Mineral Management.

- Administer mining laws and regulations to permit the uninterrupted production of minerals while assuring the adequate protection of other resources and environmental values.

- Where valid existing rights within withdrawn areas are exercised, operating plans should be consistent with the purpose of withdrawals.
- Coordinate the mineral management program with the Bureau of Land Management.

The LRMP also includes the following Standards and Guidelines for the management of Leasable Minerals, which includes Geothermal Resources.

- Provide for the leasing of National Forest lands for exploration and development of oil, gas and geothermal resources commensurate with other resource values. Follow existing Memoranda of Understanding between the Bureau of Land Management and the Forest Service that relate to oil, gas, and geothermal mineral activities. Follow applicable regulations, operating orders, and notices for oil, gas and geothermal leases issued pursuant to appropriate authority.
- Prepare environmental documents that analyze full-scale development prior to consenting to Bureau of Land Management's issuance of geothermal leases.
- Prepare post-lease environmental documents in cooperation with the Bureau of Land Management for site-specific exploration, development, and production proposals. Assure that impacts to resources are appropriately analyzed. Assure that impacts to these resources are mitigated to the extent possible.
- Consider the location of fluid conveyance lines and facilities for geothermal development to ensure the viability of deer migration corridors. Encourage geothermal development that utilizes air cooling rather than evaporative cooling systems.

Standards and Guidelines apply to other resource areas as well and are incorporated here by reference.

The majority of the Project area, and all of the proposed surface disturbing activities, is located within the northwestern corner of LRMP Management Area #9 ("Mammoth"). Portions of the northwestern and northeastern corners of the Project area are located within the southwestern corner of LRMP Management Area #7 ("Upper Owens River"). The LRMP notes that uses in Management Area #9 are directly related to the support of nearby Mammoth Lakes. These include various utilities, the Mammoth Lakes/Yosemite Airport, various parks, the Hot Creek Fish Hatchery, and land owned by the City of Los Angeles. Management Area #9 also contains two important viewsheds (along U.S. 395 and State Route 203), portions of two grazing allotments (one cattle and one sheep), and is important as a mule deer migration path and staging area in the fall and spring.

The LRMP identifies four "Management Prescriptions" applicable to the Project area. In Management Area #7, Management Prescription 9 (Uneven Aged Timber Management) applies to the northeast corner of the Project area. Management Prescription 16 (Dispersed Recreation) applies to a very small portion of the northwest corner of the Project area. In Management Area #9, where all of the surface disturbance would occur, Management Prescription 12 (Concentrated Recreation Area) and Management Prescription 15 (Developed Recreation Site) each apply. The LRMP also describes future Management Directions for Management Area #9, including guidelines to direct future uses of lands managed by the USFS. Table 1 lists each of the LRMP Management Directions for Management Area #9.

**Table 1: Inyo National Forest LRMP, Management Directions for Management Area #9 (Mammoth)**

<b>MANAGEMENT DIRECTIONS</b>
<b>Cultural Resources</b>
Maintain and enhance interpretive sites such as Indian Caves.
<b>Facilities</b>
Allow new ski base areas commensurate with transportation planning.
<b>Fish</b>
Maintain the productivity and resources of Hot Creek Fish Hatchery; study Laurel Pond for introduction of fish; and implement the 1986 Hot Creek Wild Trout Management Plan.
<b>Geology</b>
Cooperate and encourage geophysical exploration and research including post-caldera formation and current and future seismic and volcanic activity.
<b>Lands</b>
Enter into land exchanges where the best use of USFS land would be in the private sector, the exchange would conform to state/county/USFS planning, and the proposed use is consistent with the local General Plan. Allow no exchanges north of SR 203; solicit comment on proposed exchanges from other interested agencies; and allow development on USFS lands where infrastructure is available and the use would have benefits that outweigh adverse impacts.
<b>Recreation</b>
Provide for trail links within the community of Mammoth Lakes; maintain open space areas around the Town for passive use; prohibit dispersed camping; prohibit further development of Shady Rest Park; Allow development of Mammoth Creek Park; Identify and fund expansion potential of the Shady Rest and Sherwin Creek Campgrounds; and fund the interpretive potential of the Hot Creek geologic site.
<b>Visual Resources</b>
Develop a viewshed analysis for SR 203 and U.S. 395; mitigate visual impacts of major uses seen from these major gateway routes.
<b>Water</b>
Allow development where water supplies are adequate after first meeting the water requirements of natural resources; allow development of new water sources on USFS lands only when private sources have been exhausted; support state and local ordinances that mitigate adverse impacts of runoff onto USFS lands.
<b>Wildlife</b>
Continue to maintain waterfowl habitat at Laurel Pond; and maintain the integrity of winter ranges, holding areas, migration routes, and fawning areas for mule deer.

**1.4.4 USFS Sierra Nevada Forest Plan Amendment**

In January 2004 the Record of Decision (ROD) for the Sierra Nevada Forest Plan Amendment (SNFPA) Supplemental Final Environmental Impact Statement was signed. This ROD replaced in its entirety the ROD signed in January 2001 for the Sierra Nevada Forest Plan Amendment Final Environment Impact Statement. The ROD amended the Pacific Southwest Regional Guide and the land and resource management plans (LRMPs) for national forests in the Sierra Nevada, including the Inyo National Forest. The SNFPA focused on and established new Forest LRMP Standards and Guidelines for five specific problem areas. These problem areas are the protection of old forest ecosystems and associated species; the protection of aquatic, riparian and meadow ecosystems and associated species; the management of fire and fuel loading; reducing the potential for noxious weeds; and the enhancement of hardwood forest ecosystems in the lower west side of the Sierra Nevada.

Only the provisions addressing the protection and viability of native plant and animal species associated with old forest ecosystems; the protection of aquatic, riparian and meadow ecosystems; and reducing the potential for noxious weeds are applicable to the Project area. The Project has been designed to avoid all native plant and animal species associated with old forest ecosystems, and all aquatic, riparian and meadow ecosystems. The reduced potential for noxious weeds also has been incorporated into the Project and this EA. Therefore, the Project is consistent, to the extent applicable, with the general intent and specific goals of the January 2004 SNFPA ROD.

### **1.4.5 National Energy Policy**

The Proposed Action is in accordance with the National Energy Policy (May 2001), which sought to increase renewable energy production, including geothermal resources. It is also consistent with Executive Order 13212 (May 2001), which directed executive departments and agencies to take appropriate actions, to the extent consistent with applicable law, to expedite projects that would increase the production, transmission, or conservation of energy. It also directed agencies to expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. Consistent with Section 2 of the Mining and Mineral Policy Act (MMPA) of 1970 and sections 102(a)(7), (8), and (12) of the Federal Land Policy and Management Act of 1976 (FLPMA), it is the policy of the Department of the Interior, to encourage the development of mineral resources, including geothermal resources, on federal lands. Finally, the Proposed Action is consistent with the Geothermal Energy Research, Development, Demonstration Act of 1974, which promotes the development and utilization of geothermal resources.

### **1.4.6 County of Mono General Plan**

That portion of the Project area located on public lands managed by the USFS is designated by the Mono County General Plan as “Resource Management”/“Inyo National Forest” (County of Mono Planning Department 2001). Private lands within the Project area are designated as “Open Space” (those lands owned by the City of Los Angeles), “Resource Management” (the western end of the MPLP-leased private land) and “Resource Extraction” (the eastern end of the MPLP-leased private land).

The General Plan notes that the “Resource Management” 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 “Resource Management” designation, and other “similar” uses may also be permitted uses. The MPLP MP I project power plant and well field are located on the MPLP-leased private land parcel zoned “Resource Management.” The General Plan also notes that lands designated “Resource Management”/“Inyo National Forest” are subject to the land use authority of the Inyo National Forest Land and Resource Management Plan.

The “Open Space” zone “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 “Resource Extraction” zone “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 “Resource Extraction”



designation, and other “similar” uses may also be permitted uses. No Project activities are proposed on areas zoned “Resource Extraction.”

#### **1.4.7 Town of Mammoth Lakes General Plan**

The Town of Mammoth Lakes, incorporated in August 1984, 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 southwestern portion of the Project area is located within the designated boundaries of the Town of Mammoth Lakes (see Figure 1) in an area that the General Plan designates as Urban Planning District #17, “Joaquin Ridge.” Because all of the land in this district is part of the Inyo National Forest, land use planning and management is the responsibility and jurisdiction of the USFS. However, the Project is not inconsistent with the “open space” designation for this district in the Town of Mammoth Lakes General Plan, which specifically permits geothermal exploration and production. The remainder of the Project area is located within the Town of Mammoth Lakes "planning area."

#### **1.4.8 Agency Required Permits**

##### *Federal Agencies*

The BLM is the federal agency delegated with the responsibility for managing all geothermal operations on federal lands leased for geothermal resource development. All operations conducted on the geothermal leases by MPLP are subject to the approval of the BLM. Approval of the Plan would give MPLP the right to build and operate the Project. However, MPLP could not commence construction until a facility construction permit was approved by the BLM. BLM approval of a commercial use permit is also required before the produced geothermal resources could be used. BLM approval of a geothermal sundry notice is required to conduct subsequent well operations on the geothermal wells or make any changes in any other previously approved permit.

The USFS is the federal agency responsible for managing and administering surface activities within national forests. Because the federal geothermal leases are located within the Inyo National Forest, the BLM must consult with the USFS as it prepares the EA. USFS must also concur with the BLM Plan approval for the Project. No other approvals are believed to be required from the USFS for the Project. However, the USFS would consult with the U.S. Fish and Wildlife Service as required under Section 7 of the Endangered Species Act and the California State Historic Preservation Officer as required under Section 106 of the Historic Preservation Act.

##### *Local and State Agencies*

Mono County 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 use permit by Mono County through the Mono County Energy Management Department and the Mono County Planning Commission. If required,

ministerial building permits for construction of some aspects of the Project would be granted by the Building Division of the Mono County Community Development Division.

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 California Department of Transportation (Caltrans) is responsible for maintaining U.S. Highway 395. Activities conducted within (or under) the U.S. Highway 395 right-of-way requires Caltrans' approval. Caltrans approval of an encroachment permit would be required in order for MPLP to construct the geothermal fluid pipeline under U.S. Highway 395.

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. Activities proposed by MPLP to divert or obstruct the natural flow or change the bed, channel or bank of any stream require notification and negotiation of an agreement with the CDFG to protect these resources.

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 two geothermal wells.

### **1.5 JOINT NEPA/CEQA DOCUMENT**

#### **1.5.1 Conformance with NEPA and CEQA**

This EA/Draft EIR was prepared as a joint federal/state environmental document, as encouraged by NEPA regulations [40 CFR 1506.2(c)] and CEQA regulations (CEQA Guidelines 15226). A third party consultant, Environmental Management Associates, Inc. (EMA), prepared the NEPA/CEQA document under the direction of the BLM, USFS and Mono County. A Memorandum of Understanding (MOU) among the BLM, USFS, Mono County, EMA and MPLP (collectively “the participants”) was signed by these parties. The MOU (BLM *et al.* 2003) established requirements and procedures for preparing a joint environmental document to meet the NEPA/CEQA requirements for evaluating the proposed Basalt Canyon Geothermal Pipeline Project.

This EA/Draft EIR was prepared to conform to the policy guidance provided in BLM’s National Environmental Policy Act (NEPA) Handbook (BLM Handbook H-1790-1). This handbook provides instructions for compliance with the Council on Environmental Quality’s (CEQ’s) regulations (40 CFR 1500-1508) for implementing NEPA and the U.S. Department of the Interior’s manual guidance on NEPA (516 DM 1-7). This EA/Draft EIR was also prepared to conform to the policy guidance provided in USFS’s Environmental Policy and Procedures Handbook (FSH 1909.15). This handbook also provides instructions for compliance with CEQ regulations for implementing NEPA, the U.S. Department of Agriculture’s NEPA Policies and Procedures (7 CFR 1b) and the Forest Service Manual (FSM 1950).

CEQA guidelines provide some guidance for preparing joint NEPA/CEQA documents (CEQA Guidelines 15220-15228); NEPA does not. This EA/Draft EIR follows CEQA guidance for joint NEPA/CEQA documents.

### 1.5.2 Public Scoping

Following receipt of the Plan from MPLP, the BLM published and distributed public notice of their intent to prepare an EA for the proposed Project. The notice was published in local newspapers on or about July 10, 2003. It was also distributed to 69 agencies and interested members of the public identified on the BLM interested party list. A public field trip to the Project site was conducted on Saturday, July 26, 2003 with members of the BLM, Inyo National Forest and MPLP in attendance to answer questions. The BLM requested that written comments on the Basalt Canyon Geothermal Pipeline Project be received by August 11, 2003. BLM received a total of five written comment letters on the Project following the public notice. Comments were received from the following.

- California Regional Water Quality Control Board, Lahontan Region, Victorville, California
- Mammoth Community Water District, Mammoth Lakes, California
- Joe F. Echenique Livestock, Bakersfield, California
- California Department of Transportation, District 9, Bishop, California
- California Department of Fish and Game, Bishop Field Office, California

Following the BLM public notice, Mono County determined that an EIR would be required for the Project. On September 24, 2003, Mono County filed a Notice of Preparation (NOP) of this Draft EIR with the State Clearinghouse. Four additional comment letters were received in response to the NOP. Comments letters were received from the following.

- Great Basin Unified Air Pollution Control District, Bishop, California
- California Regional Water Quality Control Board, Lahontan Region, Victorville, California
- California Department of Fish and Game, Bishop Field Office, California
- Community Development Department, Town of Mammoth Lakes, California

Copies of these letters are on file with the BLM at the White Mountain Ranger District Office in Bishop and the Mono County Energy Management Department in Mammoth Lakes.

In February 2005 MPLP modified the Project by expanding the Project area to include additional forest lands north of Shady Rest Park. In response the BLM published a new request for public comments and a notice of public meeting in the local newspaper. On February 24, 2005 a public meeting was held to discuss the project. No comment letters were received.

### 1.5.3 Identified Issues and Concerns

Five potential environmental issues were identified through a review of the written comments and concerns voiced during formal scoping and preliminary agency review of the Project.

- The proposed pipeline route would cross areas near U.S. Highway 395 and California State Route 203 that have been designated with a VQO of “Retention” by the USFS. U.S. Highway 395 is also a California Scenic Highway and State Route 203 is a County Scenic Highway. The construction of the pipeline through these areas adjacent to these highways could affect the visual character of the area and may have the potential to result in a significant impact.

- Production of geothermal fluid from the two 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. These geothermal reservoir changes may adversely affect other hydrothermal features (Hot Creek Fish Hatchery springs and Hot Creek springs). They may also influence or adversely affect the local or regional shallow, fresh groundwater system.
- Changes to the geothermal reservoir(s) from Project operations could adversely affect the Hot Creek Fish Hatchery springs. This could alter the listed critical habitat of the endangered Owens tui chub, which is dependent on the flow of these springs.
- Mule deer are known to use the Project area as summer range, and possibly as a migration corridor and fawning habitat. Project construction activities and/or the placement of Project facilities may have the potential to adversely affect mule deer use of the Project area. Existing site-specific and region-wide information should be used to analyze the potential effects of the Project on mule deer herd populations, migration, fawning habitat, and summer range.
- The Project is located within the Sherwin/Deadman Sheep and Goat Grazing Allotment of the Inyo National Forest. Project facilities could either directly (through removal of vegetation) or indirectly (by preventing or restricting the movement of sheep through the allotment) reduce the availability of grazing land throughout the life of the Project. The Project could also introduce cheat grass or other noxious weeds into new areas of the allotment that could also adversely impact grazing.



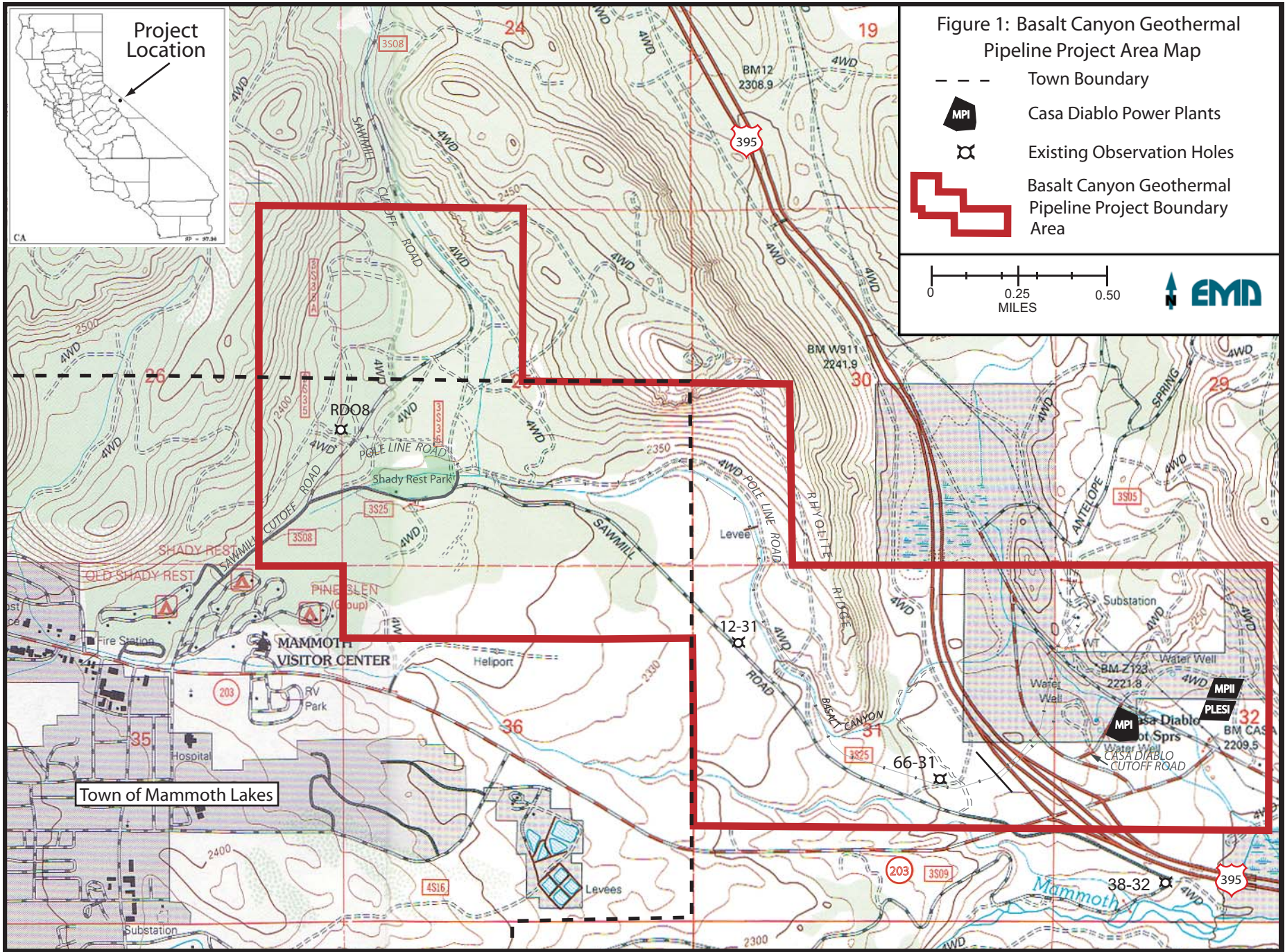




Figure 2: Project Area Land Status and Geothermal Leases

- - - Project Area Boundary
  - Geothermal Lease Boundary
  - "No Surface Occupancy" Stipulation
- CA 11672 Federal Geothermal Lease Number

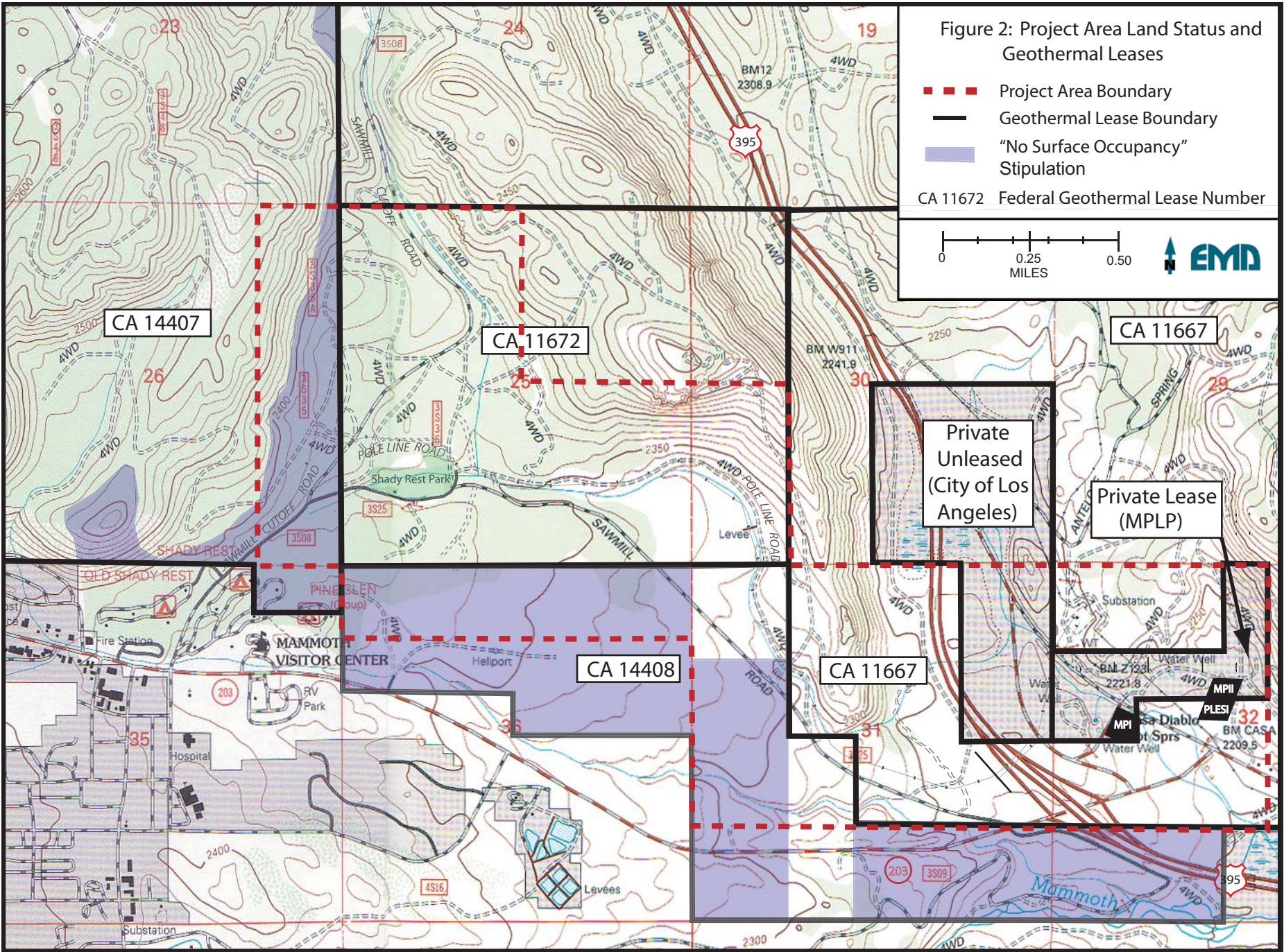
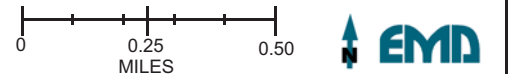





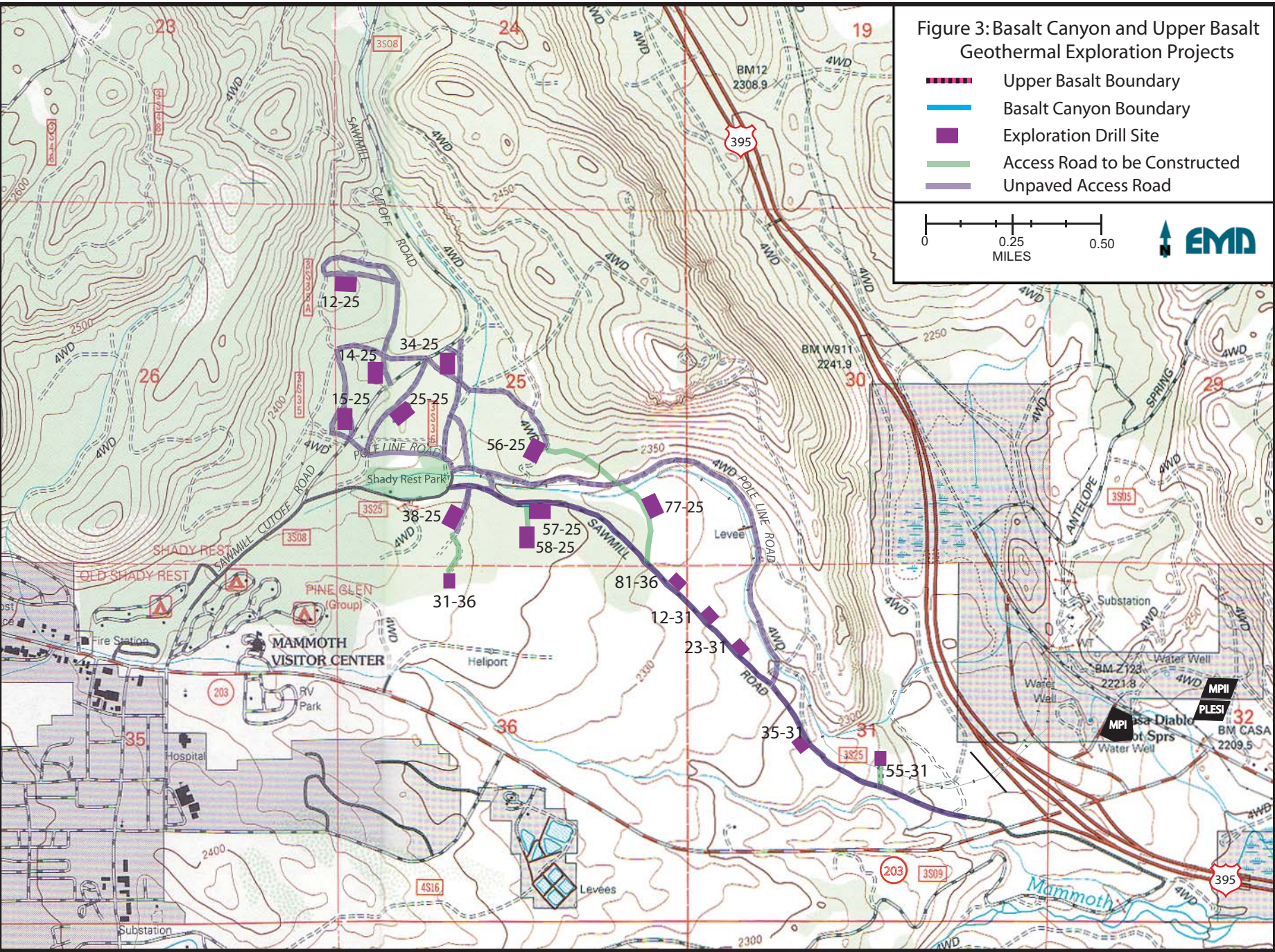
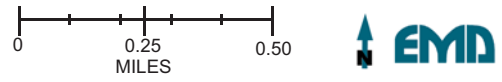




Figure 3: Basalt Canyon and Upper Basalt Geothermal Exploration Projects

-  Upper Basalt Boundary
-  Basalt Canyon Boundary
-  Exploration Drill Site
-  Access Road to be Constructed
-  Unpaved Access Road





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**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

## **2 PROPOSED ACTION AND ALTERNATIVES**

### **2.1 PROPOSED ACTION**

#### **2.1.1 Project Location and Overview**

Mammoth Pacific, L.P. (MPLP) has proposed to conduct, operate, maintain and, following the expected 30-year life, decommission the Basalt Canyon Geothermal Pipeline Project (Project or Proposed Action). The Project would deliver an average of 3,600 gallons per minute (gpm) of geothermal fluid pumped from two geothermal wells through a new pipeline to two existing geothermal power plants.

The Project area is located northeast of the Town of Mammoth Lakes in Mono County, California, near the junction of U.S. Highway 395 and California State Route 203 (see Figure 1). All Project activities would be conducted within a 1,660-acre Project area. The Project area includes portions of Sections 30, 31 and 32 of T3S, R28E and Sections 25, 26 and 36 of T3S, R27E, MDB&M. Most of the Project area consists of public lands within Inyo National Forest leased to MPLP for the development of geothermal resources. A small portion of the Project area located in Sections 31 and 32, T3S, R28E consists of private lands (see Figure 2).

The two geothermal wells would be drilled, completed and tested from two of sixteen drill sites as part of the previously approved Basalt Canyon Geothermal Exploration Project and/or Upper Basalt Geothermal Exploration Project (see Section 1.3). These approved exploration well drill sites are located west of U.S. Highway 395 and north of California State Route 203.

The pipeline would be a nominal 16-inch diameter insulated, welded-steel pipe. It would be constructed above ground on low piers or underground where necessary to cross under existing roads. Power and control cables for the two well pumps would be placed on conduits on the pipeline supports or buried adjacent to the pipeline. The pipeline would deliver produced geothermal fluid to the existing MPLP Mammoth Pacific Unit I (MP I) and Mammoth Pacific Unit II (MP II) power plants. These power plants are located on private lands leased to MPLP located east of U.S. Highway 395 at Casa Diablo (see Figure 1). The geothermal fluid would be injected into the geothermal reservoir at Casa Diablo through existing geothermal injection wells after extraction of the heat by the power plants.

#### **2.1.2 Pipeline Routing**

The two Project wells could be drilled at two of the six drill sites approved under the Basalt Canyon Geothermal Exploration Project (see Figure 3) or the ten drill sites approved under the Upper Basalt Geothermal Exploration Project (see Figure 3). Since the two wells have not yet been drilled, the exact route of the pipeline cannot be determined yet. The following description of the pipeline routing process was summarized from the detailed description prepared by MPLP which is attached to this EA/Draft EIR as Appendix A.

The five easternmost approved drill sites (81-36, 12-31, 23-31, 35-31 and 55-31) are generally on a line from the westernmost drill site (81-36) to the MP I power plant in the east. Therefore, MPLP has proposed that east of drill site 81-36 the pipeline would follow a defined route (see Figure 4). MPLP has stated that this pipeline route was designed to gather geothermal fluid from any of these five geothermal drill sites and meet three criteria.

- Use a minimum length of pipe.
- Be located only on lands leased to MPLP for geothermal resource development.
- Do not encroach on any of the ephemeral riparian conservation areas (RCAs) delineated by Inyo National Forest.

The eleven exploratory drill sites west of drill site 81-36 are not aligned along a single line. Thus, it is not possible to define a single pipeline route in this portion of the Project area. Instead, west of drill site 81-36 MPLP has proposed that the final pipeline route would be located within a "pipeline corridor area." This approximately one-half mile wide pipeline corridor area is generally bounded by the Upper Basalt Project access roads and drill sites (see Figure 4). MPLP would select a specific pipeline route within this pipeline corridor area once MPLP had determined which, if any, of the western drill sites would be connected to the pipeline. For the purposes of this analysis, it is assumed that the pipeline could be constructed anywhere within this pipeline corridor area.

The selected pipeline route within the pipeline corridor area would be 300 feet from the developed portions of Shady Rest Park to obscure the pipeline, or would be substantially screened from view from the park by topography or vegetation. The selected pipeline route would generally not parallel Sawmill Cutoff Road Forest Road 3S08) within 300 feet of the road. The pipeline also would leave at least 20 feet of un-obstructed shoulder on each side of Sawmill Cutoff Road in any location where the pipeline crossed under this road. The selected pipeline route within the pipeline corridor area would typically follow the existing or new roads used to access the approved exploration drill sites. However, the pipeline could also be routed "cross country" (that is, not adjacent to an access road). Thus, pipeline route segments could be located by MPLP anywhere within the pipeline corridor area, subject to MPLP's pipeline routing constraints noted above and in Appendix A.

The length of the final pipeline route would depend on which wells were connected to the pipeline. The shortest Project pipeline route would connect the easternmost drill sites (35-31 and 55-31) to the MP I power plant (see Figure 5). This pipeline route would be approximately 4,970 feet (0.94 miles) long. The longest pipeline route likely would connect drill sites 12-25 and 31-36 to the MP I power plant (see Figure 6). This pipeline route would be approximately 17,620 feet (3.34 miles) long. However, these two Project pipeline routes are only the shortest and longest which could be constructed by MPLP under the Proposed Action. The length of the final Project pipeline route could fall anywhere in between.

### **2.1.3 Pipeline Design and Construction**

#### *Pipeline Design*

The pipeline is a nominal 16-inch diameter, seamless, welded-steel pipe designed, constructed, tested and inspected pursuant to current industry standards for high temperature, high pressure piping. It would be nearly identical to the pipelines currently used to move geothermal production fluid to the MP I and MP II power plants at Casa Diablo. The steel pipe would be covered with two to three inches of insulation and a

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protective aluminum sheath (appropriately colored to blend with the area). This would increase the diameter of the finished pipe to about 20 to 22 inches. The pipeline would be constructed near ground level (averaging about one foot off the ground) on pipeline supports installed approximately every 20 feet along the pipeline route.

"Expansion loops" would be constructed about every 250 to 350 feet along the pipeline route so that the pipeline can flex as it lengthens and shortens due to heating and cooling. These horizontal, square bends in the pipeline would be approximately 30 feet in length by 30 feet in width. Electrical power and control cables for the well pump motors, valves and instrumentation would be installed in steel conduit constructed on the pipe supports or buried in a trench dug next to the pipeline.

No new temporary construction roads or permanent access roads for pipeline maintenance would be built. Sawmill Road (Forest Road 3S25) would provide access to construct much of the pipeline in Sections 25 and 36 and the western half of Section 31. Antelope Spring Road and Casa Diablo Cutoff Road would provide access to construct most of the pipeline east of U.S. Highway 395. Access to construct much of the rest of the pipeline would be over existing Forest Service roads. To reach those sections of the pipeline not immediately adjacent to an existing access road, the construction equipment would drive over the existing vegetation. Vehicle access to these off-road construction areas would be limited to that specifically necessary for construction. No vehicles would be allowed to turn or drive in any area beyond a nominal 20-foot wide temporary construction corridor along the pipeline route. Personal vehicles and vehicles not in use during construction would be parked on existing well pads or at locations along existing access roads where they would not block public access or risk igniting the vegetation from hot exhaust pipes.

### Pipeline Construction

Pipeline construction would not require grading of the pipeline route. Pipeline construction would begin by vertically auguring nominal 24-inch diameter holes into the ground about eight to ten feet deep at approximately 20-foot intervals along the pipeline route. Twin holes for two supports may be drilled at the pipeline anchor points, located at the center of each expansion loop and in between each expansion loop. Dirt removed from the holes would be cast on the ground adjacent to each hole. Steel pipe supports would be placed in each hole and concrete poured to fill the hole slightly above the ground surface. The steel pipe supports would extend above the concrete, averaging approximately one foot above ground surface.

While the concrete cures, the approximately 30-foot long steel pipe sections would be delivered and placed along the construction corridor. The pipe sections would be lifted onto the pipe supports and temporary pipe jacks by a small crane. The pipe sections would then be welded together to form a solid pipeline. Once the welds were tested, the pipeline would be wrapped with insulation and the aluminum sheath (appropriately colored to blend with the area). When completed, the top of the new pipeline would average less than three feet above ground surface. Electrical power and control cables for the wells would then be installed in steel conduit constructed along the pipe supports. Alternatively, the power and control cables could be buried in a 12-inch wide trench excavated to a depth of three feet along side the pipeline supports.

The pipeline construction is expected to take two to three months. Construction traffic likely would include about 15 to 20 small trucks/service vehicles/worker vehicles each day. The number of small

trucks/service vehicles/worker vehicles driven into the Project area for the Project could be as high as 30 on the busiest days. An average of two to three large (18-wheel highway tractor-trailer) trucks delivering pipe and equipment also would be expected each day.

### Road Crossings

The pipeline would be constructed under existing roads it must cross to allow continued public access. These pipeline road crossings would typically be constructed by the cut-and-fill method. This construction technique minimizes the time during which the road would be blocked. A trench would first be cut through the road. A “U”-shaped section of geothermal fluid pipe would then be installed in the trench. This section of pipeline would typically be prefabricated. The pre-shaped, insulated pipeline may be wrapped and coated, placed inside a larger diameter pipe, or otherwise protected so that it is strong enough to support traffic on the road above. The excavated dirt would then be backfilled and compacted around and above the pipeline or pipe sleeve, and the roadbed material would be repaired or replaced.

For the single-lane dirt roads in the Project area, public access would be restricted for only a couple of hours during actual construction. For roads of two or more lanes, cut-and-fill construction would usually be conducted in steps so that only one lane (or one lane in each direction) would be blocked at a time. Appropriate traffic controls (including detour signs) would be in place during any construction within the roadbed or adjacent shoulders of each road to warn and control traffic.

The pipeline and accompanying power and control cables may be placed under U.S. Highway 395 by using micro-tunneling procedures. These techniques do not disrupt traffic and would not cause settlement of the road bed. Micro-tunneling would be conducted by specialty contractors using specialized equipment. Oversize steel casing would be installed behind a boring machine that would be advanced under the road by “jacking.” Pits would first be excavated and braced at each end of the casing run. The boring machine and casing sections would then be lowered into one pit. The boring machine (with casing behind it) would be “jacked” under the road using specially designed jacks. Casing sections would be welded together as they are moved forward to form a continuous casing under the road. Once the welded casing is in place under the entire road the boring machine would be removed through the other pit. Cement grout under pressure would be used to fill any voids between the casing and the dirt under the road.

### **2.1.4 Geothermal Well Pumps and Auxiliary Equipment**

Two wells would be connected to the pipeline and pumped to deliver hot geothermal fluid to the existing MP I and MP II power plants located at Casa Diablo. This Project assumes that these two wells would be successfully drilled, completed and tested as exploration wells under the previously approved geothermal exploration projects. Thus, this EA/Draft EIR does not assess the potential impacts of the drilling, completion and testing of these two wells. Descriptions of these well activities and their potential impacts can be found in the EAs/CEQA Initial Studies (ISs) prepared and approved for each of these two MPLP projects (BLM and USFS 2002, BLM and USFS 2005).

Each of the two production wells would be equipped with a pump driven by a vertical electric motor located on top of the well pump discharge head. A small, truck-mounted well maintenance rig would install these pumps in the well. Other small trucks and vehicles would be involved in installing the pump, which is normally conducted only during daylight hours. The electric cable installed along the pipeline

from the MP I and MP II power plants would provide the electricity to power the well pump motor. Either water or mineral oil pumped down from the surface at the rate of from one to three gallons per day would lubricate the downhole pump lineshaft bearings. This lineshaft bearing lubrication water or mineral oil would be discharged into the produced geothermal fluid and eventually injected into the geothermal fluid injection reservoir at Casa Diablo.

Wellhead dimensions are not expected to exceed a height of fifteen feet above the ground surface or four feet in diameter. An approximately 8-foot by 15-foot, 10-foot high motor control building would be located within approximately 50 feet of each well. It would house and protect the auxiliary well systems, motor switch gear controls and sensors, and transmitters for temperature, pressure, and flow rate data. Each motor control building also would house a 55-gallon drum of pump lineshaft bearing lubricating oil or water and a 55-gallon drum of glycol (anti-freeze)/water mixture seal fluid. The wellhead, pump motor and motor control building would each be painted forest green or another appropriate color to blend with the area and minimize visibility. An approximately 90-foot by 120-foot gated fence would be constructed around each of the two production well sites for site protection and public safety. It also would be painted an appropriate color to blend with the area.

### **2.1.5 Project Operation and Maintenance**

During normal operations the two Project geothermal wells would produce an average of about 3,600 gpm of geothermal fluid, up to a short-term maximum of 4,000 gpm. This geothermal fluid would be delivered through the pipeline to the MPLP MP I and MP II power plants at the point of interconnection with the existing MP I geothermal fluid pipelines along Casa Diablo Cutoff Road. The downhole pumps would be designed to deliver this geothermal fluid to each power plant at or about a pressure of 200 pounds per square inch gauge (psig).

The MP I and MP II project power plants currently produce less electrical energy than they were designed and permitted to produce. This is because the Casa Diablo production wells are currently producing less and cooler geothermal fluid than they did when the projects began operating. The geothermal fluid delivered by the Project would allow MPLP to restore the electrical output of the MP I and MP II project power plants to the original design and operating levels. However, the geothermal fluid produced by the Project wells would be hotter than the geothermal fluid originally produced from the Casa Diablo wells. Therefore, MPLP also would reduce the geothermal fluid produced from the existing Casa Diablo geothermal field by approximately 1,800 gpm by shutting in or throttling back one or more of the existing Casa Diablo production wells. There would be no other changes to the existing MP I and MP II projects, and they would continue to operate as currently designed and permitted.

The production of hot geothermal fluid from each Project downhole well pump would be flow-rate controlled. Pressure limit sensors would automatically shut down each pump in the event of an excessively high discharge pressure, which could damage the pump. These pumps also would be monitored by the existing power plants' computer control systems. These systems would shut down the pumps in the event of a mismatch in the geothermal fluid flow measured to and from the existing plants (which could result from, for example, a large leak or rupture in the pipeline). These and other automatic shutdowns would be designed with brief delays to avoid false shutdowns caused by momentary, transient conditions. They also would require operator overrides during well and pipeline startup.

The well sites and pipeline would be inspected for leak detection, safety and vandalism once each 12-hour work shift during normal operations. Those sections of the pipeline not adjacent to roads would be inspected from the nearest roads and vantage points with binoculars. The pipelines sections not adjacent to roads also would be walked every week for closer inspection. The pipeline also would be subject to periodic ultrasonic thickness testing to detect any substantial thinning of the pipe wall.

Normal well and pipeline operations would continue through the winter months, but would be conducted without the need to plow, blow or otherwise remove snow from the access routes. If critical Project maintenance operations, such as the replacement of a failed well pump, must occur when substantial snow is on the ground, MPLP has proposed measures to minimize the impacts to winter recreation (see Appendix B).

MPLP anticipates that the well pumps would require regular maintenance and/or replacement every two to five years (on average once every three years). When necessary, well pumps would be removed and re-installed in the well bore in the same manner as the initial installation.

MPLP desires to maintain the geothermal fluid production rate and temperature through the pipeline over the life of the Project. Thus, it may be necessary to re-drill, work-over or stimulate the two wells, and/or drill one or more replacement wells. MPLP has stated that any well re-drilling, work-overs, stimulation, and/or replacement well drilling for the Project would be conducted as approved for the two exploration projects (see Appendix C). Descriptions of these well activities and their potential impacts are presented in the EAs/ISs prepared and approved for these exploration projects. The environmental documents prepared for each of these MPLP projects have been incorporated by reference into this EA/Draft EIR (see Section 1.3).

### **2.1.6 Personnel Requirements and Schedule of Construction**

Approximately ten to fifteen workers would be working on pipeline construction. At the same time less than ten workers would be installing the wellhead facilities and the pipeline road crossings. Construction of the pipeline and wellhead facilities is anticipated to require approximately two to three months. Construction is most likely to occur in the spring, summer or fall, but could be conducted during winter. Normal well and pipeline operations would be conducted by existing MPLP staff. No additional operating personnel would be required.

### **2.1.7 Pipeline Decommissioning and Abandonment**

The estimated life of the Project is 30 years. At the end of Project operations the wells would be plugged and abandoned as required by BLM regulations. All above-ground equipment, including the pipeline and its supports, would be removed. MPLP would prepare for BLM approval, and then implement, a site reclamation plan. The plan would address restoring the surface grades, surface drainage and revegetation of cleared areas as required by USFS regulations.

### **2.1.8 Project Proposed Environmental Protection Measures**

The Project includes measures designed by MPLP to protect the environment and reduce or prevent potential environmental impacts. These include measures to prevent fire, soil erosion and noise. Measures also were proposed to protect public health and safety, wildlife and vegetation, cultural resources, water

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quality, air quality and recreation. MPLP also designed the Project 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. These environmental protection measures proposed by MPLP are presented in Appendix B.

### 2.2 PROJECT ALTERNATIVES

NEPA and CEQA both require consideration of a reasonable range of alternatives to the Proposed Action. Alternatives must be feasible, meet the purpose and need for the Project and attain most of the basic Project objectives (as described in Section 1.2). Alternatives must also substantially lessen one or more of the potentially significant effects of the Project.

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 action” or “no project” alternative is specifically required, as is a discussion of those alternatives considered but rejected as not feasible.

Section 15126.6 of CEQA also 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

#### 2.2.1 Alternative Pipeline Route

A common concern raised during Project scoping (see Section 1.5.2) was portions of the pipeline near U.S. Highway 395 and State Route 203 would be visible from these highways. Both U.S. Highway 395 and State Route 203 are designated scenic highways, and the foreground views from these two highways are important to the traveling public. The Alternative Pipeline Route was developed to eliminate the visual impact of the pipeline from State Route 203. By crossing U.S. Highway 395 about 0.3 miles north of where the Proposed Action pipeline route would cross U.S. Highway 395 the pipeline would not be visible from State Route 203 (see Figure 7). The pipeline also would cross U.S. Highway 395 in a drainage swale which would reduce the length of pipeline visible from U.S. Highway 395. This also would reduce the length of U.S. Highway 395 from which the pipeline would be visible. However, portions of the Alternative Pipeline Route would be constructed within the riparian conservation area (RCA) designated by the USFS along the drainage from Basalt Canyon to Casa Diablo (see Appendix A). It also would cross over land owned by the City of Los Angeles which is not leased to or controlled by MPLP (see Figure 2).

The Alternative Pipeline Route alternative is considered the “environmentally superior” alternative (after the No Action Alternative) under CEQA because it eliminates the visual impact of the pipeline from State Route 203 and reduces the visual impact of the pipeline from U.S. Highway 395.

From drill site 81-36 to drill site 55-31 the Proposed Action pipeline route and the Alternative Pipeline Route are identical. As shown on Figure 7, from drill site 55-31 the Alternative Pipeline Route would turn north-northeast. The Alternative Pipeline route would follow the line of trees at the bottom of the eastern slope of Rhyolite Ridge to reduce the visibility of the pipeline from U.S. Highway 395. The Alternative Pipeline Route would enter the drainage swale at the eastern end of Basalt Canyon and cross beneath

U.S. Highway 395 while in this drainage swale. On the east side of U.S. Highway 395 the Alternative Pipeline Route would turn southeast, crossing through scattered trees from USFS lands onto private land owned by the City of Los Angeles.

After crossing under Antelope Spring Road the Alternative Pipeline Route would take one of two paths to connect to the MP I plant production pipelines along Casa Diablo Cutoff Road. MPLP would select which of the two paths the Alternative Pipeline Route would follow based upon design studies to be conducted if the Alternative Pipeline Route is the alternative selected by the agencies. This EA/Draft EIR analyzes the potential impacts of both paths.

The northern path runs to the northeast, crossing over a small rise from land owned by the City of Los Angeles onto private land leased by MPLP. As the northern path approaches Old Highway 395 it turns southeast. It would stay south of the ephemeral stream channel south of Old Highway 395 to the point of interconnection with the MP I plant pipelines. The southern path follows existing dirt roads/trails to the southeast. When it intersects Casa Diablo Cutoff Road it turns northeast and follows the road to the point of interconnection with the MP I plant pipelines. Both of these paths are shown on Figure 7. The Alternative Pipeline Route from drill site 55-31 to the interconnection point with the MP I plant pipelines would be about 970 feet (0.18 miles) longer than the Proposed Action pipeline route connecting the same points regardless of which path it would follow.

Routing of the Alternative Pipeline Route pipeline within the pipeline corridor area west of drill site 81-36 would not change from the Proposed Action. The pipeline design and construction; and the well and pipeline operation, maintenance and decommissioning; would not differ from that proposed under the Proposed Action. The shortest Alternative Pipeline Route would be about 5,940 feet (1.13 miles) long. The longest Alternative Pipeline Route likely would be about 18,590 feet (3.52 miles) long.

No other reasonable alternatives to the Project which could feasibly meet the purpose and need for the Project and attain most of the basic Project objectives were identified.

### **2.2.2 No Action Alternative**

The No Action Alternative would occur if the proposed Basalt Canyon Geothermal Pipeline Project was not approved. The environmental effects which could occur from the Proposed Action or the other Project alternatives would not occur. The previously approved geothermal resource exploration and development projects described in Section 1.3 would not be affected by selection of the No Action Alternative. Activities associated with these other projects would be able to continue. No additional, hotter geothermal fluid would be supplied to the MP I and MP II power plants, and their electrical output would not be restored to the original design and operating capacity. The No Action Alternative is the “environmentally superior” alternative under CEQA because the environmental effects which could occur from the Proposed Action or the other Project alternatives would not occur.

### **2.2.3 Alternatives Considered but Eliminated from Detailed Consideration**

One alternative considered to reduce the potentially significant visual impact of the pipeline sections visible from U.S. Highway 395 and State Route 203 was to place these sections of the pipeline underground. An underground pipeline in this area could also reduce the potential impact the

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above-ground pipeline would present to wildlife movement, cross country skiers and snowmobiles. This potential alternative was eliminated from detailed consideration because it was not technically practical nor economically feasible.

Pipelines expand and lengthen as they are heated by the geothermal fluid. They also contract and shorten as they cool when there is no geothermal fluid flowing. Geothermal fluid pipelines cannot be buried directly in the earth as they would rupture from the stress caused this expansion and contraction. Geothermal fluid pipelines can be constructed below ground if they are contained within a culvert or a larger pipe that provides for expansion and contraction. Underground geothermal pipelines must be designed so that they can be drained of fluid. The enclosing structure must also allow for visual inspection of the pipeline for leaks and access to the pipeline for maintenance and repair, if necessary. These requirements typically dictate the construction of large geothermal fluid pipeline culverts or encasing pipes.

The surface disturbance from the construction of a below-ground pipeline would far exceed that from the construction of same pipeline above ground because of the large size of the enclosing structure. This surface disturbance also usually lasts for the life of the project because reclamation is not feasible until the containment structure is removed when the pipeline is abandoned. Constructing an underground pipeline is also much more expensive – as much as three to four times the cost of the same above-ground pipeline. In the Basalt Canyon area this cost difference could be much greater if blasting or other hard-rock excavation techniques are required to trench through large areas of rock.

A second alternative considered to reduce the potentially significant visual impact of the pipeline sections visible from the highways was to drill and produce additional wells in the Casa Diablo area. This alternative would eliminate the need to cross U.S. Highway 395 with a pipeline. However, this alternative was eliminated from detailed consideration because it would not be technically feasible; geothermal fluids at the higher temperatures required cannot be produced from Casa Diablo. This alternative also would not meet MPLP's purpose and need for the Project. This is because this alternative would not produce and commercially utilize the geothermal resources identified under those portions of Federal Geothermal Leases CA-11672 and/or CA-14408 within the Project area.



Figure 4: Pipeline Route East of Drill Site 81-36 and Pipeline Corridor West of Drill Site 81-36

- Drill Site
- Proposed Pipeline Route
- Proposed Pipeline Corridor

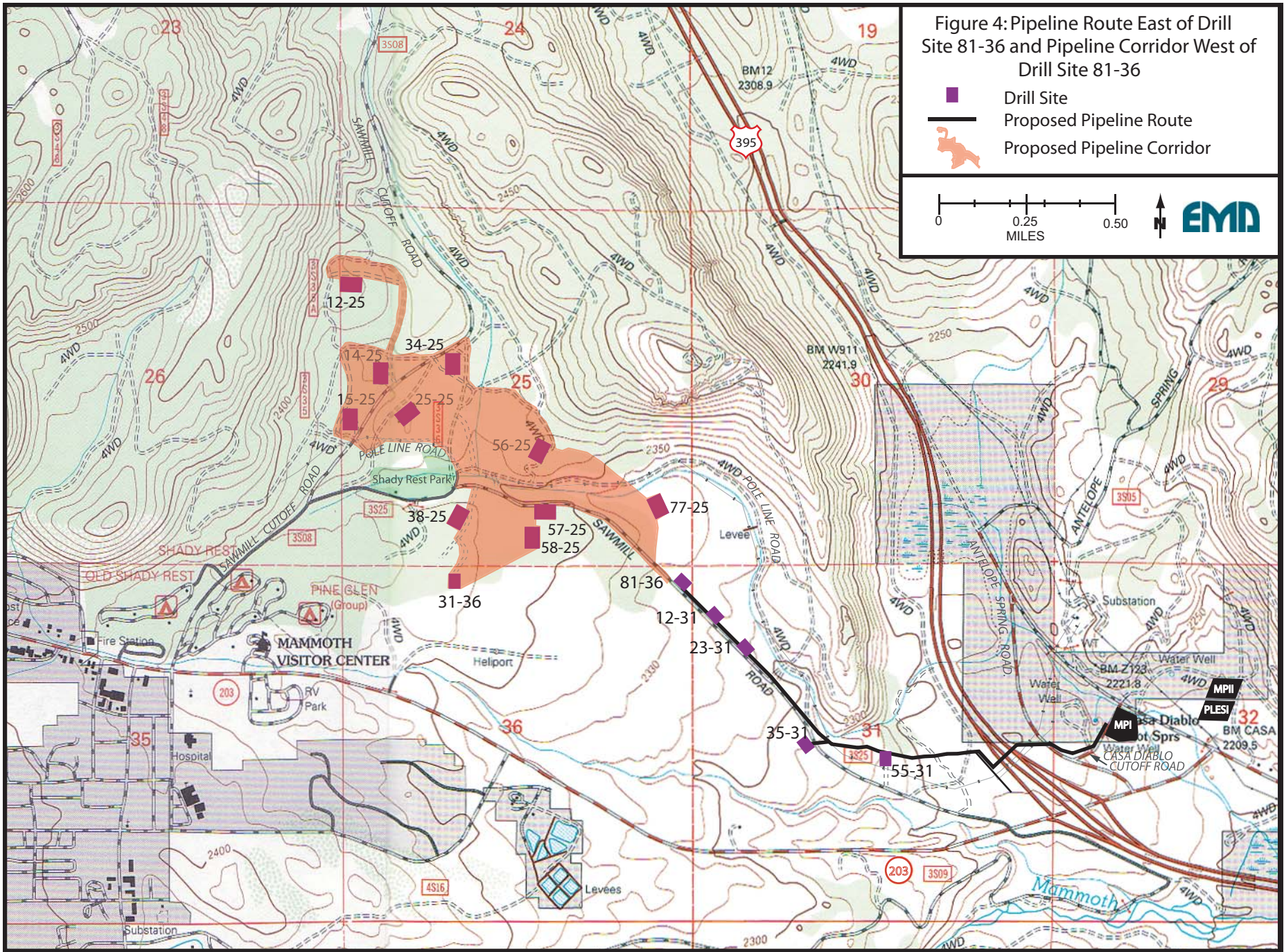
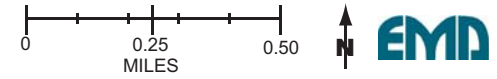








Figure 6: Longest Project Geothermal Pipeline Route

- Longest Project Pipeline Route
- Drill Site
- Proposed Pipeline Corridor

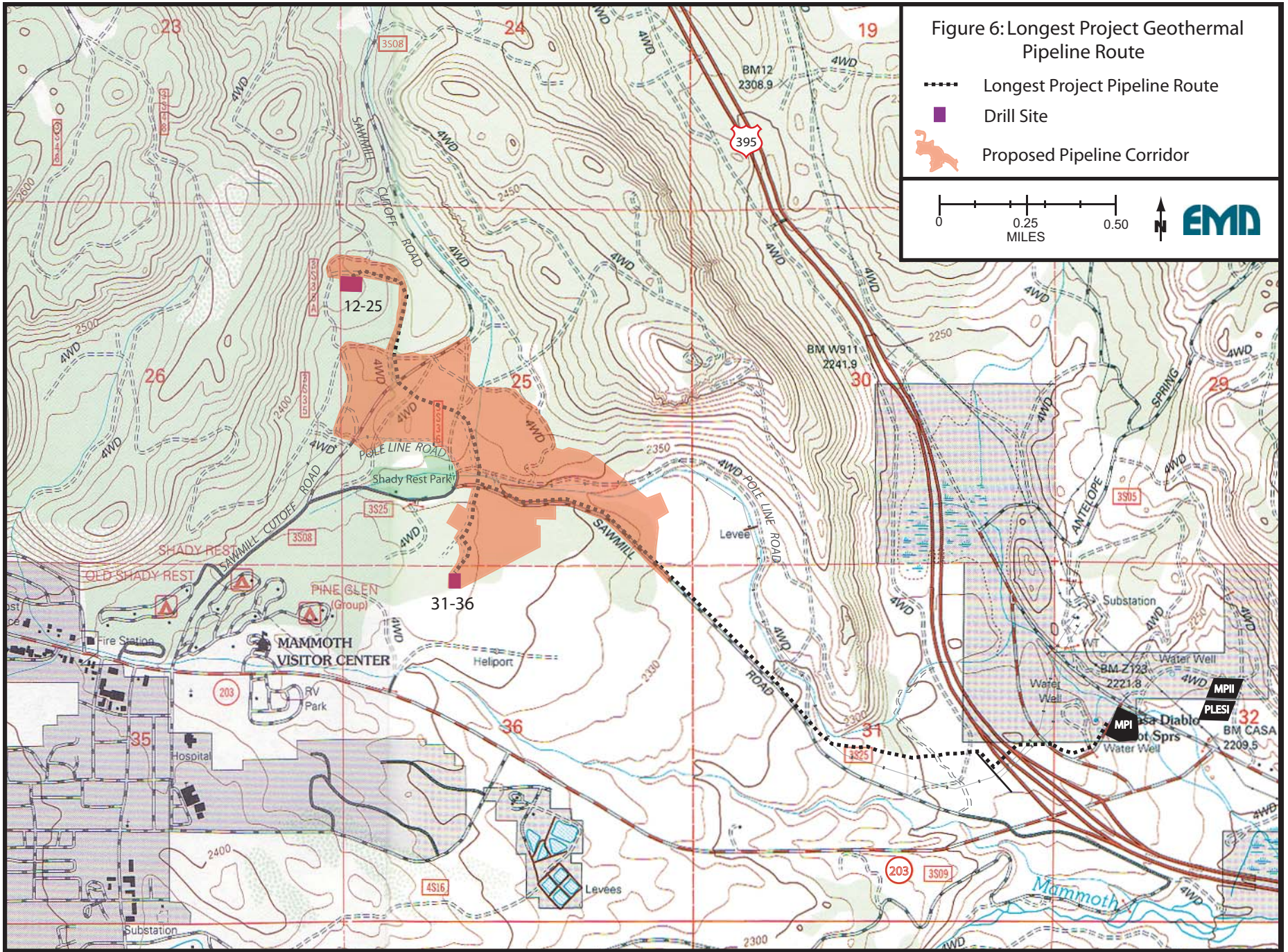
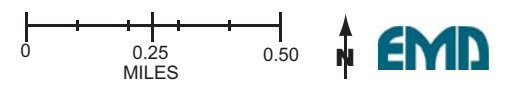
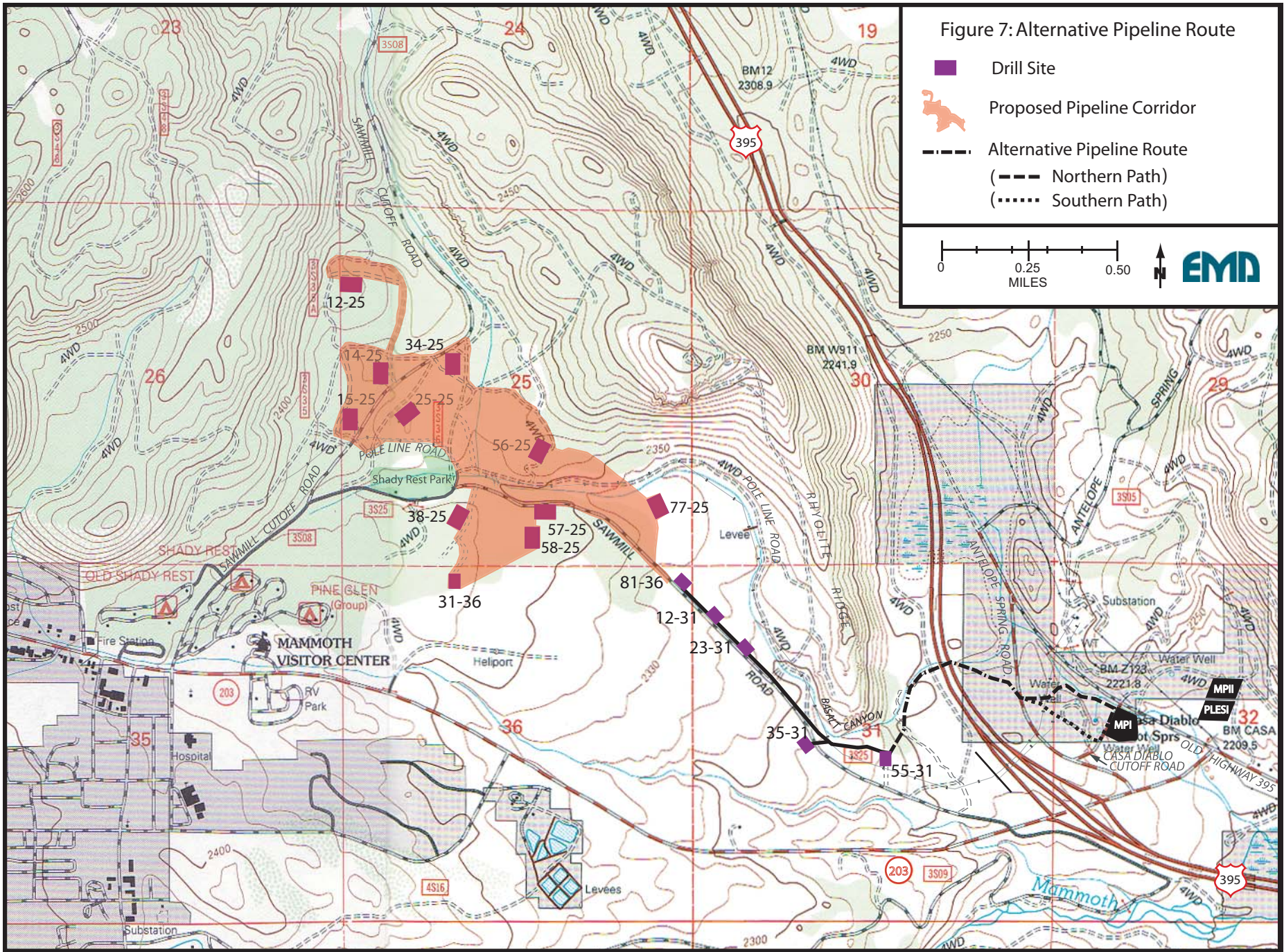
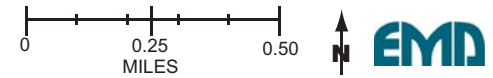




Figure 7: Alternative Pipeline Route

- Drill Site
- Proposed Pipeline Corridor
- Alternative Pipeline Route
  - (--- Northern Path)
  - (..... Southern Path)





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**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

## **3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

### **3.1 INTRODUCTION**

This Chapter is divided into sections, one for each environmental resource topic. Each of these resource sections has subsections for the Regulatory Framework, the Affected Environment and the Environmental Consequences. The Regulatory Framework subsections describe the important regulations, policies, guidelines and standards which guide agency decisions. The Affected Environment subsections describe the environmental setting, or existing conditions, for each resource in and around the Project area. The Environmental Consequences subsections describe the potential adverse environmental impacts of the Project and each alternative. Any recommended measures to reduce these adverse impacts also are presented in the Environmental Consequences subsections. The cumulative effects of the Project are evaluated in Chapter 4.

This EA/Draft EIR is a joint federal/state document prepared to comply with the requirements of both NEPA and CEQA. NEPA and CEQA requirements are similar but differ in certain details. BLM guidance for complying with NEPA requires that the BLM manager determine whether the project would have a significant impact on the quality of the human environment. Therefore, the significance of an impact under NEPA is typically not presented in the NEPA document, but instead in the decision document. The NEPA document is an analysis tool the agency decision-maker uses to formulate his/her decision. Their decision, and rationale for its selection, is recorded in the decision document, as well as a written conclusion to identify whether the decision's impacts are significant.

In contrast, CEQA requires an EIR to identify the significant environmental effects of the project. An EIR will typically present criteria 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.

To accommodate this difference, the Environmental Consequences subsections of this EA/Draft EIR each contains a subsection identified as "*CEQA Significance Criteria*." These criteria are used in this EA/Draft EIR only to determine the significance under CEQA of each identified adverse effect. These determinations of significance under CEQA are presented in separate paragraphs.

Feasible mitigation measures which could minimize adverse impacts determined significant under CEQA are specifically identified in this EA/Draft EIR as "*mitigation measures*." This EA/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 impacts which are not determined significant under CEQA are identified in this EA/Draft EIR only as "*measures*."

## **3.2 SOILS, GEOLOGY AND MINERAL RESOURCES**

### **3.2.1 Regulatory Framework**

#### *U.S. Forest Service*

The Pacific Southwest Region (Region 5) of the U.S. Forest Service adopted a set of best management practices for the protection of water quality and the prevention of soil erosion (USDA, Forest Service 2000). Included is the requirement for the preparation of an erosion control plan to limit and mitigate erosion and sedimentation.

#### *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 adopted the 2001 California Building Code (replacing the “Uniform Building Code”). Among other elements, this code dictates the design and construction standards applicable to resist seismic shaking.

### **3.2.2 Affected Environment**

#### *Soils*

A comprehensive soil survey of the west half of the Inyo National Forest was completed by the Forest Service (USDA, Forest Service 1995). Four soil map units are found in the Project area.

The soil unit in the northwestern portion of the Project area near Shady Rest Park (Vitrandic Haploxerolls) typically supports Jeffrey pine forest. To the east in the areas of mixed Jeffrey pine forest-Great Basin scrub along Sawmill road are the Haypress family soils. These two soils are very similar in that they each have a low runoff potential, rapid permeability, low erosion hazard, and low to moderate soil productivity.

The soils in the lower (and flatter) portions of the Project area both east and west of U.S. Highway 395 (Calpine family) support Great Basin scrub. These soils are similar to those above, but have a moderately low runoff potential, a moderately rapid permeability, and a low to moderate erosion hazard.

Soils in a small portion of the Project area on the hillsides around Casa Diablo (Corbett family - Vitrandic Xeropsamments - Rock Outcrop) are a mixed group of soils which support Jeffrey pine forest or are bare. These soils also have a low runoff potential and rapid permeability, but have a low to moderate erosion hazard and very low soil productivity.



### Geology

The Project area is located in the western portion of the Long Valley caldera. This area is sometimes known as the “west moat” because it lies between the faults (“ring fractures”) that mark the western edge of the caldera and the “resurgent dome” near the center of the caldera. The Long Valley caldera is a large (about 10 miles by 20 miles) volcanic crater formed about 730,000 years ago by the eruption of nearly 150 cubic miles of volcanic ash (see Figure 8) (USGS 2000). (To compare, the 1980 eruption of Mount St. Helens in Washington produced about 0.25 cubic miles of volcanic ash.) This volcanic ash formed the massive Bishop Tuff deposit, which in some places within the caldera is nearly one mile thick (CMEMD and BLM 1987a) (see Figure 9). Since the formation of the caldera there have been many smaller eruptions which have filled much of the caldera with volcanic flows and built the “resurgent dome” in the center of the caldera (USGS 1999a).

Mammoth Mountain, located on the southwestern edge of the caldera, is the most prominent feature of the more recent volcanism in the region. Mammoth Mountain was formed from about 220,000 to 50,000 years ago by eruptions of numerous volcanic flows (USGS 1999a). About 40,000 years ago, eruptions began occurring along the Mono-Inyo Craters volcanic chain inside and north of the caldera (Sorey *et al.* 1991). The most recent of these eruptions occurred in the Inyo Craters, northwest of the Project area but in the caldera west moat, only 560 to 660 years ago (see Figure 8).

The region is subject to several geologic hazards, including volcanic activity, surface deformation, seismic shaking and shallow geothermal fluids/thermal ground. Each of these is related to the volcanic origins of the area. Volcanic-related activity in the Long Valley area has increased since a May 1980 swarm of earthquakes (USGS 1999b). This swarm included four strong (magnitude 6) earthquakes, the northernmost of which was centered just south of the eastern edge of the Project area. The ongoing volcanic-related activity includes recurring earthquake swarms, uplift of the “resurgent dome,” and changes in hot spring and carbon dioxide gas emissions. All of this activity is interpreted to indicate an increased chance of a volcanic eruption occurring in the future, although there is not sufficient data to know by how much. Based on the timing between geologically recent eruptions along the Mono-Inyo Crates volcanic chain, the probability of an eruption occurring is roughly one chance in a few hundred in any year (USGS 1999b). In cooperation with the California Office of Emergency Services and other authorities, the USGS has established procedures to alert the public to a possible eruption (USGS 2000).

The entire Project area is subject to the potential for substantial seismic ground shaking. There is a one in ten chance of the peak ground acceleration from an earthquake exceeding 50 percent of gravity in the next 50 years (CDMG 2005). Further, the Project area is located within Seismic Zone 4, as mapped by the California Building Code. Seismic Zone 4 is the zone with the greatest risk of severe ground shaking during a major earthquake.

The “N/W 1/4 Mt. Morrison” Alquist-Priolo Earthquake Fault Zoning Map produced by the California Division of Mines and Geology (CDMG 1982) designates three north-northwest trending “earthquake fault zones” within the eastern end of the Project area. The easternmost zone barely touches the northeast corner of the eastern edge of the Project area. The middle zone, known as the “Taylor-Bryant” earthquake fault zone, is immediately west of the MP I project power plant and overlaps the intersection of State Route 203 and U.S. Highway 395. Both of these zones showed very small amounts of movement/cracking during the 1980 earthquake swarm. The westernmost zone lies on the eastern edge of “Rhyolite Ridge,” with its southern terminus at Sawmill Road. None of the existing Casa Diablo

geothermal power plants are built within any of the designated earthquake fault zones. However, the western edge of the MP I and MP II geothermal production and injection well field likely overlaps a portion of the “Taylor-Bryant” zone.

Areas of natural thermal ground (including vents of geothermal steam and gas and steam-heated ground) have been evident in the Casa Diablo area since humans first visited the area. Smaller areas of thermal ground are located in “Basalt Canyon” (at the southern tip of “Rhyolite Ridge”), northeast of Shady Rest Park, and atop “Rhyolite Ridge.” These areas are characterized by the surface emissions of geothermal steam and gasses, such as carbon dioxide and hydrogen sulfide. They may also appear simply as areas of elevated soil temperature, which can range from slightly warm to hot. Geothermal alteration of soil minerals and deposition of other minerals often also occur at or near the soil surface.

No map of the areas of thermal ground in the Casa Diablo area prior to the operation of the MP I project in 1984 is known. Thus, there is no way to know what, if any, changes to the thermal ground may have occurred after operation of this project began in 1984. However, based on current physical evidence and the judgment of long-term MPLP staff, it is estimated that approximately 45 acres of thermal ground existed in the Casa Diablo area at the end of 1990. All of these areas of thermal ground appear to be generally located on or adjacent to one of the natural faults mapped in the Casa Diablo area. Since 1991, when the PLES I and MP II projects began operation, incidental observations by MPLP plant operators and others suggest that the areas of thermal ground increased by about 24 acres. These expanded areas of thermal ground also appeared to be generally located on or adjacent to the natural faults mapped in the Casa Diablo area.

Evidence of this increase in thermal ground since 1991 included increased steam releases; additional or expanded areas of active geothermal steam and gas vents; and additional or expanded areas of hot, steaming ground. Specific evidence of hot, steaming ground includes accelerated melting of snow and/or the death of Jeffrey pine trees or big sagebrush scrub (with the corresponding increase in annual grasses). These new areas of thermal ground could have been created by geothermal project operations if pressure reductions in the geothermal production reservoir were sufficient to produce steam which could make its way to the surface through pre-existing faults. However, other known causes of thermal ground or vegetation die-off (which could look like thermal ground) include seismic activity, increased carbon dioxide emissions associated with increased volcanic activity, a six-year drought centered around the early 1990’s, and a substantial bark beetle infestation.

### Mineral Resources

Mineral resources are typically considered to be one of three types.

- “Locatable” minerals, which are metallic or non-metallic minerals subject to locating and claiming under the Mining Law of 1872.
- “Salable” minerals, which are sand, gravel and other construction/maintenance materials which are “sold” by the federal government.
- “Leaseable” minerals, like geothermal, oil and gas, coal or other resources available through leasing from the federal government.

The only locatable, salable or leaseable minerals known to exist in the Project area are the geothermal resources to be developed by the Project (Personal Communication, Lynn Oliver, Inyo National Forest Geologist, April 15, 2005).

### 3.2.3 Environmental Consequences

#### 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 soils defined as expansive are located within the Project area. No areas subject to substantial risk of landslides have been identified within the Project area.

The Project would not produce any waste water which would require the use of septic tanks or alternative waste water disposal systems.

#### Environmental Consequences of the Proposed Action

##### *Soils*

No clearing of the pipeline route or creation of new access roads is proposed as part of the Project. However, some soil disturbance (compaction, removal, and replacement) would still occur from the drilling of the pipe supports, the excavations for the road under-crossings, the trenching for the buried cable, and the construction vehicles driving over the vegetation. This analysis assumes that the soils in a 20-foot wide corridor along the entire length of the constructed pipeline would be disturbed by Project

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construction activities. Based on this assumption, between about 2.3 acres and 8.0 acres of soils would be disturbed by the Proposed Action, depending on the final length of the pipeline constructed. About 85 percent of this disturbance would be reclaimed following the two- to three-month construction period.

All of the soils in the Project area have a low to moderate erosion hazard and very low to moderate soil productivity. As part of the Project, MPLP has committed to the following (see Appendix B and Appendix C).

- Topsoil would be salvaged, as feasible, and stockpiled (no more than two feet high) for use during subsequent reclamation of the disturbed areas.
- Subsoils would be de-compacted as part of reclamation prior to the replacement of topsoil.
- USFS and State of California best management practices (BMPs) for storm water would be implemented to prevent erosion and sedimentation.

Because of these measures, the Proposed Action would not result in any substantial soil erosion or the loss of substantial topsoil. The minor amount of disturbed soils would be a residual impact for the life of the Project.

This impact is below the level of significance under CEQA.

### *Geology*

**Seismic ground shaking** – Although the Project area is subject to the potential for substantial seismic ground shaking, all Project construction is required to comply with Seismic Zone 4 standards, the most stringent under the California Building Code. The well site facilities and pipeline are low-profile structures and, therefore, not likely to fail from seismic ground shaking. The Project also has many design and control features which would shut in the production wells and close off the pipeline to reduce environmental affects should any failure occur from seismic ground shaking (see Section 2.1.5). The adverse affects of this hazard on the Project are minimal.

**Fault offset** – Regardless of which wells are connected to the pipeline, the pipeline would cross both the “Rhyolite Ridge” and “Taylor-Bryant” earthquake fault zones. In addition, any well site facilities constructed on drill site 55-31 would be located within the “Rhyolite Ridge” earthquake fault zone. The Project design for the geothermal pipeline includes expansion loops and other features to accommodate substantial pipeline movement as it heats and cools. These design features also allow the pipeline to accommodate, without rupture, substantial offset where it crosses a fault trace. In addition, the Project has many design and control features which would shut in the production wells and close off the pipeline to reduce environmental effects should any failure occur from fault rupture (see Section 2.1.5). The adverse effects of this hazard on the Project are minimal.

**Volcanic eruption** – The potential adverse effects to the Project of a volcanic eruption could range from as little as additional maintenance, through interruption of service to loss of the facilities. However, the Project has many design and control features which would shut in the production wells and close off the pipeline to reduce environmental affects should any volcanic activity be imminent or occur which could result in failure of the facilities (see Section 2.1.5). The adverse effects of this hazard on the Project are minimal.

The potential impacts from these geologic hazards would not expose people or structures to substantial adverse effects from the rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, volcanic eruptions or landslides. Therefore, the adverse effects of these geologic hazards are considered below the level of significance under CEQA.

Implementation of the following measures would reduce the potential for pipeline rupture across the fault zones and minimize the adverse effect of any volcanic eruption (or threat of an eruption) on the Project.

*GSM Measure 1:* The operator shall design and construct the pipeline within the California Department of Mines and Geology-designated earthquake fault zones to reasonably minimize the potential for rupture in the event of fault offset in these zones.

*GSM Measure 2:* The operator shall review and revise, as appropriate, MPLP's emergency contingency plans to detail the actions to be taken by operator's employees and contractors for the Project wells and pipeline in the event responsible agencies declare a volcanic hazard warning or alert, or in the event of a volcanic eruption.

**Unstable ground** - No area to be crossed by the pipeline has been identified which would be subject to liquefaction during seismic ground shaking. Uplift of the "resurgent dome" in the northeast corner of the Project area has resulted in tilting and deformation of the land surface, although these changes are small and would have no effect on the pipeline or well site facilities. The underground extraction and injection of geothermal fluids is capable of creating compaction and inflation in some types of geothermal reservoirs. In certain cases this has led to subsidence or uplift of the ground above. However, because the geothermal reservoir in the Project area is composed of hard volcanic rock and little pressure reduction or increase is predicted in the reservoir (see Section 3.3.3), little, if any, reservoir compaction or inflation is expected. Also, because the production wells are relatively deep, there is very little chance that any compaction or inflation, even if created by Project production or injection of geothermal fluid, would create any subsidence or uplift.

**Thermal ground** - Since 1991, when the PLES I and MP II projects began operation, incidental observations by MPLP plant operators and others suggest that the areas of thermal ground at Casa Diablo have increased by about 24 acres. The Project could create new areas, or expand existing areas, of thermal ground in either the area of the new wells or in the Casa Diablo area. However, as discussed in Section 3.3.3, this is unlikely to occur in either area.

The Project would not be located on a geologic unit or soil that is or could be unstable and potentially result in substantial on- or off-site adverse effects. Therefore, the potential adverse effects of these impacts are considered below the level of significance under CEQA.

No residual impacts are anticipated as none of these geologic hazards are expected to occur over the life of the Project.

*Mineral Resources*

As there are no mineral resources (other than the geothermal resources to be developed by the Project) located within the Project area, the Project would not result in the loss of availability of a valuable known mineral resource.

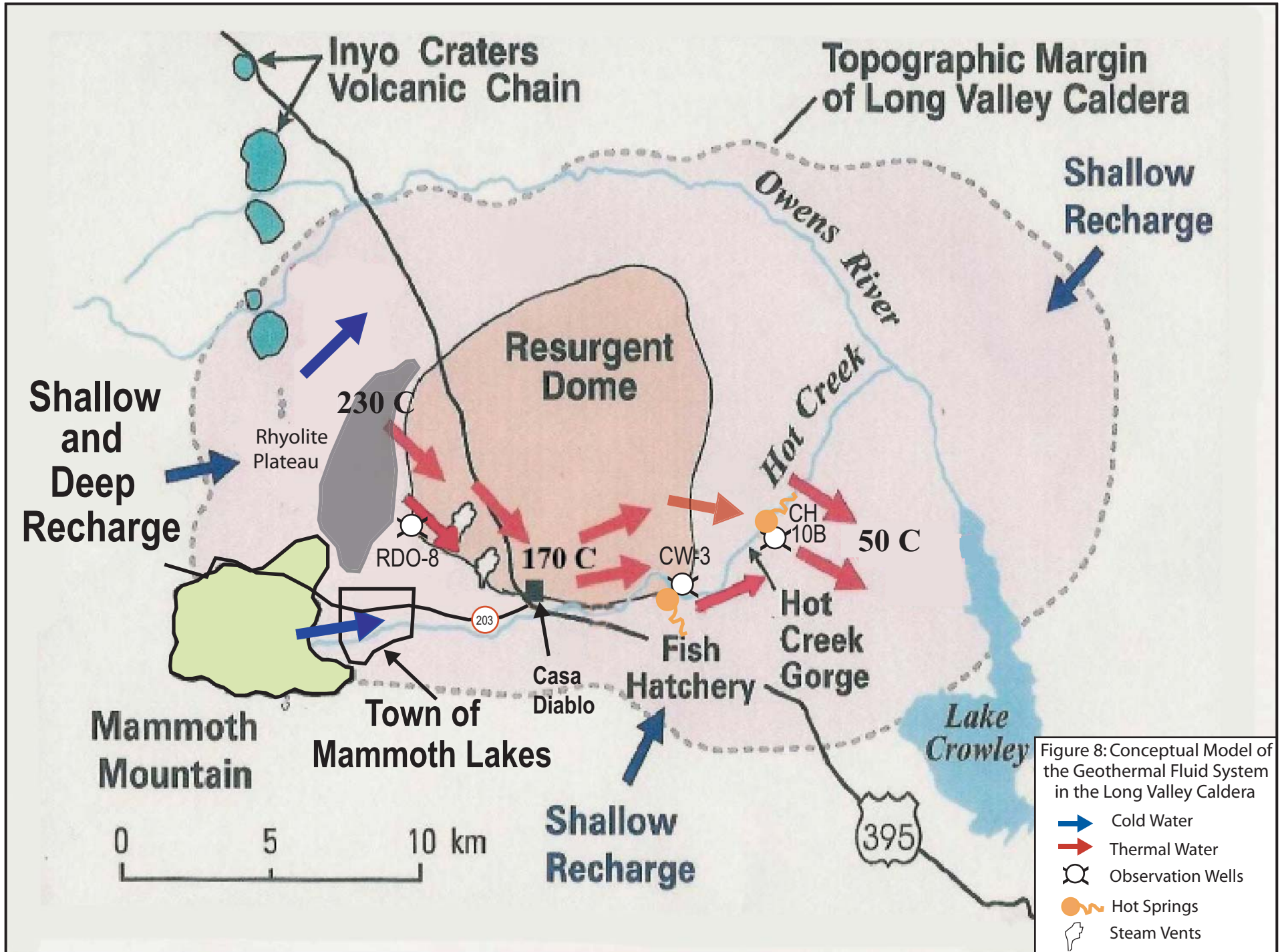
This impact is below the level of significance under CEQA.

*Environmental Consequences of the Alternative Pipeline Route*

The impacts to geology and mineral resources, and the potential impacts to the Project from geologic hazards, from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route would be identical to those described for the Proposed Action. The potential impacts to soils would differ only because the Alternative Pipeline Route is about 1,000 feet longer than the Proposed Action, resulting in about 0.4 acres more potential soil disturbance. The significance of all of the soil, geology and mineral resources impacts under CEQA also would be identical to those described for the Proposed Action.

*Environmental Consequences of the No Action Alternative*

The Project would not be constructed if the No Action Alternative is selected. As such, there would be no effects on soils, geology or mineral resources from the No Action Alternative.





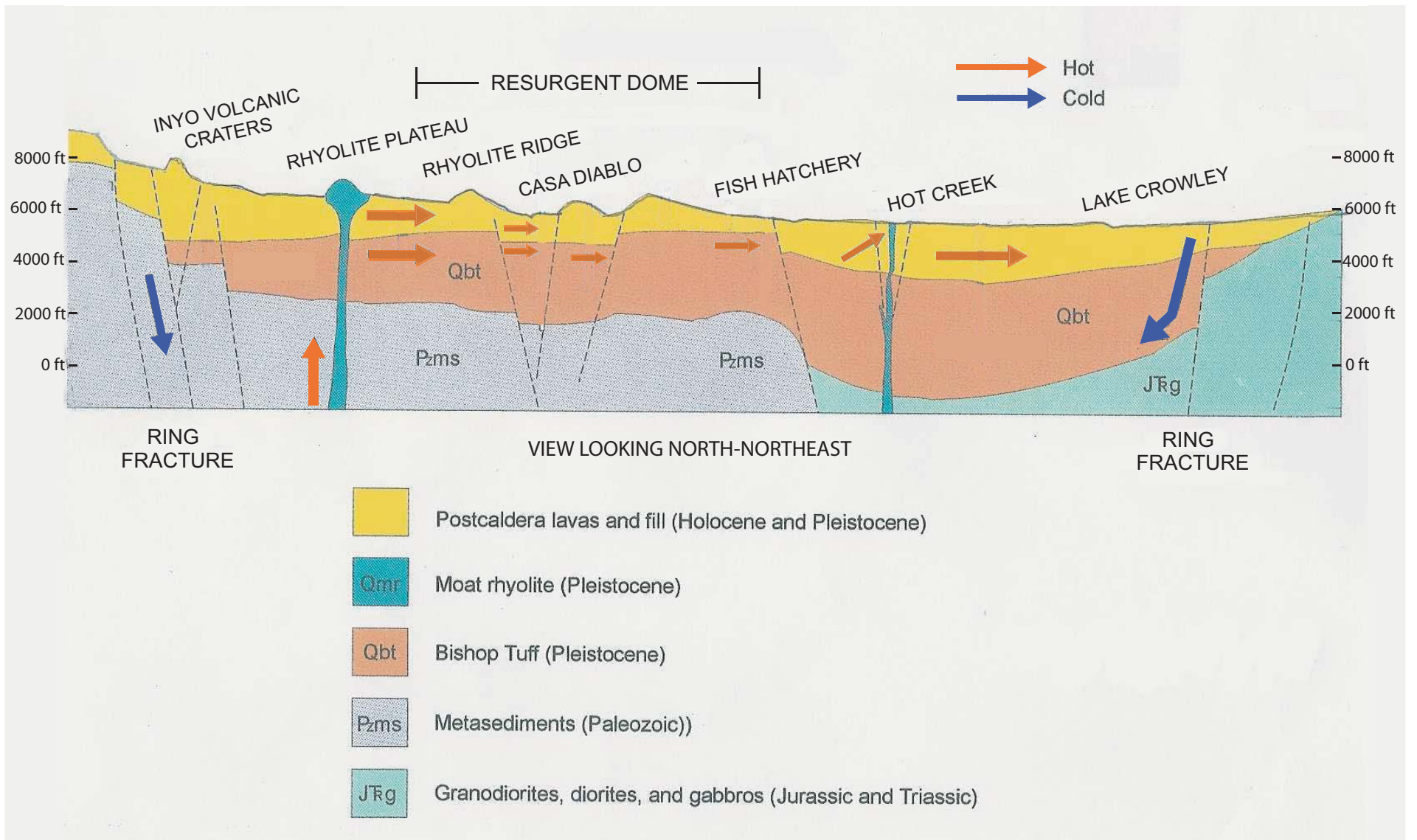


Figure 9: Simplified Geologic Cross Section of the Geothermal System in the Long Valley Caldera



### **3.3 HYDROLOGIC AND GEOTHERMAL RESOURCES**

#### **3.3.1 Regulatory Framework**

##### *Bureau of Land Management*

All federal geothermal lessees must comply with BLM regulations, including 43 CFR 3270.11, which requires that “operations must prevent unnecessary impacts to surface and subsurface resources.” Under the authority of the federal geothermal lease, BLM can require whatever is deemed needed to protect ground water. This may include well casing shoe integrity tests, well and pipeline pressure monitoring, and periodic mechanical integrity tests.

##### *Inyo National Forest*

Consistent with the Sierra Nevada Forest Plan Amendment (SNFPA) Record of Decision (ROD) (USDA, Forest Service 2004), “riparian conservation areas” (RCAs) have been identified by the USFS throughout the forest. Activities conducted within 150 feet of the center of areas identified as ephemeral/intermittent RCAs (or 300 feet of “perennial” RCAs) are subject to special management objectives and associated standards and guidelines. These are intended to attain and maintain specific “desired conditions,” all as specified in the SNFPA ROD (USDA, Forest Service 2004). “Desired conditions” for RCAs include maintaining or attaining the following.

- Adequate water quality.
- Viable populations and diversity of aquatic-dependent plant and animal species.
- Spatial and temporal connectivity for species movement.
- The ability to distribute flood flows.
- Flows sufficient to sustain desired habitats.
- Stream banks which minimize erosion.

##### *California State and Regional Water Quality Control Boards*

The California State Water Resources Control Board (CSWRCB) and the California Regional Water Quality Control Board, Lahontan Region (CRWQCB) are the primary entities responsible for protecting water quality and regulating activities which may have an adverse effect on water quality within the state. The Water Quality Control Plan for the Lahontan Region (CRWQCB 1994) designates the beneficial uses for waters within the region and sets forth the objectives, control measures and prohibitions to protect these beneficial uses.

The CSWRCB has adopted several orders specific to protecting water quality which are applicable to the Project. The National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (“Construction General Storm Water Permit”) requires actions to be taken by construction projects to protect water quality from storm water runoff. The Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (Water Quality Order No. 2003-0003) specify the requirements for well boring and cleanout waste, which may be applicable for well work-over and re-drilling activities.

### 3.3.2 Affected Environment

#### Surface Waters

There are no perennial streams or other surface waters located within the Project area. Neither are there any springs, seeps or wet swales.

Mammoth Creek, a perennial stream that flows east through the Town of Mammoth Lakes south of State Route 203, is just south of the Project area (see Figure 10). Mammoth Creek flows east under U.S. Highway 395, becoming Hot Creek near the Hot Creek Fish Hatchery before flowing into the Owens River upstream of Lake Crowley (see Figure 8). The water quality in Mammoth Creek is generally very good above U.S. Highway 395. Below U.S. Highway 395 the quality degrades from the addition of thermal fluids from hot springs and the effects of grazing. The Water Quality Control Plan for the Lahontan Region (CRWQCB 1994) designates the beneficial uses for Mammoth Creek. These include drinking water supply, ground water replenishment, recreation, and wildlife habitat. These same beneficial uses apply to all of Mammoth Creek's tributaries.

Two "blue line" streams are identified within the Project area on the U.S. Geological Survey (USGS) topographic map ("Old Mammoth" quadrangle, 1:24000 series) for the Project area. Each has been identified as an ephemeral/intermittent "riparian conservation area" (RCA) by the USFS under the SNFPA ROD (USDA, Forest Service 2004) (see Figure 10). One is an ephemeral drainage which has been informally named the "Basalt Canyon" drainage or RCA. It follows Sawmill Cutoff Road (Forest Road 3S08) south into the Project area near Shady Rest Park. There it meets a short RCA segment which starts south of Shady Rest Park and turns east. It parallels "Pole Line Road" through "Basalt Canyon" (at the southern tip of "Rhyolite Ridge") and drains through a culvert under U.S. Highway 395. East of U.S. Highway 395 it joins another RCA from the north before draining through the Casa Diablo geothermal development area.

This "Basalt Canyon" drainage passes through the Casa Diablo projects' existing 1,600,000 gallon emergency spill containment basin before draining into Mammoth Creek. The emergency spill containment basin is located near the intersection of Old Highway 395 and the extension of State Route 203 east of U.S. Highway 395 (see Figure 10). It was designed, and is maintained, by MPLP to contain and control any large spills of geothermal fluid or other water contaminants which may be accidentally discharged into these waters.

The other RCA is locally known as "Murphy Gulch." It is an ephemeral channel which drains the areas immediately west and south of the Project area, including the northern portions of the Town of Mammoth Lakes. It generally parallels the north side of State Route 203, flowing though only a small portion of the Project area (see Figure 10). A siltation basin has been constructed behind a small dam in "Murphy Gulch" within the Project area to collect and store sediment in the storm water and snow melt runoff from the Town of Mammoth Lakes. "Murphy Gulch" flows under State Route 203 just west of the junction with Sawmill Cutoff Road and into Mammoth Creek about one-third mile downstream.

Ground check visits to these RCAs within the Project area were conducted during 2001, 2002, and 2004 in conjunction with botanical surveys (Paulus 2001b, Paulus 2001c, Paulus 2001f, Paulus 2002a, Paulus 2002b, Paulus 2002d, Paulus 2004a, Paulus 2004b, Paulus 2004d and Paulus 2004e). The purpose was to

identify and describe any riparian habitat indicators such as surface flows, defined channels with evidence of scour, or transitions in plant species frequency and composition.

Within the “Basalt Canyon” RCA only three small areas were found to have any of these RCA indicators. Scour and sediments deposited on vegetation were seen at the eastern edge of Shady Rest Park where storm water runs off of the paved parking lot (Paulus 2004e). No evidence of any flow was seen downstream of the sediment trap constructed about 200 yards east of the park. In that portion of the “Basalt Canyon” RCA adjacent to the Alternative Pipeline Route (Northern Path) near Casa Diablo (see Figure 7), a drainage ditch constructed next to Old Highway 395 supported several small clumps of riparian plant species (Paulus 2004c). However, overall the species were typical of the surrounding sagebrush. Finally, the Casa Diablo emergency spill containment basin (see Figure 10) was found to be supporting vegetation generally associated with riparian corridors (Paulus 2004a). However, many (43 percent) of the species found in the constructed basin were non-native species (Paulus 2002a).

Scour and/or sediment deposited on vegetation were seen throughout the length of “Murphy Gulch” RCA (Paulus 2001b, Paulus 2001c and Paulus 2004a). However, no riparian vegetation was identified anywhere within “Murphy Gulch” RCA within the survey area.

The Federal Emergency Management Agency (FEMA) oversees a program which has identified lands which have a one-percent chance of being flooded in any year. Lands within these areas are within the “100-year flood hazard zone.” Within the Project area, only that portion of “Murphy Gulch” essentially coincident with the “Murphy Gulch” RCA is identified as within a “100-year flood hazard zone” (FEMA 2005) (see Figure 10).

### Ground Waters

Ground waters in the Long Valley caldera consist of both shallow, cold ground water and deeper geothermal waters. Evidence suggests that in the west both begin as snowmelt and stream infiltration near the western edges of the caldera near San Joaquin Ridge and Mammoth Mountain (see Figure 8 and Figure 9) (Sorey 2005). Shallow ground waters also are 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 ground water 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 (see Figure 9). There these waters are heated to become the geothermal fluids produced through wells at Casa Diablo, naturally discharged at Hot Creek and other locations, and the target of the geothermal exploration well drilling projects. The following sections describe both of these systems and their interaction.

### *Cold Ground Waters*

The only cold ground water produced from the Project area is from a shallow ground water well located near the MP I plant at Casa Diablo. This well produces small quantities of warm water which is used for non-potable plant needs, such as landscaping and washing. No potable (drinking quality) ground water is known to exist in the Project area, although some other shallow ground waters may occur. Deeper ground waters within the Project area are believed to be exclusively geothermal fluids (see below).

The Mammoth Community Water District (MCWD) has drilled and produces ground water wells for the Town of Mammoth Lakes water supply. All of these wells are located south of State Route 203 in the Mammoth Creek Basin. They are located from 1.5 to 3.5 miles southwest of the closest potential Project well (38-25). The MCWD wells are generally drilled to about 700 feet below ground surface, but produce from between 150 feet down to 700 feet below ground surface (Kenneth D. Schmidt and Associates 2003).

The MCWD wells located closest to Mammoth Mountain exhibit slightly higher temperatures, electrical conductivity and alkalinity, and lower pH values, than those MCWD wells located further away, to the east. After several years of production, small increases in alkalinity and electrical conductivity, and decreases in pH, have been observed in these westernmost wells. Some have suggested that these western wells draw some amount of thermal water from the underlying or adjacent geothermal system (Kenneth D. Schmidt and Associates, 2003). However, the available data suggests that the westernmost MCWD well water is most similar to ground water from wells in the Dry Creek drainage, north of Mammoth Mountain and west of the Project area. Ground water in this region of Dry Creek contains cold carbon dioxide and other gases derived from magma beneath Mammoth Mountain (Sorey et al., 1999). Increasing amounts of dissolved carbon dioxide from Mammoth Mountain appears to have created these observed changes in chemical constituents in both areas.

The average temperature of the westernmost MCWD wells in the Mammoth Basin (about 17.5 °C) is high compared to ground water temperatures in the Upper Dry Creek drainage (8 °C) and in the easternmost wells in the Mammoth Basin (8 °C to 14 °C). Some have suggested that this, too, shows that these wells draw in water from zones of thermal-water flow. The suggested thermal water source was that encountered in the wells drilled north of the MCWD wellfield (but still south of State Route 203) that drilled into the volcanic rocks filling the caldera. However, the MCWD wells are too shallow to penetrate these volcanic formations. Thus, the higher temperatures in the westernmost MCWD wells are likely the result of heat conduction from adjacent or underlying thermal-water flow zones.

### *Geothermal Fluids*

The most recent, and still current, period of geothermal activity in the caldera is believed to have started about 40,000 years ago (Sorey, *et al.* 1991). The geothermal fluids are heated to as much as 450°F [230°C] in the deep rocks below the western portion of the caldera. They are thought to rise up into the volcanic rocks filling the caldera in the upflow zone near the southern end of the Inyo Craters Volcanic Chain (see Figure 8). These geothermal fluids continue to rise and move laterally to the southeast, with the flow controlled by faults and the permeable flow paths through the volcanic rocks filling the caldera. The fluids cool as they move eastward through a combination of heat loss to the surrounding rocks and mixing with cold ground waters.

Casa Diablo Hot Springs was the westernmost point of discharge of these geothermal fluids. Historically consisting of several boiling hot springs, Casa Diablo currently supports only vents of geothermal steam and gasses. Other areas of weak steam and gas vents are found in the Project area in “Basalt Canyon,” east of Shady Rest Park and on “Rhyolite Ridge.” The primary areas of geothermal fluid discharge are east of Casa Diablo. These include the hot springs at Hot Creek Gorge and Little Hot Creek, and the warm water spring discharges at the Hot Creek Fish Hatchery springs and between Hot Creek Gorge and Lake Crowley (see Figure 8). The hot springs discharge a sodium bicarbonate-chloride water with a total dissolved solids (TDS) content of about 1,000 to 1,400 milligrams per liter (mg/l). These thermal fluids

also contain very small concentrations of other elements, such as antimony, lead, arsenic and mercury, and gases, principally carbon dioxide with small amounts of methane, ammonia and hydrogen sulfide (BLM *et al.* 1989).

Modern geothermal development has occurred only at the Casa Diablo well field on the southwestern edge of the caldera's "resurgent dome." Here geothermal fluids with temperatures as high as 340°F [170°C] are produced from relatively shallow (about 450-foot deep) wells. After the useable heat is extracted, all of the produced geothermal fluids are injected into cooler, deeper (about 2,000-foot deep) geothermal zones below and immediately to the east of the production wells. Total geothermal fluid production rates averaged about 3,200 gallon per minute when MP I was the only project (1985-1990) (Sorey 2005). Total geothermal fluid production rates ranged from 12,700 gallons per minute to 14,200 gallons per minute with all three plants (MP I, MP II and PLES I) running (1991-2003) (Sorey 2005). These produced geothermal fluids are chemically very similar to the thermal fluids discharged from the hot springs. The geothermal fluids are generally sodium chloride/sulfate waters with a total dissolved solids concentration of about 1,250 parts per million (ppm). They also contain small concentrations of boron (10 ppm), fluoride (8 ppm), and arsenic (0.3 ppm).

An extensive program of surface and ground water monitoring had been conducted by the U.S. Geological Survey (USGS) in the caldera for some time. Agency conditions of approval for the MP II and PLES I projects at Casa Diablo in 1988/1989 required MPLP to implement or fund additional hydrologic monitoring, especially of the geothermal system. These monitoring programs are coordinated under the Long Valley Hydrologic Advisory Committee (LVHAC), an advisory committee to the Mono County Board of Supervisors, the BLM and the USFS made up of agency representatives interested in the hydrology of the caldera.

The hydrologic monitoring program is designed to gain an understanding of the hydrologic system in the Long Valley caldera and observe and assess potential changes in this system brought on by climate changes and resource development. The monitoring program includes collection of the following information.

- Measurements of pressure and water levels in both geothermal and cold water wells.
- Discharge rates of streams and springs.
- Fluid sampling and chemical analyses at the Hot Creek Fish Hatchery and Hot Creek Gorge springs.
- Fluid production rates, injection rates, and wellhead temperatures at the Casa Diablo geothermal well field.

In addition, precipitation data collected by the USFS and various types of data collected by the MCWD from the ground water production and monitoring wells located in the vicinity of Old Mammoth are used.

Sorey (2005) summarized and interpreted the observations from the monitoring data collected between 1982 and 2003.

Geothermal development at Casa Diablo from 1985 to 2004 has reduced the temperature and pressure in the geothermal production reservoir at Casa Diablo. Reduced pressures have also been monitored in observation wells completed at Casa Diablo and to the west and east. This data demonstrate hydrologic connections in the shallow parts of the geothermal system over distances of several miles. The period of

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most rapid pressure change occurred in 1991, when the start-up of the MP II and PLES I power plants and the deepening of geothermal fluid injection wells resulted in pressure declines of about 35 pounds per square inch (psi) in Casa Diablo production reservoir. Since 1985, the total pressure decline in the Casa Diablo geothermal production reservoir has been about 55 psi. However, since 1991 the rates of decline in both the temperature and pressure of the geothermal production reservoir have been relatively small (Sorey 2005).

Pressures in the shallow thermal water zone monitored about three miles east of Casa Diablo (well CW-3, see Figure 8) also dropped in 1991, although by only about two to three psi. However, monitoring of both thermal and cold water wells in the caldera indicate that the shallow, cold ground water system and the deeper thermal water system interact in portions of the south moat (see Figure 8). Here, pressures in the thermal water system mimic pressure changes in the cold ground water system. Thus, pressures in these same thermal water zones monitored in well CW-3 three miles east of Casa Diablo rose by comparable amounts starting in 1995 in response to several years of above-average precipitation and the related rise in pressure in the shallow ground water system.

Rates of flow of thermal water in springs at Hot Creek Gorge and the Hot Creek Fish Hatchery (see Figure 8) have been estimated from the concentrations of chloride and boron measured in the water. The estimated rate of thermal water discharge at Hot Creek Gorge has varied little since 1988, with the observed variations likely related to the errors naturally created by the estimating technique. Thus, it is not possible to determine if there are any changes in the thermal water discharge rate that might be related to geothermal development. Water level measurements in well CH10B, located near Hot Creek Gorge (see Figure 8), do not appear to show reservoir pressure changes related to the geothermal developments.

At the Hot Creek Fish Hatchery springs, cold water makes up about 95 percent of the total spring flow. The flow of cold water varies both seasonally and annually, closely following the amount of snow-melt recharge to the shallow ground water system. The rate of thermal water discharge in each of the springs also varies both seasonally and annually, also closely tracking the changes in the flow of cold water. This suggests that much of the observed variations in thermal water flow are a result of the variations in the cold water flow.

Measured temperatures of the Hot Creek Fish Hatchery springs also show both seasonal and annual changes. The relationship between spring temperatures and total spring flow rates is negative, in that the spring temperatures tend to go down as the flow rates rise. The degree of correlation between spring temperatures and total flow is not as good as the correlation between total flow and the calculated thermal water flow rates. This suggests that there are factors which moderate spring temperatures, such as thermal water flows increasing as the cold water flow rates (and pressures) rise. This also suggests that the Hot Creek Fish Hatchery springs are fed from a zone of mixed thermal and cold ground water, rather than by the two waters mixing immediately before discharging through the springs.

Net changes in temperature at the two main Hot Creek Fish Hatchery springs over the 1988 to 2003 time period are less than 2°F, although temperature changes greater than that have occurred during this time period. The largest temperature changes occurred in 1995 when high winter precipitation rates created high spring flows during the summer, when spring temperatures declined by about 4°F. While it is plausible that thermal reservoir pressure declines from geothermal development at Casa Diablo have caused some decrease in the flow of thermal water at the Hot Creek Fish Hatchery springs, substantially

greater changes in thermal water flow in these springs are clearly related to seasonal and annual precipitation changes.

### **3.3.3 Environmental Consequences**

#### *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 in a manner that would result in substantial erosion or siltation onsite or offsite.
- 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 onsite or offsite.
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water 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.
- Contribute to inundation by seiche, tsunami, or mudflow.

No lands within the Project area are subject to seiche, tsunami or mudflow.

#### *Environmental Consequences of the Proposed Action*

##### *Surface Waters*

Surface water quality could be adversely affected from storm water runoff carrying either sediment eroded from areas disturbed by the Project or incidental spills of materials on the well sites. However, the Project contains a number of measures designed to reduce the potential for, and severity of, this impact. The pipeline route would not be cleared, which reduces the amount and degree of soil disturbed. The Project would obtain coverage under, and comply with, the CSWRCB Construction General Storm Water Permit. Off-site storm water would be intercepted in ditches and channeled around the well sites to energy dissipaters as necessary to minimize erosion. Storm water generated on any well site would be collected and contained on site. The Project “Spill or Discharge Contingency Plan” would be followed to clean up any incidental material or geothermal fluid spills. USFS and State of California best management practices for storm water would be followed, as applicable. The Project also would comply with the measures to implement best management practices to prevent erosion and sedimentation and protect the RCAs from sediment during flood flows (see Appendix B). As a result of these measures, the potential for any substantial adverse affect to surface water quality from storm water runoff would be very small.

Geothermal fluids would not be discharged under normal operating or most upset conditions. Geothermal fluids could be accidentally released to the environment as a result of spills on the well sites or power plants, pipeline rupture or uncontrolled releases from the wells ("well blowouts"). Large discharges of geothermal fluids are extremely unlikely for many reasons, including frequent inspections, ultrasonic testing of the pipeline, flow and pressure monitoring and automatic well pump and pipeline valve shutdown features (see Appendix B). However, if they occurred they could pose a threat to surface water quality because of the higher concentrations of total dissolved solids and temperatures of these geothermal fluids. The Project "Spill or Discharge Contingency Plan" and "Well Blowout Contingency Plan" would be followed to prevent, control, contain, clean up and mitigate the impacts of any large spills of geothermal fluid.

Any discharged geothermal fluids that exceeded on-site containment would follow the local topography down gradient. The Project area south of "Rhyolite Ridge," east of drill site 35-31 and west of Antelope Spring Road drains overland toward Murphy Gulch. The rest of the Project area would drain toward the "Basalt Canyon" drainage, which is directly tributary to the Casa Diablo projects' existing 1,600,000 gallon emergency spill containment basin.

As discussed in Appendix B, at most an estimated 160,000 gallons (0.6 acre feet) of geothermal fluid could discharge in the very unlikely event of a complete rupture of the longest pipeline at the worst location, near "Murphy Gulch." (A rupture at any other location would discharge less geothermal fluid and likely discharge to the "Basalt Canyon" drainage.) This discharge would occur over time as the geothermal fluid drained from the pipeline. Depending on the location of the rupture and the soil conditions, it is possible that this fluid could reach "Murphy Gulch," about 1,000 feet away. It is much less likely, although still possible, that a very small amount could reach Mammoth Creek, approximately one mile downstream. However, given the flow rate in Mammoth Creek it is very unlikely that this very small amount of geothermal fluid could substantially degrade water quality in Mammoth Creek.

A maximum estimated 600 gallons per minute of geothermal fluid could flow from one of the production wells if it were to suffer an even less likely uncontrolled flow event (sometimes called a "well blowout"). This uncontrolled flow could continue for days (or even weeks), until the well was brought back under control. However, the maximum uncontrolled flow rate likely would drop substantially over this time as the pressure in the reservoir around the well was reduced by the flow. Geothermal fluid discharged from a well uncontrolled flow event would either naturally, or could easily be diverted to, flow into the "Basalt Canyon" drainage. From there the fluid would flow downstream into the existing Casa Diablo emergency spill containment basin, preventing any substantial degradation of water quality in Mammoth Creek.

None of the RCAs within the Project area contain waters which support viable populations and diversity of aquatic-dependent plant and animal species. None of these RCAs provide water flows sufficient to sustain aquatic habitats or provide spatial and temporal connectivity for aquatic species movement. Thus, the only "desired conditions" applicable to the RCAs within the Project area are maintaining water quality (through preventing sediment or material spills), protecting stream banks which minimize erosion and maintaining the ability to distribute flood flows (preventing obstructions to flood flows).

No Project activities would be conducted, and no Project facilities would be constructed, in the "Murphy Gulch" RCA. Existing roads constructed within the "Basalt Canyon" RCA would be utilized during construction, operation, maintenance and decommissioning of the Project. It is also likely that the pipeline would be constructed through the "Basalt Canyon" RCA in at least one, and possibly two, locations,



depending on the wells connected to the pipeline. The Project has committed to comply with those SNFPA ROD Standards and Guidelines concerning RCAs applicable to the Project, as identified in the Upper Basalt Geothermal Exploration Project ROD (see Appendix B).

The only portion of the “Basalt Canyon” RCA which showed any evidence of RCA attributes (evidence of storm water flow) was the 200-yard section immediately east of the eastern edge of Shady Rest Park downstream to the sediment trap. A pipeline crossing this portion of the RCA should avoid impeding or redirecting flood flows by being constructed above the high water mark and without support footings located in the potential flood zone. RCA attributes are lacking from the rest of the “Basalt Canyon” RCA within the pipeline corridor area and along the pipeline route. Because of this, the potential for adverse impacts to RCA attributes from the construction, operation, maintenance and decommissioning of the Project would be very remote.

No Project activities would be conducted, and no Project facilities would be constructed, within a “100-year flood hazard zone” as identified by FEMA (see Figure 10). The Project does not propose any activities or facilities which would alter the existing drainage pattern of the area or substantially increase the rate or amount of surface runoff. The Project would not expose any people or structures to any increased risk of adverse effects from flooding.

The potential impacts to surface waters would not violate any water quality standards or alter existing drainage patterns that would result in substantial erosion or siltation. Neither would they create substantial additional sources of polluted runoff or substantially degrade water quality. Therefore, the adverse effects of these impacts are considered to be below the level of significance under CEQA.

Implementation of *HAZ Measure 2* (pipeline rupture contingency plan) would reduce the potential for any adverse impacts to water quality from a rupture of the pipeline, and implementation of the following measure would ensure that the pipeline does not impede or redirect flood water flows. No residual impacts to surface water quality are anticipated because small spills and storm water discharges would be prevented or corrected and larger discharges are not expected to occur.

*HYD Measure 1*: The pipeline shall either avoid crossing the approximately 200-yard section of the “Basalt Canyon” RCA immediately east of the eastern edge of Shady Rest Park downstream to the sediment trap or be designed and constructed to ensure that neither the pipeline nor its footings impede or redirect flood flows.

### *Ground Waters*

Uncontrolled discharges of geothermal fluid, or spills of other materials, through the well casing, on the well sites or power plants, or from the pipeline, also have the potential to adversely affect the quality of the shallow (cold) ground water. However, no potable (drinking quality) ground water is known to exist in the Project area, and the MCWD ground water production wells are located over one mile, and up gradient, from the closest Project facilities. Also, as described above, BLM implements regulations to protect ground water (see Section 3.3.1), and the Project contains a number of measures designed to reduce the potential for, and severity of, these potential discharges. As a result, the potential for the Project to substantially degrade the quality of any shallow (cold) ground water would be very small.

As discussed in Section 3.3.2, there is no current evidence to suggest that the relatively shallow MCWD ground water well production zone is hydraulically connected with the deeper geothermal reservoir. Production of the geothermal fluids by the Project are not expected to adversely affect the MCWD well field, either by depleting the aquifer or by drawing in lower quality waters. The data collected through the ongoing hydrologic monitoring of both the cold ground water and geothermal systems, as coordinated by the LVHAC, would be reviewed at least annually by the BLM (and the LVHAC) to assure that there was no substantial interconnection or adverse effect. The regulations implementing the Geothermal Steam Act give the BLM the ability to order corrective actions should any adverse effects be determined.

The amount of water required for Project construction (principally dust control) would be very small, and likely would use non-potable water from the Casa Diablo water well. Activities proposed by the Project would not interfere with ground water recharge. Thus, the Project would not substantially deplete ground water supplies.

It may be necessary to re-drill, work-over or stimulate the two wells, and/or drill one or more replacement wells, over the life of the Project. This would be conducted consistent with the activities approved for the Basalt Canyon and Upper Basalt exploration projects (see Appendix C). Descriptions of these well activities and their potential impacts are presented in the EAs/ISs prepared and approved for these exploration projects. The environmental documents prepared for each of these MPLP projects have been incorporated by reference into this EA/Draft EIR (see Section 1.3). These EAs found that through implementation of the measures proposed by the Project to:

- case the wells;
- use only non-toxic, non-hazardous drilling mud;
- discharge waste drilling mud, drill cuttings and runoff from the well pad into the lined reserve pits; and
- use primarily non-potable water for well re-drilling,

the impacts from re-working or re-drilling these wells would be minor. No mitigation measures were required, but several measures were provided and adopted into the project approvals to ensure the implementation of the measures proposed by the Project (see Appendix C).

The potential impacts to ground waters would not violate any water quality standards or substantially degrade water quality. Neither would they substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Therefore, the adverse effects of these impacts are considered to be below the level of significance under CEQA.

No residual impacts to ground waters are anticipated.

### *Geothermal Waters*

Production of geothermal fluid from the two 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. These geothermal reservoir pressure changes may adversely affect other hydrothermal features (Hot Creek Fish Hatchery springs and Hot Creek springs) in the caldera, or create or expand areas of thermal ground, if they were transferred to these areas.

In order to assess the potential changes to the geothermal production and injection reservoirs which could result from the Project, an updated geothermal reservoir computer model was prepared by MPLP in consultation with the LVHAC. (This model and the Casa Diablo well production and injection data used to construct the model are considered by MPLP to be "trade secrets" as defined in Section 6254.7 of the California Government Code. As such, Sections 21160 of CEQA and 15120 of the CEQA Guidelines direct that it shall not be included in the environmental impact report or otherwise disclosed by any public agency.)

The model is a tool developed to help predict future behavior of the geothermal reservoir by matching (calibrating) the computer output against information monitored from past behavior. It uses proprietary computer software to create a three-dimensional simulation of the pressure and temperature distributions over time in most of the Long Valley caldera. Originally created in 1993, it has been periodically updated and adjusted since that time. It provides reasonably accurate matches to the historic monitoring data from the Casa Diablo geothermal production and injection reservoirs, where substantial data is available on which to build the model. It also has provided fairly good, though not as accurate, matches to the historic data to the east of Casa Diablo. Here the data density is much less, as there are substantially fewer wells from which data can be collected, so the model is constructed from less information. Also, many of the wells which are monitored in this area show substantial influences from the shallow (cold) ground water system, something the model does not consider.

In order to predict the potential future influences of the Project on pressures and temperatures in the geothermal reservoir, the two Project production wells were added to the calibrated model. (Since it is not known where the two Project production wells would actually be located, the two modeled wells were placed in locations immediately west of U.S. Highway 395, in locations thought to present the "worst case" for pressure and temperature interferences to reach Casa Diablo.)

Two model runs were conducted to predict the pressure and temperature changes over time at the geothermal reservoir monitoring points (wells). The first was a "base case" model run that assumed that the existing Casa Diablo projects would continue to operate exactly as they have been until 2033, when all of the Casa Diablo wells were assumed to be shut-in. This model run is equivalent to implementation of the "No Action Alternative." The second model run ("Proposed Action" case) assumed that each of the two new Project production wells began producing 1,800 gallons per minute in 2003. Simultaneously, production from the existing Casa Diablo area production wells was reduced by 1,800 gallons per minute. This simulation also assumed that the new Project wells, and all of the Casa Diablo wells, were shut-in in 2033, after the expected 30-year Project life.

To determine the predicted effects of the Project on the geothermal reservoir temperatures and pressures, the predicted results of the "base case" were subtracted from the results of the "Proposed Action" model run. Predicted pressure reductions in the "Basalt Canyon" geothermal reservoir were about 8 to 9 psi, or only about 15 percent of the pressure reduction experienced in the Casa Diablo production reservoir since geothermal operations began. Temperatures of the geothermal fluid in the "Basalt Canyon" geothermal reservoir were predicted to rise somewhat as hotter geothermal fluid flowed into the reservoir from the west.

The Project production wells would be located no closer than 0.5 miles up gradient of, and would be completed about three times deeper than, the existing Casa Diablo production wells. The current rate of geothermal fluid production at Casa Diablo also would be reduced as part of the Project. Both of these

factors work to restrict the size of the geothermal reservoir pressure drop from the Project wells measured at the Casa Diablo production reservoir or further east. The model confirms this assessment, as it predicted a very small (one to two psi) increase in the pressure of the Casa Diablo geothermal production reservoir. For the monitoring points (wells) further east, the model predicted that implementation of the Project would result in no change in the geothermal reservoir pressure.

Thus, because no substantial changes in the pressures in the Casa Diablo geothermal reservoir, or the geothermal reservoir further east, were predicted, there is no expectation that the Project would adversely affect hydrothermal features (such as the Hot Creek Fish Hatchery springs or the Hot Creek Gorge springs) in the caldera.

Since 1991, when the PLES I and MP II projects began operation, incidental observations by MPLP plant operators and others suggest that the areas of thermal ground at Casa Diablo have increased by about 24 acres. The Project could create new areas, or expand existing areas, of thermal ground if pressure reductions in the geothermal production reservoir were sufficient to produce steam which could make its way to the surface through pre-existing faults. However, this is unlikely to occur at Casa Diablo because the geothermal production reservoir pressure is actually expected to rise very slightly. This is also not likely to occur in the “Basalt Canyon” area because the pressure drop in the proposed Project production reservoir is predicted to be only about 15 percent of the pressure reduction experienced in the Casa Diablo production reservoir since geothermal operations began. This makes the production of steam in the “Basalt Canyon” area unlikely. Further, the Project production wells would be substantially (two to three times) deeper than the average depth of the existing Casa Diablo production wells. Thus, it would be much more difficult for any produced steam to reach the surface in the local area and create or expand existing thermal ground. Therefore, it is unlikely that the Project would result in any new or additional thermal ground in the “Basalt Canyon” area.

No residual impacts to geothermal waters or from new or expanded areas of thermal ground are expected to occur as a result of the Project.

### *Environmental Consequences of the Alternative Pipeline Route*

The impacts to geothermal resources from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route would be identical to those described for the Proposed Action.

Potential impacts to hydrologic resources from the Alternative Pipeline Route would differ only slightly from the Proposed Action. Although the Alternative Pipeline Route is about 1,000 feet longer than the Proposed Action, most of this additional length would be located in areas tributary to the “Basalt Canyon” drainage. Thus, the remote potential for accidental, upset discharges of geothermal fluid to enter “Murphy Gulch,” and possibly reach Mammoth Creek, would be further reduced under the Alternative Pipeline Route.

About half of the Alternative Pipeline Route which differed from the Proposed Action route would be located within the “Basalt Canyon” RCA. Several small clumps of riparian plant species were identified in a drainage ditch constructed next to Old Highway 395 in that portion of the “Basalt Canyon” RCA adjacent to the Alternative Pipeline Route (Northern Path) near Casa Diablo. The hydrologic effects of damaging these small clumps of riparian vegetation are negligible. However, because overall the species

in the RCA were typical of the surrounding sagebrush, it would be easy to locate and construct the pipeline to avoid these riparian clumps (see Section 3.6.3 and *VEG Measure 1A*).

The significance of all of the Alternative Pipeline Route hydrologic and geothermal resources impacts under CEQA would be identical to those described for the Proposed Action.

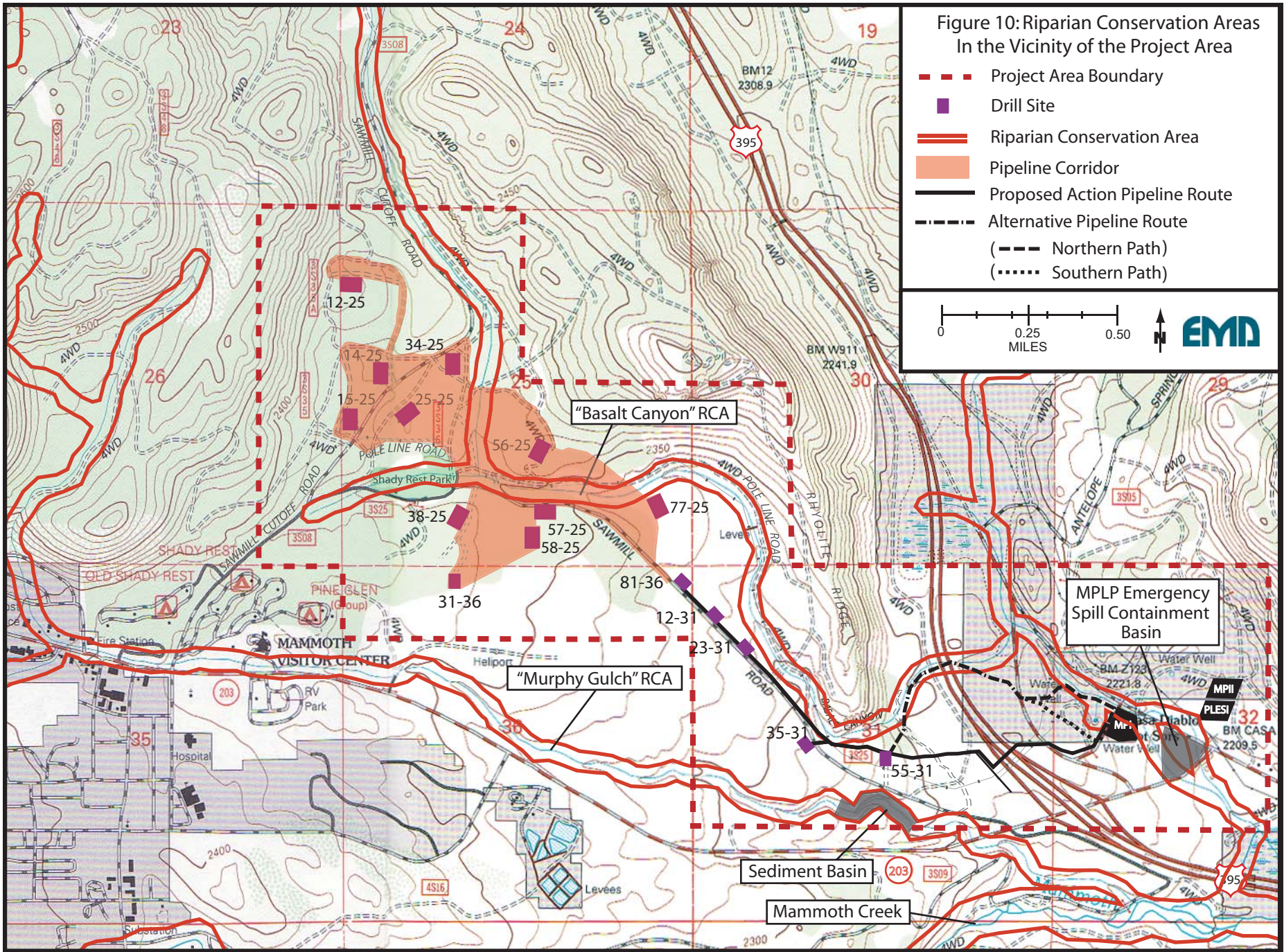
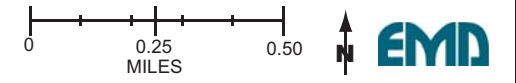
*Environmental Consequences of the No Action Alternative*

The Project would not be constructed if the No Action Alternative is selected. As such, there would be no effects on hydrologic or geothermal resources from the No Action Alternative.



Figure 10: Riparian Conservation Areas In the Vicinity of the Project Area

- - - - Project Area Boundary
- Drill Site
- Riparian Conservation Area
- Pipeline Corridor
- Proposed Action Pipeline Route
- Alternative Pipeline Route  
( Northern Path)  
( Southern Path)





### **3.4 AIR QUALITY**

#### **3.4.1 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<sub>3</sub>);
- carbon monoxide (CO);
- nitrogen dioxide (NO<sub>2</sub>);
- sulfur dioxide (SO<sub>2</sub>);
- particulate matter less than or equal to 10 microns in diameter (PM<sub>10</sub>);
- particulate matter less than or equal to 2.5 microns in diameter (PM<sub>2.5</sub>) and
- lead (Pb).

California has established ambient air quality standards for these same seven air pollutants, plus sulfates (SO<sub>4</sub>), visibility reducing particles (VRPs), vinyl chloride and hydrogen sulfide (H<sub>2</sub>S).

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.

##### *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 (know 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.

##### *Bureau of Land Management*

All federal geothermal lessees must comply with BLM Geothermal Resources Operational (GRO) Orders. GRO Order No. 4 (General Environmental Protection Requirements) requires that the concentrations of emitted geothermal gases shall not exceed applicable federal, state, or regional air pollution standards.

### 3.4.2 Affected Environment

The Project area 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<sub>10</sub>. (This is mostly because of the smoke from wood fires.) The state has designated the sub-basin (or basin) as “non-attainment” for ozone and PM<sub>10</sub>. The basin has been designated “attainment” or “unclassified” by the state for all other air pollutants.

The existing Casa Diablo geothermal projects and the Basalt Canyon and Upper Basalt geothermal explorations wells are the only activities within the Project area known to require and have been granted air quality permits from the GBUAPCD. The Casa Diablo geothermal power plants are authorized to emit isobutane (which is a precursor to ozone) and H<sub>2</sub>S. The exploration wells projects are authorized to operate drill rig diesel engines and emit H<sub>2</sub>S during exploration well drilling and flow testing.

There are no sensitive receptors (schools, hospitals, daycare centers, long-term care facilities) located within or next to the Project area. However, Shady Rest Park, a Town of Mammoth Lakes sports complex located within the Project area, receives substantial use by school-age children.

### 3.4.3 Environmental Consequences

#### 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 Consequences of the Proposed Action

##### *Construction and Decommissioning Activities*

The principal air pollutant emissions from Project construction and decommissioning activities are fugitive dust and engine combustion (“tailpipe”) gases.

Fugitive dust (PM<sub>10</sub>) would be created by Project vehicles moving on unpaved roads or other surfaces. It also would be created by wind blowing across ground disturbed by Project activities. However, the Project has proposed to control fugitive dust by watering disturbed areas during construction and

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decommissioning. Vehicle speeds on unpaved roads also would be limited (see Appendix B). The Project also would limit fugitive dust by not grading the pipeline route or constructing any new access routes.

Engine combustion ("tailpipe") gases include CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub> and toxic air pollutants from the combustion of diesel fuel. These would be emitted by Project vehicles, construction equipment, delivery trucks, and welding generators. The number of construction vehicles working on the Project is small. On average, 15 to 20 small trucks/service vehicles/worker vehicles and two to three large (18-wheel highway tractor-trailer) trucks would travel to the Project area each day. The daily trip length for most of these vehicles would be very short, only a few miles. Few pieces of construction equipment also would be required. These include a small drill or auger, one or two cranes, concrete trucks, water trucks, a backhoe, a grader for maintaining roads and the jacking equipment for the crossing under U.S. Highway 395. The generators used by the welders would each be small.

Air toxic emissions from the combustion of diesel fuel include small quantities of diesel particulate matter, acetaldehyde, benzene and formaldehyde. These toxic air pollutants can create excess cancer risk and chronic health hazards if the public is exposed to higher concentrations over long periods. However, the air toxic emissions from the Project construction operations would be small and short-term. There also are few nearby receptors. Those receptors which are nearby are not stationary (that is, they are there infrequently). Therefore, the cancer and health risk from these air toxic emissions is expected to be very small.

The adverse effects of all of these short-term, temporary construction emissions are minor. They also are below the level of significance under CEQA because they would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. They also would not expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people.

Construction and decommissioning activities would not create any residual impacts to air quality.

### *Operations and Maintenance Activities*

Project operations would not directly produce any appreciable air pollutant emissions. The well pumps are electrically powered, so there are no combustion emissions. The geothermal fluid is carried to the existing Casa Diablo geothermal plants in the closed pipeline, so no hydrogen sulfide (which smells like rotten eggs) would be released to the atmosphere. The additional geothermal fluid delivered to the power plants would increase the production of electrical energy. However, these power projects emit very few air pollutants, and none that are directly related to the amount of geothermal fluid going through the plant. Only small amounts of fugitive dust would be generated by vehicle travel on the unpaved roads during the twice-daily well site and pipeline inspections.

Well pumps would require regular maintenance and/or replacement every two to five years. When necessary, well pumps would be removed and re-installed in the well bore. This would be done in the same manner as the initial installation. The resulting air quality impacts would be the same as well site construction activities for the one to two days required to change out the pump.

It may be necessary to re-drill, work-over or stimulate the two wells, and/or drill one or more replacement wells, over the life of the Project. This would be conducted consistent with the activities approved for the

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two exploration projects (see Appendix C). Descriptions of these well activities and their potential impacts are presented in the EAs/ISs prepared and approved for these exploration projects. The environmental documents prepared for each of these MPLP projects have been incorporated by reference into this EA/Draft EIR (see Section 1.3). These EAs found that through implementation of the measures proposed by the Project to limit emissions and compliance with the requirements of the GBUAPCD, the impacts from drilling and re-drilling these wells would be minor. No mitigation measures were required, but several measures were provided and adopted into the project approvals to ensure the implementation of the measures proposed by the Project (see Appendix C).

The adverse effects of these operation and maintenance air quality impacts are below the level of significance under CEQA because they do not conflict with or obstruct implementation of any applicable air quality plan or result in a cumulatively considerable net increase of any criteria pollutant for which the region is non-attainment. The Project operations also would not violate any air quality standard or contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors affecting a substantial number of people. No mitigation measures are required, and there would be no residual impacts to air quality.

### *Environmental Consequences of the Alternative Pipeline Route*

The air quality impacts from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

### *Environmental Consequences of the No Action Alternative*

The Project would not be constructed if the No Action Alternative is selected. As such, there would be no effects on air quality from the No Action Alternative.

### 3.5 VISUAL RESOURCES

#### 3.5.1 Regulatory Framework

Visual resource objectives are mapped throughout Inyo National Forest. The visual impacts of projects are judged against these visual objectives. Areas of special sensitivity receive higher levels of protection. Mono County policies and objectives focus mainly on protecting views from scenic highways. The Town of Mammoth Lakes policy guidance aims to minimize adverse effects on recreation.

Portions of Geothermal Leases CA-14407 and CA-14408 (see Figure 2) are covered by the special stipulation which states that “No surface disturbing activities will be permitted in the No Surface Occupancy areas shown on Map 5, attached, unless the lessee can demonstrate through an appropriate plan of operation or permit application that no unacceptable environmental impacts will occur from the proposed operations.” These restrictions were adopted in part to protect the “critical visual zones” (both foreground and middle ground) along U.S. Highway 395, State Route 203 and Sawmill Cutoff Road on these two leases.

#### Inyo National Forest

The Inyo National Forest Land and Resource Management Plan provides Standards and Guidelines for the protection of visual resources in the Forest (USDA, Forest Service, Inyo National Forest 1988). The following visual resource standards and guidelines are relevant to the Project.

- *Obtain the Forest Supervisor's approval through the environmental analysis process for any deviations from Visual Quality Objectives (VQOs) assigned in Prescriptions.*
- *Maintain foregrounds and middlegrounds of the scenic corridors of the following travel routes to Retention and/or Partial Retention VQOs as inventoried, but not less than Partial Retention:*
  1. *Highways officially designated by the state of California and County Scenic Highways.*
    - *California State Scenic Highway System routes as designated in the September 1970 Master Plan. These highways include: ...U.S. 395...State Highway 203....*
- *Meet the Retention VQO in all foreground zones of other Sensitivity Level 1 roads and trails, recreation sites, and within all concentrated recreation areas.*

As discussed in Section 1.4.3, all of the Project surface disturbance would be located in areas covered by Management Prescription 12 (Concentrated Recreation Area). The following visual management directions are applicable to this management prescription.

- *Meet the Retention VQO for all new, non-recreation-oriented facilities and the Partial Retention VQO for all other facilities, including recreation sites.*
- *Meet the Retention VQO when implementing all other resource activities.*

Visual Quality Objectives (VQOs), Distance Zones, Sensitivity Levels and Variety Classes have been established throughout the Inyo National Forest consistent with the direction of the Forest Service's *Visual Management System* (USDA, Forest Service 1974). As shown in Figure 11, portions of the Project area have been designated as follows (from most sensitive to least sensitive).

- “Rfg1A” (Retention VQO, foreground distance zone, Sensitivity Level 1, Distinctive variety class).
- “Rfg1B” (Retention VQO, foreground distance zone, Sensitivity Level 1, Common variety class).
- “Rmg1A” (Retention VQO, middleground distance zone, Sensitivity Level 1, Distinctive variety class).
- “PRmg1B” (Partial Retention VQO, middleground distance zone, Sensitivity Level 1, Common variety class).

The “retention” VQO designation “provides for management activities which are not visually evident.” Activities “may only repeat form, line, color and texture which are found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc., should not be evident.” The “Partial Retention” VQO designation requires that “management activities remain visually subordinate to the characteristic landscape.” Activities may “introduce form, line, color or texture which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape.”

Those portions of the Project located on private land are not subject to the forest visual inventory.

### Mono County

The “Conservation/Open Space Element” of the Mono County General Plan has several sections applicable to visual resources. The “Conservation/Open Space Element” addresses *Energy Resources* and provides specific policies and objectives for geothermal exploration and development:

*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 I, Objective D, Action 1.18).*

*Geothermal exploration and development projects shall be carried out with the fewest visual intrusions reasonably possible (Goal I, Objective F).*

The “Conservation/Open Space Element” also contains *Visual Resource* objectives and policies intended to further the goal of protecting and enhancing the visual resources and landscapes of Mono County (County of Mono Planning Department, 1993d). The following are the applicable objectives.

- Maintain and enhance visual resources in the County (Objective A).
- Maintain a countywide system of state and county designated scenic highways (Objective B).
- Ensure that development is visually compatible with the surrounding community, adjacent cultural resources, and/or natural resources (Objective C).



The “Development Standards – Scenic Combining District” chapter of the “Land Use Element” of the Mono County General Plan presents general development standards to minimize visual impacts in areas visible from designated scenic highways within the county (County of Mono Planning Department 2001). In the vicinity of the Project area, the following are the designated scenic highways.

- The section of State Route 203 from its intersection with U.S. Highway 395 west to its junction with Sierra Park Road. This is a Mono County-designated scenic highway.
- The section of U.S. Highway 395 from its junction with State Route 120 in the north to the Inyo County line in the south. This is a California state-designated scenic highway.
- The entire section of U.S. Highway 395 in Mono County. This is the federal-designated Eastern Sierra Scenic Byway.

The following are the “Scenic Combining District” general development standards applicable to minimizing visual impacts along these designated scenic highways.

- Adequately screen visually offensive land uses.
- Minimize earthwork, grading and vegetative removals.
- Minimize the construction of new access roads.
- Keep design, color and structure material compatible with the natural settings.

The Scenic Combining District also presents additional development standards to minimize visual impacts from new developments in areas visible from U.S. Highway 395.

- Maintain the natural topography of a site as much as possible.
- Minimize earthwork, grading and vegetative removals.
- Utilize existing access roads whenever possible.
- Protect existing trees and native ground cover.
- Revegetate all site disturbances and maintaining with plants that blend with the surrounding natural environment.
- Place new structures where, to the extent feasible, they will be the least visible.
- Keep color, shape and structure materials compatible with the natural settings.

### Town of Mammoth Lakes

Portions of the Project area located on public land administered by Inyo National Forest also are located within the municipal boundaries of the Town of Mammoth Lakes (see Figure 1). The rest of the Project area is located within the larger Town of Mammoth Lakes planning area. Visual resource planning for the Town of Mammoth Lakes is largely discussed in the Conservation and Open Space Element to the Town’s General Plan. However, the “Land Use Element” to the General Plan also provides specific policy guidance regarding the visibility of geothermal facilities (Town of Mammoth Lakes 1987).

*The Town shall encourage the Bureau of Land Management to site geothermal wells and production facilities in such a manner that they are not visually obtrusive or environmentally damaging and do not interfere with the outdoor recreational experiences of residents and visitors (Land Use Element, Facilities and Services, Overall Goals and General Policies, Policy 5).*

The Town is in the process of revising its General Plan. A preliminary (July 13, 2004) draft of sections of the new General Plan provides a subchapter on Visual Resources within a proposed Environment and Resource Management chapter. However, this draft does not appear to provide any additional visual resource guidance with respect to geothermal facilities.

### **3.5.2 Affected Environment**

The Project area is set at an elevation of about 7,250 to 7,550 feet. The Sierra Nevada peaks rise in excess of 12,000 feet west and south of the Project area. The eastern portion of the Project area is mainly a gently sloping area of sagebrush scrub vegetation and scattered pine trees. The western portion extends into the Jeffrey Pine forest.

The visual setting of the Project area is dominated by the natural environment. However, evidence of human activity is also readily apparent. U.S. Highway 395 runs north-south through the eastern half of the Project area. Within the Project area east of U.S. Highway 395 is a Southern California Edison (SCE) electric substation, the MPLP Casa Diablo geothermal development complex (see Section 1.3), and several named and unnamed roads and trails, including Antelope Spring Road, the eastern extension of former State Route 203, and Old U.S. Highway 395 (see Figure 12).

Crossing U.S. Highway 395 north of its junction with State Route 203 is an SCE electric transmission line (which consists of a 33-kV transmission line mounted on wooden poles with a 12.5-kV distribution line and a fiber optic line built underneath). This electric transmission line runs northwest, generally parallel to Sawmill Road, then runs west immediately north of Shady Rest Park. Another SCE 33-kV electric transmission line built on wooden poles crosses U.S. Highway 395 north of the junction with State Route 203 and drops underground immediately west of U.S. Highway 395.

West of U.S. Highway 395 within the Project area are Sawmill Cutoff Road (Forest Road 3S08), Sawmill Road (Forest Road 3S25), and a network of other unpaved roads and trails. At the western end of the Project area is Shady Rest Park, a Town of Mammoth Lakes sports complex located on USFS land (see Figure 12). An approximately 800-foot long, eight-foot high segmented snow fence has been built along the southbound exit of U.S. Highway 395 to State Route 203. Road signs and boundary fences also are seen along both State Route 203 and U.S. Highway 395. The wellhead facilities of MPLP observation holes 66-31 and 12-31 also are located north of State Route 203 near Sawmill Road.

#### *Key Observation Points*

Key observation points (KOPs) are specific points which are representative of important views of the Project and Project area. For this Project KOPs were selected along the designated scenic highways from which Project facilities would be visible within the “Retention” VQO and the scenic highway corridors. Potential KOPs were identified along both U.S. Highway 395 and State Route 203 for both the Proposed Action and the Alternative Pipeline Route through an inspection of the Project area and a review of USGS maps and recent aerial photographs.

Based on this review, the following KOPs were identified for the Proposed Action pipeline route (see Figure 13).

- KOP#1, located on the eastbound lanes of State Route 203 west of the junction with U.S. Highway 395, from which the pipeline would be visible to the north (driver's side of the vehicle) (see Figure 14).
- KOP#2, located on the southbound lanes of U.S. Highway 395 before the Mammoth Lakes exit, from which the pipeline would be visible to the southwest (passenger's side of the vehicle) (see Figure 18).

The following KOPs also were identified for the Alternative Pipeline Route (see Figure 13).

- KOP#3, located along the southbound lanes of U.S. Highway 395 before the Mammoth Lakes exit, from which the pipeline would be visible to the west (passenger's side of the vehicle) (see Figure 22).
- KOP#4, located along the northbound lanes of U.S. Highway 395 after the end of the Mammoth Lakes onramp, from which the pipeline would be visible to the east (passenger's side of the vehicle) (see Figure 24).

Shady Rest Park was also identified as an important visual observation area as it is designated with the VQO of "retention." Because of its size, no KOP was identified as being representative. Instead, the visual impacts of the Project on the park were assessed as a whole.

### **3.5.3 Environmental Consequences**

#### *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.

#### *Environmental Consequences of the Proposed Action*

##### *Construction Activities*

Construction activities and construction-related traffic would be visible from multiple vantage points in the Project area and vicinity throughout the two- to three-month construction period. However, construction activities would result in very little surface disturbance or removal of vegetation (see Section 2.1.3). They also would be short-term, and would not result in long-term inconsistencies with Forest VQOs or local policy goals or objectives. Construction impacts would not be visually evident and would meet both retention and partial retention VQOs.

The construction impacts would not be significant under CEQA because they would not substantially degrade the existing visual character or quality of the Project area.

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### *Well Site Facilities*

Well site facilities (including the well head, pump motor, pump control building, well head fence and well site pipeline – see Section 2.1.4) would be hidden or fully obscured from view by vegetation and terrain from the designated scenic highways, including the identified KOPs. Because of the distance and the intervening trees and/or topography, none of the well site facilities would be visible from either Shady Rest Park or the USFS campgrounds.

Well site facilities constructed on drill sites 81-36, 12-31, 23-31 or 35-31 would be easily visible in the immediate foreground (that is, at a distance of less than 300 feet) above the sagebrush to viewers traveling on Sawmill Road. The Project has committed to paint the well site facilities an appropriate color to blend with the existing environment, which would reduce the visual contrast of these well site facilities. The “boxy” form and straight lines of the well head fence, pump control building and wellhead are found infrequently in the area, but these features would remain subordinate to the visual strength of the landscape. Thus, these well site facilities would meet the applicable “partial retention” VQO designation.

Well site facilities constructed on drill sites 14-25, 15-25, or 34-25; or on drill site 57-25; would be occasionally visible in the immediate foreground through the forest to viewers traveling on Sawmill Cutoff Road and Sawmill Road, respectively. Well site facilities constructed on drill site 25-25; or on drill sites 38-25, 58-25 or 55-31; may also be occasionally visible through the forest to viewers on Sawmill Cutoff Road or Sawmill Road, respectively, although at distances beyond the immediate foreground (beyond 300 feet). Well sites in those areas where the forest has recently been thinned under the Mammoth fuelbreak project may be more visible until the forest understory grows higher.

The vertical form and straight lines of the well head fence, pump control building and wellhead generally repeat the vertical form and straight lines characteristic of these forested areas as viewed from Sawmill Cutoff Road. The Project also has committed to paint the well site facilities an appropriate color to blend with the existing environment. Thus, these well site facilities would not be visually evident, and would meet the “retention” VQO designation applicable to this area.

Each of the well sites would be lighted at night for safety by a single small light. It would be directed downward and shaded to keep the light on the well site. Additional lights would be turned on only when needed to conduct well site inspections and maintenance activities. These lights also would be shaded and directed downward.

These impacts would not substantially degrade the existing visual character or quality of the Project area or create a new source of substantial light or glare. Therefore, the adverse effects of these impacts are considered to be below the level of significance under CEQA.

None of the Project well sites are within those portions of Geothermal Leases CA-14407 and CA-14408 covered by the “no surface occupancy” stipulations (see Figure 2).

Implementation of the following measure would help reduce the adverse effects of those well site facilities which may be visible from Sawmill Cutoff Road and Sawmill Road. After implementation of this visual measure, the well site facilities still would be partially visible from some locations. This would be a residual impact during the life of the Project.

*VIS Measure 1:* Following completion of construction, the Permittee shall prepare, submit for approval by the authorized officer, and implement a landscape plan to plant native trees and shrub vegetation at select locations to further screen well site facilities from view from Sawmill Cutoff Road and Sawmill Road.

*Retention VQO (Shady Rest Park and Sawmill Cutoff Road)*

The Inyo National Forest VQO for the area around Shady Rest Park and Sawmill Cutoff Road is “retention.” Only those activities that would repeat form, line, color and texture of the surrounding landscape would meet this VQO.

To reduce the visual impact of the pipeline in this area, the Project has proposed that the pipeline would be colored to blend with the area. The Project also has committed to the following.

- Any pipeline route selected within the pipeline corridor would either be 300 feet from the developed portions of Shady Rest Park or would be substantially screened from view from the developed portions of the park by topography or vegetation.
- The selected pipeline route within the pipeline corridor would not parallel Sawmill Cutoff Road within 300 feet of the road.

The topography and heavy vegetation immediately surrounding Shady Rest Park would effectively screen the pipeline so that it is not visible from any areas within the park.

Vegetation also would generally screen the pipeline from the view of travelers on Sawmill Cutoff Road, although less of the pipeline likely would be hidden by topography. Short segments of pipeline would be occasionally visible through the forest to viewers from Sawmill Cutoff Road. This would be especially true in those areas where the forest has recently been thinned under the Mammoth fuelbreak project. The pipeline would repeat the color and the cylindrical form characteristic of the trees in the surrounding forest. The pipeline’s straight lines also would generally repeat the straight lines of the trees and roads in the area. Given that the pipeline also would be close to the ground and the view would be interrupted by individual trees, the pipeline should not be visually evident. As such, the portions of the pipeline visible from Sawmill Cutoff Road would be consistent with the designated VQO of “retention.”

The adverse effects of this impact are considered to be below the level of significance under CEQA because the impact would not substantially degrade the existing visual character or quality of the site.

Only the extreme western ends of the pipeline corridor area fall within that portion of Geothermal Lease CA-14407 covered by the “no surface occupancy” stipulation (see Figure 2). Because the pipeline would be consistent with the designated VQO of “retention,” “no unacceptable environmental impacts will occur from the proposed operations.”

Implementation of the following measures would help ensure that the visual effects of the pipeline from Shady Rest Park and Sawmill Cutoff Road would meet the applicable VQO of “retention” for this area. After implementation of these measures, the pipeline still would be visible from some locations. This would be a residual impact during the life of the Project.

*VIS Measure 2:* The Geothermal Sundry Notice filed to obtain approval from the authorized officer to construct the pipeline shall specifically describe how the selected pipeline segments would be constructed

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in areas with the VQO of “retention” near Shady Rest Park to minimize the visibility of the pipeline from Sawmill Cutoff Road and Shady Rest Park through distance, vegetation and terrain.

*VIS Measure 3:* The pipeline segments to be constructed in areas with a VQO of “retention” in the vicinity of Sawmill Cutoff Road shall use “textured” (“dimpled”) pipeline cladding and shall be colored with a color or colors (approved by the authorized officer) to blend with the area so that the pipeline repeats the color and roughened texture of the characteristic landscape.

*VIS Measure 4:* Following completion of construction, the Permittee shall prepare, submit for approval by the authorized officer, and implement a landscape plan to plant native trees and shrub vegetation at select locations to further screen from view those portions of the pipeline which may be visible from Sawmill Cutoff Road.

### *Partial Retention VQO*

Segments of the pipeline would be visible to individuals engaged in dispersed recreation activities (such as hiking, dog-walking, cross-country skiing, snowmobiling, etc.) in those parts of the Project area with a VQO of “partial retention.” Many of these activities occur along the existing roads in the Project area.

MPLP has proposed to color the pipeline to blend with the landscape. MPLP also has proposed to set the pipeline back 10 to 15 feet from any of the roads it would parallel.

The pipeline would repeat the color characteristic of the surrounding shrubs, and pipeline’s straight lines also would generally repeat the straight lines of the adjacent road. Although the top of the pipeline would often be visible above the vegetation from the roads it parallels in these areas, because it is built low to the ground it would still be subordinate to the visual strength of the landscape. Thus, the pipeline visible from these roads would be consistent with the VQO of “partial retention” applicable to the area.

The adverse effects of this impact are considered to be below the level of significance under CEQA because the impact would not substantially degrade the existing visual character or quality of the site. No mitigation measures are required under CEQA.

Implementation of the following measure would further reduce the adverse visual effects of the pipeline in the areas with a VQO of “partial retention.” After implementation of this measure the pipeline would still be from locations within the area. This would be a residual impact during the life of the Project.

*VIS Measure 5:* In sections of the Project area with a VQO of “partial retention,” the Permittee shall, with the approval of the authorized officer, locate the pipeline so that it is not immediately adjacent to existing roads and takes advantage of existing vegetation or terrain screening opportunities to reduce the visibility of the pipeline from these roads.

### *Designated Scenic Highways and KOPs*

Short sections of the Proposed Action pipeline route east of drill site 55-31 would be visible to travelers on the designated scenic highways (see Figure 13). To reduce the visibility of the pipeline in these areas, MPLP has proposed to color the pipeline to blend with the landscape.



A 1,100-foot section of the pipeline located west of U.S. Highway 395 would be visible from vehicles traveling either eastbound or westbound on portions of State Route 203 near the intersection with U.S. Highway 395 (see Figure 13). In this area, the pipeline would generally parallel State Route 203 to the north at distances from about 1,000 feet to 1,500 feet. The visible sections of the pipeline would be at about the same elevation as the highway. The pipeline would be visible from vehicles on an estimated 1,450-foot section of State Route 203 while eastbound, or for about 20 seconds. The pipeline also would be visible from vehicles on an estimated 1,150-foot section of the highway while westbound, or for about 16 seconds. Topography and existing vegetation would sometimes interrupt the view of the pipeline from these sections of the state highway. No other sections of the pipeline should be visible from any other locations on State Route 203.

KOP#1 was selected as a representative vantage point on the eastbound (south) side of the state highway. From KOP#1, about 1,100 feet of the pipeline would be visible looking to the left (driver's side) of the vehicle (see Figure 13). Portions of this section of pipeline would be hidden from view by existing vegetation and the snow fence that parallels U.S. Highway 395. Figure 14 reflects the existing view from KOP#1. Figure 15 reflects this same view with the addition of the proposed pipeline. (The pipeline can be seen immediately to the left of the tip of snow wand in the center foreground of the photo.)

This same section of the pipeline west of the U.S. Highway 395 also would be visible from vehicles traveling southbound on U.S. Highway 395 north of the intersection with State Route 203. The pipeline would be visible from vehicles on an estimated 1,000-foot section of U.S. Highway 395, or for about 11 seconds, at distances from about 1,100 feet to as little as 200 feet away (see Figure 13). No other sections of the pipeline should be visible from any other locations on U.S. Highway 395.

KOP#2 was selected as a representative vantage point on the western shoulder of the southbound highway. About 1,300 feet of the pipeline would be visible to the south from KOP#2. The pipeline would be viewed from slightly above while looking to the right (passenger's side). The pipeline would be partially hidden from view by trees, other vegetation and some highway signs. Figure 16 reflects the existing view from KOP#2. Figure 17 reflects this same view with the addition of the proposed pipeline.

Those sections of pipeline visible in the foreground from the scenic highways would repeat the color of the characteristic landscape and the cylindrical form of the trees and power poles. The pipeline also would generally repeat the line of the roads, power lines, fences and low horizon, although this more from KOP#1 than from KOP#2. The pipeline would introduce a smooth texture that is not apparent in the existing characteristic landscape. As such, the view of these sections of the pipeline from the scenic highways would be inconsistent with the VQO of "retention" prescribed for this part of the Project area. However, because these views would still be subordinate to the visual strength of the landscape they would be consistent with a VQO of "partial retention." Implementation of the following mitigation measures would alter the texture of the pipeline to match the character of the site and obscure the view of the pipeline so that it would not be visually evident (see Figure 19 and Figure 21). The pipeline would then meet the designated "retention" VQO. Although after implementation of these mitigation measures the pipeline would meet the applicable VQO of "retention," it would remain visible. This would be a residual impact for the life of the Project.

None of the Project facilities within those portions of Geothermal Leases CA-14407 and CA-14408 covered by the "no surface occupancy" stipulations would be visible from State Route 203 or U.S. Highway 395 (see Figure 2).

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The visibility of the pipeline from these short sections of the designated scenic highways also would be inconsistent with the Mono County objective to have pipelines in the scenic corridors obscured from view. This impact is considered significant under CEQA because it would substantially degrade the existing visual character or quality of the site and may have a substantial adverse effect on a scenic vista. However, implementation of the following mitigation measures would reduce the adverse effects of the impact to below the CEQA level of significance by altering the texture of the pipeline to match the character of the site and obscuring the view of the pipeline to reduce the adverse effect on the scenic vista. Figure 19 and Figure 21 show the simulated views of the pipeline from KOP#1 and KOP#2, respectively, after implementation of these mitigation measures.

*VIS Mitigation Measure 6:* The pipeline segments to be constructed on Inyo National Forest managed-land in areas with the VQO of “retention” and visible from State Route 203 and/or U.S. Highway 395 shall use textured pipeline cladding and shall be colored with a color or colors (approved by the authorized officer) to blend with the area so that the pipeline generally repeats the color and texture of the characteristic landscape.

*VIS Mitigation Measure 7:* Following completion of construction, the Permittee shall prepare, submit for approval by the authorized officer, and implement a landscape plan to plant native trees and shrub vegetation at select locations on Inyo National Forest-managed land to further screen from view those portions of the pipeline which may be visible from State Route 203 and/or U.S. Highway 395 to ensure that the pipeline is at least subordinate to the visual strength of the characteristic landscape.

*VIS Mitigation Measure 8:* Following completion of construction, the Permittee shall prepare, obtain the approval of the Mono County and other required parties, and implement a landscape plan to plant native trees and shrub vegetation at select locations on private land to further screen from view those portions of the pipeline which may be visible from U.S. Highway 395 to ensure that the pipeline is generally obscured from view.

### *Well Maintenance Operations*

Over the life of the Project it may be necessary to re-drill, stimulate, work-over or otherwise repair or replace one or both of the production wells. The visual impacts of these well maintenance operations were evaluated in the environmental assessments prepared for the Basalt Canyon Geothermal Exploration Project and the Upper Basalt Geothermal Exploration Project. These environmental assessments have been incorporated by reference into this EA/Draft EIR. MPLP has stipulated that these well maintenance operations would be conducted in conformance with the stipulations required of these projects (see Section 2.1.5).

The visual analyses of these well maintenance operations found that during well drilling the upper portions of the drilling rig mast likely would extend above the top of the forest. Thus, the rig mast would be visible from some locations along State Route 203, in the Town of Mammoth Lakes, and maybe along U.S. Highway 395. Some portion of the drilling equipment on some well sites could also be visible through the forest from locations near the drilling operations. Lighting required for worker safety during night-time drilling would increase the visibility of the operations. The environmental assessments found that drilling operations were temporary visual impacts which would not result in long-term inconsistencies with Forest VQO or local policy goals or objectives.

The environmental assessments also found that these operations would not result in significant impacts under CEQA because they were very short-term and temporary.

### *Decommissioning Activities*

At the end of operations, expected in 30 years, the Project would be decommissioned. The well site and pipeline facilities would be removed and the drill sites and pipeline route reclaimed. The decommissioning activities would not result in substantial surface disturbance, removal of vegetation or involve any other activities which could lead to any substantial visual impacts. Successful reclamation would return the Project area to its pre-Project appearance.

The decommissioning impacts would not be significant under CEQA because they would not substantially degrade the existing visual character or quality of the Project area.

### *Alternative Pipeline Route*

The Alternative Pipeline Route pipeline would be designed, constructed and decommissioned as described for the Proposed Action (see Sections 2.1.3 and 2.1.7). The routing of the Alternative Pipeline Route pipeline within the pipeline corridor west of drill site 81-36, and from drill site 81-36 east to drill site 55-31, would be the same as for the Proposed Action. However, the Alternative Pipeline Route pipeline would eliminate the visual impact of the pipeline from State Route 203 by crossing U.S. Highway 395 where it would not be visible from State Route 203 (see Figure 7). The pipeline also would cross U.S. Highway 395 in a drainage swale which would reduce the length of pipeline visible from U.S. Highway 395 and reduce the sections of U.S. Highway 395 from which the pipeline would be visible (see Section 2.2.1).

### *Construction Activities*

The visual impacts from the Alternative Pipeline Route construction activities, and the significance of these impacts under CEQA, would be the same as described for the Proposed Action.

### *Well Site Facilities*

The visual impacts from the Alternative Pipeline Route well site facilities, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action. The measure proposed to further reduce the adverse effects of the impact for the Proposed Action is also applicable to the Alternative Pipeline Route.

### *Retention VQO (Shady Rest Park and Sawmill Cutoff Road)*

The visual impacts from Sawmill Cutoff Road described for the Proposed Action, and the significance of these impacts under CEQA, would be identical for the Alternative Pipeline Route. The measures proposed to further reduce the adverse effects of the impact for the Proposed Action also are applicable to the Alternative Pipeline Route.

### *Partial Retention VQO*

The visual impacts on dispersed recreation from the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action. The measure proposed to further reduce the adverse effects of the impact for the Proposed Action is also applicable to the Alternative Pipeline Route.

### *Designated Scenic Highways and KOPs*

Short sections of the Alternative Pipeline Route pipeline adjacent to U.S. Highway 395 would be briefly visible in the immediate foreground from vehicles traveling both southbound and northbound on U.S. Highway 395 (see Figure 13). The pipeline would be visible from vehicles along an approximately 400-foot section of U.S. Highway 395, or for about 4 seconds. Except as described below, no other sections of the Alternative Pipeline Route pipeline should be visible from any other locations on U.S. Highway 395 or State Route 203.

KOP#3 was selected as a representative vantage point on the southbound shoulder of the highway. From KOP#3, about 450 feet of the Alternative Pipeline Route pipeline, located in the drainage swale adjacent to the highway, would be briefly visible to the west (passenger's side) of southbound vehicles. Passengers in the vehicles would be looking slightly down on the visible sections of the pipeline. The rest of the Alternative Pipeline Route pipeline further to the west would be hidden from view by existing vegetation and topography. Figure 22 reflects the existing view from KOP#3. Figure 23 reflects this same view with the addition of the proposed Alternative Pipeline Route pipeline.

KOP#4 was selected as a representative vantage point on the northbound shoulder of the highway. From KOP#4, about 600 feet of the Alternative Pipeline Route pipeline adjacent to the highway would be briefly visible to the southeast (passenger's side) looking back from northbound vehicles. Passengers in the vehicles would be looking slightly down on the visible sections of the pipeline. The remainder of the Alternative Pipeline Route pipeline further southeast would be obscured from view by existing vegetation and topography. Short segments of the Alternative Pipeline Route pipeline could also be sometimes visible to the east of U.S. Highway 395 at middleground distances (one-half mile or more) from southbound vehicles on U.S. Highway 395. Figure 24 reflects the existing view from KOP#4. Figure 25 reflects this same view with the addition of the proposed Alternative Pipeline Route pipeline.

Those sections of Alternative Pipeline Route pipeline visible in the foreground from the scenic U.S. Highway 395 would repeat the color of the characteristic landscape and the cylindrical form of the trees. The pipeline also would generally repeat the line of the road from KOP#3 and the trees from KOP#4. The pipeline would introduce a smooth texture that is not apparent in the existing characteristic landscape. As such, the view of these sections of the pipeline from the scenic highways would be inconsistent with the VQO of "retention" prescribed for this part of the Project area. However, because these views would still be subordinate to the visual strength of the landscape they would be consistent with a VQO of "partial retention." Implementation of the following mitigation measures would alter the texture of the pipeline to match the character of the site and obscure the view of the pipeline so that it would not be visually evident (see Figure 27 and Figure 29). The pipeline would then meet the designated "retention" VQO. Although after implementation of these mitigation measures the pipeline would meet the applicable VQO of "retention," it would remain visible. This would be a residual impact for the life of the Project.

The visibility of the pipeline from designated scenic U.S. Highway 395 also would be inconsistent with the Mono County objective to have pipelines in the scenic corridors obscured from view. This impact is considered significant under CEQA because it would substantially degrade the existing visual character or quality of the site and may have a substantial adverse effect on a scenic vista. However, implementation of the mitigation measures proposed for this impact under the Proposed Action, and implementation of the following mitigation measure, would reduce the adverse effects of the impact to below the CEQA level of significance by altering the texture of the pipeline to match the character of the site and obscuring the view of the pipeline to reduce the adverse effect on the scenic vista. Figure 27 and Figure 29 show the simulated views of the pipeline from KOP#3 and KOP#4, respectively, after implementation of all of these mitigation measures.

*VIS Mitigation Measure 9A:* The Alternative Pipeline Route pipeline segments to be constructed on private land within the scenic highway corridor along U.S. Highway 395 where visible shall use textured pipeline cladding and shall be colored with a color or colors selected (with the concurrence of Mono County) to ensure that the color and structure material are compatible with the natural setting.

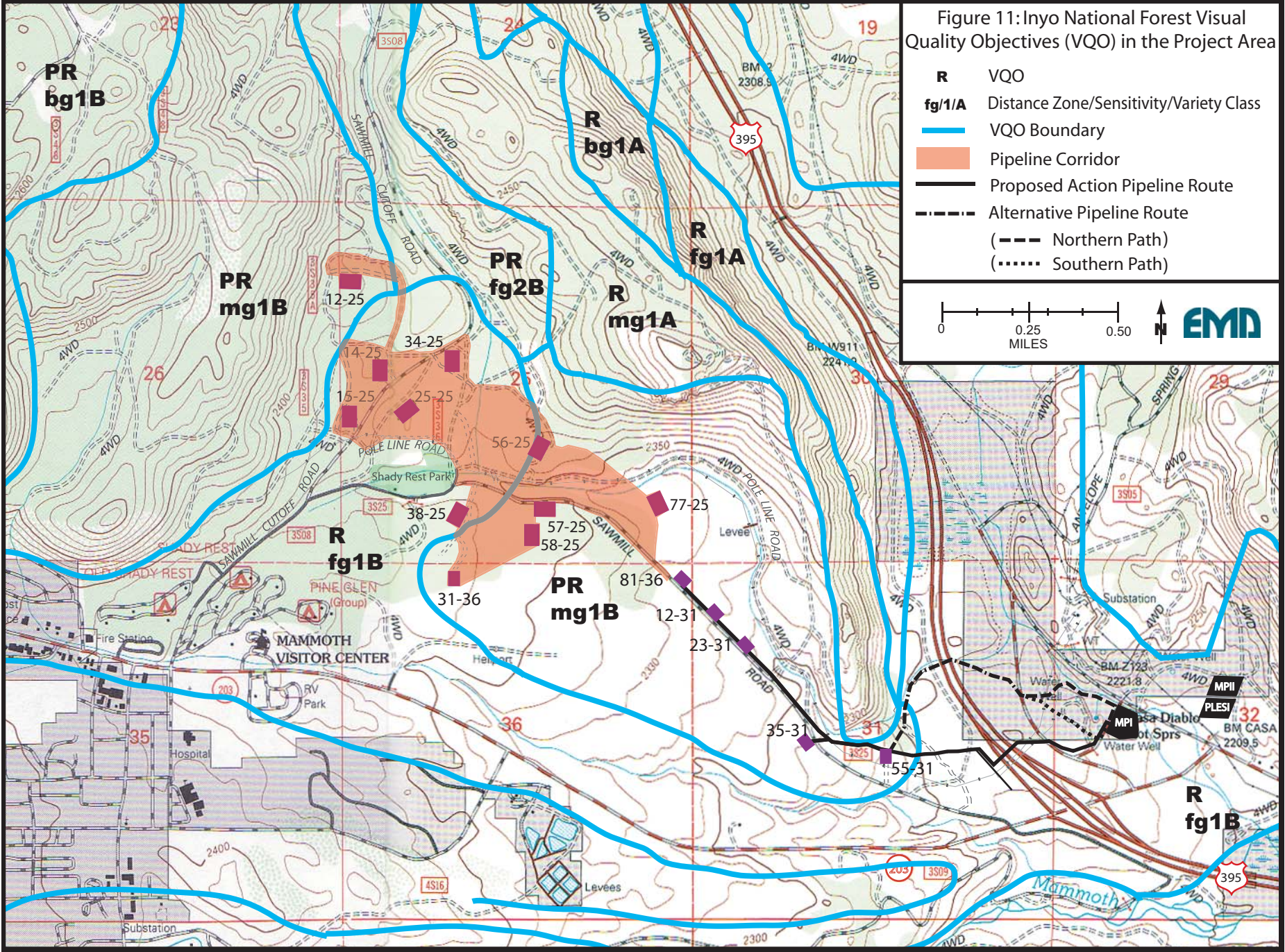
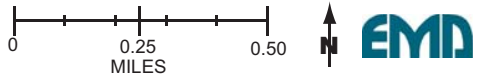
### *No Action Alternative*

The Project would not be constructed if the No Action Alternative were selected. Thus, there would be no effects on visual resources from the No Action Alternative.



Figure 11: Inyo National Forest Visual Quality Objectives (VQO) in the Project Area

- R** VQO
- fg/1/A** Distance Zone/Sensitivity/Variety Class
- VQO Boundary
- Pipeline Corridor
- Proposed Action Pipeline Route
- Alternative Pipeline Route
- ( - - - Northern Path)
- ( ····· Southern Path)





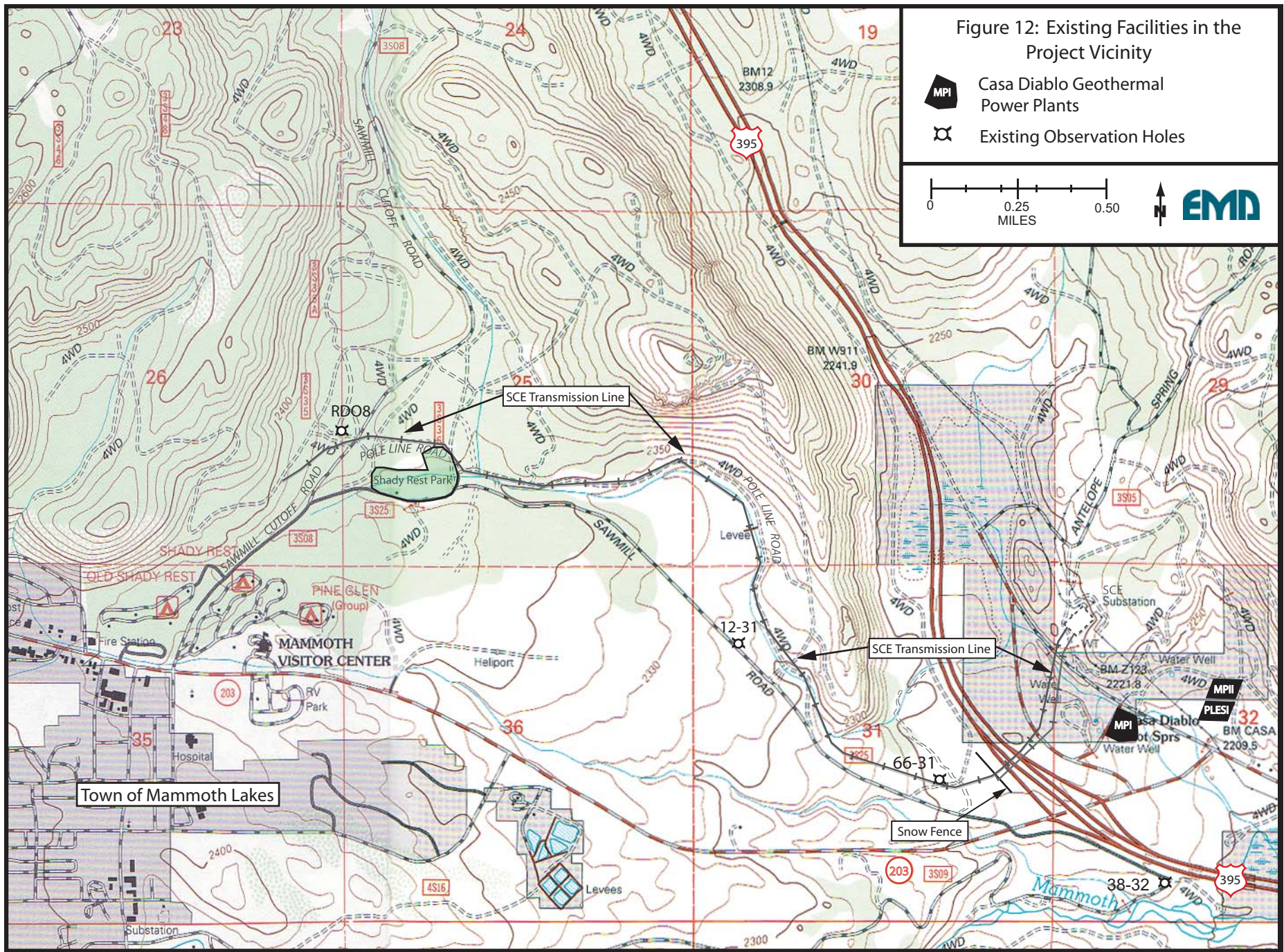
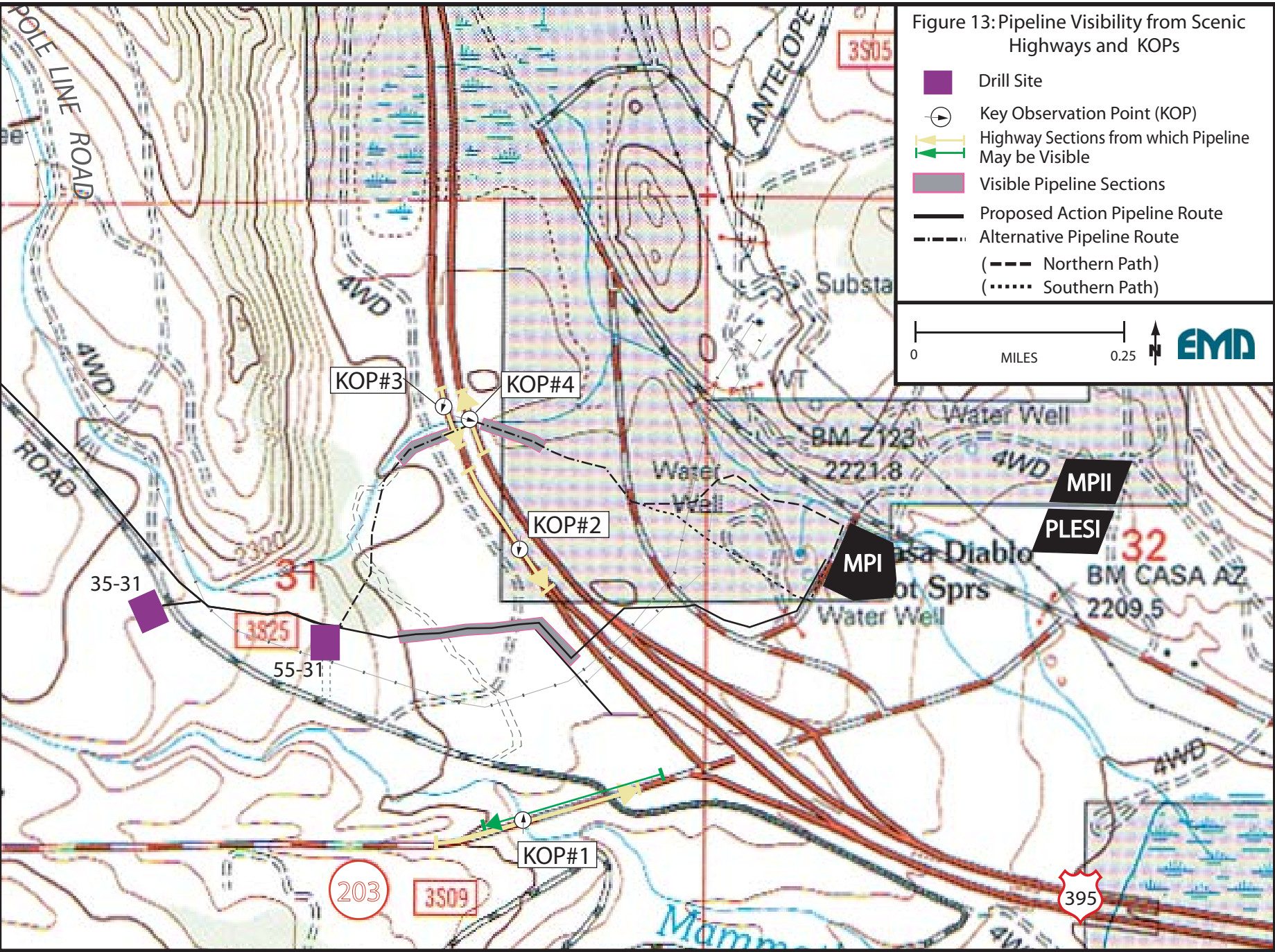
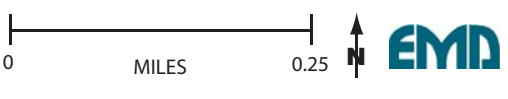




Figure 13: Pipeline Visibility from Scenic Highways and KOPs

- Drill Site
- ⊙ Key Observation Point (KOP)
- Highway Sections from which Pipeline May be Visible
- Visible Pipeline Sections
- Proposed Action Pipeline Route
- Alternative Pipeline Route  
 (--- Northern Path)  
 (..... Southern Path)





**Figure 14: Existing View from State Route 203 – KOP #1 Facing Northeast**



**Figure 15: Simulated View of Proposed Pipeline from State Route 203 – KOP #1 Facing Northeast**





**Figure 16: Existing View from U.S. Highway 395 – KOP #2 Facing Southwest**



**Figure 17: Simulated View of Proposed Pipeline from U.S. Highway 395 – KOP #2 Facing Southwest**





**Figure 18: Existing View from State Route 203 – KOP #1 Facing Northeast**



**Figure 19: Simulated View of Proposed Pipeline from After Mitigation**





**Figure 20: Existing View from U.S. Highway 395 – KOP #2 Facing Southwest**



**Figure 21: Simulated View of Proposed Pipeline from KOP #2 After Mitigation**





**Figure 22: Existing View from U.S. Highway 395 – KOP #3 Facing West**



**Figure 23: Simulated View of Alternative Pipeline Route from U.S. Highway 395 – KOP #3 Facing West**





**Figure 24: Existing View from U.S. Highway 395 – KOP #4 Facing Southeast**



**Figure 25: Simulated View of Alternative Pipeline Route from U.S. Highway 395 – KOP #4 Facing Southeast**





**Figure 26: Existing View from U.S. Highway 395 – KOP #3 Facing West**



**Figure 27: Simulated View of Alternative Pipeline Route from KOP #3 After Mitigation**





**Figure 28: Existing View from U.S. Highway 395 – KOP #4 Facing Southeast**



**Figure 29: Simulated View of Alternative Pipeline Route from KOP #4 After Mitigation**

### **3.6 VEGETATION**

#### **3.6.1 Regulatory Framework**

##### *Federal Protection for Special Status Plant Species and Habitats*

The federal Endangered Species Act of 1973 (ESA) provides a federal 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.

The Regional Forester of the Pacific Southwest Region of the USFS is responsible for designating sensitive plant species that may be found in the Region. These species receive special protection to ensure that they do not become listed as threatened or endangered under the federal ESA. The Inyo National Forest maintains a subset of the Regional list that contains sensitive plant species known or suspected to occur on the forest. The Record of Decision (ROD) for the Sierra Nevada Forest Plan Amendment (SNFPA) established standards and guidelines for threatened, endangered, proposed, and sensitive (TEPS) plant species. It requires the USFS to “Conduct field surveys for TEPS plant species early enough in the project planning process that the project can be designed to conserve or enhance TEPS plants and their habitat.” In addition, the Inyo National Forest Sensitive Plant Management Plan (USDA, Forest Service 1991) requires that forest activities will not disturb any sensitive plant population, or part of a sensitive plant's essential habitat, until its status is determined through a Biological Evaluation (BE). After a BE is completed, no action is to be taken that would cause a sensitive plant population to fall below the number of individuals necessary to maintain a viable population.

The SNFPA ROD also established special management objectives and standards and guidelines for identified “riparian conservation areas” (RCAs) in Inyo National Forest (USDA, Forest Service 2004). SNFPA RCA requirements include attaining and maintaining viable populations and diversity of aquatic-dependent plant species and maintaining water flows sufficient to sustain desired habitats.

##### *California State Protection for Special Status Plant Species and Habitats*

The California Endangered Species Act of 1984 (CESA) and the California Native Plant Protection Act of 1977 (CNPPA) provide a framework for the protection of “special status” plant species in California. These include rare, threatened and endangered species; candidate species; and species of special concern. The California Department of Fish and Game (CDFG) provides oversight of these state laws. The CDFG also 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.

The California Native Plant Society (CNPS) is a statewide, non-profit organization of amateurs and professionals with a common interest in California's native plants. The CNPS has developed a statewide database on California native plants and their distributions. The CNPS also has developed listings of



plants to identify CNPS's concern for these species as potential rare, threatened or endangered species. These listings do not give legal status or protection to the species, but the lists are used by agencies in planning for activities which could impact the species or their habitat.

### 3.6.2 Affected Environment

#### Plant Communities

The Project area is located at elevations between roughly 7,200 feet in the southeast and 8,300 feet in the northwest, although most of the Project area falls below 7,900 feet. Winter and spring precipitation averages about 30 inches, most of which falls as snow. The average summer temperature is 70°F. The average winter temperature is about 30°F. The frost-free growing season is characterized by low humidity and moderate daytime temperatures. Most of the soils in the Project area are thin and dry, so plant productivity is low to moderate (see Section 3.2.2). There are no perennial streams or other surface waters located within the Project area, nor are there any springs, seeps or wet swales (see Section 3.3.2).

Plant communities within the Project area were mapped during 2001, 2002 and 2003 (Paulus 2001d, Paulus 2001e, Paulus 2002a, Paulus 2002b, Paulus 2002c and Paulus 2004a). Most of the mapping was initially done on color aerial photographs taken by the USFS in 2001. Mapping in the Casa Diablo area also used more detailed topography maps where available. The minimum mapping unit size was 1.5 acres for the principal plant communities, but 0.1 acres for any special aquatic features. One of a total of eleven plant community types, including one de-vegetated designation, was assigned to each mapped polygon. Plant community names were based on the list currently recognized in the CDFG CNDDDB. Most mapped polygons also were visited in the field and any required adjustments made to polygon boundaries or vegetation community types.

The dominant plant communities within the Project area are Great Basin Mixed Scrub and Jeffrey Pine Forest (see Figure 30). Small areas of Tobacco Brush and Devegetated, and very small areas of Sierran Coniferous Mixed Forest, Pumice Flat and Alkaline Meadow, also were mapped within the Project area. Only areas mapped as Great Basin Mixed Scrub, Jeffrey Pine Forest or Devegetated would be disturbed by any Project activities.

The Great Basin Mixed Scrub community is dominated by big sagebrush (*Artemisia tridentata*), Bitterbrush (*Purshia tridentata*), and sometimes rabbit goldenbush (*Ericameria bloomeri*), co-dominate in some areas. Perennial grasses sometimes make up a substantial portion of the total cover. Scattered individuals or clumped Jeffrey pine (*Pinus jeffreyi*) occur throughout the areas mapped as Great Basin Mixed Scrub.

The Jeffrey Pine Forest community within the Project area typically consists of nearly pure stands of second growth Jeffrey pine. Rocky outcrops east of U.S. Highway 395 support some Western juniper (*Juniperus occidentalis*) and singleleaf pinyon (*Pinus monophylla*) amongst the Jeffrey pine. Understory vegetation density and diversity within the Jeffrey Pine Forest community is related to tree canopy cover. Dense tree cover builds leaf litter and shading, limiting understory vegetation. Gaps in the tree cover, whether natural or caused by mechanical thinning, increase the understory vegetation and species diversity. Typical understory vegetation within the Project area includes components of Great Basin Mixed Scrub community. Other understory vegetation includes currant (*Ribes cereum*), snowberry (*Symphoricarpos rotundifolius*) and some sparse native perennial grasses. The boundary between the

Jeffrey Pine Forest and Great Basin Mixed Scrub is often indistinct and very broad. Increasing elements of Great Basin Mixed Scrub occur as forest tree stands open up at the edge of the forest.

Polygons mapped as Devegetated include areas where vegetation has been removed either mechanically or eliminated by high soil temperatures. Mechanically Devegetated areas include Shady Rest Park and the MPLP emergency spill containment basin. Other areas mapped as Devegetated appear to result from high soil temperatures, which may either be natural or associated with the geothermal developments at Casa Diablo (see Section 3.2.2). Areas which are devegetated as a result of thermal ground are mapped in Basalt Canyon proper and around Casa Diablo. In the Casa Diablo area, the active fumarole areas are relatively moist but do not support wetland vegetation. However, vegetation cover in some of these thermal areas is relatively high because the microhabitat favors temperature-tolerant non-native plant species (Personal Communication – Jim Paulus, Botanical Consultant; April 15, 2004).

### Riparian Conservation Areas (RCAs)

Two drainage systems have each been identified as an ephemeral/intermittent RCA by the USFS under the SNFPA ROD (USDA, Forest Service 2004) within the Project area (see Section 3.3.2). One is an ephemeral drainage which has been informally named the “Basalt Canyon” drainage or RCA (see Figure 10). The other, locally known as “Murphy Gulch,” is an ephemeral channel which drains the areas immediately west and south of the Project area.

Ground check visits to both of these RCAs within the Project area were conducted during 2001, 2002, and 2004 in conjunction with botanical surveys (Paulus 2001b, Paulus 2001c, Paulus 2001f, Paulus 2002a, Paulus 2002b, Paulus 2002d, Paulus 2004a, Paulus 2004b, Paulus 2004d and Paulus 2004e). In that portion of the “Basalt Canyon” RCA adjacent to the Alternative Pipeline Route (Northern Path) near Casa Diablo (see Figure 7), a drainage ditch constructed within the RCA next to Old Highway 395 supported several small clumps of riparian plant species (Paulus 2004c). However, overall the species were typical of the surrounding sagebrush. The Casa Diablo emergency spill containment basin (see Figure 10) was also found to be supporting vegetation generally associated with riparian corridors (Paulus 2004a). However, many (43 percent) of the species found in the mechanically constructed basin were non-native species (Paulus 2002a). No other riparian vegetation was identified within the “Basalt Canyon” RCA, and no riparian vegetation was identified anywhere within “Murphy Gulch” RCA within the survey area (Paulus 2001b, Paulus 2001c and Paulus 2004a).

### Special Status Plant Species

Literature searches were conducted to identify plant species having some potential to occur within the Project area which were either listed under the federal ESA or the CESA, or which were identified on USFS, CNPS or CDFG CNDDDB lists as “sensitive” or “watch” species. No plants listed under the federal ESA, and only one plant listed as “rare” under the CESA (Mono milkvetch [*Astragalus monoensis* var. *monoensis*]) were identified. Six additional plants were identified from the USFS, CNPS or CDFG CNDDDB as having special status under one or more of these entities.

Field surveys for these special status plant species were conducted within different portions of the Project area in 2001, 2002 and 2004 (Paulus 2001c, Paulus 2001d, Paulus 2001e, Paulus 2002a, Paulus 2002b, Paulus 2002c, Paulus 2002d, Paulus 2004b, Paulus 2004d and Paulus 2004e). None of these special status plant species were observed in the Project area during any of the field botanical surveys. One occurrence

of a CNPS “List 4” (“plants of limited distribution”) and CDFG CNDDDB “S3.3 ranking” (limited distribution or numbers but no current threats known) “special status” plant species (pine fritillary [*Fritillaria pinetorum*]) was identified just north of the Project area east of U.S. Highway 395 in dry Jeffrey forest habitat similar to habitat in portions of the Project area (Paulus 2002c). The only identified “special status” species with potential habitat in the Project area is Mono milkvetch. Up to three acres of marginal Mono milkvetch habitat exists in the Project area (Paulus 2002b).

The results of these surveys also were documented in the Biological Evaluation (BE) prepared for the Project (USDA, Forest Service, Inyo National Forest 2005c). This BE identified a total of four plant species on the Inyo National Forest “sensitive” list which had some potential to occur within the Project area. None of these plant species were observed during any of the field surveys.

### **3.6.3 Environmental Consequences**

#### *CEQA Significance Criteria*

Pursuant to Appendix G of the CEQA Guidelines, the following effects on vegetation 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;
- 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.

No local policies or ordinances protecting biological resources have been adopted which cover the Project area.

No adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans are in place within the Project area.

#### *Environmental Consequences of the Proposed Action*

##### *Construction Activities*

No clearing of the pipeline route or creation of new access roads is proposed as part of the Project. However, some vegetation disturbance or loss would still occur from the drilling of the pipe supports, the excavations for the road under-crossings, the trenching for the buried cable, and the construction vehicles driving over the vegetation. This analysis assumes that the vegetation in a 20-foot wide corridor along the entire length of the constructed pipeline would be disturbed by Project construction activities, and that the

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vegetation within the three feet immediately under the pipeline would be lost for the 30-year life of the Project. Therefore, based on these assumptions, between about 2.3 acres and 8.0 acres of vegetation would be disturbed by construction of the Proposed Action, depending on the final length of the pipeline constructed. Of these amounts, about 0.3 acres to 1.2 acres would be lost for the 30-year life of the Project.

Construction of the shortest pipeline route would damage about 0.5 acres, and result in the 30-year loss of about 0.1 acres of this amount, of Jeffrey Pine Forest plant community. About 1.4 acres of Great Basin Mixed Scrub would be damaged, of which about 0.2 acres would be lost for 30-years. Construction of the longest pipeline route would damage about 4.7 acres of Jeffrey Pine Forest, and result in the 30-year loss of about 0.7 acres of this amount. About 2.9 acres of Great Basin Mixed Scrub would be damaged, of which about 0.4 acres would be lost for 30-years. The pipeline (whether shortest or longest) also would “disturb” about 0.4 acres of lands mapped as “devegetated.”

Few, if any, trees likely would be cut or removed during construction of the pipeline in the Jeffrey Pine Forest plant community. Only in the densest areas would individual trees need to be removed to create the 10-foot wide construction corridor. Understory vegetation within the forest areas would be damaged within the construction corridor from the drilling of holes and the movement of construction vehicles over the ground. This would not likely change the forest character in these areas (Personal Communication – Jim Paulus, Botanical Consultant; April 15, 2004).

None of the RCAs within the Project area which could be disturbed by Project construction activities contain viable populations of aquatic-dependent plant species. None of these RCAs provide water flows sufficient to sustain aquatic plant habitats.

No “special status” plant species were identified in the Project area. The three acres of marginal habitat for the Mono milkvetch identified within the Project area lies outside of the Project corridor area. No Project activities are proposed to occur in this area.

The adverse effects of construction on vegetation resources are considered to be below the level of significance under CEQA because they would not have a substantial adverse effect on any riparian habitat or other sensitive natural community, on protected wetlands, or on any plant species (or habitat) identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by any agency. No mitigation measures are required under CEQA.

The vegetation which would remain disturbed following construction would be a residual impact for the life of the Project.

### *Operations and Maintenance Activities*

No additional surface disturbance is anticipated during Project operations and maintenance activities which could adversely affect vegetation.

The Project is not expected to create new areas, or expand existing areas, of thermal ground in either the area of the new wells or in the Casa Diablo area (see Section 3.3.3). No new or additional effects to vegetation from thermal ground are expected.



Geothermal fluids could be released accidentally to the environment as a result of spills on the well sites or power plants, pipeline rupture or uncontrolled releases from the wells ("well blowouts"). Large discharges of geothermal fluids are very unlikely for many reasons (see Appendix B). However, a large discharge could damage the small areas of riparian vegetation identified in the "Basalt Canyon" RCA drainage ditch and the Casa Diablo projects' emergency spill containment basin. Since most of the Project area drains toward the "Basalt Canyon" drainage, plants in these small riparian areas could be killed if the temperature of the geothermal fluid was still very high when it reached the emergency spill containment basin. However, if this unlikely impact were to occur the riparian vegetation in these small areas would return in a few seasons once the geothermal fluid flow ceased and normal conditions were reestablished in the drainages.

The adverse effects of Project operations and maintenance on vegetation resources are considered to be below the level of significance under CEQA because there would not be a substantial adverse effect on the two small areas of riparian habitat within the Project area, protected wetlands or other sensitive natural community. No mitigation measures are required under CEQA.

Implementation of the following measure would document that adverse effects to vegetation are not occurring from new or expanded areas of thermal ground. No residual impacts to vegetation are anticipated to result from the operation and maintenance of the pipeline.

*VEG Measure 1:* New or expanding areas of dead or dying vegetation observed in the Project area by the Permittee shall be reported annually to the authorized officer.

### *Decommissioning Activities*

At the end of operations, the Project would be decommissioned. The well site and pipeline facilities would be removed and the drill sites and pipeline route reclaimed (see Appendix B and Appendix C, Upper Basalt Project Decision Record, stipulations VEG-1, SGM-1 and SGM-2). The decommissioning activities would not result in substantial additional damage to vegetation beyond that caused by the construction and maintenance of the pipeline.

The adverse effects of decommissioning on vegetation resources are considered to be below the level of significance under CEQA because they would not have a substantial adverse effect on any riparian habitat or other sensitive natural community and would not have a substantial adverse effect on protected wetlands. No mitigation measures are required under CEQA.

### *Environmental Consequences of the Alternative Pipeline Route*

The Alternative Pipeline Route pipeline would be operated, maintained and decommissioned as described for the Proposed Action. The adverse effects of the Alternative Pipeline Route would differ from those of the Proposed Action only in the amount and type of vegetation affected.

### *Construction Activities*

Between about 2.7 acres and 8.5 acres of vegetation would be disturbed by construction of the Alternative Pipeline Route, depending on the final length of the pipeline constructed. Of these amounts, about 0.4 acres to 1.3 acres would be lost for the 30-year life of the Project.

Construction of the shortest Alternative Pipeline Route would damage about 1.0 acres, and result in the 30-year loss of about 0.2 acres of this amount, of Jeffrey Pine Forest plant community. About 1.1 acres of Great Basin Mixed Scrub would be damaged, of which about 0.2 acres would be lost for 30-years. Construction of the longest pipeline route would damage about 5.2 acres of Jeffrey Pine Forest, and result in the 30-year loss of about 0.8 acres of this amount. About 2.7 acres of Great Basin Mixed Scrub would be damaged, of which about 0.4 acres would be lost for 30-years. The pipeline (whether shortest or longest) also would “disturb” about 0.6 acres of lands mapped as “devegetated.”

The small clumps of riparian plant species identified in a drainage ditch constructed next to Old Highway 395 are located in that portion of the “Basalt Canyon” RCA adjacent to the Alternative Pipeline Route (Northern Path) near Casa Diablo. Loss of these small clumps of riparian plant species through construction activities is not expected, but would be an adverse impact if it occurred. However, because overall the species in the RCA were typical of the surrounding sagebrush, it would be easy to locate and construct the pipeline to avoid these riparian clumps. *VEG Measure 2A* is proposed to reduce the potential for these adverse effects. There would be no residual impacts to this riparian vegetation following implementation of this measure

The incidental loss of these small clumps of riparian vegetation would be below the level of significance under CEQA because it would not result in a substantial adverse effect on riparian habitat or on federally protected wetlands. The significance under CEQA of all of the other Alternative Pipeline Route impacts on vegetation resources would be identical to those described for the Proposed Action.

Although no mitigation measures are required under CEQA, implementation of the following measure would reduce the potential for adverse effects on these clumps of riparian vegetation.


*VEG Measure 2A:* The pipeline shall avoid disturbing the small clumps of riparian plant species identified in the drainage ditch constructed next to Old Highway 395 in that portion of the “Basalt Canyon” RCA adjacent to the Alternative Pipeline Route (Northern Path) near Casa Diablo.

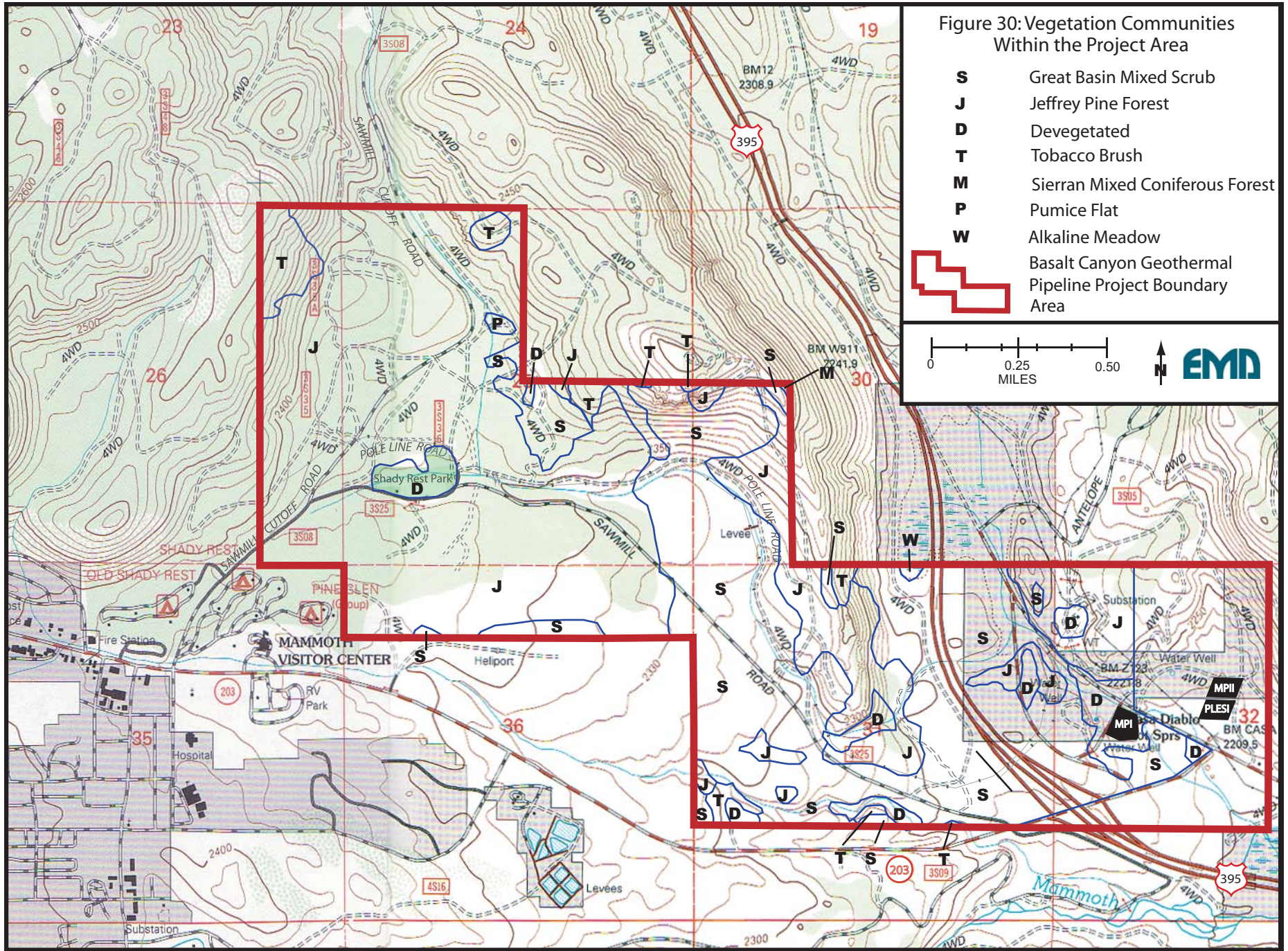
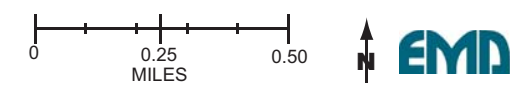
### *Environmental Consequences of the No Action Alternative*

The Project would not be constructed if the No Action Alternative is selected, and there would be no impact on vegetation in the Project area.



Figure 30: Vegetation Communities Within the Project Area

- S** Great Basin Mixed Scrub
  - J** Jeffrey Pine Forest
  - D** Devegetated
  - T** Tobacco Brush
  - M** Sierran Mixed Coniferous Forest
  - P** Pumice Flat
  - W** Alkaline Meadow
-  Basalt Canyon Geothermal Pipeline Project Boundary Area





### **3.7 NOXIOUS WEEDS**

#### **3.7.1 Regulatory Framework**

##### *Inyo National Forest*

The 2004 Sierra Nevada Forest Plan Amendment (SNFPA) Record of Decision (ROD) established new Standards and Guidelines for noxious weed management that are applicable to the Project area (USDA, Forest Service 2004). The goals are to prevent the introduction of new weeds, quickly treat new weed infestation and contain and control established infestations.

#### **3.7.2 Affected Environment**

Because the Project area is close to the Town of Mammoth Lakes it has been and continues to be heavily used. The Project area has been harvested for timber, grazed, crossed by roads and used for recreation. Each of these activities has had the potential to introduce and spread noxious weeds throughout the Project area.

Botanical inventories of the Project area identified fifteen non-native plant species in disturbed upland areas (Paulus 2001c, 2002a, 2002c, and 2004a, 2004d, and 2004e). Two additional non-native species were identified at a disturbed ponded area on private land. Two of the identified species, cheatgrass (*Bromus tectorum*) and red brome (*Bromus madritensis* spp. *rubens*), tend to also spread into undisturbed areas. These field surveys also showed that the percentage of ground adjacent to Sawmill Road covered by cheat grass increased dramatically following the implementation of the fire fuelbreak project along the road (Paulus 2001c and 2004c). The risk that these weeds may spread further in the Project area as a result of additional surface disturbance from any source is high.

#### **3.7.3 Environmental Consequences**

This assessment reflects the findings of the Noxious Weed Risk Assessments prepared for the Basalt Canyon Geothermal Pipeline Project (USDA, Forest Service, Inyo National Forest 2005b) and the Upper Basalt Geothermal Exploration Project (USDA, Forest Service, Inyo National Forest 2005a).

##### *CEQA Significance Criteria*

There are no specifically applicable CEQA significance criteria for noxious weeds. However, the following effects of noxious weeds on plant habitats could be considered significant under CEQA pursuant to Appendix G of the CEQA Guidelines 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; or



- 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.

### Environmental Consequences of the Proposed Action

Pipeline construction would not require grading or general clearing of the ground along the pipeline route. Vegetation would only be removed for the installation of the pipeline supports, along the trench for the cables (if buried), and in those areas where the pipeline would be placed under existing roads. No new temporary construction or permanent access roads for pipeline maintenance would be built. Construction equipment and vehicles would instead use existing roads or drive over the vegetation. The Project also has committed to comply with the noxious weed and revegetation measures contained in the stipulations approved for the Upper Basalt Geothermal Exploration Project (see Appendix B and Appendix C).

These Project design features substantially limit the potential for the spread of noxious weeds specifically as a result of the Project. However, there is still a high potential for weed spread beyond the existing conditions. The following measures are provided to conform the Project measures (when implemented on Inyo National Forest lands) to the measures recommended in the Noxious Weed Risk Assessments and the 2004 SNFPA ROD Standards and Guidelines for noxious weed management. Following the implementation of these measures, there would still be the potential for the spread of noxious weeds within the Project area, which would be a residual impact.

*NOX Measure 1:* Ground disturbance will be limited to the extent possible during operations, particularly during any cut and fill operations, and during the micro-tunneling under U.S. Highway 395.

*NOX Measure 2:* Prior to entering and upon exiting the Project area, all trucks and construction equipment that will operate off of previously existing roads shall be washed to remove soil and plant parts. A central washing facility will be provided for this purpose, either at the MPLP equipment area at Casa Diablo on private land, or at a location approved by the authorized officer. Vehicle inspections will be conducted by an authorized representative to verify the absence of noxious plant propagules.

*NOX Measure 3:* All materials used in erosion control and/or rehabilitation efforts (e.g. straw bales, seeds, etc.) on the Project will be certified as being free of noxious weed materials.

*NOX Measure 4:* New non-native species introduced as a result of the Project, will be eradicated (i.e., 0% cover). Where this standard is not met, appropriate weed control measures will be implemented in order to comply with the standard for a period of three years following Project completion.

*NOX Measure 5:* With the exception of cheatgrass, all non-native weed species already present in the Project area will account for no more than 5% total of the relative cover of the disturbed areas, including roadsides at the end of the 3-year evaluation period following completion of revegetation measures. Weed control will be implemented immediately following implementation of the Project, and throughout the Project life to meet this standard.

*NOX Measure 6:* Cheatgrass is largely absent from the forested portions of the Project area. In order to maintain this condition, cheatgrass will be removed from all areas where ground disturbance occurs west of drill sites 56-25, 57-25 or 58-25. Appropriate weed control measures will be implemented as necessary,

in order to prevent the invasion and spread of cheatgrass, throughout the life of the project, and for a period of three years following Project completion.

The adverse effects of noxious weeds are considered to be below the level of significance under CEQA. Only three acres of marginal habitat for a single “special status” plant species (the Mono milkvetch) was identified within the Project area, and it lies outside of the Project corridor area where disturbance and weed spread may occur. The two small areas of riparian habitat within the Project area would not be disturbed, and there are no protected wetlands or other sensitive natural communities which would be disturbed into which weeds could spread. No mitigation measures are required under CEQA.

*Environmental Consequences of the Alternative Pipeline Route*

The construction, operation, maintenance and decommissioning of the Alternative Pipeline Route pipeline would differ from the Proposed Action only by a small increase in the total length of the pipeline. The environmental consequences of the Alternative Pipeline Route from noxious weeds would not be different from that of the Proposed Action. The noxious weed measures recommended for the Proposed Action also would be equally applicable to the Alternative Pipeline Route.

*Environmental Consequences of the No Action Alternative*

The Project would not be constructed if the No Action Alternative is selected. As such, there would be no Project effects on noxious weeds from the No Action Alternative. The condition of noxious weed populations in the Project area would not be worsened by the Project. Potential benefits of the implementation of the noxious weed measures to the Project area would not be realized.

### **3.8 WILDLIFE**

#### **3.8.1 Regulatory Framework**

##### *Federal Protection for Sensitive Wildlife 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.

The Section 7 consultation process requires each federal agency to prepare a “Biological Assessment” (BA) to determine if the project is likely to adversely affect listed species or designated critical habitat. In response, the USFWS prepares a “Biological Opinion” (BO) which states the USFWS position on whether the project likely would jeopardize the continued existence of the listed species or adversely modify designated critical habitat.

The Inyo National Forest LRMP (USDA, Forest Service, Inyo National Forest 1988) provides direction for implementing management practices and activities applicable to wildlife. The LRMP emphasizes protection and improvement of habitat for all federal listed species. Management indicator species (MIS) designated under USFS regulations are to be maintained at viable levels. Specific direction is provided for several wildlife species, including avoiding critical or significant wildlife habitats. “Biological Evaluations” (BEs) are prepared to evaluate the potential adverse effects of any USFS management action on forest-designated “sensitive” species.

The Record of Decision (ROD) for the Sierra Nevada Forest Plan Amendment (SNFPA) established new Forest LRMP Standards and Guidelines to reduce the potential for adverse effects to identified wildlife resources (USDA, Forest Service 2004). Specific species applicable to the Inyo National Forest include the California spotted owl, the northern goshawk and the willow flycatcher. The SNFPA also directs protections for aquatic and riparian ecosystems and associated wildlife species.

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 (CNDDDB). The CNDDDB 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 will 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 General Plan

The Conservation/Open Space Element of the Mono County General Plan indicates that the Basalt Canyon Project area is within the *Hot Creek Deer Migration Zone* (County of Mono Planning Department 1993d). The Conservation/Open Space Element goes on to state that projects “shall not be permitted unless a finding is made that potential impacts to deer have been avoided or mitigated to a level of non-significance.”

### **3.8.2 Affected Environment**

#### General Wildlife and Habitat

The Project area is located on the eastern flanks of the Sierra Nevada mountains. Elevations range from about 7,200 feet in the southeast to 8,300 feet in the northwest, although most of the Project area falls below 7,900 feet.

The Project area consists primarily of Great Basin Mixed Scrub habitat in the lower elevations and Jeffrey Pine Forest habitat in the higher elevations (see Section 3.6.2 and Figure 30). The boundary between these two habitat types is often indistinct and very broad within the Project area. Increasing elements of Great Basin Mixed Scrub occur at the edge of the Jeffrey Pine Forest. Understory vegetation density and diversity within the Jeffrey Pine Forest community is related to tree canopy cover. Typical understory vegetation within the Project area includes components of Great Basin Mixed Scrub community. Other understory vegetation includes currant (*Ribes cereum*), snowberry (*Symphoricarpos rotundifolius*) and some sparse native perennial grasses.

There are no perennial streams or other surface waters located within the Project area, nor are there any springs, seeps or wet swales, which would provide habitat for riparian or aquatic wildlife (see Section 3.3.2). Neither do the two drainage systems which have each been identified as an ephemeral/intermittent RCA by the USFS within the Project area provide any habitat for riparian or aquatic wildlife.

In part because it is close to the Town of Mammoth Lakes, the Project area has been affected by a substantial number of human activities. These include highways, roads, transmission lines, power plants, recreational facilities and forest thinning. Although 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 of the wildlife to use this habitat.



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Wildlife species observed in the Project area during the botanical surveys include mule deer, jackrabbits, cottontail rabbits, ground squirrels, least chipmunks, kangaroo rats and wood rats (Paulus 2001b). Bird species included black-billed magpie, gray flycatcher, pinyon jay, sage thrasher, sparrows and hawks.

### Listed and Sensitive Wildlife Species

“Listed” wildlife species are those listed by the USFWS under the federal ESA or by the CDFG under the CESA. “Sensitive” wildlife species are those identified as “sensitive species” by the USFS, “species of concern” by the USFWS, or “species of special concern” by the CDFG. Table 2 lists all of the listed and sensitive wildlife species known to occur in the Inyo National Forest which were evaluated for their potential to occur within the Project area or their potential to be adversely affected by the Project.

**Table 2: Listed and Sensitive Wildlife Species**

Common Name	Species Name	USFS <sup>1</sup>	USFWS <sup>2</sup>	CDFG CNDDB
Bald eagle	<i>Haliaeetus leucocephalus</i>	Listed, MIS	Threatened	Endangered
Sierra Nevada bighorn sheep	<i>Ovis canadensis californiana</i>	Listed, MIS	Endangered	Threatened
Lahontan cutthroat trout	<i>Oncorhynchus clarki henshawi</i>	Listed	Threatened	Not Listed
Paiute cutthroat trout	<i>Oncorhynchus clarki seleniris</i>	Listed	Threatened	Not Listed
Owens tui chub	<i>Siphateles bicolor snyderi</i>	Listed	Endangered	Endangered
Northern goshawk	<i>Accipiter gentiles</i>	SS, MIS	SC	SSC <sup>3</sup>
Swainson's hawk	<i>Buteo swainsoni</i>	SS	SC	Threatened
Greater sage-grouse	<i>Centrocercus urophasianus</i>	SS, MIS	SC	SSC
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	SS	Not Listed	Endangered
Willow flycatcher	<i>Empidonax traillii</i>	SS	SC	Endangered
Great gray owl	<i>Strix nebulosa</i>	SS, MIS	Not Listed	Endangered <sup>3</sup>
California spotted owl	<i>Strix occidentalis occidentalis</i>	SS, MIS	SC	SSC
Peregrine falcon	<i>Falco peregrinus</i>	SS	Not Listed	Endangered
Pallid bat	<i>Antrozous pallidus</i>	SS	Not Listed	SSC
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SS	SC	SSC
Western red bat	<i>Lasiurus blossevillii</i>	SS	Not Listed	Not Listed
California wolverine	<i>Gulo gulo luteus</i>	SS	SC	Threatened
American marten	<i>Martes americana</i>	SS	SC	Not Listed
Sierra Nevada red fox	<i>Vulpes vulpes necator</i>	SS, MIS	SC	Threatened <sup>3</sup>
Inyo Mountain salamander	<i>Batrachoseps campi</i>	SS	Not Listed	SSC
Kern Plateau slender salamander	<i>Batrachoseps sp.</i>	SS	Not Listed	SSC
Yosemite toad	<i>Bufo canorus</i>	SS	Not Listed	SSC
Mountain yellow-legged frog	<i>Rana muscosa</i>	SS	Candidate Species	SSC

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Common Name	Species Name	USFS <sup>1</sup>	USFWS <sup>2</sup>	CDFG CNDDDB
Northern leopard frog	<i>Rana pipiens</i>	SS	Not Listed	SSC
Panamint alligator lizard	<i>Elgaria panamintina</i>	SS	Not Listed	SSC
Owen's Valley springsnail	<i>Pyrgulopsis owensensis</i>	SS	Not Listed	Not Listed
Wong's springsnail	<i>Pyrgulopsis wongi</i>	SS	Not Listed	Not Listed
Volcano Creek golden trout	<i>Oncorhynchus mykiss aguabonita</i>	SS	Not Listed	SSC
Owens sucker	<i>Catostomus fumeiventris</i>	Not Listed	Not Listed	SSC <sup>3</sup>
Pygmy rabbit	<i>Brachylagus idahoensis</i>	Not Listed	SC	SSC
Mule deer	<i>Odocoileus hemionus</i>	MIS	Not Listed	SSC

<sup>1</sup> Inyo National Forest identified species designations: SS = Sensitive Species; MIS = Management Indicator Species

<sup>2</sup> USFWS List of Federal Endangered and Threatened Species that may be affected in Mammoth Mtn. 7.5 Minute Quad (Updated March 1, 2004) – SC = Species of Concern

<sup>3</sup> Identified by the CDFG CNDDDB inventory report for the Old Mammoth quadrangle (Report RF2WIDE, September 15, 2003) - SSC = Species of Special Concern

### Project Biological Assessment

From the list presented in Table 2, the five federal listed wildlife species were evaluated in the Project BA prepared for the Inyo National Forest (EMA 2005b).

The Lahontan cutthroat trout and the Paiute cutthroat trout were both determined to have no potential habitat within the Project area and no potential to be adversely affected by the Project. The Project BA also found that there was no suitable foraging or nesting habitat for the bald eagle in the Project area. Although the Project area does contain potentially suitable winter range for bighorn sheep, the BA determined that the Project area was not suitable habitat. This was because of the significant distance between known bighorn sheep habitat and the Project area, the proximity of the Project area to the Town of Mammoth Lakes, and the barriers to bighorn sheep movement between the known habitat and the Project area.

The Owens tui chub subspecies is one of several found throughout the Great Basin and Pacific Ocean basins. 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 fish which eat it. It is also necessary to prevent interbreeding and hybridization of the Owens tui chub with another subspecies, the Lahontan tui chub. Native Owens tui chub populations occur in the “warm” (mixed cold and thermal) water springs which feed the Hot Creek Fish Hatchery located approximately three miles east of the Project (see Figure 8 and Section 3.3.2). These springs have been designated by the USFWS as critical habitat for the Owens tui chub.

The Owens tui chub was historically a wide-spread and abundant native fish species in the Owens River drainage. However, its range has been reduced as a result of the loss of its spring and edge-water habitat through development, channelization, and water diversions. Habitat degradation also has resulted from the introduction of both game fish and the non-native Lahontan tui chub. Factors that continue to threaten the Owens tui chub habitat include non-native fish species and the diversion and impoundment of waters.

Important habitat requirements for the Owens tui chub are high quality and low velocity water. Also required are adequate cover, in the form of rocks, undercut banks, or dense aquatic vegetation, and a sufficient insect food base. The USFWS “Recovery Plan” for the species also suggests that the water should be cool. Owens tui chub appear to be tolerant of a wide range of water temperatures. However, substantial changes in water temperature could adversely affect Owens tui chub habitat and could threaten the viability of Owens tui chub populations.

Formal Section 7 consultation was conducted in 1987 and 1988 for the PLES I project at Casa Diablo between the BLM, USFS and USFWS. A Biological Assessment was prepared for the potential impacts of the PLES I project (and other MPLP projects at Casa Diablo) on the critical habitat of the Owens tui chub. During the formal Section 7 consultation process the PLES I project was revised by adopting a hydrology monitoring and remedial action program (Stipulation No. 1) intended to protect the Owens tui chub Hot Creek Fish Hatchery springs critical habitat. The USFWS subsequently issued a Biological Opinion (Case No. 1-1-88-F-3) stating that “the proposed project, as revised ... is not likely to jeopardize the continued existence of the Owens tui chub or adversely modify its critical habitat at the Hot Creek headsprings.”

At the Hot Creek Fish Hatchery springs, cold water makes up about 95 percent of the total spring flow (see Section 3.3.2). The flow of cold water varies both seasonally and annually, closely following the amount of snow-melt recharge to the shallow ground water system. However, the rate of thermal water discharge in each of the springs also varies both seasonally and annually, also closely tracking the changes in the flow of cold water. This suggests that much of the calculated variations in thermal water flow are a result of the variations in the cold water flow.

Net changes in the temperature of the two main Hot Creek Fish Hatchery springs over the 1988 to 2003 time period of detailed measurement are a reduction of less than 2°F. Temperature changes greater than this have occurred during this same time period. The largest measured temperature changes, a decrease of about 4°F, occurred in the summer of 1995 when high precipitation rates during the winter created high spring flows during the summer. Thermal reservoir pressure declines from the existing geothermal development at Casa Diablo may have caused some decrease in the flow of thermal water, and thus some decrease in temperature, at the Hot Creek Fish Hatchery springs. However, substantially greater changes in thermal water flow in these springs are clearly related to seasonal and annual precipitation changes.

The Section 7 consultation process for the Project under the federal ESA is ongoing.

### Project Biological Evaluation

From Table 2, the wildlife species listed as USFS “sensitive species” were evaluated in the Project Biological Evaluation (BE) (WRM and EMA 2005). All but the following five species were either determined in the BE to have no potential habitat within the Project area, or they would not be affected adversely by the Project.

**Northern goshawk** - The northern goshawk is a forest generalist species which utilizes a variety of forest types, conditions, and ages as habitat. However, it principally occupies the mixed conifer, Jeffrey pine and red fir forests. The Jeffrey pine stands in the western portion of the Project area around Shady Rest Park are suitable northern goshawk nesting and foraging habitat. Northern goshawk “protected activity centers” (PACs) have been established by the USFS under the SNFPA within these portions of the Project

area. Three known northern goshawk nest sites have been identified in this portion of the Project area that are believed to be associated with one pair of goshawks which return seasonally. Surveys conducted during the 2004 breeding season by USFS biologists detected an active goshawk nest at one of these three sites that had been used in previous years.

The Upper Basalt Geothermal Exploration Project included environmental protection measures designed to prevent adverse effects to the goshawk in the vicinity of Shady Rest Park (USDI, BLM 2005). These measures prohibited well drilling at the two drill sites closest to the known nest sites between March 1 and June 15. Drilling also would be prohibited at these two well sites between June 15 and July 15 unless a biologist determined that no nest had been established at the nest site nearest the well site to be drilled.

**Greater sage grouse** – Potential sage grouse habitat exists in the Mixed Sage Brush Scrub plant community along Sawmill Road. This habitat is of marginal quality due to the density of the sagebrush, the presence of interspersed Jeffrey pines and the lack of herbaceous cover. Walking transects conducted during spring 2002 failed to flush any birds or detect other sign of sage grouse. The closest documented grouse activity is approximately one-quarter mile south of the Project area, south of Mammoth Creek.

**Pallid bat** - The key components of habitat for the pallid bat consist of open foraging opportunities in combination with suitable roost areas in association with water. Suitable foraging habitat exists across the Project area and suitable roosting habitat exists within the Jeffrey pine forest along the northern boundary of the Project area. The species is thought to be present in the Project area based on habitat suitability.

**Townsend's big-eared bat** - This species has three principal habitat requirements: foraging opportunities, night roost sites, and day roost sites. Foraging habitat appears to be diverse. The open nature of the Project area would constitute suitable foraging habitat for this species. Suitable roosting habitat (caves and/or mine shafts) are not found in the Project area. However, suitable roosting sites are found in the vicinity at Mammoth Mountain and Rhyolite Ridge.

**American marten** - This species is found in coniferous forests in northern California. The Project area is located along the southern edge of a relatively large block of marten habitat, and marten have been detected in the northwest corner of the Project area. However, the majority of the Jeffrey Pine Forest plant community within the Project area is marginal quality habitat for marten due to the relative lack of snags, downed logs and large trees. This is the result of both historic timber harvests and the ongoing fuelbreak projects. It is unlikely that marten are utilizing the Project area to any great degree.

### CDFG Species of Special Concern

The three species listed in Table 2 as CDFG species of special concern that were not otherwise evaluated in the Project BA or the Project BE are discussed below.

**Owens sucker** - The Owens sucker is endemic to the Owens River drainage and is distributed widely throughout the Owens Valley (CDFG 2003). It is most abundant in Crowley Reservoir in Mono County. Other populations exist in Convict Lake and June Lake in Mono County. Owens suckers are most abundant in river and stream sections with long runs and few riffles which have beds consisting mostly of fine material, with lesser amounts of gravel and rubble. Adults can thrive in lakes and reservoirs, but presumably need gravelly riffles in tributary streams for spawning. There is no available habitat in or around the Project area for the Owens sucker.



**Pygmy rabbit** - Pygmy rabbits are a resident small game species in California. They are associated only with dense stands of tall sagebrush and rabbitbrush. Soils must be friable for burrowing. Pygmy rabbits appear to be associated with areas with greater shrub cover, shrub height, soil strength, and soil depth compared to adjacent, unoccupied sites. The nearest reported sighting of the species to the Project area is a 1957 distribution record reported as north of Crowley Lake (CDFG 1983). The Great Basin Mixed Scrub habitat within the Project area is considered marginal potential habitat because the soils are thin to very thin and comprised largely of pumice sands and loose alluvium.

**Mule deer** – Mule deer are an important game species, and also are used as a management indicator species by the USFS to evaluate the relative health of the local environment. The Environmental Assessment for the Upper Basalt Geothermal Exploration Project (USDI, BLM 2005) presented a review and assessment of the available mule deer literature. This included recent tracking studies, deer pellet group studies, and analysis of highway mortality data in the project vicinity (including the Project area). This review and assessment concluded that the deer that occupy the Project area are predominantly from the Round Valley herd. There is a relatively even dispersion of deer in the Project area throughout the spring, summer and fall months. Deer appear to use the Project area as summer range, and no significant numbers of deer are seasonally migrating through the Project area. The number of deer summering in the Project area and vicinity is not known. However, it may be inferred that the number is not large, as tracking studies, pellet data, and telemetry information indicates that the majority of deer are summering in other locations. The available information indicates that deer migrating into the western Long Valley area disperse and summer over a wide area, both west and east of the Sierra Nevada crest. Deer typically arrive on the summer range in May-June and leave in late October and early November. Deer density on the summer range is uneven and dependent on the availability of high quality forage interspersed with thermal and escape cover.

### **3.8.3 Environmental Consequences**

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;
- 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.

No adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans are in place within the Project area.

*Environmental Consequences of the Proposed Action*

*General Wildlife and Habitat*

The amount of wildlife habitat damaged or lost by the Proposed Action depends on which two wells are connected to the pipeline. The analysis conducted in Section 3.6.3 assumed that the vegetation in a 20-foot wide corridor along the entire length of the constructed pipeline would be disturbed by Project construction activities. It also assumed that the vegetation within the three feet immediately under the pipeline would be lost for the 30-year life of the Project. Based on these assumptions, between about 2.3 acres and 8.0 acres of vegetation would be disturbed by construction of the Proposed Action, depending on the final length of the pipeline constructed. Of these amounts, about 0.3 acres to 1.2 acres would be lost for the 30-year life of the Project.

Construction of the shortest pipeline route would damage about 0.5 acres, and result in the 30-year loss of about 0.1 acres of this amount, of Jeffrey Pine Forest habitat. About 1.4 acres of Great Basin Mixed Scrub habitat would be damaged, of which about 0.2 acres would be lost for 30-years. Construction of the longest pipeline route would damage about 4.7 acres of Jeffrey Pine Forest habitat, and result in the 30-year loss of about 0.7 acres of this amount. About 2.9 acres of Great Basin Mixed Scrub habitat would be damaged, of which about 0.4 acres would be lost for 30-years. The pipeline (whether shortest or longest) also would “disturb” about 0.4 acres of lands mapped as “devegetated,” which provides little wildlife habitat.

The damage of up to 7.6 acres, and 30-year loss of up to 1.1 acres, of Jeffrey Pine Forest and Great Basin Mixed Scrub habitat is a negligible impact to general wildlife because there is abundant, comparable wildlife habitat in the Project area and vicinity.

Noise, traffic and associated disturbances would reduce the habitat available to certain noise- and disturbance-sensitive species during the two to three months of construction and decommissioning activities. However, the total amount of habitat affected would be small, and substantial comparable habitat is immediately available in the area.

The pipeline would be a physical obstruction that could impede wildlife movement. The pipeline would be constructed on supports that provide an average of one foot of clearance between the ground and the bottom of the pipeline. Depending on the terrain, the ground clearance could be as much as two feet. The top of the pipeline would average less than three feet above ground level, but could be as much as four feet in certain locations. The pipeline also would be constructed with multiple below-ground crossings (of existing roadways). Most wildlife known to frequent the area (jackrabbits, cottontail rabbits, ground squirrels, least chipmunks, kangaroo rats and wood rats) would be easily able to cross under the pipeline. Adult deer would be able to jump over the pipeline (Colorado Division of Wildlife 2003), as is the case with the existing geothermal pipelines in the Casa Diablo area (Personal Communication – R. Sullivan, Facility Manager, Mammoth Pacific, L.P., 2005). However, young deer may not jump over the pipeline, and they typically require at least 16 inches clearance to go under a fence (Colorado Division of Wildlife 2003). Although there would be numerous places where the pipeline would be at least 16 inches above the ground, implementation of the following measure would ensure that the pipeline did not substantially impede the movement of deer and other wildlife.

*WLD Measure 1:* The route of the pipeline would be walked by a qualified wildlife biologist once each year for the first three years following completion of construction to survey for any signs that the pipeline is impeding wildlife movement. If such evidence is found, the authorized officer may require the lessee to clear one or more areas under the pipeline of at least 16 inches height, or sufficient to allow wildlife to pass under the pipeline, at the points where movement is impeded.

No special or sensitive aquatic or riparian habitats (perennial streams, springs, seeps or wet swales) would be affected adversely by construction of the pipeline.

Operation of the Project would not create new areas, or expand existing areas, of thermal ground which would alter habitat in either the area of the new wells or in the Casa Diablo area (see Section 3.3.3).

Geothermal fluids could be accidentally released to the environment as a result of spills on the well sites or power plants, pipeline rupture or uncontrolled releases from the wells ("well blowouts"). Large discharges of geothermal fluids are very unlikely for many reasons (see Appendix B). As discussed in Section 3.3.3, in the very unlikely event of a complete rupture of the longest pipeline at the worst location, near "Murphy Gulch," a small amount of geothermal fluid could reach Mammoth Creek, approximately one mile downstream. However, because of the flow in Mammoth Creek, it is very unlikely that this small amount of cooled geothermal fluid could substantially affect the aquatic and riparian habitats in this perennial creek.

Geothermal fluid discharged from an even less likely well uncontrolled flow event (sometimes called a "well blowout") would either naturally, or could be diverted easily to, flow into the "Basalt Canyon" drainage. From there the fluid would flow downstream into the existing Casa Diablo emergency spill containment basin. The emergency spill containment basin is designed to contain 1,600,000 gallons or more of geothermal fluid, or at least two days flow from an uncontrolled well flow event. The Casa Diablo projects spill containment plans specify that the contained fluids would be injected before the spill containment basin was filled and there was any discharge to Mammoth Creek (BLM, USFS and GBUAPCD 1989). Thus, the potential for any substantial degradation to aquatic or riparian habitat in Mammoth Creek is very small.

The adverse effects of construction, operation, maintenance and decommissioning of the Proposed Action on general wildlife resources and habitat are considered to be below the level of significance under CEQA. This is because there is very little chance of any substantial adverse effect on any riparian habitat or other sensitive natural community. The Proposed Action also would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors.

The wildlife habitat which would remain disturbed following construction of the pipeline would be a minor residual impact for the life of the Project.

### *Listed and Sensitive Wildlife Species*

The following paragraphs discuss the potential environmental consequences of the Project on those listed and sensitive wildlife species identified in Section 3.8.2 as having either some potential habitat within the Project area, or having some potential to be adversely affected by the Project.

**Owens tui chub** - Native Owens tui chub populations occur in the “warm” (mixed cold and thermal) water springs which feed the Hot Creek Fish Hatchery located approximately three miles east of the Project (see Figure 8 and Section 3.3.2). Production of geothermal fluid from the two Project 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. These geothermal reservoir pressure changes may affect the thermal water flow to the Hot Creek Fish Hatchery springs. This could change the temperature and/or chemistry of these springs, adversely affecting the designated critical habitat of the Owens tui chub.

In order to assess the potential changes to the geothermal production and injection reservoirs which could result from the Project, an updated geothermal reservoir computer model was prepared by MPLP in consultation with the Long Valley Hydrologic Advisory Committee (see Section 3.3.3). The model is a tool developed to help predict future behavior of the geothermal reservoir by matching the computer output against information monitored from past behavior.

To predict the potential future influences of the Project on pressures and temperatures in the geothermal reservoir, the two Project production wells were added to the model. Two model runs were conducted to predict the pressure and temperature changes over time at the geothermal reservoir monitoring points. The first was a “base case” model run that assumed that the existing Casa Diablo projects would continue to operate exactly as they have been. This model run is equivalent to implementation of the “No Action Alternative.” The second model run (“Proposed Action” case) assumed that each of the two new Project production wells began producing 1,800 gallons per minute in 2003. Simultaneously, production from the existing Casa Diablo area production wells was reduced by 1,800 gallons per minute.

To determine the predicted effects of the Project on the geothermal reservoir temperatures and pressures, the predicted results of the “base case” model run were subtracted from the results of the “Proposed Action” model run. The model predicted a very small (one to two pounds per square inch) increase in the pressure of the Casa Diablo geothermal production reservoir. For the monitoring points further east, toward the Hot Creek Fish Hatchery springs, the model predicted that implementation of the Project would result in no change in the geothermal reservoir pressure.

Because no substantial changes in the pressures in the Casa Diablo geothermal reservoir, or the geothermal reservoir further east, were predicted, the Project is not expected to adversely affect the temperature, flow or chemistry of the Hot Creek Fish Hatchery springs. Therefore, the Project BA concluded that the Project would have no adverse direct or indirect effects on the Owens tui chub or the designated critical habitat at the Hot Creek Fish Hatchery springs (EMA 2005b).

The Project also has committed to producing and operating the Basalt Canyon geothermal wells in conformance with Stipulation No. 1 to the Record of Decision (ROD) for the PLES I Geothermal Project at Casa Diablo and approved by the BLM and USFS on June 9, 1989 (see Appendix B). It requires the implementation of a monitoring and remedial action program designed to prevent, or mitigate, potential hydrothermal effects to the Hot Creek Fish Hatchery springs, Owens tui chub critical habitat and the Owens tui chub.

**Northern goshawk** –The BE found that Project construction and decommissioning could have a adverse affect on the ability of individual goshawk to forage at the western edge of the Project area, but would not likely result in a trend toward federal listing or loss of viability. The BE also found that well re-drilling



conducted during Project maintenance had the potential to adversely affect goshawk foraging in the same manner. However, the Project committed to comply with the goshawk protection measure contained in the stipulations approved for the Upper Basalt Geothermal Exploration Project (see Appendix B and Appendix C). Thus, these adverse affects also were not likely to result in a trend toward federal listing or loss of viability for the goshawk. The BE provided management recommendations for continuing USFS monitoring of the goshawk occupying the habitat at the western edge of the Project area to evaluate the validity of the analysis that there would be no loss of viability.

**Greater sage grouse** – The BE concluded that the Project may affect individuals, but would not likely result in a trend toward federal listing or loss of viability. A maximum of 2.9 acres of Great Basin Mixed Scrub habitat would be damaged and only 0.4 acres of that would be lost for the 30-year life of the Project. Noise during construction and decommissioning may cause temporary displacement of individuals, but operational noise likely would not result in displacement. Although no sage grouse or sage grouse nests have been found within the Project area, the BE recommended implementation of the following measure to ensure that no active nests were affected by the Project. Following implementation of this measure, there would be no residual impacts to sage grouse.

*WLD Measure 2:* Immediately prior to beginning construction of the pipeline, a 200-foot corridor centered on the selected pipeline route within Great Basin Mixed Scrub habitat would be surveyed for the presence of active sage grouse nests. Construction activities would not occur within 100 feet of an active sage grouse nest until the young have fledged.

**Pallid bat and Townsend's big-eared bat** – The BE concluded that the Project may affect individuals, but would not likely result in a trend toward federal listing or loss of viability for either species. Potential roosting sites (trees, cliffs or caves) would not be affected by the Project. Both species feed at night, and Project construction activities are only scheduled for daylight hours. The pipeline would not interfere with the species ability to forage.

**American marten** – The BE concluded that the Project may affect individuals, but would not likely result in a trend toward federal listing or loss of viability. Because the majority of the Jeffrey Pine Forest habitat within the Project area is marginal quality for marten due to the relative lack of snags, downed logs and large trees, the BE recommended following measure to improve the quality of the habitat. Following implementation of this measure, there should be no residual impacts to American marten habitat from construction of the Project.

*WLD Measure 3:* Within the Jeffrey Pine Forest habitat within the Project area, retain as many snags, downed logs, coarse woody debris and brush piles as possible to provide American marten hunting and denning opportunities.

**Pygmy rabbit** - The Great Basin Mixed Scrub habitat within the Project area is considered marginal potential habitat for the pygmy rabbit. The temporary damage of up to 2.9 acres and 30-year loss of up to 0.4 acres, of this marginal potential habitat due to the Project is a negligible potential impact to the pygmy rabbit because there is substantial preferable habitat in the region. Project operations and maintenance should have no effect on the pygmy rabbit.

**Mule deer** - The damage of up to 7.6 acres and 30-year loss of up to 1.1 acres, of mule deer summer habitat is a minor impact because there is abundant, comparable habitat in the Project area and vicinity.

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Noise, traffic and associated disturbances could further reduce the habitat available to deer during the two to three months of construction and decommissioning. However, the total amount of habitat affected would be small, and substantial comparable habitat is immediately available in the area. The pipeline would not be a physical obstruction to deer, as the top of the pipeline would average less than three feet above ground level, a height which is easily cleared by adult deer. The pipeline also would be constructed with multiple below-ground crossings of existing roadways that would provide paths for juvenile deer to cross the route of the pipeline without going over the above-ground pipeline.

The adverse effects of construction, operation, maintenance and decommissioning of the Proposed Action on listed or sensitive wildlife and habitat are considered to be below the level of significance under CEQA. This is because there is very little chance of any substantial adverse effect on any candidate, sensitive, or special status species. The Proposed Action also would not interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors. Finally, the Proposed Action would not conflict with the Mono County General Plan Conservation/Open Space Element requirement that potential impacts to deer be avoided or mitigated to a level of non-significance.

### *Environmental Consequences of the Alternative Pipeline Route*

The Alternative Pipeline Route pipeline would be operated, maintained and decommissioned as described for the Proposed Action. The adverse effects of the Alternative Pipeline Route would differ from those of the Proposed Action only in the amount and type of wildlife habitat affected.

Between about 2.1 acres and 7.9 acres of wildlife habitat would be disturbed by construction of the Alternative Pipeline Route, depending on the final length of the pipeline constructed. Of these amounts, about 0.4 acres to 1.3 acres would be lost for the 30-year life of the Project.

Construction of the shortest Alternative Pipeline Route would damage about 1.0 acre, and result in the 30-year loss of about 0.2 acres of this amount, of Jeffrey Pine Forest habitat. About 1.1 acres of Great Basin Mixed Scrub habitat would be damaged, of which about 0.2 acres would be lost for 30-years. Construction of the longest pipeline route would damage about 5.2 acres of Jeffrey Pine Forest habitat, and result in the 30-year loss of about 0.8 acres of this amount. About 2.7 acres of Great Basin Mixed Scrub habitat would be damaged, of which about 0.4 acres would be lost for 30-years. The pipeline (whether shortest or longest) also would “disturb” about 0.6 acres of lands mapped as “devegetated,” which provides little wildlife habitat.

The significance under CEQA of all of the Alternative Pipeline Route impacts on wildlife resources would be identical to those described for the Proposed Action. The wildlife measures recommended for the Proposed Action also would be equally applicable to the Alternative Pipeline Route.

### *Environmental Consequences of the No Action Alternative*

The Project would not be constructed if the No Action Alternative is selected, and there would be no impact on wildlife resources in the Project area.

### **3.9 GRAZING**

#### **3.9.1 Regulatory Framework**

##### *Inyo National Forest*

The Inyo National Forest LRMP (1988) recognized the forest's domestic livestock grazing program and elected to maintain the current level of forage production. Although "range" was designated an LRMP "management prescription," it was not applied to any portion of the Project area.

LRMP Amendment #6 (1995) amended the LRMP to incorporate forest-wide range utilization standards for the grazing of domestic livestock. It focuses on standards that would accelerate the restoration and improvement of degraded range sites and maintain non-degraded sites. None appear directly applicable to the Project.

#### **3.9.2 Affected Environment**

Grazing allotments are areas of federal land designated and managed for the grazing of domestic livestock. Two different allotments cover all but the southwest corner of the federal land within the Project area.

Most of the Project area west of U.S. Highway 395 is located within the Mammoth and Sawmill Units of the Sherwin/Deadman Sheep and Goat Allotment. This allotment includes a total of 26,882 acres, of which 12,418 acres are considered capable acres. Capable acres are those lands considered suitable for forage production at a level that can sustain livestock grazing. Grazing of sheep within this allotment is authorized by a term permit and annual operating instructions. The permitted grazing season for this allotment is July 5 to September 30 for 2,600 sheep using a once-over grazing pattern.

The current allotment permittee is Joe F. Echenique Livestock of Bakersfield, California. The sheep typically run in two bands of about 1,300 each. Forage within the Project area is typically used about seven to ten days each year, most often in early July. The sheep are typically moved into the allotment by truck at a location near the USFS heliport (east of the Mammoth Visitor Center) or via a trail crossing Highway 203 at Sawmill Road (see Figure 1). Within the allotment the sheep trail openly, grazing between established bedgrounds. After grazing the general area in and surrounding the Project area, the sheep move north and out of the Project area along Sawmill Cutoff Road, following the vegetation most suitable for forage.

Within the Project area, established bedgrounds are located about one-quarter mile east of drill site 77-25 on "Pole Line Road," between drill sites 35-31 and 55-31 on Sawmill Road, and about one-quarter mile northeast of drill site 34-25. The bedground at the main staging area is just outside of the Project area, east of the USFS heliport and about one-third of a mile south of drill site 58-25.

The northwest portion of the Project area has the lowest diversity of plants suitable for grazing within the Project area. This area, mapped as "Jeffrey/sagebrush/bitterbrush" vegetation, is generally coincident with the pipeline corridor area. The remainder of the Project area in this allotment, mapped as "bitterbrush" vegetation, consists of plants most suitable for grazing.

The permit requires the permittee to comply with measures in the Interagency Domestic Sheep Management Strategy (USFWS 2001). These measures are designed to protect the endangered Sierra Nevada Bighorn Sheep from diseases from the domestic sheep. These measures require the permittee to account for all sheep, and the USFS and the permittee to locate and recover any sheep determined missing.

Nearly all of the federal lands within the Project area located east of U.S. Highway 395 are within the Casa Diablo and Long Canyon Units of the Hot Creek Cattle and Horse Allotment. The allotment includes 13,339 acres, of which 8,731 acres are considered capable. Cattle grazing within this allotment is authorized by a term permit and annual operating instructions. The permitted grazing season for this allotment is from June 15 to September 25 for 340 cattle plus 98 cattle under on/off provisions for the same period. The allotment is grazed using a rotational or deferred schedule.

The current allotment permittee is Dave Wood Ranches of Coalinga, California. Currently, there is very little use by cattle in either the Casa Diablo or Long Canyon Units within the Project area. Cattle use in the Project area is mostly restricted to the area south of the extension of State Route 203 east of U.S. Highway 395.

### **3.9.3 Environmental Consequences**

#### *CEQA Significance Criteria*

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

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use.

The Project area does not contain prime farmland, unique farmland, or farmland of statewide importance, as shown on the maps prepared by the Farmland Mapping and Monitoring Program of the California Department of Conservation (CDC 2004). The Project area is not zoned for agricultural use, nor would convert farmland to non-agricultural use.

#### *Environmental Consequences of the Proposed Action*

##### *Construction and Decommissioning*

Potential effects to grazing from Project construction and decommissioning activities are related to direct conflicts during the construction period and a decrease in the quantity or quality of available forage.

The Sherwin/Deadman Allotment is under mitigation measures outlined in the Interagency Domestic Sheep Management Strategy (2001) to ensure accurate livestock numbers each day during the grazing season. The mitigation measures are required by the terms of the Endangered Species Act of 1973 to

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protect endangered Sierra Nevada Bighorn Sheep from the threat of disease transmission from domestic sheep. The Sherwin/Deadman Allotment was determined to be a low risk operation by the USFWS because of the substantial distance between the domestic sheep and the bighorn sheep, physical barriers and the non concurrent timing of the domestic sheep operations.

The Project anticipates a two- to three-month construction period, with the different construction activities moving along the pipeline route in succession. Although the Project area is used by the grazing permittee for only a short period of time each year, there is still the potential for some direct conflicts should construction coincide with the grazing period. Livestock could wander into the construction areas and be injured or killed. Construction noise and traffic could make the sheep more difficult to manage, and sheep could be lost from the herd if they are spooked.

No clearing of the pipeline route or creation of new access roads is proposed as part of the Project. However, forage would still be lost from the drilling of the pipe supports, the excavations for the road under-crossings, the trenching for the buried cable, and the construction vehicles driving over the top of the vegetation. This analysis assumes that forage in a 20-foot wide corridor along the entire length of the constructed pipeline would be lost, at least temporarily, from Project construction activities. All but a small portion of this area would be reclaimed following the two- to three-month construction period, and forage restored within a few seasons.

Based on this assumption, within the Sherwin/Deadman Sheep and Goat Allotment about 0.5 acres of “Jeffrey/sagebrush/bitterbrush” forage and about 1.2 acres of “bitterbrush” forage would be temporarily lost if the shortest pipeline route was built. All but about 0.1 acres and 0.2 acres, respectively, of this lost forage would be restored within a few years following reclamation. If the longest pipeline route was constructed, about 4.7 acres of “Jeffrey/sagebrush/bitterbrush” forage and about 2.7 acres of “bitterbrush” forage would be temporarily lost, and all but about 0.7 acres and 0.4 acres, respectively, of this lost forage would be restored within a few years following reclamation. This temporary reduction in forage is a negligible percentage of the capable acres within the allotment.

Within the Hot Creek Cattle and Horse Allotment, construction of the pipeline would result in the temporary loss of about 0.2 acres of “bitterbrush” forage, about half of which would be restored within a few years. This is also a negligible percentage of the allotment acres.

The impacts from decommissioning would be essentially identical to the construction impacts, although following the completion of reclamation it is expected that there would be no residual loss of forage.

To reduce the potential for any of these impacts, the Project has committed to comply with the grazing measures contained in the stipulations approved for the Upper Basalt Geothermal Exploration Project (see Appendix B). These include coordination through the USFS of all Project construction operations and compensation by the USFS if the grazing permittee suffers a reduction in allowable annual use. The capable grazing acres which would remain disturbed during the life of the Project would be a minor residual impact to grazing from construction of the Project.

### *Operation and Maintenance Activities*

It may be necessary to re-drill, work-over or stimulate the two wells, and/or drill one or more replacement wells, over the life of the Project. This would be conducted consistent with the activities approved for the

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two exploration projects (see Appendix C). Descriptions of these well activities and their potential impacts are presented in the EAs/ISs prepared and approved for these exploration projects. The environmental documents prepared for each of these MPLP projects have been incorporated by reference into this EA/Draft EIR (see Section 1.3). These EAs found that through implementation of the measures proposed by the Project to coordinate with the grazing permittee, the impacts from drilling and re-drilling these wells would be minor. No mitigation measures were required, but several measures were provided and adopted into the project approvals to ensure the implementation of the measures proposed by the Project (see Appendix C). The Project has committed to conducting any well re-drilling, work-overs or stimulations in conformance with these approved measures.

The Project has the potential to create new areas, or expand existing areas, of thermal ground, which could adversely affect the quality and/or quantity of available forage. However, as discussed in Section 3.3.3, the creation of new or expanded areas of thermal ground by the Project is considered very unlikely, either at Casa Diablo or in the “Basalt Canyon” area. Thus, the potential for any loss of forage from the creation of additional thermal ground is also very unlikely.

The pipeline would be constructed above ground, except where crossing under roads. The top of the pipeline would average about three feet above the ground surface. Thus, the above-ground pipeline would present a barrier to the movement of the foraging sheep. Within the pipeline corridor and along the pipeline route east of drill site 23-31, road crossings likely would occur about every one-quarter mile. These road under-crossings would provide sufficient opportunity for the sheep to be moved to the other side of the pipeline. However, between drill sites 57-25 and 23-31 there is about three-quarters of a mile along Sawmill Road without a road junction. Although this length of above-ground pipeline would not prevent the sheep from reaching all of the forage within the allotment, it could make management of the sheep somewhat more difficult. The following measures are suggested to ensure that the pipeline as constructed does not substantially impede the movement and management of the sheep in the Project area, and that the USFS is able to seek reimbursement from the geothermal lessee for the costs of implementing the sheep escape plan if caused by the geothermal lessee’s operations. Following implementation of these measures, no residual impacts to grazing from operation and maintenance of the pipeline would be expected.

*GRZ Measure 1:* The Forest Officer in Charge of the affected grazing allotments would review the Facility Utilization Permit for construction of the pipeline when submitted and recommend to the Authorized Officer the appropriate location for additional under-crossings in any continuous section of above-ground pipeline one-half mile in length or longer that may be appropriate to facilitate management of the grazing sheep.

*GRZ Measure 2:* The USFS may seek reimbursement from the geothermal lessee for the costs of implementing the sheep escape management plan, including all measures taken to recover stray sheep, should it be demonstrated that the lessee’s operations associated with the Project directly resulted in any sheep becoming strays.

### Environmental Consequences of the Alternative Pipeline Route

The Alternative Pipeline Route pipeline would be constructed, operated, maintained and decommissioned as described for the Proposed Action. It would differ from the Proposed Action in only very minor ways because of the slightly different length and location of the pipeline in each allotment.

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Within the Sherwin/Deadman Sheep and Goat Allotment, about 0.2 more acres of “Jeffrey/sagebrush/bitterbrush” forage and about 0.5 fewer acres of “bitterbrush” forage would be temporarily lost if the Alternative Pipeline Route pipeline were constructed instead of the Proposed Action. All but about 0.1 acre of the additional “Jeffrey/sagebrush/bitterbrush” forage would be restored within a few years following reclamation. This temporary reduction in forage under the Alternative Pipeline Alternative is a negligible percentage of the capable acres within the allotment.

No portion of the Alternative Pipeline Route is located on federal lands within the Hot Creek Cattle and Horse Allotment. Therefore, about 0.2 fewer acres of “bitterbrush” forage would be temporarily lost from the Hot Creek Cattle and Horse Allotment if the Alternative Pipeline Route pipeline were constructed instead of the Proposed Action.

The environmental consequences of the Alternative Pipeline Route on grazing would not differ from that of the Proposed Action in any other ways. The grazing measure recommended for the Proposed Action also would be equally applicable to the Alternative Pipeline Route.

*Environmental Consequences of the No Action Alternative*

The Project would not be constructed if the No Action Alternative were selected. Thus, there would be no effects on grazing from the No Action Alternative.

### **3.10 RECREATION**

#### **3.10.1 Regulatory Framework**

Inyo National Forest has set management directions for the Project area which focus on recreation as the highest use. The Town of Mammoth Lakes policies emphasize expansion of the uses of Shady Rest Park.

Portions of Geothermal Leases CA-14407 and CA-14408 (see Figure 2) are covered by the special stipulation which states that “No surface disturbing activities will be permitted in the No Surface Occupancy areas shown on Map 5, attached, unless the lessee can demonstrate through an appropriate plan of operation or permit application that no unacceptable environmental impacts will occur from the proposed operations.” These restrictions were adopted in part to protect the existing and potential concentrated and dispersed recreational use on these two leases.

#### *Inyo National Forest*

The Inyo National Forest Land and Resource Management Plan (LRMP) provides management direction for those portions of the Project area within Inyo National Forest. The entire surface disturbance associated with the Project is located within Management Area #9 (Mammoth) (see Section 1.4.3). Both Management Prescription 12 (Concentrated Recreation Area) and Management Prescription 15 (Developed Recreation Site) apply to the Project area.

The purpose of Management Prescription 12 is to manage concentrated recreation areas to maintain or enhance major recreational values and opportunities. The emphasis is on providing a broad range of facilities and opportunities that will accommodate large numbers of people safely, conveniently, and with little resource damage. Other resource activities will not be prohibited, but they are secondary to recreational values and use and should not detract from them (USDA, Forest Service, Inyo National Forest 1988).

The purpose of Management Prescription 15 is to maintain developed recreational facilities to provide necessary user services and to protect Forest Service values. The emphasis is on the recognition of public demand for developed recreation site opportunities. This prescription is applied to all existing and potential developed sites, whether publicly-operated or concessionaire-operated (USDA, Forest Service, Inyo National Forest 1988).

Management Area #9 (Mammoth) includes several management directions specific to recreation which are applicable to the Project area.

- Maintain open-space areas adjacent to the Town of Mammoth Lakes for passive recreation use.
- Prohibit development of Shady Rest Park beyond existing perimeter roads, and north of the powerline right-of-way.
- Identify and program the expansion potential of the Shady Rest and Sherwin Creek Campground complexes and develop as funds become available.



*Mono County*

The Conservation/Open Space Element of the Mono County General Plan states that natural resource based outdoor recreation is and will continue to be the foundation of Mono County's economy (County of Mono Planning Department 1993d). Since much of the recreation in Mono County takes place on federal lands, the plan recognizes that federal land management agencies would develop the policies and facilities for the recreational use of those lands. There are no goals, objectives or policies which are directly applicable to the Project area.

*Town of Mammoth Lakes*

The Parks and Recreation Element of the Town of Mammoth Lakes General Plan contains several policies which are applicable to the Project area (Town of Mammoth Lakes 1990).

- Policy 2B-3 – The Town shall encourage the Forest Service to permit active recreational uses, including ice skating rinks, golf courses and similar community recreational facilities when those facilities cannot reasonably be located on the private land base.
- Policy 2B-11 – The Town shall continue to develop Shady Rest Park and improve access to Shady Rest Park.

**3.10.2 Affected Environment**

Recreation is the most significant resource of the Inyo National Forest, and is expected to continue in that role in the foreseeable future. The dominant form of recreation is dispersed recreation (USDA, Forest Service, Inyo National Forest 1988).

*Developed Recreation Sites*

Developed recreation sites are relatively small, distinctly defined areas where facilities are provided for concentrated public use. The only developed recreation site within the Project area is Shady Rest Park, although Pine Glen Group Campground, New Shady Rest Campground, and Old Shady Rest Campground are located just southwest of the Project area (see Figure 1).

Shady Rest Park is a sports and recreation park developed by the Town of Mammoth Lakes. The park is located on public lands within Inyo National Forest between the western end of Sawmill Road and Sawmill Cutoff Road. The park receives substantial use by individuals and organized groups for baseball, softball, soccer, volleyball, basketball, tennis, bicycle riding, and skateboarding during the late spring, summer and fall months. It is typically closed to wheeled vehicles during the winter months. The park is not a lighted facility, so recreational use at night is limited. The Town of Mammoth Lakes has proposed the construction of additional park facilities (including an ice skating rink and winter trails) to establish the park as a staging area for winter recreational activities. The USFS has not indicated any intent to approve such additional activities.

The Pine Glen Group Campground, New Shady Rest Campground, and Old Shady Rest Campground are each USFS campgrounds. The average season for the Pine Glen Group Campground, which has six group sites, is mid-May through late-September. The average season for the New Shady Rest Campground, which has 94 sites, is mid-May through late-October. The average season for the Old Shady Rest

Campground, which has 51 sites, is early-June through mid-September (USDA, Forest Service, Inyo National Forest 2004).

*Dispersed Recreation*

Concentrated recreation areas are land areas that currently receive, or could (if developed) potentially receive high-density recreation use. Dispersed recreation is defined as outdoor recreation that occurs outside of constructed and maintained recreational facilities (USDA, Forest Service, Inyo National Forest 2004). Dispersed recreation activities in the Project area are focused on and around Sawmill Road, Sawmill Cutoff Road, and the adjoining road and trail systems.

Dispersed recreational user intensity is considered to be moderate in the Project area. Dispersed recreational use is generally higher in the spring, summer and fall months than in winter.

Summer dispersed recreational activities in the Project area include walking, dog walking, jogging, bicycling, and off-highway vehicle (“OHV”) use. A system of mountain bike routes and a mountain bike single track have been established along several designated and un-designated USFS roads and trails within the Project area and vicinity.

During the winter months, additional activities within the Project area include walking, snowmobiling, cross-country skiing, Nordic skiing and snowshoeing. Sawmill Cutoff Road just south of the Project area is a main staging area for winter recreational activities. From there a system of signed and unsigned, groomed and un-groomed snowmobile and ski trails can be reached. Both Sawmill Road and Sawmill Cutoff Road are used by the public and USFS permittees for snowmobile riding and skiing. Cross-country skiers also use the Project area in winter, often starting at the Inyo National Forest Visitor Center and heading northeast.

**3.10.3 Environmental Consequences**

*CEQA Significance Criteria*

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

- Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the parks or facilities would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The Project does not include any recreational facilities.

*Environmental Consequences of the Proposed Action*

*Developed Recreation Sites*

**Construction and Decommissioning** - Project construction and decommissioning activities may occur within 300 feet (or less) of Shady Rest Park if MPLP connects one or more of the wells located west or north of the park to the pipeline (see Figure 4). These activities would occur no closer than one-third miles from Pine Glen Group Campground, and no closer than one-half mile from New Shady Rest Campground, under the same circumstances. Potential impacts from construction and decommissioning activities to recreational users of Shady Rest Park and the campgrounds would include air quality impacts, visual impacts, noise, traffic and safety hazards. All of these impacts would be short-term, temporary and intermittent during the two- to three-month construction and decommissioning periods.

Air quality impacts to park and campground users could include dust from vehicle traffic on unpaved roads and exhaust from construction vehicles. As discussed in Section 3.4.3, these impacts would be temporary and very minor. Construction and decommissioning activities in the immediate vicinity may occasionally be visible through the forest to Shady Rest Park users, but probably not visible from the campgrounds (see Section 3.5.3). The louder noises produced from Project construction and decommissioning activities in the immediate vicinity would be clearly audible at Shady Rest Park. However, these noises are not expected to be intrusive, considering the infrequent nature of the noises and the relatively intense recreational activities typically conducted at the park (see Section 3.11.3). The louder noises may be audible at the campgrounds, but at much lower levels and only during daylight hours.

Traffic entering the Project area along Sawmill Road or Sawmill Cutoff Road from State Route 203 would not directly affect users of either Shady Rest Park or the campgrounds (see Section 3.13.3). The Project would prohibit Project tractor-trailer traffic, and limit other Project traffic, on Sawmill Road south of the park to minimize disturbance to recreation activities within Shady Rest Park. Project vehicles also would be restricted to traveling no faster than 25 mph on Sawmill Cutoff Road and no faster than 15 mph on all other unimproved roads in the Project area. Construction and decommissioning also would not create any substantial safety hazards to park and campground users as these activities do not create any substantial physical hazards or expose recreational users to any substantial environmental hazards (see Section 3.15.3).

No “unacceptable environmental impacts” would occur to existing and potential concentrated recreational use on those portions of Geothermal Leases CA-14407 and CA-14408 (see Figure 2) subject to the “no surface occupancy” stipulation.

None of these resource impacts were determined to be potentially significant under CEQA because few workers would be needed to construct, maintain or decommission; and no additional workers would be required to operate; the Project. Thus, the Project would not increase the use of the park and campgrounds, and substantial physical deterioration of the facilities would not occur or be accelerated. The few workers needed for the Project also would not require the construction or expansion of recreational facilities.

Implementation of the measures proposed in the sections listed above would reduce the minor adverse effects of these impacts. Because of these measures, and the short-term, temporary nature of the

construction and decommissioning activities, there should be no residual impacts to the developed recreation sites.

**Operation and Maintenance** - Few project operations or maintenance activities may affect recreational users of the park or campgrounds. Those sections of the pipeline and well site facilities which may be located close to Shady Rest Park would not be visible to park users (see Section 3.5.3). Measures also were proposed specifically to reduce the level of these impacts. Project operations would not produce substantial air pollutant emissions, would be relatively quiet, and would not produce any substantial traffic or safety hazards to park or campground users (see Sections 3.4.3, 3.11.3, 0 and 3.15.3).

Project maintenance activities, including well pump maintenance or well redrilling, would be conducted infrequently and would be short-term. Pipeline and well site maintenance activities could produce potential impacts to park and campground users comparable to those of Project construction (see above). Impacts from well redrilling would be similar or identical to those produced during the initial drilling of the well. These impacts were described in the environmental assessment prepared for the Upper Basalt Geothermal Exploration Project, which has been incorporated by reference. These potential impacts have also been summarized in the appropriate sections of this EA/Draft EIR. They were all determined not to be significant under CEQA.

The pipeline would be located over one-half mile from the Shady Rest Campground complex and would not impair the USFS' ability to expand the campground. The pipeline also would be located outside of the existing Shady Rest Park perimeter roads and north of the SCE transmission line right-of-way, and so would not limit the full development of the park within the USFS limits. Finally, the Project would not prohibit the USFS from permitting active recreational uses, including an ice skating rink, within the boundaries of Shady Rest Park.

Section 3.15.3 of this EA/Draft EIR describes several Project upset conditions which are very unlikely to occur but are still possible. This includes the remote possibility of a substantial uncontrolled discharge of geothermal fluid from either a well or the pipeline. Such a discharge, if it occurred up-gradient (west or north) of the park, could expose park users to the high temperature fluid if the fluid flowed toward and through the park. This potential impact was determined to be less than significant under CEQA because it was highly unlikely to occur and the chances of injury were small. However, a measure was proposed to add specific plans to the existing MPLP emergency contingency plans for alerting or evacuating users of Shady Rest Park (see Section 3.15.3)

No "unacceptable environmental impacts" would occur to existing and potential concentrated recreational use on those portions of Geothermal Leases CA-14407 and CA-14408 (see Figure 2) subject to the "no surface occupancy" stipulation.

The adverse effects of these impacts are below the level of significance under CEQA because few workers would be needed to construct, maintain or decommission; and no additional workers would be required to operate; the Project. Thus, the Project would not increase the use of the park and campgrounds, and substantial physical deterioration of the facilities would not occur or be accelerated. The few workers needed for the Project also would not require the construction or expansion of recreational facilities.

As described above, the operation and maintenance of the Project facilities should not result in any residual impacts to the developed recreation sites.

### *Dispersed Recreation*

**Construction and Decommissioning** - Potential impacts from construction and decommissioning activities to dispersed recreational users of the Project area would be very similar to those described above for the developed recreation sites. The impacts to air quality, visual resources and noise would be essentially identical. All of these impacts would be short-term, temporary and intermittent during the two- to three-month construction and decommissioning periods.

All of the forest roads into and around the Project area would remain open to recreational users throughout the construction and decommissioning phases, except for short periods when specific activities may require briefly blocking traffic on individual roadways (see Section 0). There would be a small increase in traffic on Sawmill Road and Sawmill Cutoff Road, but this would not exceed the capacity of either road. Should winter access be a possibility for construction or decommissioning, MPLP would consult with the BLM and USFS and prepare a winter access contingency plan. This plan would describe how proposed activities could be conducted to minimize the adverse effects to winter recreation users of the affected roads, trails or surrounding areas.

Project vehicles would be restricted to traveling no faster than 25 mph on Sawmill Cutoff Road and no faster than 15 mph on all other unimproved roads in the Project area to minimize hazards to recreational users. Construction and decommissioning also would not create any other substantial physical hazards or expose recreational users to any substantial environmental hazards (see Section 3.15.3).

No “unacceptable environmental impacts” would occur to existing and potential dispersed recreational use on those portions of Geothermal Leases CA-14407 and CA-14408 (see Figure 2) subject to the “no surface occupancy” stipulation.

None of these resource impacts were determined to be potentially significant under CEQA. The adverse effects of these impacts on recreation are below the level of significance under CEQA because few workers would be needed to construct, maintain or decommission; and no additional workers would be required to operate; the Project. Thus, the Project would not increase the use of the park and campgrounds, and substantial physical deterioration of the facilities would not occur or be accelerated. The few workers needed for the Project also would not require the construction or expansion of recreational facilities.

The short-term, temporary nature of the construction and decommissioning activities would create no residual impacts to dispersed recreation within the Project area.

**Operation and Maintenance** - Few project operations may affect dispersed recreational users of the Project area. Sections of the pipeline and well site facilities in the immediate vicinity could be visible to dispersed recreational users (see Section 3.5.3). Measures were proposed specifically to reduce the level of these impacts. Project operations would not produce substantial air pollutant emissions and would be relatively quiet (see Sections 3.4.3 and 3.11.3). Because the pipeline is insulated and jacketed, its surface would not be hot and would not pose a hazard to dispersed recreational users. MPLP has proposed to



construct the pipeline underground where necessary to cross under existing roads so that recreational traffic on these roads is not blocked.

Much of the pipeline would be routed adjacent to existing roads. Those sections of the pipeline not adjacent to roads could be a safety hazard in winter for cross-country snowmobilers and, to a lesser extent, cross-country skiers. In portions of the Project area the snow depth can exceed the three-foot average height of the top of the pipeline. If it does, the pipeline could be both a hidden obstruction and an unstable surface for snowmobiles and skiers. MPLP has proposed posting signs along the cross-country sections of the pipeline during winter to warn snowmobilers and skiers of the pipeline should it become covered with snow (see Appendix B). This risk to snowmobilers and skiers would be a minor residual impact for the life of the Project.

The ground disturbance from construction of those sections of the pipeline not located next to existing roads and trails could attract OHVs to use these disturbed lands as unauthorized trails. Although the horizontal expansion loops, which stick out 30 feet from the pipeline every 250 to 350 feet, would impede OHV travel along the pipeline, they would not prevent it. Implementation of the following measure would ensure that those pipeline sections not adjacent to existing roads would be monitored for OHV traffic and, appropriate steps taken to stop any traffic detected. Following implementation of this measure, no residual impacts from unauthorized OHV traffic along the pipeline route would be expected.

*REC Measure 1:* The route of those sections of the pipeline not located next to existing roads would be monitored for evidence of use by OHVs. If such evidence is found, the authorized officer may require the lessee to fund or implement actions to prevent use by OHVs, such as the posting of signs and the physical blocking of access.

Project maintenance activities, including well pump maintenance or well redrilling, would be conducted infrequently and would be short-term. Pipeline and well site maintenance activities could produce potential impacts to dispersed recreation users comparable to those of Project construction (see above). Impacts from well redrilling would be similar or identical to those produced during the initial drilling of the well. These impacts were described in the environmental assessment prepared for the Upper Basalt Geothermal Exploration Project, which has been incorporated by reference.

These potential impacts have also been summarized in the appropriate sections of this EA/Draft EIR. They were all determined to not be significant under CEQA.

The pipeline would not reduce the open-space areas adjacent to the Town of Mammoth Lakes available for passive recreation use.

As discussed above, there is a remote possibility of a substantial uncontrolled discharge of geothermal fluid from either a well or the pipeline. The possibility of injury to dispersed recreational users from the discharged high temperature fluid is very small and less than significant under CEQA. However, a measure was proposed to add specific plans to the existing MPLP emergency contingency plans for alerting dispersed recreational users to a substantial discharge and preventing access to the discharged fluid (see Section 3.15.3)

No “unacceptable environmental impacts” would occur to existing and potential dispersed recreational use on those portions of Geothermal Leases CA-14407 and CA-14408 (see Figure 2) subject to the “no surface occupancy” stipulation.

The adverse effects of these impacts are below the level of significance under CEQA because few workers would be needed to construct, maintain or decommission; and no additional workers would be required to operate; the Project. Thus, the Project would not increase the use of the park and campgrounds, and substantial physical deterioration of the facilities would not occur or be accelerated. The few workers needed for the Project also would not require the construction or expansion of recreational facilities.

*Environmental Consequences of the Alternative Pipeline Route*

*Developed Recreation Sites*

The impacts to the developed recreation sites from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

*Dispersed Recreation Activities*

The impacts to dispersed recreation activities from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

*No Action Alternative*

The Project would not be constructed if the No Action Alternative were selected. Thus, there would be no effects on recreation from the No Action Alternative.

### **3.11 NOISE**

#### **3.11.1 Regulatory Framework**

Noise is most often measured in decibels (dB). These are units that measure the apparent loudness of sound.

The human ear is more sensitive to some sound frequencies than others. Noise meters typically balance measured frequencies so that they mimic what the human ear would hear. Noise levels measured this way are called “A-weighted decibels” (dBA).

Because noise levels often vary with time, a time-averaged noise level in dBA (Leq) is often used to describe the noise level at a given location.

Noise levels for common situations include (Harris and Dines 1997):

- 30-35 dBA (whispered conversations at 6 feet and quiet libraries),
- 40-50 dBA (rural to suburban residential areas during daytime),
- 60 dBA (normal conversation at 3 feet), and
- 70 dBA (a vacuum cleaner at 10 feet).

#### *Bureau of Land Management*

All federal geothermal lessees must comply with the BLM Geothermal Resources Operational (GRO) Orders. GRO Order No. 4 (General Environmental Protection Requirements) requires that lease operations “shall not exceed a noise level of 65 dBA for all geothermal-related activity including, but not limited to, exploration, development, or production operations, as measured at the lease boundary line or 0.8-km (one-half mile) from the source, whichever is greater.”

#### *Mono County*

The Mono County General Plan identifies goals and policies to attain and maintain acceptable noise levels within the county (County of Mono Planning Department 1993b). Mono County Code, Chapter 10.16 (Noise Regulation) of the Mono County Code sets noise standards for different types of land uses. It also prohibits the noise which would exceed these standards on other property within the county. However, the County defers to the Town of Mammoth Lakes noise ordinances, as the closest affected property is located in the Town of Mammoth Lakes planning area, (Personal Communication – S. Burns, Director, Mono County Community Development Department, 2004).

#### *Town of Mammoth Lakes Municipal Code*

Chapter 8.16 of the Town of Mammoth Lakes Municipal Code limits excessive noise. Section 8.16.090 (Prohibited Acts) sets noise limits for construction work.

The USFS campgrounds within the Town of Mammoth Lakes boundary could be considered within the “Type II Areas - Multifamily Residential” land use category (Personal Communication – S. Mercer, Code Enforcement, Town of Mammoth Lakes, 2004). In these areas noise from mobile construction equipment is limited to 80 dBA during the day (from 7:00 a.m. to 8:00 p.m.) except on Sundays and legal holidays. At night (from 8:00 p.m. to 7:00 a.m.) and all day on Sundays and legal holidays the maximum permitted noise level from mobile construction equipment is 65 dBA. In these same areas noise from stationary equipment is limited to 65 dBA during the day (from 7:00 a.m. to 8:00 p.m.) except on Sundays and legal holidays. At night (from 8:00 p.m. to 7:00 a.m.) and all day on Sundays and legal holidays the maximum permitted noise level from stationary equipment is 55 dBA.

Shady Rest Park could be considered within the “Type III Areas – Semi-Residential Commercial” land use category (Personal Communication – S. Mercer, Code Enforcement, Town of Mammoth Lakes, 2004). In these areas noise from mobile construction equipment is limited to 85 dBA during the day (from 7:00 a.m. to 8:00 p.m.) except on Sundays and legal holidays. At night (from 8:00 p.m. to 7:00 a.m.) and all day on Sundays and legal holidays the maximum permitted noise level from mobile construction equipment is 70 dBA. In these same areas noise from stationary equipment is limited to 70 dBA during the day (from 7:00 a.m. to 8:00 p.m.) except on Sundays and legal holidays. At night (from 8:00 p.m. to 7:00 a.m.) and all day on Sundays and legal holidays the maximum permitted noise level from stationary equipment is 60 dBA.

### **3.11.2 Affected Environment**

Current noise levels in the Project area have not been measured, but they are assumed to be typical of similar rural environments. In these areas sound levels can range from below 30 dBA to above 50 dBA. Typical sounds are mostly natural forest and rangeland sounds, like birds, wind, and insects. However, the Project area also has a number of noise sources from human activity. Traffic noise from the highways and major forest roads within the Project area are audible when close to these sources. Sounds from the recreation activities at Shady Rest Park can also be heard when the park is occupied. The turbines, air cooling fans and other equipment at the MPLP geothermal power plants at Casa Diablo, at the eastern end of the Project area, also generate noise. The sound of low-flying aircraft from the Mammoth/June Lakes Airport, which is about three miles east of the Project area, is sometimes heard. Distinctive noises also are generated by the off-highway vehicles (OHVs), motorcycles, ATVs and snowmobiles which use the Project area.

The potential noise-sensitive receptors within or next to the Project area consist of concentrated public use areas (parks and campgrounds). There are no other noise-sensitive receptors (schools, hospitals, daycare centers, long-term care facilities) located within or next to the Project area.

The only area of concentrated public use within the Project area is Shady Rest Park, a Town of Mammoth Lakes-developed sports and recreation park located on USFS land (see Figure 1). MPLP has stated that the selected pipeline route would be at least 300 feet from the developed portions of Shady Rest Park (or substantially screened from view by topography or vegetation). The closest well site to Shady Rest Park is 38-25, at a distance of about 635 feet (see Figure 4).

Southwest of the Project area are three USFS campgrounds: Pine Glen Group Campground; New Shady Rest Campground and Old Shady Rest Campground. All are located within the Town of Mammoth Lakes Planning Area. Pine Glen Group Campground is the campground located closest to the pipeline corridor

area and any well site. It is about 1,850 feet from well site 31-36, which is also the closest point within the pipeline corridor area.

Dispersed recreation occurs outside of constructed and maintained recreational facilities (see Section 3.10.2). Dispersed recreational users of the Project area include walkers, hikers, joggers, cross county skiers, Nordic skiers, mountain bikers, snowmobile riders, and OHV riders. These forest users may be exposed to Project noise for relatively short periods of time anywhere in the Project area.

### **3.11.3 Environmental Consequences**

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 alone 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 would not generate substantial groundborne vibration or noise, and so would not exposure persons to excessive groundborne vibration or groundborne noise levels. The Project is not located within two miles of a public airport or a private airstrip.



*Environmental Consequences of the Proposed Action*

*Construction and Decommissioning Activities*

Pipeline and well site construction and decommissioning activities would be conducted only during daylight hours. Pipeline construction also would appear from any given point to be intermittent as each construction task moved by.

Pipeline and well site construction and decommissioning would use equipment that would generate a noise level of about 83 dBA at a distance of 50 feet (Crocker and Kessler, 1982). Much of the construction equipment would be quieter. Table 3 presents the projected noise levels at selected distances from these louder pipeline and well site construction activities.

Also listed in Table 3 are the projected noise levels from these louder construction activities at selected "sensitive" locations. The louder noises produced from Project construction and decommissioning activities in the immediate vicinity would be clearly audible at Shady Rest Park. However, these noises are not expected to be intrusive, considering the infrequent nature of the noises and the relatively intense recreational activities typically conducted at the park (see Section 3.10.3). The louder noises may occasionally be audible at the campgrounds, but at much lower levels and only during daylight hours when construction is occurring.

Finally, Table 3 lists the noise standards applicable to these selected "sensitive" locations Table 3 shows that this louder construction noise should easily meet all of the applicable standards at these locations.

Construction noise would continue on and off for the expected two to three month construction period.

**Table 3: Projected Pipeline and Well Site Construction Noise Levels**

Distance	Selected Location	Projected Noise Level	Applicable Standards (mobile construction)	
			(Day)	(Night/Weekends)
50 feet	Source + 50 feet	83.0 dBA		
100 feet		77.0 dBA		
200 feet		71.0 dBA		
300 feet	Closest pipeline distance to Shady Rest Park	67.4 dBA	85 dBA	70 dBA
400 feet		65.0 dBA		
635 feet	Closest well distance to Shady Rest Park	60.9 dBA	85 dBA	70 dBA
800 feet		59.0 dBA		
1,600 feet		53.0 dBA		
1,850 feet	Closest well and pipeline distance to USFS campground	51.6 dBA	80 dBA	65 dBA
2,640 feet	GRO Order No. 4	48.5 dBA	65 dBA	65 dBA

Dispersed recreational users of the Project area may be able to hear the occasional louder construction activities when within one-quarter to one-half mile of any active construction site. Most construction activities would be quieter. The number of persons exposed to Project construction noise would be small, and comparable areas for dispersed recreation are available in the vicinity of the Project during the short construction period. As such, the adverse effects of Project construction noise on dispersed recreational users are considered to be minor.

The adverse effects of these short-term, temporary construction noise impacts are below the level of significance under CEQA because they do not expose persons to or generate noise levels in excess of the applicable standards or result in a substantial temporary or periodic increase in ambient noise levels. No mitigation measures are required.

The following measure is provided that would reduce the potential adverse effects of construction noise on receptors near the Project.

**NOI-1:** Prior to commencing any construction activity associated with the Project, MPLP would submit to, and secure the approval of the authorized officer for, a program designed to adequately respond to lodged noise complaints. As part of the program MPLP would publish a telephone number for use by individuals for the lodging of complaints or inquiries regarding the level of noise from construction operations. A designated representative of the permittee would be available 24 hours a day to record any lodged complaints or inquiries, and MPLP would make reasonable efforts to investigate and respond to any such complaint or inquiry within 24 hours of the complaint or inquiry. MPLP would record each lodged complaint or inquiry, and the results of its investigation and response, on a form, a copy of which would be delivered to the BLM and USFS staff designated to receive these forms within 24 hours of the complaint or inquiry.

The short-term, temporary nature of the construction and decommissioning activities would create no residual noise impacts within the Project area.

### *Operation Activities*

Normal well site and pipeline operations would be conducted 24-hours a day, 365 days per year. Typical well site operations would produce little noise. Only the steady "hum" from the electric well head pump motor and an occasional "click" from a valve or control switch would be audible. This noise level is estimated at about 60 dBA at 50 feet, or about as loud as a normal conversation at 3 feet. The resulting noise levels at Shady Rest Park (37.9 dBA) and Pine Glen Group Campground (28.6 dBA) would be far below the applicable nighttime standards at these two locations (60 dBA and 55 dBA, respectively).

Typical pipeline operations would produce almost no noise, only a very slight rumble as the geothermal fluid moved down the pipeline and an occasional "creak" as the pipe flexed.

The adverse effects of these operation noise impacts are below the level of significance under CEQA because they do not expose persons to or generate noise levels in excess of the applicable standards or result in a substantial permanent increase in ambient noise levels. No mitigation measures are required.

There would be no residual noise impacts from Project operations.

### *Maintenance Activities*

Well pumps would require regular maintenance and/or replacement every two to five years. When necessary, well pumps would be removed and re-installed in the well bore in the same manner as the initial installation. The resulting noise levels would be the same as well site construction activities for the one to two days required to change out the pump.

It may be necessary to re-drill, work-over or stimulate the two wells, and/or drill one or more replacement wells over the life of the Project. Any well re-drilling, work-overs or stimulation, and/or replacement well drilling would be conducted consistent with that approved for the two exploration projects (see Appendix C). Descriptions of these well activities and their potential impacts are presented in the EAs/ISs prepared and approved for these exploration projects. The environmental documents prepared for each of these MPLP projects have been incorporated by reference into this EA/Draft EIR (see Section 1.3).

The overall noise emissions from well drilling activity were estimated to also be about 83 dBA at a distance of 50 feet from the source. As such, the sound levels at the potentially noise-sensitive receptor locations would be the same as the sound levels from construction activities (see Table 3). Drilling noise would be audible, especially at night when the ambient noise levels would be lower. The projected drilling noise levels at Pine Glen Group Campground (51.6 dBA) and Shady Rest Park (60.9 dBA) from the closest wells would meet the applicable Town of Mammoth Lakes maximum daytime noise levels for stationary construction equipment of 65 dBA and 70 dBA, respectively.

Only the drilling noise from drill site 38-25 was projected (60.9 dBA) at Shady Rest Park to be slightly above the Town of Mammoth Lakes nighttime/Sunday/holiday standard of 60 dBA. However, the forest surrounding this well site would be expected to provide some additional sound attenuation that would decrease the projected noise levels. Also, Shady Rest Park is used for concentrated sports and outdoor recreational activities that would not typically be affected by these noise levels (see Section 3.10.2). The park also does not currently have lighting; so the recreational activities only occur during daylight hours. Since the drilling activities are both short-term and infrequent, the noise impacts to Shady Rest Park were expected to be low.

The adverse effects of these short-term, infrequent drilling noise impacts are below the level of significance under CEQA because they do not expose persons to or generate noise levels in excess of the applicable standards or result in a substantial temporary or periodic increase in ambient noise levels. No mitigation measures are required.

The short-term, temporary nature of these maintenance activities would create no residual noise impacts within the Project area

### *Environmental Consequences of the Alternative Pipeline Route*

#### *Construction and Decommissioning Activities*

The noise impacts from construction and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

*Operation Activities*

The noise impacts from operation of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

*Maintenance Activities*

The noise impacts from maintenance of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

*No Action Alternative*

The Project would not be constructed if the No Action Alternative were selected. Thus, there would be no noise impacts from the No Action Alternative.

### **3.12 CULTURAL RESOURCES**

#### **3.12.1 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.

#### **3.12.2 Affected Environment**

Because the surface rock materials are all volcanic, there is no real potential for any paleontological resources to be found in the Project area. An on-line search of the University of California Museum of Paleontology collection identified no collected specimens from the Project area or vicinity (UCMP 2005).

Cultural resources include prehistoric and historic sites, districts and objects, as well as locations of important historic events or sites of traditional or cultural importance.

Archaeological research in the region dates back to the 1930 studies of Owens Valley. Subsequent archaeological research, particularly from the 1970s to the present, produced a large volume of data about the prehistory of the region. This data documents Native American occupation and use of Long Valley from about 7,000 years before present to contact with European and American settlers. The archaeological record reflects the many changes through time in technology, settlement and subsistence patterns, and trade (Pacific Legacy, Inc. 2002).

The ethnographic information for Long Valley is sparse compared to that for the Owens Valley Paiute and Mono Lake Paiute. Fieldwork in the region during the early twentieth century focused primarily on



the larger Native American populations, such as those in Owens Valley. Thus, detailed ethnographic descriptions of the people of Long Valley are lacking.

In May 2002 the Eastern Information Center at the University of California, Riverside completed an archeological records search for all of MPLP's geothermal leases. This records search covered the entire Project area and a buffer area of at least one-quarter mile. This records search documented that, except for about 20 acres of private land west of U.S. Highway 395, all of the Project area had been previously surveyed for cultural resources. Most of these surveys were conducted from the late 1970's through the early 1990's.

Archeological investigations conducted specifically for MPLP projects within the Project area include the 1986 survey of 640 acres around the MP II and PLES I project sites in the Casa Diablo area. This survey found a number of historic and prehistoric sites within the survey area, none of which were determined eligible for the NRHP (CMEMD and BLM 1987a). The BLM approval for the project requires that Native Americans be allowed continued access to the Casa Diablo hot springs and to collect soils and plants for their traditional uses (BLM 1989).

An archaeological survey of about 146 acres was conducted in 2001 for the Basalt Canyon Geothermal Exploration Project (Pacific Legacy 2001). An 800 foot square around each of the six drill sites and a 100 foot wide area on either side of the entire length of Sawmill Road were surveyed. Two small prehistoric sites and one small historic site were identified. Measures were adopted in the approval of the project to avoid any potential for direct or indirect impacts to these sites (see Appendix C).

The EA prepared for the Upper Basalt Geothermal Exploration Project (USDI, BLM 2005) documented both historic and prehistoric sites identified by previous surveys within the boundaries of that project. All of the prehistoric sites were located in areas not expected to be affected by the project activities. Seven historic sites were either near proposed drill sites or in or near existing or new access roads. The project was approved with measures requiring all areas of surface disturbance to be surveyed. Sites identified by the survey would either not be disturbed or all impacts mitigated to the satisfaction of the USFS (see Appendix C).

Outside of that portion of the Project area within the Upper Basalt project area (see Figure 1 and Figure 4), only one previously identified cultural resource site is located near to any surface disturbance proposed by the Project.

### **3.12.3 Environmental Consequences**

#### *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 Consequences of the Proposed Action

Activities conducted as part of Project construction, operations, maintenance or decommissioning could directly or indirectly affect cultural resources. Although the previous cultural resource surveys indicate a relatively low density of cultural resources in most of the Project area, Project construction could still directly impact known, or previously unknown, cultural resources, especially in the areas near Shady Rest Park and Casa Diablo. The Project could also produce indirect impacts to immediately adjacent cultural resources.

The Project has committed that all areas proposed for new surface disturbance would be surveyed by a professional archaeologist acceptable to the BLM/USFS (see Appendix B). Any surveyed areas that contain cultural resources of significance would be avoided, or the potential for impacts mitigated in a manner acceptable to the BLM/USFS prior to surface disturbance. The Project also has proposed that if previously unrecorded cultural resources are encountered during surface-disturbing activities, all activities at that location would cease and the BLM/USFS notified immediately. Surface-disturbing activities would not recommence at the location of the discovery until the identified cultural resources(s) had been assessed, any necessary mitigation actions taken, and approved by the BLM/USFS. Based on these Project commitments, the adverse effects of the Project on cultural resources are considered to be minor.

The USFS has initiated consultation with the Native American tribes which may have an interest in the Project area. No interest or concerns with the Project, or any potential adverse effects of the Project, have yet been identified. The USFS will continue this consultation process until the decision is made by the BLM, and concurred with by the USFS, to either approve or deny the Project.

The potential adverse effects of these unlikely direct or indirect impacts to historic and prehistoric resources are below the level of significance under CEQA because they do not cause a substantial adverse change in the significance of a historical resource or an archaeological resource, as defined in Section 15064.5 of the CEQA Guidelines. No mitigation measures are required.

### Environmental Consequences of the Alternative Pipeline Route

The impacts to cultural resources from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be indistinguishable from those described for the Proposed Action.

### Environmental Consequences of the No Action Alternative

The Project would not be constructed if the No Action Alternative were selected. Thus, there would be no effects on cultural resources from the No Action Alternative.

### **3.13 TRANSPORTATION AND PUBLIC SERVICES**

#### **3.13.1 Regulatory Framework**

##### *California Department of Transportation*

The State of California Department of Transportation (Caltrans) is responsible for the design, construction, maintenance, and operation of the California State Highway System. It is also responsible for that portion of the Interstate Highway System within the state's boundaries. Caltrans' Transportation Concept Report (TCR) for U.S. Highway 395 describes the current status of the highway and establishes a twenty-year planning process and goals for its development (Caltrans 2000). No equivalent TCR has been prepared for State Route 203.

##### *Mono County*

The Circulation Element of the Mono County General Plan, consisting of the Regional Transportation Plan (RTP), as amended, contains no regional policies applicable to this analysis.

##### *Town of Mammoth Lakes*

The Revised Transportation and Circulation Element of the Town of Mammoth Lakes General Plan contains no objectives or policies applicable to this analysis (MCLTC, *et al.* 2001).

#### **3.13.2 Affected Environment**

##### *Transportation*

Regional access to the Project area is via U.S. Highway 395, a four-lane conventional highway/expressway. U.S. Highway 395 is the major eastern Sierra north-south artery serving local residents and commercial and recreational travelers from southern California to west central Nevada and further north. The current level-of-service (LOS) is "A" (free flow) in both directions from the Project area and is not predicted to degrade over the next 20 years (Caltrans 2000). U.S. Highway 395 runs north-south through the eastern end of the Project area (see Figure 1). Annual average daily traffic (AADT) was 5,500 vehicles in 1997 south of the intersection with State Route 203, and was estimated to grow to 7,850 vehicles by 2020 (Caltrans 2000). North of State Route 203, AADT was 4,100 vehicles in 1997, predicted to grow to 5,850 vehicles by 2020. The design LOS for U.S. Highway 395 is an LOS of "B."

State Route 203 links U.S. Highway 395 with the Town of Mammoth Lakes along the southern edge of the Project area (see Figure 1). In this area State Route 203 is a four-lane conventional highway. AADT in the areas south of the Project in 2003 was about 8,000 vehicles (Caltrans 2004).

Primary access to the Project area would be off State Route 203, via either Sawmill Road (Forest Road 3S25) or Sawmill Cutoff Road (Forest Road 3S08) (see Figure 1). Sawmill Road is an improved dirt road. Sawmill Cutoff Road is an improved gravel road which is paved from the Town of Mammoth

Lakes to Shady Rest Park. Alternate access to the Project area would be south on Sawmill Cutoff Road from its intersection with U.S. Highway 395 about three miles north of the Project area.

There are no counts of traffic use on either Sawmill Road or Sawmill Cutoff Road (USDI, BLM 2005). However, use is believed to be very light, with no more than a few vehicles per hour. During the summer months, traffic on Sawmill Road and Sawmill Cutoff Road consists of passenger vehicles, small trucks, motor cycles, ATVs, bicycles and pedestrians. During the winter months, when snow is on the roads, traffic decreases. There is use by snowmobiles, cross-country skiers and Nordic skiers on both Sawmill Cutoff Road and Sawmill Road, with the use of Sawmill Cutoff Road being much greater (see Section 3.10.2).

Access to construct most of the pipeline would be over existing designated and undesignated USFS roads. Pipeline construction in Section 25, Section 36, and the western half of Section 31 would be accessed via Sawmill Road. Antelope Spring Road and Casa Diablo Cutoff Road would provide access to construct most of the pipeline east of U.S. Highway 395.

### Public Services

Law enforcement responsibilities are shared by the Mammoth Lakes Police (inside the boundaries of the Town of Mammoth Lakes) and the Mono County Sheriff (outside the Town boundaries). The California Highway Patrol has the primary responsibility for traffic control and accident investigation on state highways and county roads.

Responsibility for fire protection services within the Project area is shared by Inyo National Forest, the Town of Mammoth Lakes and the Long Valley Fire Protection District, depending on the location. All jurisdictions also have mutual aid agreements.

Hospital services, including 24-hour emergency care, are available from Mammoth Hospital, a 15-bed facility located in the Town of Mammoth Lakes. Paramedic and ambulance service are provided by Mono County Paramedics and the Long Valley Fire Protection District.

The Mammoth School District provides elementary and secondary education for the local area.

Mammoth Community Water District provides water supply and waste water treatment within the Town of Mammoth Lakes. However, the Project area is outside of the service area for both services. Telephone service in the area is provided by Verizon Communications, Inc. Commercial solid waste collection is available for pick-up by a local contractor. The nearest landfill, located at Benton Crossing Road, handles non-hazardous solid wastes for landfill and source-separated waste for management through its waste diversion program. The remaining capacity of the Benton Crossing Landfill should accommodate the waste disposal requirements of the service area through the year 2023 (Mono County Planning Department 2004).

Southern California Edison (SCE) provides electrical service to the general area, including the Casa Diablo geothermal power plants and Shady Rest Park. SCE also owns and operates an above-ground 33-kV electric transmission line (mounted on wooden poles, with a 12.5-kV distribution line and a fiber optic line built underneath) that runs roughly east-west through the Project area (see Figure 12).

**3.13.3 Environmental Consequences**

*CEQA Significance Criteria*

*Transportation*

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

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system;
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to design feature or incompatible uses;
- Result in inadequate emergency access;
- Result in inadequate parking capacity; or
- Conflict with adopted policies, plans, or programs supporting alternative transportation.

The Project area is not located in the vicinity of any airport or private airstrip, and would not create any hazards or changes to air traffic patterns. No policies, plans or programs supporting alternative transportation are applicable to the Project area:

*Public Services*

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

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments; and
- Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.
- Fail to comply with federal, state, or local statutes or regulations related to wastewater or solid waste; or
- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, or the



construction of which could cause substantial environmental impacts in order to maintain acceptable public service ratios, response times or other performance objectives for fire protection, police protection, schools, parks or other public facilities.

The Project would not produce wastewater or storm water for treatment by public systems. The Project also would require a negligible amount of water from public systems to construct, maintain and decommission, and no water to operate.

### Environmental Consequences of the Proposed Action

#### *Transportation*

During construction, decommissioning and well maintenance activities, 15 to 20 small trucks/service vehicles/worker vehicles and two to three large trucks likely would travel each day to the Project area each day during these short-term activities. Thus volume of traffic is less than 0.4 percent of the current AADT and would be easily accommodated on U.S. Highway 395 and State Route 203 without a reduction in the level-of-service. This volume of traffic also would easily be accommodated on the local access roads, like Sawmill Road and Sawmill Cutoff Road.

During normal operations the well sites and pipeline would be inspected once each 12-hour work shift. Traffic associated with Project operations would be negligible.

The Project has committed to maintain Sawmill Road and Sawmill Cutoff Road during construction, maintenance and decommissioning operations to ensure that the road beds are maintained in a condition of at least equal to pre-Project conditions (see Appendix B and Appendix C). The Project also has committed that Project vehicles would not block Sawmill Road or Sawmill Cutoff Road by either waiting or parking on either road. An off-site, local location would be provided for the long term waiting or parking of vehicles. The pipeline also would be constructed under existing roads it must cross to allow continued public access. During construction, public access along any road likely would be restricted for only a couple of hours. Appropriate traffic controls would be in place during any construction within the roadbed or adjacent shoulders of each road to warn and control traffic.

The adverse effects of these Project impacts on transportation are minor, and there would be no residual impacts.

The adverse effects of these impacts also are below the level of significance under CEQA because they do not cause an increase in traffic which is substantial and would not exceed the established level-of-service standard. By parking off of existing roads, the Project would not increase hazards, would not result in inadequate emergency access, and would not result in inadequate parking capacity. No mitigation measures are required.

#### *Public Services*

Existing police protection, school, park and other government facilities would be adequate as relatively few workers would be involved in construction, maintenance and decommissioning activities for only two to three months, and no new workers would be required for operations. Project activities would create a small increase in the potential risk of wildland fires (see Section 3.15.3). The Project has proposed several

measures to minimize the risk of fire (see Appendix B). The Project should create no need for new or expanded fire protection services.

The Project would create little solid waste. Solid wastes generated during construction, maintenance and decommissioning would either be collected by a licensed waste hauler or transported by MPLP and deposited at a facility authorized to receive and dispose of these materials. No solid wastes would be generated during operations.

The amount of water required for Project construction, maintenance and decommissioning would be very small, and would not require the use of potable water from the MCWD (see Section 3.3.3). The Project would generate the electricity required for all activities, and no additional connection to SCE service would be required. The Project also has committed to consult with SCE concerning the final route of the pipeline to ensure that adverse effects to either the pipeline or SCE's transmission line are avoided (see Appendix B). The Project also has agreed that should conflicts not able to be resolved between the two parties, any dispute would be brought to the BLM and USFS.

MPLP staff receives training in fire prevention and the control of small fires which may occur in connection with MPLP operations. MPLP staff also would contact the responsible local fire fighting agency even if MPLP personnel could handle the situation or the fire poses no threat.

The adverse effects of these Project impacts on public services are minor, and there would be no residual impacts.

The adverse effects of these impacts also are below the level of significance under CEQA because the Proposed Action would not result in substantial adverse physical impacts associated with the provision of public services. The Project also would be served by a landfill with sufficient permitted capacity, and would not fail to comply with applicable statutes or regulations related to wastewater or solid waste. No mitigation measures are required.

### Environmental Consequences of the Alternative Pipeline Route

#### *Transportation*

The impacts to transportation from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

#### *Public Services*

The impacts to public services from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

#### No Action Alternative

The Project would not be constructed if the No Action Alternative were selected. Thus, there would be no effects on transportation or public services from the No Action Alternative.

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### **3.14 SOCIOECONOMICS**

#### **3.14.1 Regulatory Framework**

##### *Environmental Justice*

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994), requires federal agencies to analyze the effects of their decisions on human health and environmental conditions in minority and low-income communities. EPA's *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (EPA 1998) suggests a screening process to identify environmental justice concerns. If either of the following criterion of the two-step process is unmet, there is little chance of environmental justice effects occurring.

- Does the potentially affected community include minority and/or low-income populations?
- Are the environmental impacts likely to fall more heavily on minority and/or low-income members of the community and/or tribal resource?

#### **3.14.2 Affected Environment**

For this analysis, socioeconomic information on population, housing, employment, and ethnic composition is presented for both Mono County and the Town of Mammoth Lakes, as available.

As of the year 2000 census, Mono County had a total population of 12,853. The Town of Mammoth Lakes is a population center within this county having a year 2000 population of 7,093 (U.S. Census Bureau 2004a and 2004b).

As of the year 2000 census, Mono County had 11,757 housing units. Approximately 44 percent of these units were occupied, and 56 percent were unoccupied. Nearly 50 percent of the vacant units were for seasonal, recreational, or occasional use. The median value of owner-occupied units was \$236,300 (U.S. Census Bureau 2004a). The Town of Mammoth Lakes had 7,960 housing units. Approximately 35 percent of these units were occupied, and 65 percent were unoccupied. Nearly 58 percent of the vacant units were for seasonal, recreational, or occasional use. The median value of owner-occupied units was \$298,600 (U.S. Census Bureau 2004b).

The labor force for Mono County was estimated in the year 2000 to be 7,776 persons. Mono County's leading employers included the management, professional and related industries (35.4 percent); the service industry (23.0 percent); and the sales and office industry (21.7 percent) (U.S. Census Bureau 2004a). The labor force for the Town of Mammoth Lakes was estimated in the year 2000 to be 4,586 persons. The Town's leading employers included the management, professional and related industries (34.2 percent); the service industry (26.1 percent); and the sales and office industry (21.8 percent) (U.S. Census Bureau 2004b).

The median household income for Mono County was estimated in the year 2000 to be \$44,992, with 11.5% of persons below the poverty level (U.S. Census Bureau 2004a). The median household income for the Town of Mammoth Lakes was estimated in the year 2000 to be \$44,570, with 14.4% persons below

the poverty level (U.S. Census Bureau 2004b). The median household income for the State of California was \$47,493, with 14.2% persons below the poverty level (U.S. Census Bureau 2004c).

The 2000 census documents that both the Town of Mammoth Lakes and Mono County are overwhelmingly White (83.2 and 84.2 percent, respectively). These percentages are much larger than that for the State of California (59.5 percent). A far smaller percentage of persons in the Town of Mammoth Lakes and Mono County identified themselves as a minority race (Black, American Indian, Asian, or Native Hawaiian or Pacific Islander) (2.3 and 4.1 percent, respectively) than in the State as a whole (18.9 percent). The Hispanic population percentages in the Town of Mammoth Lakes and Mono County are comparable (22.2 and 17.7 percent, respectively). Both are much smaller than the Hispanic population percentage in the State of California (32.4 percent) (U.S. Census Bureau 2004a, 2004b, and 2004c).

### **3.14.3 Environmental Consequences**

The CEQ regulations implementing NEPA (Section 1508.14) state that “...*economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.*”

#### CEQA Significance Criteria

The CEQA Guidelines (Section 15382) state that an “economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.” CEQA Guidelines Sections 15064(e) and 15131 state that where a physical change is caused by the economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project.

Appendix G to the CEQA Guidelines also provides guidance as to when impacts to population and housing may result in significant effects. The following effects could be considered significant under CEQA if the Project would:

- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere;
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere; or
- Physically divide an established community.

#### Environmental Consequences of the Proposed Action

##### *Project Construction, Operation, Maintenance and Decommissioning*

The pipeline construction workforce is expected to consist of approximately ten to fifteen workers. An additional crew of less than ten workers would work on installation of the wellhead facilities and the pipeline road crossings at the same time. Construction of the pipeline and wellhead facilities is anticipated

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to occur over approximately two to three months. Some of these workers would be recruited locally, though most would be specialized craft workers from outside of the local area. Typically, non-local skilled craft workers do not bring families with them on these short-term construction assignments. Therefore, most are expected to stay in local hotels or rental housing units. Since there are over 4,600 recreational or occasional use housing units in the local area alone, construction would place a negligible, temporary demand on housing.

Normal well and pipeline operations would be conducted by existing MPLP staff. No additional operating personnel would be required. Temporary contract workers would be brought in to conduct major well maintenance work, if necessary. The number of workers, and the time involved, would be similar to that of the original drilling, and less than half that required for Project construction. The number of workers and time involved in decommissioning the Project is expected to be similar to but less than that of construction. These activities also would place a negligible, temporary demand on housing.

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 be constructed in an uninhabited, open space area, and so would not displace substantial numbers of people or existing housing. Finally, the pipeline would be constructed below grade at each road crossing to ensure continued access to both sides, and would not physically divide any community. Thus, the adverse effects of these activities are considered to be below the level of significance under CEQA. No mitigation measures are required.

### *Environmental Justice*

The minority population percentages in the Town of Mammoth Lakes are not “meaningfully greater” than the minority population percentages in Mono County or the State of California. Neither are the low-income population percentages for the Town of Mammoth Lakes “meaningfully greater” than those of Mono County or the State of California. Thus, a minority population does not exist in the “affected area” of the Town of Mammoth Lakes (or Mono County as a whole). Therefore, there is little likelihood of environmental justice effects occurring.

### *Beneficial Effects*

The non-local construction workers typically are paid a *per diem* rate for daily housing and meal costs. Workers normally spend the *per diem* on motel accommodations or RV campground space rent, restaurants, groceries, gasoline, and entertainment. In addition, MPLP likely would purchase or rent some portion of the equipment and supplies required to construct the pipeline and well site facilities (such as fuel and tools) from local suppliers. This spending activity associated with the Project construction would have a small, positive effect on local businesses in Mono County.

In addition, half of the royalties paid to the federal government from the geothermal fluid produced by the Project are returned to the State of California. Forty percent of these royalties are returned to Mono County. This would be a direct beneficial effect of the Project.



*Environmental Consequences of the Alternative Pipeline Route*

The impacts on socioeconomics and environmental justice from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route, and the significance of these impacts under CEQA, would be identical to those described for the Proposed Action.

*Environmental Consequences of the No Action Alternative*

The No Action Alternative would result in the loss of the beneficial socioeconomic effects associated with the Project.

### **3.15 HEALTH, SAFETY AND HAZARDOUS MATERIALS**

#### **3.15.1 Regulatory Framework**

BLM geothermal orders provide general guidance for the protection of health and safety from pipelines and other surface facilities. Inyo National Forest management directions and Mono County policies applicable to the project area focus on the prevention and control of wildfires. The State of California implements state and federal laws and regulations for the management of hazardous wastes.

##### *Bureau of Land Management*

All federal geothermal lessees must comply with BLM Geothermal Resources Operational (GRO) Orders. GRO Order No. 6 (Pipelines and Surface Production Facilities) provides minimum design and construction requirements for geothermal pipelines and surface facilities to ensure safe operations. GRO Order No. 6 also requires pipeline integrity testing, safety device testing, and operator monitoring as necessary to minimize any danger to human life or health.

GRO Order No. 4 (General Environmental Protection Requirements) also contains requirements to protect public health and safety. GRO Order No. 4 requires lessees to protect the public from any hazardous geothermal or related activities, comply with all applicable standards for the disposal of wastes, and provide safeguards to minimize accidental fires.

##### *Inyo National Forest*

The Inyo National Forest Land and Resource Management Plan (LRMP) provides management directions for all areas of the Inyo National Forest. The management direction for "protection" within the concentrated recreation area prescription (#12) and developed recreation sites prescription (#15) applicable to the Project area is to control all wildfire (USDA, Forest Service, Inyo National Forest 1988).

##### *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 will be properly collected, recycled and disposed.

##### *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 three miles west of the Project area, and State Route 203, located south of the Project area, are the major evacuation routes for area residents.

### 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.

### **3.15.2 Affected Environment**

The Project area is rural in character, but is adjacent to the Town of Mammoth Lakes. Health and safety issues focus on the potential hazards of the geothermal fluid, wildfire and hazardous materials and waste.

### Geothermal Fluids

The geothermal fluids produced by the Project should be very similar to those produced from the Casa Diablo geothermal wells 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.

### Fire Hazards

Wildland fires are a substantial concern in the Inyo National Forest, especially in the areas near the Town of Mammoth Lakes. The Project area is part of the Wildland Urban Interface (WUI) area which surrounds the Town of Mammoth Lakes. Within this area special precautions must be taken to protect the safety and welfare of the Town of Mammoth Lakes and the forest visitors and permittees. Inyo National Forest recently implemented the Mammoth Rehab Fuelbreak Project, which is a system of fuelbreaks constructed on USFS land adjacent to the Town of Mammoth Lakes. Much of this treated land is located within the Project area along Sawmill Road, Sawmill Cutoff Road, other roads within the Project area and areas south of Shady Rest Park.

### Hazardous Materials and Wastes

The Project area generally has few health and safety risks associated with hazardous materials and wastes. Existing land uses are primarily recreation and grazing, which require few hazardous materials and produce few hazardous wastes. The existing geothermal power plants at Casa Diablo cycle large amounts of isobutene, a flammable liquid, as the working fluid to transfer the heat from the geothermal fluid to the turbines. These projects also store and use other petroleum-based products, such as fuel (gasoline and diesel fuel) and lubricants (oils and greases). They also produce small quantities of hazardous wastes (waste oils and some geothermal scale).

**3.15.3 Environmental Consequences**

The Plan of Operations (POO) submitted to the BLM for approval of the Project by MPLP contains several field contingency and emergency plans which would protect public health and safety.

- Well Blowout Contingency Plan.
- Injury Contingency Plan.
- Fire Contingency Plan.
- Spill or Discharge Contingency Plan.
- Hazardous Gas Contingency Plan.
- Well Blowout Action Plan for Drilling.
- Well Blowout Action Plan for Pulling and Running Well Pumps.

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 is located about one mile from the closest well site and potential pipeline location.

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 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 evacuation routes are within the Project area.

### Environmental Consequences of the Proposed Action

#### *Geothermal Fluid Releases*

Geothermal fluid could be accidentally released to the environment as a result of spills on the well sites or power plants, pipeline failure or uncontrolled releases from the wells ("well blowouts"). Small spills on the well or power plant sites would not represent a threat to public health or safety. The geothermal fluid and gases do not contain any components at concentrations which could be potentially harmful, and the public would not be exposed to hot geothermal fluids because the sites are fenced. The Project's contingency plans direct how these spills would be contained and cleaned up.

Larger discharges of geothermal fluids are extremely unlikely for many reasons, including frequent inspections, ultrasonic testing of the pipeline, flow and pressure monitoring and automatic well pump and pipeline valve shutdown features (see Section 2.1.5 and Appendix B). There have never been any leaks from, or failures of, any of the production pipelines at Casa Diablo over the 20-year life of this project. However, if a large discharge of geothermal fluid occurred it could pose a threat to public health and safety from the high temperature of the geothermal fluid. Geothermal fluids produced from the wells and carried in the pipeline would be at a temperature of about 325°F. (Since the wellheads are fenced and the pipeline is insulated, there is no chance for the public to come into contact with these high temperatures during normal operating conditions.) However, once the geothermal fluid was released to the environment, such as from a rupture of the pipeline or a well blowout, some of the fluid would flash to steam. The temperature would immediately drop to the temperature of boiling water, or about 200°F (at this elevation). Geothermal fluid discharged to the surface would continue to cool over time, likely reaching a safe temperature (below 125°F) within a few minutes.

Anyone within the immediate vicinity (possibly up to 50 feet) of the point of discharge could suffer burns and the possibility of serious injury if the initial first seconds of geothermal fluid discharge were pointed directly at them. The potential adverse health and safety effects of a major discharge of geothermal fluid would more likely be the risk of scalding injury to anyone directly contacting the hot geothermal fluid before it cooled below about 125°F.

Any discharged geothermal fluids that exceeded on-site containment would follow the local topography down gradient. As described in Section 3.3.2, the Project area east of drill site 35-31 and west of Antelope Spring Road would drain overland toward Murphy Gulch. The rest of the Project area would drain toward the Basalt Canyon drainage, which is directly tributary to the Casa Diablo projects' existing 1,600,000 gallon emergency spill containment basin. This includes the Project areas west and north of Shady Rest Park, which drain through the park to the east. In the very unlikely event that the pipeline ruptured or a well blew out to the west or north of the park, park users could be exposed to a flowing stream of geothermal fluid in or near the park which could still be hot enough to cause scalding.



This potential adverse impact is considered below the level of significance under CEQA because this discharge is extremely unlikely to occur and the changes of substantial injury to the public are small. Thus, it 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.

MPLP's emergency contingency plans provide for controlling public access to areas made hazardous from well blowouts, but there is no discussion of warning or evacuating the public and no equivalent contingency plan for major spills from pipelines. The following measures are proposed to further reduce the potential adverse effects of a major geothermal fluid spill, should it occur. Following implementation of these measures, the residual risk to public safety would be minor because these discharges are extremely unlikely to occur and the changes of injury to the public are small.

*HAZ Measure 1:* The operator shall amend the well blowout contingency plan to include the emergency actions to be taken by operator's employees and contractors to alert or evacuate, as may be necessary and in coordination with emergency agencies and officials, users of Shady Rest Park and dispersed recreational users of the Project area in the event that they are down gradient of any off-site geothermal fluid flow resulting from a well blowout.

*HAZ Measure 2:* The operator shall prepare, submit to the authorized officer, and put into effect a pipeline rupture contingency plan to detail the emergency actions to be taken by operator's employees and contractors in the event of a substantial spill of geothermal fluid from a ruptured pipeline.

### *Fire Hazard*

Project activities would create a risk of wildland fires. Pipeline construction and decommissioning requires the extensive use of welding and metal cutting equipment. Construction vehicles would be driving directly over 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 B), 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 Project also has prepared and submitted to the BLM a Fire Contingency Plan, which would be enforced during the fire season (typically May 1 through October 31).

This 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. No mitigation measures are required.

### *Hazardous Materials and Wastes*

Small quantities of hazardous materials are expected to be transported and used during Project construction and decommissioning. These would include gasoline and diesel fuels, lubricants, hydraulic fluid and compressed gases. During operations each well site would have one or more drums of

lubricating oil or water and one or more drums of glycol (anti-freeze)/water mixture housed in the motor control building. Larger quantities of these same hazardous materials, as well as hazardous materials specific to the activity, would be transported and used on the well sites during any required well maintenance activities. (These were discussed in the Upper Basalt Geothermal Exploration Project environmental assessment.) Other hazardous materials which might be used by the Project likely would be stored at the existing power plants. These include various maintenance and cleaning supplies (paints, oils, solvents, and cleaning compounds). No hazardous waste is expected to be generated by the Project operations.

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 very small potential for public safety-related impacts due to the transport of hazardous chemicals to the Project site via public highways and access roads.

This impact 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. No mitigation measures are required.

*Alternative Pipeline Route*

The health and safety impacts from construction, operation, maintenance and decommissioning of the Alternative Pipeline Route would be the same as those described for the Proposed Action, as would the significance of these impacts under CEQA. The measures proposed to reduce the potential adverse impacts of the Proposed Action also would be applicable to the Alternative Pipeline Route.

*No Action Alternative*

The Project would not be constructed if the No Action Alternative is selected. As such, there would be no effects on human health and safety from the No Action Alternative.

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**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

## **4 CUMULATIVE EFFECTS**

Both NEPA and CEQA require the consideration of cumulative impacts for a proposed action or project. CEQ regulations (40 CFR 1508.7) implementing NEPA define a cumulative impact.

“Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency (Federal or non-Federal) or person undertakes such other action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”

CEQA Guidelines (Section 15355) state a similar 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.”

The BLM NEPA Handbook provides no specific direction or guidance as to the methodology for the cumulative impact analysis. The Forest Service’s Environmental Policy and Procedures Handbook, Chapter 10, Section 15.1, restates the NEPA definition of cumulative impact. It also states the need to conduct the analysis regardless of the land ownership boundaries. (i.e., the necessity of considering the “reasonably foreseeable related future actions of the USFS, as well as those of other agencies and individuals”).

CEQA Guidelines Section 15130(b)(1) provides two alternative methods to analyze cumulative impacts. For this environmental document, the methodology suggested in Section 15130(b)(1)(A) is followed. A list of past, present, and reasonably foreseeable future projects that would be expected to produce related or cumulative impacts has been used to determine cumulative effects.

#### **4.1 EXISTING, PROPOSED, AND REASONABLY FORESEEABLE PROBABLE FUTURE PROJECTS**

Three types of projects have been identified as existing, proposed and reasonably foreseeable probable future projects for this cumulative impact analysis. They are geothermal exploration and development projects, non-geothermal private projects, and agency projects. Figure 31 shows the locations of these projects. Table 4 provides a summary and status of the projects considered in this cumulative impact assessment.

##### **4.1.1 Geothermal Exploration and Development Projects**

Casa Diablo Geothermal Development Projects: The existing Casa Diablo geothermal development projects consist of the MP I, MP II and PLES I projects owned and operated by MPLP at Casa Diablo, northeast of the intersection of U.S. Highway 395 and State Route 203, within the Project area (see Section 1.3 and Figure 1). About 15 acres on 1,320 acres of federal and private geothermal leases east of U.S. Highway 395 is occupied by the power plants, access roads, geothermal wells and pipelines (see Figure 3).

These 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.

All of the produced geothermal fluid is typically injected into the geothermal injection reservoir. However, a supplemental evaporative cooling system using geothermal injection fluid has been successfully tested at the MP I power plant. This system, which will now be used on the MP I plant on a regular basis during the warmer days during the late-spring to early fall, would consume about one percent of the circulating geothermal fluid when in use.

The projects emit few air pollutants. Fugitive isobutane, which is used as the binary working fluid to turn the turbines after being heated by the geothermal fluid, is emitted from the power plants. Small quantities of carbon dioxide, and very small amounts of hydrogen sulfide, would be emitted to the air when the geothermal injection fluid is used in the new supplemental evaporative cooling system. All of the rest of the geothermal fluid is circulated in a closed system which prevents the emission of any of the geothermal gasses.

Basalt Canyon Geothermal Exploration Project: The Basalt Canyon Geothermal Exploration Project consists of two geothermal resource exploration drilling projects proposed by MPLP (see Section 1.3). About 3 acres on 740 acres of federal geothermal leases west of U.S. Highway 395, and mostly within the Project area, would be disturbed by the drill sites and access roads for the project (see Figure 3).

Construction of the drill sites and drilling of the slim holes and wells would consume a total of less than ten acre-feet of water (BLM and USFS 2002). The water would be obtained from one or more of four different potential water sources: Casa Diablo projects service water, Casa Diablo power plant geothermal injection fluid, Mammoth Community Water District (MCWD) reclaimed water, or MCWD municipal water.



Little, if any, geothermal fluid would be consumed during well flow tests. During drilling, the drill rig engines would emit diesel combustion emissions, including some air toxics. During flow tests, small quantities of carbon dioxide, and very small amounts of hydrogen sulfide, would be emitted to the air.

Upper Basalt Geothermal Exploration Project: The Upper Basalt Geothermal Exploration Project consists of a geothermal resource exploration slim hole and well drilling program also proposed by MPLP (see Section 1.3). About 9 acres on 1,040 acres of federal geothermal leases west of U.S. Highway 395, and also mostly within the Project area, would be disturbed by the drill sites and access roads for the project (see Figure 3).

Construction of the drill sites and drilling of the slim holes and wells would consume a total of less than ten acre-feet of water (USDI, BLM 2005). The water also would be obtained from one or more of four different potential water sources: Casa Diablo projects service water, Casa Diablo power plant geothermal injection fluid, Mammoth Community Water District (MCWD) reclaimed water, or MCWD municipal water.

Like the Basalt Canyon Geothermal Exploration Project, little, if any, geothermal fluid would be consumed during well flow tests. During drilling, the drill rig engines would emit diesel combustion emissions, including some air toxics. During flow tests, small quantities of carbon dioxide, and very small amounts of hydrogen sulfide, would be emitted to the air.

Rhyolite Plateau Geothermal Exploration Project: The Rhyolite Plateau Geothermal Exploration Project consists of a geothermal resource exploration slim hole and well drilling program proposed by MPLP (MPLP 2003). The project is proposed on 2,240 acres of federal geothermal leases located northwest of the Upper Basalt Geothermal Exploration Project, west of U.S. Highway 395 and the Project area (see Figure 31). About 20 acres would be disturbed if all eleven slim hole drill sites and eleven well sites, and the few short access roads, were constructed for the project.

Construction of the drill sites and drilling of the slim holes and wells would consume a total of about 70 acre-feet of water. Like the other MPLP geothermal exploration projects, the water also would be obtained from one or more of four different potential water sources: Casa Diablo projects service water, Casa Diablo power plant geothermal injection fluid, Mammoth Community Water District (MCWD) reclaimed water, or MCWD municipal water.

Unlike the other MPLP geothermal exploration projects, most of the Rhyolite Plateau Geothermal Exploration Project is located in the Dry Creek drainage basin, and not in the Mammoth Creek drainage basin (see Figure 8).

Although more wells are proposed to be drilled and flow-tested than the other geothermal exploration projects, there would still be little geothermal fluid consumed during well flow tests. As with the other geothermal exploration projects, during drilling the drill rig engines would emit diesel combustion emissions, including some air toxics. During flow tests, small quantities of carbon dioxide, and very small amounts of hydrogen sulfide, also would be emitted to the air.

MPLP's exploration of these geothermal leases may identify additional geothermal resources which could support a new power plant and well field. Any proposal by MPLP to develop a new power plant and

geothermal well field would be evaluated at that time by an Environmental Impact Statement with full public review.

### **4.1.2 Non-Geothermal Private Projects**

Snowcreek Golf Course Expansion: The Snowcreek Golf Course Expansion would increase the existing 9-hole Snowcreek Golf Course to an 18-hole course (USDA, Forest Service, Inyo National Forest 1995). The expansion includes construction and maintenance of clubhouse facilities, parking areas, a practice range, playing areas, water hazards and irrigation systems. It would be built on 95 acres of land located south of the Project area and the Town of Mammoth Lakes which was acquired from the USFS through a land exchange (USDA, Forest Service, Pacific Southwest Region 2003) (see Figure 31). When the expansion is completed, the maximum total surface disturbance would be about 70 acres. Water required for all of the proposed activities would total a maximum of about 134 acre-feet annually. Fugitive dust would be emitted to the air during construction.

Mammoth Yosemite Airport Expansion Project: The Mammoth Yosemite Airport Expansion Project involves extending and widening the runway at the existing airport, located on the north side of U.S. Highway 395 approximately seven miles east of the Town of Mammoth Lakes (see Figure 31). The project also would replace various facilities of the airport, primarily in the vicinity of the passenger terminal area (FAA 2003), and construct commercial lodging facilities for transient guests (Town of Mammoth Lakes 2001). The project would create a regional airport facility capable of landing larger commercial jet aircraft. About 37 acres of new surface disturbance would be created within the boundaries of the 450-acre site. The annual water requirement for operation of the terminal is estimated at 18 acre-feet. Airport expansion construction would result in fugitive dust emissions, and operation of the airport would result combustion emissions from the jet aircraft.

Sierra Business Park: The Sierra Business Park is an approved 36-acre light industrial development located directly opposite the entry road to Mammoth Yosemite Airport (see Figure 31). It is located on private property previously used as a borrow site for aggregate materials (Mono County Planning Department 2000). As approved, the site would be subdivided into 37 lots, each of which would be individually developed. Grading and installation of site improvements are currently underway. Total water demand is estimated to range from a low of about five acre-feet per year to a high of as much as 20 acre-feet per year.

### **4.1.3 Agency Projects**

Mammoth Rehab Fuelbreak Project: Inyo National Forest is constructing and maintaining a system of fuelbreaks adjacent to the Town of Mammoth Lakes (Perloff 2002). A total of about 895 acres of USFS land would be treated by thinning the forest in a “clumpy” pattern, removing all of the shortest trees and much of the understory. In the areas of sage habitat, the brush would be thinned to about 65 percent cover. Fuelbreaks would be about 300 feet wide and extend 150 feet on either side of the Scenic Loop Road (Forest Road 3S23), Sawmill Cutoff Road (Forest Road 3S08), and Forest Roads 3S24, 3S33, 3S34, 3S35, and 3S48 (see Figure 31). Next to Sawmill Road (Forest Road 3S25), the fuelbreak would be up to 1,500 feet wide and extend south of the road to the edge of the timber. Negligible water would be required for this project, which also would result in little air pollution.

## Basalt Canyon Geothermal Pipeline Project EA/Draft EIR

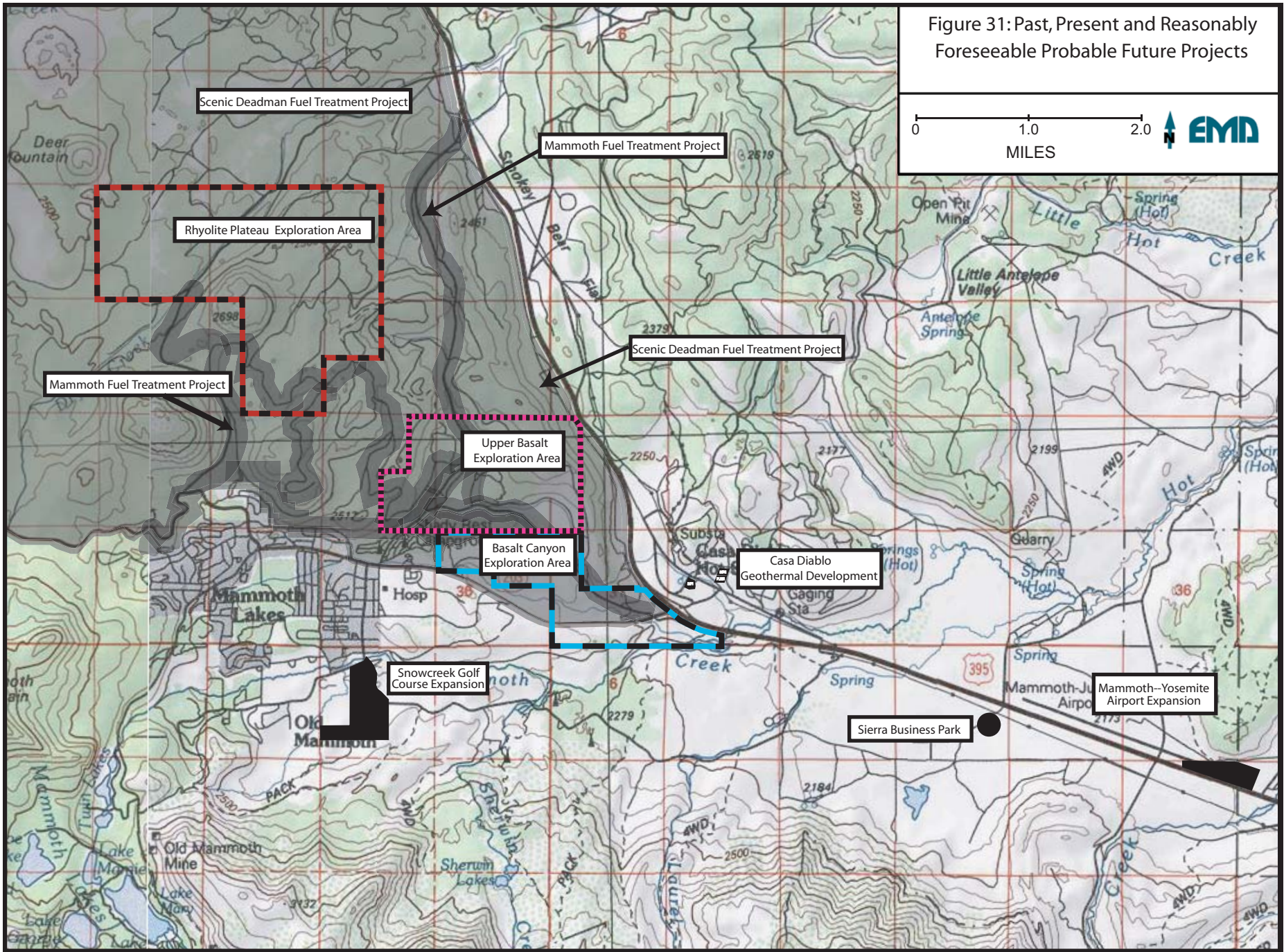
**Scenic Deadman Fuelbreak Project:** The Scenic Deadman Fuelbreak Project is proposed by the USFS on about 17,200 acres of forest (USDA, Forest Service, Inyo National Forest 2003). The project area is bounded by U.S. Highway 395 on the east, State Highway 203 and the Town of Mammoth Lakes on the south, the Inyo Volcanic Chain to the west, and State Highway 158 (south) and June Lake Junction to the north. It would utilize prescribed fire and thinning techniques to reduce fuels, improve wildlife habitat, and reduce wildland fire severity. This project would be implemented over the next twenty years as ambient conditions permit. Negligible water would be required for this project. Prescribed fires would create some air pollution emissions.

Table 4: Summary and Status of Past, Present and Reasonably Foreseeable Probable Future Projects

Project	Area Disturbed or Treated	Water Use	Project Status
<b>Geothermal Projects (Disturbed Area):</b>			
Basalt Canyon Geothermal Pipeline Project	8 acres	Negligible	Proposed Action
Casa Diablo Geothermal Development Projects (MP I, MP II and PLES I)	15 acres	Negligible	Operating since 1984
Basalt Canyon Geothermal Exploration Projects	3 acres	10 acre-feet (total)	Initiated in 2003
Upper Basalt Geothermal Exploration Project	9 acres	19 acre-feet (total)	Approved
Rhyolite Plateau Geothermal Exploration Project	15 acres	70 acre-feet (total)	Proposed
<b>Non-Geothermal Private Projects (Disturbed Area):</b>			
Snowcreek Golf Course Expansion	70 acres	134 acre-feet/year	Approved
Mammoth-Yosemite Airport Expansion	37 acres	18 acre-feet/year	Proposed
Sierra Business Park	36 acres	5-20 acre-feet/year	Approved
<b>Agency Projects (Treated Area):</b>			
Mammoth Rehab Fuelbreak	895 acres	Negligible	Initiated in 2003
Scenic Deadman Fuelbreak	17,200 acres	Negligible	Proposed



Figure 31: Past, Present and Reasonably Foreseeable Probable Future Projects



## **4.2 EVALUATION OF POTENTIAL CUMULATIVE EFFECTS**

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 hazardous and noise, may be cumulative only within the Project area. 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.

The analysis of cumulative effects conducted below does not identify any impact of the Project on the environment which, when added to the identified past, present, and reasonably foreseeable probable future actions described above, would be collectively significant, or are considerable, or which substantially compound or increase other environmental impacts.

### **4.2.1 Geology, Soils and Mineral Resources**

Within the 1,660-acre Project area, about 28 acres of soils would be disturbed by the Proposed Action and the other geothermal projects and “lost” until reclaimed following completion of the projects. Each of these projects is required to salvage topsoil, as feasible, and de-compact subsoils as part of reclamation prior to the replacement of the topsoil. Each is also required to implement USFS and State of California best management practices (BMPs) for storm water to prevent erosion and sedimentation. Additional minor soil disturbance likely would occur over the entire Project area from the Proposed Action and the Mammoth Rehab and Scenic Deadman Fuelbreak projects as a result of mechanical equipment being used over the existing vegetation without removing the vegetation. Much of the Scenic Deadman Fuelbreak project would take place in the Dry Creek drainage, where any impacts to soils or erosion or sedimentation would not add to impacts from the Project area.

Because soils in the Project area have low to moderate soil erosion hazard, and because of the small amount of surface disturbance and the required protection measures, these projects would not result in any cumulatively substantial soil erosion or the loss of substantial topsoil. There should be no cumulative residual impacts to soils following reclamation of each of the projects within the Project area.

There would be no cumulative increase in the potential hazards due to seismic ground shaking, fault offset, volcanic eruption or unstable ground from these projects within the Project area. There are no known valuable mineral resources which would be made unavailable by these projects (the usable aggregate resources were previously mined from the site of the Sierra Business Park).

As a result, the cumulative impacts to soils, geology and mineral resources would be below the level of significance under CEQA.



#### **4.2.2 Hydrologic and Geothermal Resources**

Surface water quality within the Mammoth Creek watershed could be adversely affected from storm water runoff carrying sediment eroded from areas disturbed by the cumulative projects being considered or spills of materials from these projects. Ground water quality within this same area could also be adversely affected by the application or spills of materials. Since much of the Scenic Deadman Fuelbreak project would take place in the Dry Creek drainage, impacts from storm water runoff or spills would not add to any impacts from the Project area.

Each of the cumulative projects is required to implement USFS and/or State of California best management practices (BMPs) for storm water to minimize erosion and sedimentation. Each of the projects located on forest lands must also comply with the SNFPA ROD measures to implement best management practices to prevent erosion and sedimentation and protect any RCAs from sediment during flood flows (USDA, Forest Service 2004).

Individual project implementation of a spill prevention programs limits the potential for, and adverse effects to surface or ground waters of, spilled materials. This would include geothermal fluids from the geothermal projects; reclaimed water, fertilizers or pesticides from the golf course; or fuels, lubricants or other chemicals from any of the projects.

Because of these measures, the cumulative impacts to water quality from sedimentation and spills would be minor. There should be no substantial cumulative residual impacts to water quality.

The Project would use a negligible amount of water, and would not contribute to any potential cumulative adverse impact to surface water or ground water quantity.

Because these cumulative projects would not violate any water quality standards, or create substantial erosion or siltation, or otherwise substantially degrade water quality, these projects would not result in any cumulatively significant impacts to surface or ground water resources under CEQA.

Only the Proposed Action and the existing Casa Diablo geothermal projects would have any potential to adversely affect the geothermal hydrology within the caldera, as these are the only projects which would produce or inject substantial quantities of geothermal fluid. The combined effects of these projects on the geothermal system have already been analyzed in Section 3.3.2 and Section 3.3.3 of this EA/Draft EIR. This analysis concluded that while it was plausible that the geothermal developments at Casa Diablo have caused some decrease in the flow of thermal water at the Hot Creek Fish Hatchery springs, substantially greater changes in thermal water flow in these springs were clearly related to seasonal and annual precipitation changes. This EA/Draft EIR also concluded that there was no expectation that the Project would adversely affect any of the hydrothermal features in the caldera.

#### **4.2.3 Air Quality**

The principal air pollutant emissions from these cumulative projects would be fugitive dust generated during construction (and decommissioning) activities. Other emitted air pollutants would be engine combustion ("tailpipe") gases and the accompanying air toxics, both emitted during construction and, to a much smaller degree, during operations. Because these projects are being implemented in a staggered fashion over a long period of time, and because most of the air pollution comes from short-term and

temporary construction, the potential for any cumulatively substantial impact to air quality within the air basin is very small. In addition, each project would be required to comply with the requirements of the Great Basin Unified Air Pollution Control District. These requirements are designed to ensure that emitted air pollutants do not contribute substantially to any exceedance of either federal or state ambient air quality standards. There should be no substantial cumulative residual impacts to air quality.

Because the cumulative projects would not conflict with or obstruct implementation of the applicable air quality plan; nor violate any air quality standard; nor result in a cumulatively considerable net increase of any criteria air pollutant, these projects would not result in any cumulatively significant impacts to air quality under CEQA.

#### **4.2.4 Visual Resources**

Within the Project area, construction of the drill pads and implementation of the fuelbreak projects would create openings in the forest which would be evident to recreational observers. The fuelbreak projects are expected to be maintained indefinitely, and the visual changes to the Project area from the thinning of the trees is expected to continue into the future. The Project would remove few, if any, trees. Following the completion of decommissioning and reclamation, there should be no cumulative residual visual impacts from the geothermal drilling projects.

The visual impacts from the actual drilling of the slim holes or exploration wells and construction of the Project are short-term and temporary, and not likely to be cumulatively substantial.

Because the cumulative projects which may be visible from the scenic highways are distant and widely spaced, none would be visible in the same view from any of the Project key observation points along the designated scenic highways. Also, because of topography, none of the Project pipeline or well site facilities would be visible from the designated scenic highways near any of the cumulative projects. This includes the Mammoth-Yosemite Airport Expansion and the Sierra Business Park, which are each adjacent to U.S. Highway 395 but three and five miles southeast of the Project area, respectively. Thus, there would not be a substantial cumulative impact to any scenic vista, or a cumulatively substantial degradation to the visual character of the scenic highways.

Because the projects would not cumulatively have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of the site and its surroundings, these projects would not result in any cumulatively significant impacts to visual resources.

#### **4.2.5 Vegetation**

Within the 1,660-acre Project area, about 28 acres of vegetation would be removed by the Proposed Action and the other geothermal projects and “lost” until reclaimed following completion of the projects. The two fuelbreak projects would potentially “treat” all of the rest of the Project area west of U.S. Highway 395 by thinning the forest in a “clumpy” pattern and removing all of the shortest trees and much of the understory. In the areas of sagebrush habitat, the brush would be thinned to about 65 percent cover. It is believed that this thinning of the vegetation within the Project area would cause the remaining trees and vegetation to grow more rapidly as a result of less shading and competition.

No “listed” plant species, and no candidate, sensitive, or special status species, were identified in any of the project areas.

The cumulative “loss” of 28 acres of Jeffrey Pine Forest and Great Basin Mixed Scrub vegetation within the Project area for the thirty or more years until reclamation is complete is considered minor, as there are abundant, comparable plant communities located in the vicinity and region. There should be no substantial cumulative residual impacts to vegetation after reclamation of the geothermal projects.

The adverse cumulative effects of these projects on vegetation resources are considered to be below the level of significance under CEQA because they would not have a substantial adverse effect on any riparian habitat or other sensitive natural community and would not have any adverse effect on protected wetlands.

#### **4.2.6 Noxious Weeds**

Project design features substantially limit the potential for the spread of noxious weeds within the Project area specifically as a result of the various geothermal projects, though the potential for weed spread remains moderate. The fuelbreak projects could increase the potential for noxious weed infestation in the treated portions of the Project area through the reduction of cover and competition. However, requirements for noxious weed control in conformance with the SNFPA ROD (USDA Forest Service 2004) have been, or would be, integrated into each of the fuelbreak projects. With implementation of the required noxious weed control measures by each of the projects, the cumulative potential for expansion of the existing noxious weed infestations within the Project area would be reduced, but the cumulative residual impacts from noxious weeds would still be moderate.

#### **4.2.7 Wildlife**

About 43 acres of forest and sage scrub wildlife habitat would be removed by the Proposed Action and the other geothermal projects within the caldera and “lost” until reclaimed following completion of the projects in an estimated 30 years. The two fuelbreak projects would potentially “treat” all wildlife habitats in the same area west of U.S. Highway 395 and north of State Route 203 (see Figure 31). Outside of this area, another 97 acres of principally big basin sagebrush wildlife habitat would be permanently lost by the construction of the Mammoth-Yosemite Airport Expansion and the Snowcreek Golf Creek Expansion. The Sierra Business Park is located within an old quarry without substantial wildlife habitat values. The cumulative “loss” of this general wildlife habitat is considered minor, as there is abundant, comparable wildlife habitat in the vicinity and region. The cumulative residual impacts to wildlife habitat would be the permanent loss of habitat from the airport and golf course expansion projects.

The Project would not adversely affect any federal or state “listed” species. The Project may affect individuals, but would not likely result in a trend toward federal listing or loss of viability for the four forest sensitive species (northern goshawk, pallid bat, Townsend’s big-eared bat and American marten) identified or presumed in the Project area. Those cumulative projects located within the same forest wildlife habitat west of U.S. Highway 395 and north of State Route 203 (the geothermal exploration projects and fuelbreak projects) would incrementally add to the potential to affect individuals, but not likely result in a trend toward federal listing or loss of viability, of these same species.

The Project may also affect individuals, but would not likely result in a trend toward federal listing or loss of viability, of the greater sage grouse. The Mammoth-Yosemite Airport Expansion is the only other cumulative project proposed in an area which provides habitat for sage grouse. Besides providing winter habitat for sage grouse, the airport is also generally close to known and potential sage grouse leks. These impacts were determined to be less than significant under CEQA for the airport project alone, but measures to further reduce the potential adverse effects of this project on sage grouse were proposed. The cumulative affects of these two projects would not likely result in a trend toward federal listing or loss of viability of the greater sage grouse.

The projects located principally in sage or scrub wildlife habitat could have a cumulative effect on mule deer, an Inyo National Forest “management indicator species” and a CDFG “species of special concern.” The Project area provides summer range for mule deer. No significant numbers of deer are seasonally migrating through the Project area. The Mammoth-Yosemite Airport Expansion and Sierra Business Park projects were thought to also lie outside of the deer migration corridor. To compensate for the 10.5 acres of high quality deer habitat that the airport project would fence off, an equal area of previously disturbed high quality deer habitat would be restored.

The Snowcreek Golf Course Expansion would be located on the northern edge of the deer spring “holding” area and Mammoth Rock migration corridor over the crest of the Sierra Nevada range. Deer that historically grazed and migrated through this area could continue to do so after completion of the project, or could move slightly to the south to where most of the deer currently migrate. A number of measures were proposed to reduce the adverse effects of this project on holdover and migrating mule deer.

Considering the measures proposed for each of these projects to reduce the impacts on deer habitat, the cumulative impact on deer habitat is considered small.

There also would be no substantial cumulative impact to Inyo National Forest sensitive wildlife species or CDFG species of special concern from these projects.

The cumulative adverse effects of construction, operation, maintenance and decommissioning of these projects on sensitive wildlife and habitat are considered to be below the level of significance under CEQA. This is because there is very little chance of any substantial adverse effect on any sensitive or special status species. Together these projects also would not interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors.

#### **4.2.8 Grazing**

All of the cumulative projects except the Casa Diablo Geothermal Development Projects, the Mammoth-Yosemite Airport Expansion and the Sierra Business Park are located within the Sherwin/Deadman Allotment. Each of these cumulative projects was determined to have little to no potential to reduce the quantity or quality of available livestock forage. There is some potential for direct conflicts to grazing during the construction or implementation periods of these projects. However, coordination through the USFS of project construction and implementation operations with the grazing permittee’s operations would substantially reduce any potential for conflicts. There should be little chance for any cumulative residual impacts to grazing.

### 4.2.9 Recreation

Potential impacts from the cumulative projects to dispersed recreation within the Project area and recreational users of Shady Rest Park and the adjacent campgrounds would be very similar to the impacts from Project construction, maintenance and decommissioning. These indirect effects on the recreational experience include potential air quality impacts, visual impacts, noise, traffic and safety hazards. All of these impacts would be short-term and temporary. Concurrent construction of the Project pipeline and drilling of a geothermal exploration well could increase either the magnitude or the duration of some of these impacts to recreation, but not substantially, and they would still be short-term and temporary. None of these cumulative impacts were determined to result in substantial cumulative residual impacts.

The additional geothermal operations conducted under the cumulative projects within the Project area would slightly increase the potential for (but not the magnitude of) a substantial uncontrolled discharge of geothermal fluid. The measures contained in each geothermal project to reduce the potential and decrease the severity of any a discharge ensure that this remains highly unlikely to occur and the chances for adverse effects to recreation remote.

None of these cumulative impacts were determined to be potentially significant under CEQA. The indirect adverse effects of these cumulative impacts on recreation also are below the level of significance under CEQA because substantial physical deterioration of the recreational facilities would not occur or be accelerated, and the cumulative projects would not require the construction or expansion of recreational facilities.

### 4.2.10 Noise

Only the existing Casa Diablo geothermal projects and the Mammoth-Yosemite Airport Expansion Projects have any appreciable operational noise. Worst case noise levels generated by the existing Casa Diablo geothermal power plants were predicted to be 75 dBA at 100 feet, and 55 dBA at less than 1,500 feet. Expansion of the Mammoth-Yosemite Airport was expected to reduce single-event noise levels from the current noise levels since the new commercial aircraft would climb higher and faster than the aircraft which currently use the airport. These projects would not lead to cumulatively considerable residual noise impacts within the Project area.

All of the other projects considered in the cumulative analysis would generate appreciable noise only during construction, maintenance and decommissioning activities. Only the Basalt Canyon and Upper Basalt Geothermal Exploration Projects would be located close enough to the Project area to create a potential for cumulative noise impacts. Since each of these projects would generate noise only on a short-term, temporary basis, the potential for these construction activities to occur at the same time is small. However, if drilling for either of these exploration projects coincided with construction of the Project, ambient noise predicted for the Project construction would increase by a maximum of about three dBA. This louder cumulative construction noise would still meet all of the applicable standards at the sensitive noise receptor location, and not result in any cumulative residual impacts.

The adverse effects of these short-term, temporary cumulative construction noise impacts are below the level of significance under CEQA because they do not expose persons to, or generate noise levels in excess of the applicable standards or result in a substantial temporary or periodic increase in ambient noise levels.



#### **4.2.11 Cultural Resources**

All of the cumulative projects which overlap the Project area, as well as the Rhyolite Plateau Geothermal Exploration Project, lie within the area of MPLP leases searched for archeological records in May 2002 by the Eastern Information Center at the University of California, Riverside (see Section 3.12.2). This records search documented a relatively low density of cultural resources over most of the area. Few cultural resource sites also were recorded for those cumulative projects outside this area.

Each of the geothermal exploration and development projects, as well as the Mammoth-Yosemite Airport Expansion project, have committed that all areas proposed for new surface disturbance would be surveyed by a professional archaeologist prior to disturbance. Any surveyed areas that contain cultural resources of significance would be avoided, or the potential for impacts mitigated prior to surface disturbance. The BLM approval for the Casa Diablo projects also requires that Native Americans be allowed continued access to the Casa Diablo hot springs and to collect soils and plants for their traditional uses.

The potential for cumulative direct or indirect adverse effects to historic and prehistoric resources is small because of the relatively low density of sites over the area and the measures agreed to which protect or mitigate impacts to sites. There is also little potential for any cumulative residual impact to cultural resources.

These potential impacts are below the level of significance under CEQA because they do not cause a substantial adverse change in the significance of a historical resource or an archaeological resource, as defined in Section 15064.5 of the CEQA Guidelines.

#### **4.2.12 Transportation and Public Services**

Because the Project would have a negligible effect on the regional transportation system, and would generate a negligible demand on public services in the area, there would be no potential for cumulative adverse effects on these resources, and no potential for a cumulative residual impact.

#### **4.2.13 Socioeconomics**

The Project would require no new permanent workers, nor would it provide any new infrastructure, so it would not induce any population growth. It would not displace any people or existing housing, or physically divide any community. Since a minority population does not exist in either the Town of Mammoth Lakes or Mono County as a whole, environmental justice effects would not occur from the Project. Therefore, there would be no potential for cumulative direct or indirect adverse effects, and no cumulative residual impacts, from socioeconomic effects.

#### **4.2.14 Health, Safety and Hazardous Materials**

Large, accidental discharges of geothermal fluids are very unlikely, although the potential for such a discharge increases slightly with each additional geothermal project or operation. Although the potential risk of a large, accidental discharge is slightly greater from the cumulative geothermal project, the potential adverse health and safety effects are not changed. The potential adverse health and safety effects of a major discharge of geothermal fluid would still be the risk of scalding injury, and possibly burns or serious injury, to anyone directly contacted by the hot geothermal fluid before it cooled.

Cumulative project activities also would slightly increase in the potential risk of a wildland fire over that from any individual project. Each of the geothermal projects includes measures to minimize the risk of fire and a fire contingency plan to respond to any fire. The Mammoth-Yosemite Airport Expansion project also contains specific requirements for upgrading the airport's fire suppression system.

Various hazardous materials would be transported and used by each of the cumulative projects during construction, operation, maintenance and decommissioning activities. These would include fuels (jet, diesel and gasoline), lubricants, isobutane, hydraulic fluid, compressed gases, paints, solvents, cleaning supplies, pesticides and herbicides. Little hazardous waste (mostly waste oils and some geothermal scale from the Casa Diablo projects) is expected to be generated by any of these cumulative projects. The potential for a spill into the environment from the transport, storage, and handling of these hazardous materials and wastes by the cumulative projects would be somewhat greater than from any one project. However, the potential adverse effects of any spill would not be greater. There also would be a very small cumulative increase in the potential for public safety-related impacts due to the transport of hazardous chemicals to the area via public highways and access roads.

The potential for any cumulative residual impact from wildland fires or spills of geothermal fluid or hazardous materials or waste generated from any of the cumulative projects is very small because the potential for these events to occur is small.

These potential cumulative adverse impacts are considered below the level of significance under CEQA because they 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. They also would not expose people or structures to a substantial risk of loss, injury or death involving wildland fires, nor create a substantial hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

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## **5 OTHER REQUIRED CONSIDERATIONS**

### **5.1 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: ... (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 U.S.C. 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 2.1.7, at the end of Project operations the wells would be plugged and abandoned as required by BLM regulations. All above-ground equipment, including the pipeline and its supports, would be removed, as required by the federal geothermal leases. MPLP would then implement a site reclamation plan to restore surface grades and revegetate cleared areas as may be required. Therefore, this would not be a significant irreversible environmental change.

Large discharges of 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 (like the emergency spill containment basin) to reduce the size and severity of any discharge should it occur. Therefore, this would not result in a significant irreversible environmental change.

**5.2 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 3.14.3), 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 provide additional geothermal fluid to the existing Casa Diablo geothermal power plants, which could extend their lives and the availability of the electrical energy they produce. However, the Project would not allow the existing Casa Diablo projects to increase their capacity to produce electrical energy above that which was originally approved. The Project would induce growth.

**5.3 CONFORMANCE WITH FOREST LRMP MANAGEMENT DIRECTIONS**

Table 5 lists the LRMP Management Directions for Management Area #9 (Mammoth) presented in Table 1, and discusses each in terms of its relationship to the Project. As indicated in Table 5, the Project is consistent with the Management Directions for Management Area #9 to the extent they apply to the Project area.

**Table 5: Summary of Project Conformance with Inyo National Forest LRMP Management Directions**

MANAGEMENT DIRECTIONS	DISCUSSION
<b>Cultural Resources (Conforms)</b>	
Maintain and enhance interpretive sites such as Indian Caves.	There are no interpretive centers on or adjacent to the Project area.
<b>Facilities (Conforms)</b>	
Allow new ski base areas commensurate with transportation planning.	The ski base areas are far removed from the Project area.
<b>Fish (Conforms)</b>	
Maintain the productivity and resources of Hot Creek Fish Hatchery; study Laurel Pond for introduction of fish; and implement the 1986 Hot Creek Wild Trout Management Plan.	Laurel Pond will not be affected by the Project. Analysis for potential impacts to Hot Creek Fish Hatchery from the Project indicate no impact.
<b>Geology (Conforms)</b>	
Cooperate and encourage geophysical exploration and research including post-caldera formation and current and future seismic and volcanic activity.	The Project is consistent with directions concerning geophysical exploration and geothermal resources.
<b>Lands (Conforms)</b>	
Enter into land exchanges where the best use of USFS land would be in the private sector, the exchange would conform to state/county/USFS planning, and the proposed use is consistent with	The Project does not propose any land exchanges; Project activities are consistent with prior decisions under the Geothermal Steam Act.

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MANAGEMENT DIRECTIONS	DISCUSSION
the local <u>General Plan</u> . Allow no exchanges north of SR 203; solicit comment on proposed exchanges from other interested agencies; and allow development on USFS lands where infrastructure is available and the use would have benefits that outweigh adverse impacts.	
<b>Recreation (Conforms)</b>	
Provide for trail links within the community of Mammoth Lakes; maintain open space areas around the Town for passive use; prohibit dispersed camping; prohibit further development of Shady Rest Park; Allow development of Mammoth Creek Park; Identify and fund expansion potential of the Shady Rest and Sherwin Creek Campgrounds; and fund the interpretive potential of the Hot Creek geologic site.	The Project would have minimal impact on open space recreational uses of the lands near the Town of Mammoth Lakes with implementation of the proposed measures to reduce impacts.
<b>Visual Resources (Conforms)</b>	
Develop a viewshed analysis for SR 203 and U.S. 395; mitigate visual impacts of major uses seen from these major gateway routes.	Analysis of the Project is provided of the viewshed for State Route 203 and U.S. Highway 395. The Alternative Pipeline Route eliminates the viewshed impacts from State Route 203, and mitigation measures are provided to substantially reduce the viewshed impacts from U.S. Highway 395.
<b>Water (Conforms)</b>	
Allow development where water supplies are adequate after first meeting the water requirements of natural resources; allow development of new water sources on USFS lands only when private sources have been exhausted; support state and local ordinances that mitigate adverse impacts of runoff onto USFS lands.	The negligible water requirements would be met through use of existing, private, non-potable water resources, and best management practices would be implemented to mitigate adverse impacts of storm water runoff.
<b>Wildlife (Conforms)</b>	
Continue to maintain waterfowl habitat at Laurel Pond; and maintain the integrity of winter ranges, holding areas, migration routes, and fawning areas for mule deer.	Laurel Pond would not be affected by the Project. Analysis of the Project indicates no substantial impacts to winter ranges, holding areas, migration routes, and fawning areas for mule deer.

### 5.4 LIST OF RECOMMENDED MEASURES

The following lists all of the *measures* (“feasible measures which could minimize adverse impacts which are not determined significant under CEQA”) and *mitigation measures* (“feasible mitigation measures which could minimize adverse impacts determined significant under CEQA”) recommended in this EA/Draft EIR.

*GSM Measure 1:* The operator shall design and construct the pipeline within the California Department of Mines and Geology-designated earthquake fault zones to reasonably minimize the potential for rupture in the event of fault offset in these zones.

*GSM Measure 2:* The operator shall review and revise, as appropriate, MPLP’s emergency contingency plans to detail the actions to be taken by operator's employees and contractors for the Project wells and pipeline in the event responsible agencies declare a volcanic hazard warning or alert, or in the event of a volcanic eruption.

*HYD Measure 1:* The pipeline shall either avoid crossing the approximately 200-yard section of the “Basalt Canyon” RCA immediately east of the eastern edge of Shady Rest Park downstream to the sediment trap or be designed and constructed to ensure that neither the pipeline nor its footings impede or redirect flood flows.

*VIS Measure 1:* Following completion of construction, the Permittee shall prepare, submit for approval by the authorized officer, and implement a landscape plan to plant native trees and shrub vegetation at select locations to further screen well site facilities from view from Sawmill Cutoff Road and Sawmill Road.

*VIS Measure 2:* The Geothermal Sundry Notice filed to obtain approval from the authorized officer to construct the pipeline shall specifically describe how the selected pipeline segments would be constructed in areas with the VQO of “retention” near Shady Rest Park to minimize the visibility of the pipeline from Sawmill Cutoff Road and Shady Rest Park through distance, vegetation and terrain.

*VIS Measure 3:* The pipeline segments to be constructed in areas with a VQO of “retention” in the vicinity of Sawmill Cutoff Road shall use “textured” (“dimpled”) pipeline cladding and shall be colored with a color or colors (approved by the authorized officer) to blend with the area so that the pipeline repeats the color and roughened texture of the characteristic landscape.

*VIS Measure 4:* Following completion of construction, the Permittee shall prepare, submit for approval by the authorized officer, and implement a landscape plan to plant native trees and shrub vegetation at select locations to further screen from view those portions of the pipeline which may be visible from Sawmill Cutoff Road.

*VIS Measure 5:* In sections of the Project area with a VQO of “partial retention,” the Permittee shall, with the approval of the authorized officer, locate the pipeline so that it is not immediately adjacent to existing roads and takes advantage of existing vegetation or terrain screening opportunities to reduce the visibility of the pipeline from these roads.

*VIS Mitigation Measure 6:* The pipeline segments to be constructed on Inyo National Forest managed-land in areas with the VQO of “retention” and visible from State Route 203 and/or U.S. Highway 395 shall use textured pipeline cladding and shall be colored with a color or colors (approved by the authorized officer) to blend with the area so that the pipeline generally repeats the color and texture of the characteristic landscape.

*VIS Mitigation Measure 7:* Following completion of construction, the Permittee shall prepare, submit for approval by the authorized officer, and implement a landscape plan to plant native trees and shrub vegetation at select locations on Inyo National Forest-managed land to further screen from view those portions of the pipeline which may be visible from State Route 203 and/or U.S. Highway 395 to ensure that the pipeline is at least subordinate to the visual strength of the characteristic landscape.

*VIS Mitigation Measure 8:* Following completion of construction, the Permittee shall prepare, obtain the approval of the Mono County and other required parties, and implement a landscape plan to plant native trees and shrub vegetation at select locations on private land to further screen from view those portions of the pipeline which may be visible from U.S. Highway 395 to ensure that the pipeline is generally obscured from view.

*VIS Mitigation Measure 9A:* The Alternative Pipeline Route pipeline segments to be constructed on private land within the scenic highway corridor along U.S. Highway 395 where visible shall use textured pipeline cladding and shall be colored with a color or colors selected (with the concurrence of Mono County) to ensure that the color and structure material are compatible with the natural setting.



*VEG Measure 1:* New or expanding areas of dead or dying vegetation observed in the Project area by the Permittee shall be reported annually to the authorized officer.

*VEG Measure 2A:* The pipeline shall avoid disturbing the small clumps of riparian plant species identified in the drainage ditch constructed next to Old Highway 395 in that portion of the “Basalt Canyon” RCA adjacent to the Alternative Pipeline Route (Northern Path) near Casa Diablo.

*NOX Measure 1:* Ground disturbance will be limited to the extent possible during operations, particularly during any cut and fill operations, and during the micro-tunneling under U.S. Highway 395.

*NOX Measure 2:* Prior to entering and upon exiting the Project area, all trucks and construction equipment that will operate off of previously existing roads shall be washed to remove soil and plant parts. A central washing facility will be provided for this purpose, either at the MPLP equipment area at Casa Diablo on private land, or at a location approved by the authorized officer. Vehicle inspections will be conducted by an authorized representative to verify the absence of noxious plant propagules.

*NOX Measure 3:* All materials used in erosion control and/or rehabilitation efforts (e.g. straw bales, seeds, etc.) on the Project will be certified as being free of noxious weed materials.

*NOX Measure 4:* New non-native species introduced as a result of the Project, will be eradicated (i.e., 0% cover). Where this standard is not met, appropriate weed control measures will be implemented in order to comply with the standard for a period of three years following Project completion.

*NOX Measure 5:* With the exception of cheatgrass, all non-native weed species already present in the area will account for no more than 5% total of the relative cover of the disturbed areas, including roadsides at the end of the 3-year evaluation period following completion of revegetation measures. Weed control will be implemented immediately following implementation of the Project, and throughout the Project life to meet this standard.

*NOX Measure 6:* Cheatgrass is largely absent from the forested portions of the Project area. In order to maintain this condition, cheatgrass will be removed from all areas where ground disturbance occurs. Appropriate weed control measures will be implemented as necessary, in order to prevent the invasion and spread of cheatgrass, throughout the life of the project, and for a period of three years following Project completion.

*WLD Measure 1:* The route of the pipeline would be walked by a qualified wildlife biologist once each year for the first three years following completion of construction to survey for any signs that the pipeline is impeding wildlife movement. If such evidence is found, the authorized officer may require the lessee to clear one or more areas under the pipeline of at least 16 inches height, or sufficient to allow wildlife to pass under the pipeline, at the points where movement is impeded.

*WLD Measure 2:* Immediately prior to beginning construction of the pipeline, a 200-foot corridor centered on the selected pipeline route within Great Basin Mixed Scrub habitat would be surveyed for the presence of active sage grouse nests. Construction activities would not occur within 100 feet of an active sage grouse nest until the young have fledged.

*WLD Measure 3:* Within the Jeffrey Pine Forest habitat within the Project area, retain as many snags, downed logs, coarse woody debris and brush piles as possible to provide American marten hunting and denning opportunities.

*GRZ Measure 1:* The Forest Officer in Charge of the affected grazing allotments would review the Facility Utilization Permit for construction of the pipeline when submitted and recommend to the Authorized Officer the appropriate location for one additional under-crossing in any continuous section of above-ground pipeline one-half mile in length or longer that may be appropriate to facilitate management of the grazing sheep.

*GRZ Measure 2:* The USFS may seek reimbursement from the geothermal lessee for the costs of implementing the sheep escape management plan, including all measures taken to recover stray sheep, should it be demonstrated that the lessee's operations associated with the Project directly resulted in any sheep becoming strays.

*REC Measure 1:* The route of those sections of the pipeline not located next to existing roads would be monitored for evidence of use by OHVs. If such evidence is found, the authorized officer may require the lessee to fund or implement actions to prevent use by OHVs, such as the posting of signs and the physical blocking of access.

*HAZ Measure 1:* The operator shall amend the well blowout contingency plan to include the emergency actions to be taken by operator's employees and contractors to alert or evacuate, as may be necessary and in coordination with emergency agencies and officials, users of Shady Rest Park and dispersed recreational users of the Project area in the event that they are down gradient of any off-site geothermal fluid flow resulting from a well blowout.

*HAZ Measure 2:* The operator shall prepare, submit to the authorized officer, and put into effect a pipeline rupture contingency plan to detail the emergency actions to be taken by operator's employees and contractors in the event of a substantial spill of geothermal fluid from a ruptured pipeline.

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## **6 LIST OF PREPARERS AND ORGANIZATIONS CONSULTED**

### **6.1 MEMORANDUM OF UNDERSTANDING**

Lynn Oliver	Minerals Program Manager	Inyo National Forest, White Mountain District
Cheryl Seath	Geologist	Bureau of Land Management, Bishop Field Office
Dan Lyster	Director	Mono County Economic Development Division
Bob Sullivan	Plant Manager	Mammoth Pacific, L.P.
Dwight L. Carey, D.Env.	Principal	Environmental Management Associates, Inc.

### **6.2 NEPA LEAD AND COOPERATING AGENCIES**

#### **6.2.1 Bureau of Land Management, Bishop Field Office**

William Dunkelberger	Field Manager
Joe Pollini	Assistant Field Manager, Multi-Resource
Cheryl Seath	Geologist

#### **6.2.2 United States Forest Service, Inyo National Forest**

Kathleen Morse	Mammoth District Ranger
Lynn Oliver	Minerals Programs Manager
Vernon McLean	Forest Geologist (retired)
Lisa Sims	Fisheries Biologist
Collen (Chaz) O'Brien	Forest Recreation Planner
Richard Perloff	Wildlife Biologist
Janice Lloyd	Special Uses Administrator
Kathleen Nelson	Botanist
Andrew Breibart	Hydrologist
Linda Reynolds	Archaeologist
Tamara Sawinski	Resource Management Specialist
Mike Schlaffmann	Winter Sports Specialist
Rick Laborde	Wilderness Steward
Nolan Lloyd	Battalion Chief
Scott Kusumoto	Timber Sale Administrator
Todd Ellsworth	Soil Scientist
Susan M. Dahl	Visual Specialist

**6.3 CEQA LEAD AGENCY**

Dan Lyster	Economic Development Division Director
Scott Burns	Community Development Department Director
Larry Johnston	Community Development Department

**6.4 EA/DRAFT EIR CONSULTANT**

Dwight L. Carey, D.Env.	Principal — EA/EIR Project Manager, Soils, Geology and Minerals, Hydrology and Geologic Resources, and Air Quality	<u>Education:</u> Doctor of Environmental Science and Engineering, University of California at Los Angeles; Master of Science in Geology, University of California at Los Angeles; Bachelor of Science in Geology, California Institute of Technology.
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Experience: Over 25 years of experience in providing comprehensive environmental services to industrial and natural resource development clients; recognized as NEPA/CEQA compliance expert; and supervises EMA’s air quality impact and air dispersion modeling assessments.

Terry R. Thomas, D.Env.	Principal — Vegetation, Noxious Weeds, Wildlife, Visual Resources, Health and Safety	<u>Education:</u> Doctor of Environmental Science and Engineering, University of California at Los Angeles; Master of Science in Plant Sciences, University of California at Riverside; Bachelor of Science in Biology, University of California at Los Angeles.
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Experience: Over 25 years experience of project management in the preparation of environmental impact assessments and permit acquisition and compliance documents, and regulatory affairs for the geothermal energy, mining, and other natural resource development industries.

Heather T. Altman	Environmental Specialist – Cultural Resources, Grazing, Noise, Recreation, Socioeconomics, Transportation and Public Services	<u>Education:</u> Master of Science in Environmental Management, University of San Francisco; Bachelor of Science in Environmental Science, University of California at Riverside.
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Experience: Over four 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.

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Steven Kerns	Principal, Wildland Resource Managers – Wildlife Resources	<p><u>Education:</u> Bachelor of Arts in Anthropology, and Bachelor of Arts in Biology, California State University, Chico.</p> <p><u>Experience:</u> Over 27 years of experience in the natural resource management field, and specializes in understanding habitat utilization of terrestrial wildlife, and the integration of that understanding in the forest and range management process.</p>
Jim Paulus, Ph.D.	Consulting Botanist – Vegetation, Noxious Weeds	<p><u>Education:</u> Doctor of Philosophy in Biology, University of California, Santa Cruz; Bachelor of Science in Biology and Environmental Studies, University of California, Santa Cruz</p> <p><u>Experience:</u> Over 12 years experience conducting field botanical surveys of California’s natural plant communities, with specific focus on the natural plant communities of the eastern Sierra Nevada.</p>
Michael Sorey, Ph.D.	Hydrologic Consultant – Soils, Geology and Mineral Resources, Hydrologic and Geothermal Resources	<p><u>Education:</u> Doctor of Philosophy in Geological Engineering, University of California, Berkeley; Master of Science in Agricultural Engineering from University of Arizona; Bachelor of Science, University of Arizona.</p> <p><u>Experience:</u> Over 35 years experience, 25 years with the U.S. Geological Survey, on hydrologic and geochemical monitoring and research on groundwater and geothermal systems in volcanic areas of the Western U.S. and Hawaii.</p>
John Nadolski, M.A.	Archaeological and Historical Resources Coordinator, Pacific Municipal Consultants – Cultural Resources	<p><u>Education:</u> Doctor of Philosophy Candidate, Department of Anthropology, Northwestern University; Masters of Arts., Anthropology, University of Illinois at Chicago; Bachelor of Arts., Anthropology, Loyola University of Chicago.</p> <p><u>Experience:</u> Over 30 years archaeological experience in excavation, inventory and evaluation of prehistoric and historic sites for inclusion in both the National Register of Historic Places and the California Register of Historical Resources.</p>

### 6.5 APPLICANT

Bob Sullivan	MPLP, Plant Manager
Skip Matlick	Ormat Nevada Inc., Geologist
Richard Holt	Consulting Reservoir Engineer

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### 6.6 ORGANIZATIONS AND PERSONS CONSULTED

Bill Taylor	Town of Mammoth Lakes	Environmental and Advanced Planning, Senior Planner
Scott Mercer	Town of Mammoth Lakes	Code Enforcement
Thom Heller	Town of Mammoth Lakes Fire Department	
Bridget Kobe Clayton	U.S. Fish and Wildlife Service	
Gary Sisson	Mammoth Community Water District	General Manager
Eric Wilmanns	Mammoth Community Water District	
Ralph Cones	California Department of Transportation	
Wendy Philpott	California Department of Transportation	
Elizabeth Johnson	California Division of Oil, Gas, and Geothermal Resources	Geothermal Officer
Duane Ono	Great Basin Air Pollution Control District	Deputy Air Pollution Control Officer
Christopher Farrar	U.S. Geological Survey	
Jerry Amalfitano	Southern California Edison	
Deborah Hess	Southern California Edison	
Robert Zigler	Southern California Edison	
John Walker and Nancy Peterson Walker	Sierra Club, Range of Light Chapter	
Bryce Wheeler	Sierra Club, Range of Light Chapter	



**BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL ASSESSMENT  
and  
DRAFT ENVIRONMENTAL IMPACT REPORT**

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**APPENDIX A**  
**MAMMOTH PACIFIC, L.P.**  
**BASALT CANYON GEOTHERMAL PIPELINE PROJECT**  
**PIPELINE ROUTING PROCESS**

## APPENDIX A

### MAMMOTH PACIFIC, L.P.

### BASALT CANYON GEOTHERMAL PIPELINE PROJECT

### PIPELINE ROUTING PROCESS

The following description of the Basalt Canyon Geothermal Pipeline Project pipeline routing process was prepared by Mammoth Pacific, L.P. (MPLP).

The Basalt Canyon Geothermal Pipeline Project (Project) pipeline would be constructed to interconnect with two wells drilled at two of the six drill sites approved under the Basalt Canyon Geothermal Exploration Project (Figure 1) or the ten drill sites approved under the Upper Basalt Geothermal Exploration Project (Figure 2) with the existing MPI and MPIO project geothermal fluid pipelines located near the MPI power plant at Casa Diablo (Figure 3). Therefore, the exact route of the pipeline to be constructed for transporting the geothermal fluid produced from the two geothermal exploration wells to the existing MPI and MPIO power plants cannot be determined until it is known which two wells would be connected to the pipeline. There are a great many combinations of two wells which could be produced (from the sixteen drill sites), and an even greater number of pipeline routes which could theoretically be used to interconnect these combinations of two wells with the existing MPI power plant.

Because the five easternmost exploratory drill sites (81-36, 12-31, 23-31, 35-31 and 55-31) [Figure 1] lie essentially on a line from the westernmost drill site (81-36) to the MPI power plant to the east, east of drill site 81-36 the pipeline would follow a single, defined route (Figure 4). However, the eleven exploratory drill sites west of drill site 81-36 are not aligned along a single, linear route, so it is not possible to define a single pipeline route in this portion of the Project area (Figure 3). Instead, west of drill site 81-36 the final pipeline route would be located within an approximately one-half mile wide pipeline corridor (Figure 5). More detailed descriptions of the pipeline route east of drill site 81-36 and the pipeline corridor west of drill site 81-36 follow.

That portion of the pipeline which would be located east of drill site 81-36 (generally that portion within the Basalt Canyon Geothermal Exploration Project area – see Figure 1) would follow a single, defined, linear route. The length of the final eastern pipeline route would vary depending on the wells which were interconnected with the pipeline – from approximately 4,970 feet (0.94 miles) if the easternmost two drill sites (55-31 and 35-31) were interconnected with the MPI power plant, to approximately 8,000 feet (1.52 miles) if the pipeline to the MPI power plant connected to drill site 86-31 (or any of the drill sites further west [see Figure 4]).

This eastern portion of the pipeline route was designed to:

- Gather geothermal fluid from any of the five previously approved geothermal drill sites with a minimum length of pipeline;
- Be located only on lands leased to MPLP for geothermal resource development;
- Avoid or minimize the affects of construction and operation on known environmental issues and/or constraints; and
- Minimize pipeline visibility from both intermediate and distant viewpoints.

From drill site 81-36, the eastern pipeline route first parallels Sawmill Road on the north side, the side of the road on which four of the five potential drill sites are located. Thus, only if well 35-31 were connected to the pipeline would a short spur pipeline be needed to cross under Sawmill Road. The pipeline would be placed about 10 to 15 feet off of the edge of Sawmill Road so that the existing vegetation (mapped as Great Basin mixed scrub) between the road and the pipeline would help screen the view of the pipeline from the road.

Southeast of drill site 35-31 the pipeline route turns east, away from Sawmill Road and towards drill site 55-31. In this area the pipeline route has been selected to avoid encroaching on any of the ephemeral riparian conservation areas (RCAs) delineated by Inyo National Forest consistent with the direction of the Sierra Nevada Forest Plan (see Figure 6). The route here also crosses under the existing Southern California Edison (SCE) transmission line in a manner and location which maintains SCE's existing access to the transmission line for any required maintenance.

Further east, in the vicinity of drill site 55-31, the pipeline is routed through an area of vegetation mapped as Jeffrey pine forest where the pipeline would be hidden from view by the trees. To the extent possible, the pipeline alignment through this area would avoid the need to remove existing trees. However, in the event individual trees cannot be avoided in the pipeline corridor, marketable logs would be disposed of according to specific instructions from the Inyo National Forest. East of drill site 55-31 the eastern pipeline route runs down a slight slope, leaving the area of Jeffrey pine forest and crossing the un-named road into an area of Great Basin mixed scrub (see Figure 4).

At the western edge of U.S. Highway 395 the eastern pipeline route turns southeast (between the U.S. Highway 395 fence and the adjacent snow fence) so that the pipeline can cross under U.S. Highway 395 at right angles to the road bed and remain on federal lands east of the highway. The pipeline route in this location is below the level of the road bed of U.S. Highway 395 and the southbound exit ramp to California State Route 203. On the east side of U.S. Highway 395 the pipeline route parallels the private/federal property boundary while it crosses under the Southern California Edison transmission lines and Antelope Spring Road, then parallels the east side of Antelope Spring Road southeast to Casa Diablo Cutoff Road. At this point the pipeline route turns

northeast and parallels Casa Diablo Cutoff Road to interconnect with the production well pipelines entering the MPI and MPII power plants. All but approximately the last 400 feet of this pipeline route is located on public lands within Inyo National Forest.

That portion of the pipeline which could be located west of drill site 81-36 (generally that portion within the Upper Basalt Geothermal Exploration Project area – see Figure 2) could be required to interconnect with any of the eleven drill sites located in this direction. However, these drill sites are not aligned along a single, linear route like those to the east. Instead, west of drill site 81-36 a pipeline route would be selected (as necessary to connect with any of the western drill sites) within a pipeline corridor (see Figure 5). This pipeline corridor, of from one-quarter to one-half mile in width, is generally bounded by the Upper Basalt Project access roads and drill sites (see Figure 2). The exception is the southernmost portion of the pipeline corridor boundary, which runs "cross country" to connect the Upper Basalt Project drill site 58-25 and the Basalt Canyon Project drill site 31-36 (see Figure 5). The entire pipeline corridor is located on public lands within Inyo National Forest.

Within this pipeline corridor MPLP would select a final, specific pipeline route, once MPLP had determined which, if any, of the western drill sites would be connected to the pipeline. As required under the Geothermal Steam Act and its implementing regulations at 43 CFR 3200, either a geothermal sundry notice or facility construction permit would be prepared by MPLP and submitted to, and would need to be approved by, the BLM (in consultation with the USFS) prior to the commencement of pipeline construction along the selected pipeline route within the pipeline corridor. (An approved geothermal sundry notice or facility construction permit would also be needed to commence construction of the pipeline along the eastern pipeline route.) MPLP has also proposed that the selected pipeline route within the pipeline corridor would:

- Gather geothermal fluid from whichever of the eleven previously approved exploratory geothermal drill site(s) need to be connected to the pipeline and deliver it to the connection point with the eastern pipeline route at drill site 81-36 with a minimum length of pipeline; and
- Avoid or minimize the affects of the pipeline construction and operation on known environmental issues and/or constraints within the pipeline corridor, including:
  - Minimize pipeline visibility from the developed portions of Shady Rest Park by selecting pipeline route segment(s) which are either:
    - Outside of the immediate foreground (300 feet) of the developed portions of Shady Rest Park (see Figure 7); or
    - Are within the immediate foreground (300 feet) of the developed portions of Shady Rest Park but are substantially screened from view from the developed portions of Shady Rest Park by either topography or vegetation.



- Minimize pipeline visibility from Sawmill Cutoff Road (Forest Road 3S08) by selecting pipeline route segments which generally do not parallel Sawmill Cutoff Road (Forest Road 3S08) in the immediate foreground (300 feet) [see Figure 7];
- Minimize potential pipeline interference with winter sport use of Sawmill Cutoff Road (Forest Road 3S08) by leaving at least 20 feet of un-obstructed shoulder on each side of the road in any location where the pipeline crosses under this road; and
- Minimize interference with SCE's existing transmission line by:
  - Crossing under SCE's transmission line in a manner and location which maintains SCE's existing access to the transmission line for any required maintenance; and
  - Avoiding any substantial paralleling of the existing transmission line within the same alignment.

The pipeline route selected within the pipeline corridor would typically follow the existing and new roads proposed to be used to access the approved Upper Basalt Project and Basalt Canyon Project exploration drill sites (see Figure 1 and Figure 2). Where possible, the pipeline would be placed about 10 feet off of the edge of these access roads so that the existing vegetation between the road and the pipeline would help screen the view of the pipeline from the road. However, where necessary to cross between pipeline route segments located adjacent to the approved exploration access roads or (like the pipeline route further to the east) where a "cross-country" pipeline route segment (that is, a pipeline route segment not adjacent to an access road) would substantially shorten the required length of the pipeline, the pipeline route would run "cross country."

The length of the pipeline route west of drill site 81-36 would vary depending on which wells, if any, in this portion of the Project area were connected to the pipeline. The shortest pipeline route within the pipeline corridor west of drill site 81-36 would be zero feet in length – that is, the pipeline would not be constructed east of drill site 81-36. The longest pipeline route within the pipeline corridor would likely be the one which connected both drill sites 12-25 and 31-36 to the western end of the eastern pipeline route at drill site 81-36 (see Figure 8). This western pipeline route within the pipeline corridor would be approximately 9,620 feet (1.82 miles) long to reach the interconnection point with the eastern pipeline route at drill site 81-36.

When combined with the proposed 8,000-foot (1.52-mile) eastern pipeline route from drill site 81-36 to the MPI and MPIO power plants, the total length of this "longest Project pipeline route" is approximately 17,620 feet (3.34 miles) [see Figure 8]. The "shortest Project pipeline route," from drill site 35-31 to the MPI power plant, is approximately 4,970 feet (0.94 miles) [see Figure 9]. Note that these two Project pipeline routes are simply the longest and shortest pipeline routes which could reasonably be selected and constructed under the Proposed Action. Subject to MPLP's decisions on which two wells

would be interconnected to the pipeline and the pipeline routing constraints noted above, pipeline route segments could be located by MPLP essentially anywhere within the area of the pipeline corridor.

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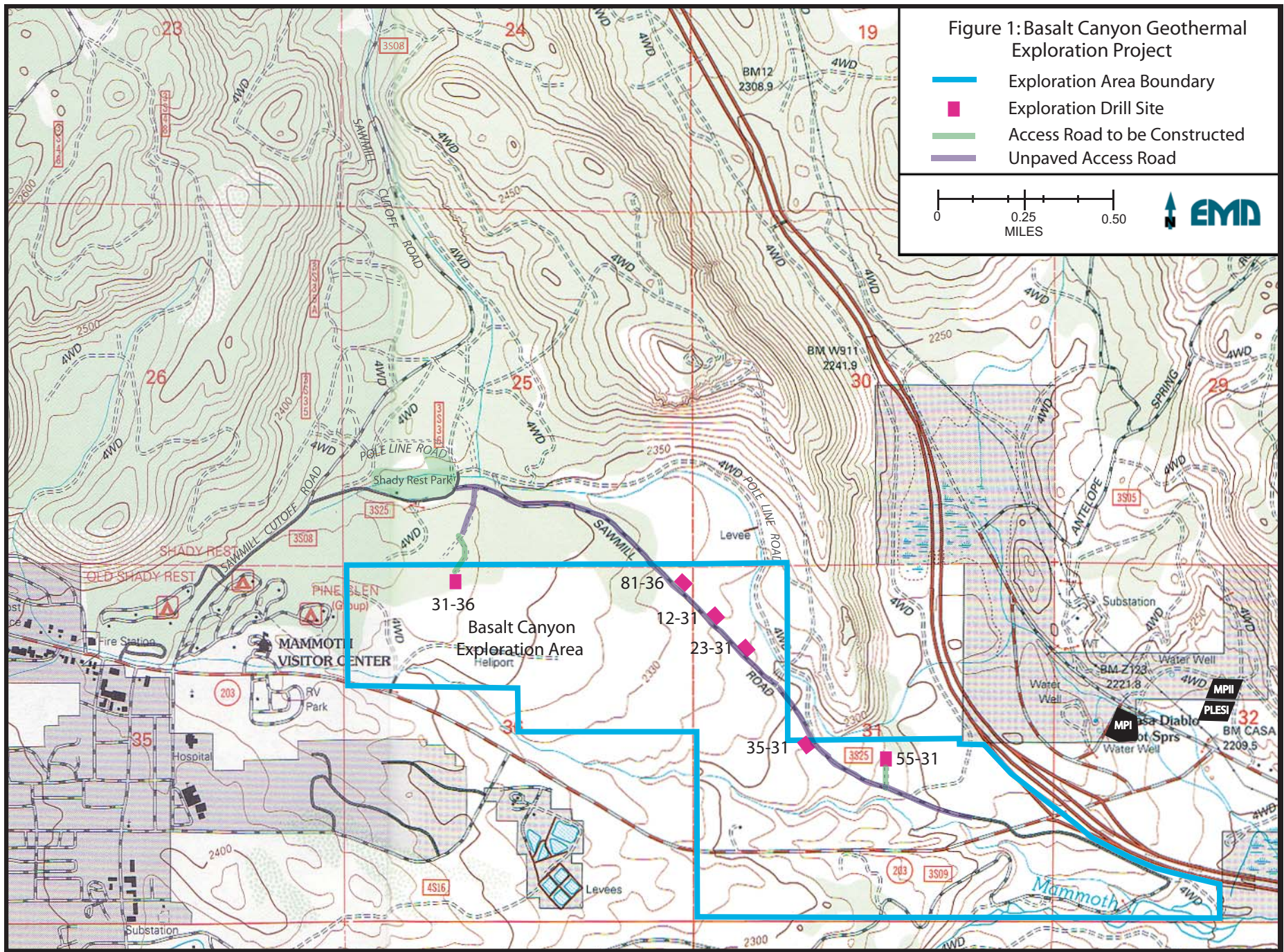
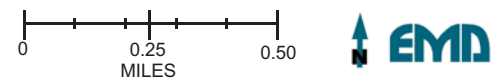


Figure 1: Basalt Canyon Geothermal Exploration Project

- Exploration Area Boundary
- Exploration Drill Site
- Access Road to be Constructed
- - - Unpaved Access Road





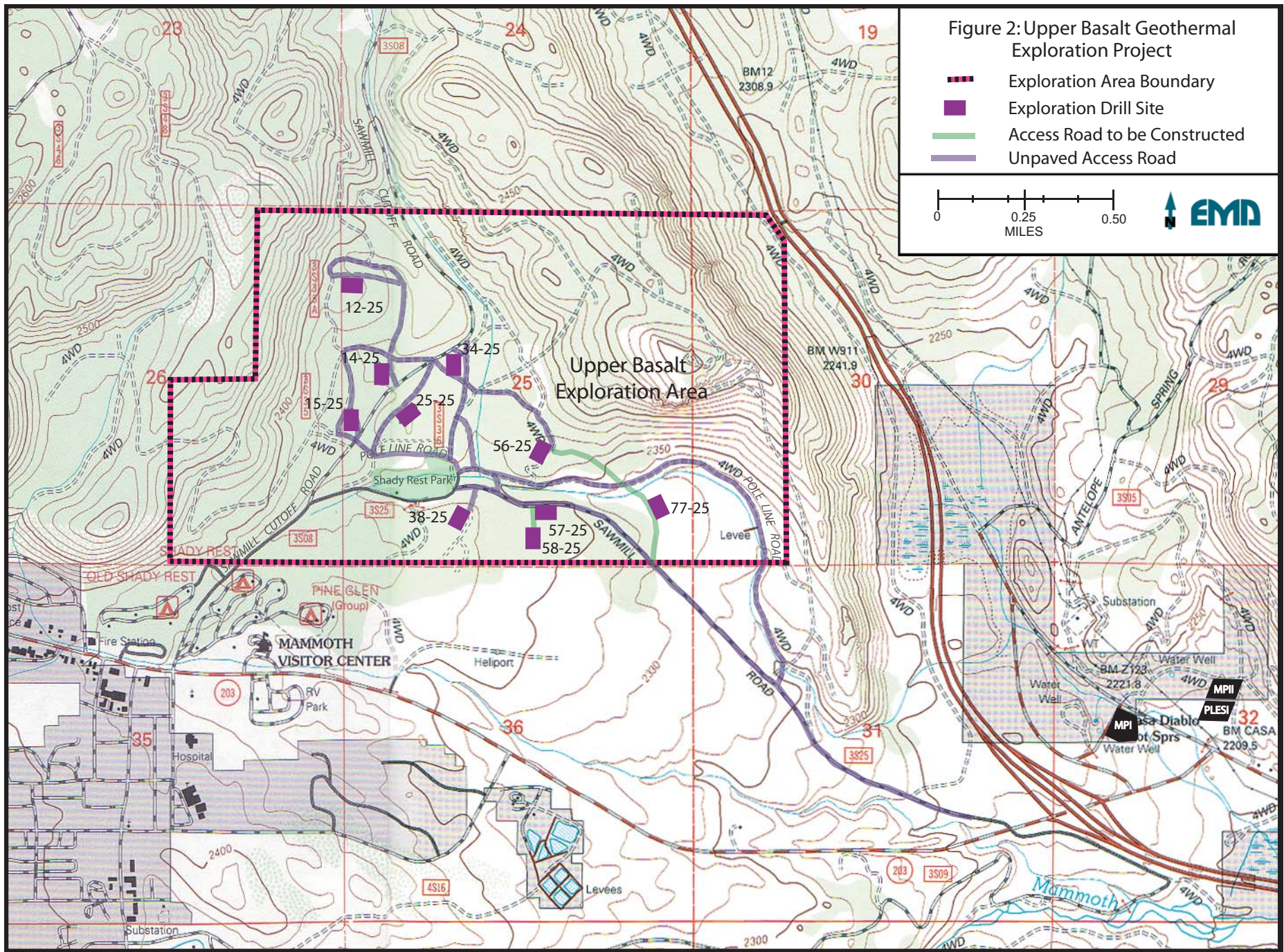


Figure 2: Upper Basalt Geothermal Exploration Project

- - - Exploration Area Boundary
- Exploration Drill Site
- Access Road to be Constructed
- Unpaved Access Road


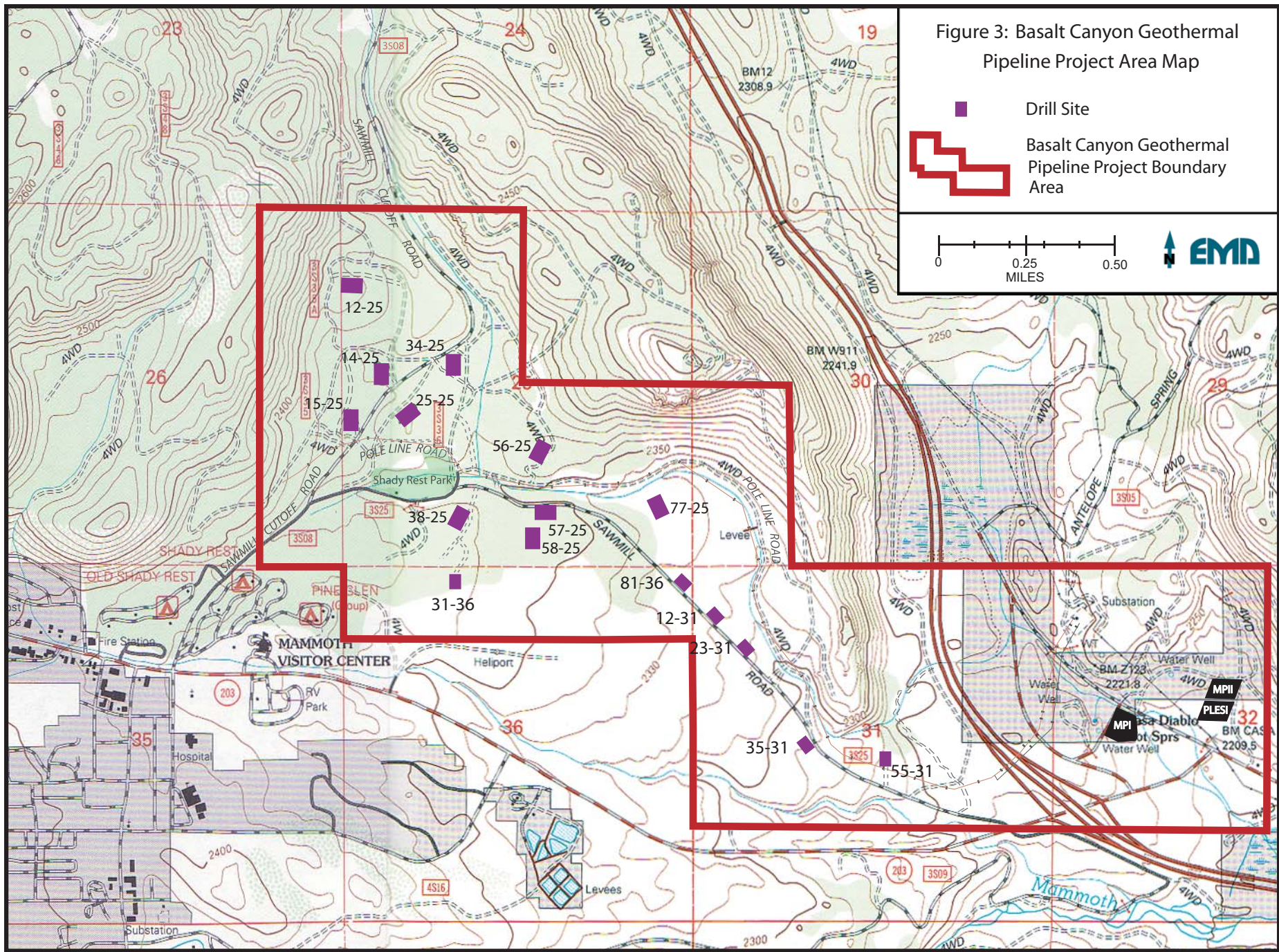
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Figure 3: Basalt Canyon Geothermal Pipeline Project Area Map

■ Drill Site  
 Basalt Canyon Geothermal Pipeline Project Boundary Area

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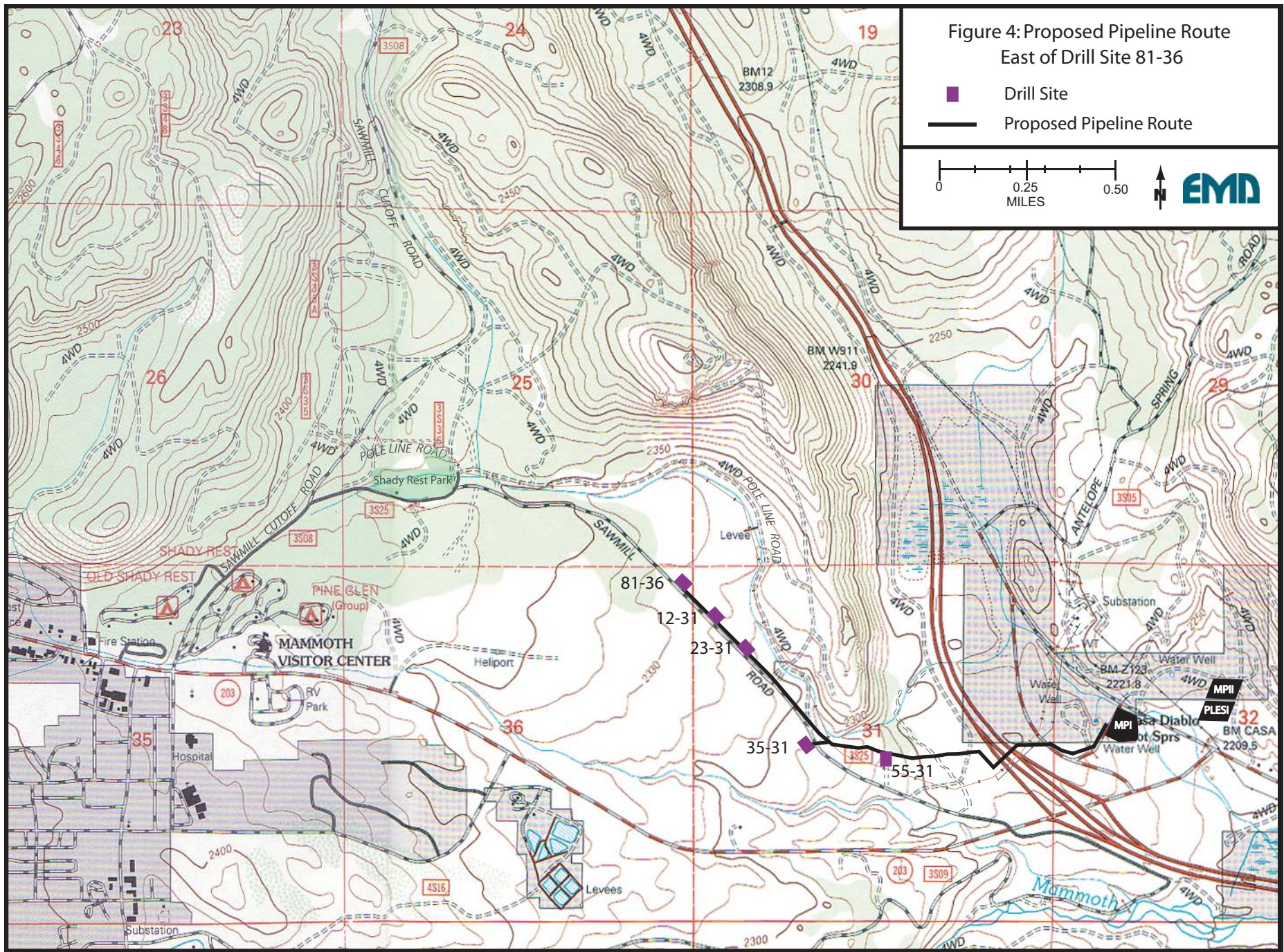




Figure 5: Proposed Pipeline Corridor  
West of Drill Site 81-36

- Drill Site
- ▭ Proposed Pipeline Corridor

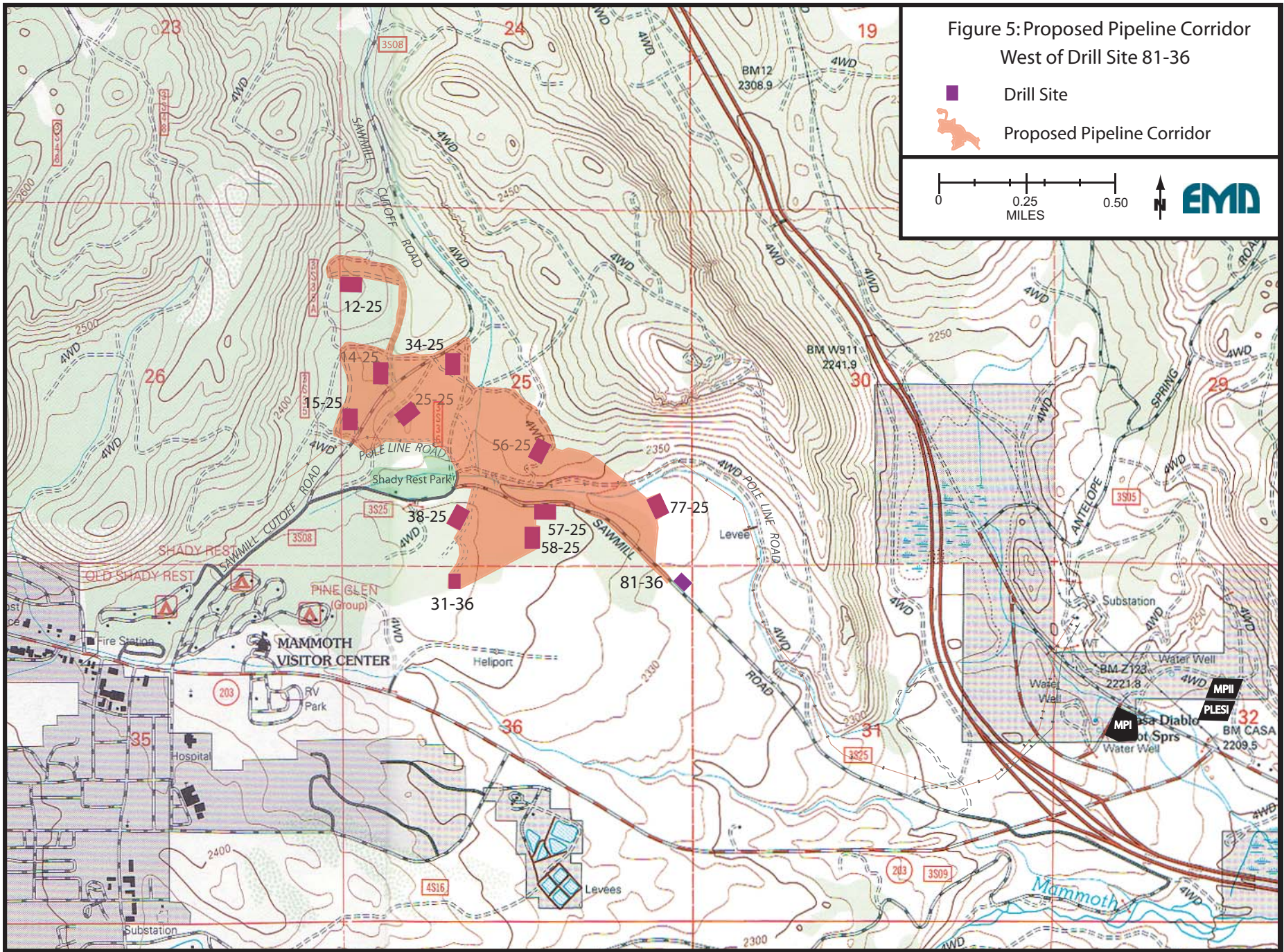
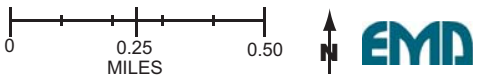




Figure 6: Proposed Pipeline Route  
East of Drill Site 81-36 on Riparian Conservation Areas

- Drill Site
- ▬ Riparian Conservation Area
- ▬ Proposed Pipeline Route

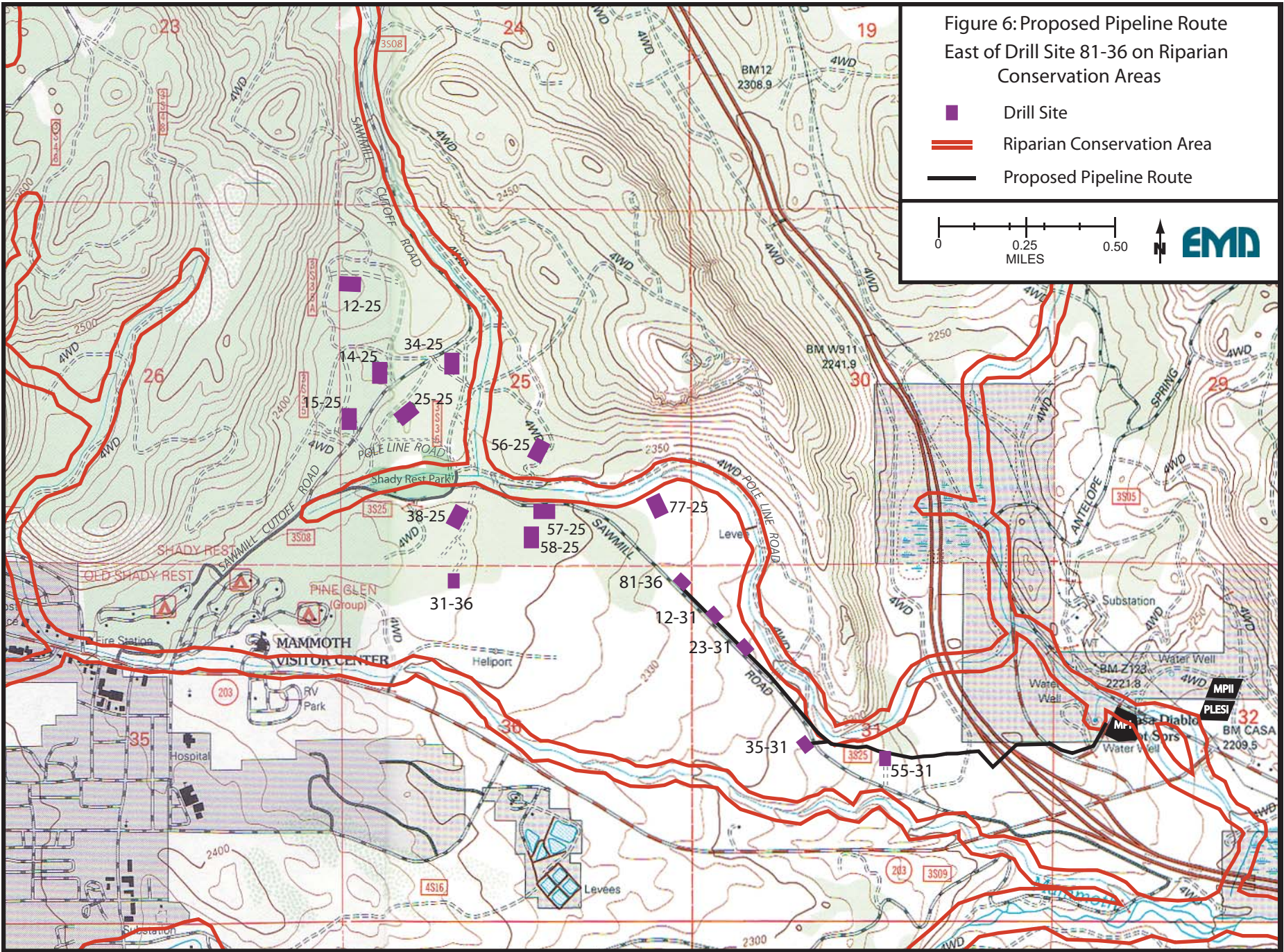
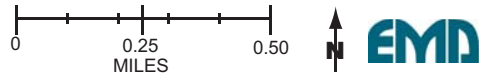







Figure 7: Areas Within the Immediate Foreground (300 Feet) of Shady Rest Park Sawmill Cutoff Road (Forest Road 3508)

-  Immediate Foreground Area (300 feet)
-  Drill Site
-  Proposed Pipeline Corridor

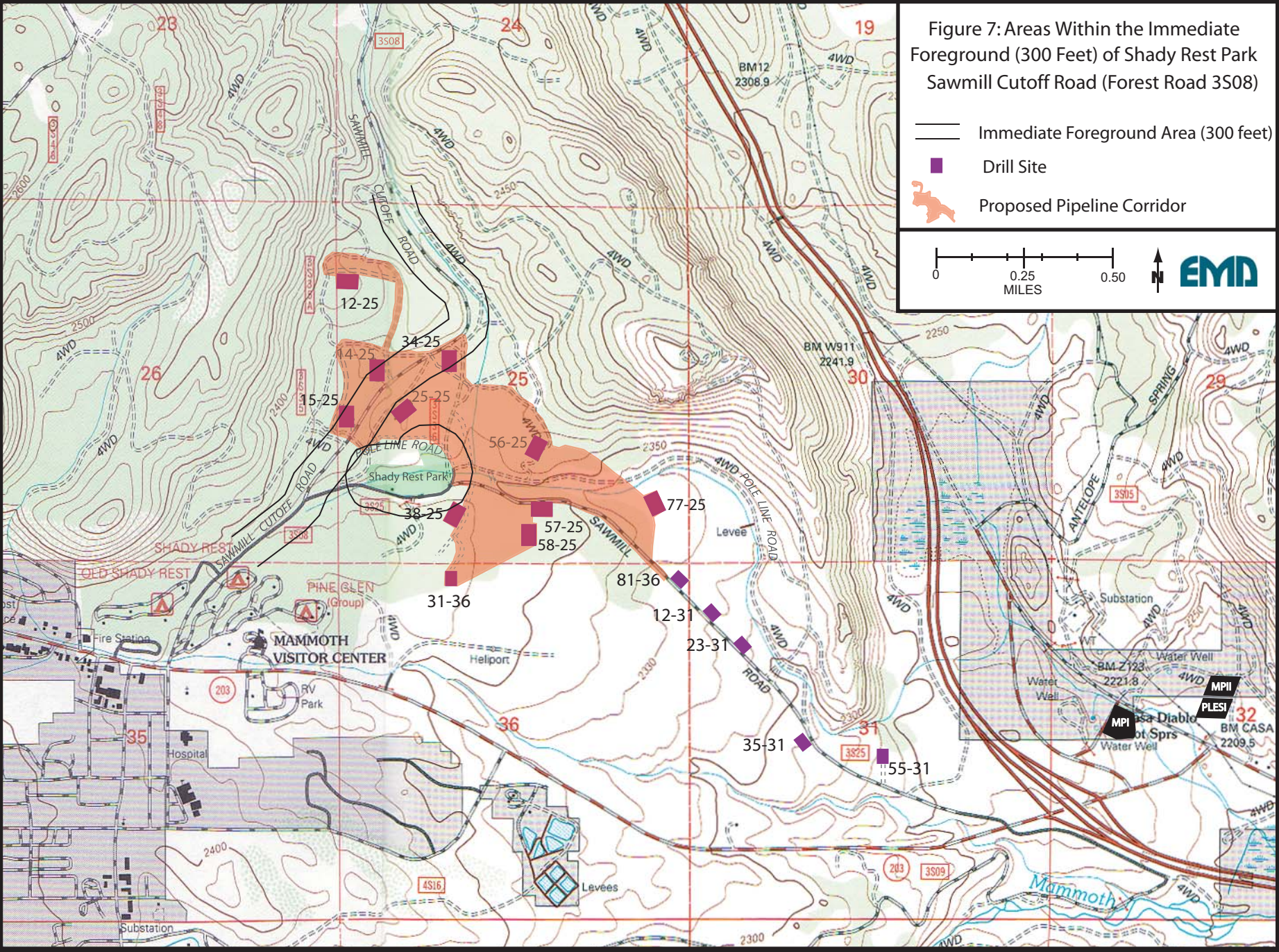
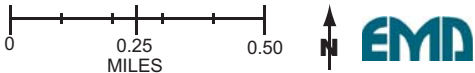




Figure 8: Longest Project Geothermal Pipeline Route

- Longest Project Pipeline Route
- Immediate Foreground Area (300 feet)
- Drill Site
- Proposed Pipeline Corridor

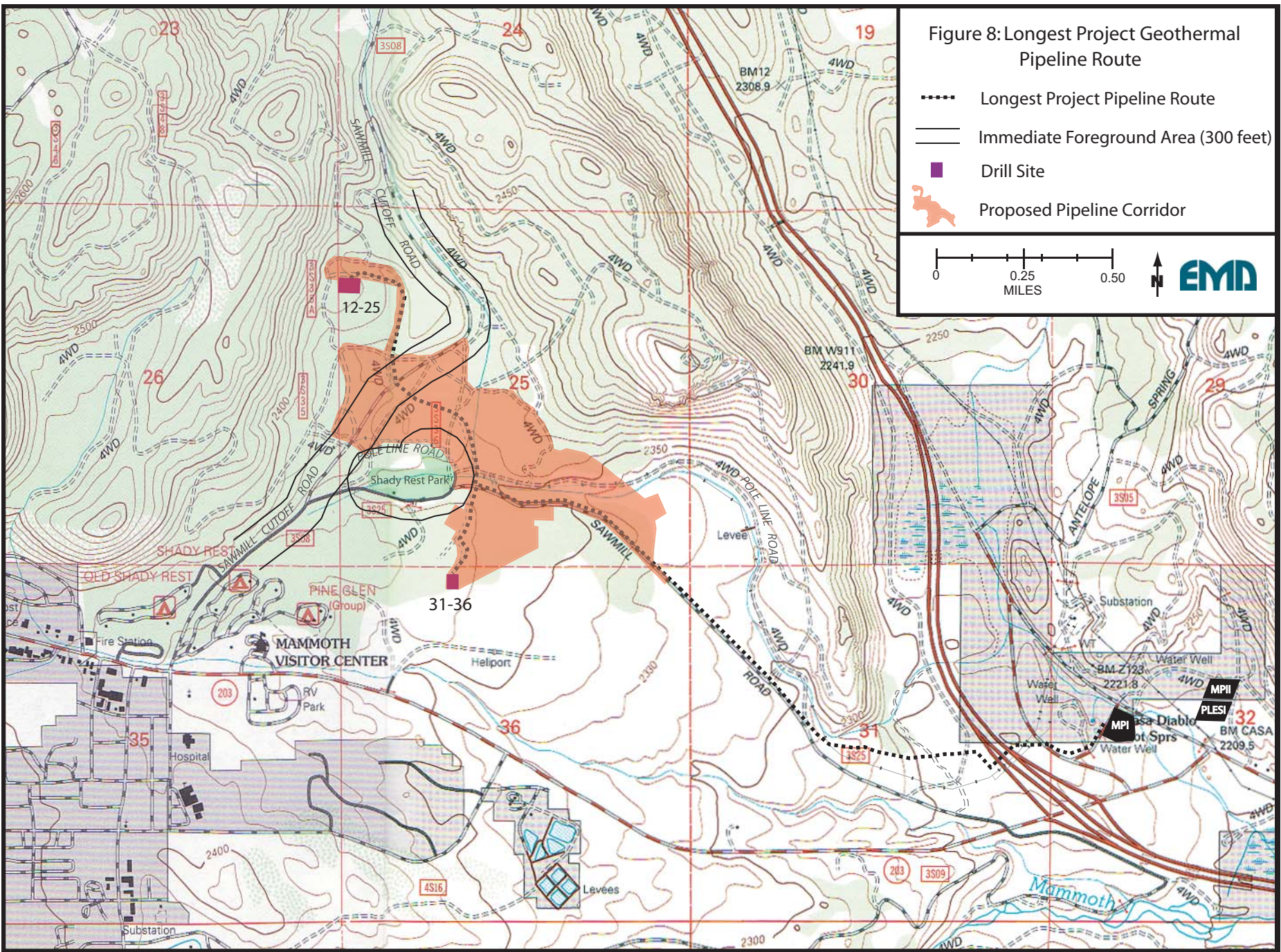
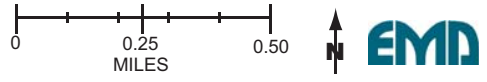
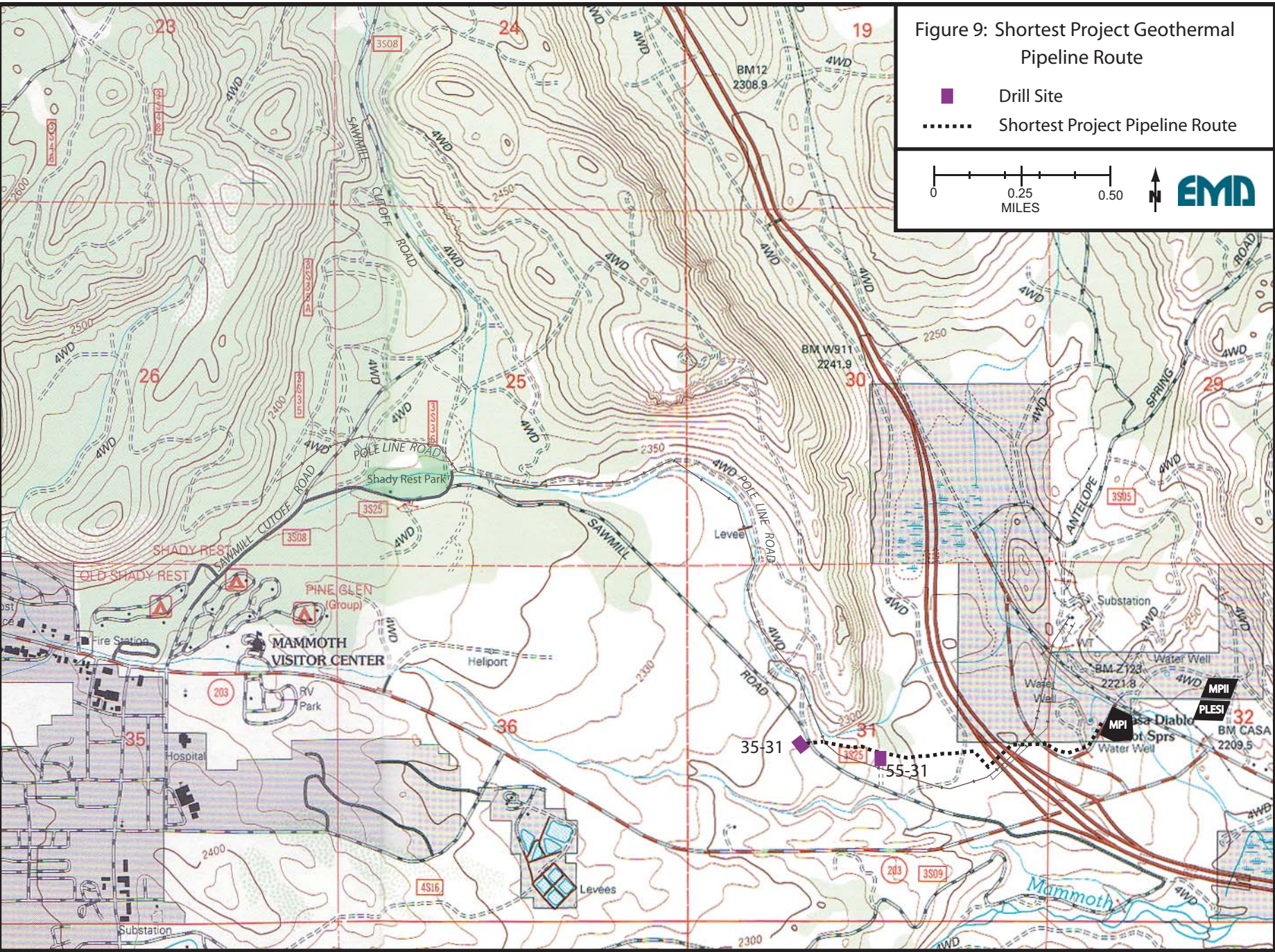
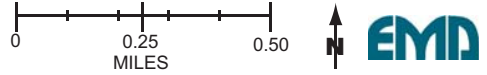




Figure 9: Shortest Project Geothermal Pipeline Route

- Drill Site
- ..... Shortest Project Pipeline Route





**APPENDIX B**  
**Mammoth Pacific, L.P.**  
**Basalt Canyon Geothermal Pipeline Project**  
**Environmental Protection Measures**

APPENDIX B  
MAMMOTH PACIFIC, L.P.  
BASALT CANYON GEOTHERMAL PIPELINE PROJECT  
ENVIRONMENTAL PROTECTION MEASURES

The following description of the Basalt Canyon Geothermal Pipeline Project environmental protection measures was prepared by Mammoth Pacific, L.P.

Environmental protection is one of MPLP's top priorities. The Basalt Canyon Geothermal Pipeline Project (Project) includes measures incorporated by MPLP to protect the environment and reduce or prevent many potential environmental impacts. Measures have also been incorporated to minimize the potential for unexpected upset conditions, and actions incorporated to be taken to protect the environment and public health and safety in the event that an unexpected upset condition should produce a release of geothermal fluid or create a Project-related hazard.

The environmental protection measures presented below have been integrated into the Project by MPLP. In addition, MPLP has committed to implementing, as an integral part of the Project, those measures related to the routing of the Project pipeline, as described in Appendix A, and the specific stipulations from the approval of the Upper Basalt Geothermal Exploration Project identified below.

Additional information concerning MPLP's award-winning operations at Casa Diablo, proposed geothermal exploration and development operations, and community outreach programs can be obtained through MPLP's web site at <http://www.mammothpacific.com/index.html>.

General

All MPLP personnel, as well as all construction and supply contractors, would be informed of and required to comply with MPLP's policy regarding prevention of undue degradation of the environment. These measures are intended to prevent all unacceptable impacts from occurring as a result of the proposed operations, as is required under the special stipulations of the Federal geothermal leases.

MPLP would also comply with mitigation measures **TPS-1** (maintenance of forest roads), **TPS-2** (blocking of Sawmill Road and Sawmill Cutoff Road), **TPS-3** (winter snow removal from roads), and **TPS-4** (consultation and coordination with Southern California Edison) from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

### Fire Prevention

All construction and maintenance equipment would be equipped with exhaust spark arresters. Personal vehicles and vehicles not in use during construction would be parked on existing well pads or at locations along existing access roads where they would not risk igniting vegetation from hot exhaust pipes. Fire extinguishers would be available on construction and maintenance vehicles. Water that is used for construction and dust control would be available for fire fighting.

Personnel would be allowed to smoke only in designated areas, and they would be required to follow applicable Inyo National Forest regulations regarding smoking. Any special permits required for welding or other similar activities would be applied for through, and received from, the District Ranger before these operations are conducted.

### Visual Resource

The wellheads, pump motors and motor control buildings would each be painted forest green or another appropriate color to blend with the area and minimize visibility. The fence constructed around each of the production well sites would also be painted an appropriate color to blend with the area. The aluminum sheath cladding the pipeline would also be appropriately colored to blend with the area.

### Prevention of Soil Erosion

No clearing of the pipeline route is proposed. Cut and fill activities would be restricted to construction of the road under-crossings. Off-site storm water would be intercepted in ditches and channeled to energy dissipaters as necessary to minimize erosion. USFS and State of California best management practices for storm water would be followed, as applicable, including USFS BMP-28 (Surface Erosion Control at Facility Sites).

MPLP would also comply with mitigation measure **HYD-1** (implementation of best management practices to prevent erosion and sedimentation) from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

### Surface and Ground Water Quality Protection

The pipeline route and construction techniques have been selected to minimize the potential for surface and ground water pollution. The proposed pipeline route is located outside of riparian conservation areas delineated by the USFS. No new permanent or temporary access roads would be constructed, and the pipeline corridor would not be graded.

To protect the region's natural hydrothermal features, including Hot Creek Gorge and the Hot Creek Fish Hatchery Springs, MPLP has committed to produce and operate the Project geothermal production wells in conformance with the ongoing hydrologic monitoring and remedial action program required by the BLM as Stipulation No. 1 of the Plans of Operation for Development, Injection and Utilization (CA-017-POO-06-60), as amended, for the MPLP PLES I Geothermal Project (see Attachment 1 to this appendix for the full text of this stipulation).

There have never been any leaks from or failures of any of the production pipelines at Casa Diablo over the 20-year life of that project. No thinning of the steel walls of the production pipelines has been detected by the periodic ultrasonic thickness testing conducted on the production pipelines. Because the production pipelines are operated above the CO<sub>2</sub> breakout pressure, the geothermal production fluid is benign and does not chemically attack the pipeline steel.

The pipeline would be constructed of seamless, welded steel pipe designed, fabricated, erected, tested and inspected pursuant to the American Society of Mechanical Engineers Standard B31.1 Power Piping 2004, which minimizes the possibility of leaking connections or rupture due to pressure, corrosion, impacts from vehicles or construction equipment, or natural forces. The pipeline would be inspected once per shift, and subject to periodic ultrasonic thickness testing to detect any substantial thinning of the pipe wall.

Major pipeline leaks or pipeline ruptures would be detected by in-line sensing equipment. Mismatches between the flow from the wells and the flow entering the plant would initiate automatic shutdown of the well pumps. Action by a power plant operator would be required to stop the automatic shutdown. Should all electricity fail, the well pumps would stop and well site pipeline valves would shut automatically. In addition, all well pumps and valves could be closed manually by plant operators within approximately five minutes.

If all of the measures described above were to fail there could be an uncontrolled flow of geothermal fluid. Less than an estimated 200,000 gallons of geothermal fluid would discharge in the very unlikely event of a complete rupture in the pipeline. This would consist of about 160,000 gallons of geothermal fluid draining from three miles of 16-inch diameter pipeline and less than 20,000 gallons of geothermal fluid from five minutes of well flow at 3,600 gallons per minute. A maximum estimated 600 gallons per minute of geothermal fluid could flow from one of the production wells if it were to suffer an even less likely uncontrolled flow event (sometimes called a "well blowout"). The maximum uncontrolled flow rate would be less than the 1,800 gallon per minute pumped flow rate because the well would not be pumped, and the pump and well head would each constrict the flow of fluid out of the well bore. Also, the maximum

uncontrolled flow rate would likely drop substantially over time as the pressure in the reservoir around the well is reduced by the flow.

All of the drill sites and the pipeline corridor area/pipeline route west of drill site 35-31 are tributary to the ephemeral Basalt Canyon drainage. This drainage is directly tributary to the Casa Diablo projects' existing 1,600,000-gallon emergency spill containment basin. This basin is designed to contain and control any large spills of geothermal fluid from the Casa Diablo geothermal field prior to reaching Mammoth Creek. Any discharges of geothermal fluid from this portion of the Project area would eventually flow into the spill containment basin, which would be able to contain and control both the geothermal fluid and any sediment picked up by the flowing fluid.

Major geothermal fluid spills from drill sites 35-31 and 55-31 or the  $\frac{3}{4}$ -miles of pipeline east of drill site 35-31 and west of Antelope Spring Road would drain overland toward Murphy Gulch and ultimately Mammoth Creek above the U.S. Highway 395 bridge. This discharged geothermal fluid would not flow into the existing Casa Diablo spill containment basin.

MPLP would also comply with mitigation measures **HYD-4** (hazardous materials with designated RCAs), **HYD-5** (preventing impediments to natural flow within designated RCAs), and **HYD-6** (protecting designated RCAs from sediment during flood flows) from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

#### Air Quality Protection

MPLP would comply with any requirements prescribed by the Great Basin Unified Air Pollution Control District (GBUAPCD) concerning emissions of air pollutants from construction engines or hydrogen sulfide from operating geothermal wells.

MPLP would also comply with mitigation measure **AIR-4** (watering to control dust during construction) from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

#### Prevention of Noise

Construction noise would be minimized through operational practices which avoid or minimize those practices which may typically generate greater noise levels, or generate distinctive impact noise.



### Protection of Public Health and Safety

Field contingency and emergency plans prepared for the proposed operations, presented as Appendix B to the Plan of Development, describe those actions to be taken by MPLP employees and contractors to first prevent; and if they occur, respond to; different incidences (well blowouts, fire, spills or geothermal fluid discharges, and hazardous gas discharges) which could endanger public health and safety. The measures and programs designed to prevent and control any unlikely accidental discharges of geothermal fluid, as described above in Surface and Ground Water Quality Protection, also work to protect public health and safety from these same potential discharges of geothermal fluid. MPLP safety training and instructions to work crews and contractors concerning public health and safety, and compliance with Cal/OSHA regulations, also help protect public health and safety.

### Protection of Fish, Wildlife and Botanical Resources

Direct impacts to wildlife habitat and botanical resources would be minimized by clearing only those small areas required for the construction of the road crossings and highway boring.

Fish habitat would be protected through the prevention of erosion and spills of geothermal fluid. Following pipeline construction, the few small areas of disturbed land would be reclaimed to promote the reestablishment of native plant and wildlife habitat.

MPLP has committed to produce and operate the Project geothermal production wells in conformance with the ongoing hydrologic monitoring and remedial action program required by the BLM as Stipulation No. 1 of the Plans of Operation for Development, Injection and Utilization (CA-017-PO06-60), as amended, for the MPLP PLES I Geothermal Project (see Attachment 1 to this appendix for the full text of this stipulation). This program is designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat within the Hot Creek Fish Hatchery springs

MPLP would also comply with mitigation measures **VEG-1** (reclamation and revegetation of disturbed areas), **NOX-1** (washing of construction vehicles), **NOX-2** (weed-free seed mixtures), **NOX-3** (weed-free erosion control materials), **NOX-5** (non-native weed species standards for revegetation), **NOX-6** (cheatgrass control), **NOX-7** (rehabilitation of disturbed areas), **WLD-1** (vehicle speeds on roads), **WLD-2** (operations near goshawk nests), **WLD-3** (harassment of wildlife), **SMG-1** (salvage of topsoil), and **SMG-2** (de-compacting subsoils). from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

### Protection of Cultural Resources

With exception of approximately 20 acres of private (fee) land owned by the City of Los Angeles, all of the Project area has been previously surveyed for cultural resources. All six drill sites and the connecting areas along Sawmill Road were surveyed for the Basalt Canyon Geothermal Exploration Project in 2001. Archaeological surveys of the Casa Diablo area east of U.S. Highway 395 were also conducted in 1986 during the environmental review process for the MP II and PLES I Projects. The rest of the Project area was surveyed for Caltrans projects along U.S. Highway 395 and State Route 203 and by the USFS for timber sales.

Although some of these cultural resource surveys are old, they indicate a relatively low density of identified cultural resources, and thus the likelihood that all important cultural resources can be avoided by Project surface disturbing activities. MPLP will contract for an archeologist acceptable to the Inyo National Forest Archaeologist to conduct site-specific surveys of those Project areas which may be disturbed prior to conducting any activities which would disturb these areas. Any areas which contain cultural resources of significance will be avoided, or the potential for impacts mitigated in a manner acceptable to the Inyo National Forest Archaeologist.

MPLP employees, contractors, and suppliers would be informed about the sensitivity of the area and reminded that all cultural resources are protected and if uncovered shall be left in place and reported to the MPLP representative and/or their supervisor.

MPLP would also comply with mitigation measures **CUL-1** (conducting cultural resource surveys prior to any new surface disturbance and protecting identified resources during construction) and **CUL-2** (protecting previously unrecorded cultural resources which may be encountered) from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

### Recreation

In order to minimize disturbance to recreation activities within Shady Rest Park, MPLP would prohibit tractor-trailer truck traffic, and would limit other Project traffic, from travel on that portion of Sawmill Road between Sawmill Cutoff Road and Forest Road 3S36 when the park is not closed for the winter.

Winter access to the well sites by vehicles when substantial snow is on the ground is unlikely but could be required to complete critical Project maintenance operations, such as the replacement of a well pump. In these circumstances it may be necessary to plow, blow or otherwise remove snow from the well site access routes. As Sawmill Cutoff Road is a signed and groomed snowmobile trail, MPLP has committed that, to the extent possible, all access to producing well sites which would require the removal of snow would be on Sawmill Road off of State

Route 203. MPLP has also committed that should well sites 12-25, 14-25, 15-25, 25-25, or 34-25 be connected to the pipeline, MPLP would consult with the BLM and USFS and prepare a winter access contingency plan to specifically describe how any critical maintenance operations would be conducted during winter to minimize the adverse effects on snowmobile and cross-country ski use of the Sawmill Cutoff Road trail or surrounding areas. The contingency plan would specify one or more of the following or other actions which would be appropriate to minimize the effects on recreation from the required maintenance operations should the clearing of snow become necessary:

- Minimize the length or width of the road cleared of snow;
- Minimize the time during which snow is cleared from the road;
- Direct the replacement of removed snow after the completion of the drilling operations;  
or
- Limit the crossing of Sawmill Cutoff Road to a single, ramped cut along the “Pole Line Road” west to Forest Road 3S35 northwest of Shady Rest Park or to Forest Road 3S35 near drill site 34-25, which could be accessed from Sawmill Road through either the Shady Rest Park parking lot and Forest Road 3S26 or the new and existing access roads through drill sites 77-25 and 56-25.

MPLP would install temporary warning signs and devices along Sawmill Cutoff Road, in conformance with USFS recommendations, to alert snowmobile drivers of the vehicle crossing hazard at the Sawmill Cutoff Road/”Pole Line Road” junction and/or in other locations, as needed. Temporary warning signs would also be posted along the cross country sections of the pipeline during winter to warn snowmobilers and skiers of the pipeline should it become covered with snow.

MPLP would comply with mitigation measures **TPS-5** (proper signage to avoid conflicts with winter recreation users along Sawmill Cutoff Road) and **REC-1** (crossing Sawmill Road by cross-county skiers) from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

#### Protection of Grazing

MPLP would comply with mitigation measure **GRZ-1** (coordination with the USFS and term grazing permittee during drilling and testing operations) and **GRZ-3** (coordination with the USFS and term grazing permittee) from the Upper Basalt Geothermal Exploration Project ROD (see Appendix C).

### Waste Disposal

Few solid waste materials would be generated. Solid wastes generated during construction would either be collected by a licensed waste hauler or transported by MPLP and deposited at a facility authorized to receive and dispose of these materials. Portable chemical sanitary facilities would be used by all personnel. These facilities would be maintained by a local contractor.

### Environmental Monitoring

Regular, routine visual inspections of the construction areas during construction would be conducted by the on-site MPLP representative and contractor operational personnel to quickly detect and correct any operational problems that could lead to environmental problems. Environmental specialists would be monitoring and inspecting the operations if necessary during construction of the Project. Once placed into operation, the MPLP operators stationed at the Casa Diablo operations center would continuously monitor the well and pipeline operations through the data transmitted to the center by the well and pipeline monitoring sensors. In addition, these operators would also conduct regular, routine visual inspections of the well sites and pipeline.

**ATTACHMENT 1**

**PLES I GEOTHERMAL PROJECT APPROVAL STIPULATION NO. 1**



## ATTACHMENT 1

### PLES I GEOTHERMAL PROJECT APPROVAL STIPULATION NO. 1

The following is Stipulation No.1 attached to the approval of the PLES I Geothermal Project Plans of Operation for Development, Injection and Utilization (CA-017-PO06-60), as amended:

1. The operator will implement the following monitoring and remedial action program, designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs:
  - a) The operator shall be responsible for reporting to the authorized officer the monitoring measurements required to be collected by the Plan for Baseline Data Collection ("PBDC") approved for the project, or any other monitoring data which may be required by the authorized officer. The approved PBDC will incorporate the monitoring program recommended for the project by the Long Valley Hydrologic Advisory Committee ("LVHAC") dated October 1987, as corrected, including the existing monitoring well SF 65-32, and shall require monitoring information be collected and reported for the C-D Hot Creek headsprings comparable to that recommended by the LVHAC for the A-B Hot Creek headsprings which is critical habitat for the endangered Owens tui chub.
  - b) Prior to commencing commercial geothermal operations, the operator shall prepare, and have approved by the authorized officer, a detailed program for the timely implementation of hydrologic monitoring or remedial action measures which may be required through approval of these Plans of Operation. At a minimum, the program must include basic engineering designs, preliminary equipment fabrication and construction schedules, and permit or rights-of-way acquisition plans and schedules. The operator shall review and update the program annually, or as required by the authorized officer.
  - c) The operator shall establish a funding mechanism to ensure that the mitigation actions described in this stipulation will be implemented in a timely manner. Such funding shall be provided either directly through the provision of materials and services needed to satisfy the monitoring and remedial action requirements described in this stipulation, or indirectly, through insurance, performance bond, dedication of project revenues to a special escrow account or other mechanism acceptable to the authorized

officer. The funding mechanism shall be developed by the operator in consultation with the authorized officer, and agreed to by the authorized officer in cooperation with the U.S. Fish and Wildlife Service and California Department of Fish and Game, prior to the commencement of geothermal production by the operator.

- d) The authorized officer, in cooperation with the U.S. Fish and Wildlife Service regarding the Owens tui chub, and in cooperation with the California Department of Fish and Game regarding the Hot Creek Hatchery and Mammoth Creek/Hot Creek, will, at a minimum, annually evaluate the monitoring data and consult with the U.S. Geological Survey, the California Division of Oil and Gas, the County of Mono, the U.S. Fish and Wildlife Service, and California Department of Fish and Game (the "consulting agencies"), if appropriate, regarding the analysis of the data and the implementation of mitigating measures as indicated appropriate by the conclusions of the analysis of the data.
- e) The operator will fund an independent expert, acceptable to the authorized officer, to conduct annual technical analyses and evaluations of the hydrological monitoring data and will provide all results of these analyses and evaluations to the authorized officer in a timely manner.
- f) If the authorized officer, in cooperation with the U.S. Fish and Wildlife Service regarding the Owens tui chub, and in cooperation with the California Department of Fish and Game regarding the Hot Creek Hatchery and Mammoth Creek/Hot Creek, determines that the available monitoring information indicates the need for further information with respect to a threat posed by plant operations to the beneficial uses of the thermal water, or to the continued existence of the Owens tui chub, the operator shall drill a second monitoring well to be maintained and monitored in conformance with the requirements of Stipulation 1.a) above. The well shall be sited at a location to be determined by the authorized officer and the appropriate governmental agencies with land use jurisdiction, in consultation with U.S. Geological Survey.
- g) If the authorized officer, in cooperation with the U.S. Fish and Wildlife Service regarding the Owens tui chub, and in cooperation with the California Department of Fish and Game regarding the Hot Creek Hatchery and Mammoth Creek/Hot Creek, determines that monitoring information from the existing monitoring well SF 65-32 and all other monitoring information indicate that:

- (1) Pressure, temperature, and/or chemical changes or trends are occurring within the production or injection fields in excess of the anticipated variations, based on production experience;
- (2) Pressure, temperature, and/or chemical changes or trends are occurring within the monitoring well(s) in excess of the anticipated range of variations; or
- (3) Plant operations may threaten an unacceptable impact to other current beneficial uses of thermal water, or threaten a change in the temperature of the A-B or C-D Hot Creek headsprings, then

The operator shall, if required by the authorized officer, immediately implement one or more of the following mitigation actions:

- (1) Temporarily modify the production and/or injection of geothermal fluids within the field and monitor the reservoir response. Modification could include one or more of the following:
  - (i) Change fluid volumes or pressures in one (1) or more production or injection well(s);
  - (ii) Discontinue use of one (1) or more production or injection well(s);
  - (iii) Change the depth of injection;
  - (iv) Relocate one (1) or more production or injection well(s); or
  - (v) Any other measure as directed by the authorized officer, or
- (2) Permanently modify the production and/or injection program.

In reaching a decision regarding the implementation of mitigation measures, the authorized officer shall consider, among other factors, the recommendations of the consulting agencies.

- h) If the authorized officer, in cooperation with the U.S. Fish and Wildlife Service regarding the Owens tui chub, and in cooperation with the California Department of Fish and Game regarding the Hot Creek Hatchery and Mammoth Creek/Hot Creek, determines the monitoring information from the second monitoring well and all other monitoring information indicate a need for further information with respect to a threat

posed by plant operations to the beneficial uses of thermal water, or to the continued existence of the Owens tui chub, the operator shall drill a third monitoring well to be maintained, and monitored, in conformance with the requirements of this stipulation. The well shall generally be located in the area between Colton Springs and the Hot Creek headsprings, with the specific location to be determined by the authorized officer and the appropriate governmental agencies with land use jurisdiction, in consultation with the U.S. Geological Survey.

- i) If the authorized officer, in cooperation with the U.S. Fish and Wildlife Service regarding the Owens tui chub, and in cooperation with the California Department of Fish and Game regarding the Hot Creek Hatchery and Mammoth Creek/Hot Creek, determines that monitoring information from the second monitoring well and all other monitoring information indicate that plant operations may threaten an unacceptable impact to other current beneficial uses of thermal water, or threaten a change in the temperature of the A-B or C-D Hot Creek headsprings, one or more mitigation actions, including but not limited to those listed in Stipulation 1 .9) above, shall be required. In reaching a decision, the authorized officer shall consider, among other factors, the recommendations of the consulting agencies.
- j) After monitoring the third monitoring well (located in the area between Colton Springs and the Hot Creek headsprings), should the authorized officer determine that plant operations threaten an unacceptable impact or are resulting in an unacceptable impact to beneficial uses of thermal water, or threaten a change or are resulting in a change in the temperature of the A-13 or C-D Hot Creek headsprings, one or more mitigation actions, including, but not limited to, those listed in subparagraphs (1) through (5) below shall be required. In reaching a decision, the authorized officer shall consider, among other factors, the recommendations of the consulting agencies.
  - (1) Temporarily modify the production or injection of geothermal fluids within the field and monitor the reservoir response. Modification could include one or more of the following:
    - (i) Change fluid volumes or pressures in one (1) or more injection or production well(s);
    - (ii) Discontinue use of one (1) or more production or injection well(s);

- (iii) Change the depth of injection; or
    - (iv) Relocate one (1) or more production or injection well(s).
  - (2) Permanently modify the production and/or injection program.
  - (3) Provide an alternate source of thermal energy or water to the affected Hot Creek headspring(s). Such thermal energy or water shall be conveyed to the Hot Creek headspring(s) in a manner that does not facilitate the introduction of other fishes into the headsprings.
  - (4) Inject geothermal water into the geothermal reservoir upgradient of Hot Creek Gorge to offset reservoir pressure declines reducing spring flows.
  - (5) Reduce or discontinue power production.
- k) If monitoring activities of the three monitoring wells described above indicate a progressive temperature or pressure decline is occurring that threatens a change of temperature at the A-B or C-D Hot Creek headsprings, or threatens the continued existence of the Owens tui chub, the operator shall, at a minimum, implement the mitigation action described in Stipulation 1.j) (3) above.
- 1) The Operator shall be responsible for maintaining the thermal energy or water conveyance facilities described in Stipulation 1.j) (3) above for as long as an alternate source of thermal energy or water is needed to maintain water temperatures in the affected Hot Creek headsprings at levels existing prior to the onset of impacts from plant operations.



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**APPENDIX C**

**U.S. Bureau of Land Management/U.S. Forest Service  
Approved Decision Records and Findings of No Significant Impact  
for the  
Basalt Canyon Geothermal Exploration Projects  
and the  
Upper Basalt Geothermal Exploration Project**

**DISCISON RECORD  
AND  
FINDING OF NO SIGNIFICANT IMPACT  
FOR  
BASALT CANYON SLIM HOLE  
AND  
GEOTHERMAL WELL EXPLORATION PROJECTS**

**Decision:**

It is my decision to approve the plans of operation for the Basalt Canyon geothermal well exploration and Basalt Canyon slim hole exploration projects. This approval will be subject to the stipulations identified below. The associated geothermal drilling permits and sundry notices will be approved when consistent with this plan of operations, provided that drill permit and sundry notice and engineering stipulations are required in those approvals.

**Description of the project:**

Mammoth Pacific, L.P., (MPLP) is proposing to conduct two geothermal resource exploration drilling projects on portions of two existing federal geothermal resource leases, CA-11667 and CA-14408, within the Mono-Long Valley Known Geothermal Resource Area ("KGRA"), in Mono County, California. The area to be explored, termed the Basalt Canyon geothermal exploration area, consists of those lands located within Section 31, Township 3 South, Range 28 East (T3S, R28E), and Section 36, T3S, R27E, Mount Diablo Baseline and Meridian (MDB&M), which are west of U.S. Highway 395 and north of California Highway 203. For the Basalt Canyon Slim Hole Exploration Project, MPLP proposes to drill and monitor up to five small diameter holes from up to five of six identified sites in the exploration area. For the Basalt Canyon Geothermal Well Exploration Project, MPLP proposes to drill, complete, and test up to two large diameter geothermal exploration wells from up to two of these same six identified sites. Both the Basalt Canyon Slim Hole Exploration Project and the Basalt Canyon Geothermal Well Exploration Project ("Projects") are located entirely on public lands within the Inyo National Forest.

The specific objectives of the Basalt Canyon Slim Hole Exploration Project are to drill targets identified through geologic and geophysical surveys to confirm the geologic information, measure temperature profiles, obtain samples of the geothermal fluid for water chemistry, and monitor reservoir pressures. The specific objectives of the Basalt Canyon Geothermal Well Exploration Project are to drill into and flow test the identified geothermal reservoir to confirm the characteristics of the geothermal reservoir and determine if the geothermal resource is commercially viable. Should a commercially viable geothermal resource be verified by the Projects, MPLP would be required to submit new applications and receive additional approvals before proceeding with any commercial development or production of those resources.

### **Rationale for Decision:**

I have reviewed the plans of operation for the Basalt Canyon slim hole exploration project and the Basalt Canyon geothermal well exploration project. The Environmental Assessment (EA) was prepared based on issues the USFS, BLM and the public identified during scoping. A field trip was scheduled subsequent to the public scoping and the public was invited to attend through published notification in the local papers and over local radio and television stations. Comments from the public were then incorporated within the EA.

I have reviewed the public and agency comment letters received by this office during the NEPA process. The public comments and USFS/BLM's responses are attached.

This Action is approved because:

- A. This decision is consistent with the purpose for which lands were leased by the United States of America to MPLP and which conveyed to MPLP the "exclusive right and privilege to drill for, extract, produce, remove, utilize, sell, and dispose of geothermal steam and associated geothermal resources." To maintain this right, MPLP must "diligently explore the leased lands for geothermal resources until there is production in commercial quantities" applicable to each of these leases.
- B. The decision is consistent with surface use stipulations that were made part of the Leases CA-11667 and CA-14408. The operator has completed archaeological and Threatened, Endangered, and Sensitive wildlife and botanical surveys, the potential impacts to surface and ground water resources has been evaluated, the operator is monitoring water characteristics in Hot Creek, visual impacts have been evaluated, and the proposed operations, as modified by the included mitigation measures, will not result in unacceptable environmental impacts.
- C. The exploration of the geothermal resource is consistent with initiatives of the Secretary of Interior's National Energy Policy and supports the National Renewable Energy Initiative by providing more information about the energy production from geothermal resources.
- D. No impacts were identified in the subject EA that would justify denial of the applicant's rights granted under the existing lease.

The Bishop Paiute Tribe recommended that a representative of the Bishop Paiute tribe be funded by the operator, BLM, or the Forest Service, to monitor new ground disturbing activities associated with the project for the prevention of impacts to cultural resources within the project's area. It is not BLM policy to require the proponent to fund tribal oversight, however, MPLP has the option to fund a tribal representative during the ground disturbing activities.

Comments on the EA raised resource impact issues related to deer migration, ground water contamination, and public concern about development in the area.

Our evaluation of possible impacts on project area mule deer use included reviewing existing reports on general deer usage in the Mammoth Lakes area, specific deer studies completed for other projects, and research on the affects of development on deer use. In addition, we discussed this information with California Department of Fish and Game personnel during a meeting on February 8, 2002. Tim Taylor, California Department of Fish and Game Wildlife Biologist, said that he considers the Basalt Canyon geothermal exploration area to be important as a holding area (an intermediate destination to be used while waiting to finish migration to the main summer range) for a small portion of the Round Valley mule deer herd (Taylor, 2001 and 2002 per. com.). Telemetry data indicates that during years of "normal" precipitation deer from the Round Valley herd begin to arrive on the Sherwin holding area in early April and may inhabit the Basalt Canyon area by April 15. The deer generally spend several months in and around the project area while they wait to complete their migration. Tim indicated that, though limited in total numbers, the deer that use this area generally arrive in poor condition and rely on the succulent forage to replenish reserves depleted during winter months. Tim advised us that impacts during migration and holding periods would be the most significant as the deer are heavily dependent on forage and other available habitat within the migration routes and adjacent holding areas. Tim also noted that a limited resident population of deer from both the Casa Diablo and Round Valley herds use Basalt Canyon during the summer. He indicated that this use and the use during the fall migration period were less important than use during spring migration.

Limiting project implementation during the spring migration/holding period (WLD-1) would eliminate the most significant potential mule deer impacts. As these projects are exploratory in nature and somewhat flexible in their completion schedule, I am confident that implementation of the spring limitation will not unduly interfere with the proponent's ability to complete their exploration program and that the project, as modified by the included wildlife mitigation, will not result in significant direct, indirect, or cumulative impacts.

During the meeting with the Department of Fish and Game we discussed possible project impacts to Sage Grouse. It is my understanding that the Sage Grouse use would generally coincide with the mule deer migration/holding period. By restricting drilling during this period we will also mitigate possible impacts to the grouse.

We are completing a thorough review of the down-hole drilling program. I am confident that the requirements by BLM and California Regional Water Quality Control Board, Lahontan region (CRWQCB), will provide adequate drilling stipulations on well casing design that will seal off any shallow cold ground water encountered and maintain ground water quality. Additionally, BLM will have an Engineer on site to witness the drilling procedures and ensure adherence to the stipulations.

Members of the public expressed concern about commercial development for the Basalt Canyon area. As stated in the project description this project is specially designed to



explore for geothermal resources and does not propose commercial development or use. Commercial development is outside the scope of this analysis and this decision applies only to exploration.

The stipulations are listed below.

**Stipulations:**

These stipulations were compiled from mitigation measures in the Environmental Assessment, Basalt Canyon slim hole and Geothermal Exploration Projects and the public and agency comment letters received.

**CUL-2:** Drill pads and access roads shall be constructed to ensure that the recorded archaeological site materials are not disturbed. Any surface disturbing activity conducted for the Project along Sawmill Road between State Route 203 and the access road to Site 55-31, including the laying of temporary pipeline along the side of the road, shall either utilize the north side of Sawmill Road or be located to ensure that the cultural resource materials recorded adjacent to the south side of Sawmill Road are not disturbed.

Clearly mark and flag the limits of surface disturbing activities, including an adequate buffer zone, prior to the start of all grading or other surface-disturbing activities. The flagging shall be set with the assistance of a professional archaeologist, and the construction/grading contractor and each of the workers shall be trained to understand the flagging and its importance.

**CUL-3:** 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 shall cease, and the authorized officer notified. Grading or other surface-disturbing activities shall not recommence at the location of the discovery until the identified cultural resources(s) have been assessed, any necessary mitigation actions taken, and approved by the authorized officer.

**VIS-1:** All drill rig and well test facility lights shall be limited to those required to safely conduct the operations, and shall be shielded and/or directed in a manner which limits direct light to the immediate work area, except as may be required to comply with Federal Aviation Administration requirements. Special care shall be taken to minimize or avoid the placement or use of lights that may be directly visible from U.S. Highway 395, State Route 203, the Town of Mammoth Lakes, or other areas where substantial numbers of viewers may be present. Work lights shall only be on at times required for safety.

**VIS-2:** A buffer of native vegetation, approximately 25 feet or greater in width, shall be left between Sawmill Road and the drilling pad sites 35-31, 23-31, 12-31, and 81-36. Access roads and reserve pits should be out of the direct view of travelers on Sawmill road. The site entrance roads should be constructed at approximately 45-degree angles to Sawmill Road and the existing vegetation should be used for screening.

**VIS-3:** Pipelines laid to connect the well sites should either be tucked into the overhanging vegetation along the roadside or be out of view of the road, concealed by the ample and dense vegetation found along either side of the road.

**VIS-4:** Wellhead monitoring equipment left on site should be painted a color that will blend with the landscape and be screened by vegetation. Locations and color choices are subject to approval by the Authorized officer in cooperation with the Forest Landscape Architect.

**VIS-5:** Tree removal at site 55-31 shall be on the north or east sides of the drilling pad.

**VEG-1:** Topsoil shall be salvaged during the construction of all pads and access roads, as feasible, and stockpiled for use during subsequent reclamation of the disturbed areas. The depth of soil to be salvaged shall be determined by the authorized officer in consultation with the Forest Service. Soil stockpiles shall be placed in locations approved by the authorized officer and shall not be more than two feet high to encourage the continued viability of living organisms in the soil.

**VEG-2:** Upon completion of operations, all surface disturbances shall be recontoured as necessary to blend with the surrounding topography as soon as practicable. Partial, phased or concurrent reclamation may be required by the authorized officer as appropriate to minimize erosion and stabilize the disturbed areas. Salvaged and stockpiled topsoil shall be redistributed over the recontoured disturbed area. Seeding of disturbed areas will be completed using the following seed mixture and application rate.

Big sagebrush ( <i>Artemisia tridentata</i> )	0.5 PLS lb/ac
Antelope bitterbrush ( <i>Purshia tridentata</i> )	0.4 PLS lbs/ac
Desert peach ( <i>Prunus andersonii</i> )	0.2 PLS lbs/ac
Indian ricegrass ( <i>Achnatherum hymenoides</i> )	0.2 PLS lbs/ac
Western needlegrass ( <i>Achnatherum occidentale</i> )	0.2 PLS lbs/ac
Squirreltail ( <i>Elymus elymoides</i> )	0.3 PLS lbs/ac
Spurred lupine ( <i>Lupinus argenteus</i> var. <i>heteranthus</i> )	0.2 PLS lbs/ac
Chicalote, prickly poppy ( <i>Argemone munita</i> )	0.1 PLS lb/ac
TOTAL:	16.5 PLS lbs/ac

PLS = Pure Live Seed

Preferably, seeds for this project will be collected within the immediate vicinity of the project area. If this is not possible due to poor seed availability, seed from the following ecological subsections or sections the area borders on will be acceptable: 1) Eastern Slopes Subsection of the Sierra Nevada Section, and 2) Mono Section (Miles and Goudey 1997 – map available). If availability still presents a problem, the seed mix may be modified in consultation with the Forest Service.

Success standards for revegetation are as follows:

At least 3 shrubs and 8 perennial native grasses and/or forbs per 4 square meters will be established on site. Perennial grasses will account for at least 10% of the relative cover. All non-native weed species that are already present in the area will account for no more than 5% total of the relative cover at the end of the 2-year evaluation period. New non-native species introduced as a result of the project will be eradicated, i.e. 0% cover.

The revegetated areas will be monitored for compliance with the success standards defined above, and a report provided to the Forest Service the first and second years following completion of the project. Failure to meet the success standards will require additional planting and/or weed control, as appropriate, until standards are met.

**VEG-3:** Slash material produced from clearing the site access roads and drill pads would be chipped and stockpiled and spread to a depth of 1 to 2 inches over the drill sites after seeding, to serve as a native mulch and to provide an additional seed source for revegetation.

**NOX-1:** Prior to entering and upon exiting the Basalt Canyon geothermal exploration area, all trucks and construction equipment that will operate off of previously existing roads shall be washed to remove soil and plant parts. A central washing facility shall be provided for this purpose, either at the MPLP equipment area at Casa Diablo on private land or at a location approved by the authorized officer. Vehicles washed prior to traveling to the area shall be inspected the Forest Service prior to entering the Basalt Canyon geothermal exploration area to verify that they are soil and weed free.

**NOX-2:** Where appropriate, seed mixtures used to revegetate disturbed areas shall be certified as being free of noxious weed materials. In some cases, e.g. when seed is collected locally vs. grown in a nursery setting, weed certification may not be available.

**NOX-3:** Forest litter located on Site 31-36 shall be salvaged during construction of this pad and access road, as feasible, and stockpiled for use during subsequent reclamation of the disturbed areas to minimize the potential invasion of noxious weeds.

**NOX-4:** All non-native weed species already present in the area will account for no more than 5% total of the relative cover at the end of the 2-year evaluation period, following completion of revegetation measures. New non-native species introduced as a result of the project will be eradicated, i.e. 0% cover. Where this standard is not met, appropriate weed control measures will be implemented.

**WLD-1:** No operations are permitted during the migration and migration-holding period from April 15 through June 15.

**WLD-2:** Immediately prior to occupancy at site 31-36, a Forest Service biologist will conduct a survey to determine whether new northern goshawk nests have been constructed adjacent to the drill pad or access road. If a new nest is discovered, drilling will be delayed until after the nesting season.

**WLD-3:** All Drivers accessing drill sites will adhere to a speed limit of 25 mph.

**WLD-4:** Domestic dogs will not be brought to or kept on the drill sites.

**HYD-1:** The permittee shall use the following Best Management Practices (BMPs) to ensure the full containment of all sediment that may be generated by storm water runoff from the construction of each pad and access road throughout the life of the project. (See Appendix B for a description of each BMP)

Erosion Control Plan (BMP 2.2)

Timing of Construction (BMP 2.3)

Stabilization of Road slope Surface and Soil Disposal Areas (BMP 2.4)

Servicing and Refueling of Equipment (BMP 2-12)

Snow Removal Control (BMP 2-25)

This mitigation measure shall be implemented by developing a plan to prevent storm water pollution, which plan shall be prepared prior to construction of each well pad and access road. This plan shall identify structures such as sediment traps, filter fences, straw bales, or activities that will implement the intent of the BMPs. The permittee shall be responsible for ensuring that the identified BMPs are implemented immediately as required or applicable throughout the course of the exploration activities.

**HYD-2:** The slim holes and the geothermal well bores will be cased as appropriate and utilize the appropriate blow-out prevention equipment (BOPE) as authorized by the BLM in the drilling permits to prevent interzonal migration of geothermal or drilling fluids and to reduce the possibility of uncontrolled flows.

**HYD-3:** To minimize the potential of any contamination of shallow ground water from drilling fluids or drilling mud, the reserve pit shall be lined, and all drilling fluids not contained in the mud mixing tanks, mud system, or down hole shall be contained in the reserve pit. Upon completion of drilling activities, the solids remaining in the mud pit shall be dried, tested in accordance with the requirements of the California Regional Water Quality Control Board and, if authorized by the California Regional Water Quality Control Board, buried in the reserve pit.

**HYD-4:** Only nontoxic drilling materials shall be used in the drilling mud or drilling fluids.

**HYD-5:** To prevent cross-contamination of aquifers, geothermal fluids that are produced to the surface and injected shall only be injected back into the same formation from which they are produced.

**HYD-6:** The operator shall acquire all necessary permits and/or agreements, including the completion of any required additional environmental review, prior to any installation or use of reclaimed water for this project.

**GRZ-1:** If required by the authorized officer, the operator shall fence active pads sufficiently to prevent access by grazing animals.

**GRZ-2:** If the allotment permittee is unable to occupy a portion of the allotment adjacent to an active drilling operation due to the potential loss of sheep, the operator will compensate the permittee for lost forage. In general the compensation would be equal to the amount of unavailable forage. The authorized officer, in conjunction with the Forest Service, will determine the amount and type of compensation to the permittee.

**GRZ-3:** The Authorized Officer, in conjunction with the Forest Service, will identify alternate bedgrounds or other permittee use areas, if exploration-drilling operations displace the permittee's use. The geothermal operator will be responsible for reclaiming all new or old bedgrounds that are abandoned as a result of drilling operations, including revegetation and weed control.

**TPS-1:** Sawmill Road shall be maintained by the permittee during construction, drilling and testing operations, and any other period of high traffic associated with the projects, to ensure that the roadbed is maintained in a condition at least equal to pre-projects conditions.

**TPS-2:** Pads located immediately adjacent to Sawmill Road shall be constructed with at least a 25-foot wide area of undisturbed ground or other low, visually unobtrusive barrier to vehicles between the pad and Sawmill Road.

**TPS-3:** Project vehicles shall not block Sawmill Road by either stopping for any substantial length of time or parking on Sawmill Road. The permittee shall provide an off-site, local location for the long-term parking of vehicles.

**TPS-4:** During the winter, MPLP shall erect snow stakes or wands to aid in the removal of snow from Sawmill Road, other access roads, and pads and limit incidental disturbance. Actual removal of snow shall be with a loader or blower, not a bulldozer.

**TPS-5** Prior to construction of the Site 55-31 pad, MPLP shall consult with SCE regarding adequate separation between SCE's transmission line and the pad and the equipment to be sited on the pad. To the extent feasible, the pad shall be located to avoid conflicts between the SCE transmission line and equipment placement. The authorized officer will mediate unresolved disputes between the two parties.

**AIR-1:** To limit NO<sub>x</sub> emissions to less than 250 pounds per day, diesel engines shall have ignition timing retarded at least 2 degrees, and total consumption of diesel fuel for each drill rig shall be limited to an actual (not average) throughput of 900 gallons per day. Fuel flow shall be monitored at each drill site and shall be made available to the District staff upon request. If NO<sub>x</sub> emissions exceed 250 pounds per day, Best Available Control Technology shall be applied to each diesel engine.



**AIR-2:** The permittee shall discharge into the atmosphere from any geothermal well, including well drilling, well reworking and well testing, no more than 2.5 kilograms per hour per well (kg/hr/well) of hydrogen sulfide (H<sub>2</sub>S). If the emission of H<sub>2</sub>S from any well exceeds 2.5 kg/hr, or the State's H<sub>2</sub>S ambient air standard for one hour is exceeded at a monitoring station located at a District approved site, further venting of that well containing H<sub>2</sub>S will be curtailed until an H<sub>2</sub>S abatement plan, approved by the District, is implemented to reduce H<sub>2</sub>S well emissions below 2.5 kg/hr and ambient concentrations below the State standard of 0.03 parts per million. Such plan shall include a description of the abatement technology, the degree of control expected from such technology, and the test data indicating that such degree of control can be expected in a geothermal well application; and air quality analysis showing that the use of such abatement technology will not result in any violation of the State ambient air quality standard for H<sub>2</sub>S.

**AIR-3:** If, during drilling, concentrations of H<sub>2</sub>S greater than 5 lbs/hr. are encountered, the applicant will notify the District within 24 hours and either put into operation new or additional H<sub>2</sub>S abatement capacity as approved by the District, or cease operation and close in the well according to appropriate standards of operation.

**AIR-4:** The permittee shall apply water during the construction and utilization of pads and access roads as necessary to control dust. Dust shall not be discharged into the air for a period or periods aggregating more than three minutes in any one-hour that is as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart.

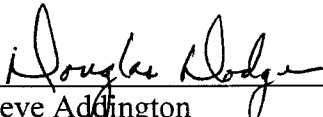
**REC-1:** Access to the Basalt Canyon geothermal exploration area by Projects vehicles (whether MPLP, contractors or others) shall be on Sawmill Road from State Route 203; no Project access shall be through Shady Rest Park.

## FINDING OF NO SIGNIFICANT IMPACT AND PROPOSED DECISION

It is my decision to approve the Basalt Canyon geothermal well exploration projects as modified with the stipulations above. Exploration will be conducted as described in the submitted plan of operations and abiding by all state and federal regulations.


I have reviewed the Environmental Assessment for the plan of operations for the Basalt Canyon slim hole exploration project and the Basalt Canyon geothermal well exploration project and all comments submitted in response to the proposed action. Based on this review, I have determined that this project, including the identified stipulations, will have no significant affect on the quality of the human environment and that an EIS is not required. I have determined that the proposed project is in conformance with the approved land and resource management plan.

Approved:

*for*  
  
Steve Addington  
BLM Bishop Field Manger

Date: 2/21/02

Concurred with:

  
John Borton  
USFS Acting District Ranger

Date: 2/20/02

**DECISION RECORD  
AND  
FINDING OF NO SIGNIFICANT IMPACT  
FOR  
UPPER BASALT CANYON  
GEOTHERMAL EXPLORATION PROJECTS**

**Decision:**

It is my decision to approve the plan of operation as described in the Environmental Assessment for the Upper Basalt Canyon geothermal exploration project. This approval is subject to the mitigations identified below. The associated Geothermal drilling permits and Sundry notices will be approved when consistent with this plan of operations, provided that drill permit and sundry notice and engineering stipulations are required in those approvals.

**Description of the project:**

Mammoth Pacific, L.P., (MPLP) is proposing to conduct two geothermal resource exploration drilling projects on portions of two existing federal geothermal resource leases, CA-11667 and CA-14408, within the Mono-Long Valley Known Geothermal Resource Area ("KGRA"), in Mono County, California. The area to be explored, termed the Upper Basalt Canyon geothermal exploration area, consists of those lands located within Section 25 and portions of Section 26, Township 3 South, Range 27 East (T3S, R27E), and portions of Section 30, T3S, R28E, Mount Diablo Baseline and Meridian (MDB&M), which are west of U.S. Highway 395 and north of California Highway 203. The project has identified ten potential drill sites for the completion of two related drilling programs. The first phase of the project is to drill, sample, and monitor up to five small diameter holes for the Upper Basalt Slim-hole Exploration Program. The second phase is to drill, complete, test and monitor up to four large diameter geothermal exploration wells for the Upper Basalt Geothermal Well Exploration Program. This project is located entirely on lands within the Inyo National Forest.

The purpose of the project is to explore for, locate and verify the existence and characteristics of a commercially viable geothermal resource within these portions of the identified federal geothermal leases. The specific objectives of the Slim-hole Exploration Project are to drill targets identified through geologic and geophysical surveys to confirm the geologic information, measure temperature profiles, obtain samples of the geothermal fluid for water chemistry, and monitor reservoir pressures. The specific objectives of the Geothermal Well Exploration Project are to drill into and flow test the identified geothermal reservoir to confirm the characteristics of the geothermal reservoir and determine if the geothermal resource is commercially viable. Should a commercially viable geothermal resource be verified by the Projects, MPLP would be required to submit new applications and receive additional approvals before proceeding with any commercial development or production of those resources.

**Rationale for Decision:**

I have reviewed the plan of operations for the Upper Basalt Canyon slim hole and well exploration projects. The Environmental Assessment (EA) was prepared based on issues the USFS and BLM discussed with MPLP; the timeframes for the environmental document were also decided at this meeting. A field trip was conducted after the public scoping notification was

published in the local papers and over local radio and television stations. Comments from the public were then incorporated within the EA.

I have reviewed the public and agency comment letters received by this office during the NEPA process. The EA and mitigation measures were modified based on the comments received. This Decision Record and Finding of No Significant Impact include the mitigation measures adopted and public comments with USFS and BLM's responses to those comments.

The rationale for approval of this project includes:

- A. This decision is consistent with the purpose for which lands were leased by the United States of America to MPLP, and which conveyed to MPLP, the "exclusive right and privilege to drill for, extract, produce, remove, utilize, sell, and dispose of geothermal steam and associated geothermal resources." To maintain this right, MPLP must "diligently explore the leased lands for geothermal resources until there is production in commercial quantities" applicable to each of these leases.
- B. The decision is consistent with surface use stipulations that were made part of the Leases CA-11667 and CA-14408.
- C. The exploration of the geothermal resource is consistent with initiatives of the National Energy Policy and supports the National Renewable Energy Initiative by providing more information about the energy production from geothermal resources.
- D. The potential impacts of this project as identified in the subject EA are primarily noise, development, and impacts to water quality, grazing, recreation use, and the northern goshawk. All potential impacts can be adequately mitigated and there is no justification to deny the applicant's rights granted under the existing lease.

Based on my review of the down hole drilling program I am comfortable that the requirements by BLM and California Regional Water Quality Control Board, Lahontan region (CRWQCB) will provide adequate drilling stipulations on well casing design that will seal off any shallow cold ground water encountered and maintain ground water quality. Additionally, BLM will monitor the drilling procedures and adherence to the mitigation measures prepared in the BLM approved Geothermal Drilling Permit (GDP) and Sundry notices (GSN).

The Forest Service and members of the public expressed concern about impacts to the recreational opportunities in the Basalt Canyon area during the scoping period. Mitigation measures and changes to the location of drill pads were made to address concerns of drilling noise, winter plowing and excess lighting. The locations of the drill sites and road access were coordinated with the Forest Service to meet the needs of the snowmobile use, cross country skiing and mountain bike riding paths.

I have reviewed the potential noise impacts and have determined that the noise levels from drilling activities should not exceed local noise ordinances. A noise monitoring and complaint response program, as well as other mitigations, will be implemented as an additional contingency measure.

Three known, potentially active, northern goshawk nests were identified during the scoping period. To eliminate the potential impacts to the northern goshawk, drill holes were relocated, and mitigations were established to protect the northern goshawk during critical nesting periods.

I have reviewed the mitigations and determined that there should be no residual effects to these northern goshawk sites.

**Mitigation Measures Adopted:**

These mitigations were compiled from mitigation measures in the Environmental Assessment, Basalt Canyon Slim Hole and Geothermal Exploration Projects, agency and public comment letters and are required as a condition of approval for the project.

**Upper Basalt Geothermal Exploration Project Mitigation Measures**

**Cultural Resource Protection Measures:**

**CUL-1:** Each area proposed for any new surface disturbance, including an appropriate buffer, would be surveyed by a professional archeologist acceptable to the BLM/USFS, and the results of this survey reported to the BLM/USFS with the request to commence surface disturbance. Drill pads and access roads would be constructed in such a way so as to ensure that recorded archaeological site materials are either not disturbed or, if they need be disturbed, that they are inventoried, documented and reported to the BLM/USFS, and a determination of their eligibility for the National Register of Historic Places and appropriate mitigation, if any, be completed by the BLM/USFS prior to disturbance to the site. To ensure that identified cultural resource sites adjacent to areas of disturbance are not disturbed, the limits of surface disturbing activities, including an adequate buffer zone, would be clearly marked and flagged prior to the start of all grading or other surface-disturbing activities. The flagging would be set with the assistance of a professional archaeologist, and the construction/grading contractor and each of the workers would be trained to understand the flagging and its importance.

**CUL-2:** 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 authorized officer notified. Grading or other surface-disturbing activities would not recommence at the location of the discovery until the identified cultural resources(s) have been assessed, any necessary mitigation actions taken, and the expressed approval of the authorized officer or his designee granted.

**Visual Resources Mitigation Measures**

**VIS-1:** All drill rig and well test facility lights would be limited to those required to safely conduct the operations, and would be shielded and/or directed in a manner which focuses direct light to the immediate work area, except as may be required to comply with Federal Aviation Administration requirements. Special care would be taken to minimize or avoid the placement or use of lights that would be directly visible from U.S. Highway 395, State Route 203, the Town of Mammoth Lakes, or other areas where substantial numbers of viewers may be present. Work lights would only be on at times of darkness or when required for safety.

**VIS-2:** To the extent vegetation screening opportunities are available, temporary pipelines laid to connect the well sites would be set back from roadways to conceal the pipelines from view on existing roads.

**VIS-3:** Wellhead monitoring equipment left on the drill sites would be painted a color that would blend with the landscape and, where practical, be screened by vegetation. Locations and color choices are subject to approval by the authorized officer in cooperation with the forest landscape architect.



**VIS-4:** Should tree removal be necessary for the construction of new access roads or drill sites, then to the extent practical the tree removal would be on the north and east sides of the areas of construction to optimize screening by existing vegetation to views from the foreground vantage points to the south and west of the Project area.

**Vegetation Mitigation Measures**

**VEG-1:** Upon completion of operations, all Project-affected areas of surface disturbance would be re-contoured as necessary to blend with the surrounding topography. Partial, phased or concurrent reclamation may be required by the authorized officer as appropriate to minimize erosion and stabilize the disturbed areas. Salvaged and stockpiled topsoil would be redistributed over the re-contoured disturbed area. Seeding of disturbed areas would be completed using the following seed mixture and application rate.

Species	Pure Live Seed (Pounds per Acre)
Big sagebrush ( <i>Artemisia tridentata</i> )	0.5
Antelope bitterbrush ( <i>Purshia tridentata</i> )	4
Desert peach ( <i>Prunus andersonii</i> )	2
Indian ricegrass ( <i>Achnatherum hymenoides</i> )	2
Western needlegrass ( <i>Achnatherum occidentalis</i> )	2
Squirreltail ( <i>Elymus elymoides</i> )	3
Spurred lupine ( <i>Lupinus argenteus</i> var. <i>heteranthus</i> )	2
Chicalote, prickly poppy ( <i>Argemone munita</i> )	1
<b>Total:</b>	<b>16.5</b>

Preferably, seeds for this project would be collected within the immediate vicinity of the project area. If this is not possible due to poor seed availability, seed from the following ecological subsections or sections the area borders on would be acceptable: Eastern Slopes Subsection of the Sierra Nevada Section; and Mono Section (Miles and Goudey 1997 – map available). If availability still presents a problem, the seed mix may be modified in consultation with the Forest Service.

Success standards for revegetation are as follows:

- \* At least 3 shrubs and 8 perennial native grasses and/or forbs per 4 square meters would be established on site.
- \* Perennial grasses would account for at least 10% of the relative cover.
- \* All non-native weed species that are already present in the area would account for no more than 5% total of the relative cover at the end of the 3 year evaluation period. New non-native species introduced as a result of the project would be eradicated, i.e. 0% cover.

The revegetated areas will be monitored for compliance with the success standards defined above, and a report provided to the Forest Service the first three years following completion of the

project. Failure to meet the success standards would require additional planting and/or weed control, as appropriate, until standards are met.

**VEG-2:** Slash material produced from clearing the site access roads and drill pads would be chipped and stockpiled and spread to a depth of 1 to 2 inches over the drill sites after seeding, to serve as native mulch and to provide an additional seed source for revegetation.

#### **Noxious Weed Prevention Measures**

**NOX-1:** Prior to entering the project area, all trucks and construction equipment that will operate off of previously existing roads shall be washed to remove soil and plant parts. A central washing facility will be provided for this purpose, either at the MPLP equipment area at Casa Diablo on private land, or at a location approved by the authorized officer. Vehicle inspections will be conducted by an authorized representative to verify the absence of noxious plant propagules. Prevention is a high priority.

**NOX-2:** Where appropriate, seed mixtures used to revegetate disturbed areas would be certified as being free of noxious weed materials. In some cases, e.g. when seed is collected locally vs. grown in a nursery setting, weed certification may not be available.

**NOX-3:** All other materials used in erosion control or rehabilitation efforts, e.g. straw bales, would be certified as being free of noxious weed materials.

**NOX-4:** Forest litter located on drill sites 12-25, 14-25, 15-25, 25-25, 34-25, 38-25, 57-25, and 58-25, and on the new roadways to drill sites 56-25, 58-25, and 77-25 would be salvaged during construction, as feasible, and stockpiled for use during subsequent reclamation of the disturbed areas to minimize the potential invasion of noxious weeds.

**NOX-5:** All non-native weed species already present in the area would account for no more than 5% total of the relative cover at the end of the 3-year evaluation period, following completion of revegetation measures. New non-native species introduced as a result of the Project will be eradicated (i.e. 0% cover). Where this standard is not met, appropriate weed control measures will be implemented in order to comply with the standard for a period of three years following project completion.

**NOX-6:** Cheatgrass is largely absent from the forested portions of the Project area. In order to maintain this condition, cheatgrass will be removed from all areas where ground disturbance occurs. Appropriate weed control measures will be implemented as necessary, in order to prevent the invasion and spread of cheatgrass, throughout the life of the project, and for a period of three years following Project completion.

**NOX-7:** Disturbed areas will be rehabilitated according to USFS specifications.

#### **Wildlife Protection Measures**

**WLD-1:** To reduce the potential for vehicle collisions with wildlife, especially deer, Project-related vehicles (whether driven by employees, contractors, or suppliers) traveling on unpaved roads in the Project area would be limited to a speed of 15 mph, except for Sawmill Cutoff Road, for which the speed limit would be 25 mph.

**WLD-2:** No well or slim hole drilling activities would be conducted at either drill site 12-25 or 15-25 between March 1 and June 15 of any year (for the purpose of this environmental protection

measure, "well or slim hole drilling" includes site construction, access road improvement, or well or slim hole re-drilling, but not well testing, temporary pipeline construction, well or slim hole monitoring, or other similar activities).

If on or after June 15 of any year a survey conducted by a qualified biologist using an approved protocol determines that goshawks have not selected and established a nest in any of the three nest trees located near drill sites 12-25 or 15-25, drilling activities may be conducted at either drill site, but only following the concurrence of the BLM authorized officer.

If on or after June 15 of any year a survey conducted by a qualified biologist using an approved protocol determines that goshawks have selected and established a nest site at one of the three nest trees located near drill sites 12-25 or 15-25:

\* Drilling activities would not be conducted at the drill site located closest to the selected nest tree until July 15 of that same year; and

\* Drilling activities may be immediately conducted at the drill site located farthest from the selected nest tree, but only following the concurrence of the BLM authorized officer.

**WLD-3:** All Project employees, contractors, and service personnel would be advised to neither harm nor harass wildlife encountered in the Project area. To avoid potential wildlife conflicts with domestic animals, unleashed domestic dogs and other domestic pets would not be allowed on the drill sites.

**WLD-4:** Any night lighting utilized at the drill sites would be shielded and directed onto the work areas of the individual drill pads to minimize lighting adjacent habitat.

#### **Soils, Geology and Minerals Mitigation Measures**

**SGM-1:** Topsoils would be salvaged during the construction of all pads and access roads, as feasible, and stockpiled for use during subsequent reclamation of the disturbed areas. The depth of soil to be salvaged would be determined by the authorized officer. Soil stockpiles would be placed in locations approved by the authorized officer and would not be more than two feet high to encourage the continued viability of living organisms in the soil.

**SGM-2:** During reclamation, and prior to the replacement of topsoil, disturbed areas would be de-compacted by sub-soiling through a means approved by the USFS.

**SGM-3:** Excavated reserve pits would be reclaimed by backfilling to conform to final grade with at least one foot of clean soil salvaged from the site or other native materials and covered with salvaged topsoil.

#### **Hydrology Mitigation Measures**

**HYD-1** The permittee would use the following Best Management Practices (BMPs) (USDA Forest Service, 2000) to ensure the full containment of all sediment that may be generated by storm water runoff from the construction of each pad and access road throughout the life of the Project. (See Appendix A for a description of each BMP)

1. Erosion Control Plan (BMP 2-2)
2. Timing of Construction (BMP 2-3)
3. Stabilization of Road Slope Surface and Spoil Disposal Areas (BMP 2-4)
4. Servicing and Refueling of Equipment (BMP 2-12)
5. Diversion of Flows Around Construction Sites (BMP 2-15)
6. Snow Removal Control (BMP 2-25)
7. Obliteration or Decommissioning of Roads (BMP 2-26)

This mitigation measure would be implemented by developing a plan to prevent storm water pollution, which plan would be prepared prior to construction of each well pad and access road. This plan would identify structures such as sediment traps, filter fences, straw bales, or activities that would implement the intent of the BMPs. The permittee would be responsible for ensuring that the identified BMPs are implemented immediately as required or applicable throughout the course of the exploration activities.

**HYD-2:** The slim-holes and the geothermal well bores would be cased as appropriate and utilize the appropriate BOPE as authorized by the BLM in the drilling permits to prevent inter-zonal migration of geothermal or drilling fluids and to reduce the possibility of uncontrolled flows.

**HYD-3:** To minimize the potential of any contamination of shallow ground water from drilling fluids or drilling mud, all drilling fluids and drilling mud not contained in the mud mixing tanks, mud system, or down hole would be contained in the reserve pit. Upon completion of drilling activities, the solids remaining in the mud pit would be dried, tested in accordance with the requirements of the CSWRCB Water Quality Order No. 2003 – 0003 – Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality or the project-specific requirements of the CRWQCB and, if authorized by the California Regional Water Quality Control Board, USFS and BLM, buried in the reserve pit.

**HYD-4:** No fuels or other hazardous materials would be stored, or vehicle fueling conducted, within any designated RCA (SNFPA ROD Standard and Guideline 99).

**HYD-5:** All road construction, improvement or maintenance activities conducted within designated RCAs would not divert, disrupt or impede the natural surface flow paths for, or create barriers to the flow of, flood flows (SNFPA ROD Standard and Guideline 100).

**HYD-6:** All road construction, improvement or maintenance activities proposed within designated RCAs would be conducted so as to minimize the potential for the generation of sediment during flood flows. To prevent the generation of sediment during flood flows, all spoils or other excess earth materials resulting from road or drill pad construction, improvement or maintenance would not be placed within any designated RCA (SNFPA ROD Standard and Guideline 92).

#### **Grazing Mitigation Measures**

**GRZ-1:** MPLP would communicate to the Forest Officer in Charge of the effected Grazing Allotments any and all scheduled drilling and testing operations during the permitted grazing season (July 5 to September 30). Coordination of these two Forest Uses increases the probability of success for both operations.

**GRZ-2:** If required by the authorized officer, the lessee would fence active pads sufficient to prevent access by grazing animals

**GRZ-3:** In the event the Term Grazing Permittee suffers a reduction in Annual Allowable Use as a result of MPLP's operations, the Forest Service would credit or refund the permittee for that loss. The Forest Officer in Charge of the effected Grazing Allotments would coordinate with the Forest Geologist and the Term Grazing Permittee to prevent and/or mitigate recurrence of the causative factors of such loss.

#### **Transportation and Public Services Mitigation Measures**

**TPS-1:** Sawmill Road and Sawmill Cutoff Road would be maintained by the permittee during construction, drilling and testing operations, and any other period of high traffic associated with the Project, to ensure that the road beds are maintained in a condition of at least equal to pre-Project conditions.

**TPS-2:** Project vehicles would not block Sawmill Road or Sawmill Cutoff Road by either waiting for any substantial length of time or parking on either road. To reduce the need for Project vehicles to wait for any substantial length of time or park on Sawmill Road or Sawmill Cutoff Road, the permittee would provide an off-site, local location for the long-term waiting or parking of vehicles not immediately being used for current operations on that site.

**TPS-3:** If Project operations continue during the winter, MPLP would erect snow stakes or wands to aid in the removal of snow from and limit incidental disturbance to Sawmill Road, Sawmill Cutoff Road, other access roads, and drill pads. Actual removal of snow would be with a loader or blower, not a bulldozer, and conducted in a manner designed to minimize disturbance to the road bed itself. If feasible, a layer of three inches of snow would be left on the road during snow removal to protect the road bed from the snow removal operations.

**TPS-4** Prior to initiating Project operations, MPLP would consult with SCE concerning the maintenance of adequate separation between SCE's transmission line and the drill pads, the equipment to be sited on the drill pads, and the equipment to be moved under transmission line. To the extent feasible, the drill pads would be located as necessary to avoid conflicts between the SCE transmission line and the drill pad locations, the equipment to be sited on the drill pads, and the equipment to be moved under the transmission line. Should conflicts not able to be resolved between the two parties, any dispute would be brought to the BLM and USFS, which would mediate the dispute.

**TPS-5** Should winter access be necessary and facilitate the cutting across of Sawmill Cutoff Road from the "Pole Line Road," proper signage would be prominently placed alerting the winter recreation user of the cut so as to avoid conflicts.

#### **Air Quality Mitigation Measures**

**AIR-1:** MPLP would comply with the GBUAPCD requirements applicable to the drilling rig diesel engines. In order to limit NO<sub>x</sub> emissions, MPLP would either limit total daily diesel engine fuel consumption or would apply Best Available Control Technology to each diesel engine, as determine by the GBUAPCD. Records of diesel fuel flow would be maintained at each drill site and would be made available to the GBUAPCD staff upon request.

**AIR-2:** The permittee would not discharge into the atmosphere from any geothermal well, including well drilling, well reworking and well testing, more than 2.5 kilograms per hour per well (kg/hr/well) of hydrogen sulfide (H<sub>2</sub>S). If the emission of H<sub>2</sub>S from any well exceeds 2.5 kg/hr, or the State's H<sub>2</sub>S ambient air standard for one hour is exceeded at a monitoring station located at a District approved site, further venting of that well containing H<sub>2</sub>S would be curtailed until an H<sub>2</sub>S abatement plan, approved by the GBUAPCD, is implemented to reduce H<sub>2</sub>S well emissions below 2.5 kg/hr and ambient concentrations below the State standard of 0.03 parts per million. Such plan would include a description of the abatement technology, the degree of control expected from such technology, and the test data indicating that such degree of control would be expected in a geothermal well application; and air quality analysis showing that the use of such abatement technology would not result in any violation of the State ambient air quality standard for H<sub>2</sub>S.



**AIR-3:** If, during drilling, excessively high concentrations of H<sub>2</sub>S are encountered, the applicant would notify the GBUAPCD within 24 hours and either put into operation new or additional H<sub>2</sub>S abatement capacity as approved by the GBUAPCD, or cease operation and close in the well according to appropriate standards of operation. For the purpose of this condition, excessively high concentrations of H<sub>2</sub>S would mean emissions greater than 5 lbs/hr.

**AIR-4:** The permittee would apply water during the construction and utilization of pads and access roads as necessary to control dust. Dust would not be discharged into the air for a period or periods aggregating more than three minutes in any one-hour that is as dark or darker in shade as that designated and No. 1 on the Ringelmann Chart.

### **Noise Mitigation Measures**

**NOI-1:** MPLP would implement the following measures when drilling at any of the proposed Upper Basalt drill sites:

- \* Where practicable, set up the drill rig so that it would act as a barrier to best shield the closest identified sensitive receptor location (either the Shady Rest Campground, Pine Glen Campground or Shady Rest Park) from noise generated from the diesel engines and air compressors;
- \* Train all drill rig crews in drilling rig noise awareness and prevention;
- \* Publish a telephone number for use by individuals for the lodging of complaints or inquiries regarding the level of noise from drilling operations. A designated representative of the permittee would be available 24 hours a day to record any lodged complaints or inquiries, and MPLP would make reasonable efforts to investigate and respond to any such complaint or inquiry within 24 hours of the complaint or inquiry. MPLP would record each lodged complaint or inquiry, and the results of its investigation and response, on a form, a copy of which would be delivered to the BLM and USFS staff designated to receive these forms within 24 hours of the complaint or inquiry;
- \* Where and when practicable, cover the drill rig V-door and drill rig floor with rubber or wood to reduce impact noise from pipes and/or casing against these metal surfaces; and
- \* Implement procedures for handling drill pipe and casing that minimize contact with metal surfaces, such as on the V-door and pipe catwalk.

**NOI-2:** MPLP would implement the following measures, if and as practicable, when drilling with air from at any of the proposed Upper Basalt drill sites:

- \* Implement procedures for minimizing noise when starting the air compressors and during air bleed-offs;
- \* Bleed compressed air pressure through the separator/muffler rather than the drill rig floor to reduce air pressure release noise;
- \* Install a check valve in the drill string to slowly bleed off air pressure and reduce high pressure release noise; and
- \* Install mufflers around pipe connection equipment such as air tuggers and winches.

**NOI-3:** Prior to commencing any construction activity (either drill site or access road construction or slim-hole or well drilling and testing) associated with the Project, MPLP would submit to, and secure the approval of the authorized officer for, a noise monitoring program designed to adequately respond to lodged noise complaints. The program would include the monitoring of noise immediately prior to and during all periods of construction activity from monitors on or near the active drill site, at Shady Rest Park, and at the campground closest to the active drill site to allow the correlation of any complaints of noise from the public with the level of measured noise and the type of operations which occurred at the active drill site. The data

obtained would be retained by MPLP for at least three years and a summary report provided to the authorized officer at the conclusion of each monitoring period.

**NOI-4:** If, after investigation of a lodged noise complaint, construction operations are determined to have exceeded the noise impact standards applicable at Shady Rest Campground, Pine Glen Campground or Shady Rest Park, MPLP, in consultation with the BLM and USFS, would further reduce drilling noise by installing a noise barrier (from weed-free straw bales or other effective material) to shield these receptors from the principal drilling rig noise sources (diesel engines and air compressors) at the drill site being drilled.

#### **Recreation Mitigation Measures**

**REC-1:** The winter access contingency plan would ensure that there is at least one location along Sawmill Road which would be maintained to provide a safe and easy crossing by cross-country skiers.

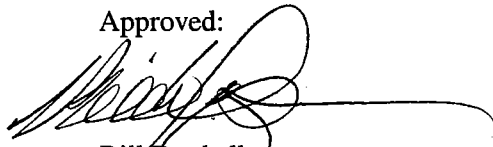
**REC-2:** Public access to each reserve/drilling mud pit shall be limited through the construction and maintenance of an appropriate temporary fence around each reserve pit when the associated drill site is not continuously staffed by operations personnel and until the pit is backfilled.

#### **FINDING OF NO SIGNIFICANT IMPACT AND PROPOSED DECISION**

It is my decision to approve the Upper Basalt Canyon geothermal well exploration project as modified to include the mitigations above. Exploration will be conducted as described in the submitted plan of operations and will abide by all state and federal regulations.

I have reviewed the Environmental Assessment for the plan of operations for the Basalt Canyon slim hole exploration project and the Basalt Canyon geothermal well exploration project and all comments submitted in response to the proposed action. Based on this review, I have determined that this project, including the identified mitigations, will have no significant effect on the quality of the human environment and that an EIS is not required. I have determined that the proposed project is in conformance with the approved land and resource management plan.


Approved:



Bill Dunkelberger  
BLM Bishop Field Manger

Date: 1/21/05

Concurred with:



Kathleen S. Morse  
USFS Mammoth Lakes District Ranger

Date: 1/21/05