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Bryce C. Alstead
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balstead@hollandhart.com

January 31, 2014

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Donna Skau
Commission Secretary
Public Utilities Commission of Nevada
1150 E. William Street
Carson City, NV 89701

RE: Docket No. 14-_____. Application of ORNI 39 LLC, for authority under the provisions of the Utility Environmental Protection Act for a permit to construct a 230-kV transmission line and associated facilities, including a 48 MW geothermal energy generating facility, to be located in Lander County, Nevada.

Dear Ms. Skau:

Accompanying this letter, for filing with the Public Utilities Commission of Nevada (the "Commission") and pursuant to the Nevada Utility Environmental Protection Act, is the Application of ORNI 39 LLC for authority under the provisions of the Utility Environmental Protection Act for a permit to construct a 230-kV transmission line and associated facilities, including a 48 MW geothermal energy generating facility, to be located in Lander County, Nevada. Also enclosed is a Draft Notice for the Application and a check for $200.00 for the filing fee.

Please contact me at 775-327-3067 if you have any questions or require additional information.

Very truly yours,

Fred Schmidt for

Bryce C. Alstead
for HOLLAND & HART LLP

BCA/cma
Enclosures
cc: Parties of Record

PUBLIC UTILITIES COMMISSION OF NEVADA

COVER SHEET

Pursuant to the Utility Environmental Act Permit Application Guidelines of the Public Utilities Commission of Nevada, the following information is provided as part of the cover sheet to the Application of ORNI 39, LLC, for authority under the provisions of the Utility Environmental Protection Act for a permit to construct a 230-kV transmission line and related facilities, including a 48 MW geothermal energy generating facility ("Proposed Project").

- **Name of the Applicant:** ORNI 39, LLC

- **Name of the Proposed Facility:** McGinness Hills II and McGinness Hills II 230 kV Transmission Line Extension

- **Name, Address and Telephone Number for Additional Information:**

Randy Peterson
Kyle Snyder
Ormat Nevada, Inc.
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Reno, Nevada 89511
Telephone: (775) 356-9029
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Fred Schmidt
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- **Environmental Statement Abstract:**

The Applicant has attached copies of the Final Environmental Assessment and the Finding of No Significant Impact ("FONSI") to the Application. *See* Exhibits 1 and 2 of the Application. Through the environmental assessment process, the Bureau of Land Management ("BLM") conducted a resource evaluation, analyzed each resource, assessed the cumulative impact related to the Proposed Project and identified the mitigation measures, which are included in the Final Environmental Assessment. The FONSI issued by the BLM concluded that net effects of the Applicant's geothermal facilities (both McGinness I and McGinness II) would be positive for public health and safety; that the construction of McGinness I and McGinness II would not disturb any wetlands or riparian vegetation; and that project-specific mitigation measures would serve to mitigate environmental impacts.

- **Public Notice:**

A copy of the Public Notice of the Amended Application and proof of publication of the Public Notice, as required by Nevada Revised Statutes 704.870 are attached as Exhibit 7 of the Application.

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Carson City, Nevada 89701

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

Application of ORNI 39 LLC, for authority under the provisions of the Utility Environmental Protection Act for a permit to construct a 230-kV transmission line and associated facilities, including a 48 MW geothermal energy generating facility, located in Lander County, Nevada.	)	Docket No. 14-_____

APPLICATION OF ORNI 39 LLC FOR A PERMIT TO CONSTRUCT A 230 KV TRANSMISSION LINE AND ASSOCIATED FACILITIES, INCLUDING A 48 MW GEOTHERMAL ENERGY GENERATING FACILITY UNDER THE UTILITY ENVIRONMENTAL PROTECTION ACT

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BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

Application of ORNI 39 LLC, for authority under the provisions of the Utility Environmental Protection Act for a permit to construct a 230-kV transmission line and associated facilities, including a 48 MW geothermal energy generating facility, located in Lander County, Nevada.	)	Docket No. 14-_____

APPLICATION OF ORNI 39 LLC FOR A PERMIT TO CONSTRUCT A 230 KV TRANSMISSION LINE AND ASSOCIATED FACILITIES, INCLUDING A 48 MW GEOTHERMAL ENERGY GENERATING FACILITY UNDER THE UTILITY ENVIRONMENTAL PROTECTION ACT

Pursuant to NRS 704.870, ORNI 39 LLC ("Applicant") hereby submits to the Public Utilities Commission of Nevada ("Commission") its application for a permit to construct a 230-kV transmission line and associated facilities, including a 48 MW geothermal energy generating facility, under the Utility Environmental Protection Act ("UEPA" and "Application", respectively). This Application is made pursuant to Sections 704.820 to 704.900 of the Nevada Revised Statutes and Sections 703.415 to 703.427 of the Nevada Administrative Code. In support of the Application, Applicant hereby submits the following information and evidence.

I. Introduction

Applicant is proposing to construct, operate, and maintain a modification and extension of an existing 230-kV overhead monopole transmission and communications line and associated facilities, including a new 48 MW geothermal energy generating facility, located near the existing McGinness Hills geothermal energy generating facility ("McGinness I") approximately 10 miles northeast of the Town of Austin in Lander County, Nevada. The McGinness I geothermal generating plant has a nameplate capacity of 48 MW, which is under the 70 MW threshold required to qualify as a "utility facility" pursuant to NRS 704.860(1). As such, Applicant was not required to obtain a UEPA Permit to Construct for McGinness I, which was completed in June of 2012. The UEPA Permit to Construct ("UEPA Permit") for the existing 230-kV transmission line, which Applicant's new transmission facilities are proposed to tie into,

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was approved by this Commission in Docket No. 11-04014 (the "Existing Line").

Applicant's proposed modification of the Existing Line would modify and extend the route of the Existing Line by approximately four tenths of a mile (.4 mile)[1] to allow the Existing Line to connect with a new 48 MW (nameplate) geothermal energy generating facility under development by Applicant ("McGinness II").[2] McGinness II is proposed to be located approximately one-quarter of a mile to the south of McGinness I. The 0.4-mile long extension of the 230-kV transmission and communications line and its related transmission and communication facilities are referenced herein as the "Gen-Tie Extension", and the Gen-Tie Extension and McGinness II are collectively referenced herein as the Project.[3]

McGinness II is proposed to be a "mirror" facility of the currently operational McGinness I facility approximately one-quarter mile to its north. Though McGinness II is an independent generating facility, McGinness II's output, layout, and generating facilities will be largely identical to those of McGinness I. The primary purpose of McGinness II is to deliver renewable energy and related attributes to Nevada Power Company ("NPC") to help meet Nevada's Renewable Energy Portfolio Standard ("RPS") requirements, and to meet the growing need for renewable energy in Nevada.[4] The Existing Line currently connects McGinness I to Sierra

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[1] The lines to and from the Existing Line are designed to parallel each other. As such, the Gen-Tie Extension is 0.4 mile long if measured by the actual distance of the new lines to be installed. If measured as the distance from the Existing Line to McGinness II, the Gen-Tie Extension is roughly 0.2 of a mile long.

[2] The nameplate capacity of McGinness II will be 48 MW; consequently, McGinness II does not qualify as a "utility facility" under NRS 704.860(1). Applicant recognizes that the combined nameplate capacity of McGinness I and McGinness II exceeds 70 MW; as such, Applicant has the new facilities associated with McGinness II in the definition of the Project in the event that the Commission views McGinness II as a "utility facility" under NRS 704.860(1).

[3] While the Environmental Assessment for McGinness I contemplated the potential construction of a second generating unit located in the area of McGinness II, *see generally* Ex. 1 at Section 1.2, Section 2.1.2, and Figure 6, McGinness I and McGinness II were developed as stand-alone projects. Following the construction and commercial operation of McGinness I, Applicant performed additional resources studies and determined that the geothermal resource in the area of McGinness I was sufficient to support a second nearby facility. For this reason, Applicant submits that the construction of McGinness II is exempt from UEPA since it is a stand-alone project with a nameplate generating capacity of 48MW. Notwithstanding this, Applicant respectfully requests that this Commission treat this application as encompassing both the Gen-Tie Extension and McGinness II in the event that this Commission believes that McGinness II is not exempt from UEPA.

[4] As discussed later in this Application, this Commission recently approved the Third Amendment to the ORNI 39 PPA (*see* Docket 13-11007), which adds the capacity of McGinness II to the existing PPA for McGinness I. As such, the McGinness II project is being built to provide energy and portfolio credits to NPC under a long-term PPA recently approved by the Commission.

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Pacific Power Company's ("SPPCo") existing Frontier Substation ("Frontier Substation"). Applicant's proposed modification and extension of the Existing Line through the construction of the Gen-Tie Extension would allow McGinness II to also deliver energy to the Frontier Substation (and thus NPC). As such, the ultimate purpose of the Project is to generate and deliver (via the Gen-Tie Extension and the Existing Line) renewable energy to the Frontier Substation for delivery to NPC.

An applicant for a UEPA Permit must undertake a two-step application procedure when a federal agency is required to conduct an environmental analysis in connection with its approval of a proposed utility facility. *See* NRS 704.870(2). Here, while the Project is located on federal land managed by the Bureau of Land Management ("BLM"),[5] the BLM's environmental analyses for the Project were completed as part of the July 19, 2011 Environmental Analysis ("EA") for McGinness I. As such, no new environmental analysis is required for the Project. Copies of the earlier EA and Findings of No Significant Impact (each, a "FONSI") were previously filed with this Commission in Docket No. 11-04014, and copies of the EA and the FONSI issued by the BLM are attached hereto as **Exhibits "1"** and **"2"**.[6]

The EA and BLM FONSI for McGinness I encompassed the real property upon which the Project is proposed to be sited.[7] *See* Ex. 1, at Sections 1.1-1.2 and 2.1.1-2.1.2, and Figure 6 *see also* Ex. 2. Further, the EA contemplated the potential construction of both McGinness I and McGinness II, as well as the Gen-Tie Extension. *See* Ex. 1, at Sections 1.1-1.2, 2.1.1-2.1.2, and 2.1.5. Additionally, the BLM FONSI's finding of no significant impact related to both McGinness I and McGinness II, as well as the substations and transmission lines for each generating facility. *See* Ex. 2 at pp. 2 ("Context"). Accordingly, even though the Project is located on federal land, because no additional environmental analyses are necessary to allow for

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[5] The McGinness II generating facility and the Gen-Tie Extension will each be constructed solely on federal lands managed by the BLM. The only associated facility of the Project to be constructed on private lands is one injection well (Well 66C-22) located on private land leased to Applicant.

[6] Because the Project uses only federal lands managed by the BLM, the FONSI previously issued by the United States Forest Service is not pertinent to this Application.

[7] Neither the Gen-Tie Extension nor McGinness II will require a new federal lease or right-of-way. Instead, both the Gen-Tie Extension and McGinness II will be located on BLM lands already leased to Applicant and held by geothermal production.

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the construction of the Project, the two-step UEPA process is not applicable in this instance. *See* NRS 704.870(2)(a) (requiring the filing of a pre-application notice only where an applicant files an application with a federal agency for approval for construction of a utility facility).

Applicant has obtained many of the permits and approvals necessary to construct the Project, and Applicant expects to receive the remaining permits it needs to construct the Project in the coming 8-10 weeks. Due to pending construction timelines for the Project that are driven by tax, financing, and PPA considerations, among others, Applicant respectfully requests that the Commission conduct an expedited review of the Application.

II. Information Regarding the Applicant

Applicant is a Delaware Limited Liability Company qualified to do business in Nevada. Applicant's corporate headquarters and principal place of business is 6225 Neil Road, Reno, Nevada 89511. Applicant is an affiliate of Ormat Nevada, Inc.

All communications or correspondence regarding the Application should be addressed or directed to the following:

Randy Peterson
Kyle Snyder
Ormat Nevada, Inc.
6225 Neil Road
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and

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III. Responses to Required Disclosures

The information required by NAC 703.423 is provided as follows.

A. NAC 703.423(1). Description of Location

1. NAC 703.423(1)(a). A general description of the location of the proposed utility facility including a regional map that identifies the location of the proposed utility facility.

The utility facility Applicant is proposing to construct, operate and maintain is: (1) an approximately four tenths of a mile (.4 mile) long 230-kV overhead monopole transmission line approximately 10 miles northeast of the town of Austin in Lander County, Nevada and (2) to the extent that the Commission determines that McGinness II requires a UEPA Permit,[8] a 48 MW geothermal energy generating facility also located approximately 10 miles northeast of the town of Austin in Lander County, Nevada.

As discussed in the introduction to this Application, the Gen-Tie Extension is an extension and modification of the Existing Line, which was approved by this Commission in Docket No. 11-04014, and which has now been operational for several years. The Gen-Tie Extension is proposed to connect the proposed McGinness II geothermal energy generating facility with Sierra's existing Frontier Substation. No improvements or alterations to the Frontier Substation are necessary to allow for this interconnection; however, a new on-site substation will be built at McGinness II to allow the Gen-Tie Extension to interconnect with McGinness II, and ultimately the Existing Line.

In addition to the Gen-Tie Extension, Applicant is also proposing to construct a new 48 MW (nameplate) geothermal energy power plant to be known as McGinness Hills II (previously defined as "McGinness II"). The purpose of the Project is to allow McGinness II to generate and deliver renewable energy to NPC. McGinness II will be located approximately one-quarter mile to the south of the existing McGinness I geothermal energy generating facility. A regional map

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[8] As discussed earlier in this Application, Applicant is applying for a UEPA Permit for McGinness II out of an abundance of caution. McGinness II is a stand-alone generating facility with a nameplate capacity under 70MW; notwithstanding this, Applicant is applying for a UEPA Permit for McGinness II in addition to the Gen-Tie Extension in the event that the Commission determines that McGinness II is not exempt from UEPA.

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of the Project's vicinity, its location, and the transmission route of the Gen-Tie Extension are attached hereto as **Exhibit "3"**. Design characteristics of the Gen-Tie Extension can be found below in **Table 1**, below, and design characteristics of McGinness II can be found in **Table 2**, below.

2. NAC 703.423(1)(b). A legal description of the site of the proposed utility facility, with the exception of electric lines, gas transmission lines, and water and wastewater lines, for which only a detailed description is required.

The Project is to be located approximately 10 miles northeast of Austin, Nevada near the existing McGinness I generating facility. With the exception of one injection well to be located on private land leased to Applicant, the Project is located entirely on BLM land on which Applicant had previously obtained a federal lease in connection with the development of McGinness I and the Existing Line.[9]

The Gen-Tie Extension is proposed to be approximately four tenths of a (.4 mile) long in total distance, and would originate just to the west of the new McGinness II generating facility. In essence, the Gen-Tie Extension will "loop" off of the Existing Line into a new on-site substation at the McGinness II facility, and from there back to the Existing Line. The two "legs" of the Gen-Tie Extension will run parallel to each other, and each leg is proposed to be approximately two tenths of a mile (.2 mile) long.

The McGinness II generating facility will be located in Sections 21 and 22, T20N, R45E, in Lander County. The proposed footprint of the McGinness II generating facility is approximately 12 acres, which includes the footprint of the new on-site substation through which the Gen-Tie Extension will connect with McGinness II. The overall site disturbance associated with McGinness II, including its ancillary facilities such as well pads, is anticipated to be approximately 34 acres in the aggregate.[10] A specific legal description of the McGinness II generating facility is attached hereto as **Exhibit "4"**.

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[9] The Project is located on BLM Lease Number NVN-083967.

[10] As discussed in more detail later in this Application, Applicant does not anticipate that 34 acres will be disturbed at any given time; rather, this figure represents the total land disturbance associated with all construction activities related to the Project.

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3. NAC 703.423(1)(c). Appropriately scaled site plan drawings of the proposed utility facility, vicinity maps and routing maps.

Please *see* Ex. 3 for vicinity maps and routing maps for the Project. Scaled site plan drawings for the Gen-Tie Extension portion of the Project are attached hereto as **Exhibit "5"** and scaled site plan drawings for the McGinness II portion of the Project are attached hereto as **Exhibit "6"**.

B. NAC 703.423(2). Description of Facility

1. NAC 703.423(2)(a). The size and nature of the proposed utility facility.

The Gen-Tie Extension portion of the Project is proposed as a 230-kV overhead transmission line and fiber optic line that will be approximately four tenths (.4 mile) of a mile long (approximately two-tenths of a mile long each way). Design characteristics of the Gen-Tie Extension can be found below in Table 1.

Table 1. Design Characteristics of the Gen-Tie Extension Portion of the Project

Line Length	Approximately 0.4 miles total (approximately .2 miles each way from the Existing Line to the on-site substation at McGinness II).
Type of Structure	Two (2) double circuit weathering steel mono-poles.
Structure Height	100 to 110 feet above ground line on concrete caisson foundations.
Span Length	Average ~ 470 ft
Number of structures	Two (2) structures total
Structure Base	Concrete Caisson Foundations
Conductor Types	Conductor - 795 ACSR All Aluminum "Tern"
Clearance of Conductor	Minimum of 8 feet phase to phase based on SPPCo Standard for structures at 230 kV
Access Roads	Existing roads would be utilized whenever possible to access the line. In those areas where no access roads currently exist, Applicant would utilize overland travel on existing BLM leases to access the

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	line. No permanent new access roads are necessary for the operation of the Gen-Tie Extension.
Voltage	230 kV

The McGinness II portion of the Project will be a 48 MW (nameplate) geothermal energy generating facility located on approximately 12 acres of land generally to the south of the existing McGinness I geothermal generating facility. McGinness II will be located within an existing BLM lease (NVN-083967) that was granted in connection with Applicant's development of McGinness I. McGinness II will use three generators to achieve its total gross nameplate rating of 55 MVA and 48 MW: (i) 20 MVA @ 0.9 Power Factor; (ii) 20 MVA @ 0.9 Power Factor; and (iii) 15 MVA @ 0.8 Power Factor. Design characteristics of McGinness II, including the on-site substation that will be used to connect with the Project, can be found below in Table 2.

Table 2. Design Characteristics of McGinness II

Process Design	Ormat Integrated 3-level Unit® (I3LU) consisting of two parallel two-level Ormat Energy Converters (OECs) followed in series by a third, low-pressure OEC.
Major Components	Preheaters, vaporizers, organic turbines, synchronous generators, recuperators, air-cooled condensers, motive fluid pumps, switchgear and controls, control building, fire detection and suppression systems, step-up/step-down transformer, protective relays, and generation meters.
Geothermal Wells	McGinness II will require five new production wells and one new injection well. The new injection well will be sited on private property leased to Applicant; all new production wells will be sited on leases that Applicant was granted in connection with the development of McGinness I.

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Maximum Output	48 MW Net
Average Output	29.8 MW Net
Total Surface Disturbance for McGinness II Generating Facility	12.2 acres
Total Anticipated Surface Disturbance for Construction of All New Facilities Associated with McGinness II	Approximately 34 acres

2. NAC 703.423(2)(b). The natural resources that will be used during construction and operation of the utility facility.

The only natural resource that Applicant needs to utilize for the construction and operation of the Project is water. Construction water will be necessary for stabilizing soils and to control fugitive dust during the grading process. Applicant estimates that approximately 10,000 gallons per day ("gpd") of water will be used during the construction phase of the Project, which will last for approximately 10 days with respect to the Gen-Tie Extension portion of the Project, and for approximately 9 to 10 months with respect to the McGinness II generating facility portion of the Project. Construction water for the Project will come from an existing well owned by Applicant.[11] Once Project grading is completed, no natural resources will be necessary for the operation of the Project. Notably, because McGinness II will be an air-cooled power plant, no water rights (or other natural resources) will be necessary for the operation of McGinness II.

3. NAC 703.423(2)(c) and (d). The layout diagrams of the structures at the proposed utility facility.

Layout diagrams for the Gen-Tie Extension are attached hereto as Ex. "5" and layout diagrams for McGinness II are attached hereto as Ex. "6".

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[11] Applicant will either file for a temporary use permit with the State Engineer to allow for this short-term use, or will obtain water from a private source that Applicant previously contracted with during the construction of McGinness I.

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4. NAC 703.423(2)(c) and (d). The scaled diagrams of the structures at the proposed utility facility.

Scaled drawings for the Gen-Tie Extension are attached hereto as Ex. "5" and scaled site plan drawings for McGinness II are attached hereto as Ex. "6".

5. NAC 703.423(2)(e). A statement concerning whether the proposed utility facility is an electrical generating plant or the associated facilities of an electric generating plant that uses renewable energy as its primary source of energy to generate electricity.

The Project includes two components. The Gen-Tie Extension portion of the Project comprises associated transmission and communications facilities of the McGinness II portion of the Project, which is an electrical generating plant using renewable geothermal energy as its primary source of energy.

C. NAC 703.423(3). Environmental Studies

A copy of the EA that the BLM issued in connection with its approval of McGinness I is attached to this Application as Ex. 1. As discussed earlier in this Application, the EA for McGinness I also contemplated the construction of McGinness II and its associated facilities, such as the Gen-Tie Extension. The environmental studies conducted by the BLM in connection with the EA ultimately resulted in the conclusion that the construction and operation of the Project would not significantly impact the quality of the human environment and that an Environmental Impact Statement (EIS) was not required for the Project. *See* Ex. 2 at pp. 1. Specifically, the BLM found that the net effects of McGinness I and McGinness II would be positive for public health and safety; that the construction of McGinness I and McGinness II would not disturb any wetlands or riparian vegetation; and that project-specific mitigation measures would serve to mitigate any impacts on sage grouse. *See* Ex. 2 at pp. 3-8. The FONSI issued by the BLM (attached as Ex. 2) provides a thorough summary of the earlier environmental studies conducted by the BLM.

D. NAC 703.423(4). Reasonable Alternative Locations.

There are no reasonable alternative locations for the Project. The Existing Line has already been constructed in the location previously approved by this Commission, and the location of McGinness II was previously approved by the BLM. The location of McGinness II

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(and its ancillary facilities, such as the Gen-Tie Extension) was approved by the BLM through the EA process. *See,* Ex. 1 and Ex. 2. An alternative location for the Existing Line was considered, and ultimately rejected, by the BLM and USFS during the EA process for McGinness I. *See* Ex. 1, at Section 2.2.1. As previously noted, the location of the Existing Line was also approved by this Commission in Docket No. 11-04014.

The primary reasons why the preferred transmission route is best suited for the proposed utility facility are that the location of McGinness II and its ancillary facilities was already approved by the BLM; that no sensitive areas will be disturbed by the preferred route; and, that the preferred route will allow Applicant to avoid the cost and land disturbance that would be attendant to a longer route.[12] Additionally, the Existing Line has already been constructed, and the preferred route of the Gen-Tie Extension provides for the shortest and most direct route to allow for the interconnection of McGinness II with the Existing Line. Finally, due to the remote location of the Project, the Project will not be visible from any municipalities or populated areas.

E. NAC 703.423(5). Proof of Public Notice

A copy of the Proof of Public Notice is attached hereto as **Exhibit "7"**.

F. NAC 703.423(6). Proof of Service to the Nevada State Clearinghouse.

A copy of the proof of service to the Nevada State Clearinghouse is attached hereto as **Exhibit "8"**.

G. NAC 703.423(7). Probable Effect on Environment

1. NAC 703.423(7)(a). A reference to any studies, if applicable.

Please *see* the Final Environmental Assessment for the McGinness Hills geothermal generating facility (July 2011), attached hereto as Ex. 1. As noted earlier in this Application, the EA for McGinness I also contemplated the construction of McGinness II and its associated facilities.

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[12] A longer route would also require additional water resources for dust suppression.

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2. NAC 703.423(7)(b). An environmental statement that includes:

i. The name, qualifications, professions and contact information for each person with primary responsibility for the preparation of the environmental statement.

A list of preparers and reviewers of the environmental statement can be found in the EA for McGinness I (Ex. 1) at Section 5.1. The following is the contact information for the lead and cooperating agencies that prepared the EA:

BLM
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820
Phone: (775) 635-4034

BLM
Battle Mountain District Office, RECO
50 Bastian Road
Battle Mountain, NV 89820
Phone: (775) 635-4000

United States Forest Service
Humboldt-Toiyabe National Forest
2035 Last Chance Road
Elko, NV 89801
Phone: (775) 778-6127

U.S Department of Energy
1000 Independence Avenue, SW
Washington D.C., 20585

Environmental Management Associates
2520 Snow Lane
Redding, California 96003-3419
Phone: (530) 246-8117

ii. The name, qualifications, professions and contact information for each person who has provided comments or input in the preparation of the environmental statement.

On August 6, 2010, the BLM and USFS sent out 180 public consultation letters that contained a brief description of McGinness I and McGinness II. A total of ten (10) responses were received from the following groups: Duckwater Shoshone Tribe, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Nevada Department of Wildlife, Center for Biological Diversity and Western Watersheds Project. *See* Ex. 1, at Section 1.6.2. On May 27,

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2011, the BLM issued a letter requesting interested persons to comment on the draft Environmental Assessment. The comments submitted are located in Appendix F of the EA. *See* Ex. 1, at page 231. Applicant does not have the name, qualifications, professions and contact information for each of the individuals that submitted comments beyond the information contained in Appendix F to the EA. The BLM also invited government entities to participate as cooperating agencies. The cooperating agencies that participated can be found in Section 5.2 of the EA. Applicant does not have the name, qualifications, professions and contact information for these cooperating agencies.

iii. A bibliography of materials used in the preparation of the environmental statement.

A complete bibliography of materials used in preparation of the EA can be found in Section 6 of the EA. *See* Ex. 1, at pp. 170-177.

iv. A description of the environmental characteristics of the project area existing at the time the application is filed with the Commission.

The Project area lies within the Wyoming Big Sagebrush-Indian Ricegrass-Thurber's Needlegrass and Basin Big Sagebrush-Wyoming Big Sagebrush-Rubber Rabbitbrush-Basin Wildrye vegetative communities. Elevations in the general area of the Project range from 6,700 feet above mean sea level (amsl) to 6,900 feet amsl. The BLM and USFS provided a detailed description of the environmental characteristics of the Project area, as it existed in 2010, in Section 3 of the EA. *See* Ex. 1, at pp. 48-145. The environmental characteristics of the Project area have not materially changed since the EA was released.

v. *A description of the environmental impacts that the construction and operation of the proposed utility facility will have on the project area before mitigation.*

The construction and operation of the Project will have a minimal impact on the Project area. The BLM has previously determined that the construction and operation of McGinness II will not have a significant environmental impact. *See* Ex. 2.[13] Potentially affected natural resources were evaluated by the BLM during its environmental review. *See* Ex. 1, at Sections 3

[13] Like the EA, the FONSI applies to both McGinness I and McGinness II. *See* Ex. 2 at pp. 2-3.

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and 4. Studies of these resources and an impact analysis were conducted, and mitigation measures and design parameters were developed to offset any significant impact. *See* Ex. 1, at Appendices C-E and Section 2.1.11.

The construction of the Gen-Tie Extension portion of the Project will result in the disturbance of approximately 9 acres of land over a period of approximately 9 weeks. Once constructed, the Gen-Tie Extension portion of the Project will have no ongoing environmental impacts. The only permanent improvements associated with the Gen-Tie portion of the Project are two (2) double circuit weathering steel monopoles and their foundations. The operation of the Gen-Tie portion of the Project will be limited to periodic inspection and maintenance activity that is not anticipated to create additional disturbances.

The construction of the McGinness II portion of the portion of the Project (including its ancillary facilities such as well pads and pipelines) will result in the disturbance of approximately 34 acres of land over a total period of 9 to 10 months.[14] Once constructed, the McGinness Hills portions of the Project will be limited to a surface disturbance of approximately 12.2 acres for the generating facility, and minor areas of disturbance associated with well pads and pipelines. Notably, McGinness II will not require the use of post-construction water resources because it is an air-cooled facility. Outside of periodic maintenance, Applicant does not anticipate the creation of additional disturbances during the operation of the McGinness II portion of the Project.

vi. A description of the environmental impacts that the construction and operation of the proposed utility facility will have on the project area after mitigation.

The BLM has provided mitigation factors and plans that Applicant must follow during the construction and operation of the Project, including various monitoring and mitigation plans. *See* Ex. 1, at Appendices C-E. The BLM concluded that to the extent that the recommended/stated mitigation measures are implemented, the Project will have no significant

---

[14] Please note that the 34 acre figure represents the total surface disturbance associated with the construction of McGinness II. Not all 34 acres will be disturbed at the same time, or to the same extent (e.g., the well pads will be placed at different times than the generating facility, and only the well pads and generating facility will result in permanent disturbances).

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impact on the environment. *See* Ex. 2 at page 3.

H. NAC 703.423(8)(a). An explanation of the extent to which the proposed utility facility is needed to ensure reliable utility service to customers in this state, including: if the proposed utility facility was approved in a resource plan, a reference to the previous approval by the Commission.

In NPC's triennial integrated resource plan filing with the Commission (Docket No. 10-02009), the Commission reviewed and approved a 20-year power purchase agreement between NPC and Applicant for renewable energy and other associated benefits from the McGinness I geothermal generating facility ("PPA"). The Commission reviewed the need and the costs and benefits of the PPA, and the Commission issued an order approving the PPA on July 30, 2010. An Amended and Restated PPA ("ARPPA") adding the McGinness II generating facility and McGinness II's output to the existing PPA was approved by the Commission in Docket No. 13-11007 on December 23, 2013.

The Project is required to allow for the construction of McGinness II's generating facilities, and for the connection of McGinness II with the Existing Line in order to allow McGinness II to ultimately connect with SPPCo's transmission system at the Frontier Substation. The construction of McGinness II and the Gen-Tie Extension is necessary to fulfill Applicant's obligations under the ARPPA to provide renewable energy to NPC. Connecting additional renewable geothermal energy capacity to SPPCo's transmission system also increases the reliability of utility service in Nevada by providing for additional base load energy. In addition, under FERC transmission rules, SPPCo is required to interconnect the McGinness II geothermal generating facility to SPCCo's transmission system. Accomplishing this required interconnection requires the installation of the transmission facilities comprising the Gen-Tie Extension, which will in turn allow McGinness II to interconnect with the Existing Line.

I. NAC 703.423(9). An explanation of how the need for the proposed utility facility as described in subsection eight balances any adverse effects on the environment as described in subsection 7.

The Project is needed to ensure NPC's compliance with Nevada's RPS and to reduce greenhouse gas emissions that are produced from conventional natural gas and coal fired power plants. The Nevada Legislature has adopted an aggressive RPS that requires electric utilities to

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acquire or generate 25% of their energy sold to retail customers from renewable energy systems by 2025. The Project will help to achieve this goal by leading to the construction and delivery of an additional 48 MW of base load renewable energy to NPC. As such, the Project serves to assist NPC in reaching its overall RPS requirements.

The EA for McGinness I and McGinness II considered both the beneficial and adverse impacts of McGinness I and McGinness II and their related facilities. Based on the analysis contained in the EA, the BLM FONSI found that as long as that the recommended mitigation measures are implemented, McGinness I and McGinness II (and their associated facilities) will not have a significant impact on the environment. *See* Ex. 2 at page 3. As a result, based upon the benefits associated with the Project and its minimal impact on the environment, the need of the Project clearly balances any adverse effects on the environment.

J. NAC 703.423(10). Explanation of Minimum Adverse Impact on Environment

An explanation of how the proposed utility facility represents the minimum adverse effect on the environment, including:

a. NAC 703.423(10)(a). The state of available technology.

The McGinness II portion of the Project is designed to be a state of the art geothermal energy generating facility using the most advanced Ormat Energy Converters to convert geothermal heat into renewable energy. The environmental impacts of McGinness II will be generally typical of utility-scale geothermal power plants; however, in contrast to many other geothermal facilities, because McGinness II will be an air-cooled facility no water resources will be required for McGinness II's operations. McGinness II has been designed to the same specifications as McGinness I and will meet all applicable laws, regulations, and codes. *See* Ex. 1 at Section 2.1.2. Applicant is not requesting any variances from applicable law in constructing the McGinness II portion of the Project.

The Gen-Tie Extension portion of the Project is designed to use similar characteristics and technology as other transmission lines that have been constructed and operated in Nevada. Indeed, the Gen-Tie Extension will be built to the same specifications and tolerances as the Existing Line. The Gen-Tie line has been designed to meet all temperature, wind, voltage, span

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and structure clearance requirements imposed by applicable law, as well as the requirements of the National Electrical Safety Code. *See* Ex. 1, at Section 2.1.5.2;[15] *see also* Table 1 *and* Ex. 6. Applicant is not requesting any variances from applicable law in constructing the Gen-Tie Extension portion of the Project.

b. NAC 703.423(10)(b). The nature of various alternatives.

Please see response in Section 3(D), *above*, regarding various alternatives studied. Because McGinness I and the Existing Line have each already been constructed, prior alternative locations for the Project are no longer feasible.

c. NAC 703.423(10)(c). The economics of various alternatives.

Please see response in Section 3(D), *above*, regarding various alternatives studied. Because McGinness I and the Existing Line have each already been constructed, prior alternative locations for the Project are no longer feasible. Further, the Gen-Tie Extension is the most direct route for the interconnection of a new geothermal facility to the Existing Line. As such, any alternative would be more expensive to connect, and would result in higher transmission costs that would ultimately be passed on to ratepayers.

K. NAC 703.423(11). Explanation on Location Conforming to State and Local Laws

a. NAC 703.423(11)(a). A list of all permits, licenses and approvals the applicant has obtained including copies thereof.

A listing of, and copies of, all permits, licenses, and approvals obtained by Applicant in connection with the Project, to date, are attached hereto as **Exhibit "9"**.[16] Please note that the applicability of state and local laws is limited because the Project is located primarily on federal lands.[17]

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[15] As noted above, the Gen-Tie Extension is proposed to be an extension of the Existing Line and it will be built to the same specifications and tolerances as the Existing Line.

[16] The EA discusses permits and approvals required for construction of McGinness I, the Existing Line, and the Project. The list attached hereto as Ex. 9 only contains the permits and approvals required to construct the Project.

[17] As noted earlier in this Application, except for one injection well, the entirety of the Project is located on federal lands.

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b. NAC 703.423(11)(b). A list of all permits, licenses and approvals the applicant is in the process of obtaining to commence construction of the proposed utility facility. The applicant must provide an estimated timeline for obtaining these permits, licenses and approvals.

A matrix of all permits, licenses, and approvals necessary to construct the Project that Applicant is in the process of obtaining, and Applicant's estimated timeline for obtaining such permits, licenses, and approvals, is attached hereto as Ex. "9".[18] Please note that the applicability of state and local laws is limited because the Project is located primarily on federal lands.

L. NAC 703.423(12). Explanation of Public Interest

a. NAC 703.423(12)(a). An explanation of the economic benefits that the proposed utility facility will bring to the applicant and this State.

The Project will result in the creation of jobs during construction and operation, and it will also result in additional tax revenues to Lander County and the State of Nevada. Applicant estimates that approximately 86 Full Time Equivalent ("FTE")[19] jobs will be created during the construction of the Project – 83 FTE jobs created for the construction of McGinness II, and an additional 2.6 FTE jobs during the construction of the Gen-Tie Extension. The operation of McGinness II will also require Applicant to hire approximately 2-3 permanent full-time workers (in addition to those workers already employed in connection with McGinness I). Applicant estimates that the average wage paid to workers on the Project will be $24.54/hour (plus benefits). Applicant anticipates that the majority, if not all, of these workers will be Nevada residents.

The Project will also generate new tax revenue for both the State of Nevada and Lander County through sales and use and property taxes. Based on the tax figures for McGinness I,[20] Applicant anticipates that the approximate amount of sales and use taxes that the Project will create is approximately $3.3 million. Applicant anticipates that the approximate amount of

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[18] It should be noted that the EA discusses permits and approvals required for construction of McGinness I, the Existing Line, and the Project. The list attached hereto as Ex. 9 only contains the permits and approvals required to construct the Project.

[19] One Full Time Equivalent (FTE) job is assumed to be 2,080 man hours.

[20] Because McGinness II will largely "mirror" the existing McGinness I generating facility, Applicant believes that the tax figures for McGinness II will be substantially similar to those derived from McGinness I.

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property taxes that the Project will create is approximately $8.1 million.[21]

Additionally, the construction and operation of the Project will allow renewable energy to be delivered to SPPCo's system and ultimately to NPC. Accordingly, the Project will help to ensure compliance with the RPS, which requires electric utilities to acquire or generate increasing annual percentages of electricity sold to retail customers from renewable energy systems.

b. NAC 703.423(12)(b). An explanation of the nature of the probable effect on the environment in this State if the proposed utility facility is constructed.

The EA analyzed the Project and covered all lands associated with the Project. As stated in the EA and FONSI, the Project will not have a significant impact on the environment. *See* Ex. 1, at Section 2.1, *see also* Ex. 2. Applicant will construct the Project in accordance with specific monitoring and mitigation plans required by the EA to ensure a minimal impact on the environment. The construction of the Project will result only in the temporary disturbance of approximately 34 acres of land, and once operational the footprint of the McGinness II generating facility will be only 12.2 acres. Finally, once the Project is constructed it will use no natural resources in operations.[22]

c. NAC 703.423(12)(c). An explanation of the nature of the probable effect on the public health, safety and welfare of the residents in this State if the proposed utility facility is constructed.

The Project is not anticipated to have any adverse effects on the health, safety, or welfare of Nevada's residents. Indeed, the Project is anticipate to have positive impacts on public health and safety. *See* Ex. 2 at pp. 3. The Project will provide economic benefits, including jobs and revenue, to Nevada's residents, which should improve their overall welfare. Further, the Project

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[21] McGinness II expects to qualify for the AB 522 Renewable Energy Project Sales and Property Tax abatements. The sales and property tax estimates provided here are conservative and assume that the abatement will be granted. If this abatement is not granted, McGinness II's tax figures will be much higher.

[22] Because McGinness II will be an air-cooled power plant, no water rights (or other natural resources) will be necessary for the operation of McGinness II.

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will allow for the displacement of coal and natural gas-fired capacity with clean renewable energy. Accordingly, the public health and welfare of Nevada's residents will also be improved by the reduction of toxic emissions.

d. NAC 703.423(12)(d). An explanation of the interstate benefits expected to be achieved by the proposed electric transmission facility in this State, if applicable.

Not applicable as to any interstate benefits expected to be achieved by the proposed transmission aspects of the Project. The Gen-Tie Extension is only four-tenths of a mile in total length, does not cross state lines, and will not require improvements to Sierra's transmission infrastructure. As such, the transmission aspects of the Project are not expected to have interstate impacts. The Project may have some interstate benefits in that, while Applicant intends to use local sources of labor and supply as much as practicable, certain components and equipment required for the construction of the Project are not available from local sources or within Nevada. As a result, these materials will need to be purchased outside of the State and transported through interstate commerce to the Project site.

IV. CONCLUSION

Applicant respectfully requests this Commission to approve this Application and issue a UEPA Permit for the Project. Applicant reserves the right to amend and supplement this Application as permitted and contemplated pursuant to NRS 704.820 to 704.900 and NAC 703.415 to 703.427.

DATED and respectfully submitted this 31st day of January, 2014.

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Fred Schmidt/for

Bryce C. Alstead, Esq.
Fred Schmidt, Esq.
377 South Nevada Street
Carson City, Nevada 89703
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PROOF OF SERVICE

I hereby certify that on January 31st, 2014 pursuant to NRS 704.870.3 and 704.870.4(a), I caused to be served via hand-delivery or U.S. Mail upon the following persons and/or agencies a copy of the Application of ORNI 39 LLC for a Permit to Construct a 230-kV Transmission Line under the Utility Environmental Protection Act (UEPA).

Nevada State Clearinghouse
Nevada Dept. of Administration
209 E. Musser Street, Room 200
Carson City, NV 89701
nevadaclearinghouse@lands.nv.gov

Tammy Cordova, Staff Counsel
Regulatory Operations Staff
Public Utilities Commission of Nevada
9075 West Diablo Drive, Suite 250
Las Vegas, NV 89148
tcordova@puc.nv.gov

Eric Witkoski, Chief Deputy Attorney General
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Bureau of Consumer Protection
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Las Vegas, NV 89101
bcpserv@ag.nv.gov

Leo Drozdoff
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
khoward@ndep.nv.gov

Sadie Sullivan
Lander County Clerk
315 S. Humboldt St.
Battle Mountain, NV 89820
clerk@landercountynv.org

Nevada Department of Conservation and Natural Resources
901 S. Stewart Street, Ste. 5001
Carson City, NV 89701

Signature of person serving

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PUBLIC UTILITIES COMMISSION OF NEVADA
DRAFT NOTICE
(Applications, Tariff Filings, Complaints, and Petitions)

Pursuant to Nevada Administrative Code ("NAC") 703.162, the Commission requires that a draft notice be included with all applications, tariff filings, complaints and petitions. Please complete and include **ONE COPY** of this form with your filing. (Completion of this form may require the use of more than one page.)

A title that generally describes the relief requested (see NAC 703.160(5)(a)):

Application of ORNI 39, LLC under the Utility Environmental Protection Act for a permit to construct a 230-kV transmission line and associated facilities, including a 48 MW geothermal energy generating facility, to be located in Lander County, Nevada.

The name of the applicant, complainant, petitioner or the name of the agent for the applicant, complainant or petitioner (see NAC 703.160(5)(b)):

ORNI 39, LLC

A brief description of the purpose of the filing or proceeding, including, without limitation, a clear and concise introductory statement that summarizes the relief requested or the type of proceeding scheduled **AND** the effect of the relief or proceeding upon consumers (see NAC 703.160(5)(c)):

The purpose of ORNI 39's filing to is obtain permission to construct a four-tenths of a mile long 230-kV transmission line and associated facilities, including a 48 MW geothermal energy generating facility. The effect of the requested relief upon consumers would be the delivery of renewable energy to Nevada Power Company and ultimately Nevada Power's customers. Please *see* Public Notice of Application; Exhibit 7 to the Application for a more thorough description of ORNI 39's Application.

A statement indicating whether a consumer session is required to be held pursuant to Nevada Revised Statute ("NRS") 704.069(1)[1]:

A consumer session is not required.

If the draft notice pertains to a tariff filing, please include the tariff number **AND** the section number(s) or schedule number(s) being revised.

N/A

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[1] NRS 704.069 states in pertinent part:

> 1. The Commission shall conduct a consumer session to solicit comments from the public in any matter pending before the Commission pursuant to NRS 704.061 to 704.110 inclusive, in which:
> (a) A public utility has filed a general rate application, an application to recover the increased cost of purchased fuel, purchased power, or natural gas purchased for resale or an application to clear its deferred accounts; and
> (b) The changes proposed in the application will result in an increase in annual gross operating revenue, as certified by the applicant, in an amount that will exceed $50,000 or 10 percent of the applicant's annual gross operating revenue, whichever is less.

EXHIBIT 1

Environmental Assessment

EXHIBIT 1

United States Department of the Interior
Bureau of Land Management
Battle Mountain District

Mount Lewis Field Office
Bureau of Land Management
50 Bastian Road
Battle Mountain, NV 89820

United States Department of Agriculture
United States Forest Service
Humboldt-Toiyabe National Forest
Austin and Tonopah Ranger Districts July 2011

Environmental Assessment
DOI-BLM-NV-B010-2011-0015-EA

McGinness Hills
Geothermal Development Project
Lander County, Nevada

NVN-84268X
N-88978
N-88979
#AUS74

McGinness Hills Geothermal Development Project
ENVIRONMENTAL ASSESSMENT

DOI-BLM-NV-B010-2011-0015-EA

Lander County, Nevada

Lead Agency:
U.S. Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
Contact:
Tim Coward, Renewable Energy Project Manager
Bureau of Land Management
P.O. Box 911
Tonopah, NV 89049
(775) 482-7800

Cooperating Agencies:
USDA Forest Service
Humboldt-Toiyabe National Forest
Contact:
Doug Clarke, Planner
United States Forest Service
2035 Last Chance Road
Elko, NV 89801
(775) 778-6127

U.S. Department of Energy
Loan Programs Office
Contact:
Matt McMillen, Director, Environmental Compliance Division
Joe Montgomery, NEPA Coordinator, Ormat-Nevada Project
U.S. Department of Energy LP 10
1000 Independence Avenue, SW
Washington D.C. 20585

Abstract:

This environmental assessment (EA) describes the anticipated environmental effects of the proposed McGinness Hills Geothermal Development Project and alternatives to the proposed action, including the No Action alternative. This project is located in Lander County, approximately 16 miles northeast of Austin, Nevada. The Project includes the construction and operation of two geothermal power generating facilities; geothermal production and injection wells and well pads; access roads; geothermal production and injection pipelines; an electrical transmission line, and ancillary support facilities.

Ormat Nevada, Inc.
McGinness Hills Geothermal Development Project
Environmental Assessment

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1 INTRODUCTION

1.1 BACKGROUND

Ormat Nevada, Inc. (Ormat) obtained federal geothermal leases in 2007 in the McGinness Hills area of Lander County, Nevada (see Figure 1). These leases were obtained and lease stipulations applied (see Appendix A). In 2008, the federal geothermal leases were unitized, creating the McGinness Hills Geothermal Unit (NVN-84268X) (McGinness Hills Unit or Unit). Following acquisition of the federal geothermal leases and formation of the Unit, Ormat began conducting exploration activities.

In April 2009, the Bureau of Land Management (BLM), Mount Lewis Field Office (MLFO), issued a Finding of No Significant Impact (FONSI) based on the Environmental Assessment (EA) (NV063-EA08-093) for Ormat's McGinness Hills Geothermal Exploration Project. This exploration project included the drilling and testing of temperature gradient holes (TGHs), observation wells, and full-size wells at 27 identified sites, and the building and use of access roads, as appropriate, within federal geothermal Unit NVN-84268X. Figure 2 identifies the well sites which were evaluated by the BLM in the EA. Total surface disturbance associated with the McGinness Hills Geothermal Exploration Project was identified in the EA at approximately 68 acres. Subsequently, some of the approved drill sites were relocated. To date, 8 wells have been drilled from 7 pads and associated access roads have been constructed. See Table 1 for an itemization of well status.

Subsequent to the approval of the McGinness Hills Geothermal Exploration Project, Ormat acquired the Lake Ranch lease on private land. The Lake Ranch lease is part of the McGinness Hills Unit. Within the private land lease (which is private surface and private minerals), Ormat has drilled 5 additional wells and built associated access roads.

Figure 3 shows all public and private land wells and associated access roads that have been constructed to date. Surface disturbance associated with these construction activities totals 57.1 acres (33.9 acres on public lands managed by the BLM, and 23.2 acres on private land).

Based on the successful results of the exploration activities conducted within the McGinness Hills Unit Area, Ormat has determined that the geothermal resources within the Unit are capable of commercial production. Thus, Ormat is proposing the McGinness Hills Geothermal Development Project described herein. For purposes of this EA, all components of the proposed Project are analyzed as connected actions under the National Environmental Policy Act.

In April 2011, Ormat designated ORNI 39, LLC as the Unit Operator, and ORNI 39 and ORNI 49 as tenants in common on the transmission system. This redesignation was recognized by the BLM in April 2011.

1.2 SUMMARY AND LOCATION OF PROPOSED ACTION

Ormat is proposing to construct, operate, maintain, and decomission the McGinness Hills Geothermal Development Project (McGinness Hills Project or Project). The Project includes the construction and operation of two power generating facilities; geothermal production and injection well pads and wells; access roads; geothermal production and injection pipelines; a microwave communication tower at each power plant; a domestic water well located at each of the power plants; an electrical transmission line and co-located Optical Ground Wire (OPGW)/fiber optic line (hereafter, fiber optic line); and ancillary support facilities (see Figure 4, Figure 5 and Figure 6).

The components of the proposed Project directly related to the geothermal resource (geothermal production and injection wells, access roads, geothermal pipelines, geothermal power plants and microwave communication towers) would all be located within the McGinness Hills Geothermal Unit (NVN-84268X). This Unit is comprised of federal geothermal leases NVN-83967, NVN-83966 and the Lake Ranch lease on private land. The Unit Area encompasses approximately 7,680 acres of public lands managed by the BLM and private lands in Sections 9-16 and 21-24, Township 20 North, Range 45 East (T.20N., R.45E.), Mount Diablo Baseline and Meridian (MDB&M).

The approximately 9.01 mile, 230 kV overhead transmission line and fiber optic line would be constructed, originating at the proposed new McGinness Hills substations adjacent to the power plants, trending south and east and terminating at the existing Sierra Pacific Power Company (SPPCo.) dba NV Energy (NVE) Frontier substation (N-25341). Approximately 3.22 miles of the proposed 230 kV transmission line and fiber optic line (N-88978 and N-88979) would be located on public lands managed by the BLM, while the remaining 5.79 miles would be located on National Forest System lands (#AUS74) (see Figure 4).

Throughout its development, the McGinness Hills Geothermal Development Project has evolved to minimize environmental impacts. Where feasible, Ormat has made changes in the location and design of the power plants, transmission line, and other project facilities, in an effort to reduce impacts. In addition, Ormat has provided financial and other support toward efforts to better understand and protect important project-area resources. Such measures include the following:

- Improvements in the design of the cooling fans to reduce power plant noise.
- Elimination of an alternative location for the transmission line that would have caused major impacts to sage-grouse habitat and populations.
- In efforts to ensure the continued success of the sage-grouse meta-populations in the project area, Ormat has committed to providing support for the development of habitat improvement projects.
- In efforts to improve the understanding of project-area habitat and sage-grouse use of that habitat, Ormat has committed to providing support for the development of monitoring activities.

Ormat has adopted additional environmental protection measures that are identified in Section 2.1.11. For purposes of NEPA analysis, the BLM analyzes these environmental protection measures as design features.

1.3 PURPOSE AND NEED

1.3.1 Background

Ormat's purpose of the Project is to commercially develop the geothermal resources within the McGinness Hills Unit; to construct and operate commercial geothermal power plants and a wellfield within the Unit; and to transport generated electricity from the Project to a power purchaser in compliance with the Nevada State mandated Renewable Portfolio Standard. The purpose of the Project's transmission line and electrical substation is to provide the electrical interconnection with the existing SPPCo./NVE electrical transmission system at the proposed junction in an economically viable manner which minimizes transmission line energy losses and adverse environmental impacts. The purpose of the fiber optic line is to provide line safety in protection of the existing transmission system. Ormat needs to be able to produce geothermal resources in commercial quantities from the Unit or the federal geothermal leases will terminate.

1.3.2 BLM Purpose and Need

In accordance with the Federal Land Policy and Management Act of 1976 and its implementing regulations, public lands are to be managed for multiple use that takes into account the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Interior is authorized to grant rights-of-way on public lands for systems of generation, transmission, and distribution of electric energy (Section 501(a)(4)). Taking into account the BLM's multiple use mandate, the purpose and need for the proposed action is to respond to Ormat's Right-of-Way (ROW) application. Under the terms of the Geothermal Steam Act, its revisions of 2007, its implementing regulations (including 43 CFR 3200), the Programmatic Geothermal Environmental Impact Statement for Geothermal Leasing in the Western United States (BLM 2008b) and its Record of Decision of December, 2008, BLM must respond to the proposed plans, applications and programs submitted by the lessee or the lessee's designated operator. The BLM's need for the Proposed Action is to respond to the Operations Plan, Utilization Plan and FLPMA ROW application submitted by the proponent to construct and operate the McGinness Hills Geothermal Development Project. This proposed action would, if approved, assist the BLM in addressing the management objectives in the Energy Policy Act of 2005 (Title II, Section 211) that establish a goal for the Secretary of the Interior to approve 10,000 MWs of electricity from non-hydropower renewable energy projects located on public lands. This proposed action, if approved, would also further the purpose of Secretarial Order 3285A1 (March 11, 2009) that establishes the development of environmentally responsible renewable energy as a priority for the Department of the Interior.

1.3.3 USFS Purpose and Need

Under the Federal Land Policy and Management Act of 1976 and the Forest Service's regulations, at 36 CFR 251, the Forest Service must respond to Ormat's Special Use Permit (SUP) application.

The Forest Service's need for the Proposed Action is to respond to the SUP application submitted by the proponent to construct and operate the transmission line that crosses national Forest System land.

1.3.4 DOE Purpose and Need

Title XVII of the Energy Policy Act of 2005 (EPAct), P.L. 109-58 as amended by section 406 of the American Recovery and Reinvestment Act of 2009, P.L. 111-5 (the "Recovery Act"), established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII authorizes the Secretary of Energy to make loan guarantees for various types of projects, including those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued." Section 406 of the Recovery Act added section 1705, which is designed to address the current economic conditions of the nation, in part, through eligible renewable and transmission projects to commence construction no later than September 30, 2011. The primary purposes of the Recovery Act are job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and state and local fiscal stabilization. The purpose and need for the Department of Energy (DOE) action would be to comply with its mandate by selecting eligible projects that meet the goals of EPAct and the Recovery Act.

1.3.5 BLM Decisions to be Made

The BLM has determined that an EA is the appropriate level of analysis to evaluate and disclose the potential environmental impacts associated with this proposed action and any reasonable alternatives to the proposed action, including a no action alternative. This EA will assist the BLM Battle Mountain District Office, MLFO authorized officer in a determination to approve the proposed action, require modification or deny the proposed action. At the conclusion of the EA process, the BLM must determine if the proposed action and/or any modifications of the proposed action would cause significant impacts to the human environment. If no such impact would occur, then a Finding of No Significant Impact (FONSI) would be prepared, and the BLM would make a decision whether or not to approve the submitted Operations Plan, Utilization Plan and a Right-of-Way application (for the 3.22 miles of the proposed transmission line and fiber optic line on public lands managed by the BLM). If, at any time during the analysis, a determination of significant impacts is made that could not be mitigated appropriately at the EA level, an Environmental Impact Statement (EIS) would be required.

1.3.6 USFS Decisions to be Made

The USFS has also determined that an EA is needed to evaluate and disclose the potential environmental impacts associated with this proposed action, any reasonable alternatives to the proposed action, and a no action alternative. The Forest Supervisor for the Humboldt-Toiyabe National Forest as the Responsible Official would make a decision based on this analysis regarding the approximately 6 miles of the proposed transmission line and fiber optic line on National Forest System lands. At the conclusion of the EA process, the Forest Service must first determine if the proposed action and/or any modifications of the proposed action would cause significant impacts to the human environment. If no such impact would occur, then the Responsible Official will decide 1) whether or not to approve implementation of the Proposed Action analyzed in this document, 2) approve an alternative to the proposed action, and 3) determine which mitigation measures to require. The Responsible Official's selected alternative, and accompanying rationale for the selection, would be documented in a forthcoming Decision Notice and Finding of No Significant Impact.

1.3.7 DOE Decisions to be Made

Pursuant to provisions of section 1705, on October 7, 2009, DOE competitively solicited applications for, "Commercial Technology Renewable Energy Generation Projects Under the Financial Institution Partnership Program." In response to that solicitation the John Hancock Life Insurance Company submitted an application to DOE on July 28, 2010, for a Federal loan guarantee for the Ormat Nevada, Inc. McGuiness Hills Geothermal Project. As part of the loan review process DOE carries out a detailed financial, technical, and legal evaluation of the project submitted by the loan applicant, and negotiates the terms and conditions of a possible Federal loan guarantee pursuant to its procedures set out at 10 CFR Part 609. DOE is a cooperating agency on this EA pursuant to a Memorandum of Understanding (MOU) between DOE and the BLM Nevada State Office signed in April 2010. This EA would be used to meet the DOE's NEPA requirements in making a determination regarding a possible loan guarantee for this project.

1.4 LAND USE PLAN CONFORMANCE

The BLM-managed public lands within the Project Area are administered through the MLFO. The area is subject to the BLM Shoshone-Eureka Resource Management Plan (RMP), which was approved in 1986, and its amendments. The Proposed Action is in conformance with the Shoshone-Eureka RMP.

Part II, Section E, "Management Actions Not Expressly Addressed by the Resource Management Plan," of the RMP includes the section "Minerals Objectives and Management Decisions," brought forward unaltered from the earlier BLM "Management Framework Plan" (Record of Decision, page 29). Minerals Objectives 1, 2 and 3 lead to Management Decision #2 (Leaseable Minerals - Geothermal Steam). The three objectives are:

- Objective 1: Make available and encourage development of mineral resources to meet national, regional and local needs consistent with national objectives for an adequate supply of minerals.
- Objective 2: Assure that mineral exploration, development and extraction are carried out in such a way as to minimize environmental and other resource damage and to provide, where legally possible, for the rehabilitation of lands.
- Objective 3: Develop detailed mineral resource data in areas where different resources conflict so that informed decisions may be made that result in optimum use of the lands.

Management Decision #2 (Leaseable Minerals – Geothermal Steam), states that: "All areas designated by the BLM as prospectively valuable for geothermal steam will be open for exploration and development unless withdrawn or restricted from mineral entry. All public lands disposed of in these areas will have the geothermal resources reserved to the federal government." (BLM 1987).

The RMP includes another Management Decision, entitled Utility Corridors. The stated objectives are:

- Objective 1: To ensure a system for transmission of utilities through the resource area by establishing an east-west and north-south network of utility corridors.
- Objective 2: To minimize adverse impacts to the environment by concentrating compatible rights-of-way in designated corridors that avoid sensitive resource values.

The National Forest System lands within the Project Area are administered through the Austin Tonopah Ranger District. The area is subject to the USDA Forest Service Toiyabe National Forest Land and Resource Management Plan (LRMP), which was approved in 1986. The Proposed Action is in conformance with the LRMP. The following goals are identified in the LRMP which are applicable for the proposed Project Area and are provided below in their entirety:

- High quality water yields will be enhanced for approximately 949,500 acre-feet to meet state water quality standards. Water rights and instream flows will be acquired as necessary for management and use of the National Forest.
- The Forest will improve water quality and manage riparian areas to satisfactory condition. All riparian area-dependent resources will be maintained or enhanced. Water resource improvement projects and other projects will be designed to improve and maintain the quality of water and soil resources.
- Threatened, endangered and sensitive species will be recognized and protected through habitat management and coordination with state wildlife agencies. Habitat will be in good-to-excellent condition. Lahontan cutthroat trout will be delisted. Paiute trout species will be firmly established. Bald eagle habitat will be maintained and peregrine falcons successfully reintroduced in the Sierra.

- Fish and game populations will be enhanced and managed at levels commensurate with habitat conditions with an emphasis on improving overall quality of wildlife habitat.
- Forest-wide programmatic inventory and evaluation will be implemented to identify cultural resources on the Toiyabe.
- Significant properties will be identified, evaluated for National Register nomination, and protected, as appropriate.
- The Forest will manage cultural resources in a comprehensive manner and eliminate "crisis management."
- Enhancement and interpretation of cultural resources will encourage public interest.
- Use and occupancy of the National Forest will be provided when it is consistent with Forest management area objectives, is in the public interest, and when it cannot reasonably be served by development on private land.
- Land ownership will be adjusted to optimize public benefits and administrative effectiveness of the National Forest System.
- Sufficient access will be provided for public use and resource management of the Forest.
- A safe and efficient transportation network will be provided for resource protection, management and public use of National Forest System lands.
- Facilities will be developed or improved to facilitate resource management, and to ensure the health and safety of employees.

The Project Area is within Management Area #8 (Toiyabe), and there is no additional management area direction.

1.5 RELATIONSHIP TO LAWS, REGULATIONS AND OTHER PLANS

The EA has been prepared in accordance with the following statutes and implementing regulations, policies and procedures:

- The National Environmental Policy Act of 1969, as amended (Public Law [PL] 91-190, 42 U.S.C. 4321 (*et seq.*);
    - 40 CFR 1500 (*et seq.*). CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.
    - Considering Cumulative Effects under the National Environmental Policy Act [CEQ 1997];
    - USDI requirements (Departmental Manual 516, Environmental Quality [USDI 2007]);
    - BLM NEPA Handbook (H-1790 1) (BLM 1988 and BLM 2008a);
- The Federal Land Policy and Management Act of 1976 (PL 94 579, 43 U.S.C. 1761 (*et seq.*);
    - 43 CFR 2800, Rights-of-Way, Principles and Procedures; Rights-of-Ways under the Federal Land Policy and Management Act and the Mineral Leasing Act; Final Rule, April 22, 2005.
- The Geothermal Steam Act of 1970 (Act) (30 USC 1001-1025).
    - 43 CFR 3200, Geothermal Resources Leasing and Operations; Final Rule, May 2, 2007.

- The 2005 Energy Policy Act; The National Energy Policy, Executive Order 13212;
- Best Management Practices as defined in the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (Gold Book) (USDI and USDA 2007);

Other environmental analysis documents which were used in production of this EA:

- Programmatic Environmental Assessment Geothermal Leasing and Exploration Shoshone-Eureka Planning Area (BLM BMFO 2002); and
- McGinness Hills Geothermal Exploration Project Environmental Assessment (BLM 2009).

1.5.1 Programmatic EIS for Geothermal Leasing in the Western United States

The Record of Decision (ROD) for the Programmatic EIS for Geothermal Leasing in the Western United States was signed on December 17, 2008 by the Department of the Interior Assistant Secretary for Land and Minerals Management. The ROD approves the BLM's decision to facilitate geothermal leasing of the federal mineral estate in 12 western states, which includes Nevada. This decision, 1) allocates BLM lands as open to be considered for geothermal leasing or closed for geothermal leasing, and identifies those National Forest System lands that are legally open or closed to leasing; 2) develops a reasonably foreseeable development scenario, and 3) adopts stipulations, best management practices and procedures for geothermal leasing and development.

These actions have been implemented as BLM Resource management plan amendments for 114 land use plans, which includes the Shoshone-Eureka RMP. The decision does not amend any USFS land use plans.

1.6 Public Involvement

1.6.1 Tribal Involvement

On August 3, 2010, BLM and USFS initiated coordination/consultation activities with the Fallon Paiute Shoshone Tribe, Battle Mountain Band Council, Duckwater Shoshone Tribe, Yomba Shoshone Tribe, Te-Moak Tribal Council, Elko Band Council, South Fork Band Council, Ely Shoshone Tribe, and Timbisha Shoshone Tribe. Members of the Western Shoshone Defense Project and the Western Shoshone Descendants of Big Smoky have been contacted and have been given an opportunity to provide information to the BLM and USFS. Various meetings/field visits have occurred and future opportunities for tribal input and participation have been extended. Coordination/consultation will be ongoing at least until completion of the Project (see also Section 3.4). However, depending on any site specific mitigation or monitoring agreements/commitments, coordination/consultation opportunities may continue throughout the life of the Project.

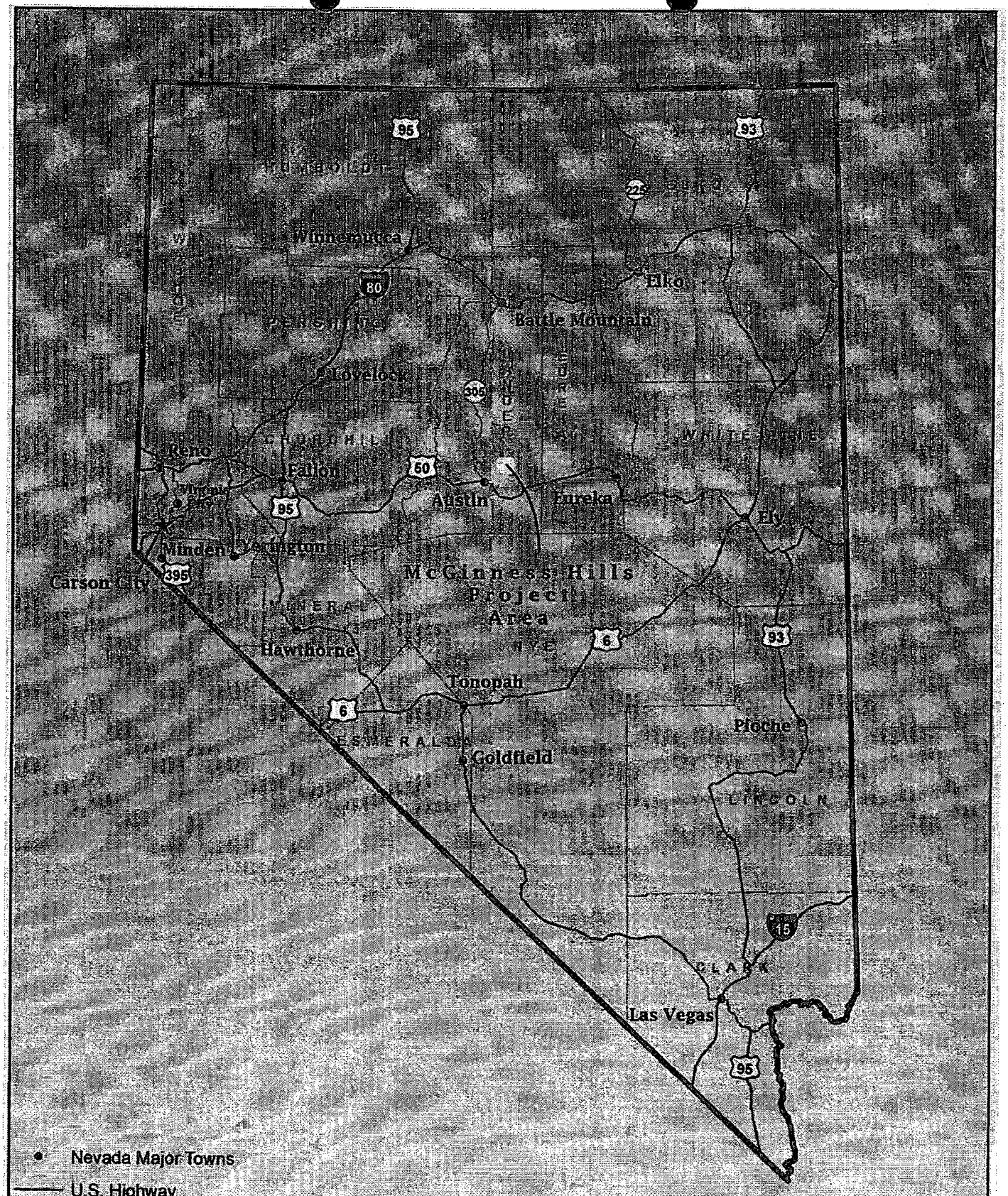
1.6.2 Public Scoping

The BLM and USFS sent out 180 public consultation letters on August 6, 2010, which contained a brief description of the proposed Project activities. The scoping period in which comments were accepted was from August 6, 2010 through September 8, 2010. A total of ten responses were received from the following groups: Duckwater Shoshone Tribe, US Fish and Wildlife Service, US Environmental Protection Agency, Nevada Department of Wildlife, Center for Biological Diversity, and Western Watersheds Project.

1.7 Identified Issues

In addition to requirements of law, regulation and policy, the scope of this EA is based upon specific issues and concerns identified through the scoping process by BLM, USFS, other federal, state and local agencies, and the public. These issues, related to potential environmental impacts associated with the proposed Project, are:

- Impacts to cultural resource sites;
- Impacts to Native American concerns;
- Impacts to riparian vegetation and riparian habitat;
- Impacts to visual resources;
- Impacts to Special Status Species, including sage-grouse and pygmy rabbits; and
- Impacts to the quality and quantity of waters on public lands.



Nevada Major Towns

U.S. Highway

State Route

Interstate

0 10 20 40 Miles

1:3,500,000

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Projection: Transverse_Mercator

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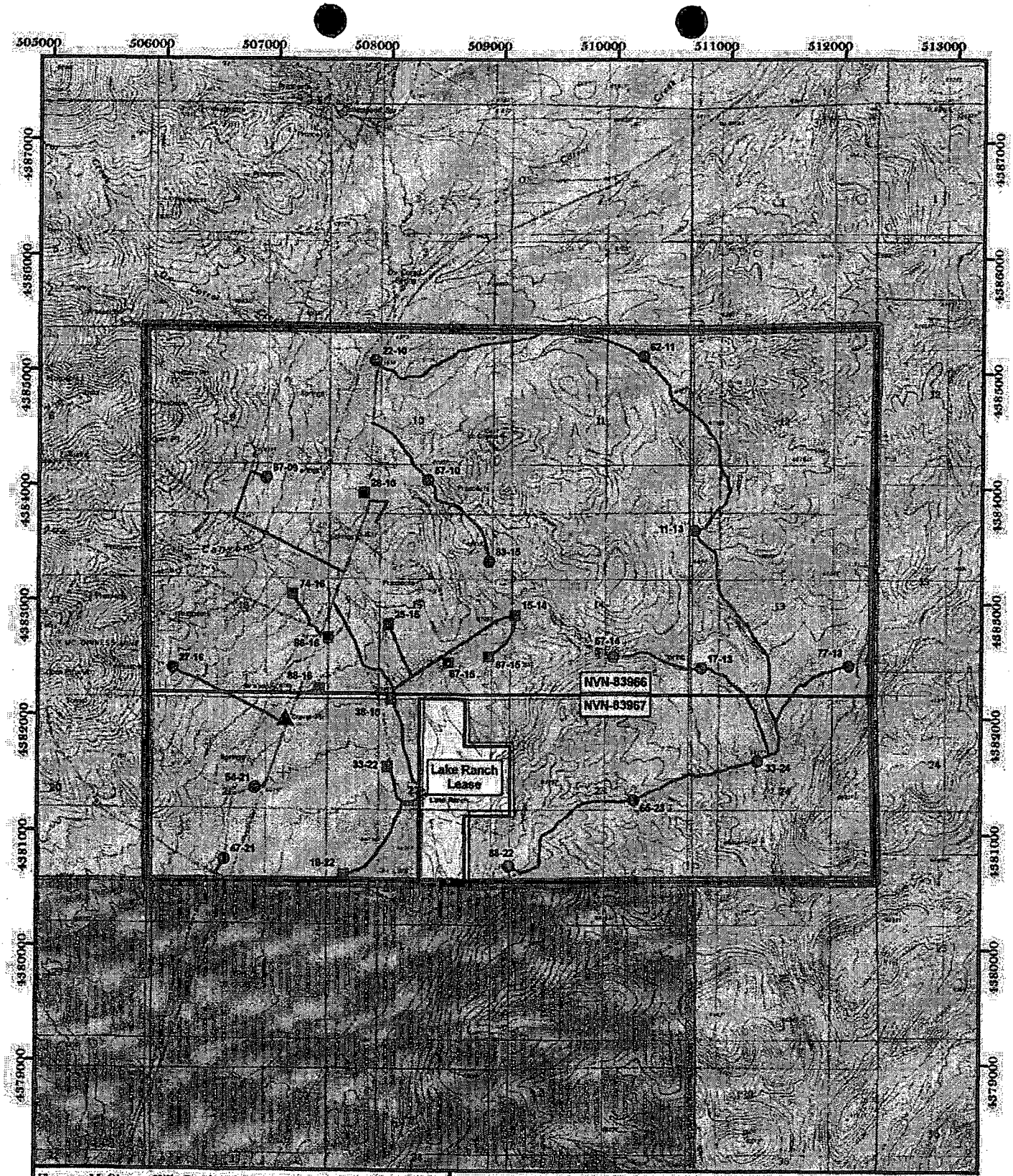
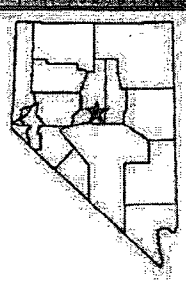


Figure 2: McGinness Hills Geothermal Exploration EA Approved Activities

- Previously Approved Access Roads
- Previously Approved Gravel Source
- Previously Approved Temperature Gradient Hole (TGH) Location
- Previously Approved TGH/Observation/Production Well Location
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private



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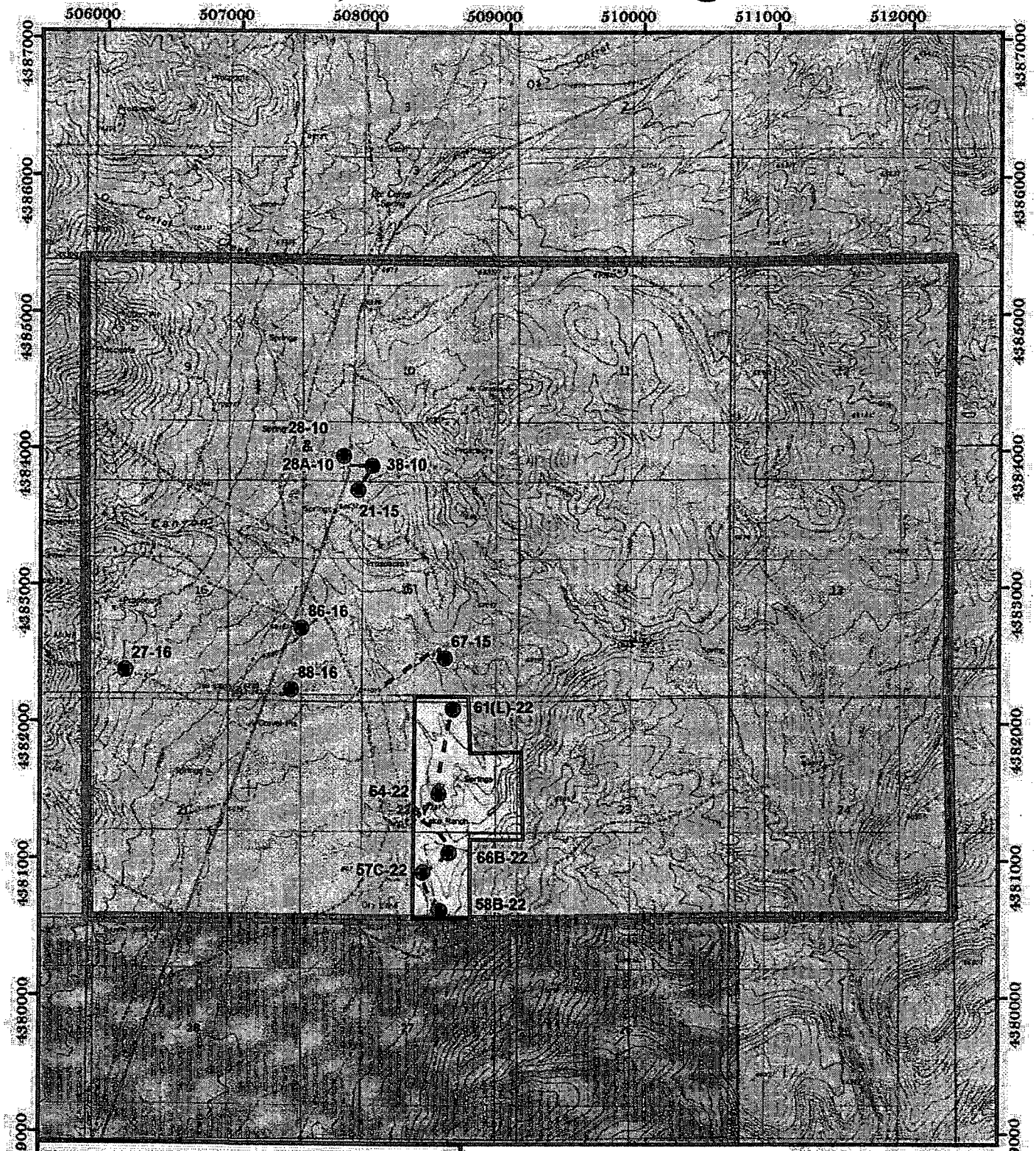
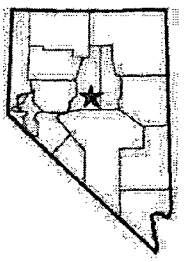
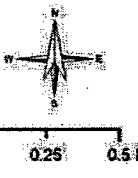


Figure 3: Activities Constructed on Public and Private Land

- Constructed Well Sites
- Existing Access Roads
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private





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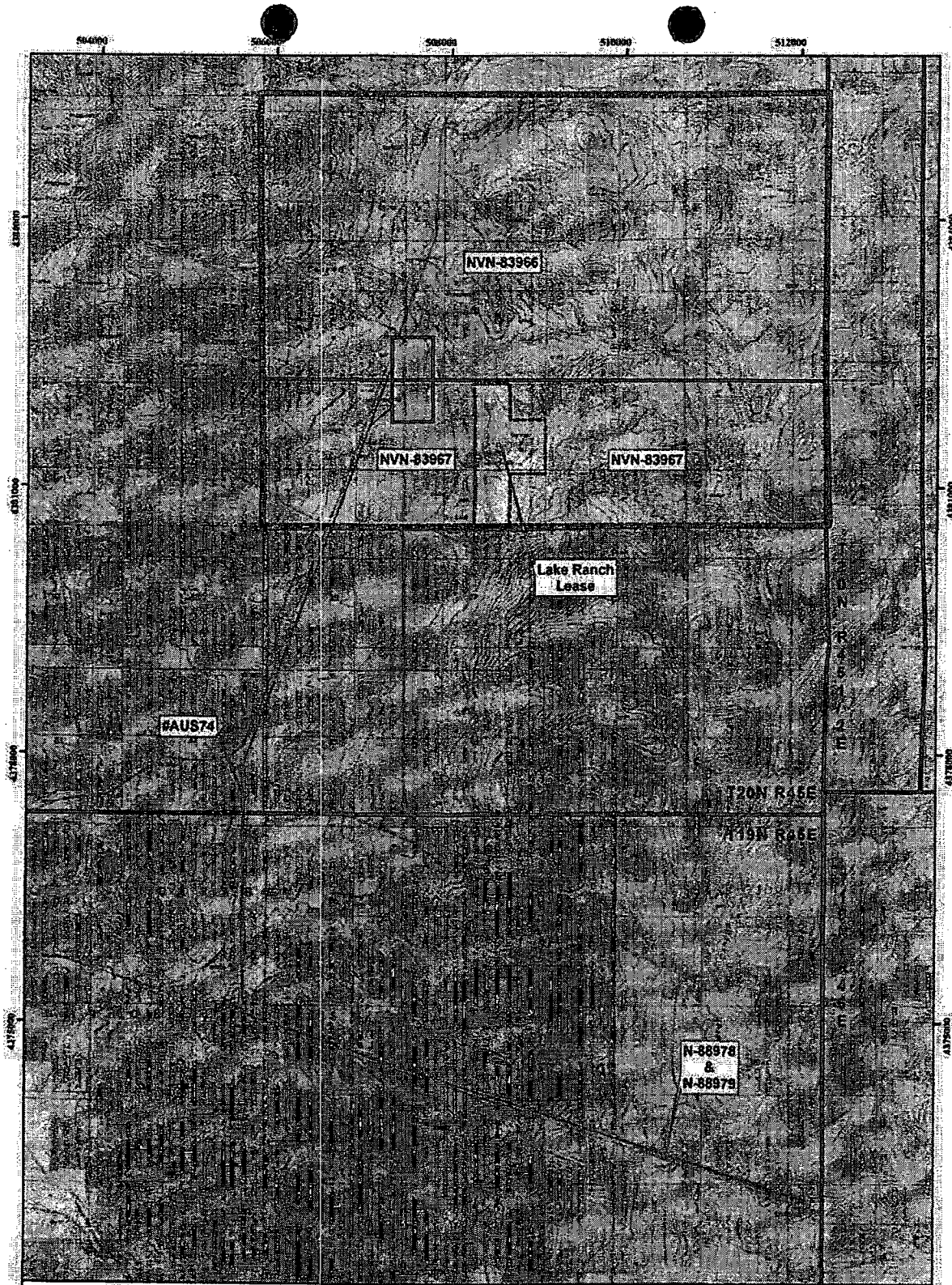
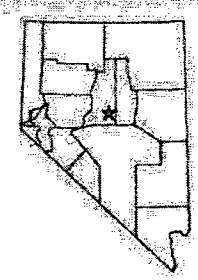


Figure 4: McGinness Hills Unit Area and Transmission Line Corridor Overview

- 230 kV Transmission Line-Proposed
- Project Area
- Development Area
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management
- Forest Service
- Private



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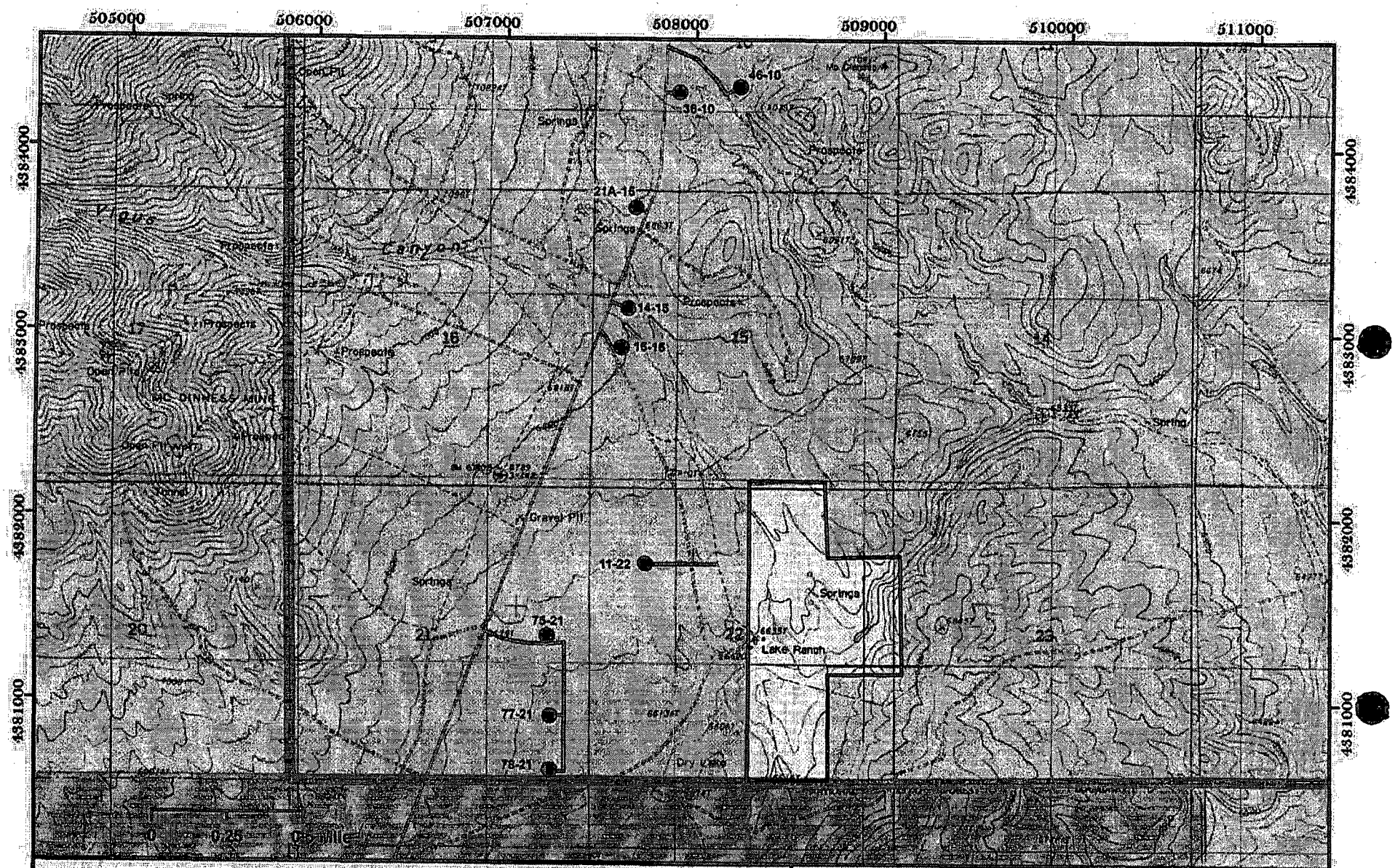
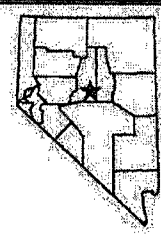


Figure 5: New Wells and Associated Roads Proposed Under the Development Project

- New Wells
- Private
- Forest Service Administered Land
- Bureau of Land Management Administered Land
- Proposed Access Roads
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries



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Map Date: 03/05/2011

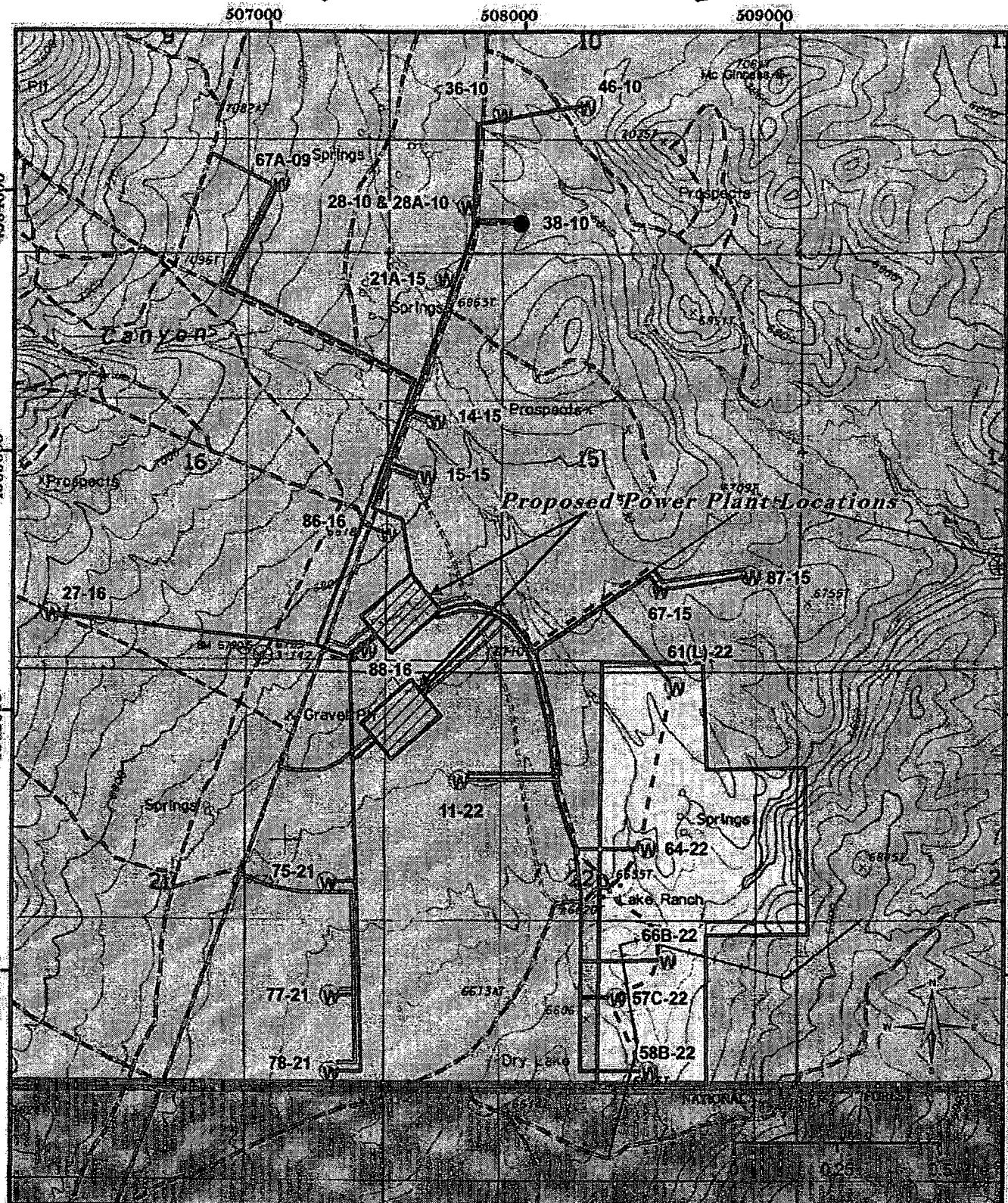
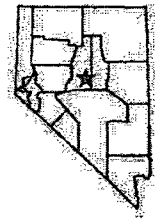


Figure 6: McGinness Hills Geothermal Development Project Components

- Production Well
- Injection Well
- Production Pipeline
- Injection Pipeline
- Proposed Access Roads
- Existing Access Roads
- Monitoring Well
- Fences
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private



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Map Date : 05/05/2011

2 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

2.1.1 Proposed Project Area

The proposed Project Area is composed of the McGinness Hills Unit Area and the width of the proposed ROW for the transmission line (200-feet wide, expanded an additional 100 feet at the angle points) (see Figure 4). The Project components within the proposed Project Area either avoid adverse effects to eligible or unevaluated historic properties, or the adverse effects will be mitigated by an accepted Historic Properties Treatment Plan (HPTP).

2.1.2 Power Plants

Under the Proposed Action, Ormat would build and operate two binary air-cooled geothermal power plants, each approximately 33 MW (net), 45 MW (gross). One proposed power plant would be primarily located in the SW1/4SW1/4 Section 15, T.20N., R.45E. The other proposed power plant would be primarily located in the NW1/4NW1/4 Section 22, T.20N., R.45E (see Figure 6, depicting specific locations of the power plants). Each power plant would have a surface disturbance of approximately 16.5 acres. A substation, used to transform generated low voltage to the higher voltage required for a transmission line, would be constructed within each power plant boundary.

Additionally, a microwave communication tower and antenna would be constructed within each of the proposed power plant sites to deliver signals from control centers and other remote locations, and to report operating status. This network would also provide voice communication from dispatchers to power plant operators and maintenance personnel. The communications towers would be about 40 feet high and would be constructed at the proposed power plant sites, with a microwave antenna aimed toward an existing communication link at Austin Peak (SW1/4NW1/4 Section 5, T.18N., R.44E.) on National Forest System lands.

2.1.2.1 Construction Procedures and Surface Disturbance

Power plant site preparation activities would begin with clearing, earthwork, drainage, fencing and other improvements necessary for commencement of construction. Clearing would include removal of organic material, stumps, brush and slash, and will be stockpiled onsite for interim reclamation purposes throughout the proposed Project Area. Fencing of the power plant sites would be required for security and safety during construction, and would be permanent throughout the life of the proposed Project.

A portion of the power plant sites and portions of the well pads would be devoted to equipment and materials laydown, storage, construction equipment parking, small fabrication areas, office trailers and parking. Equipment and materials laydown space is required for large turbine parts, structural steel, piping spools, electrical components, substation equipment, and building parts.

Mobile trailers or similar suitable facilities (e.g., modular offices) would be brought to the site to be used as construction offices for owner, contractor, and subcontractor personnel, and would be located within the disturbed areas associated with power plant and well pad construction areas. Parking would be provided for construction workers and visitors within the power plant areas.

Temporary utilities would be provided for the construction offices, the laydown area, and the power plant sites. Temporary construction power would be supplied by a portable generator and, if available when the transmission line is completed, at the site by utility-furnished power. Area lighting would be provided for safety and security. Drinking water would be imported and distributed daily. Portable toilets would be provided throughout the site.

Unless precluded by safety requirements, power plant buildings, structures, pipe, etc. would be painted covert green to blend with the area and minimize visibility, pursuant to BLM Instructional Memorandum (IM) 2007-021.

Estimates of the short and long term surface disturbance resulting from construction of the power plants are summarized in Table 5.

2.1.2.2 Operation and Maintenance Procedures

The Ormat power plants will utilize an air-cooled binary geothermal design.

The geothermal fluids for the binary power plants would be produced from the production wells by pumping. Once delivered to the power plants by the geothermal fluid production pipelines, the heat in the geothermal fluid would be transferred to the "binary" ("secondary" or "working") fluid in multiple-stage, non-contact heat exchangers ("vaporizers"). The binary turbine units would use pentane (C_5H_{12}), a flammable but non-toxic hydrocarbon, as the binary fluid, which would circulate through each power plant in a closed loop. The heat from the geothermal fluid would vaporize the binary fluid, which would turn the binary turbine and electrical generator to make electricity.

The vaporized binary fluid would exit the turbine and be condensed back into a liquid in an air cooled condenser. The condensed binary fluid would then be pumped back to the vaporizers for re-heating and vaporization, completing the closed cycle.

The geothermal fluid exiting from the vaporizers would be pumped under pressure out to the geothermal injection wells through the injection pipelines and injected back into the geothermal reservoir. The geothermal fluid would flow through the binary power plant in a closed system, with minimal emissions of non-condensable gases to the atmosphere.

Air-cooled condensers are large, open structure air-cooled heat exchangers, and would be the most prominent features of the power plants, both with respect to height and mass. They range between 28 and 35 feet in height and are about two-thirds the length of each site. Large finned tube radiators lie horizontal approximately 20 feet above the ground on steel beams. Large horizontal fans (about thirteen feet in diameter) on top of the tube assemblies draw ambient air at

the dry bulb temperature up through the tubes, cooling and condensing the binary vapor flowing through the inside of the tubes.

2.1.3 Wells, Wellfields, Well Maintenance and Other Ancillary Facilities

Production wells flow geothermal fluid to the surface. Injection wells are used to inject geothermal fluid from the power plant into the geothermal reservoir. Injection ensures the longevity and renewability of the geothermal reservoir. The number of geothermal production and injection wells required for the Project is principally dependent on the productivity (or injectivity) of the wells and the temperature and pressure of the produced geothermal fluid. Operation of the McGinness Hills power plants would co-mingle production from wells on federal leases with production from wells on the private Lake Ranch lease.

Within the McGinness Hills Unit Area, Ormat expects that together the two power plants would require 11 production wells (7 on public lands managed by the BLM and 4 on private lands) and 11 injection wells (10 on public lands managed by the BLM and 1 on private land) (see Figure 6). These sites are comprised of previously approved sites as identified in the McGinness Hills Exploration EA, relocated sites, private land sites and newly proposed sites (see Table 1). Two of the production wells (28-10 and 28A-10) would be drilled from the same well pad.

Table 1: Well Status, Current and Historic

Kettleman No.	Type[1]	Section No. and Aliquot Part (T. 20 N., R. 45 E.)	UTM (NAD 83)		Approval		Current Status
			Easting	Northing	Date	Type[2]	
Sites Identified in McGinness Hills Geothermal Exploration EA (BLM 2009)							
22-10	T	NW1/4NW1/4, Sec. 10	507783	4385300	4/2009	EA	Not built.
57-10	T	SW1/4SE1/4, Sec. 10	508258	4384265	4/2009	EA	Not built.
83-15	T	SE1/4NE1/4, Sec. 15	508801	4383556	4/2009	EA	Not built.
57-14	T	SW1/4SE1/4, Sec. 14	509908	4382735	4/2009	EA	Not built.
47-21	T	SE1/4SW1/4, Sec. 21	506473	4380957	4/2009	EA	Not built.
88-22	T	SE1/4SE1/4, Sec. 22	508995	4380908	4/2009	EA	Not built.
33-24	T	SE1/4NW1/4, Sec. 24	511189	4381831	4/2009	EA	Not built.
17-13	T	SW1/4SW1/4, Sec. 13	510685	4382633	4/2009	EA	Not built.
11-13	T	NW1/4NW1/4, Sec. 13	510616	4383830	4/2009	EA	Not built.
62-11	T	NW1/4NE1/4, Sec. 11	510158	4385343	4/2009	EA	Not built.
65-23	T	NW1/4SE1/4, Sec. 23	510094	4381493	4/2009	EA	Not built.
54-21	T	SW1/4NE1/4, Sec. 21	506739	4381586	4/2009	EA	Not built.
77-13	T	SE1/4SE1/4, Sec. 13	511987	4382655	4/2009	EA	Not built.
27-16	F	SW1/4SW1/4, Sec. 16	506005	4382616	11/2009	Sundry/GDP	Proposed as TGH. Pad built; well drilled. Proposed for development. (see below)
67-9	T	SW1/4SE1/4, Sec. 9	506823	4384280	4/2009	EA	Not built. Proposed for development (see below)
21-15	F	NW1/4NW1/4, Sec. 15	507791	4383890	4/2009	GDP	Pad built; well drilled. Not included in development project; will be reclaimed.
35-15	T/O/F	NE1/4SW1/4, Sec. 15	507912	4383011	4/2009	EA	Not built.
18-22	T/O/F	SW1/4SW1/4, Sec. 22	507536	4380825	4/2009	EA	Not built.
86-16	F	NE1/4SE1/4, Sec. 16	507382	4382890	06/2009	GDP	Pad built; well drilled. Proposed for development (see below).
88-16	F	SE1/4SE1/4, Sec. 16	507306	4382444	10/2009	GDP	Pad built; well drilled. Proposed for development (see below).
74-16	T/O/F	SE1/4NE1/4, Sec. 16	507062	4383354	4/2009	EA	Not built.
33-22	T/O/F	SE1/4NW1/4, Sec. 22	507915	4381773	4/2009	EA	Not built.
15-14	M	NW1/4SW1/4, Sec. 14	509037	4383095	5/2009	Sundry/GDP	15-14 relocated to 38-10. Monitoring well drilled. Proposed for development (see below).
28-10	F	SW1/4SW1/4, Sec. 10	507693	4384153	02/2010	GDP	Pad built; two wells drilled on pad. Both wells proposed for development (see below).
38-15	W	SE1/4SW1/4, Sec. 15	507941	4382357	04/2009	EA	Not built
87-15	T/O/F	SE1/4SE1/4, Sec. 15	508809	4382732	4/2009	EA	Not built. Proposed for development (see below).
67-15	F	SW1/4SE1/4, Sec. 15	508452	4382677	08/2010	GDP	Pad built; well drilled. Proposed for development (see below).
Sites Constructed on Private Land							
61(L)-22	F	NW1/4NE1/4 Sec. 22	508594	4382099	01/2010	NDOM	Pad built; well directionally drilled. Proposed for development (see below).
64-22	F	SW1/4NE1/4, Sec. 22	508487	4381484	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
66B-22	F	NW1/4SE1/4, Sec. 22	508487	4381087	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
57C-22	F	SW1/4SE1/4, Sec. 22	508371	4380910	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
58B-22	F	SW1/4SE1/4, Sec. 22	508496	4380630	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
Proposed in McGinness Hills Geothermal Development Project							
46-10	P	NE1/4SW1/4, Sec. 10	508234	4384335	NA	NA	Pad not built. To be used in development project.
36-10	P	NW1/4SW1/4, Sec. 10	507909	4384302	NA	NA	Pad not built. To be used in development project.

Kettleman No.	Type[1]	Section No. and Aliquot Part (T. 20 N., R. 45 E.)	UTM (NAD 83)		Approval		Current Status
			Easting	Northing	Date	Type[2]	
28-10	P	SW1/4SW1/4, Sec. 10	507754	4383941	NA	NA	Pad built (co-located with 28A-10) and well drilled. To be used in development project.
28A-10	P	SW1/4SW1/4, Sec. 10	507754	4383941	NA	NA	Pad built (co-located with 28-10) and well drilled. To be used in development project.
14-15	P	SW1/4NW1/4, Sec. 15	507653	4383129	NA	NA	Pad not built. To be used in development project.
15-15	P	NW1/4SW1/4, Sec. 15	507618	4382918	NA	NA	Pad not built. To be used in development project.
21A-15	P	NW1/4NW1/4, Sec. 15	507686	4383675	NA	NA	Pad not built. To be used in development project.
64-22	P	SW1/4NE1/4, Sec. 22	508487	4381484	NA	NA	Pad built and well drilled. To be used in development project.
66B-22	P	NW1/4SE1/4, Sec. 22	508487	4381087	NA	NA	Pad built and well drilled. To be used in development project.
57C-22	P	SW1/4SE1/4, Sec. 22	508371	4380910	NA	NA	Pad built and well drilled. To be used in development project.
58B-22	P	SW1/4SE1/4, Sec. 22	508496	4380630	NA	NA	Pad built and well drilled. To be used in development project.
67A-9	I	SW1/4SE1/4, Sec. 9	507036	4384033	NA	NA	Pad not built. To be used in development project
86-16	I	NE1/4SE1/4, Sec. 16	507471	4382704	NA	NA	Pad built and well drilled. To be used in development project.
27-16	I	SW1/4SW1/4, Sec. 16	506148	4382376	NA	NA	Pad built and well drilled. To be used in development project.
75-21	I	NE1/4SE1/4, Sec. 21	507238	4381351	NA	NA	Pad not built. To be used in development project
77-21	I	SE1/4SE1/4, Sec. 21	507253	4380915	NA	NA	Pad not built. To be used in development project
67-15	I	SW1/4SE1/4, Sec. 15	508532	4382477	NA	NA	Pad built and well drilled. To be used in development project.
87-15	I	SE1/4SE1/4, Sec. 15	508889	4382532	NA	NA	Pad not built. To be used in development project
78-21	I	SE1/4SE1/4, Sec. 21	507250	4380623	NA	NA	Pad not built. To be used in development project
61(L)-22	I	NW1/4NE1/4 Sec. 22	508594	4382099	NA	NA	Pad built and well drilled. To be used in development project.
11-22	I	NW1/4NW1/4, Sec. 22	507749	4381745	NA	NA	Pad not built. To be used in development project.
38-10	M	SE1/4SW1/4, Sec. 10	507985	4383882	NA	NA	Pad built and monitoring well drilled. To be used in development project.

1: Temperature Gradient Hole (T); Observation Well (O); Full-Size Well (F); Production Well (P); Injection Well (I); Monitoring Well (M)
2: Environmental Assessment (EA); Sundry Notice (Sundry); Geothermal Drilling Permit (GDP)

2.1.3.1 Construction Procedures and Surface Disturbance

Each well is or would be located on a well pad in the shape of a rectangle and approximately 4.2 acres in size.

Reserve pits would be constructed on each pad for the containment and temporary storage of water, drill cuttings and waste drilling mud during drilling operations. Each reserve pit would be constructed in accordance with best management practices identified in the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (The Gold Book)" (Fourth Edition – 2007) and would measure approximately 75 feet by 200 feet by 10 feet deep (a 2-ft freeboard would be maintained). The McGinness Hills Geothermal Exploration EA (BLM 2009) identified 3 freshwater wells in the vicinity of the Project as having depth to groundwater of 10-20 feet. In order to prevent co-mingling geothermal fluids and other potential contaminants from the drilling process with groundwater, Ormat would line all reserve pits with an approved pit liner.

During well drilling, the reserve pits would be fenced on three sides, per the Gold Book standard. Once drilling has been completed, the fourth side would be fenced. Fencing would prevent access by persons, wildlife or livestock. In addition to this fence, Ormat would install a smaller-mesh barrier/wildlife deterrent fence. This fence helps exclude smaller mammals and also provides a measure of protection to human safety. All fencing would remain in place until pit reclamation begins.

Well pad construction on BLM-managed land would disturb a total of 75.6 acres. Well pads constructed on private land have disturbed a total of 21 acres. The estimated short and long term surface disturbance associated with well pad construction and other geothermal wellfield activities is summarized in Table 5.

2.1.3.2 Well Drilling and Testing

The specific drill rig and drilling information proposed for the Project is provided in Table 2. Photo 1 is a representative shot of a geothermal well site during well drilling.

Table 2: Well Drilling Specifics

Rig Type	Rig Height (ft)	Trucks Needed (on average)	Drilling Time (days)[1]	Workers On Site	Depth Drilled (ft.)
Large rotary drilling rig	160-170	25+ tractor/trailer 8 small trucks	45[2]	Avg. = 9-10 Max = 18	7,000

[1] Difficulties encountered during the drilling process, including the need to re-drill the well, could as much as double the time required to successfully complete each well.
[2] Drilling would be conducted 24 hours a day, 7 days a week.

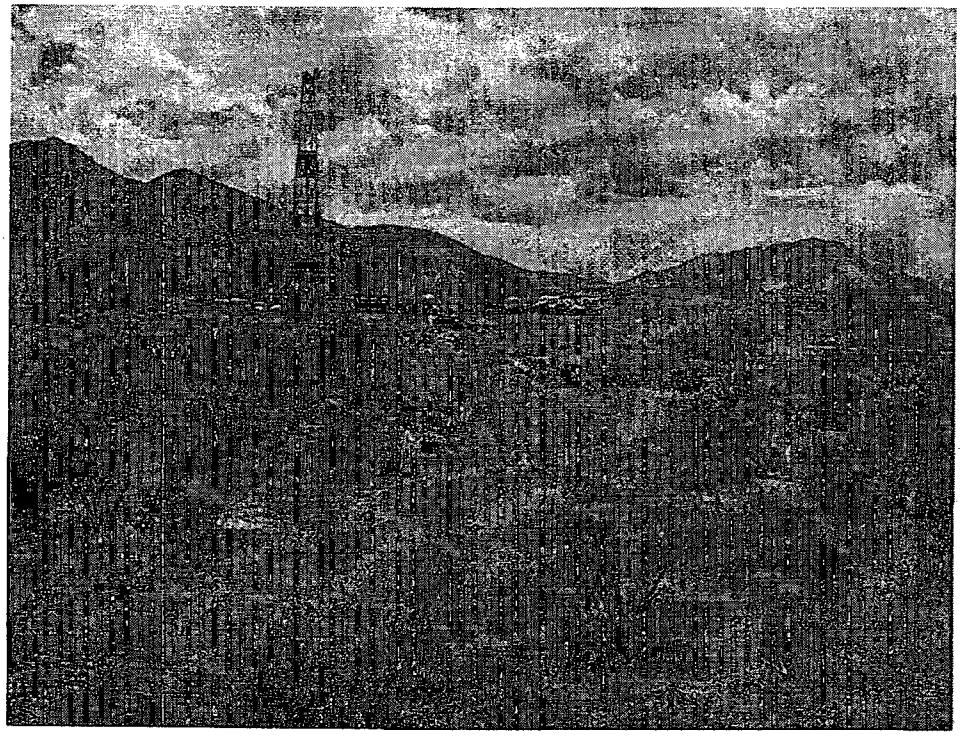


Photo 1: Representative Geothermal Well Site During Well Drilling

The drilling supervisor and mud logger would typically sleep in a trailer on the active drill site while the well is being drilled. The drilling crew may also live "on site" during the drilling operations in a self-contained "bunkhouse" (sleeping quarters, galley, water tank and septic tank) or portable trailers which would be placed on one of the drill sites not being actively drilled to accommodate the drill rig workers.

"Blow-out" prevention equipment would be utilized while drilling below the surface casing. During active drilling operations, a minimum of 10,000 gallons of cool water and 12,000 pounds of inert, non-toxic, non-hazardous barite (barium sulfate) would be stored at each well site for use in preventing uncontrolled well flow ("killing the well"). Following completion of well drilling, unused water would be evaporated, used for dust suppression or pumped down the well.

The well bore would be drilled using non-toxic, temperature-stable drilling mud composed of a bentonite clay-water or polymer-water mix for all wells. Variable concentrations of additives would be added to the drilling mud as needed to prevent corrosion, increase mud weight, and prevent mud loss. Some of the mud additives would be hazardous substances (see Section 3.12), but they would only be used in low concentrations that would not render the drilling mud toxic. Additional drilling mud would be mixed and added to the mud system as needed to maintain the required quantities.

Each well may need to be worked over or redrilled. Depending on the circumstances encountered, working over a well may consist of lifting the fluid in the well column with air or gas or stimulation of the formation using dilute acid or rock fracturing techniques.

Well redrilling may consist of: 1) reentering and redrilling the existing well bore; 2) reentering the existing well bore and drilling and casing a new well bore; or 3) sliding the rig over a few feet on the same well pad and drilling a new well bore through a new conductor casing. While the drill rig is still over the well, the residual drilling mud and cuttings would be flowed from the well bore and discharged to the reserve pit.

Short-Term Well Testing

Each short-term well test, lasting approximately 3 to 5 days on average, would consist of flowing the well into the reserve pit or portable steel tanks brought onto the well site while monitoring geothermal fluid temperatures, pressures, flow rates, chemistry and other parameters. An "injectivity" test may also be conducted by injecting the produced geothermal fluid from the reserve pit or steel tanks back into the well and the geothermal reservoir. The drill rig would likely be moved from the well site following completion of these short-term test(s). Each short-term well test is expected to flow approximately 1.5 million gallons.

Long-Term Well Testing

One or more long-term flow test(s) of each well drilled may be conducted following the short-term flow test(s) to more accurately determine long-term well and geothermal reservoir productivity. The long-term flow test(s), each lasting between 7-30 days, would be conducted by pumping the geothermal fluids from the well through onsite test equipment closed to the atmosphere (using a line shaft turbine pump or electric submersible pump) to the reserve pit. Each long-term well test is expected to flow approximately 15 million gallons.

A surface booster pump would then pump the residual produced geothermal water/fluid from the reserve pit through a temporary 8" to 10" diameter pipeline to either inject the fluid into one of the other geothermal wells drilled within the Project Area or to the reserve pit on another well pad. The temporary pipeline would be laid on the surface of the disturbed shoulders on the access roads connecting the geothermal full-size wells (as required, roads would be crossed by trenching and burying the temporary pipe in the trench). The onsite test equipment would include standard flow metering, recording, and sampling apparatus.

Geothermal fluid produced from a well during flow testing will also drain to the reserve pit. The reserve pit waste will be sampled for hazardous contaminants. Typical tests may include the Toxicity Characteristic Leaching Procedure (TCLP) (EPA Method 1311), tested for heavy metals; pH (EPA Method 9045D); Total Petroleum Hydrocarbons/Diesel (EPA Method 8015B); and Oil and Grease (EPA Method 413.1). Contaminated materials, if any, would be disposed of at an approved facility.

2.1.3.3 Well Operations

Once a well is drilled and well head completed, an industrial grate would be placed over the hole to prevent humans and wildlife from falling into the cellar.

Each of the production wells would be equipped with a lineshaft pump to bring the geothermal fluid to the surface under pressure. The electricity to power the wellhead pump motors would be supplied via an insulated electric conductor installed from the power plant to the wellheads along the connecting pipelines.

Wellhead dimensions for the production wells are not expected to exceed a height of fifteen feet above the ground surface or four feet in diameter. Wellhead dimensions for the injection wells would be much smaller (approximately 4 ft. in height) since they would not have wellhead pump motors.

An approximately 15-foot by 15-foot by 10-foot high motor control building may be located on production well pads within approximately 50 feet of each production well. The well control systems, data transmitters and geothermal fluid treatment systems used for the injection wells would be placed inside a smaller structure on the injection well pads.

2.1.4 Geothermal Pipelines

Geothermal production pipelines bring the geothermal fluid from the production wells to the power plant. Geothermal injection pipelines deliver the cooled geothermal fluid from the power plant to the injection wells.

Approximately 3.65 miles of production pipeline (3.28 miles on public lands managed by the BLM and 0.37 miles on private land) and 5.33 miles of injection pipeline (5.26 miles on public land managed by the BLM and 0.07 miles on private land) would be constructed within the McGinness Hills Unit Area (see Figure 6). A 60-foot wide construction corridor would be needed along the length of the pipeline. Long term disturbance associated with pipeline operation assumes a 20-foot width along the length of the pipeline, as some of the short term construction disturbance would be reclaimed flowing completion of construction.

The production and injection pipeline routes generally follow the shortest distance from each well pad to the next well pad or the power plant in order to minimize the amount of pipe required, reduce heat losses, reduce the energy required to move the fluids, and to minimize the amount of surface disturbance associated with the pipeline. Additionally, the proposed pipeline routes are generally located adjacent to existing or proposed roads to facilitate ongoing monitoring and future maintenance.

The final alignment and total lengths of the pipeline routes would be dictated by the specific wells developed for the project and the need to match fluid characteristics and balance fluid volumes in these pipelines.

2.1.4.1 Construction Procedures and Surface Disturbance for the Geothermal Pipelines

The geothermal fluid pipelines would be constructed from seamless, welded-steel pipe. They are expected to range in diameter from 8 inches to 24 inches. Two to three inches of insulation and a protective aluminum sheath would jacket the steel production pipes, increasing the diameter of the finished production pipelines by up to six inches. Unless precluded by safety requirements, pipelines and power trays would be painted covert green to blend with the area and minimize visibility, pursuant to BLM IM 2007-021.

Horizontal and/or vertical expansion loops (a square bend in the pipeline approximately 30 feet in length by 40 feet in width) would be constructed about every 300 to 600 feet along the production pipelines. Expansion loops allow the pipeline to flex as it lengthens and shortens due to heating and cooling. Fewer expansion loops would be needed along the injection pipelines, as the injection pipelines are subject to less heating and cooling.

The pipelines would be constructed near ground level (averaging about one foot of ground clearance) on steel supports called "sleepers." Sleepers support the pipeline and would be constructed approximately every 30 feet.

When completed, the top of the new geothermal pipelines would average three feet above the ground surface. However, a number of pipeline lengths could be up to six feet in height to accommodate terrain undulations and to facilitate movement of wildlife and livestock through the wellfield. Additionally, to further facilitate livestock movement and access to water, the pipelines would be buried at the following three locations in T.20N., R.45E.: Section 10, SW1/4; Section 21, NE1/4; and Section 22, NW1/4NE1/4.

The pipelines would be constructed across roads to allow continued vehicle access, either by trenching under the road, or running the roadbed up and over the pipeline. Electrical power and instrumentation cables for the wells would then be installed in steel conduit constructed along the same pipe sleepers.

Photo 2 below shows a typical insulated geothermal pipeline with electrical cables.

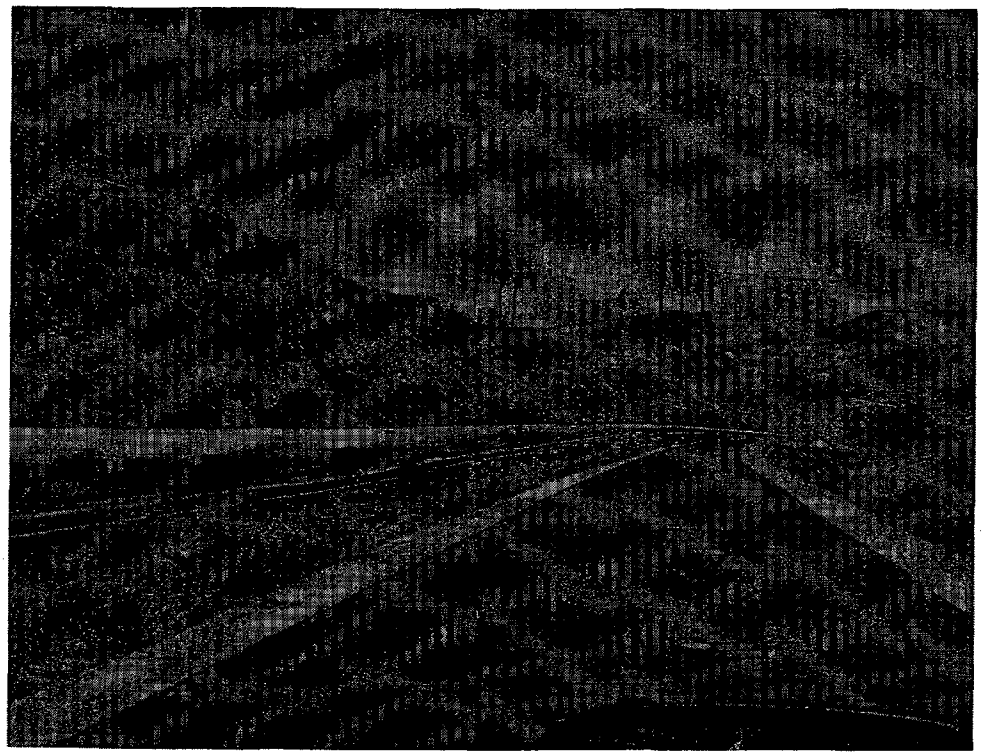


Photo 2: Typical Insulated Geothermal Pipeline with Electrical Cables

The estimated short and long term surface disturbance associated with pipeline construction activities is summarized in Table 5.

2.1.4.2 Operation and Maintenance Procedures of Geothermal Pipeline

The pipelines would be periodically inspected for leak detection, safety and vandalism during normal operations. The pipelines also would be subject to periodic ultrasonic thickness testing to detect any substantial thinning of the pipe wall.

2.1.5 Right of Way/Special Use Permit for the Transmission Line Corridor and Fiber Optic Line

Ormat is also proposing to construct, operate and maintain an approximately 9.01-mile 230 kV overhead transmission line and fiber optic line (for control and protection of the electrical system, and would be an exclusive use for Ormat), originating at the proposed McGinness Hills substation adjacent to the power plant in the SW1/4SW1/4 Section 15, T.20N., R.45E and terminating at the existing SPPCo/NVE Frontier substation in the SE1/4 Section 13, T19N, R45E; which is located on public lands managed by the BLM (see Figure 4). The transmission line and fiber optic line would be co-located. The proposed transmission line would require a 200-foot wide ROW (90-foot permanent width and an additional 110-foot temporary

width required for construction). At the angle points, an additional 100-foot width would be required.

No additional surface disturbance associated with improvements to the existing SPPCo./NVE substation is anticipated.

Approximately 3.22 miles of the proposed 230 kV transmission line would be located on public lands managed by the BLM, while the remaining 5.79 miles (including the two angle points) would be located on National Forest System lands (see Figure 4).Figure 4). The southernmost 4.2-mile segment of the proposed transmission line would closely parallel an existing 230 kV transmission line. This existing transmission line is located within a 125-foot-wide right-of-way (NVN-005253).

2.1.5.1 Construction Procedures and Surface Disturbance of the Transmission Line

The transmission system structures would consist of 69 steel mono-poles, 2 three-pole steel structures used at angle points, 1 two-pole steel switch structure, and 1 wood H-frame structure (see Table 3). Perch protection would be provided on the top of every pole. Structural components would be transported to the pole location site by truck or helicopter. Helicopter operations would be located at the Austin airport. Structure sites would include assembly and crane-landing areas. On average, each of these structure sites would disturb an area of approximately 2,500 square feet. For ground construction, a crane or helicopter would be used to erect the structure. Approximately 14 poles would be placed by helicopter. The approximate area of helicopter pole placement is reflected on Figure 8. Specific helicopter pole placement locations are identified in the Plan of Development. Total short term and long term surface disturbance associated with the transmission line is shown in Table 5.

Equipment could include cranes, augers, bulldozers, bucket trucks, backhoes, air compressors, electric generators, pickup trucks, and other vehicles, machinery, and field equipment. Construction materials and equipment would be placed in areas that would minimize disturbance to vegetation. Existing USFS and BLM roads would be used for construction of the transmission line and no new roads would be constructed.

2.1.5.2 Facility Design Factors and Additional Components

The transmission line would be designed to meet all temperature, wind, voltage, span and structure height clearance requirements. The proposed transmission line would also provide raptor protection in compliance with the standards described in the "Suggested Practices for Raptor Protection on Power Lines, The State of the Art in 2006" (APLIC 2006). To prevent perching, a cone (Kaddas Enterprises type KE1140 or equal) would be installed on the top of each transmission line pole along the entirety of the transmission line.

The design, construction, operation, and maintenance of the 230 kV transmission line would meet or exceed the requirements of the National Electrical Safety Code (NESC), U.S.

Department of Labor, Occupational Safety and Health Standards, and Sierra Pacific Power Company's requirements for safety and protection of landowners and their property.

Typical design characteristics for the transmission line are summarized in Table 3 below.

Table 3: Typical Transmission Line Typical Design Characteristics

Type of structure	69 Single weathering steel poles (see Figure 9 and Figure 10). Two (2) weathering three-pole steel structures. One (1) two-pole steel switch structure. One (1) wood H-Frame structure.
Structure height	Single Pole: 82 to 104 feet (above ground line), direct buried 10% + 4' of total pole length. Three Pole: 48 to 52 feet (above ground line), direct buried 10% + 2' of total pole length. Switch Structure: ~50 feet (above ground line), direct buried. H-Frame: ~80 feet (above ground line), direct buried.
Span length	Average ~ 640 ft.; Minimum ~ 150 ft.; Maximum ~ 1,240 ft.
Number of structures/mile	Approximately 8 per mile
Structure Base	Direct embedded
Conductor Types	Conductor – 795 ACSR All Aluminum "Tern" Shield Wire – Optical Ground Wire, 12 Fiber Insulators – lightweight, thin line polymer rubber with non-reflective light gray color
Clearance of Conductor	Minimum of 8 feet phase to phase based on SPPCo standard for structures at 230 kV

Staging areas would be located on public land managed by the BLM and on private land locations as identified in Table 4 below and as shown on Figure 7. These staging areas would be used to temporarily store materials required for construction. There would be no additional surface disturbance related to the staging areas, as the areas are either already disturbed (i.e. Frontier Substation area) or the surface disturbance is accounted for in other areas of this EA (i.e. the well sites and power plant area).

Table 4: Staging Area Locations

Staging Areas	Township/ Range	Legal Description (Section Number & Aliquot Part)
McGinness Hills Power Plant Area	T.20N., R 45E.	SW1/4SW1/4 Section 15
Well Site 75-21	T.20N., R.45E.	NE1/4SE1/4 Section 21
Well Site 87-15	T.20N., R.45E.	NE1/4SE1/4 Section 15
Frontier Substation Area	T.19N., R.45E.	SE1/4 Section 13
Well Site 66B-22	T.20N., R 45E.	NW1/4SE1/4 Section 22
Well Site 57C-22	T.20N., R.45E.	SW1/4SE1/4 Section 22

Conductor pulling sites for stringing the conductor would typically be spaced at 12,000 feet to 15,000 feet intervals. However, distances between each site would vary depending on the geography and topography and environmental sensitivity of the specific area, the length of the conductor pull, and the accessibility by equipment. Pulling sites would require a temporary working area. At each pulling site, stringing equipment would be set up approximately 250 feet from the initial structure for leveraging the conductor pull safely. Angle structure pulling sites will be located inside the temporary construction ROW, and all conductor pulling operations will be contained within the environmental study corridor.

The estimated short and long term surface disturbance associated with transmission line construction activities are summarized in Table 5.

2.1.5.3 Operation and Maintenance Procedures for the Transmission Line and Fiber Optic Line

Infrequently, maintenance would include transmission line, fiber optic line and pole repair and/or replacement. Corridor maintenance could include limbing and brushing activities. Ormat would annually inspect the transmission line from a light, off-road vehicle. Repairs and/or facility replacement would transpire, as necessary. Routine travel within the ROW is not expected. Repair and maintenance of the access roads commensurate with the operator's use could be determined by the BLM and/or USFS.

2.1.6 Water Requirements and Needs

Water required for well drilling and testing (see Section 2.1.3.2) is estimated to be 13.0 acre-feet total. Water required for construction of both power plants, the associated pipelines and the transmission line (including earthwork, erosion control, concrete, finishing subgrade, aggregate base and dust suppression) is estimated to be 17.6 acre-feet throughout the 2 year construction period. Therefore, total water required for well drilling and construction is estimated to be 30.6 acre-feet.

Water required for the drilling, testing and construction activities would be obtained from a water well (Lancaster B well) on private land at the Grass Valley Ranch (T. 21 N., R. 46 E., SE1/4NW1/4, Section 16). This water would be trucked from Lancaster B to the construction sites. Ormat would be required to obtain a waiver from the Nevada State Water Engineer (Nevada Department of Water Resources) for this use of the Lancaster B well. The waiver would address the use of the water for the Project, and allow for an increase of up to 30.6 acre-feet of water to be used from the well.

A water well, which would be used for domestic purposes only, would be drilled at each power plant site. During project operation, total water consumption from each well would be approximately 2.5-3.0 af/yr.

Water required for decommissioning of the project, including earthwork and reclamation, is estimated to be 13.6 acre-feet. This water would also be obtained from the Lancaster B well, via waiver from the Nevada State Water Engineer, and trucked to the project sites where needed.

2.1.7 Site Access

The Project Area would be accessed by traveling south on State Route 305 from Battle Mountain, Nevada approximately 87.5 miles to US-50. Turn left onto US-50 and travel east for approximately 6 miles. Turn left onto a north-northeast trending Lander County road (County Road 201, also known as the Grass Valley Road) and travel for approximately 10 miles. County Road 201 runs through the western portion of the proposed Project Area (see Figure 4 and Figure 6).

The proposed Project Area is traversed by numerous roads and "two-tracks." To the extent feasible, existing roads will be utilized for Project construction and operations. Existing roads would be maintained as necessary to prevent the formation of deep ruts.

Within the McGinness Hills Unit Area, approximately 2.19 miles of new access roads will be constructed on public lands managed by the BLM (see Figure 6).

Large portions of the proposed transmission line route would be constructed along existing roads and/or County maintained roads. However, portions of approximately 4.52 miles of existing roads may need to be improved to maintain all weather access (see Figure 11). Approximately 3.57 miles are on National Forest System lands and approximately 0.95 miles are on public lands managed by the BLM. Otherwise, existing access roads and/or overland vehicle travel will be utilized.

Maintenance activities could include blading, surface replacement, dust abatement, spot repairs, slide removal, ditch cleaning (if ditches are needed), culvert cleaning (if culverts are necessary), litter cleanup, noxious weed control and snow removal (USDI and USDA 2007, pages 30 – 36). The final reclamation plan includes the reclamation of all roads constructed for the Project back to original contour.

Prior to the commencement of surface disturbing activities, Ormat, in conjunction with the Lander County Road Department, will document the condition of the County Road. Over the life of the proposed Project, Ormat will work with Lander County to maintain the road in this condition, to the extent that road deterioration can be reasonably attributable to Ormat's proposed activities.

The estimated short and long term surface disturbance associated with access road construction is summarized in Table 5.

2.1.8 Aggregate Requirements and Source(s)

Native materials (derived from grading to balance cut and fill) would be used for power plant site and road building materials, to the extent practical.

Total aggregate required for the well pad construction is estimated at 18,000 cubic yards. Approximately 45,000 cubic yards of surfacing material may be needed for power plant and pipeline construction. Aggregate material would be obtained from an approved BLM mineral materials sale located in the NW1/4NE1/4 of Section 21, T.20N., R.45E.

2.1.9 Work Force and Schedule

Drilling would be conducted by a crew of 9-10 workers with as many as 18 workers on site during short periods. Power plant and pipeline construction would likely require a maximum of up to 50 workers, although substantially fewer would be on site most of the time during construction, as the construction activities are staged. Construction of the transmission line and fiber optic line would require approximately 8 – 10 workers. In total, approximately 70 construction workers would be needed during the construction period.

Once the power plants are operating, and if they are remotely operated, 5-8 workers would be needed. If the power plants are not remotely operated, approximately 8-15 workers would be needed.

Construction of the Project would require 12 to 24 months to complete once all permits are obtained and equipment orders scheduled. Transmission line construction is expected to take approximately 6 months. Commercial operations would commence at the end of the fourth quarter of 2011.

2.1.10 Project Decommissioning and Site Reclamation

The estimated life of the Project is 30 years, consistent with the issued site license (43 CFR 3273.22(a)

A complete reclamation plan is provided as Appendix B. A general description of Project reclamation activities is provided below.

Once drilling is completed at a drill site, the shoulders of the respective well pad could be reclaimed, but the majority of the pad must be kept clear for ongoing operations and the potential need to work on or re-drill the well. The portions of the cleared well sites not needed for operational and safety purposes would be recontoured to a final or intermediate contour that would blend with the surrounding topography as much as possible. Areas able to be reclaimed would be ripped, tilled, or disked on contour, as necessary. National Forest System lands would be reseeded with native grasses and forbs. Public lands managed by the BLM would be reseeded with the appropriate seed mixes. The stockpiled topsoils would also be spread on the area to aid in revegetation.

At the end of Project operations, the wells would be plugged and abandoned. Abandonment typically involves filling the well bore with clean, heavy abandonment mud and cement until the top of the cement is at ground level, which is designed to ensure that fluids would not move across these barriers into different aquifers. The well head (and any other equipment) would then be removed, the casing cut off well below ground surface and the hole backfilled to the surface.

Reclamation of the roads would include recontouring the road back to the original contour, seeding and controlling noxious weeds. Reclamation may include other techniques to improve reclamation success, such as ripping, scarifying, replacing topsoil, pitting and mulching.

When it is time to remove the poles, conductors, and hardware associated with the 230 kV transmission line, the holes would be filled with soil gathered from the immediate vicinity. The areas where the poles were removed would be raked to match the surrounding topography. Bladed areas would be recontoured and seeded with the appropriate seed mix.

The power plants, geothermal pipelines and all other above-ground facilities and areas of surface disturbance associated with geothermal development would be removed and reclaimed. Stormwater diversion would remain in place until successful revegetation is attained.

2.1.11 Adopted Environmental Protection Measures (AEPMs)

Ormat would comply with all stipulations that are applicable to the proposed Project operations on the geothermal leases (see Appendix A) and the transmission line ROWs (see Appendix E). In addition, Ormat would implement the following additional environmental protection measures:

- Water would be applied to the ground during the construction and utilization of the drill pads, access roads, and other disturbed areas as necessary to control dust.
- Portable chemical sanitary facilities would be available and used by all personnel during periods of well drilling and/or flow testing, and construction. These facilities would be maintained by a local contractor.
- To prevent the spread of invasive, nonnative species, all vehicles, heavy earth-moving construction equipment, mobile trailers and RV campers brought to and used on the Project site would go through high pressure washing of the entire vehicle/unit at a commercial wash station prior to arriving, being used on, and/or departing the Project site.
- On public lands managed by the BLM, revegetation would include site appropriate seed mixtures for various ecological site types encountered. All seed must be certified weed seed free and tested in a certified laboratory per BLM protocols. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious, invasive, and non-native seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM.
- All construction and operating equipment would be equipped with applicable exhaust spark arresters. Fire extinguishers would be available in all vehicles/equipment, and would be available on the active sites. In addition to requirements that water that is used

for construction and dust control would be available for firefighting. Personnel would be allowed to smoke only in designated areas, and they would be required to follow applicable BLM regulations.

- Cut and fill activities have been minimized through the selection of the power plant sites and pipeline routes. Off-site storm water would be intercepted in ditches and channeled to energy dissipaters as necessary to minimize erosion around the power plant. To minimize erosion from storm water runoff, access roads would be maintained consistent with the best management practices applicable to development roads. BLM best management practices for storm water would be followed, as applicable, on public lands.
- Geothermal fluids would not be discharged to the ground under normal operating conditions. Accidental discharges of geothermal fluids are unlikely because of frequent inspections, ultrasonic testing of the pipeline, flow and pressure monitoring and well pump and pipeline valve shutdown features.
- Following project construction, areas of disturbed land no longer required for operations would be reclaimed to promote the reestablishment of native plant and wildlife habitat.
- The power plant, pipelines, wellheads, pump motors and motor control buildings would each be painted covert green to blend with the area and minimize visibility.
- The proposed transmission line would also provide raptor protection in compliance with the standards described in the "Suggested Practices for Raptor Protection on Power Lines, The State of the Art in 2006."
- An anti-perching device, (a cone, Kaddas Enterprises type KE1140 or equal) would be installed on the top of each transmission line pole along the entirety of the transmission line (see Figure 9 and Figure 10). These cones help protect raptors and prevent raptors from preying on sage-grouse and other wildlife which may be in the area.
- All power poles will utilize BLM-approved raptor deterrents.
- Ormat will obtain and comply with an Underground Injection Control (UIC) permit, as appropriate.
- During well drilling, the reserve pits would be fenced on three sides, per the Gold Book standard. Once drilling has been completed, the fourth side would be fenced. Fencing would prevent access by persons, wildlife or livestock. In addition to this fence, Ormat would install a smaller-mesh barrier/wildlife deterrent fence. This fence helps exclude smaller mammals and also provides a measure of protection to human safety. All fencing would remain in place until reserve pit reclamation begins.
- Speed limits of 20-25 mph would be maintained for Project related travel through the Project Area (USDI and USDA 2007, p. 25-26).
- Noise would be minimized through operational practices using best available control technology (BACT). Vinyl fencing slats would be used, and the plant design would be reviewed for opportunities to reduce noise.
- Cooling fans utilized in the air-cooled power plants would be designed to minimize power plant noise.
- Wildland Fire Management and Mitigation Plans, Spill or Discharge Contingency Plan and Hydrogen Sulfide Contingency Plan have been submitted and would be complied with.

- A reclamation plan describing interim and final reclamation procedures for this Project has been submitted (Appendix B) and would be complied with.
- As a condition of approval, Ormat would obtain and comply with provisions of a waiver from the Nevada State Water Engineer (Nevada Department of Water Resources) for the use of the Lancaster B well to obtain a maximum of 30.6 acre-feet of water for construction and 13.6 acre-feet for decommissioning and reclamation.

2.2 ALTERNATIVES

NEPA requires that a reasonable range of alternatives to the Proposed Action be considered that could feasibly meet the objectives of the Proposed Action as defined in the purpose and need for the project [40 CFR 1502.14(a)]. The range of alternatives required is governed by a "rule of reason" (i.e., only those feasible alternatives necessary to permit a reasoned choice need be considered). Reasonable alternatives are those that are practical or feasible based on technical and economic considerations [46 Federal Register 18026 (March 23, 1981), as amended; 51 Federal Register 15618 (April 25, 1986)].

Alternatives to the Proposed Action must be considered and assessed whenever there are unresolved conflicts involving alternative uses of available resources (BLM 1988 and BLM 2008a). An alternative to the Proposed Action has been identified which may reduce or avoid potential effects to sensitive species.

2.2.1 Alternative 1

Alternative 1 differs from the Proposed Action only in the location of the southern half of the transmission line corridor and the need to construct a new switching station (see Figure 12). In the NE1/4SE1/4, Section 34, T.20N., R.45E., the Alternative 1 transmission line route diverges from the Proposed Action route and trends generally west and south, terminating in the SW1/4NE1/4, Section 1, T.19N., R.44E. Under this alternative, a new approximately 5-acre switching station would be constructed (Willow Creek switching station). There would also be an approximately 0.75 mile "line fold" which would trend southeast and tie into the existing Fort Churchill/Frontier 230 kV SPPCo. transmission line in the SE1/4SE1/4 Section 1. The line fold would consist of two parallel transmission lines running from a break in the existing 230 kV line to the switching station and back. The Alternative 1 transmission line route is approximately 5.5 miles long. All geothermal components would remain the same as the Proposed Action. Estimates of the short and long term surface disturbance comparing the Proposed Action and Alternative 1 are summarized in Table 5 below.

Construction of the Willow Creek switching station would require extensive site work utilizing heavy construction equipment, resulting in a minimum of 5 acres of surface disturbance. In addition to the switching station itself, new access roads would also need to be constructed and maintained. It is estimated that construction of the switching station would require more than 1 ½ years to complete and cost approximately $11.5 million. Eighty percent of those costs would be borne by the rate payers.

Because of its juxtaposition with other electrical substations in the area (Frontier and Austin), the Willow Creek switching station would create instability and dependability issues on the existing SPPCo. transmission line. If this instability resulted in a line failure, it could affect all NV Energy customers from Fort Churchill to Gonder.

Due to these high construction costs and transmission line dependability issues, Alternative 1 was not selected as the Proposed Action.

2.3 OTHER ALTERNATIVES DROPPED FROM DETAILED ANALYSIS

The BLM and the Forest Service also considered other reasonable alternatives that would still substantially meet the purpose and need for the proposed action. In particular, alternatives were considered for their ability to reduce impacts to sensitive species and other resources. Several alternatives were considered but eliminated from detailed consideration for the reasons discussed below.

BLM Only Transmission Line Corridor Alternative

One alternative included a transmission line located entirely on BLM land. The transmission line alignment considered in this alternative ran due east from the power plants and then due south, terminating at the existing Frontier substation (see Figure 13). It was determined in consultation with the NDOW, however, that high quality sage-grouse habitat exists along much of this route, and that development of this alignment through either an aerial transmission line, or a buried transmission line would be constructed directly through several known sage-grouse leks; thus resulting in greater impacts to sage-grouse. Therefore, this alternative was dropped from detailed analysis.

Buried Portions of the Transmission Line Corridor Alternative

Another alternative that was considered included the burial of portions of the transmission line (see Figure 13). This alternative would have some environmental advantages, such as reduced perching opportunities for various birds that prey on sage-grouse and reduced visual impacts. However, it was calculated that this alternative would increase surface disturbance by more than 27 acres over that of the Proposed Action. In addition, repairs to the transmission line would involve re-excavation and additional site disturbance over the life of the project. This additional surface disturbance would result in greater environmental impacts. Thus, this alternative was dropped from further consideration for the following reasons:

- greater potential impacts to sensitive plant species;
- adverse effects to 16 known archaeological sites, six of which are eligible for the National Register of Historic Places;
- adverse effects to an unknown number of as-yet-undiscovered surface and subsurface cultural resources
- the increased impacts to cultural resources would likely have corollary impacts to Tribal and Native American concerns;

- increased potential for sedimentation into seeps, springs and meadows, reducing water quality and decreasing infiltrating and groundwater recharge;
- increased impacts to air quality from fugitive dust emissions as well as hydrocarbon emissions from equipment;
- increased impacts to vegetation, soils and range;
- increased potential for noxious weeds, invasive and non-native plants;
- increased costs to the proponent estimated at more than $3 million/mile;
- increased interruptions to the electrical power being supplied to the grid, due to increased down time for repairs.

Water Cooled Power Plants Alternative

Ormat's original permit application submission to the BLM included two water-cooled power plants. Water-cooling at certain times of the year when ambient air temperatures are higher would improve electrical output of the plants. There were originally two water cooled proposals submitted by Ormat: 1) Ormat would construct two new wells on the Lancaster Ranch located in central Grass Valley, nine miles north of the power plant sites. Water was to be transported to the power plants via a buried underground pipeline; and 2) using less water from the same proposed wells, Ormat proposed treating geothermal water through an osmosis treatment process, which would result in cutting the proposed consumptive cold water well use by 50%.

A few technical issues resulted in Ormat formally withdrawing both water-cooled power plant applications to the BLM:

- Ormat discovered through their water rights application to the Nevada State Engineer's office that the hydrographic basin where the two cold-water wells were to be located was nearly fully appropriated with respect to that basin's (Hydrographic Basin 138) total recharge capability. In concert with the Nevada State Engineer's office, Ormat had a model constructed that demonstrated that there was sufficient recharge to allow the state engineer to allocate approximately 2,500 acre feet of additional ground water from the basin. This amount would meet only 50% or less of Ormat's projected water cooling needs for the two power plants;
- Ormat investigated making up the lack of available cooling water by considering using geothermal make-up water. Based on the above, as well as other projected projects, Ormat has been studying the feasibility of converting some of a geothermal reservoir's water to cooling water through an osmosis filtering process. The geothermal water would need to be highly filtered to limit scale and other formations building up in a cooling circuit. To date, Ormat's work related to constructing an osmosis filtering process has been unsuccessful in developing sufficient quantities of geothermal make-up water;
- Based on these technical issues, Ormat formally withdrew their application for two water-cooled power plants, and re-submitted an application for two air-cooled power plants. Thus, the water-cooled power plants alternative was dropped from further analysis.

Reduced Footprint Alternative

Ormat worked closely with the BLM, the NDOW and various contractors, such as cultural contractors, in sighting the power plants and appurtenant facilities such as the well fields. Ormat has determined through engineering as well as proprietary geothermal information that construction and operation of two 40 megawatt power plants are the most efficient utilization of the geothermal resource being developed in concert with BLM regulations.

Ormat also states that its geothermal plants are constructed in modules for construction cost savings, increased efficiencies and reduced transportation costs. Thus, the proposed footprints are designed around these power plant modules. Construction of power plant components outside of the parameters for these modules would be considered custom built and considerably more expensive in terms of custom tooling and construction.

The current power plant and well field and other appurtenant facilities are the minimum footprint required for this project.

Reconfiguration Alternative

As identified previously, Ormat worked closely with the BLM, the NDOW and its various contractors to site the power plant and its associated facilities.

Besides minimizing impacts to sage-grouse and other resources such as cultural resources, the following considerations were also used to locate the project site:

Geothermal power generation requires primarily three factors to be successful: temperature, fluid flows and strategic injection locations to return the resource. In Nevada, geothermal fluids flow through geologic fault block conduits. Drilling involves tapping the fault system at specific depths and locations to reach optimum temperature and fluid flows. Likewise, considerations for injection must occur in permeable fault zones where it will not cool the resource, it will maintain well field pressure and eventually return the resource for reheat and reuse. All of this necessitates strategic and multiple drilling locations and limits the ability to drill multiple holes from one location.

In contrast, other resources such as oil and gas are geologically located in a pooled or ubiquitous subsurface resource. This pooling of the resource is more conducive to drilling multiple holes, in multiple directions from one well pad.

When attempting to identify different viable geothermal development locations, the following constraints must be considered. Development of geothermal projects for power production is resource location driven. That is to say, it must be developed where the resource occurs. This presents limited location opportunities for power plant development and even fewer options for fluid production/injection pad locations. When the need to locate facilities at the resource and other resource constraints are combined, avoidance of all impacts is a near impossibility. Therefore, the best approach is to look for micro-site opportunities to minimize the impact.

At the McGinness Hills project site, the plant was located to maximize the distance from sage-grouse leks and habitat and to place the facility in an area where terrain would provide the greatest visual and noise buffer. Additionally, the site was selected to place the facilities, geothermal pipelines, and transmission line in the areas of greatest existing impacts (roads & gravel pits, for example) and to minimize the impact to visual and cultural resources.

2.4 SURFACE DISTURBANCE SUMMARY

Table 5 identifies the long-term surface disturbance and short-term surface disturbance associated with the construction and operation of the Proposed Action and Alternative 1. For purposes of this analysis, long term disturbance is defined as surface area that would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately 5 years to ensure that reclamation is successful, as determined by the appropriate agencies). Short-term disturbance is defined as that surface disturbance which would undergo interim reclamation, in accordance with the Project reclamation plan (see Appendix B).

Table 5: Surface Disturbance Summary, Proposed Action and Alternative 1

	Proposed Action		Alternative 1	
	Short Term (ac.)[1]	Long Term (ac.)[1]	Short Term (ac.)[1]	Long Term (ac.)[1]
Geothermal Components, BLM-Managed Lands				
Well Pads	7.6	68.0	7.6	68.0
Pipelines	41.8	20.9	41.8	20.9
Power Plants	0.0	32.9	0.0	32.9
Access Roads	1.3	5.3	1.3	5.3
SUB-TOTAL	***50.7***	***127.1***	***50.7***	***127.1***
Geothermal Components, Private Lands				
Well Pads	1.0	20.0	1.0	20.0
Pipelines	2.1	1.1	2.1	1.1
Power Plants	0.0	0.0	0.0	0.0
Access Roads	0.0	0.0	0.0	0.0
SUB-TOTAL	***3.1***	***21.1***	***3.1***	***21.1***
Transmission Line/Fiber Optic Line Corridor, BLM-Managed Lands (N-88978 and N-88979)				
Tangent Pole Placement	1.2	0.1	0.2	0.1
Angle Pole Placement	0	0	0	0
Stringing Sites	2.8	0	0	0
Access Road Maintenance	0.6	0	0	0
Substation	0	0	0	0
SUB-TOTAL	***4.6***	***0.1***	***0.2***	***0.1***
Transmission Line/Fiber Optic Line Corridor, National Forest System Lands				
Tangent Pole Placement	2.5	0.1	1.6	0.1
Angle Pole Placement	1.4	0.1	2.2	0.1
Stringing Sites	4.2	0	3.5	0

	Proposed Action		Alternative 1	
	Short Term (ac.)[1]	Long Term (ac.)[1]	Short Term (ac.)[1]	Long Term (ac.)[1]
Access Road Maintenance	2.2	0	0	0
Substation	0	0	0	5.0
SUB-TOTAL	***10.3***	***0.2***	***7.3***	***5.2***
TOTAL	***68.7***	***148.5***	***61.3***	***153.5***

[1] All acreages of surface disturbance have been rounded to the nearest tenth of an acre.

Total long term surface disturbance is approximately 5.0 acres greater with Alternative 1.

If the Proposed Action or Alternative 1 are selected, the reclamation plan will be implemented following completion of the Project. Following successful reclamation, surface disturbance would be zero.

2.5 NO ACTION ALTERNATIVE

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

It should be recognized that Ormat has a geothermal lease for the lease unit. Purchase of that lease comes with certain rights, including the right to conduct geothermal exploration activities, subject to the lease stipulations. With that understanding, Ormat applied for and received approval to begin geothermal exploration activities on the lease unit. To date, that exploration consists of the drilling of eight geothermal wells from seven well pads and the construction of associated access roads on the federal leases. In addition, five geothermal wells and well pads and associated access roads have been constructed on the private Lake Ranch lease. This has resulted in 33.9 acres of surface disturbance on public lands and 23.2 acres of surface disturbance on private lands.

To date, the McGinness Hills geothermal exploration activities on public lands have resulted in 33.9 acres of disturbance to various resources through direct and indirect impacts. Those impacts were analyzed in the BLM's McGinness Hills Geothermal Exploration EA, dated January, 2009 (NV063-EA08-093). For a more detailed description of the exploration impacts, you may request a copy of that EA from the Mount Lewis Field Office. That EA and its impact analysis are incorporated by reference into this document.

The federal geothermal lease approval allows Ormat up to 10 years of exploration activities. Thus, Ormat has approximately seven years remaining on their lease to continue geothermal exploration activities. Any additional geothermal exploration activities above those currently analyzed in the Exploration EA (BLM 2009) and the associated approvals will require additional NEPA documentation and BLM decisions.

Under the No Action Alternative, DOE would not issue a loan guarantee to John Hancock Life Insurance Company for construction and startup of the Project. While the facilities might be built with other financing, for purposes of this analysis it is assumed that the project would not be completed or become operational.

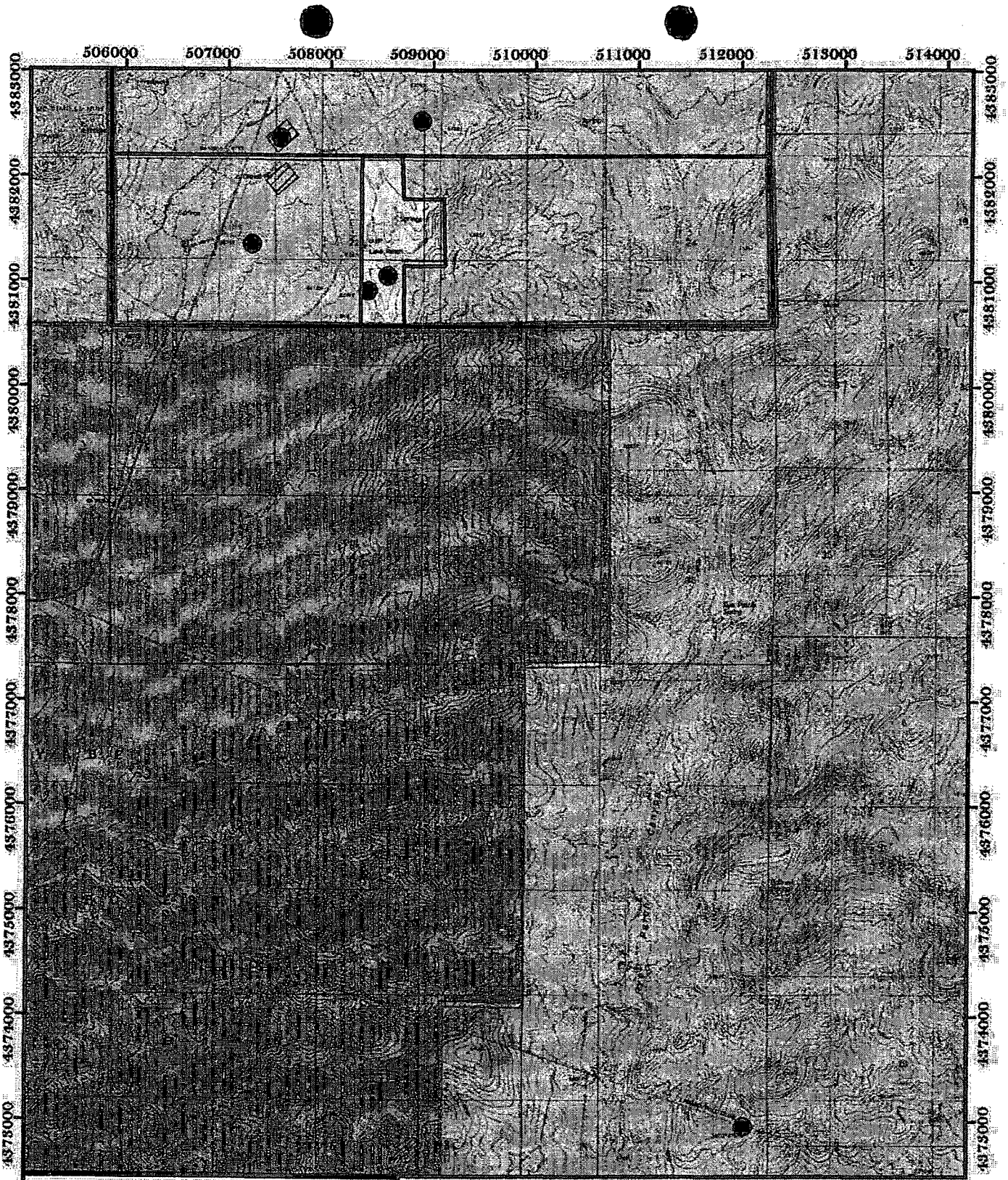
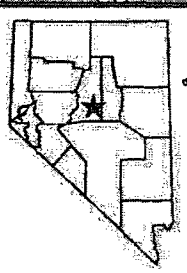
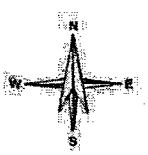
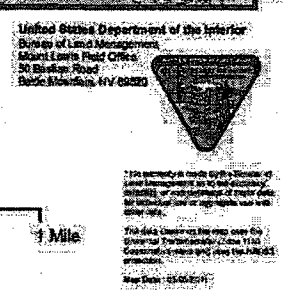


Figure 7: Construction Staging Areas

- Staging Areas
- Proposed Power Plants
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private







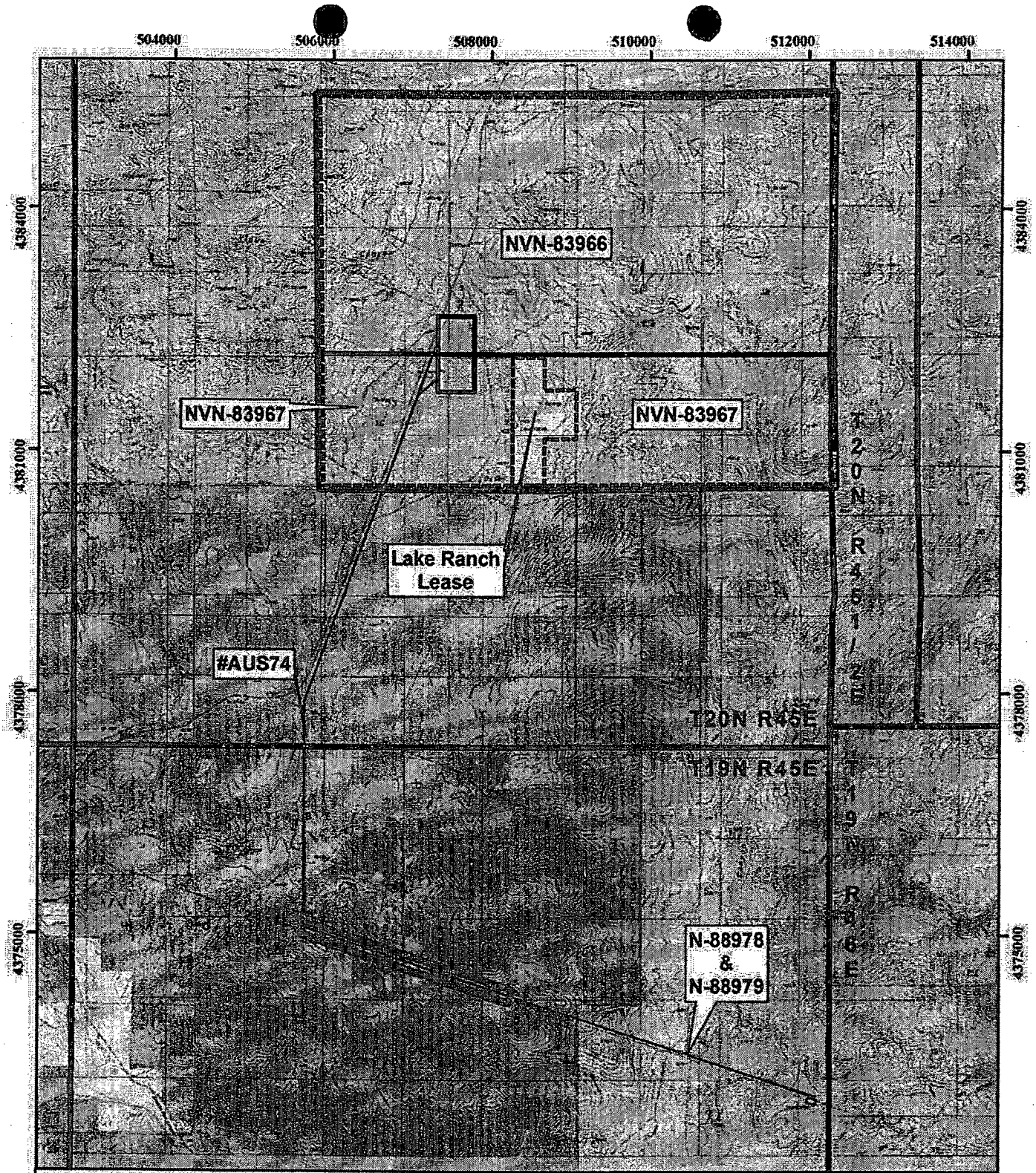
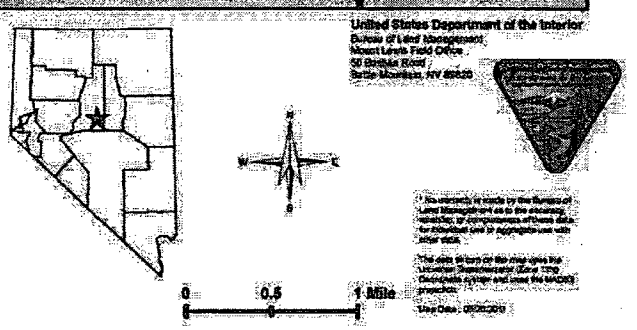
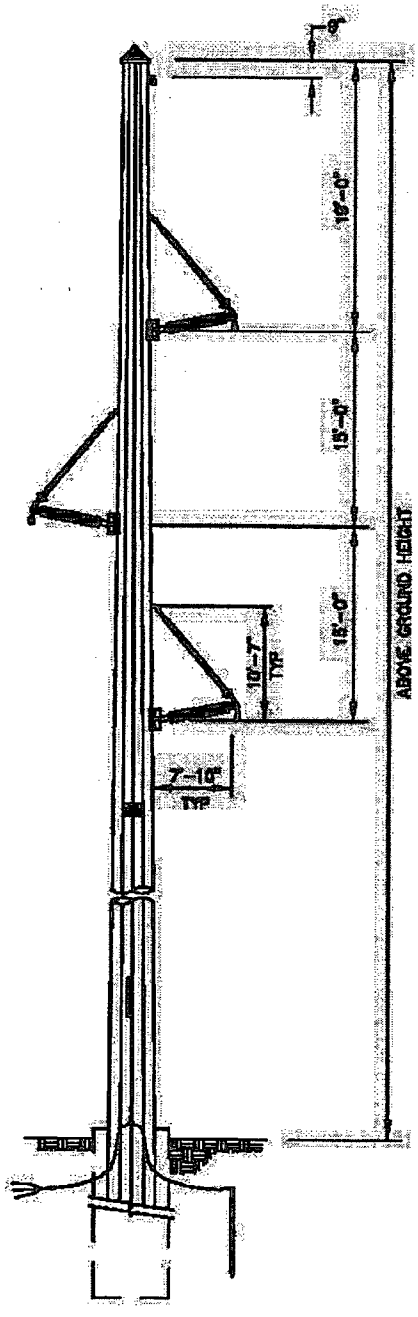


Figure 8: Helicopter Pole Placement

- 230 kV Transmission Line-Proposed
- Approximate Pole Placement Area
- Development Area
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management
- Forest Service
- Private





NOTES:

1. ALL DIMENSIONS ARE TO CENTERLINE OF ATTACHMENT.
2. EMBEDMENT DEPTH - 10% + 4'.
3. INSTALL POLE TOP CONE FOR ANTI-PERCHING AS REQUIRED. KADDAS ENTERPRISES TYPE KE1140 OR SIMILAR.

Total pole height will be 82 to 104 feet above ground

ORMAT®

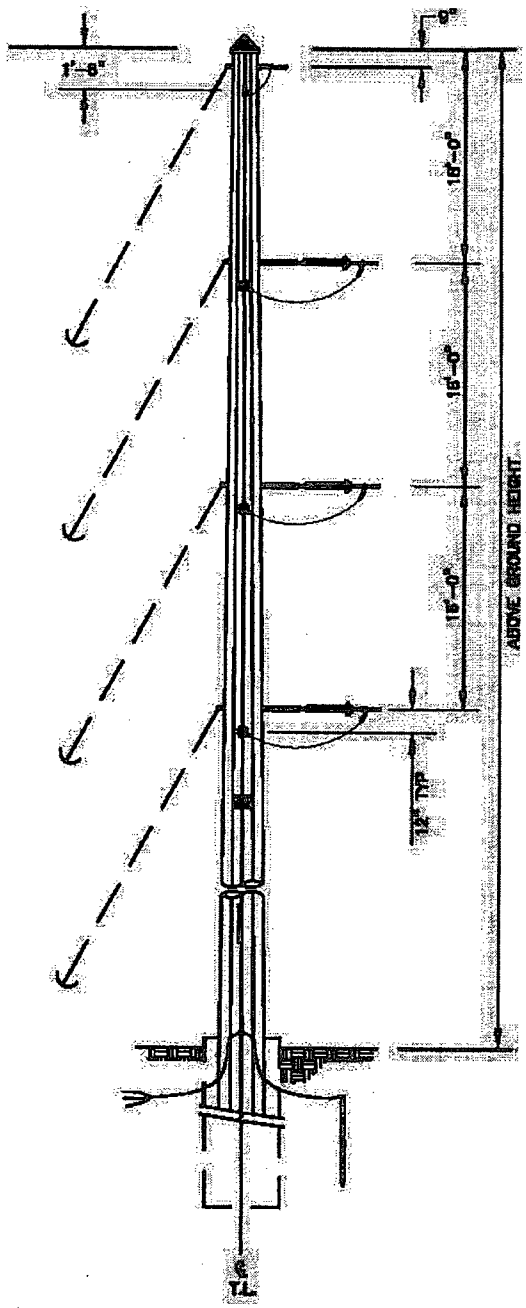
ORMAT McGINNESS HILLS 230KV LINE
SINGLE POLE STRUCTURE, TANGENT 0°-2°

Figure 9

REVISION NO.	DATE
ORIGINAL ISSUE	[illegible]

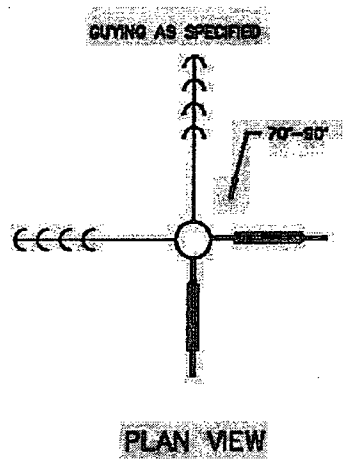
TRIVAGE CONSULTING
5418 Longley Lane
Suite A
Reno, NV 89511
Ph: (775) 336-1300
Fax: (775) 336-1308

ENGINEER:	JIM HENGOCHEA
PHONE NUMBER:	(775) 336-1302
PROJECT NUMBER:	MH_01
PREPARED BY:	KLC
CHECKED:	JMB
APPROVED:	



NOTES:

1. ALL DIMENSIONS ARE TO CENTERLINE OF ATTACHMENT.
2. EMBEDMENT DEPTH - 10% + 2'.
3. INSTALL POLE TOP CONE FOR ANTI-PERCHING AS REQUIRED. KADDAS ENTERPRISES TYPE KE1140 OR SIMILAR.



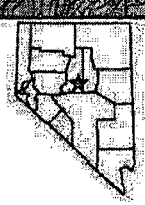
Total pole height will be 82 to 104 feet above ground

ORMAT®	REVISION NO.	DATE	TRI SAGE CONSULTING	ENGINEER: JIM HENGOCHEA
ORMAT McGINNESS HILLS 230KV LINE SINGLE POLE STRUCTURE, HEAVY ANGLE 70°-90°	ORIGINAL ISSUE	[illegible]	5418 Longley Lane Suite A Reno, NV 89511 Ph: (775) 336-1300 Fax: (775) 336-1309	PHONE NUMBER: (775) 336-1302 PROJECT NUMBER: MH_01 PREPARED BY: KLC CHECKED: JHB APPROVED:

Figure 10

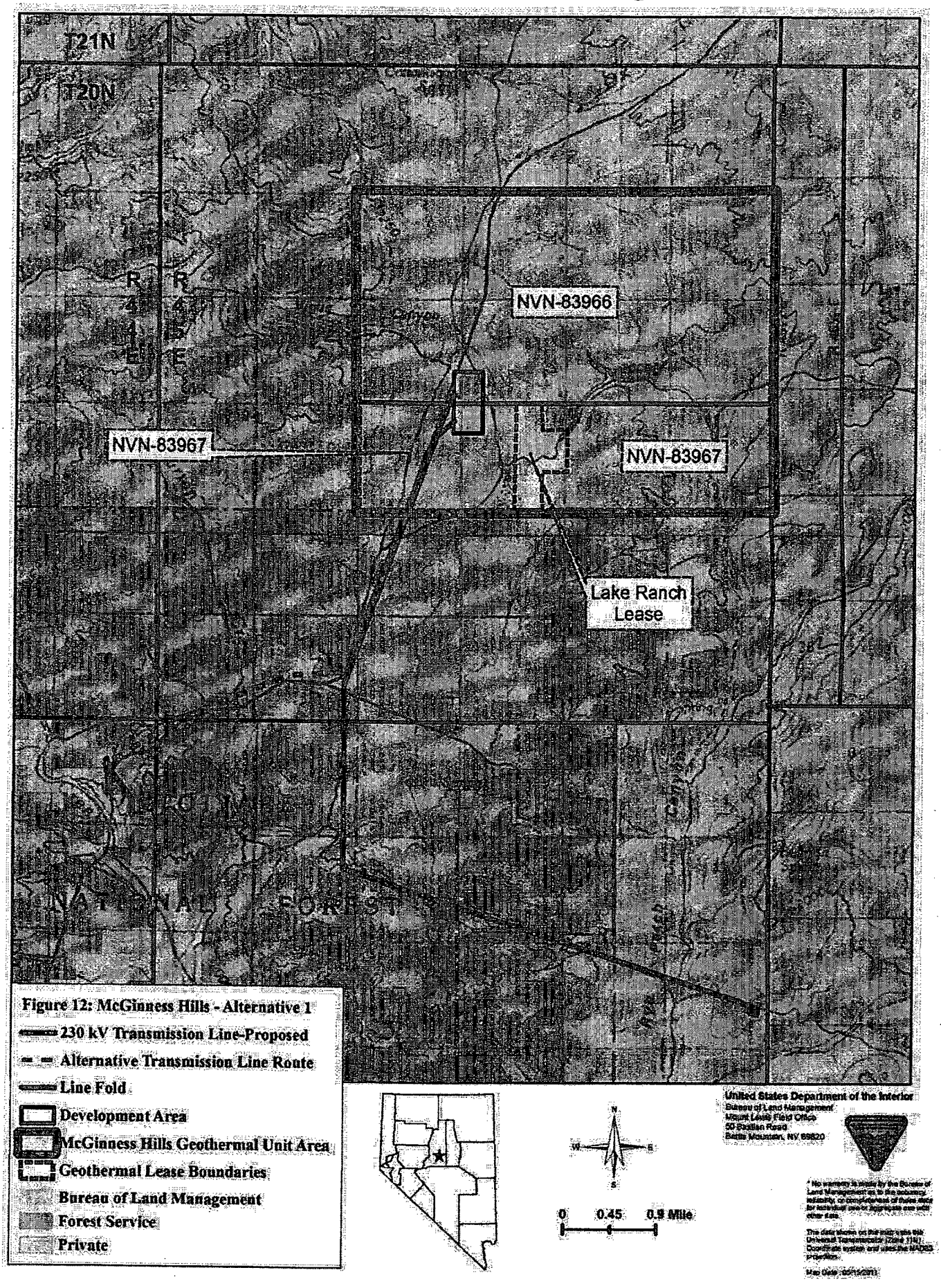
Figure 11: Transmission Line Access Road to be Improved

- Access Road To Be Improved
- 230 kV Transmission Line-Proposed
- Development Area
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management
- Forest Service
- Private



0 0.25 0.5 Mile

United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bowman Road
Battle Mountain, NV 89820


T21N
T20N
R 44 E
R 45 E
NVN-83966
NVN-83967
NVN-83967
Lake Ranch Lease
NATIONAL FOREST
Figure 12: McGinness Hills - Alternative 1
230 kV Transmission Line-Proposed
Alternative Transmission Line Route
Line Fold
Development Area
McGinness Hills Geothermal Unit Area
Geothermal Lease Boundaries
Bureau of Land Management
Forest Service
Private
N
W
E
S
0
0.45
0.9 Mile
United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Station Road
Battle Mountain, NV 89820

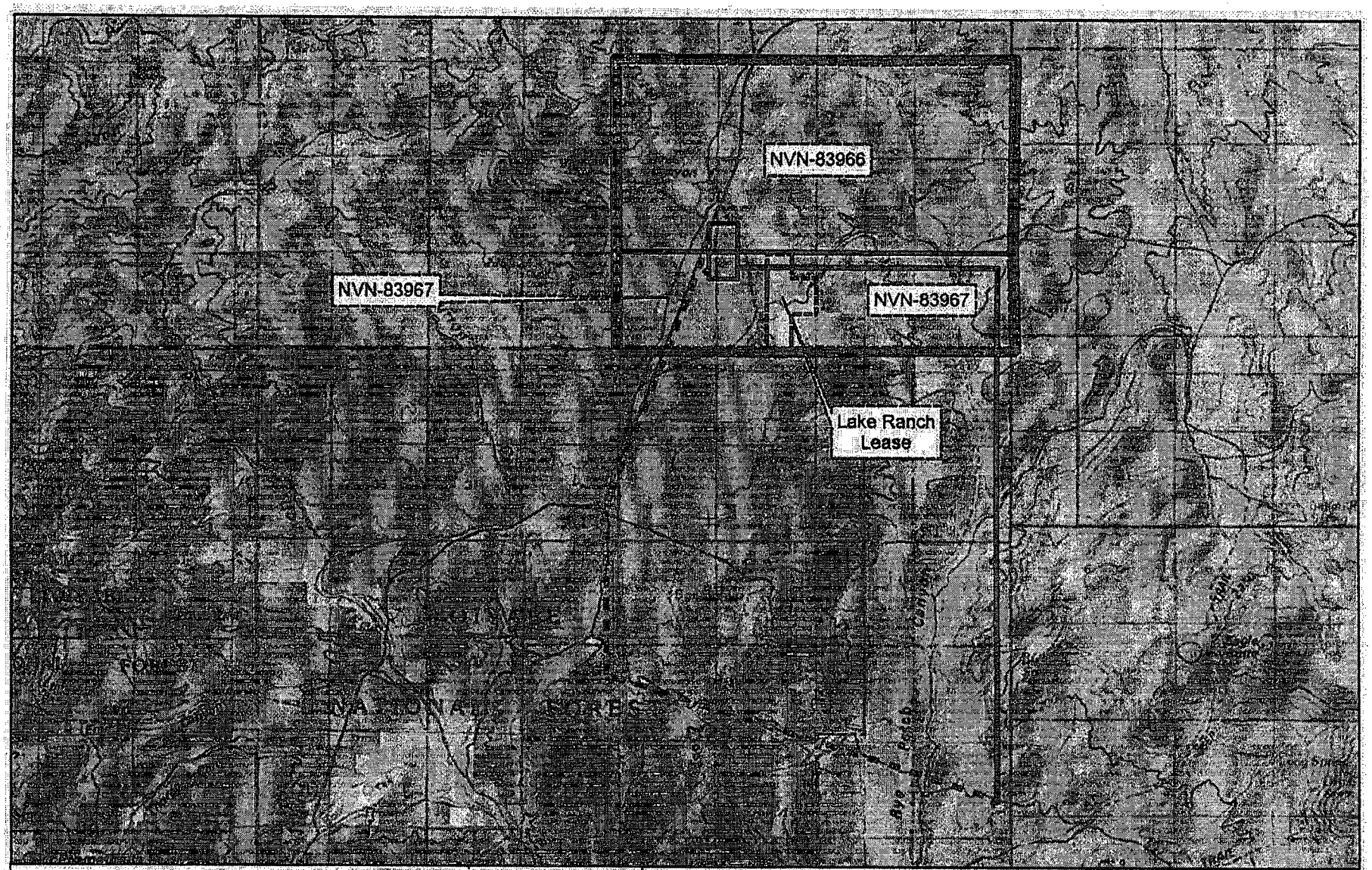
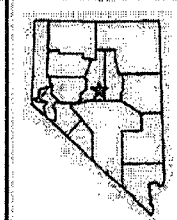


Figure 13: Alternatives Considered but Dropped from Analysis

- Underground Transmission Line Route
- Alternative Route - Dismissed
- Development Area
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management
- Forest Service
- Private



0 1 2 Mile

United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820

* No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection.

Map Date : 05/03/2011

3 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

3.1 TABLE OF SUPPLEMENTAL AUTHORITIES/SPECIFICALLY REQUIRED DISCLOSURES/OTHER RESOURCES

To comply with NEPA, the BLM and USFS are required to address specific elements of the environment that are subject to requirements specified in statute or regulation or by executive order (BLM 1988 and BLM 2008a). These required elements are listed in Table 6. This environmental assessment also addresses other elements of the environment that were deemed appropriate for evaluation by the BLM and USFS or that were identified by other agencies, organizations or individuals through the public scoping process (see Section 1.7). These additional elements are listed in Table 7.

This chapter describes both affected environment and environmental consequences. The affected environment sections include descriptions of the environmental setting of each resource that could be impacted by Ormat's proposal, the No Action Alternative and Alternative 1. Following each affected environment section is a description of potential impacts or environmental consequences to each resource that could result from the Proposed Action, the No Action, and Alternative 1.

Where applicable or required, mitigation, as defined by the CEQ regulations (40 CFR 1508.20), has been identified to limit the impacts to a resource from the proposed action or alternative. Included in these sections are any monitoring plans and/or trigger points that set the framework for mitigation implementation, a description of the likely effectiveness of that mitigation, and, as required by BLM policy (BLM, 1988), both the potential positive and negative impacts that may occur when any mitigation is implemented. The latter will be identified in the following chapter as "Mitigation Impacts".

If the McGinness Hills Geothermal Project is approved and prescribed mitigation that cannot be definitely located or selected prior to monitoring or trigger points is to be implemented, the BLM will require the following procedures to be completed prior to implementation of that mitigation:

1) Section 106 of the National Historic Preservation Act, including Class III surveys of any proposed ground disturbance;
2) Related to number 1, Native American Coordination/Consultation;
3) While the current EA has not identified any endangered species in the project area or vicinity, compliance with Section 7 of the Endangered Species Act (ESA) will be implemented should any ESA species be identified in the mitigation area(s);
4) Contacting the Nevada Department of Wildlife (NDOW), the U.S. Fish and Wildlife Service, and the Nevada Natural Heritage Program to identify any Special Status Plants or Animals that may reside in the mitigation area.

Table 6: Supplemental Authorities/Specifically Required Disclosures

Element	Present Yes/No	Affected Yes/No	JUSTIFICATION
Air Quality; Clean Air Act	Yes	Yes	See Section 3.2
Cultural Resources; National Historic Preservation Act; Executive Order 13007	Yes	Yes	See Section 3.3
Environmental Justice; Executive Order 12898; Civil Rights, Women and Minorities	No	No	No minority or low income populations would be disproportionately affected by the Project.
Fish Habitat; Executive Order 12962	No	No	There is no fish habitat in the proposed Project Area.
Floodplains; Executive Order 11988	No	No	There are no FEMA-designated 100-year floodplains in the proposed Project Area.
Forests and Rangeland; Prime Farmland, Range Land and Forestland	Yes	Yes	See Section 3.14
Migratory Birds; Executive Order 13186	Yes	Yes	See Section 3.5
Native American Religious Concerns	Yes	Yes	See Section 3.4
Prime or Unique Farmlands	No	No	There are no prime or unique farmlands in or near the proposed Project Area.
Threatened, and/or Endangered, Species	No	No	According to the USFWS letter dated July 14, 2010, there are no Threatened and/or Endangered Species in the proposed Project Area.
Wastes, Hazardous or Solid	Yes	Yes	See Section 3.12
Water Quality (Surface and Ground)	Yes	Yes	See Section 3.10
Wetlands and Riparian Zones; Executive Order 11990	Yes	Yes	See Section 3.11
Wild and Scenic Rivers	No	No	There are no wild and scenic rivers in the proposed Project Area.

Element	Present Yes/No	Affected Yes/No	JUSTIFICATION
Wilderness	No	No	There are no wilderness areas or wilderness study areas within the proposed Project Area.
Wilderness Characteristics	No	No	A wilderness characteristics study was completed on 7/21/2010. That study indicated that the proposed Project Area does not meet the Secretarial Order (Number 3310) definitions of wilderness characteristics.

Other resources of the human environment that have been considered for this EA are listed in Table 7 below.

Table 7: Other Resources

Other Resources	Present Yes/No	Affected Yes/No	Comments
Geology and Minerals	Yes	No	Geology and Minerals would not be adversely affected by implementation of the Proposed Action. Geothermal resources are a leasable mineral and given that the resource is not consumed during plant operations, geothermal resources should not be affected.
Noise	Yes	Yes	See Section 3.7
Soils	Yes	Yes	See Section 3.8
Vegetation	Yes	Yes	See Section 3.9
Noxious Weeds, Invasive and Nonnative Species	Yes	Yes	See Section 3.6
Wildlife Resources	Yes	Yes	See Section 3.5
Recreation	Yes	Yes	See Section 3.15
Visual Resources	Yes	Yes	See Section 3.16
Socio-Economic Values	Yes	Yes	See Section 3.17
Special Status Species	Yes	Yes	See Section 3.5
Health and Safety	Yes	Yes	See Section 3.12
Paleontology	Yes	Yes	See Section 3.13
Wild Horse and Burro	Yes	No	The Callahan Herd Management Area (HMA) is within the proposed Project Area. However, inventory data indicates that there is limited wild horse use in this portion of the HMA. Therefore, no direct impacts to Wild Horse and Burros are anticipated.

DOE Required Language: Consideration of International Destructive Acts

According to the DOE, the proposed Project presents an unlikely target for an intentionally destructive act and has an extremely low probability of attack. In addition, gates will restrict vehicle access to the facility. The limited access in addition to the relative remoteness of the facilities would deter intruders. Theft or opportunistic vandalism would be more likely than sabotage or terrorist acts. The results of any such acts could be expensive to repair, but no prolonged disruption of electrical service would be anticipated. No environmental impacts would be expected from physical damage to the proposed project or from loss of power delivery.

3.2 AIR QUALITY

3.2.1 Affected Environment

The Nevada Department of Conservation and Natural Resources (NDCNR), Division of Environmental Protection (NDEP), Bureau of Air Pollution Control (BAPC) has been delegated responsibility by both the federal Environmental Protection Agency (USEPA) and the State of Nevada to regulate air pollution and emissions of air pollutants in all areas of the State, other than Clark and Washoe Counties.

Air quality in Lander County has been designated as "attainment/unclassified" (which means it either meets, or is generally assumed to meet, the applicable federal ambient air quality standards) for all standard ("criteria") air pollutants [ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), lead particles and hydrogen sulfide] (U.S. EPA 2010).

Neither the McGinness Hills Unit Area nor the transmission line corridor are located in or adjacent to any mandatory Federal Class I (most restrictive) air quality areas, U.S. Fish and Wildlife Service Class I air quality units, or American Indian Class I air quality lands.

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

The primary pollutant of concern during construction activities would be particulates in the form of fugitive dust. Fugitive dust would be generated from earth-moving activities and travel on unpaved roads during construction and drilling activities. Based on the implementation of environmental protection measures adopted by Ormat, water and gravel would be applied to the ground as necessary to control dust (see Section 2.1.11). This would minimize fugitive dust emissions during construction activities.

Fugitive dust which could be generated when drilling with air would be controlled by a separator/muffler, and only the air and water vapor would be discharged to the atmosphere.

An NDEP-BAPC Surface Area Disturbance Permit, documenting the areas of proposed disturbance and the best practical dust control methods to be used, will be required for the Project because the surface disturbed by the Project would be greater than 5 acres. Best practical dust control methods applicable to the project activities include use of water trucks to spray water on disturbed areas on a regular basis; pre-watering of areas to be disturbed; graveling of roadways, storage areas and staging areas; posting and limiting vehicle speeds to 20-25 miles per hour, and use of wind fences to reduce wind speeds and the generation of fugitive dust. Implementation of the applicable best practical dust control methods, through compliance with the Surface Area Disturbance Permit, would minimize fugitive dust emissions during construction, operation and reclamation of the Proposed Project.

Combustion emissions of criteria air pollutants [nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter less than or equal to 10 microns in diameter (PM_{10})], criteria air pollutant precursors [volatile organic compounds (VOCs)] and air toxics (small quantities of diesel PM, acetaldehyde, benzene, and formaldehyde) would be released during well drilling and construction activities from the diesel engines used.

Small quantities of naturally occurring non-condensable gases, such as carbon dioxide (CO_2), hydrogen sulfide (H_2S), nitrogen (N_2), and methane (CH_4), would be emitted to the air during geothermal well testing. Carbon dioxide is a greenhouse gas. Although the Proposed Action would contribute an increase in greenhouse gases in the atmosphere, these emissions would be extremely small relative to state, national, and global greenhouse gas emissions. Any resultant effects would also be extremely small and cannot be reliably estimated.

With a binary power plant, some of the binary working fluid (pentane) would be released to the atmosphere from gaskets, rotating seals, and flanges during operations. Also during normal operations, a small quantity of air would enter the pentane loop in the air-cooled condenser. This air leaked into the pentane loop would be discharged back to the atmosphere through a stack, along with a small quantity of pentane. During major maintenance activities on the pentane side of the binary power plant units, the liquid pentane would first be transferred to the pentane storage tank. However, not all of the pentane can be removed in this manner, and the residual pentane would escape to the atmosphere when the binary power plant unit is opened for repair. All of these releases, estimated to average about 12 tons per year, are regulated through a permit issued by BAPC to ensure that these emissions do not result in ambient concentrations of ozone (which can be created from the reaction of ambient concentrations of hydrocarbons and NO_x) in excess of the applicable federal ambient air quality standards (AAQS).

Monitoring and Trigger Points

Implementation of Ormat's AEPMs and compliance with the NDEP's Surface Area Disturbance Permit will effectively limit fugitive dust emissions.

For fugitive dust emissions resulting from drilling and/or construction activities, Ormat employees will visually monitor the project area as required by the requisite Surface Area Disturbance Permit. Further, Ormat management will monitor all company traffic to ensure

compliance with applicable speed limits so as to limit generation of fugitive dust from traffic flow.

Visible fugitive dust emissions, in concert with the NDEP permit, will trigger watering or use of dust palliatives on disturbed areas to limit fugitive dust emissions. Certain dust palliatives contain salts that may be harmful to plants and wildlife; therefore, the use of a dust palliative will be approved by the BLM following consultation with NDOW. Implementation of the AEPMs should reduce or eliminate the generation of fugitive dust emissions. Compliance with the requisite Surface Area Disturbance Permit combined with the AEPMs will keep Ormat in compliance with NDEP air quality standards.

Water for construction will be obtained from the Lancaster B well at Grass Valley Ranch. That ranch is located approximately nine miles north of the project area. Increases in combustion emissions will likely occur from trucking the water to the construction and drilling locations. Although the hydrocarbon combustion emissions would contribute an increase in greenhouse gases in the atmosphere, these emissions would be extremely small relative to state, national, and global greenhouse gas emissions. Any resultant effects would also be extremely small and cannot be reliably estimated.

There will be no impact to plants or wildlife from the use of a dust palliative, since the BLM will approve, in consultation with the NDOW, only dust palliatives that are minimally harmful to plants and wildlife.

There will be an increase in water withdrawal from Basin 138 by use of the water for dust suppression. This water use has been granted a waiver by the Nevada State Water Engineer (waivered from its current agricultural use to industrial use for this project). The total projected use for all construction activities is described in Chapter 3.10, "Water Quality and Quantity".

Ambient air quality in the project area will be maintained because of adoption of these AEPMs.

3.2.2.2 Alternative 1

The potential air quality impacts from construction, operation, maintenance and reclamation of Alternative 1 would be slightly greater than those described for the Proposed Action due to the disturbance of approximately 5.0 more acres during site construction.

3.2.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, additional exploration activities would disturb an additional 34 acres. If this were to occur, fugitive dust emissions from earthwork and vehicle emissions from construction

machinery would continue. See the 2009 Geothermal Exploration EA for a complete analysis of potential air quality impacts.

3.3 CULTURAL RESOURCES

3.3.1 Affected Environment

The project area is associated with the Central Subregion of the Western Great Basin Region prehistoric and historic period culture area. The Central Great Basin cultural area is divided into time periods representing adaptive prehistoric strategies: Pre-Archaic, Early Archaic, Middle Archaic, and Late Archaic. Western Shoshone groups inhabited the area at the time of historic contact. Historically, the area was settled by cattle ranchers and gold and silver miners.

Class III cultural resource inventories of the Project Area were conducted by archaeologists from Kautz Environmental Consultants and Western Cultural Resource Management (WCRM) in seven phases, as follows:

1) During the summer of 2008, approximately 485 acres of public lands managed by the BLM were surveyed (Kautz 2008);
2) Later in 2008 Kautz surveyed an additional 161 acres of public Land;
3) Between August 26 and September 12, 2009, approximately 443 acres of public lands managed by the BLM were surveyed (WCRM 2010a);
4) Between December 1 and 7, 2009 and April 6 and 26, 2010, WCRM surveyed an additional 545 acres. This acreage included both public lands managed by the BLM and National Forest System lands managed by the US Forest Service (WCRM 2010b); and
5) Between April 25 and July 2, 2010, WCRM surveyed an additional 1,819 acres of public lands and National Forest System lands (WCRM 2010c);
6) In February, 2011 WCRM surveyed 1.3 acres of Public and private lands for groundwater monitoring wells;
7) Between May 10 and 16, 2011, WCRM surveyed an additional 54 acres on National Forest System lands (WCRM 2011)

Survey methods focused around the identification, recording and evaluation of all cultural resources within the survey area.

Based on the findings of the cultural resource surveys, a McGinness Hills Archaeological District (MHAD) has been proposed on selected public and private lands. There are a total of 171 loci (sites), of which 167 are on BLM land and 6 are on both BLM and National Forest System lands. Of the 171 loci, 36 have been determined to be, or are recommended as, contributing elements.

The MHAD has been recommended for eligibility on the National Register of Historic Places (NRHP) (WCRM 2010a, 2010b, 2010c).

In addition to the MHAD, 43 archaeology sites were recorded on, or partially on, National Forest System land. These were recorded and evaluated independently from the MHAD by the Forest Service. Of these, 42 are entirely on National Forest System land and one overlaps both National Forest System land and private lands. Sixteen of the 43 USFS sites are eligible to the NRHP and one is unevaluated.

The Pony Express National Historic Trail is located south of the McGinness Hills project area and north of US Highway 50. The trail comes within approximately ½ mile of the existing SPPCo/NVE Frontier substation at the southern terminus of the proposed transmission line. In the vicinity of the Project Area the trail is a two-track dirt road, which is used for general public land access, access by grazing permittees, and by recreationalists.

3.3.2 Environmental Consequence

3.3.2.1 Proposed Action

Thirty-five contributing/NRHP eligible loci/sites in the MHAD may be adversely affected by the Proposed Action. One site remains unevaluated, but the BLM treats such sites as NRHP eligible. Of the 35 eligible or unevaluated MHAD loci, 32 are located entirely on BLM managed lands, and two lie on both BLM and USFS managed lands.

Nine eligible or unevaluated sites outside of the MHAD and located entirely on National Forest System land may be adversely affected by the Proposed Action. These nine sites may be adversely affected by maintenance to or use of existing roads through the sites, overland travel, and/or transmission line pole placements within the sites.

Contributing loci and sites determined eligible for listing in the NRHP or whose NRHP eligibility is unevaluated are formally designated as "historic properties" and any adverse effects to these resources as a result of a federal undertaking must be mitigated. Note that unevaluated sites are treated as if they are eligible for inclusion on the NRHP. Mitigation is commonly conducted in phases to facilitate treatment of historic properties as well as minimize delays to the project schedule.

Section 106 Process – public lands managed by the BLM

Treatment/mitigation recommendations for all prehistoric and historic resource categories follow:

Mitigation Measure:

Those historic properties determined eligible for inclusion on the NRHP, or are unevaluated, will be avoided or else will be treated with an approved Historic Properties Treatment Plan (HPTP). Contributing elements/eligible sites that are near or adjacent to project activities will be buffered by a minimum 30 (thirty) meter buffer, and project activities will be monitored by a Nevada State Office Certified archaeologist monitor.

Monitoring and Trigger Points

Ormat will hire a BLM Nevada State Office permitted archaeologist as monitor/s for all aspects of construction.

As required by the mitigation, all eligible or unevaluated historic properties will be either avoided and buffered; or treated under the provisions of an approved Historic Properties Treatment Plan (HPTP).

Effectiveness of the Proposed Mitigation

Avoidance with buffering of any and all historic properties is the preferred choice in avoiding potential impacts to such properties. If a historic property can't be avoided, recordation of that historic property using approved protocols is appropriate, but will ultimately result in destruction of the property. Use of an HPTP may include archiving the artifacts from a historic property in an approved BLM/SHPO facility, such as a museum.

Mitigation Impacts

If a historic property can be avoided using a buffer, there will be no impacts to that property. When a site is mitigated according to the provisions of an approved HPTP, very often it is completely excavated. This destroys the site, but the artifacts from the site are curated in a facility that meets federal curation standards. If a historic property is treated through an approved HPTP and the artifacts are archived in a facility such as a museum, the artifacts from the historic property will be preserved. However, the archived artifacts would then be out of context with their historical setting.

Artifacts recovered from sites on federally managed lands will be curated in accordance with 36 CFR 79 at a facility in Nevada that meets federal standards.

If cultural resources, Native American remains, funerary items, sacred items, or objects of cultural patrimony are discovered, the proponent must cease operations in the vicinity of the discovery and ensure adequate protection of the discovery, then notify the BLM immediately, by telephone, with written confirmation to follow (43 CFR 10.4 (c), (d), (g); 43 CFR 7; Nevada State Protocol Agreement VIII(b)). For unanticipated discoveries on BLM-managed lands, notification should be made to the Mount Lewis Field Manager, 50 Bastian Road, Battle Mountain, NV 90820; telephone 775/635-4000. No activity in the vicinity of the discovery should resume until the proponent has been issued a Notice to Proceed (NTP) by the authorized officer. NRS 383.150 through 383.190 applies to Native American burials on private lands. NRS 440.025 applies to human remains found on private lands. In addition, ARPA provides for the assessment of criminal and/or civil penalties for damaging cultural resources.

Section 106 Process – National Forest System Lands

Artifacts recovered from sites on federally managed lands will be curated in accordance with 36 CFR 79 at a facility in Nevada that meets federal standards.

If previously unidentified cultural resources, Native American remains, funerary items, sacred items, or objects of cultural patrimony are discovered, the proponent must cease operations in the vicinity of the discovery and ensure adequate protection of the discovery, then notify the Forest Service immediately, by telephone, with written confirmation to follow (43 CFR 10.4 (c), (d), (g); 43 CFR 7). For unanticipated discoveries on National Forest System land, notification should be made to the Austin District Ranger, P.O. Box 130, Austin, Nevada (775) 964-2671. No activity in the vicinity of the discovery should resume until the proponent has been issued a Notice to Proceed (NTP) by the authorized officer. NRS 383.150 through 383.190 applies to Native American burials on private lands. NRS 440.025 applies to human remains found on private lands. In addition, ARPA provides for the assessment of criminal and/or civil penalties for damaging cultural resources.

Portions of the extreme southern end of the proposed transmission line would be visible from some locations on the Pony Express National Historic Trail. Where visible, the transmission line would be located from ½ to 1 ½ miles away from the trail. Although visible, this portion of the transmission line would be adjacent and parallel to an existing transmission line. The existing NVE Frontier substation is also visible from the trail in this area. Thus, construction of the transmission line would not create a new contrasting visual intrusion into the viewshed from the trail.

3.3.2.2 Alternative 1

Sixteen eligible loci in the MHAD could be impacted by construction of the Alternative 1.

Three eligible sites outside of the MHAD and on National Forest System land along the Alternative 1 transmission line corridor could be impacted by construction of the transmission line. Impacts may occur by maintenance to or use of existing roads through the sites, overland travel, and/or transmission line pole placements within the sites.

Portions of the extreme southern end of the Alternative 1 transmission line would be visible from some locations on the Pony Express National Historic Trail. Where visible, the transmission line would be located from 1 to 1 ½ miles away from the trail. Although visible, portions of the transmission line would be adjacent to an existing transmission line. The switching station that would be constructed as part of Alternative 1 would also be visible from some portions of the Pony Express Trail, contributing to some visual impacts.

The mitigation measures and the section 106 process requirements recommended for the Proposed Action would also be applicable for Alternative 1.

3.3.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. The April 2009 Geothermal Exploration EA calls for complete avoidance of impacts to cultural resources. Therefore, continued exploration under the No Action Alternative would not cause any direct or indirect impacts to cultural resources. See the April 2009 Geothermal Exploration EA for a complete analysis of potential effects to cultural resources.

3.4 NATIVE AMERICAN RELIGIOUS CONCERNS

3.4.1 Affected Environment

Located within the traditional territory of the Western Shoshone Tribes, the BLM Battle Mountain District Office administrative boundary contains spiritual/traditional/cultural resources, sites, and social practices that aid in maintaining and strengthening social, cultural, and spiritual integrity. Recognized tribes with known interests within the BLM Battle Mountain District Office administrative boundary are the Te-Moak Tribe of Western Shoshone (Elko, South Fork, Wells, and Battle Mountain Bands), Duck Valley Sho-Pai Tribes of Idaho and Nevada, Duckwater Shoshone Tribe, Ely Shoshone Tribe, Yomba Shoshone, the Timbisha Shoshone Tribe, and various other Tribal groups, community members, and individuals. The proposed Project Area lies well within the lands traditionally inhabited by Western Shoshone people.

Though archaeological data and theory states that the Western Shoshone (Newe) began to inhabit the Great Basin area around 600 years ago, contemporary Western Shoshone contend they were here since "time immemorial." Social activities that define the culture took place across the Great Basin. Pine nut gathering, edible and medical plant gathering, hunting and fishing, spiritual/ceremonial practices, and trade occurred as the Great Basin peoples practiced a mobile hunting and gathering lifestyle. As with the delicate and sensitive nature of the fragile resources of the Great Basin, the native cultures appeared to be heavily impacted by social, cultural, and environmental change, which rapidly accompanied the non-native migration from east to west. Confined to reservations and "encouraged" to participate in a more sedentary lifestyle (farming and cattle ranching), the Western Shoshone and other Great Basin tribes continued to practice certain cultural/spiritual/traditional activities, visited their sacred sites, and hunted and gathered the available game and medicinal/edible plants. Through oral history, the practice of handing down knowledge from the elders to the younger generations, many Western Shoshone and Paiute continue to maintain a world view not unlike that of their ancestors.

Such sites of importance include, but are not limited to: existing antelope traps; certain mountain tops used for vision questing and prayer; medicinal and edible plant gathering locations;

prehistoric and historic village sites and gravesites; sites associated with creation stories; hot and cold springs; material used for basketry and cradle board making; locations of stone tools such as points and grinding stones (mano and metate); chert and obsidian quarries; hunting sites; sweat lodge locations; locations of consistent pine nut harvesting and ceremonies, traditional gathering, and camping; boulders used for offerings and medicine gathering; tribally identified Traditional Cultural Properties (TCP's); TCP's found eligible to the National Register of Historic Places; rock shelters; "rock art" locations; lands that are near, within, or bordering current reservation boundaries; lands that conflict with tribal land acquisition efforts that involve the Nevada Congressional Delegation, water sources in general, which are considered the "life blood of the Earth and all who dwell upon it."

In accordance with the National Historic Preservation Act (P.L. 89-665), the National Environmental Policy Act (P.L. 91-190), the Federal Land Policy and Management Act (P. L.94-579), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L. 101-601) and Executive Order 13007, the BLM and USFS must also provide affected tribes an opportunity to comment and consult on the proposed Project. BLM and USFS must attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities, and resources.

On August 3, 2010, BLM and USFS initiated coordination/consultation activities with the Fallon Paiute Shoshone Tribe, Battle Mountain Band Council, Duckwater Shoshone Tribe, Yomba Shoshone Tribe, Te-Moak Tribal Council, Elko Band Council, South Fork Band Council, Ely Shoshone Tribe, and Timbisha Shoshone Tribe. Members of the Western Shoshone Defense Project and the Western Shoshone Descendants of Big Smoky have been contacted and been given an opportunity to provide information to the BLM and USFS. Various meetings/field visits have occurred and future opportunities for tribal input and participation have been extended. Coordination/consultation will be ongoing at least until completion of the Project. However, depending on any site-specific mitigation or monitoring agreements or commitments, coordination/consultation opportunities may continue throughout the life of the Project.

Of all the tribal entities contacted, Duckwater and Yomba Shoshone Tribal representatives have been the most active. Meetings and field visits have occurred on the following dates with various tribal entities: September 22, 2008 (exploration site visit); August 13, 2010 (council meeting); November 10, 2010 (site visit); December 22, 2010 (meeting); and January 26, 2011 (site visit). In addition, on June 29, 2011, a Tribal member, representing the Fallon Paiute Shoshone Tribe visited the Battle Mountain Office of the BLM to discuss the Project and its associated EA. Representatives from the BLM and U.S. Forest Service were present at this meeting. The Tribal representative was the Cultural Coordinator for the Fallon Paiute Shoshone Tribe. Additional site visits were conducted on June 13, 2011, with the Duckwater Tribal Monitor and the Yomba Tribal Monitor and on June 15, 2011, with the Fallon Paiute-Shoshone Tribal Monitor. These Tribal Monitors were given site visits to numerous historic properties located on National Forest System lands that could be adversely affected by project activities. All Tribal Monitors were given the opportunity to make comments and express their concerns.

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

Concerns raised, to date, include avoidance of identified cultural resources within the proposed Project Area, potential impacts to water sources (adjacent cold springs complex), opportunities for tribal monitors/observers during construction, cultural resources data recovery, new surface disturbance and also impacts to sage-grouse as the tribes attach great significance to sage-grouse and mimic their courtship and strutting through their dances.

Mitigations have been proposed (see below) that address these concerns and include avoidance, as practical, of all NRHP-eligible and unevaluated cultural resource sites and treatment of all eligible and unevaluated cultural resources sites according to the provisions of an accepted HPTP. In addition, qualified archaeologist monitors would monitor project activities that are near or adjacent to contributing elements, NRHP eligible or unevaluated properties. Sage-grouse mitigations include seasonal restrictions (see Appendix C). Additionally, although the water chemistry data suggests that there is essentially no interaction between the cold water springs in the Unit Area and the thermal fluid in the geothermal reservoir (see Section 3.10), continuing the current program of monitoring a selected number of these cold water springs for flow (water level), chemistry and temperature during Project construction and operation would provide data which would either confirm the absence of any connection between the cold water springs and the geothermal reservoir, or provide documentation of adverse changes and information to develop effective correction measures. Potential corrective measures could include providing produced cold water to replace reduced spring flows, or implementing appropriate geothermal reservoir management techniques to reduce and/or reverse these adverse effects to the cold water springs.

Vehicles, equipment, and personnel used for development purposes can have negative impacts to areas utilized by native peoples and associated artifacts as identified in Section 3.3.1. Long and short term noise and visual impacts can have a detrimental impact to existing cultural/traditional/spiritual activities that may occur in certain areas. Sacred sites such as prayer, sweat lodge, and vision quest sites, along with edible/medicinal plant gathering sites and activities, must remain quiet and undisturbed.

The physical remains of past cultural and subsistence practices and activities (antelope traps, points, flakes, stone tools, grinding stones, etc) are also considered to be extremely important and sacred due to such artifacts having been made by the ancestors and considered the evidence of thousands of years of native inhabitance. Construction activities, and personnel working in close proximity to cultural sites, can destroy artifacts, thus eliminating not only the physical evidence of native occupation, but also archaeological data, which can produce a better understanding of past and present cultures. Archaeological data along with native oral history can reveal information pertaining to past cultural activities and associated social practices, trade routes, subsistence activities, environmental changes, etc.

Also, the act of drilling wells (regardless of the data being sought) is often viewed by traditional practitioners and believers as being harmful to "mother earth" due to impacts to underground and surface waters, which are considered the "life blood of the Earth and all who dwell upon it." Other than consumption by people, wildlife, and plant species, certain hot and cold spring locations are also used for healing and spiritual purposes.

Mitigation Measures

During the Project activities, if any cultural properties, items, or artifacts (stone tools, projectile points, etc.) are encountered, it must be stressed to those involved in the proposed Project activities that such items are not to be collected. Cultural and archaeological resources are protected under the Archaeological Resources Protection Act (16 U.S.C 470ii) and the Federal Land Management Policy Act (43 U.S.C. 1701). The above language is applicable to previously identified artifacts and site locations, surface artifacts possibly missed during the original survey, and any subsurface artifacts (below ground).

Ormat would be required to ensure, through both formal and "tailgate" training sessions that all employees, contractors and subcontractors are made fully aware of the cultural and Native American concerns contained in both the Cultural Resources and these sections. The importance and sensitivities of both of these types of resources and their context to the overall McGinness Hills Historic District would be conveyed to all new employees. Included in these orientations should be a discussion of the potential ramifications of failure to adhere to these strict guidelines to both individual employees, as well as to Ormat and its contractors/subcontractors.

Though the possibility of disturbing Native American gravesites within most Project Areas is extremely low, inadvertent discovery procedures must be noted. Under the Native American Graves Protection and Repatriation Act, section (3)(d)(1), it states that the discovering individual must notify the land manager in writing of such a discovery. If the discovery occurs in connection with an authorized use, the activity, which caused the discovery, is to cease and the materials are to be protected until the land manager can respond to the situation. NRS 383.150 through 383.190 applies to Native American burials on private lands. NRS 440.025 applies to human remains found on private lands.

If any traditional cultural properties or artifacts are identified before or during development activities, a protective "buffer zone" may be acceptable, where physical avoidance is an issue, and if doing so satisfies the needs of the BLM, the proponent, and affected Tribe. The size of any "buffer zone" would be determined through coordination/consultation and communication between all participating entities. Those significant cultural sites that were identified during the cultural resources inventory (pre-historic and historic) would be avoided or treated consistent with the approved Historic Properties Treatment Plan.

Native American consultation will remain ongoing throughout the life of the project.

The opportunity will be given to the interested Tribes to monitor all project construction and excavation activities. All reasonable tribal monitor logistical requests will be considered and addressed.

Monitoring and Trigger Points

Ormat, under the cultural resources mitigation requirements will be required to hire one or more BLM Nevada State Office permitted archaeological monitor/s. Ormat will be required to have a NV State Office permitted archaeologist at all locations where there is ground disturbance in the vicinity of NRHP eligible or unevaluated sites or contributing loci.

Ormat will also be responsible for communicating logistics and project work schedules to the appropriate Tribes and to accommodate any tribal monitoring that the Tribes may request.

As required, identification of any undiscovered Native American grave sites will require immediate stopping of all work in the vicinity of that site/s and notification of the appropriate line officer (USFS or BLM), per the provisions of the NAGPRA.

Inadvertent discovery of a prehistoric or historic property/ies will require the archeological monitor to be notified immediately. The monitor will ascertain whether the property/ies is an evaluated or unevaluated property/ies. If unevaluated, work in the immediate vicinity of the property shall stop and the appropriate line officer will be notified immediately. Work in that area will not recommence until a notice to proceed is given by the appropriate line officer.

Effectiveness of the Proposed Mitigation

Implementation of all aspects of the above requisite monitoring and mitigation will ensure either adequate protection of Native American concerns, protection of prehistoric or historic properties, or adequate treatment, recordation or archiving of such properties.

Mitigation Impacts

Application of the above mitigation measures will: 1) protect both prehistoric and historic cultural properties (both evaluated and unevaluated) by avoidance and use of buffer zones; 2) recordation of pre-historic or historic properties prior to their loss; 3) archiving of prehistoric or historic properties in a BLM/USFS/SHPO approved facility such as a museum. Archiving such resources in a facility will remove such properties from their current context.

Inadvertent discovery of human remains will be dealt with in accordance with State and Federal laws. If any such remains are determined to be related to or of local Tribal origin, those remains may be remanded back to the appropriate Tribe according to NAGPRA regulations.

3.4.2.2 Alternative 1

The potential impacts to Native American Religious Concerns from the construction, operation, maintenance and reclamation of Alternative 1 would be essentially the same as those described for the Proposed Action.

3.4.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. The April 2009 Geothermal Exploration EA calls for complete avoidance of impacts to cultural resources. Therefore, continued exploration under the No Action Alternative would not cause any direct or indirect impacts to cultural properties that are important to Native Americans. See the 2009 Geothermal Exploration EA for a complete analysis of potential effects to Native American Religious Concerns.

3.5 WILDLIFE (INCLUDING SPECIAL STATUS SPECIES- PLANTS AND ANIMALS, AND MIGRATORY BIRDS)

3.5.1 Affected Environment

This section covers wildlife and plant resources present in the Project Area and includes the following: general wildlife resources, which include big game and those species that are relatively abundant and are not classified as special status species; migratory birds; BLM special status species (SSS), which encompasses (1) species that are listed as threatened or endangered or proposed or candidates for listing under the Endangered Species Act of 1973 as amended (60 CFR 17.11 [listed animals], 50 CFR 1712 [listed plants], and subsequent notices published in the Federal Register), and (2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for further listing under the ESA, which are designated as Bureau sensitive by the [Nevada] State Director (BLM IM NV-2003-097, BLM Manual 6840 2008); and USFS Intermountain (R4) Regional Forester Sensitive Species (RFSS; USFS 2011), which encompasses individual species with significant current or predicted downward trends in: (1) population numbers or density, or (2) habitat capability that would reduce a species' existing distribution (USFS 1990).

The area of analysis for all wildlife and plant resources includes all components of the Project (see Figure 4 and Figure 6).

A biological survey of the Project Area was conducted by Great Basin Ecology (GBE) on July 2 and 3, 2010, and sections of the Project were surveyed on November 16, 2010 (GBE 2010).

3.5.1.1 Proposed Action

General Wildlife

The variety of vegetation communities within the Project Area and vicinity provide habitat for a diversity of wildlife species. A number of species have been documented through sightings or sign by the Nevada Department of Wildlife (NDOW), Nevada Natural Heritage Program (NNHP), or GBE (see Table 8). A number of these species are listed as special status or sensitive by the BLM and/or USFS and will be further covered under the Special Status or Sensitive – Wildlife Section below.

Table 8: Wildlife Species with Recorded Occurrence at the McGinness Hills Project Area

Mammals			
Scientific Name	*Common Name*	*Scientific Name*	*Common Name*
Antilocapra americana	Pronghorn[2,4]	***Myotis ciliolabrum***	**Western small-footed myotis[2]**
Brachylagus idahoensis	**Pygmy rabbit[1,2,4]**	*Neotamias dorsalis*	Cliff chipmunk[2]
Canis latrans	Coyote[3,4]	*Neotoma cinerea*	Desert packrat or Bushy-tailed woodrat[2,4]
Corynorhinus townsendii	**Townsend's big-eared bat[2]**	*Odocoileus hemionus*	Mule deer[2,3,4]
Eutamias minimus	Least chipmunk[3]	*Peromyscus truei*	Pinon deermouse[2]
Lemmiscus curtatus	Sagebrush vole[4]	*Puma concolor*	Mountain lion[2]
Lepus californicus	Black-tailed jackrabbit[3,4]	*Spermophilus sp.*	Ground squirrel[2,3]
Lynx rufus	Bobcat[2,4]	*Sylvilagus Nuttallii*	Mountain cottontail[3,4]
Marmota flaviventris	Yellow-bellied marmot[3]	*Vulpes macrotis*	Kit fox[2]
Mustela sp.	Weasel[2,4]		
Birds			
Scientific Name	*Common Name*	*Scientific Name*	*Common Name*
Accipiter cooperii	Cooper's hawk[1, 2]	*Colaptes auratus*	Northern flicker[3]
Accipiter gentilis	**Northern goshawk[1, 2]**	*Corvus corax*	Common raven[3]
Accipiter striatus	Sharp-shinned hawk[1]	*Dendragapus obscurus*	Blue grouse[2]
Alectoris chukar	Chukar[2,3]	*Dendroica coronata*	Yellow-rumped warbler[2]
Amphispiza belli	Sage sparrow[3]	*Ermophila alpestris*	Horned lark[3]
Amphispiza bileneata	Black-throated sparrow[3]	*Falco columbarius*	Merlin[1, 2]
Anas acuta	Northern pintail[2]	***Falco mexicanus***	**Prairie falcon[1, 2,3]**

Anas platyrhynchos	Mallard[2]	*Falco sparverius*	American kestrel[1,2]
Anthus rubescens	American pipit[2,3]	***Haliaeetus leucocephalus***	**Bald eagle[2]**
Aphelocoma californica	Western scrub-jay[2]	***Lanius ludovicianus***	**Loggerhead shrike[3]**
Aquila chrysaetos	**Golden eagle[1,2,3]**	*Oporornis tolmiei*	MacGillivray's warbler[2]
Athene cunicularia	**Western burrowing owl[3]**	*Oreoscoptes montanus*	Sage thrasher[3]
Bubo virginianus	Great horned owl[1, 2,3]	*Pipilo maculatus*	Spotted towhee[2,3]
Buteo jamaicensis	Red-tailed hawk[1, 2,3]	*Salpinctes obsoletus*	Rock wren[3]
Buteo lagopus	Rough-legged hawk[1, 2]	*Sphyrapicus ruber*	Red-breasted sapsucker[2]
Buteo regalis	**Ferruginous hawk[1, 2]**	*Spizella breweri*	Brewer's sparrow[3]
Buteo swainsoni	**Swainson's hawk[1, 2]**	*Sturnella neglecta*	Western meadowlark[3]
Callipepla californica	California quail[2]	*Tachycineta thalassina*	Violet-green swallow[2]
Carpodacus mexicanus	House finch[3]	*Troglodytes aedon*	House wren[2]
Cathartes aura	Turkey vulture[3]	*Turdus migratorius*	American robin[2]
Centrocercus urophasianus	**Greater sage-grouse[1,2,3,4]**	*Vermivora celata*	Orange-crowned warbler[2]
Chondestes grammacus	Lark sparrow[3]	*Vireo gilvus*	Warbling vireo[2]
Chordeiles minor	Common nighthawk[3]	*Vireo solitarius*	Solitary vireo[2]
Circus cyaneus	Northern harrier[1, 2,3]	*Zenaida macroura*	Mourning dove[3]
Amphibians and Reptiles			
Scientific Name	*Common Name*	*Scientific Name*	*Common Name*
Bufo boreas	Western toad[2]	*Phrynosoma platyrhinos*	Desert horned lizard[2,3]
Callisaurus draconoides	Zebra-tailed lizard[2]	*Pituophis catenifer deserticola*	Great Basin gophersnake[2]
Charina bottae	Northern rubber boa[2]	*Pituophis melanoleucus*	Gopher snake[2]
Gambelia wislizenii	Long-nosed leopard lizard[2,3]	*Sceloporus graciosus*	Sagebrush lizard[3]
Phrynosoma hernandesi	Greater short-horned lizard[2]	*Sceloporus occidentalis*	Western fence lizard[2,3]
Phrynosoma platyrhinos	Desert horned lizard[2]	*Thamnophis elegans*	Western garter snake[3]

Source: Nevada Department of Wildlife Sighting Data[1], Nevada Natural Heritage Program Sighting Data[2], Great Basin Ecology Survey Sighting[3] (2010), Great Basin Ecology Observed Sign[4] (2010); ***Bolded species are SSS***

Based on the habitat present in and around the Project Area (see Table 12), the vegetation that occurs provides food, water, and cover for many small mammals (e.g., jackrabbits, squirrels, woodrats, and rodent species), mesocarnivores (e.g., kit foxes, coyotes, and bobcats), avian species, and big game.

Pronghorn utilize a variety of habitats, including the cold desert shrublands and Great Basin sagebrush and grassland habitat types (Tsukamoto 1983). The McGinnis Hills provide year-round habitat for pronghorn with concentrations being found in early spring, late summer, and early fall. As many as 30 pronghorn have been documented during post-season pronghorn surveys in the McGinnis Hills (J. Lutz, NDOW, personal communication, March 28, 2011).

Mule deer occupy many types of habitats in mountains and lowlands, including various forests and woodlands, forest edges, shrublands, grasslands with shrubs, and residential areas. In winter, mule deer tend to be on warmer slopes or other areas with minimal snow cover (Natureserve 2010a). The mountain big sagebrush, pinyon-juniper, Wyoming big sagebrush, and the dwarf sagebrush communities are the primary habitats in the Project Area for this species. The riparian areas and meadows are also important to mule deer. NDOW has designated the Project Area to be included in winter use for mule deer, but concentrations are low in the area (J. Lutz, NDOW, personal communication, March 28, 2011).

Special Status Species – Plants

Sixteen USFS sensitive plant species were identified to occur in the Austin-Tonopah Ranger District, and eight BLM sensitive plant species were identified to occur in Lander County (U.S. Department of Agriculture Online Plant Database). Most of these were eliminated from further consideration based on known habitat criteria and the lack of those criteria in the survey area (GBE 2010) and scoping information provided by USFWS (2010a) and NNHP (2010). The three SSS and/or RFSS plant species with the potential to occur in the survey area are identified and described below (see Table 9). Although none of the three species was observed during surveys of the Project Area, the surveys cannot be considered conclusive because of their timing and their incomplete coverage of suitable habitat within the Project Area.

Table 9: BLM Special Status or USFS Sensitive Plant Species with Potential Vegetation Habitat to Occur in the Project Area

Scientific Name	Plant Name	Listing Agency	Elevation (ft. amsl)	Vegetation Community	Habitat
Asclepias eastwoodiana	Eastwood milkweed	BLM USFS	4,680 to 7,080	Mixed desert shrub, sagebrush, and pinyon-juniper	In open areas on a wide variety of basic soils, generally barren and lacking competition, frequently in small washes or other moisture-accumulating microsites. Associated species are shadscale saltbush (*Atriplex confertifolia*), greasewood (*Sarcobatus vermiculatus*), littleleaf horsebrush (*Tetradymia glabrata*), bud sagebrush (*Picrothamnus desertorum*), and green molly (*Bassia americana*). The blooming period for Eastwood milkweed is from May through June. Known from the Ely and Austin/Tonopah RDs (all ranges).
Astragalus toquimanus	Toquima milkvetch	BLM USFS	6,200 to 7,500	Pinon-juniper, sagebrush	Gravelly hillsides with gentle slopes in basic or calcareous soils. Associated plants include shadscale saltbush, spiny hopsage (*Grayia spinosa*), and naked milkvetch (*Astragalus serenoi* var. *sordescens*). Known from Tonopah RDs (only from S. Toquima and S. Monitor). Flowers between May and June.
Eriogonum esmeraldense var. *toiyabense*	Toiyabe buckwheat	USFS	7,200 to 9,200	Pinon-juniper, mountain sagebrush, mountain mahogany, and subalpine conifer	Found on generally steep, loose, sandy to gravelly or clay slopes derived from rhyolitic or andesitic volcanic materials, frequently on white ash deposits. Known from Austin/Tonopah RD (all ranges). Flowers late-spring to summer with the range of most frequent survey months from June and July (annual).

Suitable habitat is present for Eastwood milkweed in the Project Area. The nearest known location for this plant is approximately 13 miles west of the Project Area (BMDO 2010). This plant may occur in suitable habitat within the Project Area.

Suitable habitat is present for Toquima milkvetch in the Project Area. The nearest known location for this plant is approximately 65 miles south of the Project Area (BMDO 2010). This plant may occur in suitable habitat within the Project Area.

Although suitable vegetation is present for Toiyabe buckwheat in the Project Area, the specific soils/ash deposits where this species is found do not occur. The nearest known location for this plant is approximately 20 miles southwest of the Project Area (BMDO 2010). This species is not expected to occur within the Project Area.

Special Status Species – Wildlife

Seven wildlife species listed as sensitive or candidate species were identified by the USFS Austin-Tonopah Ranger District with potential to occur in and around the Project Area (GBE 2010). Eighteen wildlife species listed as BLM special status species were identified by the MLFO with potential or known occurrences in and around the Project Area (see Table 10).

Table 10: Special Status or Sensitive Species with Potential or Known Occurrence in the Project Area

Mammals					
Scientific Name	*Common Name*	*Agency Listing*	*Scientific Name*	*Common Name*	*Agency Listing*
Brachylagus idahoensis	Pygmy rabbit	BLM USFS	*Myotis ciliolabrum*	Western small-footed myotis	BLM
Corynorhinus townsendii	Townsend's big-eared bat	BLM USFS	*Ovis canadensis nelsoni*	Desert bighorn sheep	BLM USFS
Euderma maculatum	Spotted bat	BLM USFS			
Birds					
Scientific Name	*Common Name*	*Agency Listing*	*Scientific Name*	*Common Name*	*Agency Listing*
Accipiter gentilis	Northern goshawk	BLM USFS	*Centrocercus urophasianus*	Greater sage-grouse	BLM USFS
Aquila chrysaetos	Golden eagle	BLM	*Falco mexicanus*	Prairie falcon	BLM
Asio flammeus	Short-eared owl	BLM	*Gymnorhinus cyanocephalus*	Pinyon jay	BLM
Asio otus	Long-eared owl	BLM	*Haliaeetus leucocephalus*	Bald eagle	BLM USFS
Baeolophus griseus	Juniper titmouse	BLM	*Lanius ludovicianus*	Loggerhead shrike	BLM
Buteo regalis	Ferruginous	BLM	*Pooecetes*	Vesper	BLM

	hawk		*gramineus*	sparrow	
Buteo swainsoni	Swainson's hawk	BLM	*Athene cunicularia*	Western burrowing owl	BLM

Pygmy Rabbit

Pygmy rabbits are typically found in islands of tall, dense sagebrush (*Artemisia* spp.) cover and are highly dependent on sagebrush to provide both food and shelter throughout the year (Himes and Drohan 2007, Larrucea and Brussard 2008). Their diet in the winter consists of up to 99 percent sagebrush (Green and Flinders 1980). The pygmy rabbit is believed to be one of only two Leporids in Northern America that digs its own burrows. Pygmy rabbit burrows are typically found in friable, loamy-type soils, and some preference for sites closer to perennial streams with deeper soils has been documented (Himes and Drohan 2007, Larrucea and Brussard 2008). They occasionally make use of burrows abandoned by other species and as a result, may occur in areas of shallower or more compact soils that support sufficient shrub cover (USFWS 2010b).

Generally, the survey area for the Project consists of sites with shallow soils or woodlands, or lacks the tall sagebrush islands suitable for pygmy rabbits (GBE 2010). Occupied and suitable pygmy rabbit habitat was found in isolated areas during surveys for the McGinness Hills Geothermal Exploration Project at T. 20 N., R. 45 E., Section 24, near the head of Rye Patch Canyon Creek and along the creek floodplain in Section 13 (GBE 2008). These areas are more than 2 miles from Project disturbance and thus will not be affected by the Project development. Occupied and suitable habitat was also found in the Burton Creek drainage of T. 20 N., R. 45 E., Section 31 (GBE 2010). This area is approximately 1 mile west of the proposed transmission corridor and therefore would not be affected by the Proposed Action. Habitat throughout the rest of the Project lacks either a soil component needed for burrows to exist and/or suitable vegetation (GBE 2010).

Townsend's Big-eared Bat, Spotted Bat, and Western Small-footed Bat

The western small-footed bat, spotted bat, and Townsend's big-eared bat are all likely to be present in the area. Each of these species is known to forage over one or more of the habitat types present in the Project Area. The small-footed bat and the spotted bat both roost in rock crevices that can be found in the small rock outcrops in the Project Area. Townsend's big-eared bat roosts primarily in caves and cave analogs (e.g. historic mine workings). None of this type of roosting habitat was observed during the survey (GBE 2010). Occurrence records exist for the western small-footed bat and Townsend's big-eared bat approximately 8 miles west of the transmission corridor (BMDO 2010). Only those individual bats utilizing the Project Area for foraging would be affected by project development.

Desert Bighorn Sheep

Bighorn sheep inhabit alpine meadows, grassy mountain slopes and foothill country near rugged, rocky cliffs and bluffs, allowing for quick escape. In winter, Bighorn sheep prefer slopes at

elevations of 2,500 to 5,000 feet where annual snowfall is less than 60 inches a year because they cannot paw through deep snow to feed. Their summer range is between 6,000 and 8,500 feet in elevation.

Bighorn sheep are found in the mountains west of the geothermal plant area and use some of the foothill areas as winter range as well as the area south of the Lake Ranch. No sign of this species was observed in the survey areas for the Project (GBE 2010), and no occurrence records of bighorn sheep are known in or around the proposed Project Area (BMDO 2010). The Project Area occurs in NDOW-designated bighorn sheep habitat, but bighorn sheep have not been observed and are not expected in the Project Area or vicinity (J. Lutz, NDOW, personal communication, 2011).

Northern Goshawk

The northern goshawk is widely distributed throughout North America and Eurasia. It is an uncommon permanent resident of the Great Basin montane forests requiring extensive mixed woodlands and large trees for nesting. The Northern goshawk is a year-round resident of Nevada and may be observed in mountainous terrain up to 9,000 feet during the warmer months and in lower foothills and valley habitats during winter. Goshawks are generalists in their prey selection (Squires and Reynolds 1997); over 50 prey species, including mammals, birds, and insects, are known to be taken by goshawks (GBE 2010). Foraging typically occurs in dense forests and more rarely in open habitat and along ecotones (Squires and Reynolds 1997).

The typical northern goshawk nest site in Nevada is located in aspen stringers near small perennial streams (normally within 100 yards) at approximately 7,400-7,800 feet in elevation. Aspen is the most commonly used nesting tree in Nevada. Nests are large, 30 inches or greater comprised of one and one-half inch diameter sticks. Pinyon and juniper trees are occasionally used for nest sites. Numerous nests (alternate nest sites) may be present within the territory (GBE 2010).

Based on the presence of pinyon-juniper along portions of the transmission line, this vegetation type could be considered habitat for northern goshawk. No active goshawk nests were located within the Project Area during field surveys (GBE 2010). Five recorded nest records exist within 10 miles of the Project, the nearest of which is greater than 4 miles from the nearest surface disturbance (NDOW 2011b). Therefore, foraging and nesting habitat may be affected, but no affect to known nest sites is expected.

Golden Eagle

Golden eagle habitat is generally open country, in prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions (Kochert et al. 2002). Golden eagles nest on rock ledges, cliffs or large trees. Pairs may have several alternate nests, and may use some in consecutive years or shift to alternate nests used in different years (Natureserve 2010b). Golden eagles use a wide range of habitats for foraging. Golden eagle sightings have been documented within and surrounding the Project Area (BMDO 2010, S.

Cooper personal observation). The salt desert shrub, sagebrush, and meadow habitats in the Project Area are all suitable foraging habitats for golden eagles.

Nesting habitat generally consists of rock ledges on large rock outcrops or cliffs. This type of habitat does not occur in the disturbance area of the Project and few potential nesting sites are present in the surrounding area (GBE 2010). No documented golden eagle nests are known to exist within a 10-mile buffer of the Project Area (NDOW 2011b). GIS analysis, using slope, viewshed, and Gap Analysis Program, of the surrounding habitat identified very isolated pockets of potential nesting habitat, the nearest of which is greater than 2 miles from any proposed disturbance (GBE 2010). Based on this, while golden eagles frequent the area for foraging, the Project Area appears to lack suitable nesting habitat. Therefore, golden eagle foraging habitat is likely to be affected, but nesting habitat will not be.

Short-eared Owl

Short-eared owls tend to be found in open habitats, including grasslands, prairies, wet meadows, and lowland riparian areas, where small mammals and other prey species may be hunted (Wiggins et al. 2006, Floyd et al. 2007). Short-eared owl nest sites are located on the ground typically on dry knolls, ridges, or hummocks but occasionally in wet areas (Wiggins et al. 2006).

No nest locations are known in the vicinity of the Project, but sightings have been made during site visits (S. Cooper, personal observation, April 2011). Due to the seasonality of the sightings, potential nesting and foraging habitat may occur in proximity to the Project.

Long-eared Owl

Long-eared owl habitat includes deciduous and evergreen forests, orchards, wooded parks, farm woodlots, river woods, desert oases and is typified by open shrubland and sparsely forested habitat (Marks et al. 1994). Wooded areas with dense vegetation are needed for roosting. Nest sites vary throughout their range, including thick, brushy riparian areas, willows, junipers, in old nests of crows, squirrels, hawks, magpies, or herons, sometimes in tree cavities, and rarely on the ground (Marks et al. 1994, Natureserve 2010c).

The pinyon-juniper woodlands and riparian areas in and surrounding the Project represent potential habitat for long-eared owls. One documented observation exists in the general area of the Project more than 5 miles from the edge of any proposed disturbance (BMDO 2010). Use of the Project Area by long-eared owls has been rare. Therefore, long-eared owls are not expected to be affected by Project development.

Western Burrowing Owl

Western burrowing owls inhabit open terrain and typically create a nest by occupying an abandoned burrow created by other animals such as a badger (Taxidea taxus). They are also found in roadside berms (Stamm 2006). The project area contains potential nesting and foraging habitat, and during the baseline surveys this species was observed.

Juniper Titmouse

Juniper titmice are associated with pinyon-juniper woodlands in Nevada (Cicero 2000). Nest sites include natural tree holes, woodpecker-excavated cavities, and artificial sites, such as nest boxes and fence posts (Cicero 2000). Suitable habitat occurs in the Project Area along segments of the transmission corridor that run through pinyon-juniper woodlands. One documented observation exists in the general area of the Project more than 5 miles from the edge of any proposed disturbance (BMDO 2010). Therefore, both nesting and foraging habitat for juniper titmice occur along the proposed transmission corridor.

Ferruginous Hawk

Ferruginous hawks are typically found in open habitats, such as grasslands, sagebrush, salt desert shrub, and deserts, and are dependent on these habitats for foraging (Bechard and Schmutz 1995). In Nevada, this species generally nests in isolated juniper or pinyon pine trees that are near the wooded-shrubland interface or along a stringer of trees. When trees are not available, this species may occasionally nest on the ground (Bechard and Schmutz 1995).

Although no ferruginous hawks or nest sites were observed during baseline surveys (GBE 2010), the entire Project Area and vicinity provides suitable for foraging habitat and potential nest sites. Three documented ferruginous hawk nests are known to exist within a 10-mile buffer of the Project (NDOW 2011b). One nest area is approximately 2 miles from the nearest proposed disturbance; its current condition and status are unknown. The other two nests are within one mile of each other and less than one mile from the proposed transmission corridor and the Alternative 1 transmission corridor; their current condition and status are unknown. Therefore, the Project may affect both foraging habitat and nesting habitat for ferruginous hawks.

Swainson's Hawk

Swainson's hawks are typically found in habitats consisting of grass-dominated vegetation, open shrublands, and small, open woodlands and have also adapted to agricultural and developed fields (Bechard et al. 2010). Primary prey species include small mammals, birds, reptiles, and invertebrates (Bechard et al. 2010). Suitable foraging habitat and prey species occur in the Project Area.

Swainson's hawk nests are typically found in a solitary tree or bush along a riparian corridor and may occasionally be found on a manmade structure, such as a power pole (Bechard et al. 2010). Preference for sites near agricultural or developed fields has been documented (Bechard et al. 2010). Suitable nesting habitat is not found in the Project Area, but one documented nest location is known approximately 6.5 miles south of the transmission corridor, near private land with developed fields. Therefore, foraging habitat may be affected by the Project development, but nesting habitat is not expected to be affected.

Greater Sage-Grouse

The Geothermal Unit Area is located in the greater sage-grouse Toiyabe Population Management Unit (PMU; 1,127,000 acres) as designated by the South Central Planning Team (South Central Planning Team 2004). The NDOW has designated all of the habitat in the Toiyabe PMU as sage-grouse summer range, the majority (972,000 acres) of the habitat as sage-grouse winter range, portions (420,000) as nesting habitat, and portions (222,750 acres) as core-breeding habitat (NDOW 2011c, BLM 2010; Doherty et al. 2010; see also Figure 14 as denoted in light blue). The entire Unit Area, production plants, injection and production pipelines, and transmission line occur in NDOW-designated sage-grouse summer and winter range (NDOW 2011e and 2011f). The majority of the Unit Area, production plants, injection and production pipelines, and 3.0 miles of the proposed transmission line occur in sage-grouse core-breeding habitat (see Figure 14).

Sage-grouse are sagebrush obligates; they require sagebrush for different life cycle and foraging needs throughout the year (Schroeder et al. 1999). Both the big sagebrush species and dwarf sagebrush types (e.g., low sagebrush [*Artemesia arbuscula*], black sagebrush [*Artemesia nova*]) provide seasonal habitat requirements. Winter habitat use varies depending on snow depth but includes habitats with both big sagebrush and dwarf sagebrush species (Crawford et al. 2004), and is primarily used November through February. Lekking typically occurs in areas with sparse vegetation that are surrounded by the taller sagebrush with greater canopy cover and density of grasses and forbs needed for suitable nesting (Connelly et al. 2000, Crawford et al. 2004). Brood-rearing habitat (i.e., sagebrush, riparian, and wet meadow habitats) is variable as chicks grow but consists of those habitats that provide forage in the form of forbs, invertebrates, and sagebrush (Crawford et al. 2004). Sage-grouse fall habitat use includes sagebrush habitat in the transition zone between brood-rearing and winter habitat but may overlap with brood-rearing and winter habitats.

Photo 3: Typical Sagebrush Community at the McGinness Hills Geothermal Unit Area

Suitable habitat exists throughout and around the Project Area for all seasonal uses (i.e. winter, lek/breeding/nesting, brood rearing, and fall) by sage-grouse. Sage-grouse have been documented in the Project Area throughout the year through field surveys (GBE 2010), observational records (BMDO 2010), and telemetry data collection (NDOW 2011; see Figure 14).

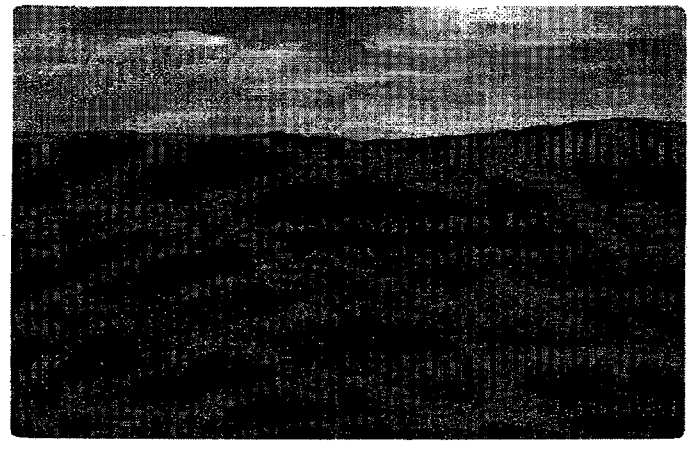


Photo 4: Low Sagebrush Site Typical of Lek Habitat

To account for habitat fragmentation and indirect effects from Project activities and disturbance, a 2-mile buffer was placed around components of the Project. For this analysis, active leks also had a 2-mile buffer place around them (Connelley et al 2000). If the lek or lek buffer intersected the 2-mile Project buffer and that lek was less than 3 miles from the project, then that lek and its associated habitat (2-mile buffer) was included in the acres for analysis. The total acreage for the project/lek buffer equates to approximately 51,800 acres. The entire Project occurs within the NDOW-designated winter and summer habitat. Thus, 5% of the NDOW-designated winter

habitat and 5% of NDOW-designated summer habitat for sage-grouse in the Toiyabe PMU occurs within 2 miles of the Project. A similar percentage of fall habitat also occurs in the Project buffer. Sage-grouse telemetry data document sage-grouse use of habitat near portions of the Project facilities during the lekking/nesting, brood-rearing, and winter seasons (see Figure 14; NDOW 2011d, 2011e and 2011f). No fall use of the Project vicinity has been documented by the telemetry data (see Figure 14; NDOW 2011). The extent of connectivity and movement corridors between sage-grouse metapopulations of the Toiyabe PMU has not been studied and is unknown.

Active (or occupied) leks are those traditional display areas attended by ≥2 male sage-grouse in ≥2 of the previous five years (Connelly et al. 2000). Four active leks are known to occur within 2 miles of the Project Area, which accounts for 12% of the known active leks (n=33) in the Toiyabe PMU (see Figure 14). During 2011 lek surveys, strutting males were located at all four of these leks. In addition, strutting males were located at three other locations within the 2-mile buffer. Status for these leks is currently considered unknown until surveys are completed in additional years to designate the lek as active or inactive. Although no surface disturbance or direct impacts are proposed at any known active lek locations, indirect impacts may affect these leks (see Section 3.5.2).

Sage-grouse nesting habitat occurs in and around the Project Area in suitable sagebrush stands. In this analysis, sage-grouse core-breeding habitat will be used for further evaluation of impacts to sage-grouse nesting habitat. Core-breeding habitat has been identified based on high-density breeding areas and habitat suitability (Doherty et al. 2010). Within the 2-mile Project buffer, approximately 22,467 acres of sage-grouse core-breeding habitat occurs and may be affected by Project development (see Figure 14 as denoted in light blue). This accounts for 10% of the core-breeding habitat in the Toiyabe PMU.

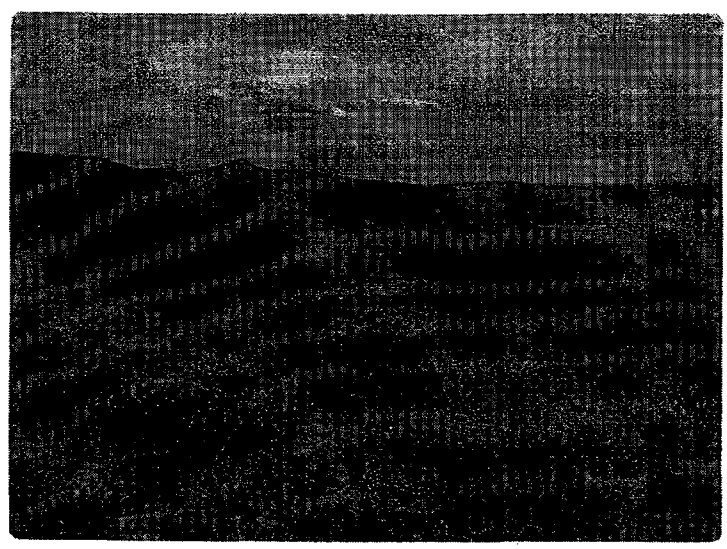


Photo 5: Typical Sage-Grouse Nesting Habitat at McGinness Hills

Brood-rearing is expected throughout the sagebrush habitat and is likely concentrated on seeps, springs, wet meadow, and riparian areas in the Project Area. No surface-disturbing activities

have been proposed directly on seeps, springs, wet meadow, or riparian areas, but several of these areas exist in either close proximity to the development or within the 2-mile Project buffer (see Figure 19). Therefore, these areas with expected concentrated brood-rearing habitat may be affected to various degrees based on proximity to Project development (see Section 3.5.2).

The section of transmission line for the Proposed Action that traverses National Forest lands includes approximately two miles of pinyon-juniper woodland mixed with sagebrush. The NDOW included this as summer and winter distribution areas, but sage-grouse use of woodlands is unlikely. For the purposes of this analysis therefore, the segment of the transmission line running through woodland habitat is not considered sage-grouse habitat.

Prairie Falcon

Prairie falcon habitat is characterized by cliffs and canyons surrounded by open sagebrush, salt desert shrub, plains, and deserts (Steenhof 1998). This species generally nests on ledges in cliffs and escarpments (Steenhof 1998).

Suitable nesting habitat does not occur in the disturbance area of the Project and very few potential nesting sites are present in the surrounding area (GBE 2010). One documented nest is greater than 4 miles from any proposed disturbance. The Project Area and surrounding habitat is suitable for foraging although very few prairie falcon sightings have been documented (BMDO 2010, NDOW 2011a). Because of their low occurrence in and around the Project, a negligible effect to those individual birds using the Project Area and vicinity is expected.

Pinyon Jay

Pinyon jays are gregarious, flocking birds typically found in and around the edges of pinyon-juniper woodlands but may also be found in sagebrush and other scrub or conifer species (Balda 2002). Pinyon jays are highly dependent on pine seeds for foraging and develop large seed caches to store excess seeds (Balda 2002). Arthropods, reptiles, and small mammals are potential prey species for pinyon jays (Balda 2002). Nest sites are typically in the upper portions of pinyon or juniper trees and consist of an open cup built of grass and twigs (Balda 2002).

Suitable foraging and nesting habitat exist in and around the Project Area, especially along the transmission corridor.

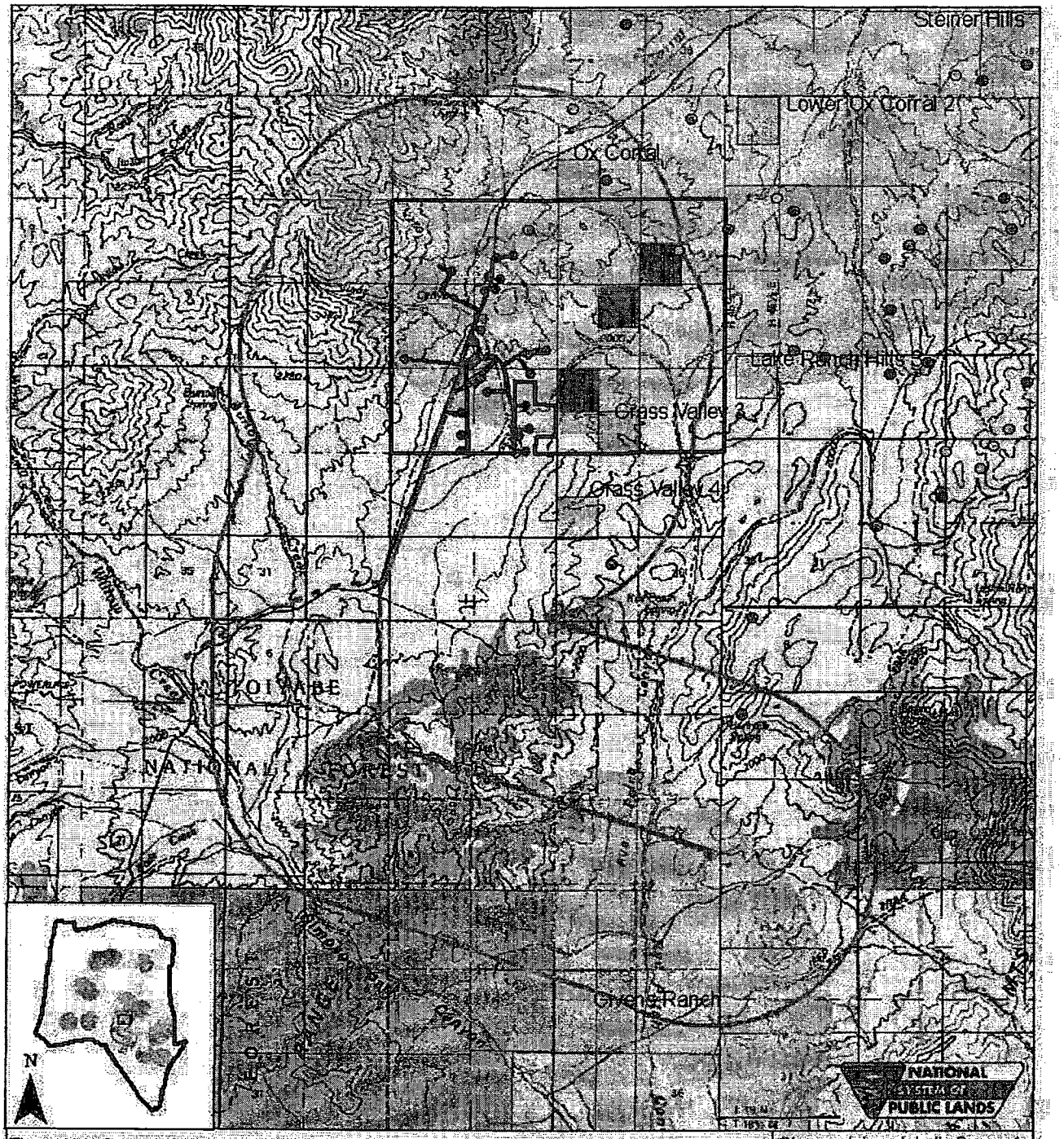


Figure 14: Greater Sage-Grouse Seasonal Habitat Use from Telemetry Data (NDOW 2008) and Core-Breeding Habitat (BLM 2010).

Seasonal Locations

- Winter
- Fall
- Lekking, Nesting
- Brood-Rearing
- Area with Active Sage-Grouse Lek
- Area with Unknown Sage-Grouse Lek
- Monitoring Well
- Injection Pipeline and Wells
- Production Pipeline and Wells
- Proposed Access Roads
- 2-Mile Proposed Project Buffer
- Power Plants
- Proposed Power Line
- Alternative Power Line
- Geothermal Unit Area
- Toiyabe Sage-Grouse PMU

1:94,475

0 0.4 0.8 1.6 2.4 3.2 Miles

*No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual use or aggregate use with other data.

The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection. Map date: 03/25/2011

United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820

Bald Eagle

During the breeding season, bald eagles are closely associated with water occurring along coasts, lake shores, or riverbanks, where they feed primarily on fish. Bald eagles typically nest in large trees, primarily cottonwoods (*Populus* sp.) and conifers, although they have also been known to nest on prominent rock outcrops and cliff ledges (Buehler 2000). Due to the large size of their nests, bald eagles usually build these structures in a tree which is the largest or stoutest in the immediate vicinity. Breeding territories, including the nest tree and favored nearby perches, are defended against other eagles. Alternate nests are also common within the territory. Breeding territories are typically 250 to 500 acres in size (Buehler 2000).

During winter, bald eagles concentrate where food is available, typically in areas with open water, where fish and waterfowl can be caught (Buehler 2000). Bald eagles can live away from water and in the absence of fish. In such cases, they feed on carrion or hunt land prey. Black-tailed jackrabbits taken as carrion can be quite important in these situations (GBE 2010).

Communal winter roosts are common and located in forested stands that provide protection from the weather. Winter roosting sites are not necessarily in the immediate vicinity of foraging areas. Stalmaster and Gessaman (1984) found bald eagles expended less energy by flying one to two miles to roost in upland conifers than they would by roosting along exposed river habitats where they foraged by day. Keister and Anthony (1983) note that where bald eagles winter in basins, the birds may travel considerable distances between roosting and feeding areas. The drainages and open water areas are generally at lower elevations within the drainage and act as cold air sinks. Therefore, roosting away from the water may provide a warmer roosting site (GBE 2010).

No large open bodies of water occur in or near the Project Area, but there is potential upland winter habitat. The nearest documented sighting occurred 10 miles from the Project Area (BMDO 2010), but there are no known concentrations or nesting pairs of bald eagles in or near the Project Area. Because bald eagles rarely occur in and around the Project Area, a negligible effect to those individual birds using the Project Area and vicinity is expected.

Loggerhead Shrike

Loggerhead shrikes' habitat use throughout the year is associated with open habitats, especially areas that have been developed by humans, such as agricultural fields, mowed roadsides, and pastures (Yosef 1996). Loggerhead shrikes are often found perching on fence lines, transmission lines, and power poles, and they use these vantage points for scouting prey species, such as arthropods, reptiles, and birds (Yosef 1996). Nest sites are variable but may include trees, shrubs, and brush, including sagebrush (Yosef 1996). Therefore, foraging and nesting habitat in and around the Project Area may be affected.

Vesper Sparrow

Vesper sparrows are considered habitat generalists and are known to forage and nest in open habitats, including sagebrush, grasslands, shrublands, agricultural fields, and pastures (Jones and Cornely 2002). Vesper sparrows have been record during bird counts in the habitat surrounding the Project (BMDO 2010). Therefore, the sagebrush habitat in the Project Area provides foraging and nesting opportunities for vesper sparrows and may be affected by Project development.

Migratory Birds

Migratory birds may be found in the Project Area as seasonal residents or as migrants. Provisions of the Migratory Bird Treaty Act (MBTA; 16 USC 701-718h) prohibit the "take" of migratory birds, their feathers, or nests. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof, without a permit. Executive Order 13186, titled "Responsibilities of Federal Agencies to Protect Migratory Birds," was signed on October 1, 2001 to further enhance and ensure the protection of migratory birds.

Nongame migratory bird species utilize the various habitats present in the Project Area throughout the year to meet seasonal life requirements. The habitat in and around the Project provides foraging and nesting habitat for migratory birds. The suite of birds dependent on sagebrush to meet their life requirements will be the group most highly affected. Migratory birds utilizing habitat near the Project area are expected to be directly and indirectly affected through surface disturbance and Project activities during Project construction and maintenance. Details on special status and sensitive species are covered under the Special Status or Sensitive – Wildlife Section.

3.5.1.2 Alternative 1

General Wildlife

General wildlife species in the Alternative Area are the same as in the Proposed Area. Affected habitat is slightly smaller because the acres disturbed with the Alternative (214.8) are fewer than the Proposed Action (217.2). The primary difference in affected environment between Alternative 1 and the Proposed Action is less pinyon-juniper habitat would be affected by Alternative 1 (approximately 0 miles) than the Proposed Action (approximately 2.3 miles). The transmission line would run through similar amounts of sagebrush habitat with Alternative 1 and the Proposed action (approximately 7 miles).

Special Status and Sensitive Species - Plants

Special status and sensitive plant species are the same in the Alternative Area as in the Proposed Area.

Suitable habitat is present for Eastwood milkweed along isolated areas of the southeast end of transmission line alternative 1.

Suitable habitat is present for Toquima milkvetch in the Alternative Area. The nearest known location for this plant is approximately 65 miles south of the Project (BMDO 2010). This plant may occur in suitable habitat within the Alternative Area.

Although suitable vegetation is present for Toiyabe buckwheat in the Alternative Area, the specific soils/ash deposits where this species is found do not occur. The nearest known location for this plant is approximately 20 miles southwest of the Project Area (BMDO 2010). This species is not expected to occur within the Alternative Area.

Special Status and Sensitive Species – Wildlife

Special status and sensitive wildlife species are the same in the Alternative Area as in the Proposed Area.

The affected environment for the following species is expected to be similar for Alternative 1 and the Proposed Area: Townsend's big-eared bat, spotted bat, western small-footed bat, desert bighorn sheep, golden eagle, short-eared owl, long-eared owl, ferruginous hawk, Swainson's hawk, prairie falcon, bald eagle, loggerhead shrike, and vesper sparrow.

Because pinyon-juniper habitat would not be affected if Alternative 1 is selected, impacts to nesting habitat for the following species would be negligible: northern goshawk, juniper titmouse, and pinyon jay. Foraging habitat for northern goshawk may still be affected.

Pygmy Rabbit

Occupied and suitable habitat for pygmy rabbits was found in the Burton Creek drainage of T. 20 N., R. 45 E., Section 31 (GBE 2010). The Alternative 1 transmission line crosses through this area. Therefore, pygmy rabbits and suitable habitat would be impacted by Alternative 1.

Greater Sage-Grouse

The affected environment for sage-grouse is the same for Alternative 1 and the Proposed Action unless otherwise noted. Approximately 0.3 miles of the Alternative 1 transmission line occurs in sage-grouse core-breeding habitat. This part of the transmission line is the portion closest to the power plants and Project pipelines and would also be affected by the Proposed Action.

Three of the four previously identified active leks would also be within 2 miles of Alternative 1, and these all occur near the power plants and Project pipelines. No additional active leks would be located within this 2-mile buffer. Riparian areas associated with Burton and Willow creeks may provide additional sage-grouse nesting and brood-rearing habitat.

Migratory Birds

The affected environment for migratory birds would be similar for Alternative 1 and the Proposed Action.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

This section analyzes effects from the Proposed Action and Alternative 1 of Project development to wildlife and plant species occurring in the Project Area. Impacts considered and evaluated include direct, indirect, short-term, and long-term and the effect these may have on wildlife and plant species. Impacts will be mitigated by taking specific means, measures or practices to reduce or eliminate effects of the Proposed Action or the Alternative as defined in the BLM NEPA Handbook (BLM 2008a).

General Effect and General Wildlife

Surface disturbance required for construction of the drilling pads, power plant sites, pipelines, transmission line, substation, and access roads would result in the loss of wildlife habitat and direct displacement of wildlife. Direct effects to wildlife may include injury and mortality during surface-clearing activities. More mobile species, such as game and bird species, may avoid injury and mortality by leaving the area. However, less mobile species, such as rodents, small mammals, and lizards, especially nocturnal species or species that utilize burrows may be injured or killed during surface-clearing activities. These impacts are expected to affect individuals and would not impact local or regional wildlife populations.

Combined habitat loss through short-term and long-term disturbance is approximately 217 acres. This loss would affect those individuals of various wildlife species using the habitat removed. It is also expected that Project-generated noise and human activity would deter some wildlife from using the area surrounding the Project. This noise and human activity would result in the disruption of normal behavioral patterns of some wildlife. This effect is expected to be greatest during construction when surface disturbance and drilling is peaking in activity (see also Section 3.7), and this heightened effect is expected to be temporary, primarily lasting for the duration of construction. Wildlife may also avoid or tolerate habitat affected by the longer-term noise generated by the production plants and wellheads. These effects may displace individuals or reduce breeding success of species sensitive to noise and human activity. These impacts are expected to affect individuals and would not impact local or regional wildlife populations. Adopted environmental protection measures and mitigation measures (see Appendix C) for projected noise impacts will also reduce noise impacts to other wildlife species (i.e., pronghorn antelope, mule deer, short eared owls, loggerhead shrikes, vesper sparrow, and other migratory birds) during project operations.

Increased vehicular traffic during construction is expected. Increased wildlife mortality and injury from collisions may occur during this period. Of particular concern would be species that

commonly utilize or cross roads during travel, such as mesocarnivores, lagomorphs, and big game species. These impacts are expected to affect individuals and would not impact species at a local or regional population level. These impacts will be further minimized by the 20-25 mph Project Area speed limit agreed to by the Operator in their environmental protection measures (see Section 2.1.11).

The transmission line poles would provide perching and nesting sites for raptors and corvids (ravens). The approximately 9.01-mile-long transmission line would also increase the potential for bird collisions, electrocution, and mortality. Occurrence of perching and nesting corvids and raptors and mortalities and injuries from collisions and electrocution will be minimized by the Operator's environmental protection measures, which include line spacing of greater than 60 inches (APLIC 2006) and installation of a cone (Kaddas Enterprises type KE1140 or equal) on each transmission line pole along the entirety of the transmission line (see Section 2.1.11).

Habitat fragmentation effects from Project development are expected to be greatest near the power plants, production and injection pipelines, and wells, as this is the area with the most concentrated surface disturbance. Some species, such as mesocarnivores, lagomorphs, lizards, and rodents may be able to utilize sections of the pipeline raised enough to go under. Monitoring of pipelines at other projects has indicated that coyotes will go under pipelines and prefer pipelines less than 36 inches from the ground (Dunne et al. 2007). Therefore, smaller species are expected to exhibit similar behavior.

Pronghorn and mule deer would also be affected by habitat fragmentation caused by Project development. These effects are expected to be minimal and affect individuals and local groups of animals using or migrating through the area. Both species are expected to respond primarily by avoiding the area of development and fragmented habitat. NDOW has stated that due to the small footprint of the proposed facilities, it is unlikely that there will be a significant impact to mule deer (NDOW, personal communication, August 17, 2010).

Effects to all wildlife (General, Special Status, and Sensitive species) are expected due to reduced access to seeps, springs, wet meadow, and riparian areas. Any Project development effects would be minimized by burying sections of pipeline near seeps, springs, wet meadows, and riparian areas to allow access to wildlife. Although access may not be completely eliminated, reduced use by wildlife to springs 1 – 9 and wet meadow 1 and 2 is still likely (34 acres; Figure 20). Further mitigation measures will be required in the form of offsite projects to compensate at a 4:1 ratio for this loss (34 acres X 4 = 136 acres, see Section 3.10.2.1 and Appendix C).

Reduction of some impacts from the Project footprint is inherent in its design and layout. The number of new roads being proposed has been minimized by utilizing already existing roads; only 2.19 miles of new long-term road is proposed to be constructed. Many of the features being proposed will also be directly adjacent to existing roads. This includes the 8.98 miles of proposed injection and production pipelines, the power plants' location less than 0.5 miles from Grass Valley County Road, and the transmission line along existing road and transmission corridors.

Special Status Species – Plants

Potential habitat for Eastwood milkweed is extremely limited in the Project Area, and this species was not observed during ground survey (GBE 2010). Therefore, impacts to the Eastwood milkweed from Project development are expected to be isolated to suitable habitat. Because survey results (GBE 2010) cannot be considered conclusive due to their timing and incomplete coverage of suitable habitat within the Project Area, mitigation measures including additional surveys will be implemented for Eastwood milkweed (see below).

Suitable habitat for the Toquima milkvetch was present during ground survey although no plants were observed. Therefore, impacts to the Toquima milkvetch from Project development are expected to be isolated to suitable habitat. Because survey results (GBE 2010) cannot be considered conclusive due to their timing and incomplete coverage of suitable habitat within the Project Area, mitigation measures including additional surveys will be implemented for Toquima milkvetch (see below).

Although suitable habitat types for the Toiyabe buckwheat were present in the Project Area, suitable soils were lacking. Therefore, this species is unlikely to occur and no impacts to the Toiyabe buckwheat are expected from Project development.

Mitigation Measure:

Clearance surveys by a BLM/USFS-approved specialist/s in coordination with the BLM SSS Plant specialist and the USFS Botanist using agency-approved protocols will be conducted for special status and sensitive plant species in species-specific suitable habitat within the Project Area prior to surface-disturbing activities. Surveys must be completed before surface disturbing activities occur and results reported to the appropriate land management agency prior to implementation of surface disturbance.

Should surface disturbing construction activities carry-over into spring growing seasons, additional surveys for the remaining surface disturbances may be required based on specific SSS plant phenology.

If target species are identified in areas subject to direct and/or indirect impacts from surface-disturbing activities, the following actions will be taken:

- **If avoidance of special status and/or sensitive plants is practicable, the occurrences will be buffered by a minimum of thirty (30) meters around individual plants or colonies of plants and the buffer perimeter will be visibly marked (e.g., by staking, flagging, or fencing) in the field and identified on construction drawings. Direct impacts associated with construction will avoid identified areas;**
- **If indirect impacts are expected to special status and/or sensitive plants, BLM Wildlife Biologist and, if on USFS land, the USFS Botanist will develop practicable measures to avoid or minimize such impacts. Measures will be implemented by a BLM-approved specialist. Potential minimization measures include increasing the**

buffer around plants to 50 meters, installing silt fencing or other erosion control devices, or slightly shifting minor project features;

- **If target species cannot be avoided, potential mitigation measures include the following: seed collection from plants to be impacted, followed by reseeding; seed collection from plants to be impacted, followed by propagation and outplanting (the planting of seedlings raised in a greenhouse or nursery planting bed into the field). Seeding methods may include: hand seeding or broadcast seeding (ATV, backpack or hand spreaders). Measures would be implemented by a BLM-approved specialist with oversight of by the BLM Wildlife Biologist and (if on USFS land) the USFS Botanist. All reseeding/outplanting/enhancement will be completed in suitable habitat identified within the Project CESA. SSS plant outplanting sites will be protected from grazing for a minimum of three growing seasons;**
- **Reseeding and outplanting efforts will be carried out in ecological sites appropriate to the SSS plants.;**
- **Should initial attempts at mitigation re-seeding fail, Ormat will be required to implement the above mitigation measures for a maximum of three additional attempts.**

Monitoring and Trigger Points

Monitoring of all surface disturbing activities will be implemented by Ormat using either BLM or USFS certified specialist/s. In SSS plant species habitats and where concurrent construction/surface disturbing activities are planned for simultaneous operations, each construction site will be required to have such a monitor.

Ormat will be required to conduct outplanting monitoring to measure success rates for a minimum of three growing seasons. Ormat will report annually the findings of these monitoring studies to the appropriate agency.

Trigger points for mitigation implementation will be the identification of SSS plant/s/plant colonies within or proximate to construction activities.

Effectiveness of the Proposed Mitigation

Avoidance of direct impacts to specific SSS plants or plant colonies through the use of buffers will assist continued propagation of these species and should effectively prevent loss of individual plants or plant colonies.

Application of indirect mitigation measures to protect individual plants or plant colonies through the use of increased buffer zones, silt fencing or other erosion devices will prevent impacts to SSS plants/plant colonies by:

1) ensuring additional buffering between construction equipment and personnel where required; and

2) preventing indirect impacts potentially resulting from erosion as a result proper placement of erosion control devices up-gradient and between the plant/plant colonies and surface disturbing activities.

With respect to seed collection, nursery plantings and outplantings of SSS plant species, successful propagation has had variable success. These proposed efforts would be deemed effective even at low SSS plant survival rates.

Mitigation Impacts

Avoidance of direct or indirect impacts by buffering should have a positive impact on individual SSS plants and plant colonies through total protection of the plants or colonies, thus providing an opportunity for continued propagation of the SSS plant species.

Indirect protection of SSS plants or colonies should also provide adequate protection of individual or plant colonies by preventing erosion and conserving soil; ensuring the likelihood of future plant propagation.

Successful reseeding and outplanting of SSS plants would have a positive impact by ensuring successful propagation of SSS plants in the mitigation area. Conversely, should reseeding and outplanting fail, there will be a negative impact to the SSS plant population within the mitigation area as those plants lost during construction would not be replaced.

Minimal surface disturbance to soil may occur during outplanting of individual SSS plant seedlings. Should ATV broadcast seeding occur, some soil disturbance would occur.

Impacts to Ormat's construction activities could include: additional time delays should facility location need to be modified; more construction time consumed as equipment is required to maneuver around buffered plants or plant communities; financial costs will increase through Ormat's hiring the requisite monitors. Financial costs could go up as a result of increased construction time as equipment maneuvers around buffered plants or plant communities and financial costs incurred for seed collection, nursery plantings and outplanting costs.

<u>Special Status Species – Wildlife</u>

Pygmy Rabbit

Because surface-disturbing activities are not proposed in suitable pygmy rabbit habitat and soils, impacts to pygmy rabbits from the construction, operation, and maintenance of the Project are not anticipated through development of the Proposed Action.

Townsend's Big-eared Bat, Spotted Bat, and Western Small-footed Bat

No known roosting habitat for these bat species exists in or surrounding the Project Area. Therefore, no effects to roosting habitat from Project construction would occur. Impacts to

foraging habitat would be similar to the general effects described under the General Effects and General Wildlife Section. These impacts would affect only individual bats and would not impact the local or regional bat population.

Desert Bighorn Sheep

Bighorn sheep are not likely to be impacted by Project development because suitable habitat does not occur within the Project Area and no bighorn sheep have been documented in or surrounding the Project Area.

Northern Goshawk

Impacts to northern goshawk foraging and nesting habitat may occur due to Project development.

Impacts to foraging habitat are expected to occur in the pinyon-juniper habitat where the proposed transmission corridor would be built. A small amount of direct habitat loss is expected (217 acres). Because the proposed transmission corridor would parallel an existing transmission corridor, additional effects from the new transmission line would be negligible. The opening in the forested habitat may also provide vantage points for foraging goshawks to view prey. The environmental protection measures that Ormat will employ along the transmission line will further minimize impacts to northern goshawks (see Section 2.1.11).

Although impacts to nest sites are not likely based on occurrence records and observations from biological surveys (GBE 2010), suitable northern goshawk nesting habitat does occur in the pinyon-juniper habitat along the proposed transmission corridor of the Proposed Action and Alternative 1. The total acreage expected to be disturbed along the transmission corridor is approximately 15 acres. Because the proposed transmission corridor would parallel an existing transmission corridor, additional effects from the new transmission line would be diminished. In addition, pinyon-juniper habitat is not preferred for nesting goshawks. Therefore, although potential nesting habitat for northern goshawks will be affected, negative impacts are expected to be minimal based on current knowledge of goshawk nest sites in Nevada. Potential impacts will be minimized by employing the following mitigation measure.

Mitigation measure for raptor species:

All ground-disturbing activities will be conducted outside the raptor nesting season (March 1–July 31). If ground-disturbing activities cannot be avoided during this time, pre-construction nest surveys will be conducted by a BLM-approved specialist with the following guidelines:

- **Surveys will cover all potential nesting habitat, including previously documented nest sites, for northern goshawks, ferruginous hawks (known nest location: T20N R45E Section 32), and short-eared owls in and within 0.5-mile area to be disturbed.**

- **If active nests are detected, a 0.5-mile no-disturbance buffer zone will be established. Nest locations will be mapped and submitted to the BLM and/or USFWS as needed.**
- **If nests of other species identified in the EA as special status or sensitive are found, a 0.5-mile no-disturbance buffer will be established. Nest locations will be mapped and submitted to the BLM and/or USFWS as needed.**

Monitoring and Trigger Points

No monitoring for raptor nesting for northern goshawks, ferruginous hawks or short-eared owls will be required if earth disturbing activities occur outside the March 1-July 31 window. If any surface disturbing activities are to occur during the likely two year construction period during the March 1-July 31 window, one or more BLM/USFS approved specialist/s will be required to monitor for active nests in all potential nesting habitat for the above identified three raptors.

Trigger points for mitigation implementation will occur if active raptor nests of any of the three species are found within 05. miles of the proposed disturbance.

Effectiveness of the Proposed Mitigation

Implementing these mitigation measures, would avoid destruction and disturbance to nesting northern goshawks, ferruginous hawks and short-eared owls.

Mitigation Impacts

These mitigation measures will have a positive impact on nesting raptors including northern goshawks, ferruginous hawks, short-eared owls, and other nesting SSSs identified in this EA in that no disturbance to breeding or mated birds would likely occur from construction activities. The result may be successful breeding of adult birds and potential addition to each species population by successful rearing of fledgling birds.

Golden Eagle

Impacts to golden eagles would include the reduction of foraging habitat. Given the limited surface disturbance and area of habitat fragmentation, impacts to golden eagle foraging habitat would be minimal and concentrated around the plants, production and injection pipelines, and wells. Additional impacts from the transmission corridor construction would also be minimal because the majority of the corridor is proposed to be built along an existing road or existing transmission corridor. Further effects of the transmission line to golden eagles will be minimized by Ormat's agreement to employ environmental protection measures as described by the APLIC (2006). Because the habitat surrounding the Project Area is relatively undisturbed, golden eagles would be expected to shift their foraging efforts away from the Project development to the more undisturbed habitat. These impacts are expected to affect individuals of the local golden eagle population, but no effect to the regional population is expected.

Due to the lack of suitable golden eagle nesting habitat, impacts to nesting golden eagles are not anticipated.

Short-eared Owl

Impacts to short-eared owls would include the reduction of foraging habitat. Given the limited surface disturbance and area of habitat fragmentation, impacts to short-eared owl foraging habitat would be minimal and concentrated around the plants, production and injection pipelines, and wells. Additional impacts may occur through surface and noise disturbance. To minimize these effects, see Mitigation Measure for raptor species under northern goshawk section. Following the implementation of this mitigation measure, destruction and disturbance to nesting short-eared owls would be avoided.

Long-Eared Owl

Due to the limited use of the habitat in and surrounding the Project Area, impacts to long-eared owls are expected to occur only to individual birds traveling through the area. Individuals will likely avoid habitat that has been disturbed and shift movements away from Project facilities. No impacts to nesting long-eared owls are expected.

Western Burrowing Owl

Impacts to western burrowing owls would be the reduction in foraging habitat and potential nesting habitat. Disturbance to nests should be limited with protection measures established for pre-surface disturbance and for MBTA. Impacts would likely be indirect effects to individuals.

Juniper Titmouse

Suitable foraging and nesting habitat occur along the sections of the transmission corridor going through pinyon-juniper habitat. Overall surface disturbance is small (217 acres) and effects from the proposed transmission line would be diminished because of its location parallel to an existing transmission corridor. Greatest effects to juniper titmice would be short-term, primarily occurring during transmission line construction. Overall effects are expected to be limited to individuals, and no effect to the local or regional population of juniper titmice is expected. These impacts will be minimized by the implementation of mitigation (See Mitigation Measure under Migratory Birds Section).

Ferruginous Hawk

Impacts to ferruginous hawks would include the reduction of foraging habitat. Given the limited surface disturbance and area of habitat fragmentation, impacts to ferruginous hawk foraging habitat would minimal and concentrated around the plants, production and injection pipelines, and wells. Additional impacts from the transmission corridor construction would also be minimal because the majority of the corridor is proposed to be built along an existing road or existing transmission corridor. Further effects of the transmission line to ferruginous hawks will be

minimized by Ormat's agreement to employ environmental protection measures as described by the APLIC (2006; see Section 2.1.11). Because the habitat surrounding the Project Area is relatively undisturbed, ferruginous hawks would be expected to shift their foraging efforts away from the Project development to less disturbed or undisturbed habitat. These impacts are expected to affect individuals of the local ferruginous hawk population, but no effect to the regional population is expected.

Additional impacts to ferruginous hawks would potentially include disturbance to nesting hawks and nesting habitat. Potential ferruginous hawk nesting habitat would be reduced by a maximum of 217 acres from surface-disturbing activities. Given this limited amount of affected suitable habitat, this impact would not affect ferruginous hawks at the local or regional population level. Individual birds and nest sites may also be impacted by Project development. To minimize these effects, see Mitigation Measure for raptor species under northern goshawk section. Following the implementation of this mitigation measure, destruction and disturbance to nesting ferruginous hawks would be avoided.

Swainson's Hawk

Impacts to Swainson's hawks would include the reduction of foraging habitat. Given the limited surface disturbance and area of habitat fragmentation, impacts to Swainson's hawk foraging habitat would be minimal and concentrated around the plants, production and injection pipelines, and wells. Additional impacts from the transmission corridor construction would also be minimal because the majority of the corridor is proposed to be built along an existing road or existing transmission corridor. Further effects of the transmission line to Swainson's hawks will be minimized by the Operator's agreement to employ environmental protection measures as described by the APLIC (2006; see Section 2.1.11). Because the habitat surrounding the Project Area is relatively undisturbed, Swainson's hawks would be expected to shift their foraging efforts away from the Project development to the more undisturbed habitat. These impacts are expected to affect individuals of the local Swainson's hawk population, but no effect to the regional population is expected.

Due to the lack of suitable Swainson's hawk nesting habitat, impacts to nesting Swainson's hawks are not anticipated.

Greater Sage-Grouse

Impacts to sage-grouse from the Proposed Action would include the reduction of foraging and nesting habitat. Actual surface disturbance and direct habitat loss is small (217 acres). Effects to sage-grouse in the form of habitat fragmentation resulting from Project disturbance would be concentrated around the plants, production and injection pipelines, wells and the transmission line located within the geothermal unit.

The requisite mitigation, monitoring, and trigger points, effectiveness of the proposed mitigation, and mitigation impacts for sage-grouse may be found in Appendix C.

Project development could also result in impacts to sage-grouse movement corridors between metapopulations. Sage-grouse may respond by either traveling through the Project or adjust movement corridors to avoid the development. Effects are expected at the individual level, and sage-grouse are expected to adjust movement patterns. If through monitoring it is determined that habitat connectivity has been affected by Project development, subsequent mitigation measures will be required as necessary (see Appendix C).

The primary impact from the proposed transmission line is the increased occurrence of corvids (ravens), which increases sage-grouse mortality risks and predation to sage-grouse nests (Lammers and Collopy 2005, Bui et al. 2010). Corvid occurrence will be minimized by Ormat's utilization of a single-pole design and cone deterrents along the entirety of the transmission line in accordance with recommended environmental protection measures (APLIC 2006; see Section 2.1.11). Actual surface disturbance from the transmission route has been minimized by its placement along existing roads and an existing transmission corridor. Thus, very little previously undisturbed habitat will be utilized in construction of the transmission line. In addition, corvid occurrence and attraction to the Project will be minimized by implementing a Common Raven Monitoring, Mitigation, and Management Plan (see Appendix D).

Specific impacts and disturbance to seasonal sage-grouse life cycles are discussed in more detail below.

Fall and Winter – The main impacts to sage-grouse utilizing the Project Area during the fall and winter is displacement of these birds due to 1) habitat reduction and fragmentation, and 2) effects from Project noise, construction, and human activities. The impacts from these effects would be greatest in the vicinity of the production plants, pipelines, and wellheads. Sage-grouse are most likely to discontinue use of this area during project construction and testing compared to other phases of the project.Time lags in sage-grouse response to development have been detected at other developments (Harju et al. 2010). Sage-grouse use of the Project Area in fall and winter after construction is completed is difficult to predict but may resume in equal or reduced rates to pre-construction use or may discontinue completely. Winter habitat in a 2-mile buffer of the Project represents 5% of the NDOW-designated winter habitat in the Toiyabe PMU. Therefore, Project impacts are expected to affect individuals from the local metapopulation of sage-grouse but greater effects to the Toiyabe population or regional population are not expected. To reduce these local impacts, mitigation will be required (see Appendix C).

Lekking - No surface-disturbing activities at actual lek locations are proposed through Project development. Therefore, impacts to leks will be a result of indirect effects, which include visual and auditory impacts. Of the four active leks known to occur within 2 miles of the Project, three occur less than 1 mile from proposed structures or construction activities (see Figure 14). The southernmost lek, the Givens Ranch lek, is more than 1.5 miles from the edge of the proposed transmission corridor, and topography would block visual impacts to this lek. Noise impacts to this lek are not expected because 1) it is located more than 6 miles from where persistent noise and activity will occur, and 2) mitigation measures that limit surface-disturbing activities and sound pressure levels during the lekking season will be required (see Appendix C). The Grass Valley 3 and Grass Valley 4 leks are between 0.5-1 mile from proposed production pipelines and

wells. Topographical features would block construction activities and facilities from view at these leks, but depending on decibel levels, noise impacts would be expected to affect these leks. Visual effects from the Project to the northernmost lek, the Ox Corral lek, are likely to be negligible because the intervening topography between will block the construction activities and structures from view at the lek. In addition, this lek is also located less than 0.5 miles from the Grass Valley Country Road, so birds attending this lek may already be habituated to vehicular traffic and human disturbance. In addition to the 4 active leks, 3 leks with unknown status are also located within 2 miles of the Project; it is anticipated that the impacts to these unknown status leks would be similar to those identified above.

Research has indicated that noise impacts above certain decibel levels can have detrimental effects to sage-grouse leks (Holloran 2005, Walker et al. 2007, Harju et al. 2010). Many conservation plans recommend minimizing sound pressure levels to below 49 dBA at lek locations to reduce noise effects to sage-grouse leks (MTSGWG 2005, NDGFD 2005, WYSGWG 2006). Responses vary but may include lowered male lek attendance, shifting lek locations away from the noise source, and loss of lek locations (Holloran 2005, Walker et al. 2007, Harju et al. 2010). Based on these studies, if sound pressure levels from the Project exceed 49 dBA at lek sites, negative effects to leks would be expected. To mitigate impacts to leks and their associated nesting habitat, measures to limit surface-disturbing activities and sound pressure levels during the lekking season will be required (see Appendix C).

Nesting – Actual direct and long term impacts to sage-grouse nesting habitat from Project development are small (217 acres). Core-breeding habitat does occur within 2 miles of Project components and accounts for 10% of what occurs in the entire Toiyabe PMU. Impacts to nesting sage-grouse are expected from indirect effects due to noise, human activity, and habitat fragmentation. Greatest impacts to nesting sage-grouse are expected during Project construction and testing due to nest destruction or abandonment. To minimize effects to nesting sage-grouse, mitigation measures will be required (see Appendix C).

Brood-rearing – Several springs, seeps, wet meadow, and riparian areas occur in close proximity to components of the Project. Although it is unknown to what extent these areas are being utilized by sage-grouse, any use by sage-grouse of these areas would likely be reduced or discontinue during and after Project development. These impacts are expected to affect individuals from the local metapopulation of sage-grouse but greater effects to the Toiyabe population or regional population are not expected. To offset impacts to brood-rearing habitat affected by Project Development, compensatory mitigation at a 4:1 ratio will be required (see Appendix C).

Mitigation Measures

Detailed mitigations for potential impacts to sage-grouse are identified in Appendix C of this document. In addition, the monitoring and trigger points, the effectiveness of the proposed mitigation, and mitigation impacts are also described in Appendix C.

Prairie Falcon

Impacts to prairie falcons would include the reduction of foraging habitat. Given the limited surface disturbance (217 acres) and area of habitat fragmentation, impacts to prairie falcon foraging habitat would minimal and concentrated around the plants, production and injection pipelines, and wells. Additional impacts from the transmission corridor construction would also be minimal because the majority of the corridor is proposed to be built along an existing road or existing transmission corridor. Further effects of the transmission line to prairie falcons will be minimized by Ormat's agreement to employ environmental protection measures described by the APLIC (2006; see Section 2.1.11). Because the habitat surrounding the Project Area is relatively undisturbed, prairie falcons would be expected to shift their foraging efforts away from the Project development to the more undisturbed habitat. These impacts are expected to affect individuals of the local prairie falcon population, but no effect to the regional population is expected.

Due to the lack of suitable prairie falcon nesting habitat, impacts to nesting prairie falcons are not anticipated.

Pinyon Jay

Suitable foraging and nesting habitat for pinyon jays would especially be affected along the transmission corridor in and around the pinyon-juniper habitat. Overall surface disturbance is small (217 acres), and effects from the proposed transmission line would be diminished because of its location parallel to an existing transmission corridor. Greatest effects to pinyon jays would be short-term, primarily occurring during transmission line construction. Overall effects are expected to be limited to individuals, and no effect to the local or regional population of pinyon jays is expected. These impacts will be minimized by the implementation of mitigation (See Mitigation Measure under Migratory Birds Section).

Bald Eagle

There are no records of bald eagles nesting in or around the Project Area, and suitable nesting habitat for bald eagles is lacking. Therefore, no impacts to nesting bald eagles or nesting habitat are expected from Project development.

No local populations of bald eagles are known in or around the Project area. Documented observation of bald eagles in the vicinity of the Project is limited to one winter sighting. Therefore, impacts from Project development to foraging bald eagles would be negligible and limited to individual birds. No impact to local or regional bald eagle populations is expected from Project development.

Loggerhead Shrike

Impacts to loggerhead shrikes include the reduction of foraging and potential nesting habitat due to Project construction and operations. These impacts are limited to the 217 acres of habitat that

will be disturbed due to Project development and the associated habitat fragmentation. The greatest impacts will occur during Project construction when increased noise and activity may deter loggerhead shrikes from using the Project Area and its vicinity. Loggerhead shrikes may benefit from Project development, especially along the transmission corridor where increased perching sites on the transmission line will be available. These impacts are expected to affect individual birds utilizing the habitat within and around the Project, but no effect to the local or regional population of loggerhead shrikes is expected. These impacts will be minimized by the implementation of mitigation (See Mitigation Measure under Migratory Birds Section).

Vesper Sparrow

Impacts to vesper sparrows include the reduction of foraging and potential nesting habitat due to Project construction and operations. These impacts are limited to the 217 acres of habitat that will be disturbed due to Project development and the associated habitat fragmentation. The greatest impacts will occur during Project construction when increased noise and activity may deter vesper sparrows from using the Project Area and its surrounding habitat. These impacts are expected to affect individual birds utilizing the habitat within and around the Project, but no effect to the local or regional population of vesper sparrows is expected. These impacts will be minimized by the implementation of mitigation (See Mitigation Measure under Migratory Birds Section).

Migratory Birds

Impacts to migratory birds include the reduction of foraging and potential nesting habitat due to Project construction and operations. These impacts are limited to the 217 acres of habitat that will be disturbed due to Project development and the associated habitat fragmentation. These impacts would be on-going for the life of the Project and until reclamation is completed. Direct mortalities or injuries during surface-disturbing activities are not expected due to the highly mobile nature of migratory birds. The Project would not restrict bird migration through Grass Valley, thus no impact to migration is expected. The greatest impacts will occur during Project construction when increased noise and human activity may deter migratory birds from using the Project Area and its surrounding habitat. These impacts may displace migratory birds and/or reduce breeding success of some birds, especially those most sensitive to disturbance. To minimize these impacts, the following mitigation measure will be employed:

Mitigation Measure for migratory bird species:

All ground-disturbing activities will be conducted outside the migratory bird nesting season (15 March – 31 July). If ground-disturbing activities cannot be avoided during this time period, pre-construction nest surveys will be conducted by a BLM/USFS-approved specialist/s with the following guidelines:

- **Surveys will cover all potential nesting habitat in and within 250 feet of the area to be disturbed.**

- **Surveys must be conducted between sunrise and 3 hours post-sunrise when birds are most active.**
- **Surface-disturbing activity must be conducted within 10 days of surveys or additional surveys may be required to "re-clear" the area.**
- **If active nests are detected, a species-specific no-disturbance buffer zone (as determined by USFWS Reno [Fish and Wildlife Biologist, 775-861-6300]) will be established. Nest locations will be mapped and submitted to the BLM as needed.**
- **Surveys for simultaneous construction activities must be undertaken prior to any surface disturbance.**
- **Ormat must provide direction to all employees, contractors and sub-contractors about the necessity of avoiding any man made disturbance of nesting birds, including identifying nesting sites on maps and on the ground. These identified/marked areas must be fully avoided of any human activity during the identified nesting timeframes.**

Monitoring and Trigger Points

Monitoring of migratory bird nesting habitat by one or more BLM/USFS certified specialists will be required of all surface disturbing activities that will occur between March 15th-July 31st of each construction year.

If active nests are found within 250 of any proposed surface disturbance the mitigation above will be triggered.

Effectiveness of the Proposed Mitigation

Past implementation of these mitigation measures has demonstrated protection of active nests and the occupying birds.

Mitigation Impacts

There should be positive effects to migratory bird populations through implementation of properly sized buffer areas around active nests and their occupants. Individual birds and their species will have the opportunity for successful propagation of individual immature birds when construction activities avoid disturbance of the nests and their occupants. Following the implementation of this mitigation measure, destruction and disturbance to nesting migratory birds would be avoided.

Ormat's construction activities could be impaired through: construction delays if nests can't be disturbed in the immediate vicinity of construction activities; the possible modification/minor relocation of designed facilities could result if Ormat is forced to adjust various facilities in order to protect nesting migratory birds; potential financial losses if construction delays occur.

3.5.2.2 Alternative 1

General Effects and General Wildlife

The impacts to general wildlife from construction, operation, maintenance and reclamation of Alternative 1 would be slightly less than those described for the Proposed Action due to the disturbance of approximately 2.4 fewer acres of surface disturbance

Special Status Species – Plants

The impacts to special status and sensitive plant species from construction, operation, maintenance and reclamation of Alternative 1 would be slightly less than those described for the Proposed Action due to the disturbance of approximately 2.4 fewer acres during site construction. The same mitigation measure for Alternative 1 and the Proposed Action would be required (See 3.5.1.1 Special Status Species – Plants).

Special Status Species – Wildlife

The impacts to the following species are expected to be similar for Alternative 1 and the Proposed Action: Townsend's big-eared bat, spotted bat, western small-footed bat, desert bighorn sheep, golden eagle, short-eared owl, long-eared owl, ferruginous hawk, Swainson's hawk, prairie falcon, bald eagle, loggerhead shrike, and vesper sparrow. No impacts to nesting northern goshawks, juniper titmice and pinyon jays are expected if Alternative 1 is selected. Potential impacts to nesting raptors would be reduced by implementing the same mitigation measure as identified for the Proposed Action during the raptor nesting season (See 3.5.1.1 *Short-eared owl*).

Pygmy rabbit

Impacts to pygmy rabbits from construction, operation, maintenance and reclamation of Alternative 1 would be greater than those associated with the Proposed Action. During the current biological survey, pygmy rabbits were located in the Burton Creek drainage at T.20N., R.45E., Section. To avoid impacts to pygmy rabbits during transmission line construction, the following mitigation will be employed:

Mitigation Measure:

Complete avoidance (no surface disturbance) of occupied and suitable pygmy rabbit habitat along the Burton creek drainage at T. 20 N., R. 45 E., Section 31, SE ¼ during transmission line construction and maintenance activities.

In order to accomplish the no surface disturbance mitigation, a USFS certified specialist with a verified pygmy rabbit background must fully identify the area/areas to be avoided. The area/s must be flagged and properly mapped so construction crews are made aware of

the avoidance area/s. Construction crews must be fully briefed as to how and why the area/s are to be fully avoided of any surface disturbance in this pygmy rabbit habitat.

Monitoring and Trigger Points

The pygmy rabbit habitat will be surveyed, mapped and clearly identified on the ground prior to construction activities.

After completion of the above requirements, the CIC will monitor the area to ensure compliance of the no surface disturbance requirement in pygmy rabbit habitat.

The trigger point for implementation of this no surface disturbance requirement is implementation of surveys, mapping and flagging prior to construction activities.

Effectiveness of the Proposed Mitigation

Total avoidance of surface disturbance of the identified pygmy rabbit habitat should be 100% effective in avoiding any impacts to the habitat of individuals in that habitat.

Mitigation Impacts

The no surface disturbance requirement in the identified pygmy rabbit habitat should ensure protection of the habitat and individual pygmy rabbits from any of Ormat's construction activities.

Ormat could conceivably have to consider re-design of the transmission line , i.e. change location of transmission line pole placement or location of any construction/maintenance roads in order to comply with this requirement. It is unknown if there would be any additional financial burdens incurred on Ormat as a result of any re-design requirements.

By implementing this mitigation measure, impacts to pygmy rabbits and occupied habitat would be avoided.

Greater sage-grouse

The impacts to sage-grouse from construction, operation, maintenance and reclamation of Alternative 1 would be similar to those associated with the Proposed Action. Alternative 1 would impact less identified core-breeding habitat. Due to its proximity to riparian areas, Alternative 1 could affect additional habitat suitable for sage-grouse nesting and brood-rearing. Three of the four leks previously identified for the Proposed Action (above) would be affected by Alternative 1, and these all occur near the power plants and Project pipelines. No additional leks would be directly impacted by the Alternative 1 transmission line. The same Monitoring and Mitigation Plan would be implemented for Alternative 1 as for the Proposed Action (see Appendix C).

Migratory Birds

The impacts to migratory birds from construction, operation, maintenance and reclamation of Alternative 1 would be slightly less than those described for the Proposed Action due to the disturbance of approximately 2.4 fewer acres during site construction. The same mitigation measure as identified for the Proposed Action would be required for migratory birds if Alternative 1 is selected (See 3.5.1.1– Migratory Birds).

3.5.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. If this were to occur, additional wildlife habitat would be fragmented or lost. See the 2009 Geothermal Exploration EA for a complete analysis of potential impacts to wildlife, including special status species and migratory birds.

3.6 NOXIOUS WEEDS, INVASIVE AND NONNATIVE SPECIES

3.6.1 Affected Environment

Noxious weeds and invasive species are typically nonnative plants that infest and/or invade areas of fresh soil/ground disturbance. Noxious weed species typically have attributes which allow them to rapidly out-compete native vegetation for vital natural resources. Noxious weeds, invasive and nonnative species impact native ecosystems by reducing overall biodiversity, by altering local hydrologic and soil characteristics and can immediately increase fire intensity. On a smaller scale, noxious weeds interfere with native plant successional pathways by competing for pollinators, being prolific seed producers and inundating the surrounding soil with weed seed, displacing rare plant species, serving as reservoirs of plant pathogens and converting complex plant communities into simple plant communities.

Noxious weed, invasive and nonnative species seed or vegetative plant parts are carried, transported or deposited into and infest weed-free areas by people, equipment, livestock/wildlife or by abiotic means (wind, water).

As of 2010, the State of Nevada under Nevada Administrative Code 555.010 listed 47 species on the Nevada Noxious Weed List.

A noxious weed, invasive and nonnative species inventory was conducted during the biological survey of the proposed Project Area. Two noxious weed species were identified along portions of Grass Valley Road: hoary cress (*Cardaria draba*) and bull thistle (*Cirsium vulgare*) (GBE 2010).

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

The proposed Project could contribute to the spread of noxious weeds, invasive and nonnative species within the McGinness Hills Unit Area and along the transmission line corridor through the proposed surface disturbing activities and the number of construction and drilling vehicles involved.

Ormat has adopted environmental protection measures to help minimize the spread of weeds (see Section 2.1.11) and will conform to all applicable geothermal lease stipulations found in Appendix A of this EA. Additionally, a completed reclamation plan can be found in Appendix B. Following the implementation of these AEPMs, there would remain the potential for the spread of noxious weeds, invasive and nonnative species (seed and vegetative plant parts) within the McGinness Hills Unit Area and along the transmission line corridor, which would be a residual impact of the Proposed Action.

Monitoring and Trigger Points

Refer to Appendix B: Interim and Final Reclamation Plan for noxious weed, invasive and non-native species monitoring details. If noxious weeds, invasive or non-native species are found, they will be treated as specified in Appendix B.

While the potential for continuation of the spreading of noxious weeds, invasive plants and non-native species plants remains, Ormat's applicant practices, including their weed monitoring program should effectively limit the spread of these plant species during construction and operation of Ormat's facilities.

All weed mitigation measures will be conducted in conformance with the Battle Mountain Programmatic Weed EA (2009); all impacts have been addressed in that document.

3.6.2.2 Alternative 1

The impacts associated with invasive, nonnative species from the construction, operation, maintenance and reclamation of Alternative 1 would be slightly greater than those described for the Proposed Action due to the disturbance of approximately 5.0 more acres during site construction.

3.6.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This additional disturbance could contribute to the spread of noxious weeds, invasive and nonnative species. See the 2009 Geothermal Exploration EA for a complete analysis of potential effects of noxious weeds and invasive species.

3.7 NOISE

3.7.1 Affected Environment

Unwanted sound or noise is most often measured in decibels (dB), which is a unit of measurement of the relative loudness of sound or sound pressure level (SPL). The decibel symbol is often qualified with a suffix, that indicates which reference quantity or frequency-weighting function has been used. Examples of sound pressure levels for common situations include 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) (Harris and Dines 1997).

Because the human ear is more sensitive to particular sound frequencies, sound measurements can be filtered to approximate the average human ear. Units of sound pressure level are termed "A-weighted" (dBA) when filtered to approximate the human ear. "B-weighted (dBB) and C-weighted (dBC) measurements are also used. These symbols denote the use of different weighting filters. These measurements provide an objective means of evaluating noise and its effects on humans and animals. These measurements provide a basis to measure the effects of noise and develop measures to minimize noise impacts.

Noise is evaluated by determining the effect of noise generated by sources relative to receptors. Human receptors in the Project Area are limited. There are no public buildings, campgrounds, or habitations in the vicinity. Occasional recreational or casual users may be affected. Sound levels in the environment fluctuate over time. In these settings, a time-averaged noise level measured in dBA and expressed as "L_{eq}" is often used to characterize the noise environment at a given location. The "L_{eq}" is a single value of sound level for any desired duration (JBR 2011). Sound diminishes with distance from the source of the sound. While the rate at which sound attenuates with distance is a constant, there are many factors, including: topography, ground surface, vegetation, wind direction, air turbulence, humidity and temperature that can have an effect on the noise level at any particular location in an environmental setting.

Ambient sound level is the level of sound absent the noise source. For the Project Area ambient noise levels can be expected to be similar to rural environments. Atmospheric conditions can affect sound transmission. For example, sound generally travels farther as the temperature declines and as the humidity rises. Ambient noise, especially during days with mild to moderate winds, will alter the effects of power plant noise on the surrounding environment (JBR 2011).

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action

Short-term noise impacts resulting from the Proposed Action include noise from well drilling, construction activity, reclamation, and decommissioning. These impacts are highly variable, intermittent, and periodic in nature.

To determine the potential noise impacts resulting from the long-term aspects of the Project, sound data was collected from Ormat's Desert Peak geothermal facility (JBR 2011). Data regarding Project components (including two electrical production plants, injection and production pipelines, and wells) was input into a mathematical model to predict the potential noise impact on receptors near the proposed McGinness Hills Geothermal Development Project.

The noise modeling software used was SoundPLAN 7.0 – Kernel version: 12/23/2010. Atmospheric conditions were assumed at 800 mbar air pressure, 50% relative humidity, and temperature of 55°F (13°C). The ground was modeled as 40 percent acoustically absorptive to represent the existing ground coverage. The model also assumed that the receptor is 0.3 meters above the ground. The maximum search distance used was 7,000 meters (4.3 miles). This represents the greatest distance from the receiver that a noise source is considered in the model, as noise sources beyond 7,000 meters are considered negligible (negligible refers to sound levels that cannot be discernibly detected above typical ambient levels).

The modeling results are based upon an air cooling system for the power plants. Several iterations of the sound model were completed to account for changes in the project equipment including quieter fans for the air cooling system that Ormat is proposing to reduce noise levels (JBR 2011). Refer to sections 2.1.11 for AEPMs designed to minimize noise impacts. The model includes specific noise sources such as two geothermal plants, fans, steam turbine, generator, and 12 production wellheads. The results of the modeling are shown as noise isolines in decibels (see Figure 15 and Figure 16).

Noise receptors in the vicinity of the proposed action that require evaluation would include noise-sensitive locations. Typically, noise-sensitive locations include residences, schools, or similar locations where unwanted sound affects human activity. The Project area does not contain "typical" noise-sensitive locations. In the Project area, the known noise-sensitive receptors include wildlife such as lekking greater sage-grouse, pronghorn antelope, mule deer, short eared owls, loggerhead shrikes, vesper sparrows, and other migratory birds. Though not identified as sensitive noise-receptors, ranchers, recreationists, hunters, and Tribal members periodically use or travel through the project area and may avoid the Project area due to facility noise, especially during construction.

At the direction of the BLM and the NDOW, the noise receptors identified for study, using the noise model, focused on the known active and inactive greater sage-grouse leks. Sage-grouse leks were selected as the primary noise-sensitive receptors because sage-grouse are a SSS, known proximity of leks to the project, and evidence from published scientific studies (Holloran

2005, Walker et. al 2007, Harju et. al 2010) that demonstrate the sensitivity of lekking sage-grouse to noise. The noise prediction model used the data collected from the Desert Peak geothermal facility to calculate sound attenuation to predict environmental noise at a distance from the sources. The results are provided as "L_{dn}" and "L_{eq}" for both A-weighted and C-weighted sound. The "L_{dn}" is the A- or C-weighted sound level for a 24-hour period where an additional ten dB is imposed on the equivalent sound levels for night-time hours (10 p.m. to 7 a.m.). C-weighting allows for a larger range of sound measurements especially in the low frequency range. Modeled C-weighted results would represent a worst-case scenario, since low frequency sounds travel farther and thus higher levels would be realized farther from the noise sources. The results of the modeling are shown on Figure 15 and Figure 16. Twelve lekking sites were analyzed in the noise model; The Givens Ranch lek was not included in the model. The inactive McGinness Mine lek was determined to receive noise levels in excess of 49 dBA. Considering the worst-case scenario, the Grass Valley 3, the Lake Ranch Hills 2, and the McGinness Mine leks would receive noise levels in excess of 49 dBC.

For a discussion of potential impacts to sensitive species and recreational users from Project-generated noise, see Sections 3.5 and 3.15, respectively.

Mitigation Measures

Refer to Appendix C for a complete discussion of mitigation measures, effectiveness of mitigation measures, and impacts of noise mitigations measures pertaining to sage-grouse.

3.7.2.2 Alternative 1

The impacts associated with noise from the construction, operation, maintenance and reclamation of Alternative 1 would be the same as those described for the Proposed Action.

3.7.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. If this were to occur, noise would continue to be generated by exploration activities and equipment. See the 2009 Geothermal Exploration EA for a complete analysis of potential noise impacts.

Figure 15: Noise Levels Associated With the Proposed Action (A-Weighted)

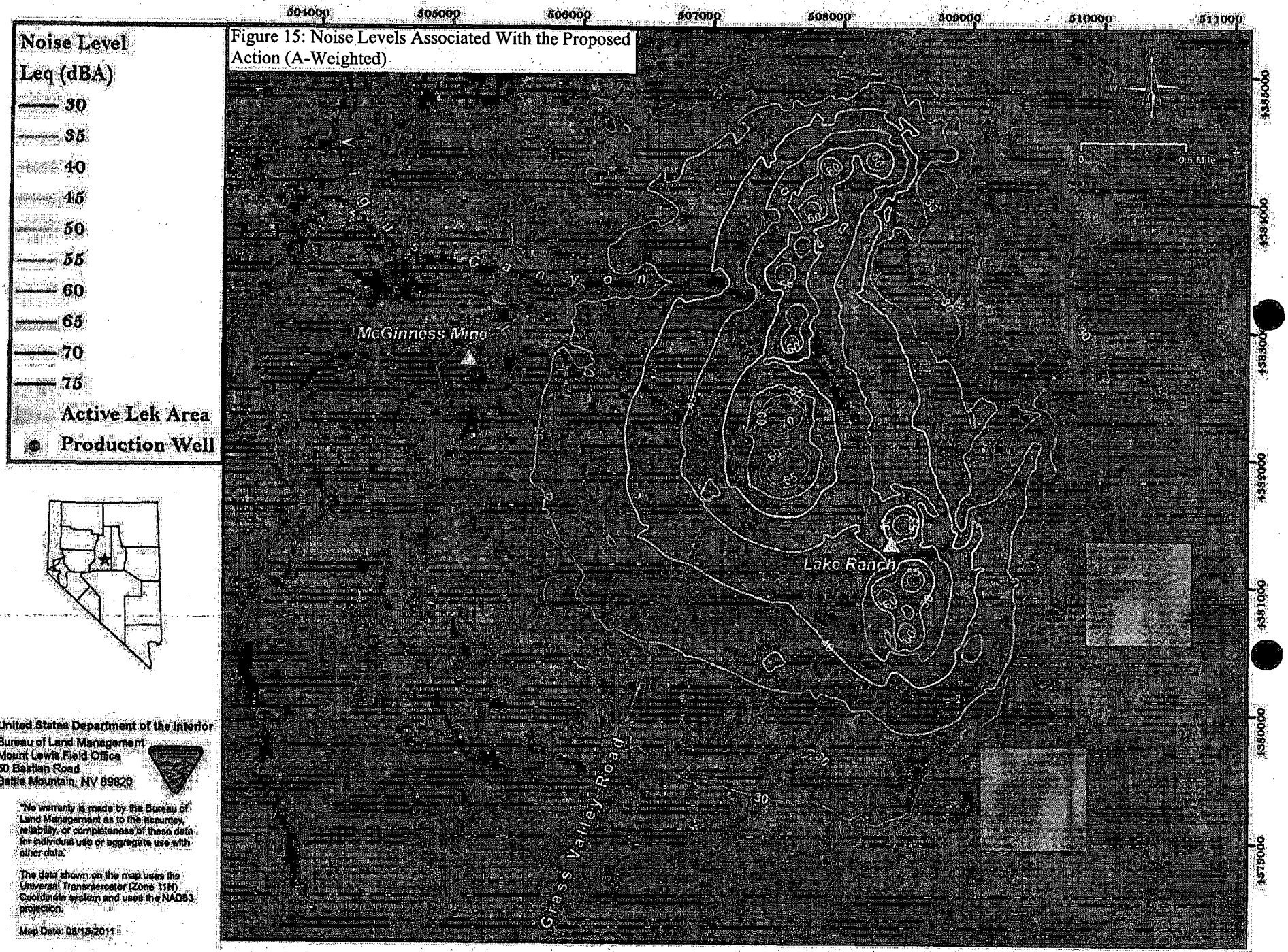
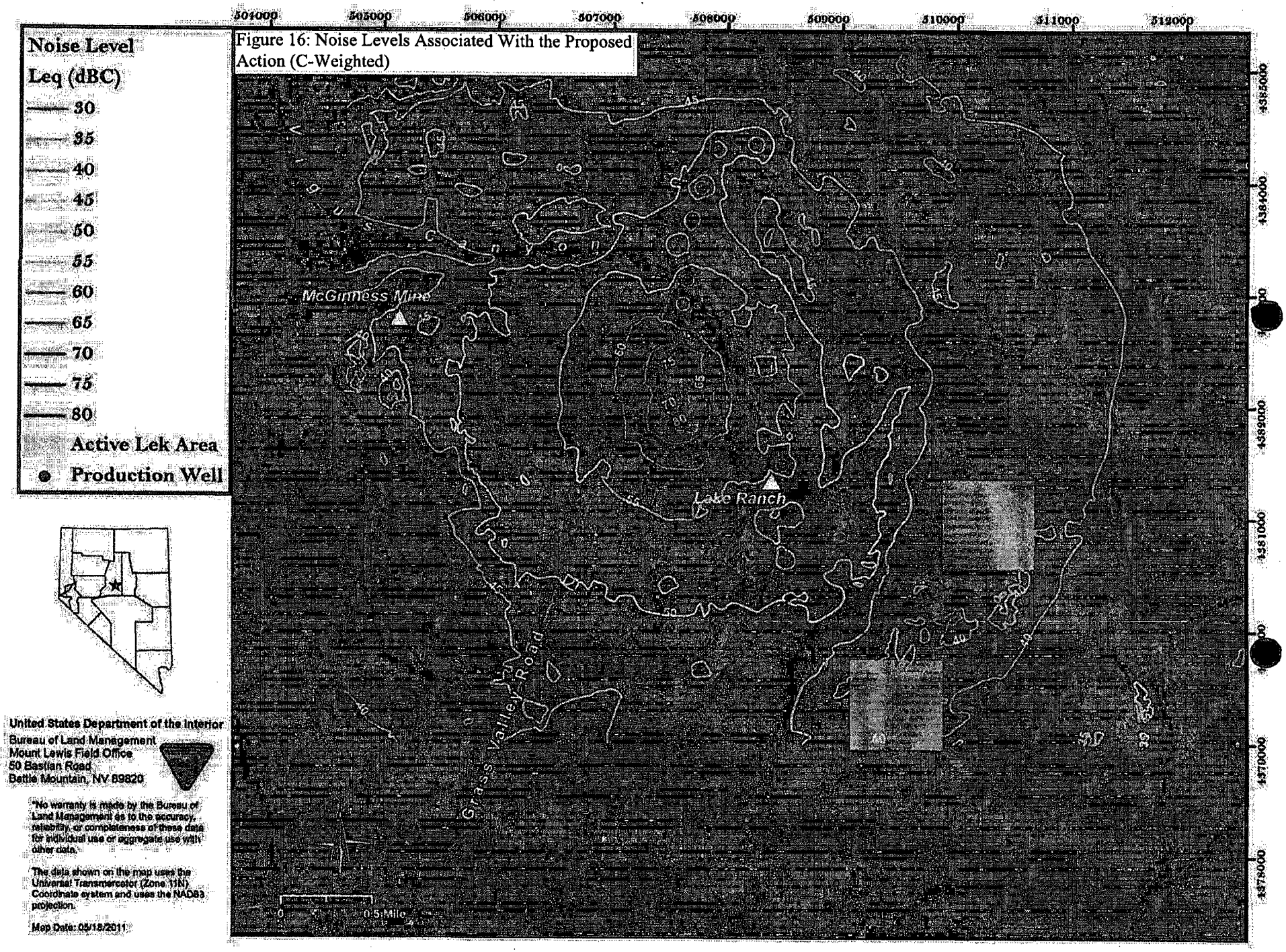


Figure 16: Noise Levels Associated With the Proposed Action (C-Weighted)



3.8 SOILS

3.8.1 Affected Environment

Soil associations within the McGinness Hills Unit Area and along the BLM-managed public land portions of the transmission line corridor have been mapped by the USDA, Natural Resource Conservation Service (NRCS) in the Lander County, South Part, soil survey, and are depicted in Figure 17. Soils data for the National Forest System lands has not been mapped by the NRCS.

Soil associations within the McGinness Hills Unit Area and along the BLM-managed public land portions of the transmission line corridors are: 121, Akerue-Simpark-Punchbowl; 702, Orovada-Creemon; 703, Orovada fine sandy loam, 0 to 2 percent slopes; 998, Sonoma-Paranat; 1146, Wedane-Sonoma-Valmy; 2011, Glyphs-Muni; 2031, Muni-Orovada-Unius; 2061, Oxcorel-Zaidy-Grassval; 2095, Punchbowl-Robson-Rock outcrop; 2096, Punchbowl-Locane-Nobuck; 2101, Grassval-Oxcorel; 2554, Laped-Hooplite-Osoll, 3001, Barrier-Kobeh, 3050, Novacan cobbly loam; 3071, Allor-Wieland; 3081, Zaidy-Allor; 3122, Walti-Sumine-Softscrabble; 3151, Robson-Ninemile-Ravenswood; 3200, Dewar gravelly loam; 3421, Belate-Softscrabble-Torro; 3562, Locane-Coztur-Punchbowl association; 3741, Kelk-Settlemeyer; 3851, Decram-Hapgood; 3960, Pineval gravelly loam, 2 to 4 percent slopes; 3964, Pineval-Orovada; 3991, Settlemeyer-Pineval; 3992, Settlemeyer complex; and 4041, Hymas-Xine-Attella.

The majority of the soils on BLM-managed public lands are clay loams. Additionally, several calcareous soils are also present. These soils range from very low to high available water capacity. The soils are generally shallow to deep, ranging from rock outcrops to 80 inches deep.

3.8.2 Environmental Consequences

3.8.2.1 Proposed Action

Approximately 217.4 acres of total disturbance are anticipated for this Project. Approximately 55.3 acres of short term disturbance and 127.2 acres of long term disturbance are anticipated on public lands managed by the BLM. Approximately 10.3 acres of short term disturbance and 0.2 acres of long term disturbance are anticipated on National Forest System Lands. For purposes of this analysis, long term disturbance is defined as surface area that would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately 5 years to ensure that reclamation is successful, as determined by the appropriate agencies). Short term disturbance is defined as that surface disturbance which would undergo interim reclamation, in accordance with the Project reclamation plan (see Appendix B).

The potential for wind erosion within the Project Area is relatively low. The water runoff potential for the soil associations is generally moderate to high.

Figure 17: Soils Associations (Source: N.R.C.S.)

- 230 kV Transmission Line-Proposed
- Line Fold
- Proposed Powerline Alternative
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Forest Service

Soils Associations

- Akerue-Simpark-Punchbowl
- Allor-Wieland
- Decram-Hapgood
- Dewar gravelly loam, 2-8 % slopes
- Grassval-Oxcorel
- Locane-Coztur-Punchbowl
- Muni-Orovada-Unlus
- Novacan cobbly loam, 2-8 % slopes
- Orovada fine sandy loam, 0-2 % slopes
- Punchbowl-Locane-Nobuck
- Punchbowl-Robson-Rock outcrop
- Robson-Ninemile-Ravenswood
- Settlemeyer-Pineval
- Walti-Sumine-Softscrabble
- Zaidy-Allor

0 0.5 1 Mile

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The data shown on this map uses the Universal Transverse Mercator (Zone 11N) Coordinate system and uses the NAD83 projection.

Map Date: 05/11/2011

Surface disturbance and vegetation removal during construction of proposed project facilities within the Project Area would increase the potential for erosion through exposure of denuded surfaces. Additionally, soil will be compacted during construction activities due to heavy vehicle travel and heavy equipment use.

To minimize erosion from storm water runoff, access roads would be maintained consistent with best management practices. Storm water would be intercepted and channeled to dissipate energy as necessary to minimize erosion around the power plant (USDI and USDA 2007, p. 16). Based on implementation of adopted environmental protection measures specified by Ormat, water would be applied to the ground during construction as necessary to control dust. Each of the well pads, access roads and the power plant site would be surfaced with aggregate, which would minimize dust and stabilize erosive soils. Additionally, disturbed areas would be reclaimed (see Section 2.1.11 and Appendix B).

An NDEP-BAPC Surface Area Disturbance (SAD) Permit, documenting the areas of proposed disturbance and the best practical dust control methods to be use, will be required for activities conducted within the Project Area because the surface disturbed would be greater than 5 acres (see Section 0). Implementation of the applicable best practical dust control methods would minimize fugitive dust emissions and soil erosion from wind and water during all phases of the proposed Project.

Ormat's AEPMs, NDEP permit requirements for fugitive dust controls, use of BMPs, and implementation of the proposed final reclamation plan will ensure impacts to soils are limited or managed appropriately.

3.8.2.2 Alternative 1

The construction, operation and maintenance of Alternative 1 would differ from the Proposed Action only by the increase (5.0 acres) in the total long term surface disturbance. The impacts of Alternative 1 to soils would not be different from that of the Proposed Action.

3.8.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This would result in additional impacts to soils from exposure to erosion and compaction. See the 2009 Geothermal Exploration EA for a complete analysis of potential soils impacts.

3.9 VEGETATION

3.9.1 Affected Environment

The Project Area is within typical plant communities within the Great Basin and Range physiography and a precipitation zone of 7 to 15 inches. The primary plant communities include pinyon-juniper, basin big sagebrush, low sagebrush, Wyoming big sagebrush and meadows.

A list of plant species by life form that were observed during the biological survey is provided in Table 11 below.

Table 11: Plants Observed at McGinness Hills

Plants	Scientific Name	Life Form			
		Grass	Forb	Shrub	Tree
Arrowleaf balsamroot	*Balsamorhiza sagittata*		x		
Biscuitroot	*Lomatium* sp.		x		
Bitterroot	*Lewisia rediviva*		x		
Black greasewood	*Sarcobatus vermiculatus*			x	
Black sagebrush	*Artemisia nova*			x	
Bladder pod	*Lesquerella* sp.		x		
Bluebunch wheatgrass	*Pseudoroegneris spicata*	x			
Bottlebrush squirreltail	*Elymus elymoides*	x			
Bulbus bluegrass	*Poa bulbosa*	x			
Bur buttercup	*Ceratocephala testiculata*		x		
Cheatgrass	*Bromus tectorum*	x			
Cushion desert buckwheat	*Eriogonum caespitosum*		x		
Death camas	*Zigadenus venenosos*		x		
Desert yellow fleabane	*Erigeron linaris*		x		
Douglas rabbitbrush	*Chrysothamnus viscidiflorus*			x	
False dandelion	*Agoseris glauca*		x		
Fennel desert parsley	*Lomatium foeniculaceum*		x		
Foxtail barley	*Hordeum jubatum*	x			
Giant lomatium	*Lomatium dissectum*		x		
Great Basin desert buckwheat	*Eriogonum desertorum*		x		
Great Basin wildrye	*Leymus cinereus*	x			
Halogeton	*Halogeton glomeratus*		x		
Hawksbeard	*Crepis accuminata*		x		
Idaho fescue	*Fescue idahoensis*	x			
Indian paintbrush	*Castilleja angustifolia*		x		
Indian ricegrass	*Achnatherum hymenoides*	x			
Inland salt grass	*Distichlis spicata*	x			
Iris	*Iris* sp.		x		
Juniper	*Juniperus osteosperma*				x
Kentuck bluegrass	*Poa pratensis*	x			
Large-fruited biscuitroot	*Lomatium macrocarpum*		x		
Larkspur	*Delphinium* sp.		x		

Plants	Scientific Name	Life Form			
		Grass	Forb	Shrub	Tree
Littleleaf Horsebrush	*Tetradymia glabrata*			x	
Low fleabane	*Erigeron pumilus*		x		
Low sagebrush	*Artemisia arbuscula* ssp. *longiloba*			x	
Lupine	*Lupinus* sp.		x		
Mat muhly	*Muhlenbergia richardsonis*	x			
Meadow foxtail	*Alopercurus pratensis*	x			
Milkvetch	*Astragalus* sp.		x		
Mountain big sagebrush	*Artemisia tridentata* ssp. *vaseyana*			x	
Mountain brome	*Bromus carinatus*	x			
Mountain mahogany	*Cercocarpus ledifolius*				x
Mules ear	*Wyethia*		x		
Munroe globemallow	*Sphaeralcea munroana*		x		
Needle-and-thread grass	*Stipa* sp.	x			
Nevada desert parsley	*Lomatium nevadense*		x		
Oval leaf desert buckwheat	*Eriogonum ovalifolium*		x		
Penstemon	*Penstemon* sp.		x		
Phlox	*Phlox* sp.		x		
Pinyon pine	*Pinus monophylla*				x
Prickly pear cactus	*Opuntia sp.*			x	
Puccoon	*Lithospermum ruderale*		x		
Rayless daisy	*Erigeron aphanactis*		x		
Rubber rabbitbrush	*Ericameria nauseosa*			x	
Rushes	*Juncus* sp.	x			
Salsify	*Tragopogon dubius*		x		
Sandberg bluegrass	*Poa sandbergii*	x			
Sedges	*Carex* sp.	x			
Sego lily	*Calochortus nuttallii*		x		
Snakeweed	*Xanthocephalum sp.*			x	
Spiny hopsage	*Grayia spinosa*		x	x	
Thurber's needlegrass	*Achnatherum thurberianum*	x			
Vetch	*Astragalus* sp.		x		
Western wheatgrass	*Paxcopyrum smithii*	x			
Whorled buckwheat	*Eriogonum heracleoides*		x		
Willow	*Salix* sp.				x
Winterfat	*Krascheninnikovia lanata*			x	
Wyoming big sagebrush	*Artemisia tridentata* ssp. *wyomingensis*			x	

Based on field surveys (see Section 3.5), 21 different vegetation community types are within one mile of the Project Area. Seventeen of the vegetation community types occur on BLM managed lands, 7 occur on National Forest System lands, and 3 occur on both BLM and National Forest System lands (see Figure 18 and Table 12).

There has been one recorded fire in the proposed project area. The fire occurred in 1985 and burned approximately five acres. Outside the project area, the nearest fire was the Iowa Complex

fire (Silver Creek) of 2006 which burned about 1,740 acres. This fire was approximately four miles west of the proposed Project Area.

A discussion of sensitive plant species can be found in Section 3.5.

Table 12: Vegetation Communities Within One Mile of Project Components

	Vegetation Type	Proposed Action		Alternative 1	
		Short Term (ac)[1]	Long Term (ac)[1]	Short Term (ac)[1]	Long Term (ac)[1]
Geothermal Components					
Wells	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	7.8	68.0	7.8	68.0
	Black sagebrush-Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	0.2	8.0	0.2	8.0
	Black sagebrush/Indian ricegrass	0.2	4.0	0.2	4.0
	Black sagebrush-Low sagebrush/Indian Ricegrass-Bluebunch wheatgrass	0.2	4.0	0.2	4.0
	Basin big sagebrush-Wyoming big sagebrush/Basin wildrye	0.2	4.0	0.2	4.0
	SUBTOTAL	**8.6**	**88.0**	**8.6**	**88.0**
Pipelines	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass1	37.1	18.7	37.1	18.7
	Basin big sagebrush-Wyoming big sagebrush-rubber rabbitbrush/Basin wildrye5	5.2	2.4	5.2	2.4
	Black sagebrush-Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass2	0.7	0.4	0.7	0.4
	Black sagebrush/Indian ricegrass3	0.7	0.4	0.7	0.4
	Black sagebrush-Low sagebrush/Indian ricegrass-Bluebunch wheatgrass	0.2	0.1	0.2	0.1
	SUBTOTAL	**43.9**	**22.0**	**43.9**	**22.0**
Power Plants	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	0	32.9	0	32.9
	SUBTOTAL	**0.0**	**32.9**	**0.0**	**32.9**
Access Roads	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	1.0	4.1	1.0	4.1
	Black sagebrush-Wyoming big sagebrush/Indian Ricegrass-Thurber's Needlegrass	0.1	0.4	0.1	0.4
	Black sagebrush/Indian ricegrass	0.1	0.4	0.1	0.4
	Basin big sagebrush-Wyoming big sagebrush-Rubber rabbitbrush/Basin wildrye	0.1	0.4	0.1	0.4
	SUBTOTAL	**1.3**	**5.3**	**1.3**	**5.3**
Transmission Line Components					
Tangent Pole Placement	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	2.4	0.1	1.2	0.2
	Pinyon-Juniper/Big sagebrush-Low sagebrush/Bluebunch wheatgrass	1.0	0.1	0.5	0.0

	Vegetation Type	Proposed Action		Alternative 1	
	Black sagebrush/Indian ricegrass	0.3	0.0	n/a	n/a
	Low sagebrush	n/a	n/a	0.1	0.0
	SUBTOTAL	**3.7**	**0.2**	**1.8**	**0.2**
Angle Pole Placement	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	0.7	0.1	1.5	0.1
	Pinyon-Juniper/Big sagebrush-Low sagebrush/Bluebunch wheatgrass	0.7	0.0	n/a	n/a
	Low sagebrush	n/a	n/a	0.7	0.0
	SUBTOTAL	**1.4**	**0.1**	**2.2**	**0.1**
Stringing Sites	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	4.0	0.0	2.5	0.0
	Pinyon-Juniper/Big sagebrush-Low sagebrush/Bluebunch wheatgrass	2.0	0.0	n/a	n/a
	Black sagebrush/Indian ricegrass	1.0	0.0	n/a	n/a
	Low sagebrush	n/a	n/a	1.0	0.0
	SUBTOTAL	**7.0**	**0.0**	**3.5**	**0.0**
Access Roads	Wyoming big sagebrush/Indian ricegrass-Thurber needlegrass	0.3	0.0	n/a	n/a
	Pinyon-Juniper/Big sagebrush-Low sagebrush/Bluebunch wheatgrass	1.5	0.0	n/a	n/a
	SUBTOTAL	**2.8**	**0.0**	**0.0**	**0.0**
Substation	Black sagebrush/Indian ricegrass	n/a	n/a	0.0	5.0
	SUBTOTAL	**n/a**	**n/a**	**0.0**	**5.0**
	TOTAL	**68.7**	**148.5**	**61.3**	**153.5**

1 Acreages are approximate.

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action

Surface disturbance associated with the proposed Project activities within the McGinness Hills Unit Area and along the transmission line corridor would result in the loss of vegetation (see Table 12). For purposes of this analysis, long-term disturbance is defined as surface area that would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately five years to ensure that reclamation is successful, as determined by the appropriate agencies). Short-term disturbance is defined as that surface disturbance which would undergo interim reclamation, in accordance with the Project reclamation plan (see Appendix B).

Approximately 68.7 acres of the proposed disturbance within the Project Area is "short-term" (see Table 5), and would undergo interim reclamation, in accordance with the Project reclamation Plan (see Appendix B). Approximately 148.5 acres of proposed disturbance within the Project Area is "long-term" (see Table 5) would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately five years to ensure that reclamation is successful, as determined by the appropriate agencies).

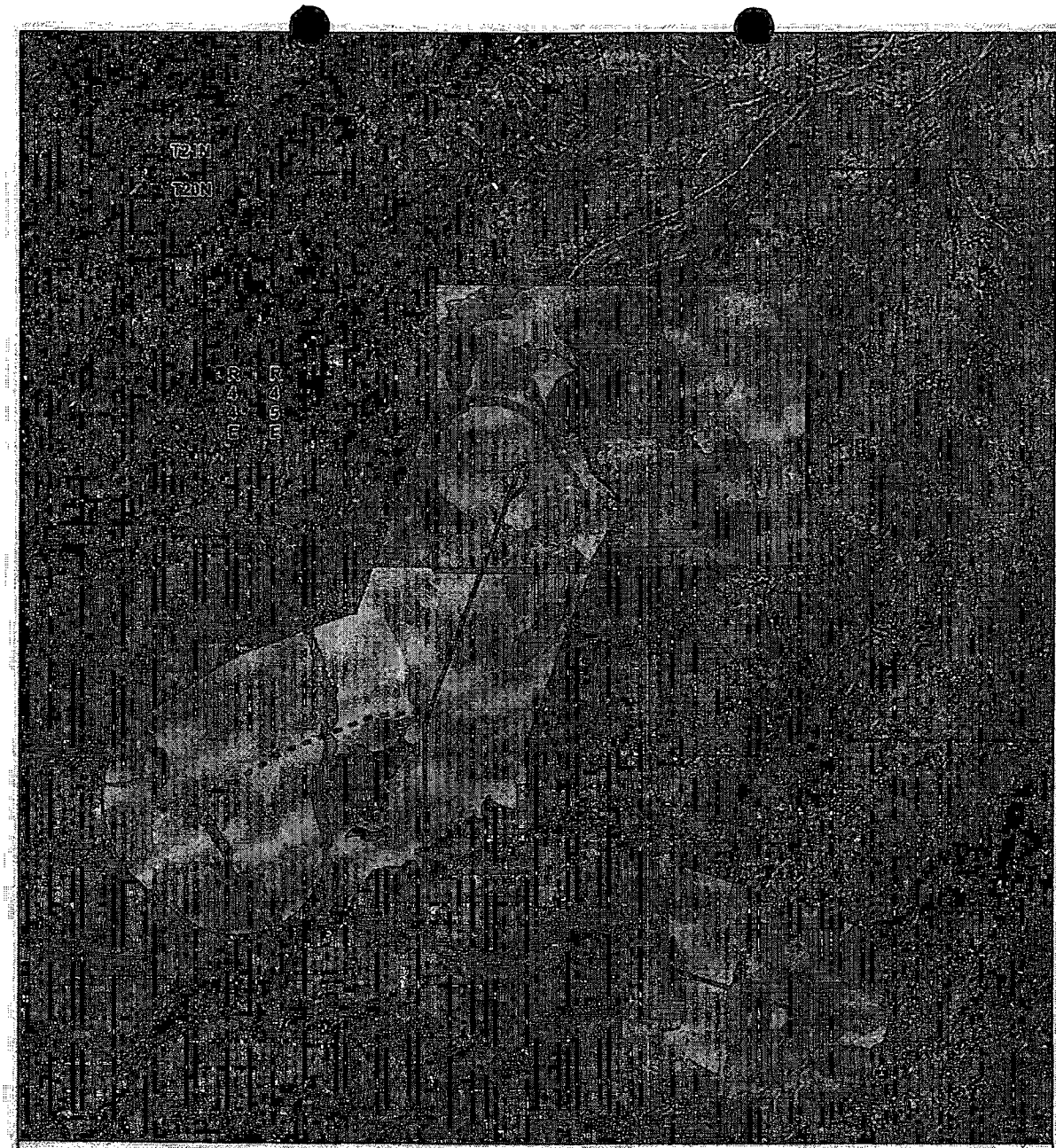


Figure 18: Vegetation Communities Within One Mile of the Project Components.

- 230 kV Transmission Line Proposed
- Proposed Powerline Alternative
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Forest Service Lands

U.S. Forest Service Administered Lands

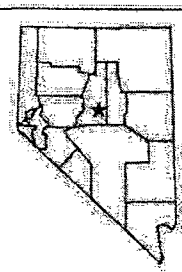
- Pinion Juniper-Big Sagebrush-Low Sagebrush, Bluebunch Wheatgrass
- Wyoming Big Sagebrush, Indian Ricegrass-Thurber's Needlegrass
- Low Sagebrush-Wyoming Big Sagebrush
- Meadow
- Basin Big Sagebrush-Wyoming Big Sagebrush-Rubber Rabbitbrush, Basin Wildrye
- Basin Big Sagebrush-Rubber Rabbitbrush
- Low Sagebrush

B.L.M. Administered and Private Lands

Major Shrub(s), Major Grass(es)

- Basin Big Sagebrush-Wyoming Big Sagebrush-Rubber Rabbitbrush, Basin Wildrye
- Black Sagebrush, Indian Ricegrass
- Black Sagebrush-Low Sagebrush, Indian Ricegrass-Bluebunch Wheatgrass
- Black Sagebrush-Wyoming Big Sagebrush, Indian Ricegrass
- Black Sagebrush-Wyoming Big Sagebrush, Indian Ricegrass-Thurber's Needlegrass
- Low Sagebrush-Black Sagebrush, Idaho Fescue-Mountain Brome
- Low Sagebrush-Mountain Big Sagebrush, Bluebunch Wheatgrass-Idaho Fescue
- Pinion-Juniper-Big Sagebrush-Low Sagebrush, Bluebunch Wheatgrass
- Wyoming Big Sagebrush, Indian Ricegrass-Thurber's Needlegrass
- Wyoming Big Sagebrush-Black Sagebrush, Thurber's Needlegrass-Bluebunch Wheatgrass

0 1 2 Miles



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The data shown on this map uses the Universal Transverse Mercator (Zone 11N) Coordinate system and uses the NAD83 projection.

Map Date : 05/17/2011

Disturbed areas could have an increase in cheatgrass compared to non-disturbed areas (see Section 3.6).

As part of the Project and Ormat's AEPMs, disturbed areas would be reclaimed in accordance with applicable BLM requirements (see Section 2.1.11 and Appendix B). The following mitigation measures, applied to BLM grazing allotments by pasture or use area, would initiate revegetation of disturbed areas and minimize the spread of invasive, nonnative species.

Mitigation Measures:

Disturbed areas would be treated with a pre-emergent herbicide for the control of cheatgrass following the application of the seed mix and prior to plant emergence. Treatment would be application of PLATEAU™ or an equivalent herbicide (Imazipic is the active ingredient), following the reseeding, at an application rate of 2-12 ounces/acre.

Seeding of disturbed areas within the Unit Area (Lake Ranch Pasture/Use Area) would be completed using the following BLM-approved native seed mixture and application rate:

Grass	Scientific Name	Pounds/acre (bulk)
Indian ricegrass	*Achnatherum hymenoides*	5.5
Needleandthread	*Hesperostipa comata*	6
Bottlebrush squirreltail	*Sitanion hystrix*	2.5
Forb		Pounds/acre (bulk)
Scarlet globemallow	*Sphaeralcea coccinea*	1
Western yarrow	*Achillea millefolium*	1
	Total Pounds/acre	16.0 lbs

Seeding of disturbed areas associated with the transmission line (Rye Patch Pasture/Use Area and Lake Ranch Pasture/Use Area) would be completed using the following BLM-approved native seed mixture and application rate:

Grass	Scientific Name	Pounds/acre (bulk)
Indian ricegrass	*Achnatherum hymenoides*	4
Needleandthread	*Hesperostipa comata*	5
Bluebunch wheatgrass*	*Pseudoroegneria spicata*	4.5
Forb		Pounds/acre (bulk)
Scarlet globemallow	*Sphaeralcea coccinea*	1
Sulfur flower	*Eriogonum umbellatum*	1
	Total Pounds/acre	15.5 lbs
* The cultivar of Bluebunch Wheatgrass used to seed disturbed areas would not be the Snake River Bluebunch wheatgrass *(Elymus wawawaiensis)*		

All seeding plans for BLM-managed lands would be reviewed and approved by the Mount Lewis Field Manager prior to implementation; to include seed mixtures, seeding rates,

methods and timing. All seeding plans for USFS-managed lands will be reviewed and approved by the USFS prior to implementation; to include seed mixtures, seeding rates, methods and timing.

The application of seed is prohibited from May 15 to September 15. Fall seeding is required for grass and forb species. Seeding will be conducted after September 15 and prior to ground freezing. Shrub species will be seeded separately during the winter. Interim soils stabilization (see the Reclamation Plan, Appendix B for interim soils stabilization requirements) from May 15-September 15 will be required to prevent loss of soils and preventing fugitive dust emissions.

Application of seed may be accomplished using BMPs and as determined by the appropriate land management agency. Seed application may include drill seeding, broadcast seeding, and broadcast seeding followed by disking or harrowing.

To reduce the threat of fire from project operations in and along the liner transmission line and to protect project infrastructure from severe fires, an annual fuels monitoring program would be implemented. Fuel loads within the area of the transmission line corridor (including 300 feet each side of the centerline of the ROW) would be monitored using the "Stereo Photo Series for Qualifying Natural Fuels Volume IV: Pinyon-Juniper, Chaparral, and Sagebrush Types in the Southwestern United States" or other BLM-approved method. Maximum acceptable fuel loads are:

- **10 tons per acre of total above-ground biomass or less in Pinyon-Juniper habitats**
- **2 tons per acre of total above ground biomass or less in sagebrush habitats**
- **800 pounds per acre of fine fuels in grasses**

Monitoring and Trigger Points

Monitoring of all revegetation efforts will be required for a minimum of two growing seasons after re-seeding takes place for all surface disturbances resulting from the proposed project. Revegetation will be considered successful when the standards outlined in "Attachment B Nevada Guidelines for Successful Revegetation for the Nevada Division Of Environmental Protection, the Bureau Of Land Management and the U.S.D.A. Forest Service" (September 3, 1988) have been met. Failure to meet this standard after two full growing seasons will require Ormat, working with the appropriate responsible agency, to re-seed the area.

The first fall season after surface disturbance (after September 15) will trigger reseeding efforts on surface disturbed areas.

Should monitoring determine that project area fuel loads exceed these levels, appropriate fuel treatments would be required. These may consist of mowing, mastication, high intensity and short-term grazing, hand thinning, and chemical treatment. If required, the specific fuel treatment

program and area would be determined in coordination with and approved by the BLM- or USFS-authorized officer, as appropriate.

Effectiveness of Mitigation

Proper application of seeding, within the established time frames, along with application of a pre-emergent herbicide will limit cheatgrass establishment. Monitoring for revegetation and meeting the prescribed successful revegetation goals will ensure successful reclamation of all surface disturbances.

Proper implementation of fuels treatment/s within the transmission line corridor and within the buffer zone would protect the transmission lines from likely damage from a high intensity wildland fire. This would ensure a continued supply of electricity from Ormat's geothermal generating facility to Nevada's power grid.

Mitigation Impacts

The surface areas disturbed by construction, maintenance, and operations of the facilities will have all appropriate cultural and biological clearances prior to those disturbances; thus, additional clearances prior to revegetation will not be required.

Revegetation will have positive impacts including: 1) soil stabilization; 2) re-establishment of habitat vegetation for wildlife and grazing forage; 3) visual evidence of construction scars should be reduced or eliminated, and 4) re-establishment of desirable, native plant species.

Ormat is required to provide a financial bond for all reclamation activities, including revegetation. This does represent a financial impact to the proponent.

Implementation of the Proposed Action would increase the potential for human caused fires during the construction and operation of the proposed Project. During transportation and storage, accidental discharge of flammable materials or chemicals (such as pentane or fuel) could increase the likelihood of fires along the County Road or at the power plant site. Impacts from these fires would vary based on fire size and intensity and could result in the destruction of structures, livestock forage, wildlife habitat, and loss of native vegetation.

A hazardous material handling, storage, and transportation plan has been produced which would reduce the potential for fires (see Section 3.12). Ormat has also proposed AEPMs to further reduce the potential for human-caused fires (see Section 2.1.11). Additionally, the Project includes the development of a wildland fire prevention and control plan, as identified in the Utilization Plan and Operations Plan, which describes prevention measures and the actions Ormat would take in the event of wildland fire.

Power transmission lines have been known to start fires from either arcing or electrocution of birds. Installation of anti-electrocution perching devices on power poles and maintenance of

roads and/or constructing fuel breaks along the ROW would also reduce the potential for wildland fires.

As noted in the beginning of Chapter 3, all requisite clearances such a cultural clearances (if not already completed), migratory bird clearances etc. will be required to be completed prior to implementation of any fuels treatment mitigation within and around the transmission corridor.

Mowing or mastication of vegetation fuel treatments would reduce the overall fuel concentrations in and around the transmission line corridor. Both vertical and horizontal continuity of the fuel bed will be reduced, thus limiting wildland fire size and intensities in the transmission corridor area. These fuel reductions will protect the transmission line infrastructure and ensure continued electrical supply to the power grid. Machinery used to conduct fuels treatments would have low-impact tires or tracks, which would minimize soils disturbance.

High intensity and short-term managed grazing could be used to reduce fine fuel loads (mostly grasses and low forbs) in the transmission corridor area. Some trampling of soils and plants would occur because of grazing animals. Specific timeframes and grazing criteria will be established based on measured fuels loads by the appropriate land management agency.

Individuals using chain saws, brush hooks and other hand tools to selectively remove heavier wildland fuels such as brush and pinion pine and juniper trees accomplish hand thinning. The resulting "slash",i.e. the removed vegetation, will be physically removed from the transmission corridor location so as to ensure fuel reduction goals. Some trampling of vegetation and soil disturbance will result from human foot traffic during this fuel reduction process.

Chemical treatment or herbicide spraying for BLM lands has been analyzed in the Battle Mountain District's Programmatic Weed Treatment environmental analysis (2009). All appropriate requirements, both BLM and Nevada State regulations will be followed if this option is to be used on BLM lands. The most likely herbicide treatment would be the application of Plateau or similar cheatgrass herbicide for killing and reducing cheatgrass on BLM lands.

3.9.2.2 Alternative 1

The construction, operation and maintenance of Alternative 1 would differ from the Proposed Action only by the increase (5.0 acres) in the total long term surface disturbance. The impacts of Alternative 1 to vegetation would be slightly greater than that of the Proposed Action. The mitigation measures recommended for the Proposed Action would be equally applicable to Alternative 1.

3.9.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This would result in additional loss of vegetation. See the 2009 Geothermal Exploration EA for a complete analysis of potential effects to vegetation.

3.10 WATER QUALITY AND QUANTITY

3.10.1 Affected Environment

The proposed Project area includes two watersheds. The Grass Valley Hydrographic Area (Basin 138) covers only the extreme north end and a small portion of the northeast corner. The Big Smoky Valley – Northern Part Hydrographic Area (Basin 137B) covers the remainder of the Project area. Both watersheds are located within the Central Hydrographic Region. The water well from which water for construction and decommissioning activities will be obtained is located on the Grass Valley Ranch in Basin 138.

Basin 137B is a "designated" ground water basin, while Basin 138 is not. Ground water basins are "designated" by the Nevada State Engineer, Department of Conservation and Natural Resources, Division of Water Resources (NDCNR-DWR) when permitted ground water rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration. Designation of Basin 137B occurred in 1983.

On average, Basin 137B receives about six inches of precipitation annually (Rush and Schroer, 1971). The northern part of the Basin is topographically closed so there is no external surface water inflow or outflow (Rush and Schroer, 1971). Within the Project area, surface water generally flows from the north to the south and ground water generally flows to the playa south of the Project area.

The Nevada Division of Water Resources lists the safe yield of Basin 137B as 65,000 acre-feet per year. The hydrographic basin summary lists the major uses of groundwater for Basin 137B as irrigation, 37,463 acre-feet/year, and mining and milling, 14,612 acre-feet/year. The Nevada Division of Water Resources lists the total active annual duty of groundwater for the basin as 54,888 acre-feet/year.

Within Basin 137B, the nearest use of groundwater for irrigation is located approximately 15 miles south southwest (NW1/4 SE1/4 Sec 19, T.17N., R.45E) of the Project. The nearest major mining operation is located approximately 60 miles south southwest of the Project.

Basin 138 is also topographically and hydrologically closed with principal surface and ground water movement toward the playa in the northern part of the valley (Everett and Rush, 1966). Most of the groundwater is contained in the alluvium and occurs under both artesian and water-table conditions (Everett and Rush, 1966). The safe perennial yield for Basin 138 is 13,000 acre-feet/year. The Nevada Division of Water Resources lists the current underground active duty as 12,630 acre-feet/year. The basin has not been designated by the State Engineer.

There are two irrigation wells and one stockwater well located on the Grass Valley Ranch (T21N R46E Section 16) in the southwestern portion of the basin. Irrigation well 87788 (Nevada State Engineer well log number) has an annual duty of approximately 1,448 acre-feet, and irrigation well 14532 has an annual duty of 1,613 acre-feet. The stockwater well 9804 has an annual duty of about 8 acre-feet/year. The wells are completed in a confined aquifer. Annually, one of the irrigation wells is pumped beginning July 1st, the second August 1st. Both wells are pumped at a flow rate of approximately 1,300 gpm. The wells are turned off in mid-September (Lancaster, Luke, 2010). Based on this information, the total amount of irrigation water pumped from the Grass Valley Ranch wells is approximately 707 acre-feet/year, approximately 2,300 acre-feet/year less than the current active duty.

Approximately ten un-named cold springs and Canyon Cold Spring occur within the Project area (see Figure 19). The flow from these springs vary with the seasons, being highest in the spring and lowest in the fall, when some are dry (7Q10, Inc. 2010). Monitoring of these springs for flow (water level), chemistry and temperature began in early 2010 and is ongoing (7Q10, Inc. 2010). No known thermal (hot) springs occur in or near the Project area (Garside and Schilling 1979).

The NDCNR-DWR water rights and well drillers log databases show that there are two vested water rights in the proposed Project area. These vested water rights are for obtaining water for livestock from Ox Corral Creek (SE1/4, SW1/4, Section 15, T20N, R45E) and from an unnamed spring (SW1/4, SW1/4, Section 14, T20N, R45E) in the Project area.

A search of the NDCNR-DWR well log database for water wells drilled within the Project area showed that there are no on-line records of any water wells having been drilled in the Project area. The search was widened to find the water wells closest to the Project area reported to the NDCNR-DWR. This search identified a well, drilled in 1947, located approximately one-half mile north of the Project area in the Basin 138.

A search of the United States Geological Survey (USGS) Nevada ground-water levels database showed two water wells located within the Project area and one located approximately one-half mile north of the Project area. The USGS reported that this latter well, the same well identified in the NDCNR-DWR well log database, had a water level of 10 feet below ground level when measured in 1948, the only measurement reported (Basin 138). The former two wells were both located within Basin 137B. The water levels in these wells were also each measured only once (at 17 feet and 29 feet below ground level), with the most recent of the two measured in 1984. It is unknown whether any of these wells are still in existence. A search of the USGS Nevada ground water level and surface water databases showed no water flow rate information had been recorded by the USGS for springs in the Project area.

Past mineral exploration in or near the Project area indicated the presence of hot water resources. Exploration holes drilled 300 meters deep through the silica sinter cap near the middle of the Project area in 2004 intercepted near-boiling waters (up to 190°F [88°C]) with some geysering action observed in one hole. Samples of the artesian hot water collected from two drill holes yielded chemical "geothermometer" temperatures of 304°F and 380°F (151°C and 193°C) (NBMG 2008).

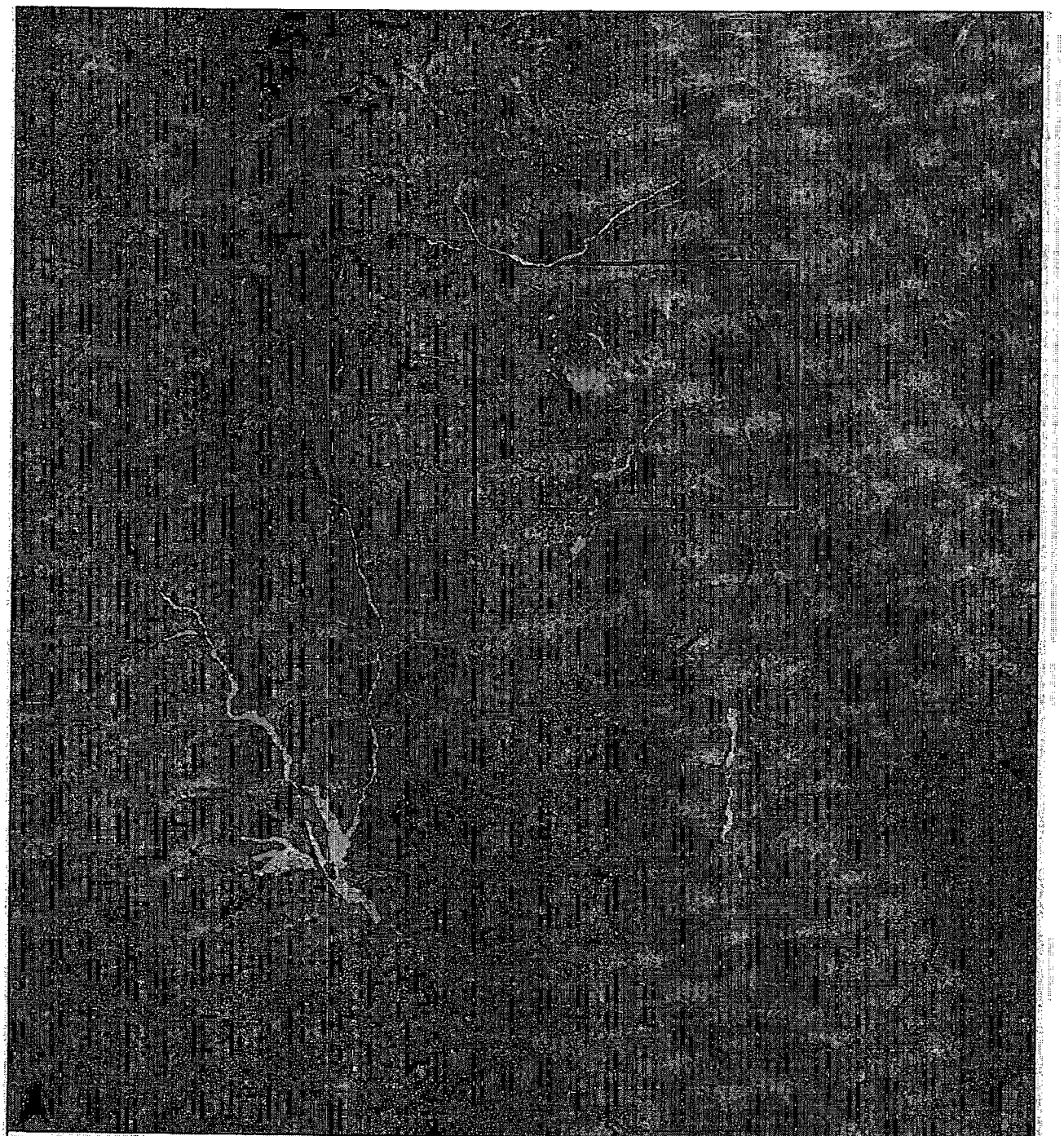

Figure 19: Springs, Seeps, Wet Meadows, and Riparian Areas Recorded through BLM Monitoring in the Vicinity of the McGinness Hills Project Area (BLM 2011).

Water Resource
Proposed Project 2-mile Buffer
Alternative Project 2-mile Buffer
Geothermal Unit Area
Monitoring Well
Proposed Access Road
Proposed Injection Pipeline and Wells
Proposed Production Pipeline and Wells
Power Plant
Proposed Power Line
Alternative Power Line

1:97,430

0 0.35 0.7 1.4 2.1 2.8 Miles

NATIONAL SYSTEM OF PUBLIC LANDS

*No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual use or aggregate use with other data.

The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection. Map date: 03/25/2011.

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Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820

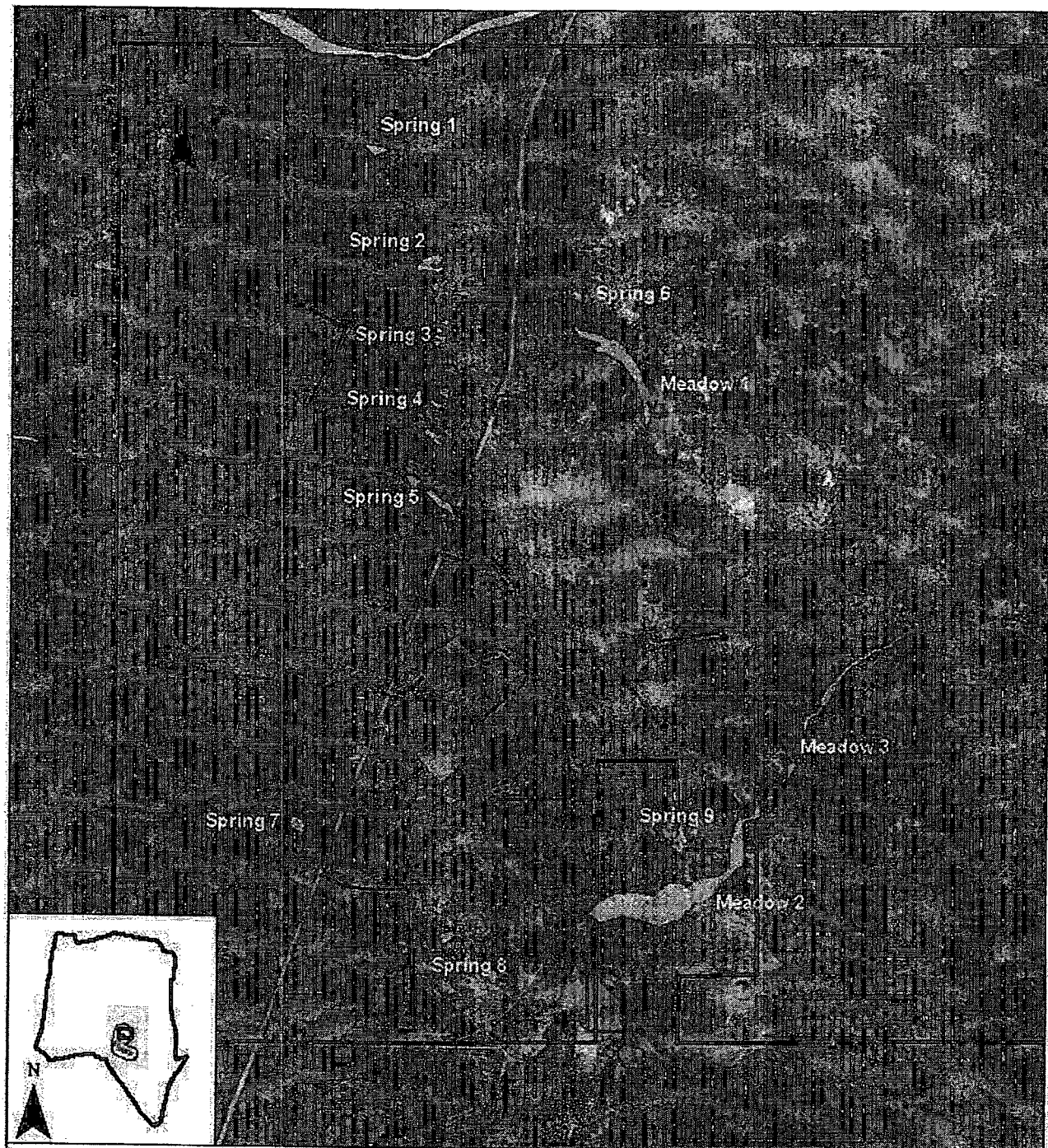

Figure 20. Springs, Seeps, Wet Meadows, and Riparian Areas Recorded through BLM Monitoring in the Vicinity of the McGinness Hills Project Area (BLM 2011).

Water Resource
Proposed Project 2-mile Buffer
Alternative Project 2-mile Buffer
Monitoring Well
Proposed Access Road
Geothermal Unit Area
Proposed Injection Pipeline and Wells
Proposed Production Pipeline and Wells
Power Plant
Proposed Power Line
Alternative Power Line

NATIONAL SYSTEM OF PUBLIC LANDS

1:24,358

0 0.1 0.2 0.4 0.6 0.8 Miles

*No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual use or aggregate use with other data.

The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection. Map date: 03/25/2011

United States Department of the Interior
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50 Bastian Road
Battle Mountain, NV 89820

Through the exploration environmental assessment (NV063-EA08-093) only TGH sites 22-10 and 62-11 are located within Basin 138. The remaining 25 TGH sites and/or well sites are located in Basin 137B. Also temporary water wells were approved to be constructed at sites 88-16, 38-15, 18-22, and/or 33-22. These wells were located down-gradient from all seep and spring sources, wetlands, and riparian zones. In June 2009, NDCNR-DWR issued a waiver to drill one temporary water well in Basin 137B to support drilling operations.

Temperature and chemical quality data for the cold water springs within the Unit Area were collected in 2008 and 2010 by Ormat and 7Q10, respectively. Chemical quality is dilute, with total dissolved solids (TDS) ranging from 103 to 186 mg/l (parts per million) and temperatures ranging from 42 to 52 degrees F (7Q10, Inc. 2010). Geothermal fluid is affected by the high temperatures encountered and includes increased concentrations of boron, silica, fluoride and lithium. These concentrations are substantially higher than the cold water springs which indicates there is no mixing between the water resources (7Q10, Inc. 2010).

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

The Proposed Action would likely have no direct impacts on the quality or quantity of either surface or groundwater. The amount of water required for well drilling is relatively small (approximately 30,000 gallons per day for each well) and the geothermal power plants have closed systems injecting the geothermal fluid back into the deeper geothermal aquifer. All wells drilled to date have been reviewed and approved by BLM, Nevada Division of Minerals (NDOM) and NDEP as necessary. Well drilling includes a drilling plan, emergency plans and safety plans. Any new wells would be drilled using air or non-toxic drilling mud. Wells would be cased with steel through the shallow groundwater aquifer to minimize the potential for contamination. Reserve pits, lined with an approved pit liner, would be constructed at each well location for containment and temporary storage of drilling mud, drill cuttings, geothermal fluid and storm water runoff. The Underground Injection Control Permit from the Nevada Department of Environmental Protection, Bureau of Water Pollution Control (NDEP-BWPC) would require that the injection program be designed and monitored to prevent degradation of underground sources of drinking water due to geothermal fluid injection practices.

Project construction, including construction of the power plants, wells and well pads, geothermal pipelines, access roads and transmission line, would involve removal of vegetation. This disturbance could result in increased sedimentation into seeps, springs and meadows, reducing water quality and decreasing infiltration and groundwater recharge. The total disturbance for the Proposed Action would be approximately 217 acres. A portion of this disturbance, estimated at almost 69 acres, would be short-term and reclaimed as soon as practical. However, more than 148 acres of the disturbed area would not be reclaimed until project decommissioning. Lack of vegetation and periodic disturbance for maintenance in these areas of long-term disturbance would potentially increase sedimentation and decrease infiltration and ground water recharge.

After the exploration EA was approved, Ormat obtained a lease for the Lake Ranch private land. Five additional production wells were constructed along with access roads. These access roads are in close proximity to Meadow 2 (see Figure 20) located on the private land. Disturbance from these roads could increase sedimentation into the meadow decreasing water quality. Access roads near Meadow 2 could reduce water infiltration and groundwater recharge. See Section 3.11.2 for proposed mitigation.

Over the life of the project, accidental discharges of geothermal fluids could contaminate surface or groundwater within the Project area. However, accidental discharges large enough to cause contamination are unlikely because of frequent inspections and ultrasonic testing of the pipelines, flow and pressure monitoring and well pump and pipeline valve shutdown features.

Only small amounts of petroleum products would be stored on site with the majority of products being brought in as needed. Petroleum products stored on site would have a containment structure large enough to contain the amount of product on site. The containment structure would be lined with an approved liner to prevent surface and groundwater contamination. A spill and disposal contingency plan, which describes the methods for cleanup and abatement of any petroleum hydrocarbon or other hazardous material spill, would be completed for the Project.

Erosion and sedimentation structures would be constructed to divert runoff around the constructed well pads, power plant sites and the substation into ditches and back into existing drainages. Construction of these structures will implement best management practices (Gold Book) to further minimize potential impacts to surface and groundwater contamination. Any ground disturbing construction would also implement best management practices to minimize erosion and water contamination.

A water well would be constructed at each of the power plants for domestic use. These wells would be located in hydrographic Basin 137B. Each well would consume approximately 20-30 gpm, or about 2.5-3.0 acre-feet/yr, over the life of the Project. Even though this is a small quantity of water, if the well is directly connected to the aquifer feeding the cold springs, it could affect the flow. Given the lack of groundwater data for the area in the immediate vicinity of the springs and seeps, it is not possible to predict the likelihood of such potential effects. See Section 3.11.2 for proposed mitigation.

The use of an additional 30.6 acre-feet of groundwater for well drilling and Project construction and 13.6 acre-feet of groundwater for Project decommissioning at projected rates would not exceed the safe perennial yield for Basin 138. Ormat must acquire the requisite waivers from the Nevada State Water Engineer's Office for this water use. By issuing this waiver, the Nevada State engineer certifies: 1) there is adequate water available for this beneficial use; 2) the Nevada State Engineer has determined there will be no effects to springs, seeps, or other water rights users.

Mitigation Measures

See Section 3.11.2.1 for mitigation measures for potential impacts to seeps, springs and meadows. The Agencies have not identified any other mitigation measures for impacts to this resource.

3.10.2.2 Alternative 1

Environmental impacts would be the same as the Proposed Action except for routing the transmission line across Burton Creek and requiring five acres of additional disturbance for a switching station. Water needed for construction of the switching station is estimated at between 10,000 and 20,000 gallons, depending on the time of year. This water use is included in the total estimated volume of water needed for construction of the alternative, which is the same as that of the Proposed Action. Surface disturbance associated with the construction of the transmission line and switching station would not occur within creeks or springs. Thus, Alternative 1 would have no direct impacts to water quality or quantity. Indirect impacts from construction are not expected when using best management practices for pole placement, site grading and sediment control.

3.10.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect, and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This could result in additional impacts to water quality and quantity. See the 2009 Geothermal Exploration EA for a complete analysis of these potential impacts.

3.11 WETLANDS AND RIPARIAN

3.11.1 Affected Environment

Figure 19 shows existing riparian areas in and around the Project area. These riparian areas consist of seeps, springs, meadows and perennial and ephemeral drainages. Most of the drainages within the Project area are ephemeral that flow only in response to runoff from storm events or snow melt. The ephemeral drainages within the Project area lacked riparian vegetation (GBE 2008). Drainages that were flowing when surveyed in late spring had narrow strips of riparian vegetation with upland vegetation immediately adjacent (GBE 2008). A larger area of riparian vegetation was identified in the southeast quarter of Section 14 where two drainages joined (GBE 2008). The private land (Lake Ranch) contains a large meadow and two springs.

Riparian vegetation observed included the following: sedges (*Carex* sp.), rushes (*Juncus* sp.), bluegrass (*Poa pratensis*), foxtail barley (*Hordeum jubatum*), mat muhly (*Muhlenbergia*

richardsonis), and meadow foxtail (*Alopercurus pratensis*). Iris (*Iris* sp.) and willow (*Salix* sp.) were also present in some areas (GBE 2008).

Little is known about the interaction between the seeps, springs, meadows and underlying geothermal resource. Ongoing monitoring of these water resources associated with the current McGinness Hills geothermal exploration project, will contribute to a better understanding of these resources. Pumping and injection of the geothermal fluid could cause indirect impacts such as changes in temperature or chemical makeup, reduced or increased flow, or stopping flow altogether. However, the water chemistry data suggests that there is essentially no interaction between the cold-water springs and the geothermal fluid.

3.11.2 Environmental Consequences

3.11.2.1 Proposed Action

There is no surface disturbance proposed within any wetlands or riparian vegetation, and no direct impacts are anticipated. However, indirect impacts from construction of pipelines and access roads and from geothermal production activities would occur. These impacts to Springs 2-6 and 8-9 along with Meadows 1 and 2 (see Figure 20) would consist of diminished use of these areas by wildlife, due to the presence and proximity of these new facilities and activities.

In addition, changes in temperature, chemical makeup or flow rates, or stopping flow altogether could be a result of Ormat's use of the geothermal resource. However, the water chemistry data suggests that there is essentially no interaction between the cold-water springs and the geothermal fluid.

Mitigation Measures

As noted in Section 3.5.2.1, anticipated indirect impacts to 34 acres of wetlands, springs, seeps, and riparian areas will be compensated by 136 acres (4:1 ratio) of protection, enhancement and/or restoration of habitat in targeted locations. These compensatory mitigation projects will be approved by the BLM, USFS and the NDOW on a site-by-site basis. See Appendix C for a detailed description of viable enhancement projects and their potential impacts.

If water flows or chemistry within springs 2-6, 8-9 and/or Meadows 1-2 are realized, Ormat would be required to modify operations to correct the impact to ensure flows are maintained at natural occurrence. If the effects cannot be corrected through operational changes, Ormat would be required to improve other existing seeps, springs and/or meadows within the 4:1 mitigation zone (Appendix C, Figure 1). Improvements, with approval from the BLM, USFS and the NDOW could include: fencing areas for habitat improvement using pipe and rail fencing, riparian enhancement through restoration efforts, or construction of small or big game guzzlers to supplement water sources (depending on current use of the spring by wildlife).

The following descriptions apply to piping water from one source to another and construction of guzzlers:

1. **Installation of a New Production Well.**

This mitigation measure consists of constructing a new water well to replace water from one or more springs or seeps. Installing a new well would include drilling to obtain sufficient water, installing appropriate casing, installing a pump with a power supply (windmill or solar electric), installing a tank to supply consistent flow, and installing piping to the affected spring or seep area. Water rights for this proposal would be within Ormat's current State Engineer's applications.

2. **Piping Water from a New or Existing Source.**

This mitigation measure consists of piping water from a new or existing water source to a spring or seep that has experienced a reduction in flow. This mitigation would include identifying a nearby, up gradient source that discharges sufficient water, or creating a new source such as a small reservoir, and installing a piping system to convey water to the affected surface water source to maintain flow and sustain the identified use(s).

3. **Installation of a Guzzler.**

This mitigation measure consists of installing a guzzler. Guzzlers are system used to collect precipitation and runoff and store the water in a surface or buried container. The container then feeds an open trough for use by livestock and/or wildlife. Installation of a guzzler would be completed at seeps and springs where the primary use of the water is for wildlife consumption. Guzzlers are use throughout Nevada, Utah, and other arid areas of the west to supply water for wildlife, especially during the dry summer months. The size of the system can vary depending on the species targeted for the system.

Larger guzzlers are needed for big game, while smaller systems can be used for small game and birds.

4. **Enhanced Development of an Existing Seep to Promote Additional Flow.**

This mitigation measure consists of enhancing flow by developing the existing seep or spring. The development typically would include the installation of a spring box and piping to direct water to a specific discharge point. This mitigation likely would be used in circumstances where there has been a decrease in flow but not a complete loss of flow at the source. These types of spring and seep enhancements (or improvements) are not expected to be effective at mitigating seeps or springs that have experienced a complete loss of flow due to project-induced groundwater drawdown, should this occur.

5. Fencing Measures for an Existing Seep to Maintain Flow.

This mitigation measure consists of fencing using pipe and pole fences or other protection measures for existing seeps. Many seeps and springs are substantially impacted by livestock and wild horses. These effects can result in reduced flow because of overgrazing of vegetation, thus increasing surface evaporation and damage to the seep or spring source.

Monitoring and Trigger Points

The current program of monitoring in these and the other identified springs (required under the 2008 Exploration EA) will be required to be continued under the development project for flow (water level), chemistry and temperature during project construction and operation. This monitoring would provide data, which would either confirm the absence of any connection between the cold-water springs and the geothermal reservoir; or provide documentation of adverse changes and information to develop effective correction measures.

Quarterly monitoring of the surface water resources are required and would be used to document the effectiveness of the implemented measures. In addition, the BLM has the ability to require the implementation of additional mitigation measures if the initial implementation is unsuccessful.

Through the monitoring program if any adverse impacts to the above springs are noted, mitigation implementation would be triggered.

Effectiveness of the Proposed Mitigation

Operational changes by Ormat would be required as identified above should the monitoring program detect any changes to the identified springs or meadows. These operational changes would either limit or eliminate the observed impact. Should these operational changes fail to meet the desired objectives, Ormat would be required to implement the additional prescribed mitigations measures in order to substitute for the losses to these resources.

Construction of a new well (method #1 above) to supplement or replace base flow affected by project-induced drawdown is anticipated to be a highly effective method to maintain the identified use(s) over the period of impact that may occur, including providing a water supply for livestock and/or wildlife and maintaining hydrophilic vegetation for habitat diversity. Well pumping is expected to provide a long-term sustainable source of water to supplement or replace the loss of base flow. There is some potential for the flow to be disrupted at times due to mechanical problems (including freezing pipes) or maintenance of the system. However, with appropriate maintenance and system monitoring, potential disruptions in flow likely would be of short duration (i.e., several days to several weeks).

Piping water from a new or existing source (method #2 above) also is anticipated to be an effective method to provide flow to supplement or replace base flow to springs or seeps affected by project potential effects. A sufficient up gradient source could provide a long-term sustainable

water supply to provide water for livestock and/or wildlife and maintain hydrophilic vegetation for habitat diversity. This measure is considered to be moderately effective since the up gradient water source created by collecting water in a surface reservoir or pond could be depleted during drought conditions. If the water resource and site conditions are favorable, this type of flow augmentation could be installed within a short timeframe after mitigation is triggered. This type of system would require long-term maintenance, and flow disruptions could occur due to freezing pipes.

Installation of a guzzler (method #3 above) would be an effective method to replace a source of water for livestock and/or wildlife. If the original spring or seep only provided a seasonal or intermittent source of water, the guzzler would provide an improved sustainable perennial source of water for livestock and/or wildlife use. However, installation of a guzzler without other spring enhancements would not be effective at providing water to sustain a diversity of habitat (such as hydrophilic vegetation) that a spring or seep may have originally supported. Guzzlers would require periodic maintenance for the life of the system.

Enhanced development of an existing spring or seep to promote additional flow (method #4 above) may or may not be effective at increasing the flow available at the surface. This mitigation likely would be used in circumstances where there has been a decrease in the flow but not a complete loss of flow at the source. For this situation, the spring enhancement measures likely would be moderately effective at increasing flow and partially or completely effective at mitigating reductions in flow. However, for seeps or springs that have experienced a complete loss of flow due to projects-induced drawdown, these enhancement measures are not expected to be effective at mitigating reduction in flows.

Eliminating grazing through installation of exclusionary pipe and pole fencing (method #5 above) to keep livestock and wild horses out but allow access for wildlife is an effective method of enhancing seep and spring flow along with hydrophilic vegetation if there has not been a complete loss of flow. However, if the flow of the spring or seep is completely lost due to a reduction in groundwater levels, then fencing alone is not expected to be an effective measure to mitigate impacts associated with project-induced drawdown. If flow from a seep or spring is reduced but not completely lost, enhancement of the area through eliminating grazing likely would increase output of the spring.

Mitigation Impacts

Operational efficiencies of the power plant and associated well fields may be affected by any operational changes Ormat may be required to implement that would limit or eliminate impacts to the identified springs or meadows.

Fencing of riparian habitat would likely limit livestock use of the fenced area. The size of the area fenced would determine how much, if any impact to livestock grazing would occur. Collisions between wildlife and new pipe and rail fences may occur; but these types of fences are more visible to birds and animals than are barb wire fences. Minor soil and plant disturbance would occur from fence construction and placement.

Riparian restoration efforts, in addition to fencing, may include projects such as: 1) plantings of desirable woody vegetation, such as willows; 2) removal of non-native vegetation such as Tamarisk sp. by hand thinning and spraying with an appropriate herbicide; 3) construction of rip/rap to armor stream sides; and 4) construction of check dams to reduce stream velocities during high flow events.

Plantings would have some minor surface disturbance when placing young brush such as willow within or proximate to a stream channel. Hand removal by chain saws or other hand removal methods would have a small amount of surface disturbance. Herbicide spraying of non-native plant roots would be done in full compliance with the Battle Mountain District's Programmatic Weed EA (BLM, 2009). A full analysis of potential impacts from herbicide spraying may be found in that EA. Construction of rip/rap to armor stream sides or construction of check dams would both cause minor soil surface disturbance and a temporary increase in turbidity of running waters.

These mitigation measures would allow riparian acreage to be maintained at pre-project levels and therefore rectifying any adverse affects from the Project within the 4:1 mitigation zone. The mitigation projects will improve riparian habitat and wetlands such as springs and seeps adjacent to the Project area to avoid a net loss of such habitat because of permitting geothermal activities. These projects would also improve brood rearing habitat for nesting sage-grouse and their young broods.

Ground disturbance activities associated with new well construction would include surface disturbance associated with the drill pad and sump, tank installation, and piping. A drill pad can range from several hundred square feet to several thousand square feet, depending on the size of the drill rig and ancillary facilities. Typical disturbance from the installation of a new production well would be approximately 0.2 acres. Buried pipelines would result in new ground disturbance.

Piping Water from a New or Existing Source: Disturbance associated with this measure would be limited to construction of a surface or buried pipeline from the source to the affected spring or seep. It is anticipated that any water rights to capture and convey water to augment flows would be addressed by transferring a portion of the existing water rights to the new point of diversion, as discussed previously for well development.

Installation of a Guzzler: Construction activities include vegetation removal at the collection apron and tank locations; excavation for the tank (assuming below ground installation); installation of the apron, tank, piping, and trough; and installation of an exclusionary fence to prevent horses and other livestock from damaging the guzzler apron. The actual design (size, location, etc.) is dependent on many variables including, but not limited to, annual precipitation, slope, and targeted wildlife (small game versus big game). Disturbance from a large game guzzler in this area would be up to 0.7 acre (assuming a disturbance area of approximately 150 feet by 200 feet).

Enhanced Development of an Existing Seep to Promote Additional Flow: The measure identified to enhance flow (i.e., installation of a spring box) at an existing spring would have minimal (less than 0.1 acre) of disturbance.

Fencing Measures for an Existing Seep to Maintain Flow: Installation of fencing around the water source would result in minimal (less than 0.05 acre) temporary disturbance for the duration of the mitigation.

3.11.2.2 Alternative 1

Environmental impacts would be the same as the Proposed Action except for routing the transmission line across Burton Creek and requiring five acres of additional disturbance for a switching station. The transmission line and switching station would be located so that their construction would have no direct impacts to riparian or wetland areas. Indirect impacts from construction are not expected when using best management practices for pole placement, site grading and sediment control.

3.11.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect, and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. If this were to occur, additional mitigation measures would be put in place to eliminate impacts to wetland and riparian habitat. See the 2009 Geothermal Exploration EA for a complete analysis of potential effects.

3.12 WASTES (HAZARDOUS AND SOLID) & HEALTH AND SAFETY

3.12.1 Affected Environment

There are no hazardous material storage facilities in the Project Area and no hazardous materials are known to be routinely used in the Project Area. The transport and handling of hazardous materials in Nevada are subject to numerous federal and state laws and regulations.

3.12.2 Environmental Consequences

3.12.2.1 Proposed Action

During drilling activities, diesel fuel, lubricants, hydraulic fluids and drilling chemicals (drilling mud, caustic soda, barite, etc.), would be transported to, stored on and used by the Project at the proposed drill sites (see Table 13). The Project must conform to both federal and state requirements for handling these hazardous/regulated wastes materials. Typical of most

construction projects, the storage and use of these materials may result in minor, incidental spills of diesel fuel or oil to the ground during fueling of equipment, filling of fuel storage tanks, and handling lubricants. Other incidental spills could be associated with equipment failures such as ruptured hoses. The Project includes the development of a hazardous material spill and disposal contingency plan, as identified in the Utilization Plan, which describes the methods for cleanup and abatement of any petroleum hydrocarbon (including petroleum contaminated soils) or other hazardous material spill.

Table 13: Materials and Chemicals Commonly Used During Well Drilling

Product	Quantity Used	Quantity Stored	Hazardous Material?[1]
Drilling Mud Gel (Bentonite Clay)	200,000 lbs	100 lb sacks on pallets	No
Salt (NaCl)	80,000 lbs	50 lb sacks on pallets	No
Barite (BaSO4)	12,000 lbs	50 lb sacks on pallets	No
Tannathin (Lignite)	2,500 lbs	50 lb sacks on pallets	No
Lime (Calcium Hydroxide)	2,000 lbs	50 lb sacks on pallets	Yes[2]
Caustic Soda (Sodium Hydroxide)	1,000 lbs	50 lb sacks on pallets	Yes[2]
Diesel Fuel	30,000 gals	6,000 gal tank	Yes[3]
Lubricants (Motor Oil, Compressor Oil)	1,000 gals	55 gal drums	Yes[3]
Hydraulic fluid	200 gals	55 gal drums	No
Anti-Freeze (Ethylene Glycol)	100 gals	55 gal drums	No[4]
Liquid Polymer Emulsion (partially hydrolyzed polyacrylamide / polyacrylate (PHPA) copolymer)	100 gals	5 gal buckets	No

1. Hazardous materials are defined and regulated in the United States primarily by laws and regulations administered by the U.S. Environmental Protection Agency (EPA), the U.S. Occupational Safety and Health Administration (OSHA), the U.S. Department of Transportation (DOT), and the U.S. Nuclear Regulatory Commission (NRC). Each has its own definition of a "hazardous material."
2. The material is characteristically hazardous due to its corrosivity
3. The material is characteristically hazardous due to its flammability
4. This material is considered orally toxic following ingestion.

Should well workover operations be necessary, these actions may involve placing a dilute mixture of hydrochloric (muriatic) and hydrofluoric acids down the well. This would only transpire when and if needed. The amount of dilute acid placed in the well bore (which can vary from 10,000 gallons to 50,000 gallons or more) is determined by calculating the amount of each type of mineral to be dissolved. Concentrated (35%) hydrochloric acid and 40% ammonium fluoride solution (to make the hydrofluoric acid) would be delivered via truck to the site on use (i.e. would not be stored onsite during well drilling and testing). The acids are mixed on site with water by experienced contractors. The dilute acid mixture is placed in the cased well bore, followed by water to push the mixture into the geothermal reservoir. After dissolving the minerals in the geothermal reservoir, the water and now spent acids are flowed back through the well to the surface where they are tested, neutralized if necessary (using sodium hydroxide or

crushed limestone or marble), and discharged to the lined reserve pit, which will be sampled prior to reclamation of the pit (see Section 2.1.3).

No geothermal fluid waste is anticipated from the Project. The Project must comply with BLM requirements to ensure that any geothermal fluid encountered during the drilling does not flow uncontrolled to the surface. These include the use of "blow-out" prevention equipment during drilling and the installation of well casing cemented into the ground.

The small quantities of solid wastes (paper trash and garbage) generated by the project would be transported offsite to an appropriate landfill facility. Portable chemical toilet wastes would be removed by a local contractor. Given Ormat's compliance with the associated lease stipulations, no effects would result from solid wastes generated by the project (see also Section 2.1.11). The disposal of these wastes would be a residual impact of the project.

Small quantities of hazardous waste would be generated during construction operations. Typically these wastes would be in the form of empty drums or spent lead acid batteries used for construction equipment. Construction activities typically generate waste oils, oily rags, and oil impregnated absorbent materials used to clean up minor spills from construction equipment. These wastes would be transported to a disposal facility authorized to accept the waste. Most waste generated from the construction activities would be solid (nonhazardous) waste which would also be transported to an offsite disposal facility authorized to accept the waste.

Hazardous materials stored on site during normal power plant operations include diesel fuel for the fire pump and standby generator, lubricating oils, and small quantities of paint, antifreeze, cleaning solvents, battery acid, transformer insulating fluid, and laboratory reagent chemicals. Geothermal fluid handling chemicals (i.e. lubricating oil and scale inhibitor) will also be stored on site. These materials will be stored within secondary containment and there will be little potential for adverse effects from spills or releases of these materials.

Substantial quantities of the binary working fluid, pentane, would be stored and used (though not consumed or intentionally released). Pentane is a flammable but non-toxic hydrocarbon similar to, but less volatile than propane. During major maintenance activities on the pentane side of the binary power plant units, the liquid pentane would first be transferred to the pentane storage tank.

Small quantities of typical office and industrial trash will be generated during power plant operations. Similar to construction wastes, the operations waste will be removed from the site by a local waste contractor and deposited in an offsite disposal facility authorized to accept the wastes. Sanitary wastes will be handled by a septic system constructed as part of the power plant facilities.

Proper handling, storage and disposal of these hazardous materials, hazardous/regulated wastes and solid wastes in conformance with federal and state regulations would ensure that no soil, groundwater, or surface water contamination would occur with any adverse effects on the environment or worker health and safety.

The following mitigation measure is provided to help contain spills at the source and prevent contamination of soils.

Mitigation Measure:

As specified in the Hazardous Materials Spill Contingency Plan, absorbent pads or sheets would be placed under likely spill sources.

Monitoring and Trigger Points

Ormat employees, contractors and sub-contractors will be required to monitor all equipment capable of producing hydrocarbon leaks and any potential generation of hazardous materials (as noted above). NDEP regulations require spills over five gallons to be immediately reported to NDEP's Spill Hotline; the proper land management agency's line officer should be called immediately after contacting the NDEP.

Effectiveness of the Proposed Mitigation

Absorbent pads and sheets are proven technologies that will limit a hydrocarbon spill impact to natural resources. In addition, Ormat will have in place a spill prevention and response plan as part of any approvals issued by the BLM/USFS. These plans are also required by the NDEP. Any hydrocarbon spill soil contamination, as required by the land management agencies and NDEP regulations must be excavated and disposed of in a recognized land fill licensed to accept such contaminated soil. Compliance with all of NDEP's hazardous materials regulations will limit or eliminate any hazardous material potentially contaminating any natural resources.

Mitigation Impacts

Prevention and cleanup of any hazardous or hydrocarbon spill will have a positive impact and protect natural resources in the project area.

3.12.2.2 Alternative 1

The impacts of Alternative 1 to Wastes (Hazardous and Solid) & Health and Safety would not be different from that of the Proposed Action. The mitigation measures recommended for the Proposed Action would be equally applicable to Alternative 1.

3.12.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This

could result in impacts from hazardous and solid wastes. See the 2009 Geothermal Exploration EA for a complete analysis of potential impacts.

3.13 PALEONTOLOGY

3.13.1 Affected Environment

A literature review of the Unit Area and vicinity was conducted by Cogstone Resource Management, Inc. to determine the potential for the rock units in the proposed Project area to produce significant fossil resources. The majority of the rock units present in the Unit area were not expected to produce fossils. The relatively recent (<1.8 million year old) silica sinter deposits near the center of the Unit area and the 470+/- million year old Valmy Formation were determined to have a low to moderate potential to yield fossils, while the relatively recent (<1.8 million year old) "older" alluvium was determined to have a moderate to high potential for producing fossils (Cogstone 2008).

3.13.2 Environmental Consequences

3.13.2.1 Proposed Action

Project activities are proposed very near one or more of the three rock units within the proposed Project area determined to have the potential to produce "significant paleontological resources" (the silica sinter deposits, the Valmy Formation or "older" alluvium).

Though no proposed Project components are directly within any of the above rock units, portions of the injection pipeline to well sites 67A-9 and 27-16 abut the Valmy Formation; and portions of injection pipeline to 67-15, and the new access road/injection pipeline to well 87-15 abut the silica sinter deposits.

Construction activities on these rock units that involve new surface disturbance could result in the disturbance or destruction of potentially important fossils. The following mitigation measure is designed to minimize the potential loss of fossils.

Mitigation Measure

Surface disturbing activities on the rock units determined to have the potential to produce "significant paleontological resources" (WO IM 2009-011) (i.e., the silica sinter deposits, the Valmy Formation or the "older" alluvium) will require pre-disturbance surveys to determine the appropriate subsequent course of action. These will include: 1) monitoring by a BLM/USFS permitted archaeological monitor during surface disturbance activities,; 2) avoidance of identified fossil localities, or 3) no further action. Maps of these rock units will be developed and provided to managers and supervisors of all surface disturbing equipment operators.

Pre-disturbance surveys by one or more permitted archaeological monitors will be required in each rock type locale. During excavation in these three soil types one or more BLM/USFS permitted archaeological monitors will be present. Discovery of a "significant paleontological resource" will require immediate work stoppage in the area of the discovery. Such a discovery will require immediate notification of the proper BLM/USFS agency administrator. Depending on the significance of the discovery, Ormat may be required to hire a BLM/USFS credentialed paleontologist to recover all aspects of the discovery.

Monitoring and Trigger Points

A BLM/USFS permitted archaeological monitor will do pre-disturbance monitoring and be present during excavation in the identified and mapped three potential fossil-bearing rock types. Discovery of any "significant paleontological resources" during construction activities will require work to stop in the discovery area and trigger mitigation requirements.

Effectiveness of the Proposed Mitigation

Implementation of these mitigation efforts will ensure protection and recovery of any "significant paleontological resource" discoveries.

Mitigation Impacts

Discovery of any "significant paleontological resources", work stoppage at the point of discovery, and recovery of such resources will ensure protection and proper recovery of these paleontological resources.

Work stoppages due to discovery of "significant paleontological resources" resource/s may represent a financial impact to the Proponent.

3.13.2.2 Alternative 1

Based on the information received, the impacts of Alternative 1 to paleontological resources would not be different from that of the Proposed Action. The mitigation measures recommended for the Proposed Action would be equally applicable to Alternative 1.

3.13.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. If this were to occur, exploration activities on some rock units could result disturbance or destruction of

fossils. See the 2009 Geothermal Exploration EA for a complete analysis of potential effects to paleontological resources.

3.14 RANGELAND

3.14.1 Affected Environment

The McGinness Hills Geothermal Project would be located within the Grass Valley and Simpson Park Allotments on public lands and the Lake Flat allotment on National Forest system land (see Table 14).

Table 14: Allotment Information

Allotment	Total Acreage	Total Permitted AUMs[1]
Grass Valley	282,854	20,041
Simpson Park	97,167	3,446
Lake Flat	25,657	1,085

1 An animal unit month (AUM) is the amount of forage needed to sustain one cow, five sheep or five goats for a month.

The livestock allotments within the McGinness Hills Unit Area are summarized in Table 15.

Table 15: Permittee and AUM Information

Allotment	Operator	Use Area (Pasture)	AUMs	Season of Use
Grass Valley	Grass Valley Ranch LLC	Antelope	2,168 (odd yrs.) 3,083 (even yrs.)	4/1 – 5/31 (odd yrs.) 8/16 – 11/30 (even yrs.)
Simpson Park	Grass Valley Ranch LLC	Lake Ranch	525	5/1 – 8/15
	Grass Valley Ranch LLC; Wolf Ranches II	Rye Patch	501	5/1 – 8/30

In addition, the transmission line would cross through both the Lake Ranch and Rye Patch Use Areas (Pastures) in the Simpson Park Allotment (see Table 15).

There have been several range improvements within the proposed Project Area: a fence exists in the northwestern portion of the McGinness Hills Unit Area which runs through Sections 9-10 and 15-16; a fence exists in the southern portion of the Unit Area which runs through Sections 14-15 and 22-23; and a corral exists in Section 22 of the Unit Area; a cattle guard (N-594236); Oscar Spring Redevelopment (N-593548); and Ox Corral Spring Walker Troughs (N-590229).

There are 2 Key Management Areas (KMAs) within the proposed Project Area. KMAs are used by the BLM for long-term monitoring and analysis of the rangelands across the landscape.

3.14.2 Environmental Consequences

3.14.2.1 Proposed Action

Long term surface disturbance associated with the Proposed Action would be 148.5 acres. It would also reduce the 23,487 AUMs within the combined allotments by 2 AUM, or less than one percent of the AUMs within the combined allotments (see Table 16).Table 16). No reductions in AUMs are anticipated in the Lake Flat (sheep and goat) allotment.

Table 16: AUM Reductions per Allotment

Allotment	Operator	Use Area (Pasture)	AUMs	Acres per AUM	AUM Reduction
Grass Valley	Grass Valley Ranch LLC	Antelope	2,168 (odd yrs.) 3,083 (even yrs.)	28	0
Simpson Park	Grass Valley Ranch LLC	Lake Ranch	525	13	2
	Grass Valley Ranch LLC; Wolf Ranches II	Rye Patch	501	12	0

To prevent access by cattle to areas which might be harmful to them, Ormat has committed to fence the reserve pits and the power plant site in conformance with the Gold Book, and has not proposed any Project activities which would substantially limit livestock's access to the undisturbed portions of the McGinness Hills Unit Area.

None of the proposed Project components are located within 200 feet of the KMAs within the Project Area. No impacts to these KMAs are anticipated.

Fencing of the reserve pits and power plants will effectively exclude cattle and other livestock from these facilities. The fencing of the power plants will exclude approximately 33 acres from livestock. The geothermal pipeline network could restrict livestock movement and distribution. Ormat has committed (see Section 2.1.4.1) to bury the pipelines at 3 strategic locations to facilitate livestock and wildlife movement and distribution.

The following mitigation measure is recommended to address potential impacts to rangeland improvements:

Mitigation Measure:

Fences and other livestock/wildlife improvements that would be affected by any Project construction or activities would be restored to provide for their original function and capacity.

Monitoring and Trigger Points

Ormat, its contractors and sub-contractors, along with and the requisite Certified Inspection Contractor (CIC) will monitor construction activities to ensure protection of existing range fences, livestock/wildlife improvements. Should it become necessary to remove, relocate or temporarily remove any of these facilities, Ormat or the CIC will immediately notify the appropriate BLM/USFS agency administrator prior to removing or affecting these types of facilities. The appropriate BLM/USFS agency administrator will immediately notify the appropriate permittee, providing the permittee sufficient time to address any impacts to their livestock operations.

Any effects to wildlife improvements, prior to their removal, destruction, etc. would require Ormat or the CIC to notify the appropriate BLM/USFS administrator so appropriate measures could be put in place to repair or replace such wildlife improvements.

Effectiveness of Proposed Mitigation

Restoration or replacement of livestock/wildlife improvements will ensure these resources remain functional with respect to their intended uses.

Mitigation Impacts

Restoration of livestock improvements will enhance the permittee's ability to manage livestock on Public Lands (e.g., proper livestock distribution, prevention of trespass livestock and promoting rangeland health). Restoration of wildlife improvements such as guzzlers will ensure adequate water supplies for targeted wildlife species.

Fencing of the reserve pits and power plants will exclude cattle and other livestock. Thereby limiting financial impacts to BLM permittee/s. Construction of these fences will represent a financial impact to the Proponent.

3.14.2.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the Proposed Action only by the increase (5.0 acres) in the total long term surface disturbance. The impacts of Alternative 1 to rangeland would not be different from that of the Proposed Action.

3.14.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This

would result in additional impacts to rangelands. See the 2009 Geothermal Exploration EA for a complete analysis of potential rangeland impacts.

3.15 RECREATION

3.15.1 Affected Environment

Recreation use within the proposed Project Area is low and mainly associated with dispersed recreation activities such as hunting, OHV use, wildlife viewing, camping and rockhounding. There are no organized OHV race courses within the proposed Project Area. The Pony Express trail is located approximately ½ mile south of the NVE Frontier substation at the southern end of the project.

3.15.2 Environmental Consequences

3.15.2.1 Proposed Action

During operation of the Project, 127.4 acres of public land would be unavailable for dispersed recreation activities. Although this disturbance would exist throughout the life of the Project, Project facilities and operations would not prevent or inhibit continued access for recreation on adjacent public lands. Project operations should also not impact the ability of hunters to access previous hunting grounds, or impact the abundance of game animals.

Air quality impacts to recreational users could include dust from vehicle traffic on unpaved roads and exhaust from construction vehicles. As discussed in Section 3.2.2, these would be short-term and temporary. Ormat has also stated that water would be applied to the disturbed ground during the construction activities as necessary to control dust (see Section 2.1.11).

Project-generated noise and traffic could cause some recreational users within the Project Area to stay away during the Project construction and drilling activities. These indirect effects would be temporary and short-term. The Project would have no foreseeable long term impacts on recreation.

3.15.2.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the Proposed Action only by the increase (5.0 acres) in the total long term surface disturbance. The impacts of Alternative 1 to recreation would not be different from that of the Proposed Action.

3.15.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect, and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This would result in additional effects to dispersed recreational use of the area. See the 2009 Geothermal Exploration EA for a complete analysis of potential recreational impacts.

Mitigation Measures

See Section 3.7.2 for proposed mitigation.

3.16 VISUAL RESOURCES

3.16.1 Affected Environment

The BLM initiated the visual resource management (VRM) process to manage the quality of landscapes on public land and to evaluate the potential impacts to visual resources resulting from development activities. VRM class designations are determined by assessing the scenic value of the landscape, viewer sensitivity to the scenery, and the distance of the viewer to the subject landscape. These management classes identify various permissible levels of landscape alteration, while protecting the overall visual quality of the region. They are divided into four levels (Classes I, II, III, and IV). Class I is the most restrictive and Class IV is the least restrictive (BLM 1986).

The portion of the Project Area on BLM-managed public lands is located in a VRM Class IV area. The objective of Class IV is to provide for management activities that require major modification of the existing landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. Every attempt, however, should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic landscape elements (BLM 1986).

The portion of the National Forest System lands that the proposed transmission line and alternative route goes through is classified as "modification" under the Visual Quality Objective system. Under the Modification Visual Quality Objective, man's activity may dominate the characteristic landscape but must, at the same time; utilize naturally established form, line, color and texture.

3.16.2 Environmental Consequences

3.16.2.1 Proposed Action

Drilling operations would be visible in the Project Area during site construction and intermittently over the life of the Project. The drill rigs proposed for the Project would be up to 175 feet in height. Well drilling operations would typically take about 45 days to complete for each well. These operations would be 24-hour per day, 7 days per week. During drilling operations, the rig will be visible at distances of greater than one mile from the respective drill

sites, and lights used when drilling at night would increase rig visibility. Impacts to visual resources from drilling operations would primarily affect the elements of line and color. As drilling operations will occur around the clock, lighting from the drill rigs will affect nighttime darkness. Drilling operations will be temporary and short-term, therefore impacts associated with drilling operations will also be temporary.

Most power plant facilities will be single story and will not be visible at a distance from the power plant site(s). The air- cooled condensers would be the tallest permanent structures on each power plant site and are estimated to be about 35 feet tall. The two power plants will be readily visible to travelers on Grass Valley Road. To reduce visual impacts, Ormat has committed to paint all permanent project facilities within the McGinness Hills Unit Area covert green, which would blend with the landscape. Painting of project facilities to reduce their visual effects would be done in accordance with BLM Instructional Memorandum (IM) 2007-021. Painting the permanent facilities covert green has proven to be effective in limiting visual contrasts in high desert environments.

Transmission line poles would be approximately 82 to 104 feet tall and would be spaced about 710 feet apart, on average. The proposed transmission line generally parallels the Grass Valley Road (County Road #201) and the existing Nevada Energy transmission line. The line terminates at an existing substation. The transmission line would be visually apparent in the foreground, middleground, and background to visitors within and adjacent to the Project Area and along the Grass Valley Road. The transmission line will add an extended linear feature to the landscape. In addition, the transmission line would be visible in the background to the casual observer from Highway 50 and various BLM and USFS managed roads.

Mitigation Measures

The following mitigation measures are recommended to reduce the visual impacts of the project within the McGinness Hills Unit Area:

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 mannerthat focuses direct light to the immediate work area.

To maintain dark sky conditions, and minimize visual disturbance, facility perimeter lighting, including lighting used to illuminate walkways, roadways, staging areas and parking areas, would be shielded so that the light would be cast in a downward direction. Low-pressure sodium lighting (or an improved technology, if readily available) would be used to reduce or eliminate detrimental lighting impacts and prevent unnecessary light pollution.

Monitoring and Trigger Points

The mitigation for lighting all of the facilities is a requirement of approval for the Project. Other than monitoring to ensure the requisite lighting is working properly, there is no further monitoring or trigger points for mitigation implementation required.

Effectiveness of the Proposed Mitigation

Installation of the prescribed lighting types along with properly shielded lighting will limit light pollution into the natural darkness of the high desert environment. These mitigations would limit lighting impacts to the central Nevada "dark skies" as well as limit light pollution effects to local wildlife populations.

With mitigation, project activities on BLM managed public lands would be consistent with the VRM Class IV objectives of the area. Project activities on National Forest System lands would be consistent with the Modification Visual Quality Objective of the area.

Mitigation Impacts

Implementation of the above mitigation will likely impose some additional financial burden on the Proponent, as low-pressure sodium lighting and additional light shielding will likely be more expensive than regular candescent lighting and no shielding.

Terrestrial wildlife impacts should be reduced, as wildlife will be less likely to avoid the Project area at night because of light pollution. Bats and other volant species such as night hawks, may be drawn to insect concentrations around lighting at the facilities. This attraction of insects may lead to more bat and night hawks impacts to Project facilities; potentially leading to injuries or fatalities of both species.

3.16.2.2 Alternative 1

The impacts of Alternative 1 to Visual Resources would be very similar to, but slightly greater than those of the Proposed Action due to the fact that portions of the transmission line would be located in a previously undisturbed corridor and the construction of a new switching station would be necessary. The mitigation measures proposed under the Proposed Action would be equally applicable for Alternative 1.

3.16.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. This

would result in additional effects to visual resources. See the 2009 Geothermal Exploration EA for a complete analysis of potential visual resource impacts.

3.17 SOCIO-ECONOMIC VALUES

3.17.1 Affected Environment

Based on the 2005—2009 American Community Survey 5-year Estimates, Lander County had a total population of 5,047 (U.S. Census Bureau 2011a) and the Battle Mountain Census Designated Place (CDP) had an estimated population of 2,711 (U.S. Census Bureau 2011b). Based on 2007 estimates available via city-data.com, the town of Austin had a 2007 population of 417 (City-Data.com 2011a).

Based on the 2005—2009 American Community Survey 5-year Estimates, Lander County has 2,287 total housing units, of which approximately 1,834 are occupied (U.S. Census Bureau 2011a), and the Battle Mountain CDP had 1,163 housing units of which 964 were occupied (U.S. Census Bureau 2011b). Based on 2007 estimates available via city-data.com, the town of Austin had 357 housing units, of which 220 were occupied (City-Data.com 2011b).

Based on the 2005—2009 American Community Survey 5-year Estimates, the labor force for Lander County was estimated to be 2,331 persons. Lander County's leading employers included the agriculture, forestry, fishing and hunting, and mining industry (29.3%); construction, extraction, maintenance and repair occupations (26.9%); and management, professional and related industries (21.4 percent). Also based on the 5-year estimates, the labor force for the Battle Mountain CDP was estimated to be 1,205 persons. The Battle Mountain CDP's leading employers included the construction, extraction, maintenance and repair occupations (30.7%); the agriculture, forestry, fishing and hunting, and mining industry (30.4%); and service occupations (27.5%) (U.S. Census Bureau 2011b). Based on 2007 estimates available via city-data.com, the leading employers included educational services (15.9%); mining, quarrying and oil and gas extraction (14.7%); and accommodations and food service industry (14.2%) (City-Data.com 2011c).

The Austin school is designed to handle 60-75 K-12 students, and is currently under capacity (Personal communication Steve Larsgard, Lander County School Superintendent).

3.17.2 Environmental Consequences

3.17.2.1 Proposed Action

Construction of the Project would require 12 to 24 months to complete once all permits are obtained and equipment orders scheduled. Drilling would be conducted by a crew of 9-10 workers with as many as 18 workers on site during short periods. Power plant and pipeline construction would likely require a maximum of up to 50 workers, although substantially fewer would be on site most of the time during construction, as the construction activities are staged. Construction of the transmission line and fiber optic line would require approximately 8 – 10

workers. In total, approximately 70 construction workers would be needed during the construction period.

Some of these workers would be recruited locally, though most would be specialized workers from outside of the local area. Typically, non-local skilled workers do not bring families with them on temporary construction assignments. Therefore, most workers would be expected to stay in local hotels, rental housing units or recreational vehicles.

Non-local construction workers are typically 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, Ormat would likely purchase or rent some portion of the equipment and supplies required to drill and complete the construction activities (such as grading equipment, fuel and tools) from local suppliers. This spending activity associated with the construction of the Project would have a small but positive effect on local businesses in Lander Counties.

Once the power plant is operating, and if they are remotely operated, 5-8 workers would be needed. If the power plants are not remotely operated, approximately 8-15 workers would be needed. Given the small amount of workers needed, the project would not induce population growth in an area. Neither does the proposed Project create or provide any infrastructure which would indirectly induce substantial population growth.

As the school is currently operating under capacity, any additional influx of new students associated with the construction and operation workforce, could be accommodated by the school within the current infrastructure.

3.17.2.2 Alternative 1

The impacts to Socio-economic values of Alternative 1 would be the same as those described for the Proposed Action.

3.17.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, exploration activities could continue for approximately seven more years. This would result in a small positive effect on local businesses in Lander County. See the 2009 Geothermal Exploration EA for a complete analysis of potential socioeconomic impacts.

Mitigation Measures

The BLM/USFS have not identified any mitigation measures for these potential impacts to the local economy.

3.18 LAND USE AUTHORIZATIONS

3.18.1 Affected Environment

Several rights-of-way (ROWs) have been granted by the BLM and the USFS within the McGinness Hills Unit Area and transmission line corridor (see Table 17Table 17), and generally consist of ROWs for power lines, aggregate pits and geothermal leases.

Table 17: Land Use Authorizations within the McGinness Hills Unit Area and Transmission Line Corridor

Holder	ROW/Activity	Case File No.	Location
Sierra Pacific Power Co.	Power Transmission Line	NVN-005253	19N 45E, sec. 13, 14
Sierra Pacific Power Co.	Power Transmission Line	NVN-025341	19N 45E, sec. 13, 24, 25, 36
Sierra Pacific Power Co.	Power Transmission Line	AUS401120	19N 45E, sec. 7, 8, 9,15 and 19N 44E, sec. 1-7, 12
Lander County	Free Use Permit	NVN-053239	19N 45E, sec. 14
Lander County Road and Bridge Dept.	Free Use Permit	NVN-082390	20N 45E, sec. 21
Ormat Nevada, Inc.	Geothermal Lease	NVN-083966	20N 45E, sec. 9, 10, 11, 12, 13, 14, 15, 16
Ormat Nevada, Inc.	Geothermal Lease	NVN-083967	20N 45E, sec. 21, 22, 23, 24
Ormat Nevada, Inc.	Geothermal Unit	NVN-084268X	20N 45E, sec. 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24
Lander County	Free use Permit	NVN-073768	21N 46E, sec. 20

3.18.2 Environmental Consequences

3.18.2.1 Proposed Action

Project facilities and activities within the McGinness Hills Unit Area would be located away from the authorized ROWs, so there would be no impacts to lands and realty within the geothermal operations area.

Although the southernmost 4.2-mile northwest to southeast trending segment of the proposed transmission line would closely parallel an existing 230 kV transmission line (NVN-005253), none of the proposed transmission line poles would be located within any existing ROWs. Thus, no impacts are expected. The transmission line conductors (wires) would pass over several land use authorizations, but would not interfere with any existing ROWs. No impacts are anticipated.

3.18.2.2 Alternative 1

The impacts to lands and realty from Alternative 1 would be identical to those described for the Proposed Action.

3.18.2.3 No Action Alternative

Under the No Action alternative, the McGinness Hills Geothermal Development Project as currently proposed would not be constructed or operated. The direct, indirect and cumulative impacts identified for the proposed action would not occur.

Under this alternative, Ormat would still have the ability to continue geothermal exploration. As currently approved, continued exploration activities would disturb an additional 34 acres. However, these exploration activities would not affect any other existing land use authorizations.

4 CUMULATIVE EFFECTS

The CEQ regulations for implementing NEPA (40 CFR 1508.7) define cumulative impacts as:

"... the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

4.1 CUMULATIVE EFFECTS STUDY AREAS

The cumulative effects study area (CESA) for all resources exclusive of sage-grouse is the approximately 352,680 acre area which was determined on a hydrographic, cultural and topographic basis (hereafter referred to as the "Principal CESA") (see Figure 21).Figure 21). The CESA for sage-grouse is the Toiyabe Population Management Unit (PMU), covering 1,127,000 acres. PMU's were established by the Governor's Sage-Grouse Conservation Team which included cooperating agencies and affected parties. PMUs were designated based on sage-grouse distribution and configuration of leks on the landscape (see Figure 21Figure 21).

4.2 PAST AND PRESENT ACTIONS

4.2.1 Principle CESA

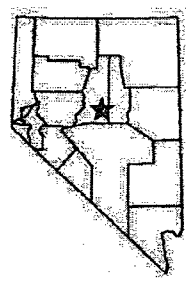
Past and present actions consist primarily of Ormat's ongoing McGinness Hills geothermal exploration activities, livestock grazing, recreational activities, transportation and access, wildfires, wild horse and burro management (including wild horse gathers), wildlife use and mineral exploration. The past and present actions identified as part of the no-action alternative in the previous sections are expected to continue, in the same manner as they have in the recent past.

Ongoing McGinness Hills Geothermal Exploration Activities – Ormat's geothermal exploration activities on the leased geothermal unit include the drilling and construction of geothermal wells and access roads (see Section 1.1). These activities have resulted in 33.9 acres of surface disturbance. Well drilling and access road construction on private land resulted in 23.2 acres of surface disturbance.

Livestock grazing – Portions of four BLM-managed grazing allotments are within the Principle CESA: Grass Valley, Simpson Park, Underwood and Austin. Portions of three USFS-managed grazing allotments are within the Principle CESA: Lake Flat, Bade Flat and Cahill. In addition, several privately owned ranches support livestock grazing and associated uses. In order to support the management of these grazing lands, a variety of range improvement projects have been implemented through the years, including fences, cattle guards, wells, and watering facilities.

Figure 21: Cumulative Effects Study Area

- CESA-Sage Grouse
- Principle CESA
- 230 kV Transmission Line-Proposed
- Proposed Powerline Alternative
- Power Plants
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries



0 5 10 Miles

United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820

* No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

The data shown on the map uses the Universal Transverse Mercator (Zone 41N) Coordinate system and uses the NAD83 projection.

Map Date: 05/17/2011

Recreational activities – There is one developed recreation site within the Principle CESA, Hickison Petroglyph Recreation Site. All other recreation in the study area is of a dispersed nature. These recreation activities include sightseeing, pleasure driving, rock collecting, off-highway vehicle use, wildlife viewing and hunting, camping, horseback riding, and hiking.

The Hickison Petroglyph Recreation Site is located approximately 24 miles east of Austin, Nevada, along US Highway 50. The site received more than 21,000 visitors in 2006. Recreational opportunities at this site include petroglyph viewing, hiking, picnicking, camping, and horseback riding. The site has 16 camp sites, four picnic sites, three restrooms, and more than three miles of equestrian/hiker trails.

Transportation and access – Past and present actions within the Principle CESA are supported by a transportation system which includes gravel County Roads, Forest Service Roads, and dirt roads or "two-tracks" on public lands. Few are regularly maintained.

Wilderness Study Area – A portion of the Simpson Park Wilderness Study Area (WSA) is located along the eastern edge of the Principal CESA. This WSA is in the Simpson Park Mountain Range approximately 50 miles northwest of Eureka, Nevada. The WSA includes almost 50,000 acres of public land. The Simpson Park WSA consists of mountainous topography with scattered stands of aspen and mountain mahogany. The WSA is approximately 17 miles long and five miles wide.

Wildfires - There have been 42 wildfires within the Principle CESA since 1985. Seven of the fires were human caused, 30 fires were natural causes and 5 fires were of unknown cause. Total acres burnt were 109,657 acres.

Wild Horse and Burro Use and Management – Portions of three BLM-managed Herd Management Areas (HMAs) are within the Principle CESA: Callahan HMA, Hickison Burro HMA and Bald Mountain HMA.

The east half of the Callaghan HMA is located within the Principle CESA. The Callaghan HMA, covers an area that is approximately 26 miles long and averages 8 miles wide. The HMA shares its north boundary with the Bald Mountain HMA. The HMA was recently estimated to support approximately 212 wild horses. However, the southeast corner of the Callaghan HMA, a portion of which is located within the McGinness Hills Geothermal Unit, has not been utilized by wild horses in the recent past.

The extreme southeastern portion of the Bald Mountain HMA is located in the Principle CESA. Wild horses frequent this area and are often observed congregating near the northern portion of the Callaghan HMA, where numerous water sources are located.

The northern portion of the Hickison HMA is located within the Principle CESA. However, all wild burros are located south of US Highway 50, which acts as a barrier to movement. Therefore, all wild burros within the Hickison HMA are located outside of the Principle CESA.

BLM management of these HMAs includes wild horse gathers to remove excess wild horses and to treat wild horses with a fertility control vaccine to slow population growth. These measures are designed to maintain population size within the Appropriate Management Level, which is the level of use by wild horses which results in a thriving natural ecological balance and multiple use relationship on the public lands in the area. Gathers can occur as frequently as every 2 years, but also occur at 3, 4, or 5 year intervals. The most recent wild horse gather was conducted on the Callahan HMA in January 2011.

Mineral exploration – Although there are no active mines, hundreds of active mining claims exist within the Principle CESA. Past and present active exploration consists of exploration mining notices (disturbances of less than five acres) and exploration plans of operations (disturbances over five acres) for precious metals exploration, as well as removal of gravel resources. The total area affected by these activities would be less than that of the Sage-grouse CESA (see below) or less than 700 acres.

Wind anemometers – Sierra Pacific Power Co (SPPCo.) maintains wind anemometers on Bates Mountain in the NE1/4, NE1/4, SW1/4 Section 7, T20N, R47E.

4.2.2 Sage-grouse CESA

In addition to the actions identified above, the following past and present actions are also within the sage-grouse CESA:

Ongoing Geothermal Exploration Activities – Two additional geothermal exploration projects (Reese River Geothermal Exploration Project and the Grass Valley Geothermal Exploration Project) are within the sage-grouse CESA. These exploration projects include the drilling and construction of geothermal wells and access roads. The Grass Valley Project is currently being reclaimed.

Mineral exploration – Although there are no active mines, hundreds of active mining claims exist within the Sage-grouse CESA. Past and present mineral activities within the Sage-grouse CESA have resulted in approximately 708 acres of surface disturbance (see Cumulative Effects Analysis Methodology, below).

Livestock grazing – Four additional BLM-managed grazing allotments are within the sage-grouse CESA: Manhattan Mountain, Gilbert Creek, Dry Creek and Potts. Portions of three USFS-managed grazing allotments are within the CESA:

Wildfires – There have been a total of 187 wildfires within the Sage-grouse CESA since 1985. Thirty-eight of the fires were human caused, 138 fires were natural causes and 11 fires were of unknown cause. Total acres burnt were 283,288 acres.

Wild Horse and Burro Use and Management – Larger portions of the three BLM Herd Management Areas described above for the Principle CESA are located within the Sage-grouse

CESA. In addition, portions of two additional HMAs are located within the Sage-grouse CESA: New Pass/Ravenswood HMA and South Shoshone HMA.

The New Pass/Ravenswood HMA is located approximately 35 miles northwest of Austin, Nevada. The HMA is approximately 18 miles wide and 24 miles long. The BLM may re-assess the Appropriate Management Level in the coming years, as recurrent wildfire in this HMA has affected forage, water and the distribution of wild horses. The most recent wild horse gather was conducted in January 2011 in conjunction with the Callaghan Complex gather.

Just north of the New Pass/Ravenswood HMA is the South Shoshone HMA, the extreme southern end of which is located within the sage-grouse CESA. The most recent wild horse gather in this HMA occurred in December 2008.

4.3 REASONABLY FORESEEABLE FUTURE ACTIONS

The past and present actions identified above are expected to continue, in the same manner and to the same degree as they have been conducted in the present and recent past.

The McGinness Hills Geothermal project area is located in what is known as the Battle Mountain/Carlin Trend. This Trend is known for containing numerous large gold mines, precious metals mines, as well as other metal commodities mines. It is anticipated that the current high commodity market prices for precious metals such as gold and silver as well as other metals such as copper will continue to drive mining notice applications and plans of operations for exploration in and around the project and CESA areas. As these market-driven commodity prices remain stable or increase, it is likely the CESAs will see an increase in mineral exploration activity.

Neither the U.S. Forest Service's Austin/Tonopah Ranger District nor the Mount Lewis Field Office of the BLM has any applications for specific activities or permitting within the CESA boundaries. However, Ormat Technologies, Inc. does have applications for water rights pending in Hydrographic Basin 138 for water withdrawals at two wells located on private property (the Grass Valley Ranch). Ormat has indicated to the BLM that these water wells and withdrawals may be used at some future date to supply cooling water to their McGinness Hills geothermal plants. This would require retrofitting to utilize water cooling technology. Should Ormat choose to pursue this option, a modification to its utilization plan and a new plan of development would be required to be submitted to the BLM with a new NEPA document.

Addition of a water cooled option would provide increased electrical generation capability during high summer ambient air temperatures. There are two possible cooling scenarios that Ormat has used on other projects: 1) water misted at the base of air cooling towers. This process lowers the ambient temperature of the surrounding air, making the cooling process, and thus the electrical generation process more efficient; and 2) adding cooling towers (approximately 50 feet in height) that would cool the water and pentane by increasing the surface area exposed in the cooling towers; again, improving electrical generation efficiency.

Ormat currently estimates that 2,500 acre-feet/year would be needed for the water-cooling process. As is currently understood, Ormat would apply for beneficial use from the Nevada State water engineer for 1,250 acre-feet for industrial purposes from wells located on the Grass Valley Ranch. The remaining 1,250 acre-feet needed for cooling would be created using treated geothermal fluid from Ormat's geothermal well field. A pipeline would also need to be developed to convey water from the Grass Valley Ranch to the geothermal power plants. It is estimated that surface disturbance associated with this RFFA would be less than about 40 acres.

Recreational use within the CESAs is expected to continue consistent with past and present use, with dispersed outdoor recreational activities being the predominant type of recreation. In addition, the BLM Mount Lewis Field Office has plans to expand the number and length of trails within the Hickison Petroglyph Recreation Area. Future funding will allow a total of 30 to 50 miles of trail to be built. The trail system will include a portion of the Pony Express National Historic Trail. Additional funding will also allow construction of new camp loops and improvements to existing campground facilities.

CUMULATIVE EFFECTS ANALYSIS METHODOLOGY

To better quantify cumulative impacts of the McGinness Hills Geothermal Development Project, the BLM undertook a quantitative analysis of the total known mining disturbance in the sage-grouse CESA (Toiyabe PMU).

The BLM's Legacy Rehost System (LR2000) provides a searchable database of public reports on BLM land and mineral use authorizations, conveyances, mining claims, withdrawals and classifications. Using the LR2000 reports, the BLM estimated the total mining disturbance in the sage-grouse CESA at 708 acres.

Since the PMU is a non-rectangular polygon (see Figure 21) and the LR2000 reports are based on rectangular Townships, Ranges and Sections, an exact fit of the two shapes is not possible. In addition, the LR2000 reports may not reflect the exact status of a particular mining notice (less than five acres of disturbance) or plan of operations (greater than five acres). For instance, a mine may be in the interim reclamation stage, where some revegetation has occurred but is not yet reflected in the report. For purposes of this analysis, it was assumed that none of the surface disturbance has yet been reclaimed. Further, it was assumed all 708 acres are located within the sage-grouse CESA boundary.

The sage-grouse CESA is comprised of 1,127,000 surface acres. The 708 acres of mining related disturbance represent .06 of one percent (.06 of 1%) of the sage-grouse CESA.

As detailed in Section 2.4, the Project is expected to create an additional 217 acres of short- and long-term surface disturbance, which would represent .02 of one percent (.02 of 1%) of the sage-grouse CESA area. Although this surface disturbance would be cumulative with that resulting from mining and mineral exploration, the total mining and leasable mineral development (Project) surface disturbance of 925 acres would represent .08 of one percent (.08 of 1%) of the sage-grouse CESA.

As identified throughout this chapter, there are other on-going activities that may be contributing direct, indirect or cumulative impacts to various resources, including sage-grouse. As previously identified, livestock grazing, wild horse and burro grazing, off-highway vehicle use, recreational activities such as hunting, camping, rock hounding, etc., may all be contributing adverse and positive effects to various resources. Quantifying these potential effects to various resources is difficult and/or problematic.

For example, there is a considerable amount of professional literature available identifying qualitative impacts to sage-grouse habitat by livestock grazing. Impacts to brood habitat along springs, seeps, and riparian areas are well known. Reduction in herbaceous understory, which provides both food and cover to sage-grouse, are also well documented. The current science to again, quantify these types of effects, is not well established. There appears to be a direct link between such habitat loss and sage-grouse populations. However, the ability to state that a XXX% loss of herbaceous understory leads to a YYY% sage-grouse population decrease correlation is outside the current ability of current science.

This analog is applicable to a wide array of potential effects from the various activities identified above.

4.4 CUMULATIVE EFFECTS ANALYSIS

4.4.1 Air Quality

4.4.1.1 Proposed Action

Although minimized by AEPMs, the Proposed Action would generate particulates in the form of fugitive dust from earth moving activities, travel on unpaved roads and reclamation activities. Diesel engines used during earth moving, well drilling and reclamation activities would create combustion emissions, criteria air pollutant precursors and greenhouse gas emissions. During operation of the power plants, up to twelve (12) tons of pentane per year would be lost to the atmosphere (see Section 0 for additional details).

Past and present actions have generated fugitive dust, principally from surface disturbing activities and travel on unpaved roads. It is likely the increased commodity prices for precious metals and other metals such as copper will drive increased exploration across the Carlin Trend, including the CESA. This increase will likely contribute to incremental increases in fugitive dust, combustion emissions, criteria air pollutant precursors and greenhouse gas emissions sporadically dispersed across the CESA. Wildfires have and will continue to intermittently contribute emissions to the CESA air basin.

There are no known other industrial complexes proposed in the CESA boundaries. Unless another binary pentane operated plant is built in the air basin, additional quantities of pentane over the proposed action quantities will not occur.

As a result of the Project's compliance with the requisite Surface Area Disturbance Permit and Project AEPMs, ambient air quality in the project area will be maintained. Any increases in

fugitive dust, combustion emissions, criteria air pollutant precursors or greenhouse gas emissions would be minimal. Similar air pollutants generated by past, present and reasonably foreseeable future actions are expected to be sporadic and dispersed across the CESA. Cumulative impacts to air quality are anticipated to be negligible.

4.4.1.2 Alternative 1

Cumulative effects to air quality under Alternative 1 would be essentially the same as those identified under the Proposed Action.

4.4.1.3 No Action Alternative

Under the No Action Alternative, impacts to air quality would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.2 Cultural Resources

4.4.2.1 Proposed Action

The current project is expected to have adverse effects to certain contributing elements of the McGinness Hills Archaeological District (MHAD). These adverse impacts could potentially occur on both BLM and National Forest System lands. In addition, adverse impacts to contributing elements and unevaluated cultural resource sites in the MHAD would be treated in accordance with an approved Historic Properties Treatment Plan.

Impacts to the integrity of setting of any subsequently identified National Register listed/eligible sites where integrity of setting is critical to their listing/eligibility could occur from future ground disturbance, such as those from mineral exploration. However, neither the U.S. Forest Service's Austin/Tonopah Ranger District nor the Mount Lewis Field Office of the BLM has any applications for specific mineral exploration or development activities or permitting within the CESA. Thus, impacts to cultural resources in the immediate vicinity of the Project area are unlikely.

The ongoing McGinness Hills geothermal exploration project has mitigation measures in place that require archaeological monitoring and avoidance of cultural resource sites. Under a reasonably foreseeable development scenario, any future disturbance resulting from construction of a waterline from the Grass Valley Ranch to the two power plants would either avoid eligible and unevaluated cultural resources sites or result in a treatment plan similar to the proposed MHAD treatment plan. Thus, no impacts to cultural resources from these actions are anticipated.

4.4.2.2 Alternative 1

Under Alternative 1, two additional cultural resource sites would be affected (see Section 3.3.2.2). Impacts to cultural resources from the RFFAs and other past and present actions would

be the same as with the Proposed Action. Cumulative effects to cultural resources under this alternative would be substantially similar to those of the Proposed Action.

4.4.2.3 No Action Alternative

Under the No Action Alternative, impacts to cultural resources would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.3 Native American Religious Concerns

4.4.3.1 Proposed Action

Implementation of the Proposed Action would include the potential for impacts to cultural resource sites, impacts to water sources (adjacent cold springs complex) and impacts to sage-grouse. Vehicles, equipment, and personnel used for development purposes could have impacts to areas utilized by native peoples. Also, the act of drilling wells could be viewed by traditional practitioners and believers as being harmful to "mother earth" due to impacts to underground and surface waters (see Section 3.4.2.1).

Over the last 15 to 20 years, the BLM, USFS and the tribes have witnessed an increase in the use of public lands, by various groups, organizations, and individuals. New ways to utilize the public lands are also on the rise. Livestock grazing, pursuit of recreation opportunities, hunting/fishing, oil, gas, geothermal, and mining leasing, exploration and development, along with relatively "newer" uses such as OHV use, interpretive trails, and mountain biking are among many increasing activities within the CESAs and the BLM Mount Lewis Field Office administrative boundary. In addition to all the existing, growing, and developing uses of the public lands, fluid mineral leasing and exploration would continue to contribute to the general decline in sites and associated activities of a cultural, traditional, and spiritual nature.

It is believed that cultural resources, including tribal resources and sites of cultural, traditional, spiritual use and associated activities are increasingly in danger of losing their physical and spiritual integrity. As populations grow, public interest in utilizing public lands (including the CESAs) could increase and thus the potential for the decline of culturally sensitive areas also could increase.

Based on past and ongoing Tribal coordination with the various Tribal entities, the Tribes have not identified any impacts to Traditional Cultural Properties (TCPs), or Properties of Cultural or Religious Importance (PCRIs) in the project area. In addition, there have been no specific, actionable impacts or concerns raised by the various Tribes that would lead the BLM to believe there are any specific direct or indirect impacts to Tribal values resulting from the proposal. Therefore, there are no cumulative impacts identified under Native American Religious Concerns.

Different world views and social and spiritual practices and beliefs often conflict with each other. Because traditional lands encompass the majority of the State of Nevada including the

BLM Mount Lewis administrative area, it is imperative that BLM and affected Tribes remain flexible and open to productive and proactive communication in order to assist each other in making decisions that will significantly reduce or eliminate any adverse effects to all party's interests, resources, and/or activities.

4.4.3.2 Alternative 1

Cumulative effects to Native American Religious Concerns under Alternative 1 would be essentially the same as those identified under the Proposed Action.

4.4.3.3 No Action Alternative

Under the No Action Alternative, impacts to Native American religious concerns would be limited to those discussed above for the past, present and reasonably foreseeable future actions

4.4.4 Wildlife (Including Special Status Species – Plants and Animals, and Migratory Birds)

4.4.4.1 Proposed Action

The cumulative effects identified would be similar for general wildlife, migratory birds, and sensitive and special status plant and wildlife species. As the proposed Project would have no effect on threatened and endangered species, there would be no cumulative impacts to these species from the Proposed Action.

The Proposed Action would result in loss of approximately 217 acres of wildlife habitat and direct displacement of wildlife. Direct effects could also include injury or mortality during surface-clearing activities. Project-generated noise and human activity would also deter some wildlife from using the area surrounding the project. Increased wildlife mortality and injury from collisions would result from increased vehicular traffic associated with the Proposed Action. Habitat fragmentation resulting from the project facilities and activities would affect various types of wildlife. Effects to all wildlife would occur due to reduced access to seeps, springs, wet meadow, and riparian areas.

Disturbance to, loss of and fragmentation of wildlife habitat resulting from the Proposed Action would be cumulative with past and present actions and RFFAs implemented in the CESA. Indirect effects could result from human activity and noise surrounding projects. The extent of these effects to habitat would depend on the cumulative size of the footprint of these activities, their locations relative to wildlife habitats, and the duration and frequency of activities disruptive to wildlife. The direct and indirect effects to wildlife from the Proposed Action (summarized above) are very small relative to the wildlife habitat within the CESA (352,680 acres). Thus, overall cumulative effects to wildlife would be negligible. Cumulative effects to individuals of species and local meta-populations utilizing specific sites could be affected, but greater effects to regional populations within the CESA are not expected.

Sage-Grouse

In order to characterize the cumulative impacts to sage-grouse, a separate CESA was analyzed. The CESA boundary for sage-grouse is the Toiyabe PMU, encompassing 1,127,000 acres.

Impacts from the Proposed Action would be cumulative with past, present and RFFAs implemented within the sage-grouse CESA. This includes wildfires, mining and mineral exploration, geothermal exploration, recreation, wild horse and burros and livestock grazing. Effects to sage-grouse could include habitat loss, associated visual and noise disturbance, and fragmentation of habitat.

The total mining-related surface disturbance within the Sage-grouse CESA, including the Project, is 925 acres (708 mining acres plus 217 acres of short- and long-term Project surface disturbance). This represents .08 of one percent (.08 of 1%) of the surface area of the sage-grouse CESA.

In addition to the approximately 217 acres of direct surface disturbance, the potential impacts from the proposed action could result in 51,800 acres of habitat disturbance. This includes direct surface disturbance and indirect effects such as noise and visual disturbance. This equates to approximately 5% of the CESA area. Thus, the Proposed Action may have localized effects, but impacts to the sage-grouse population at the PMU level are expected to be minimal.

4.4.4.2 Alternative 1

The direct impacts to general wildlife, migratory birds, and sensitive and special status plant and wildlife species from the implementation of Alternative 1 would be very similar too those of the Proposed Action. Cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.4.3 No Action Alternative

Under the No Action Alternative, impacts to general wildlife, migratory birds, and sensitive and special status plant and wildlife species would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.5 Noxious Weeds, Invasive and Nonnative Species

4.4.5.1 Proposed Action

Although the Proposed Action would include measures to help minimize the spread of noxious weeds, invasive and nonnative species (Section 2.1.11 and Appendix A) and would include reclamation of disturbed areas (see Appendix B), the project would result in the potential for the spread of noxious weeds, invasive and nonnative species (seed and vegetative plant parts) within the McGinness Hills Unit Area and along the transmission line corridor (see Section 3.6.2.1).

Within the CESAs, past and present actions have the potential to introduce and contribute to the spread of noxious weeds, invasive and nonnative species, and the same may be expected from the RFFAs. Past, present and future mineral exploration activities would cause the most extensive surface disturbance and would present an opportunity for noxious weed, invasive and nonnative species introduction and proliferation. The number and size of construction vehicles and construction activities could lend themselves to transporting noxious weeds, invasive and nonnative species to areas where they had not previously existed. Livestock grazing on allotments and private land within the CESA has also contributed to the introduction and spread of weeds. Construction and operation activities and surface disturbance associated with the Proposed Action would also provide opportunities for noxious weed, invasive and nonnative species introduction and proliferation. These effects would be cumulative with those of the other past, present and reasonably foreseeable future actions within the CESAs. Given theProject's small footprint (217 acres) and the mitigation measures and AEPMs that apply to the Project, the potential for the spread of noxious weeds, invasive and nonnative species within the McGinness Hills Unit Area and along the transmission line corridor is quite small. Any resultant cumulative impacts are expected to be minor.

4.4.5.2 Alternative 1

The direct impacts associated with noxious weeds, invasive and nonnative species resulting from the implementation of Alternative 1 would be very similar to those of the Proposed Action. Thus, cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.5.3 No Action Alternative

Under the No Action Alternative, impacts to noxious weeds, invasive and nonnative species would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.6 Noise

4.4.6.1 Proposed Action

Short-term noise impacts resulting from the Proposed Action include noise from well drilling, construction activity, reclamation, and decommissioning. These impacts are highly variable and intermittent in nature. Long-term noise impacts would be generated by operation of the geothermal power plants, geothermal wells, and pipelines. To determine the extent and degree of these anticipated noise impacts, the proposed operations were mathematically modeled. The results of modeling indicate that at distances greater than approximately 2 miles from the proposed locations of the power plants, noise produced by project operations would not be discernibly detected above typical ambient sound levels. Implementation of a suite of mitigation measures (see Appendix C) will further reduce the noise produced by the Proposed Action and, thereby, the area affected by that noise. Some of these mitigation measures apply only during the

lekking period (15 March – 15 May), but others, such as design improvements and noise barriers, would reduce Project noise year-round.

Various ongoing activities within the CESAs generate noise. Activities associated with Ormat's McGinness Hills geothermal exploration intermittently produce noise within the project area. Development of a future water-cooled option for the geothermal power plants would create additional noise impacts through construction activities and operation of water cooling towers at the power plants. Acoustic modeling indicates that cooling towers would add to the amount of noise generated by the power plants. Other actions within the CESA either produce so little sound or are so sporadic or are located so far from the project area that they do not meaningfully contribute to the project area noise level.

The effectiveness of Mitigation measures to reduce Project noise would be measured at active sage-grouse leks within the vicinity (see Appendix C). The 49 and 40 dBA thresholds apply to all sounds cumulatively measured at the leks. Thus, any cumulative noise effects are limited to these minimal levels.

4.4.6.2 Alternative 1

The direct and indirect noise impacts resulting from the implementation of Alternative 1 would be the same as those of the Proposed Action. Thus, cumulative impacts under Alternative 1 would also be the same as those of the Proposed Action.

4.4.6.3 No Action Alternative

Under the No Action Alternative, noise impacts would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.7 Soils

4.4.7.1 Proposed Action

Under the Proposed Action, surface disturbance and vegetation removal during construction of proposed project facilities within the Project Area would increase the potential for soil erosion through exposure of denuded surfaces. Additionally, soil would be compacted during construction activities due to heavy vehicle travel and heavy equipment use (see Section 3.8.2.1).

Within the CESAs, Ormat's geothermal exploration activities on the leased geothermal unit, including well and well pad construction, road construction, and other activities have resulted in 33.9 acres of surface disturbance, exposing soils and making them more susceptible to erosion.

Additional impacts to soils have and could be expected to continue to occur from mineral exploration within the CESAs. For purposes of this analysis, mining-related surface disturbance is assumed to be about the same as that estimated for the sage-grouse CESA, approximately 700 acres. Additional roads could be constructed and mineral exploration holes drilled. Thus, the

total mining surface disturbance in the principle CESA is expected to be less than 1,000 acres, or less than 0.3 percent of the CESA area. Past, present, and reasonably foreseeable future OHV use, livestock grazing, and wildfires would also disturb soils within the CESAs. Development of a future water-cooled option for the geothermal power plants would create additional soil disturbances through construction of a water transmission pipeline and other project features.

The direct disturbance and exposure of soils to erosion associated with the Proposed Action would be cumulative with these past, present, and reasonably foreseeable future effects to soils. As there are no past, present, or reasonably foreseeable future large-scale soil disturbances within the CESA or in the immediate vicinity of the Project, any impacts to soils are expected to remain localized. No cumulative impacts to soils are anticipated.

4.4.7.2 Alternative 1

The direct impacts to soils resulting from the implementation of Alternative 1 would be very similar to but slightly greater than those of the Proposed Action. Thus, cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.7.3 No Action Alternative

Under the No Action Alternative, impacts to soils would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.8 Vegetation

4.4.8.1 Proposed Action

Surface disturbance associated with the proposed Project activities within the McGinness Hills Unit Area and along the transmission line corridor would result in the loss of vegetation. Approximately 68.7 acres of the surface disturbance within the Project Area would be short-term, as these areas would be reclaimed and revegetated after construction is completed. Approximately 148.5 acres of the disturbance within the Project Area would be long-term, as these areas would remain disturbed over the operational life of the proposed Project. All disturbed areas would be subject to final reclamation following project decommissioning (see Section 3.9.2.1 and Appendix B).

Within the CESAs, Ormat's geothermal exploration activities on the leased geothermal unit, including well and well pad construction, road construction, and other activities have resulted in about 60 acres of surface disturbance, and vegetation removal.

Additional impacts to vegetation have and could be expected to continue to occur from mineral exploration within the CESAs. For purposes of this analysis, mining-related surface disturbance is assumed to be about the same as that estimated for the sage-grouse CESA, approximately 700 acres. Additional roads could be constructed and mineral exploration holes drilled. Thus, the total mining surface disturbance in the principle CESA is expected to be less than 1,000 acres, or

less than 0.3 percent of the CESA area. Past, present, and reasonably foreseeable future OHV use, livestock grazing, wild horse and burro use, and wildfires would also alter vegetation within the CESAs. Development of a future water-cooled option for the geothermal power plants would result in less than 40 acres of additional vegetation removal through construction of a water transmission pipeline and other project features.

The direct disturbance and removal of vegetation associated with the Proposed Action would be cumulative with these past, present, and reasonably foreseeable future effects to vegetation. However, as mitigation measures and Project reclamation would limit effects to relatively small areas and short periods of time, no cumulative impacts to vegetation are anticipated.

4.4.8.2 Alternative 1

The direct impacts to vegetation resulting from the implementation of Alternative 1 would be very similar to but slightly greater than those of the Proposed Action. Thus, cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.8.3 No Action Alternative

Under the No Action Alternative, impacts to vegetation would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.9 Water Quality and Quantity

4.4.9.1 Proposed Action

As described in Section 3.10.2.1, minor impacts to water quality and quantity associated with the Proposed Action could occur. When coupled with past, present and reasonably foreseeable future actions, including ongoing McGinness Hills geothermal exploration, livestock grazing, recreational activities, transportation and access, wildfires, wild horse and burro management, and mineral exploration, cumulative impacts could also occur.

The Nevada Division of Water Resources lists the safe yield of Basin 137B as 65,000 acre-feet per year. The hydrographic basin summary lists the major uses of groundwater for Basin 137B as irrigation, 37,463 acre-feet/year, and mining and milling, 14,612 acre-feet/year. The Nevada Division of Water Resources lists the total active annual duty of groundwater for the basin as 54,888 acre-feet/year.

The proposed project is located in the extreme northern portion of Basin 137B. The nearest use of groundwater for irrigation is located approximately 15 miles to the south southwest (NW1/4 SE1/4 Sec 19, T.17N., R.45E.). The Nevada Division of Water Resources irrigation inventory (2009) lists this use as two alfalfa operations each using 960 acre-feet to irrigate 240 acres. The nearest major mining operation is located approximately 60 miles south southwest of the Project.

A search of the Nevada Division of Water Resources water rights records did not return any active water rights in the extreme northern section of basin 137B. The project proposes installing two wells for domestic water use. Each well would produce 2-3 acre-feet/year. In order to determine the impacts of these two wells cumulative with potential impacts of future groundwater use on local groundwater resources, recharge from precipitation was calculated for the northern portion of Basin 137B. The methods developed by Eakin (1951) were used to compute estimated average annual recharge from precipitation to the groundwater aquifer. The recharge for the northern basin was calculated to be 4,346 acre-feet/year. Recharge to the local aquifer exceeds losses from springs/seeps and evapotranspiration. Given the recharge rate, the probability of wells located down gradient or distant from springs and seeps impacting flows is minimal. If wells are constructed so that there is direct communication between wells and springs, however, there could be a reduction in flow. A review of available fault data did not show the presence of faults within the area of the springs and seeps. Groundwater flows from the northern basin to the playa to the south. Increases in pumping in the local aquifer would minimally reduce groundwater flows to the south.

The safe perennial yield for Basin 138 is 13,000 acre-feet/year. The Nevada Division of Water Resources lists the current underground active duty as 12,630 acre-feet/year. The basin has not been designated by the State Engineer.

There are two irrigation wells and one stockwater well located on the Grass Valley Ranch (T21N R46E Section 16) in the southwestern portion of the basin. Irrigation well 87788 (Nevada State Engineer well log number) has an annual duty of approximately 1,448 acre-feet and irrigation well 14532 has an annual duty of 1,613 acre-feet. The stockwater well 9804 has an annual duty of almost 8 acre-feet/year. The wells are completed in a confined aquifer. Annually, one of the irrigation wells is pumped beginning July 1st, the second August 1st. Both wells are pumped at a flow rate of approximately 1,300 gpm. The wells are turned off in mid-September (Lancaster, Luke, 2010). Based on this information, the total amount of irrigation water pumped from these wells is approximately 707 acre-feet/year, approximately 2,300 acre-feet/year less than the current active duty.

Under a reasonably foreseeable future development scenario, Ormat would pursue water cooling of the McGinness Hills power plants. Ormat estimates that 2,500 acre-feet/year would be needed for the water-cooling process. Based on current assumptions, Ormat would apply for beneficial use from the Nevada State water engineer for 1,250 acre-feet for industrial purposes from wells located on the Grass Valley Ranch (Hydrographic Basin 138). The remaining 1,250 acre-feet needed for cooling would be created using treated geothermal fluid from Ormat's geothermal well field. A pipeline would also need to be developed to convey water from the Grass Valley Ranch to the geothermal power plants, resulting in an estimated 40 acres of additional surface disturbance. This additional pumping and use of groundwater and additional ground disturbance could result in adverse cumulative impacts to water quality and quantity. If this future development were to occur, these impacts would be analyzed in detail and mitigated through a separate environmental analysis.

4.4.9.2 Alternative 1

The cumulative impacts from selecting Alternative 1 would be the same as those of the Proposed Action.

4.4.9.3 No Action Alternative

Under the No Action Alternative, the McGinness Hills geothermal development would not be permitted. Cumulative impacts to water quality and quantity would be limited to those that may occur under the past, present and reasonably foreseeable future actions.

4.4.10 Wetlands and Riparian

4.4.10.1 Proposed Action

As described in Section 3.11.1 for riparian and wetland resources of this document, indirect adverse impacts associated with the Proposed Action may occur to wetland and riparian areas. However, any such project impacts would be mitigated through habitat treatments at a 4:1 ratio (NGSCT 2010) to protect, enhance or restore wetland and riparian habitat in targeted locations. In addition, if water flows or chemistry within springs 2-6, 8-9 or Meadows 1-2 are realized, Ormat would be required to modify operations to correct the impact to ensure flows are maintained at natural occurrence. If the effects cannot be corrected through operational changes, Ormat would be required to improve other existing seeps, springs or meadows within the 4:1 mitigation zone (see Appendix C). Any residual impacts to wetland and riparian habitat would be minimal.

When coupled with past, present and reasonably foreseeable future actions, including ongoing McGinness Hills geothermal exploration, livestock grazing, recreational activities and development, transportation and access, wildfires, wild horse and burro management, mineral exploration and potential future development of water cooling for the McGinness Hills Geothermal power plants, cumulative impacts could occur. Given the extensive mitigation that applies to the Proposed Action, any cumulative impacts are anticipated to be minor.

4.4.10.2 Alternative 1

The cumulative impacts from selecting Alternative 1 would be the same as the Proposed Action.

4.4.10.3 No Action Alternative

Under the No Action Alternative, the McGinness Hills geothermal development would not be permitted. Cumulative impacts to riparian or wetland resources would be limited to those that may occur under the past, present and reasonably foreseeable future actions.

4.4.11 Wastes (Hazardous and Solid)

4.4.11.1 Proposed Action

The Proposed Action would result in generation and disposal of solid and hazardous wastes. The Project could also result in minor petroleum hydrocarbon (including petroleum contaminated soils) or other hazardous material spills. However, no soil, groundwater, or surface water contamination is anticipated. No adverse effects to the environment or worker health and safety are anticipated (see Section 3.12.2.1).

Hazardous materials are expected to be used by both the non-renewable and renewable mineral exploration activities and the activities associated with the reasonably foreseeable development scenario (water cooled power plant), including the use of petroleum fuels (principally diesel fuel), hydraulic fluid, lubricants and drilling chemicals and materials. Additional non-hazardous solid waste and liquids would also be generated by the RFFAs. The transportation, use, storage and disposal of hazardous materials and wastes are subject to numerous federal, state and local laws and regulations which are intended to protect the public and the environment, and which are applicable to all of the past, present and RFFAs.

The Proposed Action is unlikely to result in cumulative effects to the environment from hazardous or solid wastes. Cumulative effects to worker health and safety are also unlikely.

4.4.11.2 Alternative 1

Cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.11.3 No Action Alternative

Under the No Action Alternative, impacts from wastes (hazardous and solid) and to health and safety would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.12 Rangeland

4.4.12.1 Proposed Action

The Proposed Action would result in the reduction of 2 AUMs, or less than one percent of the AUMs within the combined Project Area allotments. Additionally, the geothermal pipeline network could restrict livestock movement and distribution (see Section 3.14.2.1).

Within the CESAs, Ormat's geothermal exploration activities on the leased geothermal unit, including well and well pad construction, road construction, and other activities have resulted in about 70 acres of surface disturbance and a reduction of approximately 1 AUM of available forage. Additional impacts to livestock have and could be expected to continue to occur from

mineral exploration within the CESAs. Additional roads could be constructed and mineral exploration holes drilled, thereby removing vegetation and altering grazing patterns. For purposes of this analysis, mining-related surface disturbance is assumed to be about the same as that estimated for the sage-grouse CESA, approximately 700 acres. Thus, the total past, present, and reasonably foreseeable mining surface disturbance in the principle CESA is expected to be less than 1,000 acres, or less than 0.3 percent of the CESA area.

Past, present and reasonably foreseeable future livestock grazing on public lands within the CESAs is and would be managed in accordance with standards and guidelines to maintain rangeland health. Past, present and reasonably foreseeable future OHV use, wild horse and burro use, and wildfires would also alter vegetation and grazing within the CESAs.

The reasonably foreseeable development scenario (water-cooled option for the geothermal power plants) would result in vegetation removal and changes to grazing through construction of a water transmission pipeline and other project features.

Minor impacts to livestock grazing associated with the Proposed Action would be cumulative with these past, present, and reasonably foreseeable future effects to rangeland.

4.4.12.2 Alternative 1

The direct impacts to rangeland resulting from the implementation of Alternative 1 would be very similar to those of the Proposed Action. Thus, cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.12.3 No Action Alternative

Under the No Action Alternative, impacts to rangeland would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.13 Recreation

4.4.13.1 Proposed Action

During operation of the Project, 127.4 acres of public land would be unavailable for dispersed recreation activities. Project facilities and operations would not prevent or inhibit continued access for recreation on adjacent public lands. Air quality impacts to recreational users could include dust from vehicle traffic on unpaved roads and exhaust from construction vehicles. Project-generated noise and traffic could cause some recreational users within the Project Area to temporarily stay away during the Project construction and drilling activities (see Section 3.15.2.1).

Within the CESAs, displacement of dispersed recreational use to other areas could occur from ongoing and future geothermal and mineral exploration activities, livestock grazing, wildfires, and the reasonably foreseeable development scenario (water cooled power plant). Trail

development planned for the Hickison Petroglyph Recreation Area would provide additional non-motorized recreational opportunities within the CESAs.

Minor impacts to recreation associated with the Proposed Action would be cumulative with those of these past, present, and reasonably foreseeable future actions.

4.4.13.2 Alternative 1

Cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.13.3 No Action Alternative

Under the No Action Alternative, impacts to recreation would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.14 Visual Resources

4.4.14.1 Proposed Action

Drilling operations under the Proposed Action would be visible within the Project Area during site construction and intermittently over the life of the Project. The transmission line, visually apparent in the foreground to travelers along the County Road, would add an extended linear feature to the landscape. The air cooled condensers would be the tallest permanent structure on each power plant site and are estimated to be about 35 feet tall. However, most power plant facilities would be single story. Project facilities and activities would be consistent with the BLM Class IV Visual Resource Management classification of the area and USFS Modification Visual Quality Objective (see Section 3.16.2.1).

The CESA are rated as VRM Class IV (modification) and Modification Visual Quality Objective. Construction activities associated with the mineral exploration, the reasonably foreseeable development scenario (water cooled plant option), and other RFFAs (including wildfires) would result in long-term modifications to the line, form, color, and texture of the characteristic landscape. The creation of roads has and would create strong horizontal linear contrasts. Vegetation and soil removal create color, textural, and linear contrasts with adjacent areas that could be visible long after all the facilities were removed.

The contribution of the proposed Project to these cumulative effects on visual resources would be minimal. Any cumulative impacts would be consistent with the BLM Class IV Visual Resource Management classification and the USFS Modification Visual Quality Objective of the CESA.

4.4.14.2 Alternative 1

The direct impacts to visual resources resulting from the implementation of Alternative 1 would be very similar to, but slightly greater than those of the Proposed Action due to the fact that portions of the transmission line would be located in a previously undisturbed corridor and the construction of a new substation would be necessary. Thus, cumulative impacts to visual resources under Alternative 1 would be slightly greater than those of the Proposed Action.

4.4.14.3 No Action Alternative

Under the No Action Alternative, impacts to visual resources would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.15 Socio-Economic Values

4.4.15.1 Proposed Action

In total, approximately 70 construction workers would be needed during the construction period and these workers would be expected to stay in local hotels, rental housing units or recreational vehicles. Spending activity associated with the construction of the Project would have a small but positive effect on local businesses in Lander Counties. Given the small number of workers needed during operations, the project would not induce population growth in an area, nor would it create or provide any infrastructure which would indirectly induce substantial population growth (see Section 3.17.2.1).

Past and present activities have had a generally positive economic impact. Generally positive economic impacts would also be expected from the RFFAs, as some of the services and supplies needed for exploration and development would be contracted out to local contractors and builders, and some of the required supplies and construction materials could also be purchased from local merchants. Some positive economic impacts could also be realized from the rental of hotel rooms and purchase of meals and entertainment by workers.

4.4.15.2 Alternative 1

Cumulative impacts under Alternative 1 would be essentially the same as those of the Proposed Action.

4.4.15.3 No Action Alternative

Under the No Action Alternative, socioeconomic impacts would be limited to those discussed above for the past, present and reasonably foreseeable future actions.

4.4.16 Land Use Authorization

4.4.16.1 Proposed Action

The Proposed Action would not have direct impacts to existing land use authorizations (see Section 3.18.2.1). Thus, there would be no cumulative effects to land use authorizations.

4.4.16.2 Alternative 1

Alternative 1 would not have direct impacts to existing land use authorizations. Thus, there would be no cumulative effects to land use authorizations.

4.4.16.3 No Action Alternative

The No Action Alternative would not have impacts to land use authorizations.

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Appendix A: Federal Geothermal Lease Stipulations

LEASE STIPULATIONS:

ENDANGERED SPECIES ACT SECTION& CNOSULTATION STIPULASTION

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modifications of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 USC 1531 *et seq.*, as amended, including completion of any required procedure for conference or consultation.

CULTURAL RESOURCE PROTECTION LEASE STIPULATION

This lease may be found to contain historic properties or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, EO 13007, or other statues and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require exploration or development proposals to be modified t protect such properties, or it may disapprove any activity that is likely to result in adverse effects that could not be successfully avoided, minimized, or mitigated.

SAGE GROUSE LEKS STIPULATIONS

Operations would avoid active leks (strutting grounds) by 2 miles during strutting season (see Management Guidelines for Sage Grouse and Sagebrush Ecosystems in Nevada, October 2000). Approximate dates: March 1- May 15

Locations listed below will be avoided during strutting seasons:

Description of Lands

PARCEL NV-07-08-041 T. 20 N., R. 45 E., MDM, Nevada
sec. 09, E2, E2NW, E2NWNW, E2SWNW, NESW, E2SESW;
sec. 10, All;
sec. 11, All;

sec. 12, All;
sec. 13, All;
sec. 14, All;
sec. 15, All;
sec. 16, E2, E2NENW, SENW, NESW, SESW;

PARCEL NV-07-08-042 T. 20 N., R. 45 E., MDM, Nevada
sec. 21, E2, NWNW, E2SENW, E2SESW;
sec. 22, E2, NWNW, E2SENW, E2SESW;
sec. 23, All;
sec. 24, All;

Appendix B: Interim and Final Reclamation Plan

Reclamation Plan

Ormat Nevada, Inc. McGinness Hills Geothermal Project
Lander County, Nevada
May 2011

The McGinness Hills Geothermal Development Project and associated Transmission line will be constructed, operated, and maintained by ORNI 39 and ORNI 49 as subsidiary of Ormat Nevada, Inc. (Ormat). Intermediate and final reclamation is required for two geothermal power plants, 9.01 miles of power transmission line, geothermal wells, geothermal pipelines, and ancillary facilities located on Private lands, Bureau of Land Management and U.S. Forest Service managed properties. All disturbed areas resulting from the project will be reclaimed in accordance with the requirements of 43 CFR 3200. Interim reclamation of the project to the extent practicable will occur throughout the project life. Final reclamation will involve removal of the utilization facility and all associated equipment and will occur at the time of facility decomissioning.

Reclamation Objectives:

The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat, visual, and forage loss during the life of the project. Individual well sites and other facilities may be partially restored by interim reclamation.

The objective of final reclamation is long-term and is designed to return the land to a condition approximating that which existed prior to disturbance created by the project. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.

General Reclamation

The BLM Mount Lewis Field Office and or USFS Authorized Officer will be notified 24 hours prior to the commencement or undertaking of any interim or final reclamation operations.

Housekeeping:

1. Immediately upon well completion, all well locations and surrounding areas will be cleared and maintained free of: debris, materials, trash, and equipment not required for production or injection.
2. No hazardous substances, trash, or litter will be buried or placed in reserve pits. Upon well completion, any hydrocarbons in the reserve pit will be remediated or removed, for proper disposal at an approved facility.
3. Vegetation removal and surface disturbance will be minimized wherever possible.

Topsoil Management:

1. Operations will disturb the minimum amount of surface area necessary to conduct safe and efficient operations. When possible, equipment will be stored and operated on vegetated ground to minimize surface disturbance.
2. In areas to be heavily disturbed, the top eight (8) inches of soil material, will be stripped and stockpiled around the perimeter of the well location and along the perimeter of the access road to control run-on and run-off, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil may include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils. If additional topsoil is needed to reclaim the site, topsoil will be imported from a location approved by the BLM Mount Lewis Field Office and or U.S. Forest Service Authorized Officer.
3. Earthwork for interim and final reclamation will be completed within 12 months of well completion or plugging unless a delay is approved in writing by the BLM Mount Lewis Field Office and or U.S. Forest Service Authorized Officer.
4. Salvaging and spreading topsoil will not be performed when the ground or topsoil is frozen or too wet to adequately support construction equipment. If such equipment creates ruts in excess of four (4) inches deep, the soil will be deemed too wet.
5. No major depressions will be left that would trap water and cause ponding unless the purpose is to trap runoff and sediment.
6. Areas able to be reclaimed will be ripped, tilled, or disked on contour, as necessary, to restore to approximate original contour and minimize erosion. Deep ripping to relieve compaction will be performed. All compacted areas to be seeded will be ripped to a minimum depth of eighteen (18) inches with a minimum furrow spacing of two (2) feet.
7. Wherever possible, cut slopes, fill slopes, and borrow ditches will be covered with topsoil and revegetated. Final reclamation includes re-contouring of roads back to original contour.
8. Salvaged topsoil will be replaced at the approximate original thickness prior to seedbed preparation.

Seeding:

Seedbed Preparation:

1. Initial seedbed preparation will consist of re-contouring to the appropriate interim or final reclamation land surface. All compacted areas to be seeded will be ripped to a minimum depth of eighteen (18) inches with a minimum furrow spacing of two (2) feet, followed by re-contouring the surface. Topsoil that has been stockpiled shall be replaced by spreading in an evenly distributed manner. Prior to seeding, the seedbed will be scarified, pitted, or barricaded as necessary and left with a rough surface.
2. Appropriate planting instructions will be followed for each seed mix provided. If broadcast seeding is to be used and is delayed, final seedbed preparation will consist of contour cultivating to a depth of four (4) to six (6) inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to loosen the soil and create seed germination micro-sites.

Seed Application:

1. Seeding will be conducted no more than 24 hours following completion of final seedbed preparation.
2. Revegetation will include site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious weeds, invasive weeds, and non-native species seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM.
3. For the McGinness Hills Geothermal Project, the following seed mix and rates will be used on all disturbed surfaces, including pipelines and road cut & fill slopes:

   Disturbed areas would be treated with a pre-emergent herbicide for the control of cheatgrass following the application of the seed mix and prior to plant emergence. Treatment would be by application of PLATEAU, or an equivalent herbicide (Imazipic is the active ingredient) following the reseeding, at an application rate of 2 -12 ounces/acre.

   Seeding of disturbed areas within the Unit Area (Lake Ranch Pasture/Use Area) would be completed using the following BLM-approved native seed mixture and application rate:

Grass	Scientific Name	Pounds/acre (bulk)
Indian ricegrass	***Achnatherum hymenoides***	**5.5**
Needleandthread	***Hesperostipa comata***	**6**
Bottlebrush squirreltail	***Sitanion hystrix***	**2.5**
Forb		**Pounds/acre (bulk)**
Scarlet globemallow	***Sphaeralcea coccinea***	**1**
Western yarrow	***Achillea millefolium***	**1**
		16.0 lbs

   Seeding of disturbed areas associated with the transmission line (Rye Patch Pasture/Use Area and Lake Ranch Pasture/Use Area) would be completed using the following BLM-approved native seed mixture and application rate:

Grass	Scientific Name	Pounds/acre (bulk)
Indian ricegrass	***Achnatherum hymenoides***	**4**
Needleandthread	***Hesperostipa comata***	**5**
Bluebunch wheatgrass*	***Pseudoroegneria spicata***	**4.5**
Forb		**Pounds/acre (bulk)**
Scarlet globemallow	***Sphaeralcea coccinea***	**1**
Sulfur flower	***Eriogonum umbellatum***	**1**
		15.5 lbs
*** The cultivar of Bluebunch Wheatgrass used to seed disturbed areas would not be the Snake River Bluebunch wheatgrass *(Elymus wawawaiensis)***		

All seeding on public lands managed by the BLM would be reviewed and approved by the Mount Lewis Field Manager prior to implementation, to include seed mixtures, seeding rates, methods and timing. All seeding on USFS managed lands will be reviewed and approved by the USFS prior to implementation, to include seed mixtures, seeding rates, methods and timing.

The application of seed is prohibited from May 15 to September 15. Fall seeding is preferred and recommended. Seeding will be conducted after September 15 and prior to ground freezing. Shrub species will be seeded separately and will be seeded during the winter.

Erosion Control and Mulching:

1. Mulch, silt fencing, waddles, certified weed-free hay bales, and other erosion control devices will be used on areas at risk of soil movement from wind and water erosion.
2. Water bars, detention basins, silt fencing or other erosion control devices shall be installed as necessary.
3. Mulch will be used if necessary to control erosion, create vegetation micro-sites, and retain soil moisture and may include hay, small-grain straw, wood fiber, live mulch, cotton, jute, or synthetic netting. Mulch will be free from mold, fungi, and certified free of noxious weed or invasive weed seeds.
4. If straw mulch is used, it will contain fibers long enough to facilitate crimping and provide the greatest cover.

Reserve Pit Closure:

1. Reserve pits will be closed and backfilled within 12 months of release of the drill rig. All reserve pits remaining open after 12 months will require written authorization of the BLM Mount Lewis Field Office Authorized Officer. Immediately upon well completion, any hydrocarbons or trash in the pit will be removed. Pits will be allowed to dry, pumped dry, or allowed to solidify in-situ prior to backfilling.
2. Following completion activities, pit liners will be completely removed or removed down to the solids level and disposed of at an approved landfill, or treated to prevent their reemergence to the surface and interference with long-term successful revegetation. If it was necessary to line the pit with a synthetic liner, the pit will not be trenched (cut) or filled (squeezed) while containing fluids. When dry, the pit will be backfilled with a minimum of five (5) feet of soil material. In relatively flat areas the pit area will be slightly mounded above the surrounding grade to allow for settling and to promote surface drainage away from the backfilled pit.
3. All refuse; junk, trash, tools, residual material, or personal property shall be removed from the drill pad and reserve pit prior to restoration work.

Control of Noxious Weeds, Invasive Weeds, and Non-Native Species:

1. All reclamation equipment will be cleaned prior to use to reduce the potential for introduction of noxious weeds or other undesirable non-native species.

2. A weed monitoring and control program will be implemented prior to site preparation for planting and will continue until interim or final reclamation is approved by the BLM Mount Lewis Field Office and or U.S. Forest Service Authorized Officer.
3. Monitoring will be conducted at least annually during the growing season to determine the presence of noxious weeds, invasive weeds, and non-native species. Noxious weeds, invasive weeds, and non-native species that have been identified during monitoring will be promptly treated and controlled. A Pesticide Use Proposal (PUP) will be submitted to the BLM Mount Lewis Field Office and or U.S. Forest Service Authorized Officer for approval prior to the use of herbicides.

Interim Reclamation

A. **Transmission Line**

Procedures:

1. Temporary areas of disturbance would be re-contoured to match the surrounding terrain. Areas to be reclaimed will be ripped, tilled, or disked on contour, as necessary. Construction sites, material storage yards, and access roads would be kept in an orderly condition and free of trash.
2. Refuse, junk, trash, tools, residual material, or personal property shall be removed from the transmission line right-of-way prior to restoration work. Refuse and trash would be collected at temporary staging areas in a closed container until removed from the transmission line right-of-way and disposed of in an approved manner. Oils and fuels would not be discharged to the ground surface. Waste oils or chemicals would be collected and hauled to an approved site (approved disposal site refers to a "permitted TSD facility" as identified on the Nevada Division of Environmental Protection, Bureau of Waste Management website) for disposal.
3. Interim reclamation stormwater management actions will be taken to ensure disturbed areas are quickly stabilized to control surface water flow and to protect both the disturbed and adjacent areas from erosion and siltation. This may involve construction and maintenance of temporary detention basins, silt fences, berms, ditches, and mulching.

B. Geothermal Pads, Plant and Pipeline

Procedures:

1. Liquids from the reserve pits would either naturally evaporate or be removed as may be necessary (i.e. pumped into another well), or allowed to solidify in-situ prior to backfilling.
2. Reserve pits will be closed and backfilled within 12 months of release of the drill rig. All reserve pits remaining open after 12 months will require written authorization of the BLM Mount Lewis Field Office Authorized Officer. Immediately upon well completion, any hydrocarbons or trash in the pit will be removed.
3. The solid contents remaining in each of the reserve pits, typically consisting of non-hazardous, non-toxic drilling mud and rock cuttings would be tested to confirm that they are not hazardous. Typical tests may include the Toxicity Characteristic Leaching Procedure (TCLP) (EPA Method 1311), tested for heavy metals; pH (EPA method 9045D); Total Petroleum Hydrocarbons/Diesel (EPA Method 8015B); and Oil and Grease (EPA Method 413.1). If the test results indicate that these solids are non-hazardous, the solids would then be mixed with the excavated rock and soil and buried by backfilling the reserve pit. Hazardous materials, if any, would be taken to a "permitted TSD facility" as identified on the Nevada Division of Environmental Protection, Bureau of Waste Management website.
4. Following completion activities, pit liners will be completely removed or removed down to the solids level and disposed of at an approved landfill, or treated to prevent their reemergence to the surface and interference with long-term successful revegetation. If it was necessary to line the pit with a synthetic liner, the pit will not be trenched (cut) or filled (squeezed) while containing fluids. When dry, the pit will be backfilled with a minimum of 5 feet of soil material. In relatively flat areas the pit area will be slightly mounded above the surrounding grade to allow for settling and to promote surface drainage away from the backfilled pit.
5. All refuse; junk, trash, tools, residual material, or personal property shall be removed from the drill pad and reserve pit prior to restoration work.
6. A well with no commercial potential may continue to be monitored, but will eventually be plugged and abandoned in conformance with the well abandonment requirements of the BLM and NDOM. Abandonment typically involves filling the well bore with clean, heavy abandonment mud and cement until the top of the cement is at ground level, which is designed to ensure that fluids will not move across these barriers into different aquifers. The well head (and any other equipment) will then be removed, the casing cut off well below ground surface and the hole backfilled to the surface.
7. Portions of cleared well sites not needed for operational and safety purposes (i.e. the "shoulders" of the pad) would be re-contoured to a final or intermediate contour that would blend with the surrounding topography as much as possible. Stockpiled topsoil will be spread on the area to aid in revegetation. Areas to be reclaimed will be ripped, tilled, or disked on contour, as necessary.

8. Revegetation will include site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious, invasive, and non-native seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM.
9. Interim reclamation stormwater management actions will be taken to ensure disturbed areas are quickly stabilized to control surface water flow and to protect both the disturbed and adjacent areas from erosion and siltation. This may involve construction and maintenance of temporary detention basins, silt fences, berms, ditches, and mulching.
10. When well drilling and completion has occurred, some portions of the well location will undergo interim reclamation and some portions of the well pad may not be restored. Most well locations will have limited areas of bare ground, such as a small area around production facilities or the surface of a rocked road. Interim reclamation may not take place where work-over rigs and fracturing tanks need a level area to set up in the future. Some areas will undergo final reclamation where portions of the well pad will no longer be needed for production operations and can be re-contoured to restore the original landform.

Interim Reclamation Procedures - Additional

Re-contouring:

1. Interim reclamation actions will be completed no later than 12 months from the time that the final well on the location has been completed, season and weather permitting. Portions of cleared well sites not needed for active operational and safety purposes will be re-contoured to the original contour if feasible, or to an interim contour that blends with the surrounding topography as much as possible. Sufficient semi-level areas may remain for setup of a workover rig or for equipment storage. In some cases, rig anchors may need to be pulled and reset after re-contouring to allow for maximum interim reclamation.
2. For production or injection wells, the interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Constructed slopes may be much steeper during drilling, but will be re-contoured to the above ratios during interim reclamation.
3. Roads and well production equipment, such as tanks, treaters, separators, vents, electrical boxes, and equipment associated with pipeline operation, will be placed on location so as to permit maximum interim reclamation of disturbed areas. If equipment is found to interfere with proper interim reclamation of disturbed areas, the equipment will be moved so proper re-contouring and revegetation can occur.

Application of Topsoil & Revegetation:

1. Topsoil will be evenly spread and revegetated over the entire disturbed area not needed for all-weather operations including road cuts and fills and to within a few feet of the

production facilities, unless an all-weather, surfaced, access route or small "teardrop" turnaround is needed on the well pad.

2. In order to inspect and operate the well or complete workover operations, it may be necessary to drive, park, and operate equipment on restored, interim vegetation within the previously disturbed area.
3. Damage to soils and interim vegetation will be repaired and reclaimed following use. To prevent soil compaction, under some situations, such as the presence of moist, clay soils, the vegetation and topsoil will be removed prior to workover operations and restored and reclaimed following workover operations.

Visual Resources Mitigation:

1. Trees (if present) and tall vegetation will be left undisturbed along the edges of the pads whenever feasible to provide screening.
2. To help mitigate the contrast of re-contoured slopes, reclamation will include measures to feather cleared lines of vegetation and redistribute in-situ vegetation, woody debris, and large rocks over re-contoured cut and fill slopes.
3. Production facilities will be clustered and placed away from cut slopes and fill slopes to allow the maximum re-contouring of the cut and fill slopes.

Final Reclamation

Procedures:
The following minimum reclamation actions will be taken to ensure that the reclamation objectives and standards are met. It may be necessary to take additional reclamation actions beyond the minimum in order to achieve the Reclamation Standards.

Transmission Line

1. Poles, conductors, and hardware associated with the 230 kV transmission line would be totally removed. The remaining holes would be filled with soil gathered from the immediate vicinity within the approved permanent right-of-way. Areas so disturbed will be treated by contouring and revegetation.
2. Areas to be reclaimed will be ripped, tilled, or disked on contour, as necessary and revegetated during final reclamation. Revegetation will include site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious weeds, invasive weeds, and non-native species seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM and USFS.
3. The areas where the poles were removed would be raked to match the surrounding topography. Bladed areas would be re-contoured and revegetated with site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious weeds, invasive

weeds, and non-native species seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM and USFS

4. Refuse, junk, trash, tools, residual material, or personal property shall be removed from the transmission line right-of-way prior to restoration work.

Geothermal Plant, Well Pads, and Geothermal Pipeline

1. At the end of Project operations the wells would be plugged and abandoned as required by Nevada Division of Minerals (NDOM) regulations and BLM. Abandonment typically involves filling the well bore with clean, heavy abandonment mud and cemented at specific intervals to ensure that fluids would not move into different zones or aquifers. The top interval of the well bore is cemented to ground level to eliminate surface contamination to ground waters. The well head (and any other equipment) would then be removed, the casing cut off well below ground surface and the hole backfilled to the surface.
2. Areas to be reclaimed will be ripped, tilled, or disked on contour, as necessary. Pipeline reclamation would include placing fill in the trench, fill compaction, re-grading cut-and-fill slopes to restore the original contour, replacing topsoil and revegetation.
3. Revegetation will include site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious weeds, invasive weeds, and non-native species seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM.
4. Disposition of waste, residual material, junk trash, personal property.
5. All other above-ground facilities and areas of surface disturbance associated with geothermal development would be removed and reclaimed.

<u>Final Reclamation Procedures - Additional</u>

1. Final reclamation actions will be completed within 6 months of well plugging, season and weather permitting.
2. Final reclamation plans shall include the reclamation of roads, drill pads and sumps back to original contour. Demolition and removal of facilities, pipelines, culverts, transmission lines, substation, and total site reclamation.
3. All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be re-graded to match the contour that existed prior to initial construction; or a contour that blends indistinguishably with the surrounding landscape. Salvaged topsoil will be spread evenly over the entire disturbed site to ensure successful revegetation. To help mitigate the contrast of re-contoured slopes, reclamation will include measures to 'feather' cleared lines of vegetation and redistribute in-situ vegetation, woody debris, and large rocks over re-contoured cut and fill slopes.

4. Water breaks and terracing will only be installed when absolutely necessary to prevent erosion of fill material. Water breaks and terracing are not permanent features and will be removed and reseeded when the rest of the site is successfully revegetated and stabilized.
5. If necessary to ensure timely revegetation, well pads and other areas will be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until the intended plant communities become firmly established, whichever comes later. Fencing will meet standards found on page 18 of the Gold Book, 4th Edition, or will be fenced with operational electric fencing.
6. Final abandonment of pipelines and flowlines will involve flushing and properly disposing of any fluids in the lines. All surface lines and any lines that are buried close to the surface that may become exposed in the foreseeable future due to water or wind erosion, soil movement, or anticipated subsequent use, must be removed. Deeply buried lines may remain in place unless otherwise directed by the Mount Lewis Field Office Authorized Officer.
7. Refuse, junk, trash, tools, residual material, or personal property will be removed from the project area prior to restoration work.

Reclamation Performance Standards:

The following reclamation performance standards will be met:

1. Interim reclamation includes disturbed areas that may be re-disturbed during operations and will be re-disturbed at final reclamation to achieve restoration of the original land form and natural vegetative community.

2. Interim reclamation will be judged successful when the BLM Mount Lewis Field Office Authorized Officer determines that:

3. Disturbed areas not needed for active, long-term production operations or vehicle travel have been re-contoured.

4. Areas to be reclaimed will be ripped, tilled, or disked on contour, as necessary; protected from erosion; and revegetated with a self-sustaining, vigorous, diverse, native (or as otherwise approved) plant community sufficient to minimize visual impacts; provide forage; stabilize soils; and impede the invasion of noxious, invasive, and non-native weeds.

5. Revegetation will include site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious weeds, invasive weeds, and non-native species seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM.

6. Final reclamation includes disturbed areas where the original landform and a natural vegetative community have been restored.

7. Final reclamation will be judged successful when the BLM Mount Lewis Field Office Authorized Officer and or the USFS Authorized Officer determines that:

8. The original landform has been restored for all disturbed areas including well pads, production facilities, roads, pipelines, and utility corridors.

9. Reclaimed areas are ripped, tilled, or disked on contour, as necessary.

General Performance Standards:

A self-sustaining, vigorous, diverse, native (or otherwise approved) plant community is established on the site, with a density sufficient to control erosion and invasion by non-native plants and to reestablish wildlife habitat or forage production. At a minimum, the established plant community will consist of species included in the seed mix and/or desirable species occurring in the surrounding natural vegetation. Revegetation will include site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious weeds, invasive weeds, and non-native species seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded.

Specific Performance Standards:

1. No single species will account for more than 30% total vegetative composition unless it is evident at higher levels in the adjacent landscape. Permanent vegetative cover will be determined successful when the basal cover of desirable perennial species is at least 80% of the basal cover on adjacent or nearby undisturbed areas where vegetation is in a healthy condition; or 80% of the potential basal cover as defined in the National Resource Conservation Service Ecological Site(s) for the area. Plants must be resilient as evidenced by well-developed root systems and flowers.
2. Erosion features are equal to or less than surrounding area and erosion control is sufficient so that water naturally infiltrates into the soil and gullying, head-cutting, slumping, and deep or excessive rills (greater than 3 inches) are not observed.
3. The site is free of Noxious, invasive, and non-native seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201), field debris, equipment, and contaminated soil.
4. Invasive and non-native weeds are controlled.
5. Refuse, junk, trash, tools, residual material, or personal property is removed from the project area.

Reclamation Monitoring and Final Abandonment Approval

1. Reclaimed areas will be monitored annually. Actions will be taken to ensure that reclamation standards are met as quickly as reasonably practical and are maintained during the life of the project.

2. Reclamation monitoring will be documented in an annual reclamation report submitted to the BLM Mount Lewis Field Office and or USFS Authorized Officer by March 1 of each calendar year. The report will document compliance with all aspects of the reclamation objectives and standards, identify whether the reclamation objectives and standards are likely to be achieved in the near future without additional actions, and identify actions that have been or will be taken to meet the objectives and standards. The report will also include acreage figures for: Initial Disturbed Acres; Successful Interim Reclaimed Acres; Successful Final Reclaimed Acres.

3. Annual reports will not be submitted for the project or portions thereof when approval by the Mount Lewis Field Office and or USFS Authorized Officer was obtained in writing as having achieved interim or final reclamation standards. Monitoring and reporting shall continue annually until interim or final reclamation is approved. Whenever 30% or more of a reclaimed area is re-disturbed, monitoring will be reinitiated.

4. The BLM Mount Lewis Field Office and or USFS Authorized Officer shall be informed when reclamation has been completed, appears to be successful, and the site is ready for final inspection.

Appendix C: Greater Sage-Grouse Monitoring and Mitigation Plan

APPENDIX C

Greater Sage-Grouse Monitoring and Mitigation Plan for McGinness Hills Geothermal Development Project

C.1 MITIGATION MEASURES TO ADDRESS ANTICIPATED PROJECT IMPACTS

Greater sage-grouse (*Centrocercus urophasianus*) use of the Project area has been documented through field surveys (Great Basin Ecology 2010, Nevada Department of Wildlife [NDOW] 2011), observational records (Battle Mountain District Office 2010), and telemetry data collection (NDOW 2011). Suitable habitat exists throughout and around the Project area for all seasonal uses (i.e. winter, lek/breeding/nesting, brood rearing, and fall) by sage-grouse. Predicted impacts to sage-grouse are from Project construction, well and facility testing, existence and maintenance of the power plants, appurtenant facilities, wells, and pipelines, increased human activity, and increased noise.

The following measures (developed in consultation with the NDOW), required to mitigate anticipated Project effects to greater sage-grouse, would begin to be implemented in concert with the initiation of Project construction, where appropriate Other mitigation measures should be implemented over the life of the project as monitoring indicates the need for mitigation implementation, as determined by the BLM and USFS.

It should be noted that while a large portion of the impacted sage-grouse habitat is located on lands managed by the BLM, there is sage-grouse habitat proximate to the USFS proposed transmission line route. It should also be noted that known sage-grouse leks are located on both agencies' lands. However, it is presumed that not all leks have been identified. Thus all mitigation discussions apply to both agencies lands for sage-grouse mitigation when identified.

As noted in Chapter 3 of this EA, all BLM/USFS clearances, including Section 106 of the NHPA, Native American Consultation, ESA and SSS clearances, along with migratory bird requirements will be completed prior to implementation of any sage-grouse habitat restoration/ enhancement projects.

C.1.1 MITIGATION OF DIRECT EFFECTS ASSOCIATED WITH THE GEOTHERMAL COMPONENTS AND TRANSMISSION LINE

Key Issues for Sage-Grouse

Impacts to sage-grouse include the loss of 217 acres of sage-grouse foraging and nesting habitat, including potential Category 1 habitat as defined by Nevada's Governor Sage-Grouse Conservation Team (NGSCT, 2010), resulting from direct and/or long-term surface disturbance associated with Project construction and operation. Effects of habitat fragmentation from this habitat loss would be concentrated around the plants, production and injection pipelines, and wells.

Mitigation Measures

Ormat will complete, at a 4:1 ratio (NGSCT 2010), terrestrial habitat restoration/enhancement, and improvements to compensate for disturbance in sage-grouse habitat in the vicinity of the Project (Figure 1). Ormat will fund all restoration and enhancement projects to BLM and/or USFS specifications, following all BLM/USFS requirements.

At a 4:1 ratio, this equates to 868 acres (4 x 217 acres) of habitat restoration/enhancement. The potential or likely treatment areas to be restored/enhanced include BLM/USFS-managed lands within the vicinity of the Project area, as shown in Figure 1. These potential treatment areas will be identified on a case-by-case basis, based on field inventory of habitats, conditions, and potential value to sage-grouse as well as indications of effects to sage-grouse based on monitoring results. A preference will be given to areas in close proximity to the Project, but outside a 2-mile buffer around the project, thus minimizing any conflicting indirect effects of Project operation, testing, or maintenance. Preference for habitat restoration/enhancement treatment areas will also be given to locating restoration/enhancement in NDOW-designated sage-grouse core-breeding habitat (Figure 14 in the EA as denoted in light blue). While the project will directly and indirectly impact core-breeding habitat, the goal of the restoration/enhancement efforts will focus on entire habitat throughout the life cycle of sage-grouse. Habitat enhancement/restoration treatments will be prescribed for specific sites based on the probability of successful restoration/enhancement and the greatest benefit to local sage-grouse metapopulations (i.e., a group of spatially separated populations of the same species, which interact at some level). The determination of where a specific restoration/improvement/enhancement project is located and when work would be conducted would rest with the BLM/USFS to allow for incorporation of applicable study or monitoring data and identification of areas with the best habitat potential. Prior to implementation of these various or potential treatment options (and after an area is designated for treatment) cultural surveys and Native American Consultation/Coordination will be completed per BLM/USFS protocols.

Goals of these restoration/enhancement projects will be established based on habitat requirements for sage-grouse. Examples of these requirements include breeding habitats with 15-25% sagebrush canopy cover, grass cover greater than or equal to 15% and a diverse forb cover greater than or equal to 10%. Breeding habitats should also have a perennial herbaceous cover that is greater than or equal to 18 cm in height. In winter habitat areas, the sagebrush canopy cover should be 10 to 30% with heights of 25-35 cm (Connelly et al. 2000). Additional guidelines from the Western Association of Fish and Wildlife Agencies (WAFWA) (Connelly et al. 2000) may be used in conjunction to those outlined above.

Restoration/enhancement projects could be completed in R-1, R-2, R-3, or R-4 value habitats (NGSCT 2010). These R-values are restoration habitats defined from the "Energy and Infrastructure Development Standards to Conserve Greater Sage-Grouse Populations

and Their Habitats in Nevada" produced by the Nevada Governor's Sage-Grouse Conservation Team 2010. Below are the descriptions for the associated R-values:

- **"R-1 – Habitat areas that currently lack sufficient sagebrush and are currently dominated by perennial grasses and forbs, yet have the potential to produce sagebrush plant communities with a good understory composition of desired grasses and forbs.**
- **R-2 – Existing sagebrush habitat areas with insufficient desired grasses and forbs in the understory to meet seasonal needs of sage-grouse.**
- **R-3 – Sagebrush habitat areas where pinyon-juniper encroachment has affected the potential to produce sagebrush plant communities that provide adequate cover and forage to meet the seasonal needs of sage-grouse.**
- **R-4 – Habitat areas that have the potential to produce sagebrush plant communities, but are currently dominated by annual grasses, annual forbs, or bare ground."**

Treatments may include the following:

- **Burn restoration (historic burns) including: seedings (sagebrush and understory vegetation via broadcast, broadcast and harrow, drill or hand planting of seedlings), noxious and invasive plant treatment (Plateau® for cheatgrass and other herbicides as needed for other invasive and/or noxious weed species), and possible temporary fencing to protect areas of restoration.**
- **Brush thinning via mechanical methods, herbicide or hand thinning followed by seeding (seeding to be done via broadcast or drill methods) to increase the diversity in monotypic sagebrush habitats;**
- **Mechanical or hand shrub thinning or green stripping to reduce fuels and fire risk to sage-grouse habitats followed with successful seeding (seeding to be done via broadcast or drill methods);**
- **Weed treatment followed with successful seeding (seeding to be done via broadcast or drill methods);**
- **Pinyon-juniper reduction by hand thinning areas in which shrubs are still the dominant form (phase I pinyon-juniper woodland) or are co-dominant (early phase II pinyon-juniper woodland).**

Monitoring and Trigger Points

Implementation of the above 4:1 land treatment options would be a requirement of the BLM/USFS approval of Ormat's various applications for the McGinness Hills Geothermal Development Project. For this aspect of the mitigation plan, the BLM/USFS, working with the NDOW have determined through the NEPA process that the loss of 217 acres of sage-grouse habitat will require 4:1 replacement (by enhancement and/or restoration of nearby habitat) of that lost habitat. The trigger points for implementation and location of habitat

restoration/enhancement projects will be based on monitoring (see section C.2) and identified impacts of the project proposal.

Effectiveness of Proposed Mitigation

These measures will improve sage-grouse habitat to substitute and offset the habitat lost through Project development (IM 2008-204). Increasing the quality and the quantity of sage-grouse habitat will benefit not only individuals but also the local population.

Restoration of burned areas will in time return those areas to sage-grouse habitat. Without sagebrush, the birds are less likely utilize or at best have limited use of the burned areas. Increasing the quality of the habitat through sagebrush and understory seedings, individuals are expected to once again utilize the areas.

Monotypic sagebrush habitats do not provide high valued habitat as they lack the majority, if not all, of the perennial understory. Breeding habitat should contain a sagebrush cover of 15-25% with greater than 15% for grasses and greater than 10% for forbs; winter habitat having sagebrush cover ranging from 10 to 30% (Connelly et al. 2000). By thinning sagebrush canopy cover to the desired amount and seeding the interspaces with desired native forbs and grasses, the habitat quality should increase. By green stripping and brush thinning to create fuel breaks, the likelihood of a catastrophic fire is reduced, in turn, protecting existing and potential enhanced/restored sage-grouse habitat.

Invasive and noxious weed species reduce the health of a sagebrush stand, in turn reducing the quality of sage-grouse habitat. Treating these species to remove them from the area increases the quality of habitat for sage-grouse.

Pinyon –juniper woodlands are expanding and encroaching into sagebrush communities throughout the Great Basin (Miller et al. 2008). This expansion and encroachment leads to a reduction in viable sage-grouse habitat. Hand thinning early phases of expansion/encroachment would return areas previously used by sage-grouse to quality habitat.

In order to protect the restored or enhanced habitat, temporary fencing may be used. Once restoration/enhancement objectives, as identified above, are achieved, these fences will be removed.

Mitigation Impacts

Ormat's financial contributions that ensure the sage-grouse habitat will be replaced at a 4:1 ratio will have some financial impact to Ormat.

Any herbicide treatments for invasive or noxious weeds shall be completed within the constraints of the Battle Mountain Programmatic Weed Environmental Assessment (2009). Vegetation reseeding using mechanical means will result in some level of soil disturbance. Appropriate clearances prior to implementation of the reseeding efforts will avoid potential impacts to other resources. Successful establishment of vegetative understories and sagebrush communities over

time will provide quality habitat restoration and enhancement for sage-grouse and sage-grouse broods, which should ensure propagation of the local populations.

Burned area reseeding of grasses, forbs and sagebrush seedlings and fencing such restoration habitat will re-establish sage-grouse habitat over time. The restored areas will provide additional quality habitat, thus allowing sage-grouse populations to re-establish formerly destroyed habitats.

Fencing of restored/enhanced habitat, depending on the size of the project, could reduce a portion of the grazing permittee's carrying capacity. Agreements for fencing with the permittee/s will be required prior to fencing such projects. Ormat will be required to maintain all restoration/enhancement project fences.

Hand thinning of pinion/juniper expansion and encroachment into sage-grouse habitat will have a positive effect on sage-grouse habitat since both types of trees limit understory growth. Removal of individual trees will limit competition for nutrients and water, thus providing opportunities for understory growth.

Where prescribed, hand thinning will be conducted by Individuals on foot, using chainsaws and handsaws to remove individual trees. Trees may be left on the ground to decompose naturally over time, providing microsites for establishment of desirable plant species and habitat for small animals such as rabbits and mice.

Mechanical brush thinning or green stripping to reduce wildland fire threats to sage-grouse habitat will assist firefighters in reducing the size and intensities of potential wildland fire threats to existing sage-grouse habitats. Mechanical or hand thinning of brush will reduce horizontal and vertical continuity of fuel beds. Short-term loss of some habitat may occur. Soils may be disturbed if mechanical thinning occurs. Potential impacts to other resources will be reduced by implementation of requisite clearances prior to thinning applications. Long-term protection of remaining sage-grouse habitat may occur as a result of reduced fire intensity or fire size in existing habitat.

The changes in sage-grouse habitat by increasing diversity through seeding, seedlings, plantings, etc. will improve habitat quality, reduce the potential for plant disease, and improve sage-grouse propagation and survivability.

C.1.2 MITIGATION OF PREDATION EFFECTS ASSOCIATED WITH THE TRANSMISSION LINE

Key Issues for Sage-Grouse

The primary impact from the proposed transmission line is the increased predation risk due to an increased presence of common ravens and other avian predators resulting from added perching and nesting sites associated with the transmission line.

Mitigation Measures

The Project would require the implementation of the Common Raven Monitoring, Mitigation, and Management Plan (Appendix D). This plan includes the following mitigation measures:

- **During all phases of the Project (i.e., construction and maintenance), all food, waste, and trash will be placed in closed containers.**
- **Ormat will prohibit employees, contractors and sub-contractors from feeding wildlife or leaving food available for scavenging wildlife.**
- **Road-killed animals on the Project site and associated travel routes will be promptly removed and disposed of in closed containers to eliminate access to ravens.**
- **Presence of road-killed animals will also be minimized by Ormat's environmental protection measure of a maximum 25 mph speed limit within the Project area.**
- **Ormat has committed to implement the following environmental protection measures: perch and nest deterrents on all power poles; singlepole transmission line design (APLIC 2006).**
- **Ormat will acquire common raven depredation permits from NDOW or USFWS.**

Monitoring and Trigger Points

For all aspects of the monitoring plan for sage-grouse impacts, refer to Section C.2. This mitigation is required; there are no trigger points.

Effectiveness of Proposed Mitigation

These measures will lead to a decreased presence of common ravens and other avian predators within the vicinity of the project, thereby decreasing predation risk to sage-grouse. Travel speeds of <25 mph will also decrease the probability of collisions with animals.

Mitigation Impacts

The requirement to properly collect all food, waste, and trash are BMPs and State requirements for all industrial plant operations. These are considered operating costs for Ormat.

Acquiring depredation permits will add to Ormat's ability to maintain lower numbers of ravens. In turn, this reduction will lower potential predation on sage-grouse by ravens.

The prohibition of workers feeding wildlife or leaving food at the project or construction sites will limit the likelihood of attracting wildlife (e.g., common ravens and raptor species). Removal of road kill will limit the attraction of ravens, buzzards, and other carrion eating raptors such as golden eagles; thus limiting the likelihood of additional predation on sage-grouse. Speed limits proposed by Ormat on their workers, contractors, and sub-contractors should limit accidents that may kill or maim animals.

Application of the 2006 APLIC standards should limit perching opportunities of raptors on sage-grouse. These standards should also prevent the accidental electrocution of most avian species, especially eagles and large hawks. Application of APLIC standards to transmission line facilities will be an additional financial burden to Ormat through the purchase and use of anti-perching devices and changes in engineering design of conductors to limit potential electrocution of most avian species.

C.1.3 MITIGATION OF INDIRECT EFFECTS TO SAGE-GROUSE LEKS FROM GEOTHERMAL PROJECT CONSTRUCTION, TESTING, AND MAINTENANCE

Key Issues for Sage-Grouse

Indirect effects to sage-grouse during lekking season resulting from noise, visual intrusion and human activity associated with geothermal project construction, testing, and maintenance.

Mitigation Measures

- **Ormat will ensure that timing of shift changes and deliveries will be scheduled outside the lekking period (15 March – 15 May, 1 hour before sunrise–10:00 AM).**
- **Venting pressure or steam to the atmosphere (e.g., during well or flow testing) would occur outside the lekking period (15 March – 15 May, 1 hour before sunrise–10:00 AM).**
- **Construction or maintenance activities (including helicopter fly-overs) associated with well pads, pipelines, transmission lines, plant facilities, and roads will not be permitted within two miles of active leks (see Sage-Grouse Population Monitoring below) during the lekking period (15 March – 15 May, 1 hour before sunrise–10:00 AM).**
- **Noise generated by the Project will be managed so that sound pressure levels will be below 49 dBA (MTSGWG 2005, NDGFD 2005, WYSGWG 2006) at active leks (see Sage-Grouse Population Monitoring section below) during the lekking period (15 March – 15 May, 1 hour before sunrise–10:00 AM).**

Monitoring and Trigger Points

For all aspects of the monitoring plan for sage-grouse impacts, refer to Section C.2. This mitigation is required; there are no trigger points.

Effectiveness of Proposed Mitigation

Reduction of noise, visual, and human activity disturbances associated with the Project during the lekking season at the time of day lekking occurs will reduce the disturbance on a lek. Diminished disturbance to the lek will likely lessen the chance of lower male attendance, shifting of lek locations, or loss of active lek locations.

Mitigation Impacts

The shift changes proposed from March 15th through May 15th may be a minor inconvenience to plant employees and operations of the facilities during these periods. There should be no financial burden to Ormat from implementation of this mitigation.

The requirement to vent steam outside of the prescribed times may delay testing procedures for Ormat. Since such test procedures are usually longer than twenty-four hours, Ormat will be required to forgo such tests during the prescribed periods.

Finalization of construction and maintenance activities for well placement, pipelines, etc. are required for development of power plant and appurtenant facilities. Implementation of the above mitigation may delay full or timely facility development.

See Section C.2.1 for an analysis of the impacts of the proposed noise mitigation.

C.1.4 MITIGATION OF DIRECT AND INDIRECT EFFECTS TO NESTING SAGE-GROUSE FROM THE GEOTHERMAL PROJECT

Key Issues for Sage-Grouse

In addition to direct effects, Project impacts to nesting sage-grouse are expected from indirect effects such as noise, human activity, and habitat fragmentation. The greatest impacts to nesting sage-grouse are expected during Project construction due to nest abandonment.

Mitigation Measures

During the period from March 15 to June 30, nest "clearance" surveys will be conducted prior to any proposed surface-disturbing activities. The area to be disturbed and a 0.5-mile radius buffer will be surveyed by BLM/USFS-approved specialists to determine if nesting sage-grouse are present. If an active nest is located, a 0.5-mile radius buffer will be placed around the nest and no surface-disturbing activities will occur until the nest is vacated.

Monitoring and Trigger Points

For all aspects of the monitoring plan for sage-grouse impacts, refer to Section C.2. This mitigation is required; there are no trigger points.

Effectiveness of the Proposed Mitigation

These measures will decrease the chance of nest destruction or abandonment due to construction and surface-disturbing activities.

Mitigation Impacts

By avoiding any occupied nest during construction, the likelihood of nest success would be increased, thus ensuring propagation of the local sage-grouse populations.

Should Ormat pursue construction or other surface-disturbing activities during nesting periods, and a nest is found within the construction zone or within the 0.5 mile buffer zone, construction delays for those aspects of the project would occur.

C.1.5 MITIGATION OF INDIRECT EFFECTS OF THE PROJECT TO SAGE-GROUSE BROOD-REARING HABITAT

Key Issues for Sage-Grouse

Several springs, seeps, wet meadow, and riparian areas occur in close proximity to components of the Project. Although it is unknown to what extent these areas are being utilized by sage-grouse, any use by sage-grouse would likely be reduced or discontinued during and after Project development. The project is anticipated to impact 34 acres of brood-rearing habitat.

Mitigation Measures

Ormat will complete treatments at a 4:1 ratio (NGSCT 2010) to protect, enhance and/or restore brood-rearing habitat in targeted locations (Figure 1) on BLM- or USFS-managed land near the Project; this equates to 136 acres (4 x 34 acres). The specific areas to be treated will be identified on a case-by-case basis, determined by field inventory of habitats, conditions, and potential value to sage-grouse. Treatments will be prescribed for specific sites based on the probability of successful restoration/enhancement and the greatest benefit to local sage-grouse metapopulations. The design for these projects will allow access to water for beneficial use through the use of water gaps. Placement and construction of exclosures will also need general concurrence from the appropriate permittee/s. Ormat will fund all such restoration/enhancement/protection projects to BLM or USFS specifications.

- **Treatments may include fencing of riparian areas and meadows for protection, plantings or seedings of desired native riparian species to increase biodiversity and habitat condition, stream restoration to improve riparian areas where there are currently incised channels or nick points, and treatment of invasive and noxious weeds (e.g., salt cedar). Stream restoration may include check dams, rip/rap fortification of damaged banks and nicks, and large boulder placement within stream channels to decrease water velocity during peak flows.**
- **Riparian exclosures may be grazed if the BLM or USFS determine that it would be beneficial to riparian health. Specifics of this grazing will be based on a return to a healthy riparian condition based on current sage-grouse guidelines and working with the local grazing permittee/s.**

Monitoring and Trigger Points

For all aspects of the monitoring plan for sage-grouse impacts, refer to Section C.2. This mitigation is required; there are no trigger points.

Effectiveness of Proposed Mitigation

These treatments will improve sage-grouse brood-rearing habitat to substitute and offset the habitat lost through Project development (IM 2008-204). Riparian areas and meadows are important habitat for sage-grouse brood-rearing. Having healthy riparian areas and meadows that support the native forb species and invertebrate fauna is imperative (Sveum et al. 1998). Excluding riparian areas and meadows from grazing until deemed beneficial, protects the health of those areas. Managed grazing within these exclosures may increase species diversity with desired native species valuable to brood rearing habitat.

Sage-grouse chicks require a diet high in protein that consists mainly of forbs and insects (Sveum et al. 1998). The cover that a healthy riparian habitat provides may reduce predation from terrestrial and avian predators on sage-grouse broods. Effectively protecting and increasing the condition of the riparian habitats provides an improved value of brood-rearing habitat.

Incised channels and nick points degrade the stream habitat and can reduce the size and health of riparian areas. Resolving those stream issues will increase the riparian health and increase the quality of the habitat.

Mitigation Impacts

Riparian exclosures (fences) positively impact riparian health and may increase diversity of desired native species and improve cover and diet for sage-grouse broods. Positive changes in stream morphology will lead to higher perennial water yields, resistance to spring flood events, and improved stream water quality.

The successful planting or seeding of desired riparian vegetation when combined with exclosure fencing will hasten recovery of vegetation, increase species diversity, and enhance the overall recovery of damaged riparian areas.

Stream channel restoration of incised channels and nicks with check dams, rip/rap fortification, and boulder placement will limit future riparian habitat loss by reducing stream bank erosion during high water events. Overtime, these structures will be silted in; preventing soil loss and decreasing nick and stream incising.

Fencing springs, seeps, meadows and riparian areas may provide perching opportunities for raptors; which may lead to some predation of sage-grouse and other animals.

C.1.6 MITIGATION OF INDIRECT EFFECTS ASSOCIATED WITH THE VISUAL PRESENCE OF PROJECT COMPONENTS

Key Issues for Sage-Grouse

Indirect effects to sage-grouse may occur during all seasons resulting from human activity and visual disturbances associated with the geothermal components of the Project.

Mitigation Measures

Where Project lighting is required, low output, motion sensor lights will be installed at facilities and must be shielded and directed to focus light only on the area requiring illumination. In addition to limiting human activity impacts to sage-grouse, such lighting will assist Ormat in meeting the National Dark Skies initiative where ambient nighttime lighting has been identified as causing potential impacts to many wildlife species including volant species such as bats.

Non-reflective, tinted windows will be utilized in Project buildings to reduce visual disturbance.

Monitoring and Trigger Points

For all aspects of the monitoring plan for sage-grouse impacts, refer to Section C.2. This mitigation is required; there are no trigger points.

Effectiveness of the Proposed Mitigation

Reduced disturbance from visual and human activities will minimize effects to sage-grouse that could otherwise increase shifts of individuals or groups of sage-grouse away from the immediate Project area.

Mitigation Impacts

Low output, shielded and motion sensor lights could cost more than other types of lighting, increasing costs to Ormat.

Reduced ambient light emanating from the construction sites and operational facilities of the Project would create less visual disturbance to sage-grouse and other wildlife.

Any ambient nighttime light emanating from the facility or construction site (as compared to the current, unlighted desert setting) could cause a concentration of insects and other prey bases for bats, night hawks and other insectivores in the vicinity of the light source. Possible collisions by nighttime insectivores with construction equipment or completed plant facilities could increase, leading to volant fatalities. Ormat would be required to report to the NDOW and the BLM any incidents of such fatalities.

Non-reflective tinted facility windows will likely be more costly to Ormat than regular glass windows. Conversely, the likelihood of volant mortality caused by window strikes will be reduced. Solar glare will be reduced from facility windows, reducing visual disturbance to sage-grouse and other wildlife (e.g., attraction to or avoidance of the project site).

C.2 MONITORING OF MITIGATION MEASURE EFFECTIVENESS

All mitigation measures outlined above are effective for the life of the Project unless subsequent monitoring deems them inadequate and modification is necessary. Subsequent monitoring will include sound pressure level monitoring (see below), sage-grouse population monitoring (see below), and common raven population monitoring (Appendix D). Because time lags in sage-grouse response to development have been documented (Walker et al. 2007, Harju et al. 2010), all monitoring will be conducted for a minimum of 10 years, commencing with construction of permitted activities.

C.2.1 SOUND PRESSURE LEVEL MONITORING WITHIN THE PROJECT AREA AND 2-MILE BUFFER

The main goal for sound pressure level monitoring is to ensure sound pressure levels are below 49 dBA (MTSGWG 2005, NDGFD 2005, WYSGWG 2006). By recording daily sound pressure levels and monitoring sage-grouse activity at lek locations, a determination can be made as to the adequacy of the 49 dBA level to protect sage-grouse leks (see Sage-grouse Population Monitoring below). During the lekking season (15 March –15 May), when leks are active (one hour before sunrise –10:00 AM), continuous sound pressure level monitoring will be conducted at the four leks closest to the Project using appropriate acoustic monitoring equipment. To determine seasonal lek locations, at least one lek survey would be completed prior to placement of monitoring equipment. Acoustic monitoring equipment will be placed at the lek edge closest to the Project during the afternoon (12:00 –16:00) to avoid disruption to lek activity. During the lekking season, Ormat is required to monitor sound pressure levels daily and report any levels of 49 dBA and above to the BLM immediately. Weekly reports of monitoring will also be filed with the BLM.

Mitigation Measures

Future mitigation measures to reach appropriate sound pressure levels include the following:

- **Modifying operations to reduce the use of cooling fans, pumps, or other noise-producing Project equipment during lekking hours (one hour before sunrise–10:00 AM) during the lekking season (15 March – 15 May);**
- **Employment of an acoustic engineer to identify and assess options to further reduce noise from Project components;**
- **Installation of sound damping shelters, walls, enclosures, or other barriers for pumps or other noise-producing equipment to reduce noise emitting from geothermal facilities (e.g., power plant, wellheads, etc.);**
- **Reducing the amount or changing the timing of project related vehicular traffic;**
- **Installing poly-slats on chain link fences or other barriers around geothermal facilities to further attenuate noise emitted from those facilities.**

Trigger Point

Threshold:

If through daily monitoring, sound pressure levels are documented that exceed 49 dBA at any lek, Ormat must implement additional mitigation measures to reduce sound pressure levels below 49 dBA immediately. Sound pressure level monitoring data documenting successful reduction in dBA levels must be demonstrated and reported to the BLM within one week of the occurrence.

Effectiveness of Proposed Mitigation

By reducing noise disturbances associated with the Project during the lekking season at the time of day lekking occurs, disturbance to a lek will be reduced. The diminished disturbance to the lek will reduce the chance of lowered male lek attendance, shifting of lek locations, or loss of active lek locations due to sound disturbance.

Mitigation Impacts

Modification of plant operations to reduce noise impacts, employment of an acoustic engineer, and installation of sound dampening barriers will increase operational costs to Ormat. Any operational changes resulting from additional plant modifications prescribed by the acoustical engineer will also likely increase Ormat's operational costs.

By reducing noise levels from plant operations, impacts to occupied sage-grouse leks should be reduced or eliminated, thus enabling lek activities to continue and protecting displaying males from noise disturbance.

C.2.2 SAGE-GROUSE POPULATION MONITORING WITHIN THE PROJECT AREA AND 2-MILE BUFFER

Annual monitoring of sage-grouse leks will be required. This includes both active leks and leks with unknown status, until those leks with unknown status are determined to be inactive. Conversely, if any unknown status leks are determined to be active, the active leks mitigation would apply. Data sheets or copies of these data sheets will be provided weekly to the BLM, NDOW and USFS. Lek surveys must be completed by BLM/USFS-approved biologist/s following standard lek survey protocol (Attachment 1) and ensure the following:

- Surveys must be conducted between 15 March and 15 May of each year. Male lek attendance is typically greatest later in the season; thus adjustments to lek survey schedules may be needed to collect accurate data.

- Surveys must be conducted at least four times per lek during the lekking season with eight days between lek visits.
- A center point of the lek activity will be recorded during each monitoring visit to document any shift in the lek location over time. The center point location will be recorded with a GPS unit either after lek activity has dispersed or by projecting the location using a rangefinder and compass bearing.
- Surveys must be conducted from one-half (1/2) hour before sunrise until 10:00 AM each survey period.
- Utilizing current roads, transects will need to be completed within the 2-mile project buffer area to look for new leks. This will also need to be completed within the above seasonal and daily time frames.

To account for and evaluate annual climatic variations that may be influencing male lek attendance, the results from each of the monitored leks should be compared to the closest NDOW trend leks outside the Project influence.

Monitoring movements of sage-grouse at the affected leks will be conducted through radiotelemetry efforts. This monitoring will provide additional information should shifts in lek locations occur after the Project has been initiated. All efforts regarding capture and telemetry will be the responsibility of Ormat through coordination with the BLM, USFS and NDOW. A minimum of three males and three females per targeted lek will be monitored per season for all affected leks. A minimum of one GPS radiocollar per lek per sex will be utilized. If radiocollars continue to function annually, the same males and females as previous years may be monitored. Monitoring will occur at minimum once per week during the lekking season (15 March –15 May), and once per month outside of the lekking season.

Threshold:

If population monitoring detects any of the following conditions and they are determined to be a result of the Project, Ormat must take measures to mitigate these impacts.

- >50% decrease in the average three-year lek attendance compared to the long-term average.
- >50% decrease in male lek attendance in two consecutive years of monitoring.

MITIGATION

Mitigation measures to eliminate decreased male lek attendance:

- **Reduction in sound pressure level to <u>40 dBA</u> (Crompton 2005) at sage-grouse leks must be demonstrated during the next lekking season. This may be accomplished by adjusting to stricter levels of the previously identified measures:**

- **Modifying operations to reduce the use of cooling fans, pumps, or other noise-producing Project equipment during lekking hours (one hour before sunrise– 10:00 AM), during the lekking season (15 March –15 May);**
- **Employment of an acoustic engineer to identify and assess options to further reduce noise from Project components;**
- **Installation of sound damping shelters, walls, enclosures, or other barriers for pumps or other noise-producing equipment to reduce noise emitting from geothermal facilities (e.g., power plant, wellheads, etc.);**
- **Reducing or changing the timing of vehicular traffic;**
- **Installing poly-slats on chain link fences or other barriers around geothermal facilities to further attenuate noise emitted from those facilities.**

Effectiveness of Proposed Mitigation

Reducing noise disturbances associated with the Project during the lekking season at the time of day lekking occurs will reduce the disturbance to a lek. The diminished disturbance to the lek will likely lessen the chance of lower male lek attendance.

Mitigation Impacts

Refer back to C.2.1 "Mitigation Impacts" for a discussion of the above mitigation impacts.

C.3 REPORTING

An annual report documenting results from sound pressure level monitoring and sage-grouse lek and nest monitoring will be submitted to the BLM, USFS and NDOW no later than August 31 each year. Reports should include the following:

- Sound pressure level monitoring results, including daily dBA levels during the outlined lekking season and times; location (UTM, NAD83) of acoustic monitoring equipment; any isolated incidents that may have increased dBA levels temporarily
- Sage-grouse lek monitoring, including lek count data sheets, center point of sage-grouse leks (UTM, NAD83), isolated incidents disturbing sage-grouse lekking activities
- Sage-grouse radiotelemetry results
- Sage-grouse nest sites (UTM, NAD83) found during "clearance" surveys or collected opportunistically through other monitoring activities.
- If future mitigation measures are implemented, identification and a detailed description of the mitigation measure and date of implementation will also be reported.
- An annual meeting, to be held in the winter months, with Ormat, contractors, BLM, USFS, USFWS and NDOW. This meeting will involve a presentation and discussion of the previous year's monitoring data and further discussions regarding activities and requirements for the coming year.

Attachment 1

Greater Sage-Grouse Lek Count Protocol

NEVADA DEPARTMENT OF WILDLIFE INSTRUCTION FOR GREATER SAGE-GROUSE LEK COUNTS

1) Arrive at the lek at least 45 minutes before sunrise.
2) Do not approach any closer than about 200 meters from the lek. This will prevent disturbance of the birds while strutting.
3) Conduct all counts between 30 minutes before sunrise and 1.5 hours after sunrise.
4) If at all possible, observe the lek from inside your vehicle. Sage-grouse are less sensitive to the approach of a vehicle and its presence than they are to you.
5) Note your arrival time and departure time on the lek count form.
6) Obtain a minimum of three counts at 15-minute intervals of each lek on each date counted. A count of males, females, and unknown birds is always preferable to a flush count.
7) In the comments section of the form, please note the following information:
    a. Wind direction and speed
    b. Temperature in degrees Fahrenheit
    c. Ground condition – dry, muddy, snow (depth in inches)
    d. Cloud cover in the following manner:
        i. Clear
        ii. Partly cloudy (less than 25% cover)
        iii. Scattered (more than 25% but scattered horizon to horizon)
        iv. Cloudy (more than 50% cover)
        v. Foggy
8) Note the presence of predators by species, time and activity: Example – golden eagle @ 6:45 a.m. flying over lek; coyote chasing grouse at 8:15 a.m.
9) Be sure to use the common name of the lek.

NEVADA DEPARTMENT OF WILDLIFE

LEK COUNT DATA COLLECTION FORM

LEK ATTRIBUTES

LEK ID: _____ LEK NAME: _____

LEK COMPLEX: _____ TREND LEK: _____

PMU NAME: _____ PLANNING UNIT: _____

NDOW REGION: _____ UNIT: _____ BLM DISTRICT: _____

COUNTY: _____ RANGE/VALLEY: _____ LEK STATUS: _____

GPS COORD (NAD83): EASTING _____ NORTHING _____ NEW/UPDATED: ☐

SURVEY ATTRIBUTES

OBSERVER NAME(S): _____ SURVEY METHOD: _____

TIME OF ARRIVAL: _____ SUNRISE: _____

DATE OF SURVEY: _____ TIME OF SURVEY: _____

WEATHER CONDITIONS: _____

TEMPERATURE: _____

WIND SPEED: _____ DIRECTION: _____

OTHER ANIMALS AT LEK: _____

LEK COUNT DATA

	COUNT 1	COUNT 2	COUNT 3	COUNT 4
MALES:				
FEMALES:				
UNKNOWN:				

HIGH COUNT MALES: _____ FEMALES: _____ UNKNOWN: _____

REMARKS: _____

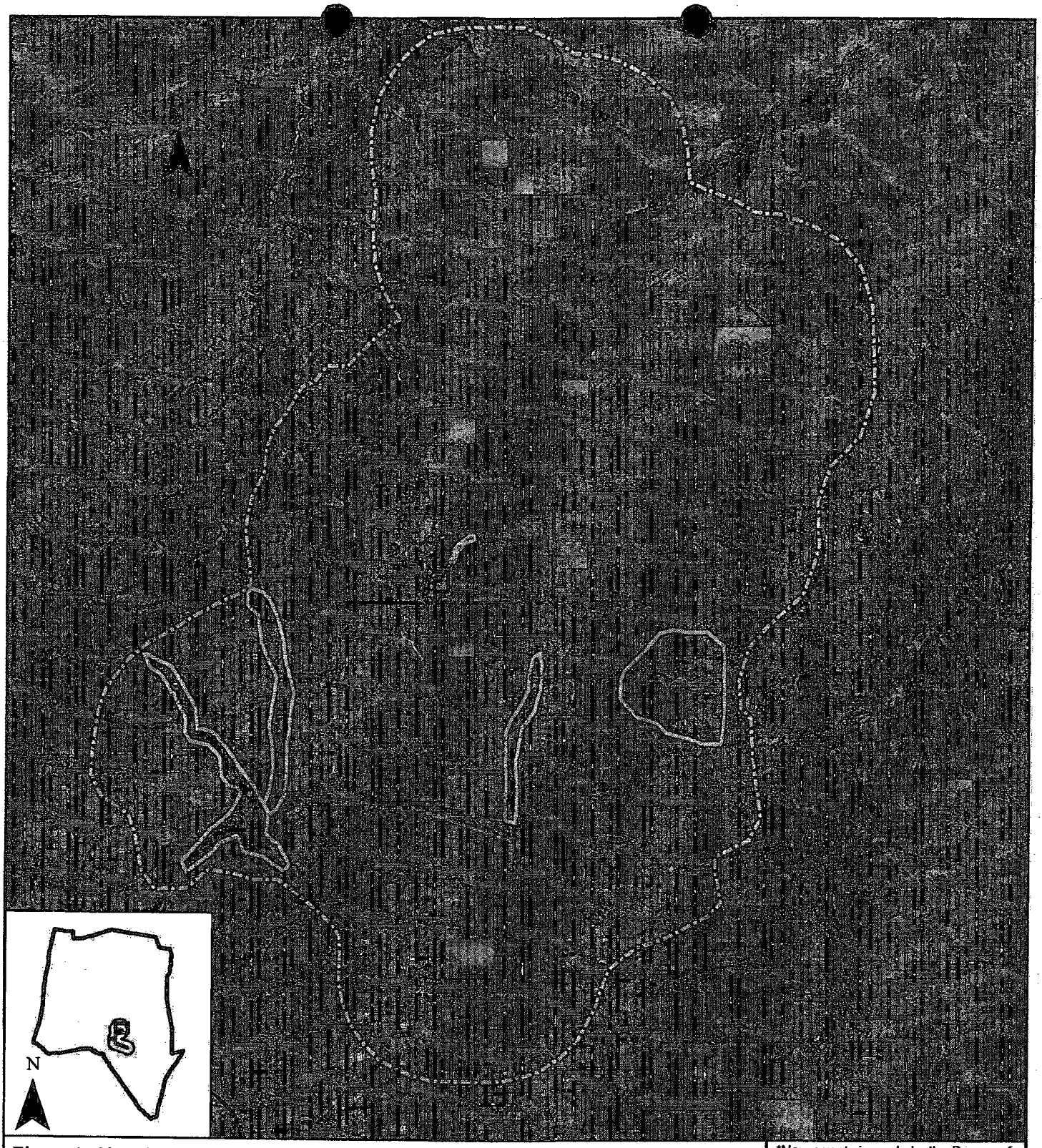

Figure 1: Sites for 4:1 mitigation for impacts to water resources (34*4 = 136 acres), and area for 4:1 mitigation for impacts to sage-grouse habitat (217*4 = 868 acres).

- Habitat Restoration Mitigation Area
- Water Resource Mitigation Site
- Active Lek Area
- Toiyabe PMU
- Proposed Project 2-mile Buffer
- Alternative Project 2-mile Buffer
- Geothermal Unit Area
- Monitoring Well
- Proposed Injection Pipeline and Wells
- Proposed Production Pipeline and Wells
- Proposed Access Road
- Power Plant
- Proposed Power Line
- Alternative Power Line

1:150,674

NATIONAL SYSTEM OF PUBLIC LANDS

0 0.5 1 2 Miles

*No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual use or aggregate use with other data.

The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection. Map date: 03/25/2011.

United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820

Appendix D: Common Raven Monitoring Plan

APPENDIX D

Common Raven Monitoring, Mitigation, and Management Plan
for
McGinness Hills Geothermal Project

Greater sage-grouse (*Centrocercus urophasianus*) use of the Project area has been documented through field surveys (GBE 2010, Nevada Department of Wildlife [NDOW] 2011), observational records (Nevada Natural Heritage Program XX), and telemetry data collection (NDOW 2011). One identified source of risk to sage-grouse from Project development is increased occurrence of common ravens (*Corvus corax*; hereafter raven) utilizing the Project vicinity. Research indicates that increased raven numbers are common near anthropogenic structures (Knight and Yawashima 1993, Webb et al. 2004). Such an increase is expected with the McGinness Hills Geothermal Project development and would likely have detrimental impacts to greater sage-grouse (Coates and Delehanty 2008, Bui et al. 2010).

By implementing monitoring, mitigation, and control measures, impacts to greater sage-grouse from increased occurrence of common ravens will be minimized.

SOURCES OF CONCERN AND MANAGEMENT PRACTICES

Several features associated with development have the potential to attract common ravens to the Project area. The primary focus of management practices will be to reduce human-provided subsidies, including food and perching/roosting/nesting sites.

Ravens are considered scavengers and will opportunistically utilize waste produced at anthropogenic sites as food resources (Webb et al. 2004, Coates et al. 2007). The following procedures will be implemented by the Operator to reduce raven food attractants near the Project.

Immediate Mitigation Measures:

- **During all phases of the Project (i.e., construction and operations), all food, waste, and trash will be placed in closed containers.**
- **Ormat will prohibit employees, contractors and sub-contractors from feeding wildlife or leaving food available for scavenging wildlife.**
- **Road-killed animals on the Project site and associated travel routes will be promptly removed and disposed of in closed containers to eliminate access to ravens.**
- **Presence of road-killed animals will also be minimized by the Operator's environmental protection measure of a maximum 25 mph speed limit within the Project area.**

- **Ormat has committed to implement the following environmental protection measures: perch and nest deterrents on all power poles; single-pole transmission line design (APLIC 2006).**
- **Ormat will acquire common raven depredation permits from the NDOW or USFWS.**

Effectiveness for Proposed Mitigation

By implementing these mitigation measures, food subsidies produced by humans will be reduced, which will likely minimize raven presence near the Project. New perching, roosting, and nesting sites would primarily occur along the 9.01 miles of transmission line and power poles. The Operator has already minimized these effects through their proposed environmental protection measures. These include utilizing a single pole design along the entirety of the transmission line, which will decrease potential perching, roosting, and nesting sites for ravens. In addition, the Operator will install a cone (Kaddas Enterprises type KE1140 or equal) on each power pole to deter raven perching, roosting, and nesting sites.

Additional perching, roosting, and nesting sites may also occur on well pads and production plant sites. These sites include wellheads, fencing, building roofs, and other structures. Monitoring of raven occurrence at these sites will identify the extent to which structures are being utilized (see Monitoring Plan). Additional mitigation measures may be required if increases or concentrated raven numbers are identified (see Monitoring Plan).

Mitigation Impacts

The requirement to properly collect all food, waste, and trash are BMPs and State requirements for all industrial plant operations. These are considered operating costs for Ormat.

Acquiring depredation permits will add to Ormat's ability to maintain lower numbers of ravens. In turn, this reduction will lower potential predation on sage-grouse by ravens.

The prohibition of workers feeding wildlife or leaving food at the project or construction sites will limit the likelihood of attracting wildlife (e.g., common ravens and raptor species). Removal of road kill will limit the attraction of ravens, buzzards, and other carrion eating raptors such as golden eagles; thus limiting the likelihood of additional predation on sage-grouse. Speed limits proposed by Ormat on their workers, contractors, and sub-contractors should limit accidents that may kill or maim animals.

Application of the 2006 APLIC standards should limit perching opportunities of raptors and common ravens on sage-grouse. Application of APLIC standards to transmission line facilities will be an additional financial burden to Ormat through the purchase and use of anti-perching devices and changes in engineering design of conductors to limit potential electrocution of most avian species.

Monitoring and Trigger Points

A common raven monitoring plan will be implemented to assess changes in raven numbers and identify areas of increased raven use due to Project development and human activities associated with the Project.

- Resumés and experience of potential biological monitors will be submitted to and approved by the BLM before monitoring begins.
- During construction and year one and two of operations, weekly monitoring for raven nests will be completed from 01 March – 31 July at the production plants, well pads, and along the transmission line.
- Basic information that will be recorded for each monitoring session will include: 1) date and time of day, 2) observer, 3) location (NAD 83 UTM), 4) activity (i.e., perching/nesting, flying, ground, 5) any other avian mortalities associated with the transmission line (e.g., raptors, sage-grouse); if ravens are located perching or nesting, note what structure is being utilized)
- During weekly monitoring, all unoccupied nests and nesting material will be removed from Project structures as located. If eggs are present in nests, a location and description (as described above) will be recorded, but the nest will be left intact until further mitigation is deemed necessary (see Future Mitigation Measures).
- A monthly report summarizing findings will be submitted to the BLM, United States Fish and Wildlife Service (USFWS), and NDOW.

Through this monitoring plan, the Operator will coordinate with the BLM, USFWS, and NDOW to determine the effectiveness and adequacy of initial mitigation measures as determined by raven trends documented in monthly reports. If initial mitigation measures are deemed adequate over the 3-year period, monitoring frequency may be reduced or eliminated as agreed upon by the BLM, USFWS, and NDOW. If initial mitigation measures are deemed inadequate because sustained increases in raven occurrences are documented during the raven and sage-grouse breeding seasons, or if a trend in raptor and sage-grouse mortalities is detected in associated with the transmission line, the following measures may also need to be implemented:

Additional Mitigation Measures:

- **Additional perch deterrents on Project structures will be required if monitoring identifies areas where raven perching, roosting, or nesting is concentrated or regularly occurring. Specific details on type of deterrent to be used will be determined and coordinated by the BLM, USFWS, and NDOW based on the Project structure.**
- **Hazing using auditory and visual deterrents may be useful in areas of concentrated raven presence are identified. Methods may include visual deterrents, such as streamers or flagging, and auditory deterrents, such as gas cannons. A variety of**

methods would need to be implemented and frequently changed to increase efficacy of deterrents.

- **Lethal measures to reduce raven numbers in the Project area may also be needed to reduce raven presence around the Project. This would require the Operator to acquire a common raven depredation permit through United States Department of Wildlife Services (WS) and USFWS. Primary depredation activities would focus on removal of active raven nests (those with eggs or chicks) and raven management using chicken egg baits treated with CPTH (3-chloro-p-toluidine hydrochloride) or another approved compound. Details regarding this depredation permit would be finalized during the permitting process by WS and USFWS.**
- **Retroactive installation of flight diverters along the transmission line to reduce the likelihood of avian collisions.**

Effectiveness of Mitigation

By implementing a suite of immediate mitigation measures and, as identified through monitoring, future mitigation measures, raven presence around the Project area should be reduced and minimized, which subsequently will reduce raven impacts to sage-grouse utilizing the habitat.

Mitigation Impacts

The measures described above will lead to additional costs to Ormat. These costs will be accrued mostly through equipment and labor.

Increasing the number deterrents (visual, auditory and perch) in areas where concentrations of ravens are occurring should alleviate raven predation on sage-grouse in those areas. Some of these measures may have some impact on other wildlife species (visual and auditory) e.g. gas cannons and noise disturbance.

Lethal measures of take for common ravens will directly reduce the raven population; this in turn, will reduce predation on sage-grouse from ravens. Limited indirect impacts may occur on other wildlife species.

The installation of flight diverters along the transmission line will reduce the impacts of avian collisions. The reduction of collisions will reduce the numbers of carcasses which could attract scavenging bird like ravens. By reducing the number of ravens, the number of raven predations on sage-grouse may also reduce.

Appendix E: Transmission Line Stipulations

TRANSMISSION LINE STIPULATIONS

N-88978

STIPULATIONS

1.0 General Stipulations:

1. In case of change of address, the Holder shall immediately notify the BLM Authorized Officer.

2. In the event that the public land underlying the right-of-way (N-88978) encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the right-of-way, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR Part [2800][2880], including any rights to have the Holder apply to BLM for amendments, modifications, or assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the right-of-way, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any disputes concerning compliance with the use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.

3. This grant is subject to all valid rights existing on the effective date of this grant.

4. Holder shall maintain a copy of this Grant and stipulations and Plan of Development on the construction site at all times.

5. All reports, notices or advisories required under the terms, conditions and stipulations of this Right-of-Way Grant are to be made to the BLM's Authorized Officer as follows:

   Field Manager
   Mount Lewis Field Office, Bureau of Land Management
   Battle Mountain District Office
   50 Bastian Rd.
   Battle Mountain, NV 89820
   (775) 635-4000

6. All design, material, and construction, operation, maintenance, and termination practices shall be in accordance with safe and proven engineering practices.

7. The Holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.

8. Roads and Construction sites shall be maintained in a sanitary condition at all times; waste materials

shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to: human waste, trash, garbage, vegetation, refuse, oil drums, petroleum products, ashes, and equipment.

9. The Holder shall comply with all applicable Federal, State, and local laws and regulations, existing or hereafter enacted or promulgated, with regard to any hazardous material, as defined in this paragraph, that will be used, produced, transported or stored on or within the R/W or any of the R/W facilities, or used in the construction, operation, maintenance or termination of the R/W or any of its facilities. "Hazardous material" means any substance, pollutant, or contaminant that is listed as hazardous underthe Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 43 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA section 101 (14), 42 U.S.C. 9601 (14), nor does the term include natural gas.

10. The Holder of Right-of-Way N-88978 agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et. seq. or the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 U.S.C. 6901 et seq.) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way Holder's activity on the right-of-way). This agreement applies without regard to whether a release is caused by the Holder, its agent, or unrelated third parties.

11. The Holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the Plan of Development that accompanied the Application and was approved and made part of the grant. Any relocation, additional construction, or use that is not in accord with the approved plan of development, shall not be initiated without the prior written approval of the Authorized Officer. A copy of the complete right-of-way grant, including all stipulations and approved plan of development, shall be made available on the right-of-way during construction, operation, and termination to the Authorized Officer. Noncompliance with the above will be grounds for immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.

12. The Holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the Holder shall immediately report the incident, in writing, to the Authorized Officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the Holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The Holder shall record such survey in the

appropriate county and send a copy to the Authorized Officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the Holder shall be responsible for the survey cost.

13. Holder shall limit excavation to the areas of construction. No borrow areas for fill material will be permitted on the site. All off-site borrow areas on public lands must be approved in writing by the Authorized Officer in advance of excavation. All waste material resulting from construction or use of the site by Holder shall be removed from the site. All waste disposal sites on public land must be approved in writing by the Authorized Officer in advance of use.

14. The Holder shall mark the exterior boundaries of the right-of-way with a stake and/or lath at 50-foot intervals. The intervals may be varied at the time of staking at the discretion of the Authorized Officer. The tops of the stakes and/or laths will be painted and the laths flagged in a distinctive color as determined by the Holder. The survey station numbers will be marked on the boundary stakes and/or laths at the entrance to and the exit from public land. Holder shall maintain all boundary stakes and/or laths in place until final cleanup and restoration is completed and approved by the Authorized Officer. The stakes and/or laths will then be removed at the direction of the Authorized Officer.

15. Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the Holder shall obtain from the Authorized Officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the Authorized Officer. Emergency use of pesticides shall be approved in writing by the Authorized Officer prior to such use.

16. During the period of May 1 through October 1 of each year, Holder should consider using spark arresters on vehicles and equipment in the project area, due to the potential for fire ignition from project related activities. This includes emission of hot carbon particles from diesel powered equipment, improperly equipped or poorly operating exhaust systems on gas powered vehicles and direct contact of wildland fuels with catalytic converters. Individuals, groups, businesses or corporations found responsible for the ignition of a wild fire may be held liable for the costs associated with the suppression of that fire.

17. The Holder shall permit free and unrestricted public access to and upon the R/W for all lawful purposes, except for those specific areas designated as restricted by the Authorized Officer to protect the public, wildlife, livestock, or facilities constructed within the R/W.

18. Within 90 days of construction completion, the Holder shall provide the Authorized Officer with data in a format compatible with the Bureau's Arc-Info Geographic Information System to accurately locate and identify the right-of-way:

    Acceptable data formats are:

    - Corrected Global Positioning System files with sub-meter accuracy or better, in UTM NAD 83; Zone 11;
    - ARCGIS export files on a CD ROM, shapefile, geodatabase.

Data may be submitted in any of the following formats:

- ARCGIS interchange, shapefile or geodatabase format.
- CD ROM in compressed or uncompressed format.

19. The Holder shall comply with all applicable Federal, State, and local laws and regulations existing or thereafter enacted or promulgated.

20. In accordance with Federal regulations in 43 CFR 2807.21 any proposed transfer of any right or interest in the right-of-way grant shall be filed with the BLM Authorized Officer. An application for assignment shall be accompanied by a showing of qualifications of the Assignee. The assignment shall be supported by a stipulation that the Assignee agrees to comply with and to bound by the terms and conditions of the grant to be assigned. No assignment shall be recognized unless and until it is approved in writing by the Authorized Officer.

2.0 Construction Stipulations:

21. The Authorized Officer may suspend or terminate in whole, or in part, any notice to proceed which has been issued when, in his judgment, unforeseen conditions arise which result in the approved terms and conditions being inadequate to protect the public health and safety or to protect the environment.

22. The Holder shall not initiate any construction or other surface disturbing activities on the right-of-way without the prior written authorization of the Authorized Officer. Such authorization shall be a written notice to proceed issued by the Authorized Officer. Any notice to proceed shall authorize construction or use only as therein expressly stated and only for the particular location or use therein described.

23. The Holder shall designate a representative(s) who shall have the authority to act upon and to implement instructions from the Authorized Officer. The Holder's representative shall be available for communication with the Authorized Officer within a reasonable time when construction or other surface disturbing activities are underway.

24. Holder will hire an independent third-party Compliance Inspection Contractor, approved by the Authorized Officer, to insure compliance with the terms, conditions and stipulations of this Grant, N-88978. All questions or concerns regarding compliance with the terms, conditions, and stipulations of this Grant shall be directed to the BLM Authorized Officer or Project Manager.

25. Overnight parking and storage of equipment and materials, including staging or stockpiling of same, shall be within 1) previously disturbed areas, 2) areas cleared by biologist and 3) areas inventoried and cleared for cultural resources.

26. Holder shall remove only the minimum amount of vegetation necessary for the construction of structures and facilities. Where possible and if needed, topsoil shall be conserved during excavation and reused as cover on disturbed areas to facilitate regrowth of vegetation.

27. The Holder shall be responsible for weed control on disturbed areas within the limits of the right-of-way. The Holder is responsible for consultation with the Authorized Officer and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations).

28. Future modifications, construction of improvements, or major maintenance operations involving disturbance of the land, shall not occur until plans for such actions have been submitted and approved in writing by the Authorized Officer. Any proposals involving new surface disturbance shall require a cultural inventory and may require completion of an environmental assessment.

29. The Holder shall prevent any activities which may cause erosion. Where erosion has resulted, the Holder shall re-vegetate and re-habilitate the location. The Holder is responsible for consultation with the Authorized Officer for an acceptable proposal.

30. Ninety days prior to termination of the right-of-way, the Holder shall contact the Authorized Officer to arrange a joint inspection of the right-of-way. This inspection will be held to agree to an acceptable termination (and rehabilitation) plan. This plan shall include, but is not limited to, removal of facilities, drainage structures, or surface material, recontouring, topsoiling, or seeding. The Authorized Officer must approve the plan in writing prior to the Holder's commencement of any termination activities.

3.0 Wildlife Stipulations:

31. Prior to any planned disturbance in potential migratory bird nesting habitat from March 1 to July 31, (the approximate nesting season), a field survey for migratory birds, their nests, eggs, or young should be performed, in order to prevent violation of the Migratory Bird Treaty Act (MBTA). If any nests, eggs, or young are found either the project should be delayed until the birds have completed their nesting and brood rearing activities, or the project should be re-designed as to not harm the migratory birds, their nests, eggs, or young. A migratory bird is any species of bird **except** upland game species, feral pigeons, European starlings, and English house sparrows. Potential migratory bird nesting habitat is any habitat that may provide nesting opportunity for any species of migratory bird. Any violation of the MBTA can incur penalties up to $15,000 or 6 months imprisonment, or both per individual offense. Any questions about the Migratory Bird Treaty Act should be referred to the Reno Office of the U.S. Fish and Wildlife Service at (775) 861-6300, or e-mail at "asknevada@fws.gov". Refer to Appendices A-D of the Environmental Analysis for further mitigation measures.

4.0 Cultural Stipulations:

32. Any cultural or paleontological resource (historic or prehistoric site or object) or Native American human remains, funerary item, sacred object, or objects of cultural patrimony discovered by the permit Holder, or any person working on their behalf, during the course of activities on Federal land, shall be immediately reported to the Authorized Officer by telephone, with written confirmation. The permit Holder shall suspend all operations in the immediate area of such discovery and protect it until an evaluation of the discovery will be made by the Authorized Officer.

    For cultural resources other than Native American human remains, funerary item, sacred object, or objects of cultural patrimony, this evaluation will determine the significance of the discovery and what mitigation measures are necessary to allow activities to proceed. The Holder is responsible for the cost of evaluation and mitigation. Any decision on treatment and/or mitigation will be made by the Authorized Officer after consulting with the permit Holder. Operations may resume only upon written authorization to proceed from the Authorized Officer.

5.0 Bonding Stipulations:

33. A Performance and Reclamation bond, in an amount determined by the Authorized Officer, shall be obtained by the holder to ensure compliance with the terms and conditions of this instrument. The Authorized Officer will require that the holder submit a Reclamation Cost Estimate for review and to assist the Authorized Officer in determining the bond amount. The Holder shall provide the Authorized Officer proof that a bond in the required amount has been obtained prior to receiving a Notice to Proceed or at such earlier date as may be specified by the Authorized Officer. The amount of the bond will be limited to the anticipated liabilities associated with the activities approved by the Notice to Proceed. If the Notice to Proceed is limited to only an initial phase of development or activity, the bond amount will be limited to that phase or activity. The bond amount would increase with the issuance of a Notice to Proceed for future phases of development or additional activities. The bond must be maintained in effect until removal of improvements and restoration of the right-of-way authorization has been accepted by the Authorized Officer. Acceptable bond instruments include cash, cashier's or certified check, certificate or book entry deposits, negotiable U.S. Treasury securities (notes, bills, or bonds) equal in value to the bond amount, or surety bonds from the approved list of sureties (U.S. Treasury Circular 570) payable to the Bureau of Land Management. The Authorized Officer will accept an irrevocable letter of credit as an acceptable form of bond. Irrevocable letters of credit must be payable to the Bureau of Land Management and issued by financial institutions that have the authority to issue letters of credit and whose operations are regulated and examined by a federal agency. The Bureau of Land Management will not accept a corporate guarantee as an acceptable form of bond. The Authorized Officer will review the bond on an annual basis to ensure adequacy of the bond amount. The bond will also be reviewed at the time of any assignment, modification, or renewal of this instrument. The Authorized Officer may increase or decrease the bond amount at any time during the term of the right-of-way authorization, consistent with the regulations.

34. The Holder agrees that any bond held as security for Holder's performance of the terms and conditions of this instrument may, upon failure on the Holder's part to fulfill any of the requirements herein set forth or made a part hereof, be retained by the United States to be applied as far as may be needed to the satisfaction of the Holder's obligations assumed hereunder, without prejudice whatsoever to any other rights and remedies of the United States.

35. Should the bond delivered under this instrument become unsatisfactory to the Authorized Officer, the Holder shall, within 30 calendar days of demand, furnish a new bond. In the event of noncompliance with the terms and conditions of this instrument, the BLM will notify the Holder that the surety or other bond instrument is subject to forfeiture and will allow the Holder 15 calendar days to respond before action is taken to forfeit the bond and suspend or terminate the authorization.

36. The Holder shall provide a bond in the amount of $145,950.00 to be maintained until restoration of disturbed areas and other requirements relative to the construction phase of the project have been accepted by the Authorized Officer. Upon completion, or partial completion of these construction related requirements, the Authorized Officer may terminate or reduce the amount of the bond.

N-88979

STIPULATIONS

1.0General Stipulations:

1. In case of change of address, the Holder shall immediately notify the BLM Authorized Officer.

2. In the event that the public land underlying the right-of-way (N-88979) encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the right-of-way, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR Part [2800][2880], including any rights to have the Holder apply to BLM for amendments, modifications, or assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the right-of-way, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any disputes concerning compliance with the use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.

3. This grant is subject to all valid rights existing on the effective date of this grant.

4. Holder shall maintain a copy of this Grant and stipulations and Plan of Development on the construction site at all times.

5. All reports, notices or advisories required under the terms, conditions and stipulations of this Right-of-Way Grant are to be made to the BLM's Authorized Officer as follows:

   Field Manager
   Mount Lewis Field Office, Bureau of Land Management
   Battle Mountain District Office
   50 Bastian Rd.
   Battle Mountain, NV 89820
   (775) 635-4000

6. All design, material, and construction, operation, maintenance, and termination practices shall be in accordance with safe and proven engineering practices.

7. The Holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.

8. Roads and Construction sites shall be maintained in a sanitary condition at all times; waste materials shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to: human waste, trash, garbage, vegetation, refuse, oil drums, petroleum products, ashes, and equipment.

9. The Holder shall comply with all applicable Federal, State, and local laws and regulations, existing or hereafter enacted or promulgated, with regard to any hazardous material, as defined in this paragraph, that will be used, produced, transported or stored on or within the R/W or any of the R/W facilities, or used in the construction, operation, maintenance or termination of the R/W or any of its facilities. "Hazardous material" means any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 43 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA section 101 (14), 42 U.S.C. 9601 (14), nor does the term include natural gas.

10. The Holder of Right-of-Way N-88979 agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et. seq. or the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 U.S.C. 6901 et seq.) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way Holder's activity on the right-of-way). This agreement applies without regard to whether a release is caused by the Holder, its agent, or unrelated third parties.

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12. The Holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the Holder shall immediately report the incident, in writing, to the Authorized Officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the Holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The Holder shall record such survey in the appropriate county and send a copy to the Authorized Officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the Holder shall be responsible for the survey cost.

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18. Within 90 days of construction completion, the Holder shall provide the Authorized Officer with data in a format compatible with the Bureau's Arc-Info Geographic Information System to accurately locate and identify the right-of-way:

    Acceptable data formats are:

    - Corrected Global Positioning System files with sub-meter accuracy or better, in UTM NAD 83; Zone 11;
    - ARCGIS export files on a CD ROM, shapefile, geodatabase.
      Data may be submitted in any of the following formats:
    - ARCGIS interchange, shapefile or geodatabase format.
    - CD ROM in compressed or uncompressed format.

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20. In accordance with Federal regulations in 43 CFR 2807.21 any proposed transfer of any right or interest in the right-of-way grant shall be filed with the BLM Authorized Officer. An application for assignment shall be accompanied by a showing of qualifications of the Assignee. The assignment shall be supported by a stipulation that the Assignee agrees to comply with and to bound by the terms and conditions of the grant to be assigned. No assignment shall be recognized unless and until it is approved in writing by the Authorized Officer.

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21. The Authorized Officer may suspend or terminate in whole, or in part, any notice to proceed which has been issued when, in his judgment, unforeseen conditions arise which result in the approved terms and conditions being inadequate to protect the public health and safety or to protect the environment.

22. The Holder shall not initiate any construction or other surface disturbing activities on the right-of-way without the prior written authorization of the Authorized Officer. Such authorization shall be a written notice to proceed issued by the Authorized Officer. Any notice to proceed shall authorize construction or use only as therein expressly stated and only for the particular location or use therein described.

23. The Holder shall designate a representative(s) who shall have the authority to act upon and to implement instructions from the Authorized Officer. The Holder's representative shall be available for communication with the Authorized Officer within a reasonable time when construction or other surface disturbing activities are underway.

24. Holder will hire an independent third-party Compliance Inspection Contractor, approved by the Authorized Officer, to insure compliance with the terms, conditions and stipulations of this Grant, N-88979. All questions or concerns regarding compliance with the terms, conditions, and stipulations of this Grant shall be directed to the BLM Authorized Officer or Project Manager.

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3.0 Wildlife Stipulations:

31. Prior to any planned disturbance in potential migratory bird nesting habitat from March 1 to July 31 (the approximate nesting season), a field survey for migratory birds, their nests, eggs, or young should be performed, in order to prevent violation of the Migratory Bird Treaty Act (MBTA). If any nests, eggs, or young are found either the project should be delayed until the birds have completed their nesting and brood rearing activities, or the project should be re-designed as to not harm the migratory birds, their nests, eggs, or young. A migratory bird is any species of bird **except** upland game species, feral pigeons, European starlings, and English house sparrows. Potential migratory bird nesting habitat is any habitat that may provide nesting opportunity for any species of migratory bird. Any violation of the MBTA can incur penalties up to $15,000 or 6 months imprisonment, or both per individual offense. Any questions about the Migratory Bird Treaty Act should be referred to the Reno Office of the U.S. Fish and Wildlife Service at (775) 861-6300, or e-mail at "asknevada@fws.gov". Refer to Appendices A-D of the Environmental Analysis for further mitigation measures.

4.0 Cultural Stipulations:

32. Any cultural or paleontological resource (historic or prehistoric site or object) or Native American human remains, funerary item, sacred object, or objects of cultural patrimony discovered by the permit Holder, or any person working on their behalf, during the course of activities on Federal land, shall be immediately reported to the Authorized Officer by telephone, with written confirmation. The permit Holder shall suspend all operations in the immediate area of such discovery and protect it until an evaluation of the discovery will be made by the Authorized Officer.

    For cultural resources other than Native American human remains, funerary item, sacred object, or objects of cultural patrimony, this evaluation will determine the significance of the discovery and what mitigation measures are necessary to allow activities to proceed. The Holder is responsible for the cost of evaluation and mitigation. Any decision on treatment and/or mitigation will be made by the Authorized Officer after consulting with the permit Holder. Operations may resume only upon written authorization to proceed from the Authorized Officer.

5.0 Bonding Stipulations:

33. A Performance and Reclamation bond, in an amount determined by the Authorized Officer, shall be obtained by the holder to ensure compliance with the terms and conditions of this instrument. The

Authorized Officer will require that the holder submit a Reclamation Cost Estimate for review and to assist the Authorized Officer in determining the bond amount. The Holder shall provide the Authorized Officer proof that a bond in the required amount has been obtained prior to receiving a Notice to Proceed or at such earlier date as may be specified by the Authorized Officer. The amount of the bond will be limited to the anticipated liabilities associated with the activities approved by the Notice to Proceed. If the Notice to Proceed is limited to only an initial phase of development or activity, the bond amount will be limited to that phase or activity. The bond amount would increase with the issuance of a Notice to Proceed for future phases of development or additional activities. The bond must be maintained in effect until removal of improvements and restoration of the right-of-way authorization has been accepted by the Authorized Officer. Acceptable bond instruments include cash, cashier's or certified check, certificate or book entry deposits, negotiable U.S. Treasury securities (notes, bills, or bonds) equal in value to the bond amount, or surety bonds from the approved list of sureties (U.S. Treasury Circular 570) payable to the Bureau of Land Management. The Authorized Officer will accept an irrevocable letter of credit as an acceptable form of bond. Irrevocable letters of credit must be payable to the Bureau of Land Management and issued by financial institutions that have the authority to issue letters of credit and whose operations are regulated and examined by a federal agency. The Bureau of Land Management will not accept a corporate guarantee as an acceptable form of bond. The Authorized Officer will review the bond on an annual basis to ensure adequacy of the bond amount. The bond will also be reviewed at the time of any assignment, modification, or renewal of this instrument. The Authorized Officer may increase or decrease the bond amount at any time during the term of the right-of-way authorization, consistent with the regulations.

34. The Holder agrees that any bond held as security for Holder's performance of the terms and conditions of this instrument may, upon failure on the Holder's part to fulfill any of the requirements herein set forth or made a part hereof, be retained by the United States to be applied as far as may be needed to the satisfaction of the Holder's obligations assumed hereunder, without prejudice whatsoever to any other rights and remedies of the United States.

35. Should the bond delivered under this instrument become unsatisfactory to the Authorized Officer, the Holder shall, within 30 calendar days of demand, furnish a new bond. In the event of noncompliance with the terms and conditions of this instrument, the BLM will notify the Holder that the surety or other bond instrument is subject to forfeiture and will allow the Holder 15 calendar days to respond before action is taken to forfeit the bond and suspend or terminate the authorization.

36. The Holder shall provide a bond in the amount of $41,700.00 to be maintained until restoration of disturbed areas and other requirements relative to the construction phase of the project have been accepted by the Authorized Officer. Upon completion, or partial completion of these construction related requirements, the Authorized Officer may terminate or reduce the amount of the bond.

Appendix F: Comments Received on the EA and Responses to Comments

A

Morrison, Jan email comment 20110606

"victorianjan@netzero.net" <victorianjan@netzero.net>

06/06/2011 05:25 PM

To

timothy_coward@blm.gov

cc

Subject

McGinness

I fully support Ormat's Utilization plan for the McGinness Hills Project.

I would also like to specifically be on record as supporting above ground transmission lines. The huge cost of burying these lines offers no off-setting value. I am a frequent hiker and traveler in our local area, and have no objection to the visual presence of these lines. I also feel it is safer to have these lines in plain sight where any issues can handily be dealt with.

Jan Morrison

Post Office Box 503

Historic Austin, NV 89310

http://www.GoAustinNevada.com

775.964-1100

June 4, 2011

RECEIVED-MAILROOM
2011 JUN -9 AM 11:04
BATTLE MOUNTAIN
DISTRICT OFFICE

BLM
Tim Coward
50 Bastian Road
Battle Mountain, NV 89820

Mr. Coward,

I want to send this letter in support of the geothermal plant at McGinness Hills.

We are happy to have Ormat putting this plant in our community and support the wells, transmission lines, and everything else needed in the project.

I look forward to the day the plant is completed and power made with renewable energy begins flowing through the power lines.

Karen

Kareen Miller
P O Box 101
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CENTER for BIOLOGICAL DIVERSITY Because life is good.

Bureau of Land Management, Battle Mountain District
Attn: Tim Coward
50 Bastian Road
Battle Mountain, NV 89820

June 20, 2011

Via e-mail: timothy_coward@blm.gov

RE: Comments on Draft Environmental Assessment – McGinness Hills Geothermal Development Project (DOI-BLM-NV-B010-2011-00154-EA)

Dear Mr. Coward:

On behalf of The Center for Biological Diversity ("Center"), please accept the following comments regarding the supplement to the environmental assessment ("EA") for the McGinness Hills Geothermal Development Project. We appreciate the notification of this opportunity to comment. We make note that we had submitted scoping comments for this project in August of 2010.

The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 315,000 members and on-line activists throughout Nevada and the United States.

We submit these comments on behalf of our members, activists, staff, and members of the general public who are interested in protecting native species and their habitats, quiet recreation activities, and wilderness experiences on BLM public and national forests system lands, particularly those lands impacted by this project.

The development of renewable energy is a critical component of efforts to reduce carbon pollution and climate-warming gases, avoid the worst consequences of global warming, and to assist in meeting needed emission reductions. The Center strongly supports the development of renewable energy production. However, like any project, proposed geothermal power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitat, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable.

Arizona · California · Nevada · New Mexico · Alaska · Oregon · Montana · Illinois · Minnesota · Vermont · Washington, DC
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The Center offers the following comments for your consideration:

1. **The BLM and Forest Service must prepare an Environmental Impact Statement rather than an Environmental Assessment.**

   We are extremely dismayed and disappointed that the agencies have erred by preparing an EA rather than an Environmental Impact Statement ("EIS"). The Ninth Circuit has repeatedly held, an EIS must be prepared if the EA shows that the proposed project may cause significant impacts to the environment. 40 C.F.R. §§ 1501.3, 1501.4; see, e.g., Ocean Advocates v. United States Army Corps of Eng'rs, 361 F.3d 1108 (9th Cir. 2004); Metcalf v. Daley, 214 F.3d 1135, 1142 (9th Cir. 2000); Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1212 (9th Cir. 1998). NEPA requires the BLM to prepare an environmental impact statement if "'substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor.' To trigger this requirement a 'plaintiff need not show that significant effects will in fact occur,' raising 'substantial questions whether a project may have a significant effect' is sufficient." Idaho Sporting Cong. v. Thomas, 137 F.3d 1146, 1149-50 (9th Cir. 1998)(internal citations omitted); see also 42 U.S.C. § 4332(2)(C). While any mention of an adverse impact does not necessarily compel an EIS, but an agency should not use a "soft touch or brush-off of negative effects." Native Ecosystems Council v. USFS, 428 F.3d 1233, 1240-41 (9th Cir. 2005)

   Where impacts to imperiled species are at issue, the agency must carefully consider all potential adverse effects. As the Ninth Circuit put it:"[a]lthough the presence of some negative effects does not mandate a finding of significant impact, the agency must 'consider the degree of adverse effect on a species.'" Alaska Wilderness League v. Kempthorne, 548 F.3d 815, 826 (9th Cir. 2008) (finding the agency failed to take a hard look at impacts to whales in an EA tiered to a programmatic EIS). See also Native Ecosystems Council, 428 F.3d at 1250 (finding agency analysis insufficient where record failed to describe the type or amount of habitat necessary to sustain the viability of the species).

   Here, it appears that the agencies failed to consider the relevant factors because it incorrectly concluded that the proposed geothermal energy development would not have significant impacts on the environment.

   The Council on Environmental Quality's ("CEQ") regulations implementing NEPA make clear that federal agencies can avoid preparing an EIS only if the federal action will have "no significant impact" on the environment. 40 C.F.R. § 1501.4(e). Caselaw interpreting the regulations indicates that the agency should make this finding confidently and with certainty that no "substantial questions" exist as to whether or not "a project may have a significant effect." *See LaFlamme v. Fed. Energy Regulatory Comm'n*, 852 F.2d 389, 397 (9th Cir. 1988)..

As the Ninth Circuit has observed, "No matter how thorough, an EA can never substitute for preparation of an EIS, if the proposed action could significantly affect the environment." Anderson v. Evans, 314 F.3d 1006, 1023 (9th Cir. 2002). The Ninth Circuit further explained:

We stress in this regard that an EIS serves different purposes from an EA. An EA simply assesses whether there will be a significant impact on the environment. An EIS weighs any significant negative impacts of the proposed action against the positive objectives of the project.

Preparation of an EIS thus ensures that decision-makers know that there is a risk of significant environmental impact and take that impact into consideration. As such, an EIS is more likely to attract the time and attention of both policymakers and the public. Id. See also Sierra Club v. Marsh, 769 F.2d 868, 874–76 (1st Cir. 1985) (holding that "under NEPA and its implementing regulations, we cannot accept [] EAs as a substitute for an EIS—despite the time, effort, and analysis that went into their production—because an EA and an EIS serve very different purposes"); 46 Fed. Reg. 18,026, 18,037 (1981) (CEQ statement advising agencies to keep EAs to not more than about 10–15 pages and stating that "[i]n most cases . . . a lengthy EA indicates that an EIS is needed").

C-1

In this case there are substantial questions as to whether the proposed geothermal energy development would significantly impact the natural and human environment, primarily through impacts to sage grouse habitat. Before reaching any conclusion that the impacts will not be significant, the agencies must put their action into context and evaluate the intensity of the action and likely environmental effects.

Whether a project is significant depends on both the project's context and its intensity. 40 C.F.R. § 1508.27.

"Significantly" as used in NEPA requires considerations of both context and intensity:

(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. . . . Both short- and long-term effects are relevant.

(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

(1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
(2) The degree to which the proposed action affects public health or safety.
(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.
(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

40 C.F.R. § 1508.27 (b)(1)-(10). See, e.g., National Parks &Conservation Association v. Babbitt, 241 F.3d 722, 731 (9th Cir. 2001) (either of two significance factors considered by the court "may be sufficient to require preparation of an EIS in appropriate circumstances"); Ocean Advocates, 402 F.3d at 865.

Given the scope and intensity of the likely impacts, we believe the context and intensity of the proposed decision show that an EIS should have been prepared for the entire project.

A. Context

The State of Nevada has divided sage grouse habitat in its boundaries into discrete "population management units" ("PMUs") that serve as the practical units for the

management and conservation of the species.[1] The proposed project is in the Toiyabe PMU, impacting approximately 3.4% of the entire unit, 7% of the core-breeding habitat and 4% of the wintering habitat. Each unit is the state's conservation plan is individually important to the conservation of the species, and in the case of the ESA, the species' recovery.

B. Intensity

The "substantial questions" raised by the types of impacts likely to be associated with the proposed development certainly implicate many of the NEPA regulations' "intensity" factors, including those relating to "unique characteristics" of the project area. Although currently there are no species listed under the Endangered Species Act ("ESA"), the greater sage grouse was found to be "warranted but precluded" for protections under the ESA in March of 2010.[2] The sage grouse utilize the project area for courtship, breeding and rearing of their young as well as for winter habitat.[3] While mapping and characterization has not been completed, the project area likely lies in Category 1 and/or 2 habitat as defined in Nevada standards to conserve sage grouse.[4] These habitats are considered to be "irreplaceable, limited and essential" and "important and of high quality.[5] The EA discloses that the project, including a 2-mile buffer, will disturb, fragment and impact over 38,000 acres of these habitats.[6] This analysis buffer under-estimates the impacts on the grouse if the energy development standards are applied and a 3-mile buffer is used rather than the 2-mile one in the EA. C-2

The pygmy rabbit, also found in the project area, is a small endemic leporid that is an extreme sagebrush habitat specialist, dependent on sagebrush for 99% of its winter diet and for critical cover from predators, while requiring deep soil sites for construction of burrows. The pygmy rabbit, and its requisite big sagebrush habitats, have suffered dramatic degradation and declines. Pygmy rabbits are not uniformly distributed over large areas but tend to be restricted or clumped, due to sagebrush and burrow requirements. Current populations occupy a geographic range estimated as well less than 10% of the known historic range, and perhaps as little as 5%.[7]

The pygmy rabbit in the Columbia Basin has been recognized as Endangered under the ESA. Elsewhere, the pygmy rabbit was petitioned for listing, but found to be not C-3

[1] [1] Sage Grouse Conservation Team. 2004. Greater sage-grouse conservation plan for Nevada and Eastern California.
[2] Federal Register, March 5, 2010. See: http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/FR03052010.pdf
[3] See Section 3 of this letter.
[4] Nevada Governor's Sage-Grouse Conservation Team. 2010. Nevada energy and infrastructure development standards to conserve greater sage-grouse populations and their habitats. 58 pages plus appendices.
[5] Ibid, pages 19-21.
[6] McGinness Hills Geothermal Development Project (DOI-BLM-NV-B010-2011-00154-EA, page 65.
[7] Committee for the High Desert, Western Watersheds Project and others. 2003. A Petition for rules to List the Pygmy Rabbit *Brachylagus idahoensis* occurring in the coterminous Intermountain and Great Basin region as Threatened or Endangered Under the Endangered Species Act 16 USC 1531 seq.

warranted at this time. Never-the-less, the Nevada BLM State Director has placed the rabbit on the special status species list, which places it under agency protections under BLM Manual 6840.2.[8]

Surveys for the rabbit found suitable and occupied habitat within 1-mile of the proposed project, and while direct impacts are not likely, indirect and cumulative impacts are. Harm to the rabbit would include direct destruction, modification and fragmentation of its habitat, increased risk to predation due to reduction and fragmentation of cover, and increased mortality from vehicle traffic. C-3

Heady et.al. (2001) summarized a series of habitat use studies and concluded: "The pygmy rabbit is a habitat specialist on all levels – from landscape to placement of burrows and use of home range. This species requires a rigid combination of shrub height and density and other vegetative components. Thus, even in a seemingly contiguous stand of big sagebrush, the landscape may seem highly fragmented for pygmy rabbits. Given their seemingly poor dispersal ability and low reproductive capabilities this may explain their slow recolonization of vacated habitat even under normal conditions. Coupling these factors with loss of sagebrush habitat due to fires, agriculture, and livestock grazing, has likely resulted in the general decline seen in this species"[9]

As part of a more inclusive EIS process, BLM and the Forest Service would engage state biologists and pygmy rabbit experts in analyzing and disclosing the true impacts and their magnitude on the rabbit, and further, to identify the appropriate measures that would avoid, minimize or mitigate these impacts.

The nature of the decision warrants and the public deserves an opportunity for full public participation in the NEPA process through the preparation of an environmental impact statement.

2. **<u>The EA is deficient in that it fails to consider a reasonable range of alternatives.</u>**

NEPA requires that the agencies consider a range of management alternatives, which is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. NEPA is intended to provide a "clear basis for choice among options by the decision maker and the public." 40 C.F.R. §1502.14.[10] NEPA requires the agencies to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions. *See* 40 C.F.R. §§ 1502.14(a) and 1508.25(c). The courts, in the Ninth Circuit as elsewhere, have consistently held that an agency's failure to C-4

[8] See page 6 of this letter for a discussion of these protections.

[9] Heady, L. T., K. I. Gabler and J. W. Laundre. 2001. Habitat selection by pygmy rabbits in southeast Idaho. BLM Technical Bulletin. No. 01-7.

[10] *Idaho Sporting Congress*, 222 F.3d at 567 (compliance with NEPA's procedures "is not an end in itself . . . [but] it is through NEPA's action forcing procedures that the sweeping policy goals announced in § 101 of NEPA are realized.") (internal citations omitted).

consider a reasonable alternative is fatal to an agency's NEPA analysis.[11] This evaluation extends to considering more environmentally protective alternatives and mitigation measures.[12] C-4

NEPA requires that an actual "range" of alternatives is considered, such that the Act will "preclude agencies from defining the objectives of their actions in terms so unreasonably narrow that they can be accomplished by only one alternative (i.e. the applicant's proposed project)."[13] This requirement prevents the EIS from becoming "a foreordained formality."[14]

If an agency rejects an alternative for consideration, it must explain why a particular option is not feasible and was therefore eliminated from further consideration. 40 C.F.R. § 1502.14(a). The courts will scrutinize this explanation to ensure that the reasons given are adequately supported by the record.[15]

In the case of this EA, the agency purports that the Alternative 1, which examines a shorter transmission line path, but requires a new substation was the only reasonable alternative to their proposed action. A different transmission line alternative was dismissed due to impacts on sage grouse and the option of burial of lines was dismissed due to cost.[16]

Completely lacking were any alternatives that contemplated different viable geothermal development locations that could better avoid key sage grouse habitat. Also lacking was a discussion and analysis of technology options that might be feasible and that would lead to a smaller development footprint, such as directional drilling to reduce the number of well pads needed. C-5

The Center in our scoping comments raised our concern about the impacts of this project to key sage grouse habitats and the need to avoid, minimize and mitigate them.[17] The BLM has not adequately responded to our issue through the development of an avoidance/minimization alternative.

"An agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action."[18] An agency violates NEPA by failing to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action.[19]

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[11] *See, e.g., Idaho Conserv. League v. Mumma*, 956 F.2d 1508, 1519-20 (9th Cir. 1992) ("The existence of a viable, but unexamined alternative renders an environmental impact statement inadequate.").
[12] *See, e.g.*, Kootenai Tribe of Idaho v. Veneman, 313 F.3d 1094,1122-1123 (9th Cir. 2002) (and cases cited therein).
[13] Colorado Environmental Coalition v. Dombeck, 185 F.3d 1162, 1174 (10th Cir. 1999), citing Simmons v. United States Corps of Engineers, 120 F.3d 664, 669 (7th Cir. 1997).
[14] City of New York v. Department of Transp., 715 F.2d 732, 743 (2nd Cir. 1983). *See also*, Davis v. Mineta, 302 F.3d 1104 (10th Cir. 2002).
[15] *See Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-15 (9th Cir. 1999); *Idaho Conserv. League*, 956 F.2d at 1522 (while agencies can use criteria to determine which options to fully evaluate, those criteria are subject to judicial review); *Citizens for a Better Henderson*, 768 F.2d at 1057.
[16] McGinness Hills Geothermal Development Project (DOI-BLM-NV-B010-2011-00154-EA, page33.
[17] Letter with scoping comments sent to BLM dated August 24, 2010.
[18] Northwest Envtl Defense Center v. Bonneville Power Admin., 117 F.3d 1520, 1538 (9th Cir. 1997).
[19] City of Tenakee Springs v. Clough, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 C.F.R. § 1502.14).

Before reaching a decision on this project, the BLM, Forest Service and proponent must develop an alternative(s) that address the concerns raised about sage grouse through means we suggest in an above paragraph of this letter.

3. **The proposed action would result in unacceptable impacts to sage grouse and contradicts the findings of recent science.**

The greater sage grouse was found to be warranted for protections under the Endangered Species Act in March 2010, and a listing action will be undertaken once the US Fish and Wildlife Service has the resources to accomplish it.[20] The sage grouse has also been identified by the BLM Nevada State Office as sensitive under BLM Manual 6840.2. This direction establishes that, "...the BLM shall designate Bureau sensitive species and implement measures to conserve these species and their habitats, including ESA proposed critical habitat, to promote their conservation and reduce the likelihood and need for such species to be listed pursuant to the ESA."

Section 6840.2 C. on implementation of this direction provides:

> "On BLM-administered lands, the BLM shall manage Bureau sensitive species and their habitats to minimize or eliminate threats affecting the status of the species or to improve the condition of the species habitat, by:
>
> 2. Ensuring that BLM activities affecting Bureau sensitive species are carried out in a way that is consistent with its objectives for managing those species and their habitats at the appropriate spatial scale.
>
> 4. Working with partners and stakeholders to develop species-specific or ecosystem-based conservation strategies.
>
> 7. Considering ecosystem management and the conservation of native biodiversity to reduce the likelihood that any native species will require Bureau sensitive species status.
>
> 8. I the absence of conservation strategies, incorporate best management practices, standard operating procedures, conservation measures, and design criteria to mitigate specific threats to Bureau sensitive species during the planning of activities and projects."

C-6

The sage grouse is similarly considered as a sensitive species by the Forest Service and managed under similar agency mandates.

Sage grouse, as the name implies, is closely allied and dependent on various stages of sage brush development for their life stages and survival. Grouse are found in different stages of sagebrush development depending upon the season and the needs of the grouse during that time.[21] Despite the well-known importance of this habitat to sage grouse and other sagebrush obligates, the

[20] Federal Register, March 5, 2010. See: http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/FR03052010.pdf

[21] Doherty, Kevin E., David E. Naugle, Brett L. Walker, and Jon M. Graham. 2008. Greater sage-grouse winter habitat selection and energy development. J. of Wildlife Management 72(1):187-195.

quality and quantity of sagebrush habitats have declined for at least the last 50 years and the welfare of the grouse mirrors this trend.[22] [23]

Sage grouse have a strong fidelity to their display, breeding, summering and wintering areas. Male grouse typically travel up to 1.3 miles to their lek sites, while during the breeding season, females typically travel less than 3 miles, but up to 22 miles to nest. Sage grouse exhibit both migratory and non-migratory behaviors, and populations of the grouse can contain both behaviors. Non-migratory grouse usually do not travel more than 6 miles annually, although migratory birds typically travel 21 miles annually, but travels up to 100 miles have been documented.[24] C-6

The EA correctly reports the importance of the project area to the greater sage grouse population in the Toiyabe Population Management Unit ("TPMU") – one of several planning and management units used to management sage grouse in Nevada.[25] The proposed project area is in a location that has previously been identified by the Nevada Department of Wildlife ("NDOW") as sage grouse summer and winter range. Over 14,530 acres of the project is in "75% Core Breeding habitat as defined and mapped by Doherty.[26] In addition, there is at least one active lek in the immediate project area and three other active leks within 2-miles of the project's activities and several more within a 3-mile buffer.[27]

Faced with increasing demands on wild public lands to supply sites for renewable energy development, NDOW developed conservation standards to help protect and conserve the species and their habitats.[28] This document gathered and synthesized the most currently available research and scientific knowledge regarding the topic, and represents the current state-of-the-art and science.

While the EA cites and references this document, it deviates from it in disturbing manner considering that the sage grouse is both a BLM and Forest Service special status species and has been found warranted for listing under the Endangered Species Act.

Some examples of the deviations include: C-7

- The NDOW standards state that leks and nesting habitat is irreplaceable and brood rearing and winter habitat critical to the long term persistence of sage grouse populations,

[22] Connelly, John W., Michael A. Schroeder, Alan R. Sands, and Clait E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Soc. Bull. 28(4):967-985.
[23] Becker, JM, CA Duberstein, JD Tagestad, and JL Downs. 2009. Sage-grouse and wind energy: biology, habits and potential effects of development. Pacific Northwest National Laboratory, operated by Battelle, for the U.S. Department of Energy. Contract DE-AC05-76RL01830.
[24] Ibid.
[25] Sage Grouse Conservation Team. 2004. Greater sage-grouse conservation plan for Nevada and Eastern California.
[26] Doherty, K. E., J. D. Tack, J. S. Evans, and D. E. Naugle. 2010. Mapping breeding densities of greater sage-grouse: A tool for range-wide conservation planning. Prepared for the Bureau of Land Management, BLM Completion Report: Interagency Agreement #L10PG00911.
[27] McGinness Hills Geothermal Development Project (DOI-BLM-NV-B010-2011-00154-EA, page 65; and NDOW map, "Sage-grouse use within the McGinness Hills Geothermal Project Area", undated.
[28] Nevada Governor's Sage-Grouse Conservation Team. 2010. Nevada energy and infrastructure development standards to conserve greater sage-grouse populations and their habitats. 58 pages plus appendices.

hence these habitats should be avoided.[29] The proposed action violates this standard by impacting over 38,000 acres of these types of habitat. C-7

- The NDOW standards establish a 3-miles buffer around leks and nesting habitat.[30] The EA analyzes a buffer of 2-miles and does not proscribe a no surface occupancy requirement within the buffer. It is interesting to note that recent standards imposed by the State of Wyoming to protect sage grouse have a 4-mile buffer and a requirement that no more than 5% of each section of land (640 acres) within it can be disturbed by projects.[31] The EA discloses that the proposed project would impact 7% of the core-breeding habitat found in the PMU. C-8
- The NDOW standards place an avoidance/minimization requirement for disturbance within 3-miles of leks and nesting habitats between March 1 and May 15, and the further state that vehicle trips within the 3-mile zone should only occur between 10 a.m. And 5 p.m. daily.[32] The EA in Appendix C only requires that personnel shifts and deliveries and flow venting between March 15 and May 15 be scheduled outside of the hours of one hour before sunrise to 10 a.m (presumably if within 2-miles of a lek). C-9
- The NDOW standards state that if construction within 3 miles of an active lek is absolutely unavoidable, then construction activities should only occur between July 15 and November 30 to avoid disturbing sage grouse during the breeding, nesting, early brood rearing and wintering periods.[33] The EA on the other hand only restricts construction activities within 2-miles of an active lek between March 15 and May 15, one hour before sunrise to 10 a.m. It would also require a .5 mile nest clearance survey around a ground disturbing activity be conducted if between March 15 and June 30. C-10
- The NDOW standards state that no development or infrastructure (such as wells, roads and transmission lines) be situated closer than .6 miles of late brood rearing habitats such as meadow complexes and springs.[34] The EA is silent on this aspect although it does disclose that such activities would occur within 2-miles of brood rearing habitat and such habitat may be affected. The proposed action would place a no surface occupancy restriction on the actual spring, meadow or riparian area. C-11

While there are other deviations, the ones above are major and serve to demonstrate how the BLM and Forest Service have ignored the current science regarding development in sage grouse habitat and by doing so unnecessarily places the species in danger of further population declines and reduced viability in the project area and PMU. The agencies have legal and internal mandates not to further place a species in greater risk of a listing under the ESA or an increase in the level of protection under the ESA. The agencies must further avoid and minimize the impacts and risks to the sage grouse, based on current science, in order to redeem this responsibility.

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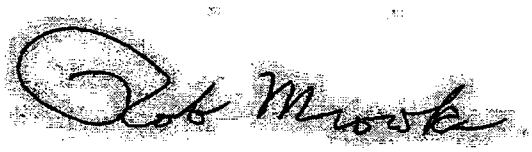
[29] Ibid, page 25.
[30] Ibid, page 25.
[31] State of Wyoming Executive Department Executive Order 2011-5. June 2, 2011. Greater Sage-Grouse Core Area Protection.
[32] Nevada Governor's Sage-Grouse Conservation Team. 2010. Pages 27-28.
[33] Ibid, page 27.
[34] Ibid, page 28.

We wish to remain engaged in this planning effort and request you keep us on any mailing lists.

Thank you for this opportunity to provide input.

Sincerely yours in conservation,



Rob Mrowka
Ecologist/Conservation Advocate

Cc: Ms. Jeanne Higgins, Forest Supervisor, Humboldt-Toiyabe NF

D

BRIAN SANDOVAL
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STATE OF NEVADA

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June 23, 2011

Timothy Coward
US Department of the Interior
Bureau of Land Management
Tonopah Field Office
1553 South Main Street
P.O. Box 911
Tonopah, NV 89049-0911

Re: SAI NV # **E2011-155**

Reference: **DOI-BLM-NV-B010-2011-0015-EA NVN-84268X N-88978 N-88979 #AUS74**

Project: **McGinness Hills Geothermal Development Project, Lander County, Nevada**

Dear Timothy Coward:

Enclosed are comments from the agencies listed below regarding the above referenced document. Please address these comments or concerns in your final decision.

Division of State Lands

This represents the comments provided to the State Clearinghouse regarding the referenced document, but does not purport to represent an exhaustive list of requirements that may be imposed by state agencies on this undertaking. Further, this document does not supersede existing regulatory requirements that may apply to your undertaking. If you have questions, please contact me at (775) 684-0213.

Sincerely,

Maud Naroll

Maud Naroll
Nevada State Clearinghouse

Nevada State Clearinghouse

From:	Skip Canfield
Sent:	Tuesday, May 31, 2011 4:26 PM
To:	Nevada State Clearinghouse
Cc:	Skip Canfield
Subject:	RE: E2011-155 McGinness Hills Geothermal Development Project, Lander County, Nevada - Bureau of Land Management

The Nevada Division of State Lands and the State Land Use Planning Agency have reviewed the McGinness Hills proposal and offer the following comments:

First of all, it is greatly appreciated that the document includes a discussion on **progressive lighting practices – Section 3.16.2.1**. The mitigation measures are strongly encouraged since there are continuing concerns about the cumulative visual impacts to public lands users' experiences from certain activities (temporary and permanent). Some notable activities include proliferation of new roads, poorly-sited and designed structures, lack of co-location of infrastructure **and improper lighting**, to name a few.

A comprehensive look at visual impacts should be considered when federal agencies review any development plan on public lands in Nevada, and nationally. The Nevada Division of State Lands encourages federal agencies to develop a consistent policy and "condition of approval" that can be required of applicants and included in NEPA decisions. It is hoped that all Federal agencies would include dark sky lighting and other visual resource protection and mitigation as a condition of approval for permanent and temporary applications.

To reiterate progressive lighting techniques, the following language is suggested that should be provided up front to applicants who propose development on public lands that includes lighting:

Utilize appropriate lighting:

- Utilize consistent lighting mitigation measures that follow "Dark Sky" lighting practices.
- Effective lighting should have screens that do not allow the bulb to shine up or out. All proposed lighting shall be located to avoid light pollution onto any adjacent lands as viewed from a distance. All lighting fixtures shall be hooded and shielded, face downward, located within soffits and directed on to the pertinent site only, and away from adjacent parcels or areas.
- A lighting plan should be submitted indicating the types of lighting and fixtures, the locations of fixtures, lumens of lighting, and the areas illuminated by the lighting plan.
- Any required FAA lighting is exempt from this condition, but should be consolidated and minimized wherever possible.

In addition, the following mitigation measures should be employed.

Utilize building materials, colors and site placement that are compatible with the natural environment:

- Utilize consistent mitigation measures that address logical placement of improvements and use of appropriate screening and structure colors. Existing utility corridors, roads and areas of disturbed land should be utilized wherever possible. Proliferation of new roads should be avoided.

- For example, the use of compatible paint colors on structures reduces the visual impacts of the built environment. Using screening, careful site placement, and cognitive use of earth-tone colors/materials that match the environment improve the user experience for others who might have different values than what is fostered by built environment activities.

- Federal agencies should require these mitigation measures as conditions of approval for all permanent and temporary_applications.

Skip Canfield
State Land Use Planning Agency

From: Nevada State Clearinghouse
Sent: Friday, May 27, 2011 9:21 AM
To: Skip Canfield
Subject: E2011-155 McGinness Hills Geothermal Development Project, Lander County, Nevada - Bureau of Land Management

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0213 Fax (775) 684-0260

Division of State Lands

Nevada SAI # E2011-155 Supplemental Memo

Project: McGinness Hills Geothermal Development Project, Lander County, Nevada

Updated 5/27/2011

Correction for McGinness Hills Geothermal Development Project, Lander County, Nevada

Project may be posted on Clearinghouse website Tuesday May 31. It is already posted on BLM's site:
http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/battle_mountain_field/blm_information/nepa/mcginness_

Follow the link below to access documents concerning the above-mentioned project.
E2011-155

Questions? Reese Tietje, (775) 684-0213 or clearinghouse@state.nv.us

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Distribution: Sandy Quilici, Department of Conservation & Natural Resources Gary Derks, Division of Emergency Management David Mouat,

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State Energy Office Rebecca Palmer, State Historic Preservation Office Terry Rubald, Nevada Department of Taxation, Local Government, Cer
Mines Russ Land, Nevada Division of Environmental Protection Clearinghouse, zzClearinghouse

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June 27, 2011

Bureau of Land Management
Battle Mountain District,
Attn: Tim Coward, Renewable Energy Coordination Office,
50 Bastian Road,
Battle Mountain, NV 89820

Mr. Tim Coward:

On behalf of the Nevada Wilderness Project (NWP), I wish to provide comments for the Bureau of Land Management's (BLM) McGinness Hills Geothermal Development Project in Lander County, Nevada, Environmental Assessment DOI-BLM-NV-B010-2011-0015-EA.

First, it is NWP's position that immediate steps are required to combat global climate change, and that a transition to renewable energy production is key to meeting this critical need. Moreover, NWP recognizes that this transition needs to happen rapidly or we will be unable to reverse the catastrophic consequences of climate change. With this in mind, we are committed to making sure that this renewable energy transition occurs in a fashion that is smart from the start. To do this, mitigation must occur to offset the damage to Nevada's wildlife habitats that will occur from accelerated development of renewable energy projects, and this mitigation must be accomplished both with both funding mechanisms and additional landscape designations. NWP recognizes that much of the BLM lands in Nevada have seen cumulative impacts from various land uses that have fragmented, degraded or destroyed wildlife habitats, especially in southern Nevada. NWP values the designation of areas dedicated to solar development to help reduce global climate change and to improve our country's national security. But we also recognize these designations are single-use management activities because utility-scale solar projects are not compatible with many other uses, such as primitive recreation or wildlife management. Because fencing and clearing of the ground surface is typically required, these actions will alter the fragile Mojave and Great Basin Desert landscapes in Nevada in ways that cannot be restored to their native condition. Appropriate mitigation through landscape protections might best be achieved by administratively designating Areas of Critical Environmental Concern (ACEC) unless the agency develops other administrative designations that could better provide permanent habitat conservation of valuable landscapes. These ACECs would need strong implementation of conservation and mitigation in their establishment, permanent mineral withdrawals and management language that clearly specifies the value of wildlife habitat as the priority purpose of these set-asides.

GENERAL EA COMMENTS

This EA does not provide alternatives for the Geothermal Unit Area that were considered. EAs must fully describe the proposal, no action, and a range of reasonable alternatives that meet objectives as laid out in the purpose section, and that reduce or eliminate impacts to important environmental resources. If the BLM finds that no reasonable alternatives exist and that the proposal does not have the potential for significant impacts, the EA may instead include a discussion of alternatives considered but rejected, and the reasons why these were rejected. In this case, the EA only considers alternatives rejected for the powerline portion of the project. The BLM should either provide an alternative for the Geothermal Unit Area or provide an explanation of which alternatives were rejected and why. E-1

For example, the EA reveals that the no action alternative will not impact any cultural resources even with further testing. Currently, no alternative was provided and/or a rational why not that would avoid the proposed McGinness Hills Archaeological District. E-2

SITE-SPECIFIC COMMENTS

Special Status Species

Plants section looks fine and reasonable.

Pygmy Rabbits

We recommend surveys for pygmy rabbits and their burrows in and around the project area. Because surveys have not been undertaken and this is a species of conservation concern, we recommend that surveys be performed. Mitigation requirements will be necessary if their presence is determined. E-3

Sage Grouse

Mitigation measures for sage-grouse discuss the use of genetic analyses to try to uncover impacts to the local population. Additionally, the concept of metapopulation dynamics is introduced. Neither of these are appropriate to the potential direct impacts to the known breeding habitat in the area, and genetic analyses will be, simply, a waste of money. The idea of being able to detect genetic variation in such a small geographic area reveals a lack of understanding of how such studies operate and the inability for these analyses to reveal useful information in this context. We cannot support this as a means of understanding impacts to sage-grouse. Also, the use of the term metapopulation is conceptually incorrect as it is not known if any metapopulation dynamics occur for the species in this region, and it should be stricken from the document as poorly used jargon. E-4

We believe that the transmission line mitigation generally addresses the potential of this issue reasonably well. Regarding Appendix D, we suggest that the statement on mitigation resulting from increases in corvids be changed from "may be required" to "shall be required" (pg. 185, par. 2). Additionally, the agency will need to require further mitigation if the planned steps do not prevent mortality increases from corvids and other avian predators. This needs to be an adaptive management program that is guided by sage-grouse responses to the development. E-5

Regarding potential impacts to local and regional population from the project (pg. 78, last par. "Fall and Winter"), it is simply not possible to know what the impacts of the project may or may not be on the regional population of sage-grouse. We suggest that the developer fund a collared bird study in an attempt to gain greater understanding of the regional population of birds in the northern Toiyabes as well as the impacts from this development. E-6

Although reasonable attempts have been made to mitigate impacts to lek activities, the Guidelines to Manage Sage-grouse Populations and their Habitats (Connelly et al. 2000) clearly specify that no development activities with potential impacts to sage-grouse should occur within 2 miles of an active lek. It is not clear if birds in these leks are migratory or non-migratory, but a 2-mile buffer assumes the more conservative guidance for non-migratory birds. This places the proposed project in opposition to the best, currently available scientific expertise. Consequently, deleterious effects to local populations of sage-grouse can and should be anticipated. If the planned project is approved, the currently defined monitoring plan should be strengthened to become a strong, robust, and peer-reviewed research project funded by the developer to fully understand the impacts to local and regional sage-grouse. This research project should also E-7

determine if the restored, off-site acreages and brood-rearing habitat restoration activities actually result in used habitat for the species. A request for proposals to develop and undertake this research should be reviewed and awarded by a team of scientific experts on sage-grouse. E-7

Regarding additional mitigation measures that attempt to limit certain activities during the lekking period, how will the BLM monitor the compliance of these mitigation requirements? E-8

In Appendix C, references to potential metapopulation structure are made in the "Evaluation of Habitat Fragmentation..." section, pg. 178. There is no basis for the claim of metapopulation structure in the peer-review literature, and detailing a costly study on the state agency having "data to suggest" this structure, subsequent genetic analyses to follow, and a trigger for mitigation on burying the transmission line, frankly, seems ridiculous. This proposal should be dropped from the EA in favor of the suggested research program detailed in our comments above. E-9

NWP supports the mitigation measure called for in the EA for wildlife and native plant species in and near proposed project with the additions and changes noted above. Although there does not appear to be a connection between surface water supporting wetlands/meadows and the deeper geothermal reservoir, NWP also supports an active surface water monitoring program such as the one mandated in this EA.

Cultural Resources and Native American Concerns

The EA does not reveal if consultation or the results of consultation for the proposed McGinness Hills Archaeological District and the Pony Express National Historic Site with the Nevada SHPO has been initiated or completed. The EA should also confirm that an agreement has been formalized for treatment for all archeological sites that are eligible or unevaluated that will be effected by the proposed project. The treatment plan should address impacts to Integrity of Setting of National Register of Historic Places eligible sites and/or districts and site that have not been evaluated. E-10

The EA should also address cumulative and indirect effects to cultural resources from increased access to archaeological sites. E-11

As discussed above, the EA should consider an alternative that avoids the archaeological district or provide a rationale why this option is not feasible. E-12

We encourage continued consultation with the Tribes throughout the process. Extra effort should be made to support continued Native American access to their special locations during construction and after. E-13

SUMMARY COMMENTS

The Nevada Wilderness Project appreciates the opportunity to provide our comments on the McGinness Hills Geothermal Development Project. We recognize the scope of the challenge faced by both the general public and the BLM to adequately address these issues in an effective and expeditious manner. However, it is our belief that with great challenges come great opportunities. We urge the BLM to think creatively on how to maximize conservation mitigation opportunities within the development process, and think "outside the box" on how cumulative impacts from energy development on public lands might also yield cumulative benefits from

creative conservation mitigation. Seizing this opportunity to make energy development "smart from the start" is critical in this early stage of the renewables boom that is coming to Nevada.

I or other NWP staff will be happy to make ourselves available to meet and discuss or further develop the any of the information we have provided on behalf of the Nevada Wilderness Project.

Sincerely yours,

Greg Seymour
Renewable Energy Program Coordinator
Nevada Wilderness Project
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUN 27 2011

Mr. Tim Coward
Bureau of Land Management, Battle Mountain District
50 Bastian Road
Battle Mountain, Nevada 89820

Subject: McGinness Hills Geothermal Development Project Draft Environmental Assessment, Lander County, Nevada

Dear Mr. Coward:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Assessment for the proposed McGinness Hills Geothermal Development Project. Our review and comments are provided pursuant to the National Environmental Policy Act and the Council on Environmental Quality Regulations (40 CFR Parts 1500-1508).

The EPA's detailed comments provide specific recommendations regarding analyses and documentation that should be considered prior to making a determination regarding the significance of potential impacts from the proposed McGinness Hills Geothermal Development Project. This additional analysis and documentation will assist the Bureau of Land Management in determining whether a "Finding of No Significant Impact" can be supported at the completion of the Final Environmental Assessment. Specifically, the EPA has concerns about the proposed Project's potential direct and cumulative impacts on aquatic, biological and air resources. Additional information is needed before it can be determined whether or not these impacts are significant.

We understand that the jurisdictional delineation of waters of the United States has not been conducted, and the full extent of impacts has not been determined. The Final EA should quantify the potential impacts to waters of the U.S. and discuss the steps that would be taken to avoid and minimize such impacts, as necessary. The Final EA should also include a robust discussion of all avoidance and mitigation measures proposed for the Project and include an outline of the requirements of a compensatory mitigation plan.

We recommend that the applicant and BLM work closely with the U.S. Fish and Wildlife Service in the identification of lands for habitat compensation for the Project's impacts to species such as the sage-grouse and golden eagle, in order to ensure that compensatory lands are of comparable or superior quality, and are suitable compensation for the unique habitat on the Project's site.

We appreciate the opportunity to review this Draft EA and are available to discuss our comments. When the Final EA is released for public review, please send one hard copy and one electronic copy to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521, or Scott Sysum at (415) 972-3742 or sysum.scott@epa.gov.

Printed on Recycled Paper

Sincerely,

Kathleen Martyn Goforth
Manager
Environmental Review Office
Communities and Ecosystems Division

Enclosure:
EPA's Detailed Comments

cc: Ms. Selena Werdon
United States Fish and Wildlife Service, Northern Nevada Ecological Services Office
Ms. Kristine Hansen
United States Army Corp of Engineers, Reno Regulatory Office

US EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE MCGINNESS HILLS GEOTHERMAL DEVELOPMENT PROJECT IN LANDER COUNTY, NEVADA, JUNE 27, 2011

The U.S. Environmental Protection Agency understands that the Bureau of Land Management intends to prepare a Final Environmental Assessment and a Finding of No Significant Impact for the proposed McGinness Hills Geothermal Development Project. As detailed below, the EPA recommends that the Final EA provide additional analyses, include supporting documentation, and identify specific minimization or mitigation measures to support the decision regarding whether or not a FONSI is appropriate.

Water Resources

Geographic Extent of Waters of the United States
The Project applicant should coordinate with the U.S. Army Corps of Engineers to determine if the proposed Project requires a Section 404 permit under the Clean Water Act. Section 404 regulates the discharge of dredged or fill material into waters of the United States (WUS), including wetlands and other *special aquatic sites*. The Final EA should describe all WUS that could be affected by the Project alternatives, and include maps that clearly identify all such waters within the Project area. The discussion should include acreages and channel lengths, habitat types, values and functions of these waters. The EPA recommends that BLM include a jurisdictional delineation for all WUS, including ephemeral drainages, in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* and the December 2006 *Arid West Region Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. A jurisdictional delineation will confirm the presence or absence of WUS in the Project area and help determine whether or not the proposed Project would require a Section 404 permit.

If a permit is required, the EPA will review the Project for compliance with *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230), promulgated pursuant to Section 404(b)(1) of the CWA. Pursuant to 40 CFR 230, any permitted discharge into WUS must be the *least environmentally damaging practicable alternative* available to achieve the Project purpose. The Final EA should include an evaluation of the Project alternatives in this context in order to demonstrate the Project's compliance with the 404(b)(1) Guidelines. If, under the proposed Project, dredged or fill material would be discharged into WUS, the Final EA should discuss alternatives to avoid those discharges.

> *Recommendation:*
> The BLM should consult with the USACE to determine if there are jurisdictional waters of the U.S. present at the Project site. If WUS are determined to be on the Project site, the Final EA should: (1) include a final determination of the extent of WUS at the Project site; (2) identify the *least environmentally damaging practicable alternative* and describe how the Project would comply with Clean Water Act Section 404 (b)(1); and (3) identify measures to avoid and minimize impacts to waters of the U.S., and mitigation measures for impacts that cannot be avoided.

F-1

Drainages, Ephemeral Washes, and Floodplains
The Draft EA fails to consider the up- and downstream reach and extent of waters and their importance in this landscape. Natural washes perform a diversity of hydrologic, biochemical, and geochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and

dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. The potential damage that could result from disturbance of flat-bottomed washes includes alterations to the hydrological functions that natural channels provide in arid ecosystems, such as adequate capacity for flood control, energy dissipation and sediment movement; as well as impacts to valuable habitat for desert species.

Recommendations:
The EPA recommends that the Final EA characterize the functions of any aquatic features that could be affected by the proposed Project and are determined not to constitute waters of the U.S., and discuss potential mitigation.

To avoid and minimize direct and indirect impacts to desert washes (such as erosion, migration of channels and local scour):

- Utilize existing natural drainage channels on site and more natural features, such as earthen berms or channels, rather than concrete-lined channels.
- Commit to the use of natural washes, in their present location and natural form and including adequate natural buffers, for flood control to the maximum extent practicable.

Discuss the availability of sufficient compensation lands within the Project's watershed to replace desert wash functions lost on the Project site.

F-2

Construction Stormwater Discharge Permit
The Draft EA states that the total disturbance for the Project would be approximately 217 acres (p. 104). A portion of this disturbance, estimated at almost 69 acres, would be short-term and reclaimed as soon as practical. However, more than 148 acres of the disturbed area would not be reclaimed until Project decommissioning. Lack of vegetation and periodic disturbance due to maintenance in these areas would potentially increase sedimentation and decrease water quantity.

The Nevada Division of Environmental Protection requires owner/operators to obtain a Construction Stormwater Discharge Permit if the project will disturb more than one acre. Given the large disturbance area for this Project, a Nevada Division of Environmental Protection Stormwater General Permit NVR100000 would likely be required. Additionally, a Stormwater Pollution Prevention Plan, that includes erosion control measures, would need to be generated for the Project and implemented on-site.

The SWPPP would include the elements described in the NVR100000 Stormwater General Permit, including a site map(s) showing the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the Project. The SWPPP also would list Best Management Practices, including erosion control BMPs that would be used to protect stormwater runoff, and include a description of required monitoring programs.

The SWPPP would be based on the requirements of the NVR100000 Stormwater General Permit and the 2008 Nevada Contractors Field Guide for Construction Site Best Management Practices. Guidance from other documents, such as the EPA document entitled "Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites" also could be used in the development of the SWPPP.

Recommendation:
The EPA recommends that the applicant determine the need for a Nevada Division of Environmental Protection Stormwater General Permit NVR100000. If such a permit is required, include a description of the proposed stormwater pollution control and mitigation measures in section 3.10 Water Quality and Quantity. F-3

Water Supplies
Public drinking water supplies and/or their source areas exist in many watersheds. Source water is water from streams, rivers, lakes, springs, and aquifers that is used as a supply of drinking water. Source water areas are delineated and mapped by the state for each federally-regulated public water system. The 1996 amendments to the Safe Drinking Water Act require federal agencies to protect sources of drinking water for communities.

Recommendations:
The Final EA should identify:

- Source water protection areas within the Project area.
- Activities that could potentially affect source water areas.
- Potential contaminants that may result from the proposed Project.
- Measures that would be taken to protect the source water protection areas.

F-4

The Final EA should also discuss compliance with the applicable regulations pertaining to the Underground Injection Control Program of the Safe Drinking Water Act.

Fencing
The Draft EA states that fencing will be used to prevent access by cattle to areas that might be harmful to them and the Project developer has committed to fence the reserve pits and the power plant site in conformance with the Gold Book[1] (p. 114). Additionally the Draft EA also indicates that fencing will be used for the reserve pits on the well pads and during site reclamation activities. The potential impacts of this fencing on sage grouse or drainage systems are not discussed. Fence collisions have been reported to cause sage-grouse injury and mortality in other regions of the country[2]. Also in this region, storms can be sudden and severe, resulting in flash flooding. Fence design should address hydrologic criteria, wildlife protection, as well as security performance criteria.

Recommendations:
Provide more detailed information in the Final EA on the proposed fencing design and placement, and its potential effects on drainage systems on the Project site. Ensure that fencing proposed for this Project will meet appropriate hydrologic, wildlife protection and movement, and security performance standards. Describe those standards in the Final EA.

F-5

The Final EA should discuss compliance with the BLM Instruction Memorandum (IM 2010-022, Managing Structures for the Safety of Sage-grouse, Sharp-tailed grouse, and Lesser Prairie-chicken). Specifically, the Final EA should discuss how the fence proposals will be evaluated for sage-grouse collision risk and are consistent with conservation measures in the State Sage-grouse Conservation Plan.

[1] The Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development
[2] Christiansen, Tom. Fence Marking to Reduce Greater Sage-grouse (Centrocercus urophasianus) Collisions and Mortality near Farson, Wyoming – Summary of Interim Results, October 26, 2009.

We recommend that the BLM review the National Park Service article[3] on the effects of the international boundary pedestrian fence on drainage systems and infrastructure to determine that such issues are adequately addressed. F-5

Emergency Planning and Community Right to Know Act, CAA §112(r), and Nevada Chemical Accident Prevention Program

Pentane will be used as the working fluid for the power plants. Large quantities of pentane will be stored on site. Hydrogen Sulfide is a potential toxic gaseous pollutant that could be released during drilling, maintenance or as the result of an accident. The geothermal power plants will have to comply with CAA §112(r), and, as applicable, EPCRA § 303, 311, & 312, and the Nevada Chemical Accident Prevention Program. Additionally, since the establishment of the Emergency Planning and Community Right-to-Know Act in 1986, the county's Local Emergency Planning Committee (LEPC) can require a facility to produce an emergency response plan whether or not it is required under other regulations. Nevada's LEPCs are currently set up at the county level.

Recommendation:
The Final EA should discuss compliance with CAA §112(r), EPCRA §§ 303, 311, & 312 and the Nevada Chemical Accident Prevention Program, as applicable. F-6

Biological Resources, Habitat and Wildlife

The Draft EA indicates vegetation would be cleared and soils moved during the construction of roads, well pads, power plants, transmission line poles and other facilities. Such activity is likely to disturb raptors, owls, sage-grouse and migratory birds. The Draft EA states that suitable golden eagle, ferruginous hawk and swainsons hawk foraging habitat is present within the Project area (p. 62). Also, according to the Draft EA, the Project occurs in designated sage-grouse summer and winter range, with a large part of the Project occurring in sage-grouse core-breeding habitat (p. 64). Further, the Project site is located in the Toiyabe Population Management Unit for the greater sage-grouse. Proposed mitigations for impacts to sage-grouse foraging and core breeding habitat include off-site mitigation projects and management practices as outlined in Appendix C to the Draft EA.

All raptor and owl species are protected under the Migratory Bird Treaty Act. The golden eagle and bald eagle also receive protection under the Bald and Golden Eagle Protection Act. The MBTA has no provision for allowing unauthorized take. In September 2009, the U.S. Fish and Wildlife Service finalized permit regulations[4] under the BGEPA for the take of bald and golden eagles on a limited basis, provided that the take is compatible with preservation of the eagle and cannot be practicably avoided. Most permits under the new regulations would authorize *disturbance,* rather than take.

The Draft EA states that the design of the transmission line would be in compliance with current standards and practices that reduce the potential for raptor fatalities and injuries (p. 26). The commonly referenced source of such design practices is found within the Suggested Practices for Avian Protection on Power Lines: State of the Art in 2006 manual (APLIC 2006). In order to comply with the BGEPA, an avian protection plan should be developed utilizing best available practices.

[3] National Park Service, August 2008, Effects of the International Boundary Pedestrian Fence in the Vicinity of Lukeville, Arizona, on Drainage Systems and Infrastructure, Organ Pipe Cactus National Monument, Arizona,
[4] See Eagle Permits, 50 CFR parts 13 and 22, issued Sept. 11, 2009. See internet address:
http://www.fws.gov/migratorybirds/CurrentBirdIssues/BaldEagle/Final%20Disturbance%20Rule%209%20Sept%202009.pdf

Recommendations:
Quantify, in the Final EA, available lands for compensatory habitat mitigation for this Project, as well as reasonably foreseeable projects in the area. Coordinate closely with the U.S. Fish and Wild Service in the identification of lands for habitat compensation for the Project's impacts to species such as the sage-grouse and golden eagle, in order to ensure that compensatory lands are of comparable or superior quality, and are suitable compensation for the unique habitat on the Project's site.

Incorporate the Standards and Best Management Practices[5] developed by the Governors Sage-Grouse Conservation Team specific to geothermal development projects into the Appendix C Greater Sage-Grouse Monitoring and Mitigation Plan.

The Final EA should include a Habitat Mitigation and Monitoring Plan. The goals of the mitigation plan would be to provide a framework that guides mitigation planning and implementation through all development phases, and to ensure that there is no net loss of acreage or functions/values from the implementation of the plan. This plan should also include the criteria needed to monitor conservation effectiveness for each species or habitat. Consider adopting a formal adaptive management plan to evaluate and monitor impacted resources and ensure the successful implementation of mitigation measures F-7

The Final EA and FONSI should discuss mechanisms that will ensure habitat selected for compensatory mitigation will be protected in perpetuity.

Identify, in the Final EA, specific measures to reduce impacts to eagles, and clarify how the proposed Project will comply with the MBTA and BGEPA.

Include, in the Final EA, design practices to be followed as described in the Avian Power Line Interaction Committee document, *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994.*

Include in the Final EA a requirement for an Avian Protection Plan to be developed using the 2005 Avian Power Line Interaction Committee and U.S. Fish and Wildlife Service Avian Protection Plan Guidelines.

For the communication tower to be constructed as part of the Project, implement all applicable conservation measures from the USFWS Guidance on the Siting, Construction, Operation and Decommissioning of Communication Towers[6].

[5] Nevadas Governor's Sage-Grouse Conservation Team (2010). Nevada Energy and Infrastructure Developments Standards to Conserve Greater Sage-Grouse Populations and Their Habitats.
[6] United States Fish and Wildlife Service (USFWS) (2000). Service interim guidelines for recommendations on communications tower siting, construction, operation, and decommissioning. Unpublished memo to Regional Directors. <http:// migratorybirds.fws.gov/issues/towers/comtow.html>.

Air Quality

The Draft EA states that the Project is located in an attainment/unclassified area for all criteria air pollutants (p. 45). The Draft EA does not provide any estimates of emissions of criteria pollutants or greenhouse gases for the construction or life of the Project. The Final EA should provide a discussion of potential air quality impacts of the proposed Project, including cumulative and indirect impacts. Such an evaluation is necessary to ensure compliance with State and Federal air quality regulations, and to disclose the potential impacts from temporary or cumulative degradation of air quality.

Recommendations:

- *Quantify Emissions* – The Final EA should estimate emissions of criteria pollutants from the proposed Project and discuss the timeframe for release of these emissions over the lifespan of the Project. The Final EA should describe and estimate emissions from potential construction activities, as well as proposed mitigation measures to minimize these emissions.

- *Specify Emission Sources* – The Final EA should specify the emission sources, by pollutant, from mobile sources, stationary sources, and ground disturbance. This source-specific information should be used to identify appropriate mitigation measures and areas in need of the greatest attention.

- *Equipment Emissions Mitigation Plan* – It is recommended that the Final EA consider the use of an EEMP. An EEMP would identify actions to reduce diesel particulates, carbon monoxide, hydrocarbons, and NOx associated with construction activities. We recommend that the EEMP require that all construction-related engines:

    - Are tuned to the engine manufacturer's specification in accordance with an appropriate time frame.
    - Do not idle for more than five minutes (unless it is necessary for the operating scope of the equipment and operation).
    - Are not tampered with in order to increase engine horsepower. F-8
    - Include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the Project site.
    - Use diesel fuel having a sulfur content of 15 parts per million or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area.
    - Include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include drilling equipment, generators, compressors, graders, bulldozers, and dump trucks.

- *Fugitive Dust Control Plan* - The Final EA should identify the need for a *Fugitive Dust Control Plan* and how that plan will meet the requirements of the Nevada Surface Area Disturbance Permit. We recommend that the plan include these general commitments:

    - Stabilize open storage piles by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.

- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

F-8

Climate Change

Emissions of carbon dioxide and other heat-trapping gases are affecting weather patterns, sea level, ocean acidification, chemical reaction rates, and precipitation rates, resulting in climate change. One report predicts that, by 2100, the average temperatures for Nevada are expected to increase by 3-4° F in the spring and fall and by 5-6° F in the summer and winter[7]. In general, Nevada is expected to have wetter winters and more arid summers as the subtropical dry zones for the whole planet are projected to increase. Higher temperatures and increased winter rainfall will be accompanied by a reduction in snow pack, earlier snowmelts, and increased runoff[8].

Recommendation:
The Final EA should discuss how climate change could affect the Project area, specifically within sensitive areas, and assess how the projected impacts of the Project could be exacerbated by climate change.

F-9

Hazardous Materials and Waste Management

Table 13 in the Draft EA lists materials and chemicals commonly used during well drilling (p. 108). For each product, this table estimates quantities to be used and stored, and indicates whether the product is considered a hazardous material. In contrast, the Draft EA only describes, in narrative form, the common materials to be used and stored on-site during the operation of the power plants (p. 110). No expected quantities are presented for materials that will be used or stored during the operation phase. As a result, the Draft EA does not provide sufficient information to describe the potential impacts to the safety and health of individuals or the environment, resulting from hazardous materials to be used and stored during the 30 years of site operation. For example, for the working fluid pentane, the Draft EA states that substantial quantities will be stored and used, without quantifying what the substantial amounts are expected to be (p. 118).

Recommendation:
The EPA recommends that the Final EA present a table, similar to Table 13, for the hazardous materials to be used and stored on site for the operational phase of the proposed project.

F-10

Invasive Species

Executive Order 13112, *Invasive Species* (February 3, 1999), mandates that federal agencies take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Executive Order 13112 also calls for the restoration of native plants and tree species. The Draft EA discusses the use of Adopted Environmental Protection Measures, one of which is intended to prevent the spread of invasive, nonnative species. This measure would ensure that all vehicles, heavy earth-moving construction

[7] United States Environmental Protection Agency. 1998. Climate Change and Nevada. Climate and Policy Assessment Division (2174), USEPA.
[8] The Center for Integrative Environmental Research (CIER) at the University of Maryland. 2008. Economic Impacts of Climate Change on Nevada.

equipment, mobile trailers and RV campers brought to and used on the Project site would go through high pressure washing of the entire vehicle/unit at a commercial wash station prior to arriving and/or being used on the Project site. The EPA suggests the following additional practices could be included:

- Minimizing disturbance of areas known to be infested with weeds.
- Minimizing soil disturbance anywhere in the right-of-way.
- Monitoring and controlling disturbed areas and soil stockpiles.

Recommendation:
The Final EA should include an invasive plant management plan to monitor and control noxious weeds. The Final Programmatic EIS for Geothermal Leasing in the Western United States[9] provides a listing of the recommended elements in Appendix D. F-11

Best Management Practices, Mitigation Measures and Management Plans

The Draft EA contains the use of Adopted Environmental Protection Measures, mitigation measures and various management plans and best management practices. The requirements and anticipated content of the plans was not defined. Appendix D of the Geothermal PEIS provides a list of recommended BMPs to be incorporated, as appropriate, into a permit application by the lessee or included in the approved use authorization by the BLM as conditions of approval. We recognize that not all the BMPs from the PEIS would be needed for this Project, but, at a minimum, the mitigation measures reasonably necessary to ensure environmentally responsible geothermal development should be selected from the list. Also, the selection of appropriate BMPs and mitigation measures should be dependent on factors such as the Project size, location, site specific characteristics, and potential resource impacts and can be further modified to meet site-specific situations and agency requirements. Additionally a menu of typical BMPs can also be found on the BLM Washington Office Fluid Minerals web site at: www.blm.gov/bmp.

Recommendations:
In the Final EA, include a review of the BMPs developed for the PEIS for Geothermal Leasing in the Western United States. The Final EA should incorporate the applicable BMPs for mitigation of the impacts analyzed, tailored to the site specific conditions.

The Final EA should include a table listing all management plans to be developed that are intended as mitigation measures, along with the requirements for the contents of the plans. F-12

The Final EA should include a list of the various mitigation measures interspersed through the document. These mitigation measures should be brought forward into the Finding of No Significant Impact.

Geological Hazards

Various studies[10] in other areas have raised concerns about induced seismicity and/or subsidence as a result of geothermal fluid injection and production. In the case of geothermal induced seismicity, withdrawal of fluids, as well as injection of fluids, can cause seismicity, though there is not a strict one

[9] Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States. Prepared by US DOI BLM, USDA Forest Service, and EMPSi. October 2008
[10] Oppenheimer, D. H. (1986), Extensional Tectonics at The Geysers Geothermal Area, California, *J. Geophys. Res.*, 91(B11), 11,463–11,476, doi:10.1029/JB091iB11p11463

to one correlation with injection. In most regions where there are economic geothermal resources, there is usually tectonic activity, such as in the western United States. These areas are more prone to induced seismicity than in more stable areas of the United States[11]. Potential geological hazards -- in particular, induced seismicity and subsidence -- should be more fully discussed in the Final EA.

Recommendations:
The Final EA should more fully discuss the potential for geological hazards such as induced seismicity or subsidence. The Final EA should discuss how geological hazards would be monitored, and mitigation measures employed, if detrimental geological hazards are manifested by the operation of the plants. F-13

The Final EA should discuss the potential impacts of induced seismicity to the safe operation of the plants.

[11] Majer, E.L. 2008. White Paper: Induced Seismicity and Enhanced Geothermal Systems. Center for Computational Seismology, Ernest Orlando Lawrence Berkeley National Laboratory.

STATE OF NEVADA
DEPARTMENT OF WILDLIFE
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Reno, Nevada 89512
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BRIAN SANDOVAL
Governor

KENNETH E. MAYER
Acting Director

RICHARD L. HASKINS, II
Deputy Director

PATRICK O. CATES
Deputy Director

June 27, 2011

Doug Furtado
Bureau of Land Management
50 Bastian Road
Battle Mountain, NV 89820

RE: McGinness Hills Geothermal Development Environmental Assessment

Dear Mr. Furtado,

Thank you for the opportunity to provide comments on the McGinness Hills Geothermal Development Environmental Assessment (EA). The Nevada Department of Wildlife (NDOW) appreciates being incorporated into the development and review of the wildlife section. We remain concerned that projects are being sited and approved in high quality Sage grouse habitat. We appreciate the opportunity for NDOW to be closely involved in this project and had our concerns incorporated into discussions involving the mitigation strategy that was ultimately used to offset impacts. We have high hopes that what we learn from this project can be incorporated into future projects that could be constructed compatible with our need to prevent a future listing of Sage grouse.

We would like to recognize the efforts of your agency and those of Ormat in making changes to the project (such as movement of the powerline and site components) to reduce our concerns regarding Sage grouse and their habitat. This truly followed the steps of minimizing the impacts of a project consistent with those outlined in NEPA by first modifying the project and then applying mitigation.

Although we are satisfied that impacts will be reduced or offset in the project, we still have some comments regarding this EA. The description of the Affected Environment for Sage grouse does not use NDOW's most recent data regarding lek status nor the results of recent telemetry findings. The omission of this data allows for a misleading representation of sage grouse use in the area and analysis of the project's impact on Sage grouse at the population level. It also leads to a reduced area of potential for the Habitat Restoration Mitigation. We would like to see the BLM allow the mitigation to be applied anywhere within the PMU that is meaningful to the associated population as supported by sound biological monitoring.

G-2 G-1

There has been confusion in the use and evaluation of Sage grouse lek buffers. Throughout the EA there is a reference to the Project's 2-mile buffer and this is carried into the sage-grouse analysis. Application of the 2-mile buffer should be applied to the lek or other Sage grouse habitat components, not to the project boundary. The purpose of the buffer is to provide a safe zone around sage grouse activity that would be free from the project's construction and operational activity.

NDOW would also like to see clarification regarding the implementation of mitigation triggers. We would like to ensure that implementation of the mitigation triggers relative to sound and lek attendance are initiated by the trigger being applied at any single active lek and not initiated through an average measure of all project impacted active leks. This would be necessary to address impacts as they are realized at discrete locations. Application on an average analysis basis may lead to unmitigated impacts to a single lek.

Finally, NDOW believes that implementation of the mitigation measures outlined in the EA is essential and would therefore like to see the development of a project-specific Wildlife Working Group (WWG). The WWG should be composed of members from the BLM, NDOW, USFWS, USFS and Ormat with other pertinent members being invited as needed. This group would help to identify, assess, and implement meaningful actions to offset the development of this project.

Again, thank you for the opportunity to be involved in this EA process and to express our concerns regarding this project. We understand that in managing Nevada's wildlife, NDOW is reliant upon BLM making well informed decisions regarding care of the habitats provided for on federal land. If you have questions or would like to further discuss this Project please do not hesitate to call.

Sincerely,

Alan Jenne
Supervisory Habitat Biologist

G-5

G-4

United States Department of the Interior

Pacific Southwest Region
FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
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RECEIVED-MAIL ROOM

June 22, 2011
File No. 2011-CPA-0094

Memorandum

To: District Manager, Battle Mountain District Office, Bureau of Land Management, Battle Mountain, Nevada

From: Acting State Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Comments on McGinness Hills Geothermal Development Project Environmental Assessment, Lander County, Nevada

The U.S. Fish and Wildlife Service (Service) appreciates the opportunity to comment on the McGinness Hills Geothermal Development Project Environmental Assessment (EA). The proposed project includes construction of 2 geothermal power plants, up to 11 geothermal production and 11 reinjection wells, associated pipelines, access roads, and installation of an approximately 9-mile-long transmission line from the project area to NV Energy, Inc.'s Frontier Substation. The proposed project would disturb approximately 217 acres and have a generating capacity of up to 66 megawatts of electricity.

We have reviewed the EA and are providing the following comments pursuant to the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*); Migratory Bird Treaty Act (MBTA; 16 U.S.C. 703); and the Bald and Golden Eagle Protection Act (BEGPA; 16 U.S.C. 668). Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq.)* and the Fish and Wildlife Act of 1956, as amended (70 Stat. 1119; 16 U.S.C. 742a-742j). Our comments are based on the information provided in the EA and our current knowledge of the fish and wildlife resources within and near the proposed project area.

The Service recognizes the need to develop alternative, renewable energy sources and is in strong support of these no carbon-based resources. We also recognize the importance of geothermal energy sources in the integrated energy mix needed by the United States market. We review and comment on numerous proposed renewable energy projects annually, including

TAKE PRIDE IN AMERICA

geothermal development projects. We typically have minor recommendations on proposed geothermal facilities. Appropriate siting of these facilities is the most important factor in minimizing biological conflicts. The proposed McGinness Hills project location poses a significant challenge to greater sage-grouse (*Centrocercus urophasianus*), and based on our current understanding we do not consider development in this location to be compatible with greater sage-grouse conservation.

In March 2010 the Service determined in a 12-month status review (75 FR 13910) that the greater sage-grouse warranted the protection of the ESA. However, listing the species at the time was precluded by the need to address higher priority species first. The result of this warranted but precluded finding is addition of the species to the candidate list; candidate species are afforded no statutory protection under the ESA. In the status review, fragmentation of contiguous sagebrush habitats and of sage-grouse populations combined with inadequate existing regulatory mechanisms to prevent this fragmentation was the principle rationale for our listing decision. As regional collections of populations (*i.e.*, metapopulations) become further isolated from one another due to natural and anthropogenic impacts, the extent or distribution of these regional metapopulations will play a significant role in their persistence and ultimately our ability to recover this species should that become necessary. Because candidate species often have a period of time during which a listing action can be averted, we encourage a proactive and conservation-minded approach to activities that may have a detrimental impact on the species.

The proposed project boundary occurs in a high density area for the greater-sage grouse, and the proposed action may have a detrimental effect on their long-term sustainability in this area. We have identified 23 leks within a 5-mile radius of the project area, 13 of which have shown recent activity (2005-2009). We anticipate that potential impacts will occur from direct habitat loss, habitat fragmentation through roads and power lines, noise, and increased human presence, shifts in the predator community [increasing abundance of common ravens (*Corvus corax*)], and the spread of invasive species. Given our knowledge of the greater sage-grouse in this area, we expect that there will be reductions and possibly a complete loss in local population numbers due to the commensurate habitat degradation resulting from construction and operation of this facility. This loss or reduction in the population will likely not be immediately obvious due to site fidelity of adult birds. Indirect impacts will further expand the actual impact area beyond the facility itself.

Measures as proposed in the EA attempt to minimize and mitigate the potential impacts caused by this proposed development, but they do not appear to be sufficient given the location and the known greater-sage grouse resource in the proposed project area. Specifically, we have concerns with the threshold levels for Sage-grouse Population Monitoring provided in Appendix C. We also question the approach taken under Evaluation of Habitat Fragmentation between Sage-grouse Metapopulations in Appendix C. This approach does not seem to be the most effective or timely means of examining impacts to greater sage-grouse from habitat fragmentation. If your agency chooses to proceed with this project as proposed, we strongly suggest that you enter into

H-4 H-3 H-2 H-1

further discussions with the Service as well as coordinate with the Nevada Department of Wildlife (NDOW) regarding mitigation efforts.

In addition, while the bald eagle (*Haliaeetus leucocephalus*) has been removed from the Federal list of threatened and endangered species (August 8, 2007; 72 FR 37346), it remains classified as endangered by the State of Nevada. Both the MBTA and the BGEPA prohibit take as defined as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, disturb, or otherwise harm eagles, their nests, or their eggs. Under the BGEPA, "disturb" means to agitate or bother a bald or golden eagle (*Aquila chrysaetos*) to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. On September 11, 2009 (74 FR 43686), the Service set in place rules establishing two new permit types: 1) authorize take of bald and golden eagles that is associated with, but not the purpose of, the activity; and 2) authorize purposeful take of eagle nests that pose a threat to human or eagle safety. We recommend you coordinate with State and Federal wildlife officials early in the planning process to develop a survey protocol and to evaluate the extent of potential take of eagles. If take is reasonably anticipated to occur, we recommend you develop an Avian Protection Plan (APP) in coordination with NDOW and the Service. An APP is intended to avoid, minimize, or mitigate impacts to these species. Please also coordinate with NDOW to ensure compliance with State regulations regarding the bald eagle.

Coordination among Department of Interior agencies on renewable energy developments represents a promising path forward with respect to meeting each of our unique but frequently overlapping missions. In Nevada, we look forward to continuing and improving upon this effort to both positively affect species conservation and to develop a robust renewable energy supply that is not reliant on carbon-based fuels. If you have any questions regarding this correspondence or require additional information, please contact me or Marcy Haworth at (775) 861-6300.

Selena J. Werdon

for Jill A. Ralston

cc:
Wildlife Biologist, Eastern Region Office, Nevada Department of Wildlife, Elko, Nevada

Yomba Shoshone Tribe

HC 61 Box 6275
Austin, NV 89310-9301
Tel. (775) 964-2463
yomba_tribe@yahoo.com

June 23, 2011

Timothy Coward Renewable Energy Project Coordinator
BLM Battle Mountain District
50 Bastian Road
Battle Mountain, NV 98920

RE: DOI-BLM0MV0B010-2011-0015-EA

The area encompassing and surrounding the McGinness Hills Project, DOI-BLM- 0MV0B010-2011-0015-EA, is ancestral land to the Yomba Shoshone Tribe. Tribal members and other Shoshone still actively use the area and participate in the same ceremonies and in harvesting food and medicine as our ancestors have done.

The Tribe previously requested our monitors to be present during any digging activity, but this has occurred without our knowledge or notification. When our families lived there, they did not have cemeteries, they buried their relatives where they died. The Western Shoshone belief is that we are not to be removed from our resting places. We do not want our grave sites desecrated, and we want to be present to ensure that does not happen.

Native wildlife will be disturbed by noise and vibrations of heavy equipment and lighting at abnormal hours. Their habitat will be destroyed. Their reproductive patterns will be disturbed resulting in the diminishment of their species. Your EA notes that there are no threatened or endangered species, and sage grouse are not present according to USFWS. However, in contradiction, another section of the EA discusses the leks and notes that they will be disturbed. We know the sage grouse are there. No real study or actual count by banding etc. has been done in this area. There is no discussion of water loss and water table lowering in the area or its affect on wildlife. Water is sacred to all life.

We are requesting another meeting and an extension to our comment period.

Sincerely,

Wayne K. Dyer

Wayne K. Dyer, Tribal Chairman
Yomba Shoshone Tribe

Cc: Steve Williams, USFS, Austin Ranger District
Gerald Smith, Bureau of Land Management

I-4 I-3 I-2 I-1

RECEIVED-MAIL ROOM
2011 JUN 28 AM 10: 30
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DISTRICT OFFICE

J

From: Katie Fite <katie@westernwatersheds.org>
SendTo: <timothy_coward@blm.gov>
Thread_Topic: McGinness Hills EA
June 28, 2011

Timothy_Coward@blm.gov

Dear Battle Mountain BLM,

Western Watersheds Project is very concerned that Nevada BLM is proceeding with a whole series of large-scale industrial renewable projects like the McGinness Hills Geothermal Project with minimal EAs.

All of these projects, including the destructive McGinness Hills Project, require an EIS. NEPA short-cuts should not be allowed for these very expensive projects that have a highly significant environmental and long lasting Footprint on public lands.

These are long-lasting industrial sites that require significant new infrastructure and development. They will have an immense footprint of disturbance to habitats and populations of rare and sensitive species, as well as to wild lands recreation and waters resources. This plant is incompatible with wild land settings like the McGinness Hills area.

An EIS is clearly required to address all direct, indirect and cumulative effects of even further disturbance and industrialization in the grazing-depleted arid lands of Battle Mountain. J-1

We have recently learned that the Humboldt-Toiyabe Forest is proposing to conduct a Geothermal Leasing EIS of a half a million acres of land near Bridgeport, plus a few cherrypicked parcels. One of these select cherrypi ked parcels is a significant area of land that touches the BLM lands considered in this current BLM EA. This is clearly a linked and connected action, and must be considered in a full BLM EIS that takes a "hard look" at the entire McGinness Hills Footprint and area. J-2

BLM and the Forest must provide mapping and analysis of all current or proposed "nominated" geothermal and oil and gas leases throughout the lands of this sage-grouse PMU and aquifer system (these areas may be different - but must be considered). How many other leases, and how much other development, might we expect? J-3

The same thing goes for mining claims, or various energy right-of-way applications.

BLM must also identify a range of alternative geothermal project siting in an expanded range of alternatives. There are large areas of KGRAs in areas to the north, in checkerboard lands closer to I-80, and adjacent areas where lands are already significantly disturbed and fragmented by mining activity, or where severe grazing and/or fires have significantly altered and degraded shrubsteppe - resulting in cheatgrass expanses. J-4

This is no longer a fast-track project, so BLM has plenty of time to do an J-5

EIS for this development that is highly controversial for wildlife. J-5

What are all the existing adverse short, mid and long term cumulative effects of grazing, mining, roading and other habitat disturbances across this landscape at present? How is this affecting, and how will grazing continue to foreseeably affect, Sage Grouse and other sensitive, rare and imperiled species habitats and populations? What will the impacts of this all - on top of McGinnness development be on rare and sensitive species habitats and populations? J-6

Can this population withstand even more intrusion -especially in such important lek and winter habitat? How significant is this habitat - isn't it true that the more that is learned about the grouse here - the more alarming that developent of a project here becomes?

The degree and severity of population declines must be presented under no action, as well as under a range of expanded alternatives. How many birds J-7

presently comprise the population? How many of those may move through, or rely on the area in any way over the course of a year? BLM cannot just point to the land area disturbed by the project - and claim minima impacts. It also has to consider the quality of the habitat, and/or its importance - to birds in their seasonal movement across the landscape.

How much more grouse use might the project area have if the drill pads, improved roading, and other components of so-called "exploration" were rehabbed, and that disturbance reduced? The already large-scale exploration disturbance has very likely caused a reduction in bird use - so the current studies are not gaining an accurate pre-development "look" at the high degree of use that traditionally occurred here. J-8

Where are all active, historic or other lek sites in the PMU? All seasonal habitats, and habitat providing connectivity? Please provide all info on population and numbers of birds for all years available. How might this project disrupt use of habitats? What is the ecological condition of habitats? Is this area now known to be a "hotspot" of sage-grouse use for the entire PMU?

The mapping in the EA does not reflect the most current (2011) sage-grouse lek surveys, which detected more leks. Why?

Where - and to what degree - are gold mining and other aquifer drawdown occurring in lands occupied by this PMU? In the Battle Mountain District? Please provide detailed upfront data and analysis of aquifer levels, flow levels of all springs and seeps, and ecological conditions including those in adjacent Forest Service or other lands. How can livestock developments be removed from springs, and fences removed rather than expanded - to mitigate impacts of geothermal or other disruption of aquifers and surface expression of waters? J-9

How degraded are these and surrounding lands by livestock grazing, and what impact has this had on habitats and populations of sage-grouse, pygmy rabbits, migratory birds, rare raptors, etc? J-10

Please provide detailed analysis of the current aquifer levels, projected aquifer levels, and the declines that have occurred in this region. Please provide mapping, and analyze all demands on these aquifers including both mine impacts and irrigation water removal. J-11

We are alarmed to read in the May 26, 2011 letter that accompanied the EA that the geothermal wells may be drilled to depths of 7000 feet! The geothermal wells may puncture several shallow or other aquifers, cause pollutants to seep into those aquifers, decrease their flows, and otherwise alter the ground water as well as surface water expression across the area. This would in turn impact sage-grouse brood rearing habitat, riparian migratory bird habitat, and the habitat for any other native species that rely on springs, seeps, riparian zones. What other demands are there on these aquifers at present? Who all holds water rights? Is water over-allocated? J-12

Where is baseline onfo on flow rates over all seasons of the year for all springs, seeps, streams? J-13

What sources of thermal waters could the McGinness Hills be connected to? Full and detailed analysis must be provided. What is the extent and characteristics of the hot water aquifer? Please provide detailed mapping and analysis. J-14

What recreational hot springs might be affected? Information must be available in detail to know the nature of, and relationship between, the geothermal reservoirs for the proposed projects. An EIS that provides sufficient data and analysis must be prepared. J-15

An EIS is in the long-term interests of everyone here -including the company that plans to invest many millions of dollars. It is needed to avoid misleading the public and investors if the geothermal potential is not what it is claimed to be, as well. We are concerned that taxpayers will be holding large loan guarantees - yet basic information is lacking. Where is detailed info on waters to be exploited? J-16

What pollutants will all components of this development entail? What will it bring to the surface? What dangerous or polluting substances may be used in this development? What toxic minerals may be in waters brought to the surface? J-17

Are there alternatives in or near mine-disturbed areas where this type of industrial development may be more suitable? Why aren't a range of development locations, including potential locations on private lands or mine areas being considered? J-18

Why has Nevada BLM not conducted responsible planning for siting of renewable facilities? We have been asking for years now that this be done. Hasn't Interior conducted a Rapid assessment? What does it show? Undersuch an assessment, the McGinness Hills would be found to be unsuitable. J-19

This area is a sage-grouse core area -as shown by the DOI-sanctioned Sage J-20

Grouse Core Area Mapping by Doherty et al. 2010. The value of the land and its habitat importance must be compared to alterative siting. There are so many torn up areas in Battle Mountain that the company should use - rather than destroying this wild area. Any company that can drill 7000 ft. underground can figure out how to responsibly site energy facilities. J-20

We have also suggested burying not only the powerline, but the plantbuildings as well. J-21

What will be the effects of underground drilling and detonations on geologic strata, surface expression of water flows, fracturing layers in aquifers, etc.? All of this information must be provided but is lacking in the EA. J-22

How will BLM assure that any re-injection does not result in contamination, or water being put in the wrong place? Again here, detailed baseline info must be provided in an EIS. J-23

What will be the Footprint of all the expanded infrastructure associated with this facility on sage-grouse, migratory birds such as sage sparrow or Brewer's, recreational uses, cultural sites, etc? Of the site itself? Systematic site-specific surveys must be conducted for all sensitive species in relation to the project. Sage-grouse are not a surrogate for sage sparrow. J-24

All elements of this proposal - from increased roading, fencing, power and other utility lines to night lighting - must be fully examined, and their effects must be minimized. J-25

Any new powerline here must be buried. This must be fully considered under an Alternative. Large portions of the facilities must be buried - for example - use the area of one of the drill pads (including sites that may have been drilled but were not productive enough), and bury all but piping underground. J-26

Please require that mitigation include purchase and retirement of public lands grazing permits as part of this proposal. The mitigation is greatly inadequate, and there is no guarantee of effectiveness. Winter habitat consists mature and old growth sagebrush - there are several leks in the Project Footprint - and the combination of these features will not be able to be mitigated. J-27

The Stipulations for environmental conditions, including cultural concerns, are woefully inadequate. J-28

There is no adequate planning or mitigation for a Worst case scenario. Please do this. J-29

Please provide triggers and thresholds for shutting down and removing the project based on declines in sage-grouse populations, or changes in surface flows of hot or other springs. Specific thresholds of grouse lek attendance, spring/seep water flow levels, etc. must be set - and if J-30

declines occur below those levels - the project must be removed. This is the only way to ensure that severe losses do not occur. J-30

What amount of water pollution, water table losses, sensitive species population decline, etc. will trigger a shut-down of this project? J-31

How many other geothermal projects alone are expected to be developed in this region? What will their cumulative effects be? Is McGinness Hills in any way tied to the same or nearby aquifers? J-32

The existing Nevada geothermal facility with miles of ugly piping near the Toulon Freeway Exit shows just how ugly, visually intrusive and damaging these geothermal projects can be. Likewise with the facility by the base of the Stillwater Range. The disturbance Footprint of is immense - and the visual intrusion is horrendous. We foresee incremental geothermal expansion and sprawl over vast areas occurring, along with the continued impacts of existing and expanded gold mining. J-33

How will this project reduce and alter the ability of the lands to buffer climate change effects? How much of a greater carbon footprint will this project have in this remote area - vs. if it were moved to a site closer to existing infrastructure? J-34

Geothermal plant wastewater/Effluent, should casings or pipelines fail - or water's course through pressure fractured rocks to uptake wells could result in the incremental or complete loss of some of the fluids. Would these eventually follow established subsurface water courses. Over time, it seems likely it could contaminate the aquifer and springs/seeps. Please address these concerns, and cumulative effects of all the mining oil and gas or other disturbances as well. J-35

What pollutants are in the explosives or other material used in drilling? The recent Oil and Gas drilling "fracing" exposes have shown how drilling activity may result in significant environmental pollution and damage. J-36

Will sage-grouse, pygmy rabbit or any species be able to survive with viable populations? If permanent losses or alteration of habitats, or aquifers, occurs - this project cannot be seen as 'renewable". Is the population here already well below the number for a viable population? Please also see Connelly et al. (2004) Conservation Assessment, and the ecent Knick and Connelly compilation for Studies in Avian Biology (Chapter by Garton et al. for population information. Please use information on energy development in the in this compilation as a basis for analysis of all direct, indirect and cumulative effects of energy development - ranging from waste or stagnant water West Nile virus mosquito breeding ponds to fences to powerlines, roading, traffic noise and disturbance in remote areas. Will winter snow plowing be required? How much disturbance will be associated with accessing the site? How much more disturbance will occur with development of the leases on the contiguous HT
Forest? J-37

BLMs Website at http:

//www.blm.gov/wo/st/en/prog/energy/renewable_energy/fast-track_renewable.ht ml shows that project sprawls across over 7000 acres. This is an immense footprint in this remote area. J-38

We are very concerned that this is another Nevada energy project where Nevada politicians are pressuring BLM to authorize without a "hard look" and full analysis of significant impacts. J-39

There is no analysis of the all the mitigation actions, including aff-site actions. J-40

We are concerned that the mitigation is much too meager - as it is based on acres of disturbance - and NOT on the full visual, noise, roading and other aspects of the project real Footprint - which extends greatly eyond acres bulldozed. WHAT indeed is this actual Footprint? We fear that an even greater burden of fencing and livestock facilities may be imposed on public lands, further subsidizing harmful and destructive grazing practices - and it be claimed to somehow "mitigate" the severe disturbance Footprint of this harmful facility. J-41

A factory located in this wild land setting cannot be considered to be green energy. It clearly violates BLM's conservation plan for sage-grouse, and a raft of recent Instruction Memos as well.

Please keep us fully informed of all parts of this action.

Thank you,

Katie Fite
Biodiversity Director
Western Watersheds Project
PO Box 2863
Boise, ID 83701
208-429-1679

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Knick, S. and J. W. Connelly, eds. 2009. Ecology and conservation of Greater Sage-Grouse: A Landscape Species and Its Habitats. Studies in Avian Biology, No. 38. http://sagemap.wr.usgs.gov/monograph.aspx

DUCKWATER SHOSHONE TRIBE

Post Office Box 140068
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2011 JUN 29 AM 10: 13

June 24, 2011

Bureau of Land Management
Battle Mountain District
Attn: Tim Coward, Renewable Energy Coordination Office
50 Bastian Road
Battle Mountain, NV 98920

Humboldt-Toiyabe National Forest
Austin/Tonopah Ranger District
Attn: Steven Williams, District Ranger
P.O. Box 130
Austin, NV 89310

RE: McGinness Hills Geothermal Development Project

Dear Sirs,

In response to the Environmental Assessment (DOI-BLM-NV-8010-2011-0015-EA) for the McGinness Hills Geothermal Development Project Lander County, Nevada, we have the following comments:

1) There are a number of cultural sites along the proposed transmission line located on Public Lands and National Forest System lands that will be adversely affected by the proposed project activities. We ask that all cultural resources be avoided as much as possible by project redesign and we ask to be part of the project redesigning. K-1

2) We are concerned that the tribe is not being adequately consulted regarding the valuable resources that will be destroyed or damaged by the proposed geothermal plant and transmission line. We formally request a project/site visit to these sites to assess whether they are Traditional Cultural Properties (TCPs) or Sacred Sites prior to any decision being made for project approval or disapproval. If we identify any TCPs or Sacred Sites, we ask you to consider the designation and consult with us for any mitigation proposed for TCPs or Sacred Sites. The USFS has scheduled a project/site visit with our tribal monitor for July 12th & 13th to sites on Forest Service System lands that will be impacted by the proposed transmission line. This is a good start for us to be able to identify TCPs or Sacred Sites, but this is occurring after the 30 day comment period defined in the EA notification. We suspect that we will have additional cultural concerns after this project site visit. K-2

3) The EA states that historic properties that will be impacted by the project would be mitigated according to a Historic Properties Treatment Plan (HPTP). We ask for the opportunity to review this treatment plan prior to any decision making. We believe that the treatment plan will only treat the research value of these historic properties, but will not mitigate our cultural values that we place on these properties. Therefore, we ask that this mitigation only be used as a last resort if the site cannot be avoided. We also ask to see the Nevada SHPO concurrence on all site eligibility determinations. K-3

4) We are also concerned that the proposed transmission route on National Forest System lands will impact too many cultural resources. We ask that you consider approving the alternate route for the transmission route over the proposed route.

5) We ask to be involved in any project ground disturbing activity including any excavation that may be proposed for mitigation. We would like one of our tribal monitor to be present during any project ground disturbing activities to monitor for inadvertent discoveries of cultural resources and Native American remains. We also want to monitor construction activities to verify that the company and subcontractors follow any approved plans. We also ask that an agency archaeologist and/or representative be present for any site mitigation that may take place. Due to the limited tribal funds and the suspected extensive project duration, we ask that ORMAT compensate the tribe at a reasonable rate for the tribal monitor's time spent in the field monitoring this project.

In summary, we feel that we are not being adequately consulted on this project or being provided with an adequate opportunity to work with the federal agency to identify cultural concerns, Traditional Cultural Properties, and Sacred Sites. We feel that these resources are important and there are multiple federal laws stating that we must be consulted on a government to government level regarding these resources. Again, these resources are important to us and we desire to work with you to avoid as many of these sites as possible and mitigate those that cannot be avoided.

Sincerely,

Maurice Isaac-Churchill
Asst to Div. Mgr.

Bureau of Land Management - Battle Mountain District
RESPONSES TO COMMENTS

McGinness Hills Geothermal Development Project

Environmental Assessment
DOI-BLM-NV-B010-2011-0015-EA

ID: A
Agency or Organization: Jan Morrison, Private Party Email
Date Received: June 6, 2011

Comment: Supports the above ground power line.

Response: Comment noted.

ID: B
Agency or Organization: Kareen Miller Private Party Email
Date Received: June 4, 2011

Comment: supports the project.

Response: Comment noted.

ID: C
Agency or Organization: Center for Biological Diversity
Date Received: June 20, 2011

C-1
Comment: EIS

Response: Comment is noted. As recognized by the attached FONSI and EA, including all required mitigation measures, the BLM and Forest Service believe that all potential impacts have been mitigated to below significance and that an EIS is not required.

C-2
Comment:

Response: The BLM's Land Use Plan directs us to use WAFWA guidelines (Connelly et al. 2000), which specifies a 3.2 kilometer (2 mile) buffer. In addition, conditions of approval,

specified for the geothermal lease (see Appendix A of the EA) also include this 2-mile buffer requirement.

C-3
Comment: Pygmy rabbit

Response: Section 3.5.1.1 of the EA describes the habitat suitable for pygmy rabbit that is located within the vicinity of the Project. Two areas of known suitable and occupied habitat are located 1 mile or more from the Proposed Action and are not expected be affected by the project.

C-4
Comment: Lack of an adequate range of alternatives

Response: The BLM and USFS and the NDOW worked closely with Ormat in siting the proposed Project and ancillary facilities. With the exception of some specific well locations, all facilities, including the well pads, pipelines and road network, plant locations and power line corridors were sited to minimize potential impacts (although not all impacts) to visual, cultural, noise, and sensitive plants and animals, especially sage grouse. When taking into account all of the potentially impacted resources these siting efforts eventually minimized viable alternative locations for the Project and its ancillary facilities. Also see C-5.

C-5

Comment: Different viable geothermal development locations and analysis of technology options leading to a smaller development footprint

Response: Pursuant to the Geothermal Steam Act of 1970 (30 U.S.C. 1001-1025), Ormat's federal geothermal leases grant the right to develop and utilize the geothermal steam and associated geothermal resources (30 U.S.C. 1003). In addition, Battle Mountain District's Shoshone-Eureka Resource Management Plan directs that all areas designated by the BLM as prospectively valuable for geothermal steam will be open for exploration and development (Management Decision 2). Each federal geothermal lessee is required to perform "diligent exploration until there is a well(s) capable of commercial production on the leased lands" (43 CFR 3203.5). Regulations at 43 CFR 3284.2(a) state that a (geothermal) unit operator is responsible for diligently drilling for and developing in the public interest the geothermal resource occurring in the unit area. Further, geothermal regulations at 43 CFR 3207.11 require a lessee to produce or utilize geothermal resources in commercial quantities in order to maintain the lease. The location of the Proposed Action's geothermal power plants and well field was

developed by Ormat to fulfill these lease requirements within the identified constraints of the site.

Geothermal power generation requires primarily three factors to be successful: temperature, fluid flows and strategic injection locations to return the resource. In Nevada, geothermal fluids flow through geologic fault block conduits. Drilling involves tapping the fault system at specific depths and locations to reach optimum temperature and fluid flows. And likewise, considerations for injection must occur in permeable fault zones where it will not cool the resource, it will maintain well field pressure and eventually return the resource for reheat and reuse. All of this necessitates strategic and multiple drilling locations and limits the ability to drill multiple holes from one location.

In contrast, other resources such as oil and gas are geologically located in a pooled or ubiquitous subsurface resource. This pooling of the resource is more conducive to drilling multiple holes, in multiple directions from one well pad.

When attempting to identify different viable geothermal development locations, the following constraints must be considered. Development of geothermal projects for power production is resource location driven. That is to say, it must be developed where the resource occurs. This presents limited location opportunities for power plant development and even fewer options for fluid production/injection pad locations. When the need to locate facilities at the resource and other resource constraints are combined, avoidance of all impacts is a near impossibility. Therefore, the best approach is to look for micro-site opportunities to minimize the impact.

At the McGinness Hills project site, the plant was located to maximize the distance from Sage Grouse leks and habitat and to place the facility in an area where terrain would provide the greatest visual and noise buffer. Additionally, the site was selected to place the facilities, geothermal pipelines, and transmission line in the areas of greatest existing impacts (roads & gravel pits, for example) and to minimize the impact to visual and cultural resources.

C-6
Comment: Sage-grouse, sensitive species

Response: The Project as proposed would have some impacts to individuals and local populations of greater sage-grouse, as described in Chapter 3 of the EA. Impacts to the species at the PMU-level and the local level would be reduced by the required mitigation measures described in Appendices C and D. In addition, see response to comment C-2.

C-7
Comment: Deviation from NDOW

Response: In ongoing coordination with NDOW, the deviations mentioned involving the proposed mitigation measures, time frames and methodology were discussed and agreed to in concert with the regional and state offices of the NDOW. In addition, surface disturbance to habitat has been mitigated at a 4:1 ratio. This exceeds the Nevada Governor's Sage-Grouse Conservation Team recommendation of a 3:1 ratio to address indirect impacts of the Project. Also see response to comment C-2.

ID: D1

Agency or Organization: State of Nevada, Department of Administration, Division of State Lands
Date Received: June 23, 2011

Comment: Lighting mitigation and "Dark Skies" initiative.

Response: The EA wording has been modified to reflect the input provided.

ID: E
Agency or Organization: Nevada Wilderness Project
Date Received: June 27, 2011

E-1

Comment: Range of Alternatives

Response: See response to comment C-4.

E-2

Comment: Avoid proposed MHAD

Response: The proposed locations of the geothermal power plants were selected to minimize disturbances to the proposed archaeological district. Also see response to comment C-5.

E-3

Comment: Pygmy rabbits

Response: See Section 3.5.1.1 of the EA, where surveys for pygmy rabbits are described. See also Section 3.5.2.2 for mitigation of impacts of Alternative 1.

E-4

Comment: Genetic analysis

Response: This analysis has been removed from the mitigation measures.

E-5

Comment: may-shall

Response: Changes have been made to the language in the mitigation. Also additional measures have been identified if original raven measures are not deemed adequate (see Appendix D).

E-6

Comment: radiotelemetry

Response: Telemetry monitoring of sage-grouse has been identified in the required monitoring. This monitoring is associated with the active leks likely to be impacted. This will be done in coordination with NDOW, and the data can be used in their ongoing regional efforts (see Appendix C).

E-7

Comment: study

Response: WAFWA management guidelines would be the minimum used in restoration/enhancement projects. There are no plans for the monitoring and mitigation to be a peer-reviewed study. Information and data collected would be available if needed to further other studies.

E-8

Comment: monitor

Response: Weekly data sheets for lek monitoring are required to be submitted the BLM, USFS and NDOW during the lekking season (see Appendix C). Mitigation measures have been incorporated into Conditions of Approval for the project.

E-9

Comment: genetics

Response: The genetic analysis part of the mitigation has been removed. Based on input during the public comment period and further consideration by the agencies of this proposed metapopulation monitoring and in consultation with the NDOW this monitoring requirement is no longer required.

E-10

Comment: Sec 106

Response: All requirements of the National Historic preservation Act have been complied with by both federal agencies, including the signing of a Memorandum of Agreement between the Forest Service, BLM, and Nevada SHPO. The Nevada SHPO has been advised regarding the proposal to create the McGinness Hills Archaeological District.

E-11

Comment: Access

Response: As required by mitigation measures applied to the project, archaeological monitors will be present during project ground-disturbing activities and will be required to report any violations of ARPA or NAGPRA. In addition, Ormat is required to educate all employees as to the importance of avoiding and protecting archaeological resources in order to avoid an ARPA or NAGPRA violation.

E-12

Comment: Avoid MHAD

Response: See response to comment C-5. In addition, impacts to cultural resources will be avoided or mitigated according to the provisions of the Historic Properties Treatment Plan.

E-13

Comment: Native American

Response: As noted in the EA, Native American coordination has taken place, is ongoing, and will continue throughout the life of the project.

ID: F

Agency or Organization: United States Environmental Protection Agency
Date Received: June 27, 2011

F-1

Comment: Jurisdictional waters of the United States

Response: Ormat contracted with JBR Consultants of Reno Nevada and had an evaluation of the Rye Patch Creek road crossing completed with respect to the ACOE Section 404 criteria. While the riparian area may qualify as a "wetland" under the ACOE criteria, the creek itself does not meet the 404 requirements of Waters of the US as outlined in a 2001 US Supreme Court Decision. That decision stated that "isolated aquatic features (that lack a tributary connection to a jurisdictional water body) are not subject to the Section 404 Clean Water Act jurisdiction." Rye Patch Creek drains into a closed basin playa, Big Smoky Valley.

The BLM and USFS have worked with Ormat to agree to provide for wetland and riparian enchantment and protection projects at a 4:1 ratio. As the EA states in the Chapter 3, "Wetlands and Riparian" section the McGinness Hills Geothermal Development Project is expected to impact 34 acres of wetlands, springs, seeps and riparian habitat/vegetation. Ormat has committed to restoring, repairing, and enhancement of 136 acres of comparable habitat.

F-2

Comment: Functions of aquatic features

Response: For a complete discussion of these recommendations, the agencies direct the EPA to the "Vegetation", Water Quality and Quantity", and "Wetlands and Riparian" sections of Chapter 3 of the EA. Also, refer to comment response F-1.

F-3

Comment: Storm Water Permit from the State of Nevada

Response: Approvals of applications by proponents on both BLM managed Public Lands or USFS National Forest System Lands require the proponent obtain all requisite Federal, State, and local permits in order to be in compliance with BLM or USFS Federally approved projects.

The EA does not specifically state that Ormat must obtain a Nevada Department of Environmental Protection, Bureau of Water Pollution Control Strom Water Discharge Permit. In fact, Ormat must have such a permit for all construction aspects of the project, as well as for plant operations.

In order to maintain some brevity in this and other EAs, the BLM and USFS has chosen to follow CEQ guidelines with respect not including a compendium of all requisite regulations, laws and policies. Rather these are incorporated by reference as well as requirements on Ormat to comply with all Federal, State and local regulatory requirements. NDEP has a detailed list of Best Management Practices proponents are required to follow in order to comply with NDEP's issued Storm Water Discharge Permits. NDEP's BMPs and other requirements may be found at:

http://ndep.nv.gov/bwqp/bmp05.htm

F-4

Comment: Source water protection areas

Response: A review of Nevada's Source Water web site (http://ndep.nv.gov/bsdw/swap.htm) indicates that there are no municipal source water sites proximate to the McGinness Hills Geothermal Development site. The Project is at the north end of the Big Smoky Valley, Nevada Hydrographic Basin 137B. While 137B has several municipal water sources across the Valley's vast areal extent there is no evidence or indications of any hydraulic connectivity between the geothermal resource and these municipal water sources.

See response to comment F-3. Ormat must comply with and have a NDEP issued underground injection permit.

F-5

Comment: Fencing design and placement and sage-grouse

Response: As of date, Ormat has not reported nor had any sage-grouse mortalities due to collisions with fences around reserve pits. In addition to the Gold Book standard for fencing, orange vinyl (snow fence) wildlife exclusion fencing has been and would be used to prevent smaller wildlife species from accessing the fenced off reserve pits. This fencing type is and would be highly visible to sage-grouse. The visibility of this type of fencing would be greater than if marking or flagging was to be used. This addition to the Gold Book standard fencing will reduce any potential collisions.

In addition to Ormat committing to following BLM and USFS BMPs, BLM and USFS have specific design criteria for fence construction in and around both perennial and ephemeral streams. Ormat must comply with those fencing standards for construction of all fences on the Project.

Gold Book fencing around "cellars" and reserve pits are BLM standard four-wire barbwire fences. As noted above, Ormat has agreed to augment those existing and future fences with orange, wildlife exclusion, web fencing. This augmentation will limit smaller wildlife exposure to cellars and reserve pits, and make the barbwire fences more visible to avian wildlife, including sage-grouse. Except for the chain link fence around the power plant used for security reasons, all other fencing constructed for habitat improvement, protecting seeps, springs, riparian areas etc. will be pipe and pole fencing.

F-6

Comment: Emergency Planning and Community Right-to-Know Act, CAA and EPCRA

Response: See response to comment F-3.

F-7

Comment: Land for compensatory habitat mitigation

Response: The figure at the end of Appendix C (Figure 1) depicts a broad area in which restoration/enhancement projects may occur. However, such projects may be located elsewhere within the PMU, if monitoring data indicates that it would beneficial to do so.

Comment: Standards and BMPs

Response: See response to comment C-2. In accordance with the BLM's Land Use Plan we used the WAFWA guidelines. However, some practices from the Nevada Governors Sage-Grouse Conservation Team Energy Guidelines have also been incorporated into the mitigation.

Comment: Habitat mitigation and monitoring plan

Response: Proposed mitigation and monitoring is included in Appendices C and D of the EA. These will be included as conditions of approval for the Project.

Comment: Perpetuity

Response: BLM has a multiple use mandate. However, any future project proposed for that area would in turn be required to provide mitigation to protect the restoration/enhancement projects and associated habitat values.

Comment: MBTA & BGEPA

Response: Pre-surface disturbance surveys are required during the nesting season; also APLIC (2006) standards have been incorporated in the transmission line design and mitigation measures.

Comment: APLIC

Response: APLIC (2006) standards are applied to the transmission line. Additional mitigation measures would apply to the Project (Appendix D), if monitoring indicates they are required.

Comment: Avian Protection Plan
Response: See Section 3.5.1.1 for information regarding bald and golden eagles. Although the Project does not include an Avian Protection Plan, other protection measures will be implemented for avian species. These include, for example, MBTA pre-surface disturbance clearance surveys and surveys of potential and known nest locations for raptors. Occupied nests will be buffered. APLIC (2006) standards will apply to the transmission line.

Comment: communication tower
Response: In reference to USFWS interim guidelines for recommendations on communications tower siting, construction, operation and decommissioning, many of the recommendations are best management practices that the BLM already implements, and the majority of the citations referred to the guidelines are already in use by the BLM (e.g., APLIC (2006) and Suggested Practices/or Raptor Protection on Power Lines).

F-8

Comment: Compliance with the CAA

Response: NDEP, Bureau of Air Pollution Control has been granted primacy for implementation of the CAA and issuing requisite permits for projects such as the McGinness Hills Geothermal Development Project, including construction. See response to comment F3.

F-9

Comment: Climate Change

Response: According to EPA's web page:

http://www.epa.gov/climatechange/science/futurecc.html

the current state of the art of computer modeling for climate change is incapable of predictions down to a distinct locale, such as the southern Grass Valley area where the McGinness Hills Development Project is planned. The recommendation to identify impacts at the scale requested, according to EPA's web page, is not possible; or at best be highly speculative, and thus outside the scope of this EA.

F-10

Comment: Table of Hazardous Materials for the operational phase.

Response: While not tabularized, a listing of all potential hazardous materials is identified in the text under the "Wastes" (Hazardous and Solid) &Health and Safety"," Environmental Consequences" section of the EA. Further, the EA states that Ormat has and will comply with all State and Federal requirements for the handling and management of hazardous materials during plant operations. Finally, see response to comment F-3.

F-11

Comment: Invasive plant management plan.

Response: The EA, along with the geothermal lease stipulations, clearly state Ormat is required to have such a plan. That plan is subject to approval by the Federal Agencies approving the Project.

F-12

Comment: BMPs for the PEIS for Geothermal Leasing in the Western United States.

Response: As noted in the comment, the appropriate BMPs have been incorporated from the referenced PEIS. Further, the geothermal lease stipulations also contain those applicable BMPs.

Comment: Table listing all management plans.

Response: This is an EA. In an attempt to keep this document somewhat brief, not all applicable plans have been listed. As the two jurisdictional agencies responsible for approving this project, the decisions approving the project comply with applicable agency specific regulations, including identifying and requiring Ormat to have those plans in place. See response to comment F-3.

Comment: List of various mitigation measures.

Response: The BLM and USFS have specific guidance approved by the CEQ as to how the agencies implement the NEPA. This approval includes how a FONSI is written. Both agencies FONSI procedures include having the mitigation either referenced or incorporated into the body of the FONSI. Further, all decisions approving the Project will have the mitigations carried forth as conditions of approval. The conditions of approval carry the weight of regulatory authority.

F-13

Comment: Geological hazards associated with geothermal development.

Response: The referenced problems have been identified with enhanced geothermal systems (EGS), where non-geothermal waters are injected into areas of subsurface heat. The heated waters are then cycled back and used in geothermal plants as though the waters were naturally generated geothermal waters.

The McGinness Hills Geothermal Development Project is not an EGS project. This Project will be using naturally occurring geothermal resources.

ID: G
Agency or Organization: State of Nevada, Department of Wildlife
Date Received: June 27, 2011

G-1

Comment: new data

Response: The environmental analysis in the EA was developed with data input from the NDOW through April 2011. Any additional data developed after this time frame was precluded from use due to the project and NEPA deadlines.

G-2

Comment: mitigation anywhere in PMU.

Response: See response to comment F-11.

G-3

Comment: 2-mile buffer

Response: We have modified the analysis to incorporate the comment. As mentioned in Section 3.5.1.1 of the EA, there is the 2-mile project buffer and a 2-mile lek buffer. If a 2-mile lek buffer intersects the 2-mile project buffer the acres within that 2-mile lek buffer are included in the analysis.

G-4

Comment: Single vs. average lek

Response: Language has been added to the mitigation (Appendix C) to address this concern.

G-5

Comment: Wildlife working group

Response: As specified in the mitigation measures (Appendix C), an annual meeting of Ormat, contractors, BLM, NDOW, USFS and USFWS will be held. This is a minimum. If this group deems it necessary, they can organize and schedule additional working meetings, as appropriate.

ID: H
Agency or Organization: United States Fish and Wildlife Service
Date Received: June 29, 2011

H-1
Comment: Analysis and Leks

Response: In accordance with our Land Use Plan (LUP), we use the Western Association of Fish and Wildlife Aagencies (WAFWA) guidelines (Connelly et. al. 2000) (see response to comment C-2). A determination was made as to which active leks fell within 2 miles. We determined that there were four active leks and three leks of unknown status. These leks and their associated habitat (2-mile buffer) were part of the analysis. There is mitigation and monitoring proposed for those active leks (Appendix C).

H-2

Comment: Impacts to populations

Response: Based on our analysis and the mitigation measures proposed (Appendix C) (measures that were developed in coordination with the NDOW) these impacts will be reduced to below significant levels.

H-3

Comment: Monitoring Thresholds

Response: The monitoring thresholds for 49 dBA are cited from the Montana Sage-Grouse Working Group (2005), North Dakota Game and Fish Department (2005), and the Northeast Wyoming Sage-grouse Working Group (2006). Plant modifications have been made in order to reduce noise disturbance, and measures have been proposed that if 49 dBA is not deemed sufficient (through the monitoring data) mitigation will take place in order to drop noise levels to 40 dBA. The thresholds that deal with greater than 50% decrease in male lek attendance were ascertained by NDOW in order to determine the deviation from normal shifts in male lek attendance.

H-4

Comment: Genetic Analysis

Response: See response to comment E-9.

H-5

Comment: NDOW and USFWS Coordination

Response: 5. Coordination with the NDOW has been ongoing since the inception of and throughout the project (see NDOW comment letter). McGuiness Hills project lead, Tim Coward, met with Steve Abele (USFWS in Reno) to discuss sage-grouse and this project in Reno. Furthermore, annual meetings will be held to discuss the previous and current years monitoring and mitigation (Appendix C), it is preferred that those meetings be attended by the BLM, NDOW, USFS, USFWS, Ormat and any contractors.

H-6

Comment: MBTA, BGEPA

Response: See response to comment F-17.

ID: I

Agency or Organization: Yomba Shoshone Tribe

Date Received: June 28, 2011

I-1

Comment: Tribal monitors

Response: The BLM is currently working with the various interested Tribes on a memorandum of understanding that would arrange to have Tribal monitors in place during surface disturbing activities. In addition, see response to comments K-1 and K-5.

I-2

Comment: Noise and vibration impacts to wildlife

Response: Disturbance will occur to wildlife as discussed in the affected environment and environmental consequences section; however, measures have been implemented to the operations and plant design to minimize those disturbances, as well as mitigation measures in order to further mitigate those disturbances will be established (Appendix C).

I-3

Comment: T and E and Sage-Grouse

Response: There are no ESA listed species in the project area, USFWS determination was that greater sage-grouse warranted protection but were further precluded at this time due to other species with higher priorities (warranted but precluded). That determination put sage-grouse onto the candidate species list (ESA), candidate species do not have protection under ESA. So while there are not any listed (threatened or endangered) species found within the project area, sage-grouse are located in the project area. Sage-grouse are addressed in the EA, and mitigation measures have been proposed to alleviate disturbance to them.

I-4

Comment: sage-grouse banding

Response: We do know that sage-grouse are present in and around the project area and the NDOW does have some telemetry studies occurring within the project vicinity. In Appendix C,

mitigation measures have been proposed that mitigate disturbances to sage-grouse. Included with the mitigation is monitoring that will also be established. A portion of this monitoring will include telemetry studies.

I-5

Comment: Water Loss

Response: There isn't any anticipated water loss expected with the project activities as further discussed in 3.11 Wetlands and Riparian. There is the potential of disruption to wildlife access to existing seeps, springs and riparian areas, however, mitigation measures are provided to alleviate these concerns as discussed in 3.5.2 Wildlife - Environmental Consequences.

ID: J
Agency or Organization: Western Watersheds Project
Date Received: June 29, 2011

J-1
Comment: EIS

Response: See response to comment C-1.

J-2
Comment: Forest Service Geothermal Leasing EIS

Response: As noted by WWP, the Humboldt-Toiyabe NF is in the process of preparing a geothermal leasing EIS, which will include analysis of National Forest system lands adjacent to the McGinness Hills Geothermal Lease Unit. However, a draft document has not been released to the public, and any decisions regarding geothermal leasing on National Forest system lands are at least one year away. This affords additional opportunities for the Public to provide input into the Forest Service leasing process. No connected actions with the McGinness Hills Geothermal Development have been identified at this time.

J-3
Comment: Nominations

Response: The cumulative effects analysis (Section 4 of the EA) describes the known relevant past, present, and reasonably foreseeable future actions.

J-4
Comment: Range of alternative

Response: See response to comments C-4 and C-5.

J-5
Comment: Fast Track/EIS

Response: See response to comment C-1.

J-6
Comment: Cumulative effects

Response: The cumulative effects analysis has been updated. See (Section 4) of the EA.

J-7
Comment: Range of alternatives

Response: See response to comments C-4.

J-8
Comment: Sage-grouse

Response: For an analysis of impacts to sage-grouse and sage-grouse habitat, see Section 3.5.2.1 and Figure 14 of the EA.

J-9
Comment: Aquifer

Response: In order to provide an analysis of an impact to a resource, a direct or indirect impact must be forecasted because of a project proposal. In order for a cumulative impact to a resource to be forecasted, a project must have a direct or indirect impact to a resource.

While there is a minor, Nevada State Engineer permitted, water withdrawal for water use for construction purposes from the Lancaster Ranch proposed by Ormat, there is no major, or significant long-term water withdrawal from either hydrographic basin (138 or 137A) proposed for the Project.

In addition, there are no major mine dewatering projects located in the Toiyabe PMU proper; ergo there are no significant cumulative impacts from the Project proposal or mines occurring in the PMU.

An analysis of the potential impacts to wetlands and riparian areas is included in the EA, along with proposed mitigation. Based on past and on-going monitoring of these resources, there appears to be no hydraulic connectivity between these resources and the geothermal resources.

J-10

Comment: Livestock grazing

Response: An analysis of both vegetative resources and range resources are included in the EA. Also, see the response to comment J-3.

J-11

Comment: Current and projected aquifer levels

Response: See the response to comment J-9.

J-12

Comment: 7,000 foot geothermal drill holes puncturing shallow aquifers

Response: See response to comment J-9. In addition, the State of Nevada, NDEP regulates geothermal drilling operations within the State. Nevada geothermal drilling regulatory requirements include the need for geothermal companies to case the drill holes through any cold-water aquifers to prevent co-mingling of geothermal waters with cold-water aquifers. Ormat complies with Nevada geothermal well drilling requirements, thus the predictions indicated in the comment are unlikely to occur.

J-13

Comment: Baseline info on flow rates over all seasons.

Response: See response to comment H-5. In addition, please refer to the "Wetlands and Riparian" section of Chapter 3 in the EA for a complete analysis of potential impacts, along with proposed mitigation for those impacts.

J-14

Comment: Sources of thermal waters

Response: There have been no surface expressions of geothermal waters identified in the Project area.

The details of the actual geothermal resource, as developed by Ormat, are Ormat's proprietary information and not subject to disclosure by the BLM or USFS.

J-15

Comment: Recreational hot springs might be affected

Response: See response to comment J-14.

J-16

Comment: EIS is in the long-term interests of everyone here

Response: See response to comment C-1.

J-17

Comment: Pollutants will all components of this development entail

Response: A complete disclosure of any potential pollutants, hazardous materials, and proposed mitigation may be found in the EA, Chapter 3. Also, see response to comment J-12.

J-18

Comment: Alternatives in or near mine-disturbed areas

Response: See response to comment C-5.

J-19

Comment: Nevada BLM not conducted responsible planning for siting of renewable facilities

Response: This comment is outside the scope of this EA.

J-20
Comment: Sage-grouse core area

Response: See the response to comment C-5.

J-21

Comment: Burying not only the power line, but the plant buildings

Response: The EA's "Other Alternatives Dropped From Detailed Analysis" has been revised to reflect the numerous reasons why burying portions of the power line is not feasible.

According to Ormat, even if feasible, burying the power plants would be financially prohibitive.

J-22

Comment: Effects of underground drilling and detonations on geologic strata

Response: With respect to "detonations": neither Ormat's 2008 exploration plan, nor any other Ormat permit applications under consideration by the BLM indicate the use of any explosives that would result in a "detonation".

As fully disclosed in both Ormat's 2008 Exploration EA as well as the current development Project EA, Ormat has requested to use both muriatic and hydrofluoric acids to dissolve minerals that are in the geothermal resource area. The use of these acids to dissolve minerals at depth is also known as "fracing," short for fracturing rock and minerals at depth in the geothermal resource.

As the EA indicates, minerals are dissolved by the acids. Once the minerals are dissolved, those dissolved minerals and now spent acid are removed from the geothermal resource and disposed of in the lined reserve pit/s. If necessary, the acids are neutralized prior to reserve pit reclamation. See the EA, Chapter 3, "Wastes (Hazardous and Solid) & Health and Safety" for a complete discussion of this process.

The fracturing of the minerals is part of the geothermal development process, and as noted in previous responses, specifics of the development of the geothermal resource are considered proprietary information by Ormat.

J-23

Comment: Re-injection does not result in contamination

Response: See response to comment J-12 and J-14.

J-24
Comment: Footprint on wildlife, etc.

Response: For an analysis of impacts of the Proposed Action, see Section 3 of the EA.

J-25

Comment: Elements of this proposal

Response: The final EA, public comment letters, FONSI, and permit approvals are the result of an extensive environmental review by the BLM and USFS. As required by the NEPA, a hard look has been taken by the Federal Agencies as to the impacts of Ormat's Geothermal Development proposal. Appropriate and extensive mitigation has been presented, the effectiveness of that mitigation disclosed, and the impacts of the proposed mitigation provided in the EA. The permit decisions include the mitigation as "Conditions of Approval" and are now binding on Ormat for implementation. Thus, the BLM and USFS believe a full and complete analysis of Ormat's Geothermal Development Proposal for the McGinness Hills project has been presented.

J-26

Comment: New power line here must be buried

Response: See response to comment C-4 and J-21.

J-27
Comment: Winter habitat

Response: The purchase and retirement of BLM livestock-grazing allotments is outside the scope of this analysis.

J-28

Comment: Stipulations for environmental conditions, including cultural concerns, are woefully inadequate

Response: Comment noted.

J-29

Comment: Planning or mitigation for a worst-case scenario

Response: CEQ regulations no longer require a worst-case analysis in a NEPA document.

J-30

Comment: triggers

Response: See response to comment C-5.

J-31

Comment: Amount of water pollution, water table losses, sensitive species population decline, etc. will trigger a shut-down of this project?

Response: The totality of the combined regulatory authority provide both the BLM and USFS line management authorities a wide array of potential penalties for infractions of regulations or operating permits by a proponent on both Public and National Forest administered lands.

In referencing response C-5, Ormat, the proponent in this Project, has certain legal obligations to develop the geothermal lease on the McGinness Hills Geothermal Unit. Upon development, Ormat also enjoys the legal right to produce electricity under the various authorities identified in response C-5.

It is conceivable that a potential infraction by Ormat or another proponent utilizing Public Land or National Forest System Lands could reach a level of significance where some level of shut-down is possible. That scenario is purely speculative on WWP's part, and the agencies will not respond to that hypothetical scenario.

It should be noted that both the BLM and USFS take their land management responsibilities, as directed by the Congress and Executive Branches, very seriously. Any violation of regulations or operating permit stipulations by Ormat or any other proponent will be dealt with in accordance with the legal authorities provided by the agencies' implementing regulations and laws, commensurate with the violation.

J-32

Comment: Other geothermal projects alone are expected to be developed in this region

Response: See comment response J-3 and J-6.

J-33

Comment: Existing Nevada geothermal facility with miles of ugly piping near the Toulon Freeway Exit shows just how ugly

Response: Comment noted.

J-34

Comment: Will this project reduce and alter the ability of the lands to buffer climate change effects?

Response: http://www.epa.gov/climatechange/science/futurecc.html

"It is important to recognize that projections of climate **change in specific areas** are not forecasts comparable to tomorrow's weather forecast. Rather, they are hypothetical examples of how the climate might change and usually contain a range of possibilities as opposed to one specific high likelihood outcome." (BLM emphasis added)

Based on the information above, provided by EPA's web sites on Climate Change (referenced above) leads the BLM to conclude that any changes to the overall global climate change the McGinness Hills Geothermal Project may cause may be speculative in nature for this site specific project and outside the scope of this EA.

J-35

Comment: Should casings or pipelines fail – or water"s course through pressure fractured rocks to uptake wells could result in the incremental or complete loss of some of the fluids

Response: As stated previously and in the EA, Chapter 3, "Wetlands and Riparian," monitoring to date does not demonstrate and hydraulic connectivity between the geothermal resource and the upper cold water alluviums.

Should any casings rupture or fail state regulations are in place to require Ormat to provide immediate corrective actions. Further, it is in Ormat's best interests to ensure geothermal well casing integrity, since the ability of the power plants to generate electricity relies on a continuous and uninterrupted geothermal water supply. Well casing, overall geothermal pipeline integrity,

including the entire closed loop geothermal supply system are regularly inspected, including the use of x-rays and other technologies by Ormat on a regularly scheduled maintenance basis.

J-36

Comment: Pollutants are in the explosives or other material used in drilling

Response: See response to comment J-22.

J-37

Comment: Sage-grouse, pygmy rabbit, etc.

Response: Comment noted

J-38

Comment: That project sprawls across over 7000 acres

Response: The EA in both Chapter 2, the Proposed Action, and in Chapter 3, throughout the Affected Environment and Environmental consequences sections clearly delineate that the total proposed disturbance for both the temporary and permanent disturbance is a total of 217 acres.

The McGinness Hills Geothermal Unit is approximately 7,680 acres.

J-39

Comment: Very concerned that this is another Nevada energy project where Nevada politicians

Response: Comment noted.

J-40
Comment: No analysis of the all the mitigation actions

Response: BLM has modified the analysis to provide information on impacts associated with mitigation measures.

J-41

Comment: Concerned that the mitigation is much too meager – as it is based on acres of disturbance – and NOT on the full visual, noise, roading and other aspects of the project real Footprint

Response: As outlined in 40 CFR 1508.20, Mitigation, (c) Mitigation includes: "Rectifying the impact by repairing, rehabilitating or restoring the affected environment." As outlined in the EA, including Appendix C, mitigation is proposed that clearly addresses both the direct and indirect impacts identified throughout Chapter 3. A prime example of indirect impacts and proposed mitigation is tied to the projected noise impacts and how noise my affect sage-grouse.

The BLM, USFS and the NDOW, working with Ormat, has secured agreements with Ormat which will fund extensive restoration projects equaling a 4:1 ratio of the total proposed disturbance acres (217 acres), equaling 868 acres of sage brush habitat improvement and restoration projects. These projects will be in areas approved by the BLM, USFS and the NDOW for sage-grouse mitigation. Refer to Appendix C for details.

In addition, Ormat has agreed to restore, improve, or protect an additional 124 acres of springs, seeps, wetlands and riparian areas, which are considered key brood rearing habitat for sage-grouse broods.

Additional mitigation, including the likely effectiveness of the proposed mitigation, monitoring plans and trigger points identified for implementation of mitigation, and the likely impacts resulting from the mitigations are provided throughout Chapter 3 and Appendix C.

ID: K
Agency or Organization: Duckwater Shoshone Tribe
Date Received: June 29, 2011

K-1

Comment: Avoiding cultural sites along the transmission line corridor.

Response: Current mitigation and adopted environmental protection measures by Ormat include the commitment, where practicable, to place power line poles in a manner that would avoid impacts to identified cultural resources. In addition, a BLM or USFS certified cultural resources monitor must be present for all surface disturbing activities.

The BLM is currently working with several Tribes to establish a memorandum of agreement that would enable one or more Tribal monitors to work at the project site during surface disturbing activities.

Finally, if a cultural site cannot be avoided, a Historic Properties Treatment Plan is in place to mitigate such impacts.

K-2

Comment: Duckwater Tribe has not been adequately consulted.

Response: Based on receipt of this letter, the BLM has agreed to another site visit with the Duckwater Shoshone Tribe on July 13, 2011. This visit will include the USFS and possibly members of the Fallon Paiute Shoshone Tribe as well. In addition, Tribal coordination will be an ongoing process throughout construction of the project and through the life of the Project.

To summarize the BLM's records on Tribal coordination with the Duckwater Tribe:

- August 3, 2010: NAC letters were sent to the following tribes; Battle Mountain Band Council, **Duckwater Shoshone Tribe**, Yomba Shoshone Tribe, Te-Moak Tribal Council, Elko Band Council, Western Shoshone Defense Project, South Fork Band Council, Ely Shoshone Tribe, Timbisha Shoshone Tribe, Western Shoshone Descendants of Big Smokey, Stanley Hooper and Fallon Paiute-Shoshone Tribe;
- August 24, 2010 : Received a letter dated August 11, 2010 from the Duckwater Shoshone Tribe. Concerns: Ethnographic report, Native American monitor before, during, and after stage of the project. Requested a site visit;
- October 12, 2010: Gerald Dixon emailed Maurice Frank-Churchill of the Duckwater Shoshone Tribe about scheduling a site visit;
- October 22, 2010: Gerald Dixon emailed Maurice Frank-Churchill of the Duckwater Shoshone Tribe about a site visit on November 10, 2010.;
- November 10, 2010 : Site visit was conducted with the Yomba Shoshone Tribe and Duckwater Shoshone Tribe (Maurice Frank-Churchill);
- July 13, 2011: Maurice Frank-Churchill and members of the Yomba Tribe made a site visit to the project area with both BLM and USFS representatives present.

K-3

Comment: Opportunity for the Tribe to review the Historic Properties Treatment Plan and review the Nevada SHPO's concurrence on all site eligibility determinations.

Response: Currently, the Duckwater Shoshone Tribe does not have either a Statewide or Project specific data sharing agreement with the BLM. Therefore, because of the sensitive nature of the

cultural sites as well as our cultural regulations, the BLM is unable to honor this request by the Duckwater Tribe.

The Nevada SHPO concurrence on all site eligibility determinations are considered available to the Tribes. The BLM will be working with its local archaeologist to make those determinations available to the Tribe in the near future.

K-4

Comment: Approving the alternative power line route versus the proposed power line route.

Response: The impacts to cultural sites are one of many resource issues that the USFS must weigh in deciding the appropriate route for the power line. The US Forest Service Supervisor will consider this input from the Duckwater Tribe along with all of the other resource issues when deciding which route will be selected for the final power line corridor.

K-5

Comment: Tribal monitors during ground disturbing activities.

Response: See response to comment K-1. With respect to compensation for a Tribal monitor: that is an issue between the proponent and the Tribes.

EXHIBIT 2

Finding of No Significant Impact (BLM)

EXHIBIT 2

FINDING OF NO SIGNIFICANT IMPACT

FOR THE
MCGINNESS HILLS GEOTHERMAL DEVELOPMENT PROJECT
LANDER COUNTY, NEVADA
ENVIRONMENTAL ASSESSMENT
DOI-BLM-NV-B010-2011-0015-EA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
BATTLE MOUNTAIN DISTRICT - MOUNT LEWIS FIELD OFFICE

Environmental Assessment (EA) DOI-BLM-NV-B010-2011-0015-EA, dated July 2011, has been reviewed through interagency and interdisciplinary team processes, and it has been sent to the Nevada State Clearinghouse and the public for a 30-day comment period. The EA was sent to 180 individuals, organizations, companies, agencies and tribes.

After consideration of the environmental effects of the Proposed Action described in the EA and supporting documentation, it has been determined that the Proposed Action is not a major Federal action that would significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as described in 40 CFR 1508.27. Therefore, preparation of an Environmental Impact Statement is not required, per section 102(2) (c) of the National Environmental Policy Act (NEPA).

LAND USE PLAN CONFORMANCE

The BLM-managed public lands within the Project Area are administered through the Mount Lewis Field Office (MLFO). The area is subject to the BLM Shoshone-Eureka Resource Management Plan (RMP), which was approved in 1986, and its amendments. The Proposed Action is in conformance with the Shoshone-Eureka RMP.

Part II, Section E, "Management Actions Not Expressly Addressed by the Resource Management Plan," of the RMP includes the section "Minerals Objectives and Management Decisions," brought forward unaltered from the earlier BLM "Management Framework Plan" (Record of Decision, page 29). Minerals Objectives 1, 2 and 3 lead to Management Decision #2 (Leaseable Minerals - Geothermal Steam). The three objectives are:

- Objective 1: Make available and encourage development of mineral resources to meet national, regional and local needs consistent with national objectives for an adequate supply of minerals.
- Objective 2: Assure that mineral exploration, development and extraction are carried out in such a way as to minimize environmental and other resource damage and to provide, where legally possible, for the rehabilitation of lands.

- Objective 3: Develop detailed mineral resource data in areas where different resources conflict so that informed decisions may be made that result in optimum use of the lands.

Management Decision #2 (Leaseable Minerals – Geothermal Steam), states that: "All areas designated by the BLM as prospectively valuable for geothermal steam will be open for exploration and development unless withdrawn or restricted from mineral entry. All public lands disposed of in these areas will have the geothermal resources reserved to the federal government."

FINDING OF NO SIGNIFICANT IMPACT

I have reviewed Environmental Assessment DOI-BLM-NV-B010-2011-0015-EA, dated July 2011. After consideration of the environmental effects, as described in the EA and incorporated herein, I have determined that the Proposed Action, with the project design specifications including adopted environmental protection measures and required mitigation measures identified in the EA, will not significantly affect the quality of the human environment and that an Environmental Impact Statement is not required to be prepared.

This finding and conclusion is based on consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and the intensity of impacts described in the EA and summarized below.

Context

Ormat Nevada Inc. has filed a Utilization Plan for the development of two geothermal power plants, geothermal wells, associated pipelines, access roads, and transmission line Plans of Development for the McGinness Hills Geothermal Development Project. The project entails developing up to 11 geothermal production and 11 reinjection wells and building an approximately 9-mile long electrical transmission line. The McGinness Hills project is located in Lander County, Nevada. The nearest inhabited town is Austin, NV, which lies approximately 16 miles southwest of the project.

The components of the proposed Project directly related to the geothermal resource (geothermal production and injection wells, access roads, geothermal pipelines, geothermal power plants and microwave communication towers) would all be located within the McGinness Hills Geothermal Unit (NVN-84268X). This Unit is comprised of federal geothermal leases NVN-83967, NVN-83966 and the Lake Ranch lease on private land. The Unit Area encompasses approximately 7,680 acres of public lands managed by the BLM and private lands in Sections 9-16 and 21-24, Township 20 North, Range 45 East, Mount Diablo Baseline and Meridian.

The approximately 9.01 mile, 230 kV overhead transmission line and fiber optic line would be constructed, originating at the proposed new McGinness Hills substations adjacent to the power plants, trending south and east and terminating at the existing Sierra Pacific Power Company dba NV Energy Frontier substation (N-25341). Approximately 3.22 miles of the proposed 230 kV transmission line and fiber optic line (N-88978 and N-88979) would be located on public lands managed by the BLM, while the remaining 5.79 miles would be located on National Forest System lands (#AUS74).

The Proposed Action would disturb approximately 217 acres during the projected 35-year life of the project. The proposed geothermal wells would be 42 inches in diameter and each would have a total depth of approximately 7000 feet. A net total of 66 megawatts of electrical energy is projected to be generated by the Project.

Intensity

1. Impacts that may be both beneficial and adverse.

The EA considered impacts that may be both beneficial and adverse through the analysis of direct, indirect, and cumulative impacts of the Proposed Action. These impacts are described in detail in Chapter 3 and Chapter 4 of the EA.

The proposal would result in a reliable, renewable energy power supply to both Nevada and National power grids. It is anticipated that jobs created directly and indirectly by the Project will increase the Lander County payroll base.

Adverse impacts of the Proposed Action will be avoided or minimized by Adopted Environmental Protection Measures, committed to by Ormat and presented in Chapter 2 of the EA, and by BLM and USFS mitigation and reclamation measures, described in Chapter 3 and Appendices A, B, C, D and E of the EA.

None of the environmental impacts discussed in detail in Chapters 3 and 4 of the EA are considered significant.

2. The degree to which the proposed action affects public health and safety.

The effects of the proposed action on public health and safety are considered to be positive. Ormat's compliance with the EA's mitigation and the lease stipulation requirements ensure the safety of the public and Ormat work forces.

3. Unique characteristics of the geographic area such as proximity of historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

Twenty sites determined eligible for inclusion on the National Register of Historic Places and located in the proposed McGinness Hills Archaeological District may be adversely affected by the Proposed Action. Seven additional eligible sites located outside of the proposed district may also be adversely affected by the Proposed Action.

Where possible, those historic properties determined eligible for inclusion on the National Register of Historic Places and those that are unevaluated, will be avoided by the Proposed Action. Where this is not possible, such sites will be treated with an approved Historic Properties Treatment Plan (HPTP). Contributing elements/eligible sites that are near or adjacent to project activities will be buffered, and project activities will be monitored by a qualified archaeologist

monitor. Artifacts recovered from sites on federally managed lands will be curated in accordance with 36 CFR 79 at a facility in Nevada that meets federal standards.

The Propose Action would not create surface disturbance within any wetlands or riparian vegetation, and no direct impacts are anticipated. However, indirect impacts to springs and meadows from construction of pipelines and access roads and from geothermal production could be realized through changes in temperature or chemical makeup, reduced or increased flow, or stopping flow altogether. However, the water chemistry data suggests that there is essentially no interaction between the cold water springs and the geothermal fluid. To mitigate for any potential indirect impacts to wetlands or riparian areas, Ormat will be required to improve other existing nearby seeps, springs and meadows at a 4:1 acreage ratio. Improvements can include fencing, habitat improvement, or riparian enhancement through restoration efforts. This mitigation measure would allow riparian acreage to be maintained at pre-project levels and therefore minimize any adverse impacts within the mitigation zone. The mitigation projects will improve riparian habitat adjacent to the Project area to avoid a net loss of such habitat as a result of permitting geothermal activities.

There are no park lands, prime farmlands, wild and scenic rivers, or ecologically critical areas in the vicinity of the Project.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The proposed action is not expected to be highly controversial. Renewable energy projects such as the McGinness Hills Geothermal Development Project are important aspects of the Nation's goal of reducing dependence on foreign oil imports. This project will also help meet Nevada's renewable energy goals.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

Although the potential effects of the Proposed Action on wetland and riparian areas, as identified in the EA, cannot be quantified, the application of mitigation measures reduces the uncertainty of any potential effects.

There is no surface disturbance proposed within any wetlands or riparian vegetation, and no direct impacts are anticipated. In addition, the water chemistry data suggests that there is essentially no interaction between the cold water springs and the geothermal fluid. However, indirect impacts from construction of the Proposed Action to springs and meadows could be realized through changes in temperature or chemical makeup, reduced or increased flow, or stopping flow altogether.

Continuing the current program of monitoring for flow (water level), chemistry and temperature during Project construction and operation would provide data which would either confirm the absence of any connection between the cold water springs and the geothermal reservoir, or provide documentation of adverse changes and information to develop effective correction

measures. Through the monitoring program, if any adverse impacts are documented, the following mitigation would be required.

If water flows or chemistry within Springs 2-6, 8-9 and/or Meadows 1-2 are realized, the proponent would be required to modify operations to correct the impact to ensure flows are maintained at natural occurrence. If the effects cannot be corrected through operational change the proponent would be required to improve other existing seeps, springs and/or meadows within the 4:1 mitigation zone. Improvements could include fencing, habitat improvement, or riparian enhancement through restoration efforts.

This mitigation measure would allow riparian acreage to be maintained at pre-project levels and therefore minimize any adverse impacts within the 4:1 mitigation zone. The mitigation projects will improve riparian habitat adjacent to the Project area to avoid a net loss of such habitat as a result of permitting geothermal activities.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The proposed action will not establish a precedent for future actions with significant effects or represent a decision about a future consideration. Completion of this EA and approval of the Proposed Action does not establish a precedent for other assessments nor does it authorize other geothermal exploration projects or further development of this area. Any future projects within the area or in surrounding areas would be analyzed on their own merits and carried out, or not, independent of the actions currently selected.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

As currently proposed, the McGinness Hills Geothermal Development Project is a "stand alone" action. I am unaware of any other geothermal projects planned for development in the area.

Past, present and reasonably foreseeable future actions have been considered in the cumulative impacts analysis in the EA (Chapter 4). The cumulative impacts analysis examined all of the other known actions and determined that the Proposed Action would not have significant cumulative impacts or incrementally contribute to significant cumulative impacts. In addition, for any actions that might be proposed in the future, further environmental analysis, including assessment of cumulative impacts, would be required prior to authorizing surface disturbing activities.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.

The site of the proposed action, including the power plants, ancillary facilities such as the geothermal production and injection well fields, and the transmission line and associated roads has been extensively surveyed for cultural resources. Based on the findings of the cultural resource surveys, a McGinness Hills Archaeological District (MHAD) has been proposed on

selected public and private land. The district is recommended for eligibility on the National Register of Historic Places (NRHP). The surveys have identified 36 sites that have been determined to be, or are recommended as, contributing elements. Twenty eligible sites in the MHAD may be adversely affected by the Proposed Action. In addition, a number of other archaeology sites were recorded on, or partially on, National Forest System land. These were recorded and evaluated independently from the proposed MHAD.

Those historic properties determined eligible for inclusion on the NRHP, and those that are unevaluated, will be avoided by the project or else will be treated with an approved Historic Properties Treatment Plan (HPTP). Contributing elements or eligible sites that are adjacent to project activities will be buffered, and project activities will be monitored by a qualified archaeologist monitor. Artifacts recovered from sites on federally managed lands will be curated in accordance with 36 CFR 79 at a facility in Nevada that meets federal standards.

There are no other known districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP within the Project area.

If any cultural resource is discovered during project activities that might be altered or destroyed by those activities, Project operations in the vicinity of the discovery would cease, the discovery would be protected and left intact and the incident would be reported to the appropriate BLM officer.

Project activities are proposed very near one or more of three rock units within the proposed Project area determined to have the potential to produce significant fossils. Construction activities on these rock units that involve new surface disturbance could result in the disturbance or destruction of potentially important fossils. Thus, surface disturbing activities on these rock units will require pre-disturbance surveys to determine the appropriate subsequent course of action, which could include monitoring during surface disturbance activities, avoidance of identified significant fossil localitites, or no further action.

Thus, no significant scientific, cultural, or historical resources will be lost or destroyed by the Project.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

No listed Threatened or Endangered species would be affected by the Project, because none of these species are known to exist within the Project Area.

Two special status plant species, with suitable habitat in the vicinity of the Project, could occur in and be affected by the Project. These include Eastwood milkweed and Toquima milkvetch. Potential Project impacts to these species would be reduced to insignificance by implementing mitigation measures, such as pre-construction clearance surveys, buffering and avoiding identified plants, installing silt fencing or other erosion control devices, seed collection, reseeding, propagation and out-planting. These mitigation measures are described in detail in Section 3.5.2 of the EA.

Suitable habitat for several special status wildlife species exists within the Project area, and some of these species could be affected by the Proposed Action. These species include northern goshawk, golden eagle, short-eared owl, western burrowing owl, juniper titmouse, ferruginous hawk, Swainson's hawk, prairie falcon, pinyon jay, loggerhead shrike, vesper sparrow, and greater sage-grouse.

Potential impacts from Project construction and operations to these bird species include the reduction of foraging habitat. In addition, the project could result in a reduction of potential nesting habitat for some special status species. These impacts are limited to the 217 acres of habitat that will be disturbed due to Project development and the associated habitat fragmentation. The greatest impacts will occur during Project construction when increased noise and activity may deter individuals of some special status species from using the Project Area and its vicinity. These impacts are expected to affect individual birds utilizing the habitat within and around the Project, but no effect to the local or regional populations of special status species is expected. Furthermore, any potential impacts to special status species will be minimized by the implementation of mitigation measures for migratory birds. This mitigation includes conducting surface disturbing activities outside the migratory bird nesting season (15 March – 31 July), pre-construction nest surveys, establishment of species-specific no-disturbance buffer zones (as determined by the USFWS), and mapping of nest locations. These mitigation measures are described in detail in Section 3.5.2 of the EA (Migratory Birds Section).

Potential impacts to raptors will be minimized by Ormat's adoption of raptor protection measures as described by the APLIC (2006), including anti-perching devices on the transmission line (see Section 2.1.11 of the EA). In addition, the following required mitigation measures will be implemented. All ground-disturbing activities will be conducted outside the raptor nesting season (March 1–July 31), pre-construction nest surveys will be conducted, and if active nests are detected, a 0.5-mile no-disturbance buffer zone will be established, mapped, and protected. Detailed descriptions of these requirements are included in Section 3.5.2 of the EA. Implementing these mitigation measures, will avoid destruction and disturbance to any nesting raptors, especially northern goshawks, ferruginous hawks and short-eared owls.

Anticipated impacts to greater sage-grouse from the Proposed Action would include the reduction and fragmentation of foraging and nesting habitat, possible disruption of sage-grouse movement corridors between metapopulations, increases in sage-grouse mortality risks and predation to nests from increased occurrence of ravens (corvids), and seasonal displacement of sage-grouse due to effects from Project noise, construction, and human activities.

To reduce these potential impacts to sage-grouse, a suite of project-specific mitigation measures will be required. This project-specific mitigation has been developed in coordination with the NDOW. A primary component of the mitigation is habitat restoration/enhancement and improvement at a 4:1 ratio to compensate for disturbance in sage-grouse habitat in the vicinity of the Project. Specific details of this mitigation are described in Appendix C of the EA.

To address mortality and predation risks from ravens, corvid occurrence will be minimized by Ormat's utilization of a single-pole design and anti-perching devices along the entirety of the transmission line in accordance with recommended environmental protection measures (APLIC

2006), as described in Section 2.1.11 of the EA. In addition, corvid occurrence and attraction to the Project will be minimized by implementing a Common Raven Monitoring, Mitigation, and Management Plan (see Appendix D of the EA).

No surface-disturbing activities at actual lek locations will occur through Project development. Therefore, impacts to leks will be a result of indirect effects, which include visual and auditory impacts. To mitigate these impacts to leks and their associated nesting habitat, measures to monitor and limit surface-disturbing activities and sound pressure levels during the lekking season will be required (see Appendix C of the EA).

Project impacts are expected to affect individuals from the local metapopulation of sage-grouse but greater effects to the Toiyabe population or regional population are not expected. However, if through monitoring it is determined that habitat connectivity has been affected by Project development, subsequent mitigation measures will be required (see Appendix C of the EA).

Additionally, to offset potential impacts to brood-rearing habitat by Project development, compensatory mitigation consisting of habitat enhancement or restoration will also be required at a 4:1 ratio (see Appendix C).

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The Proposed Action will not violate or threaten to violate any federal, state, or local law or requirement imposed for the protection of the environment.

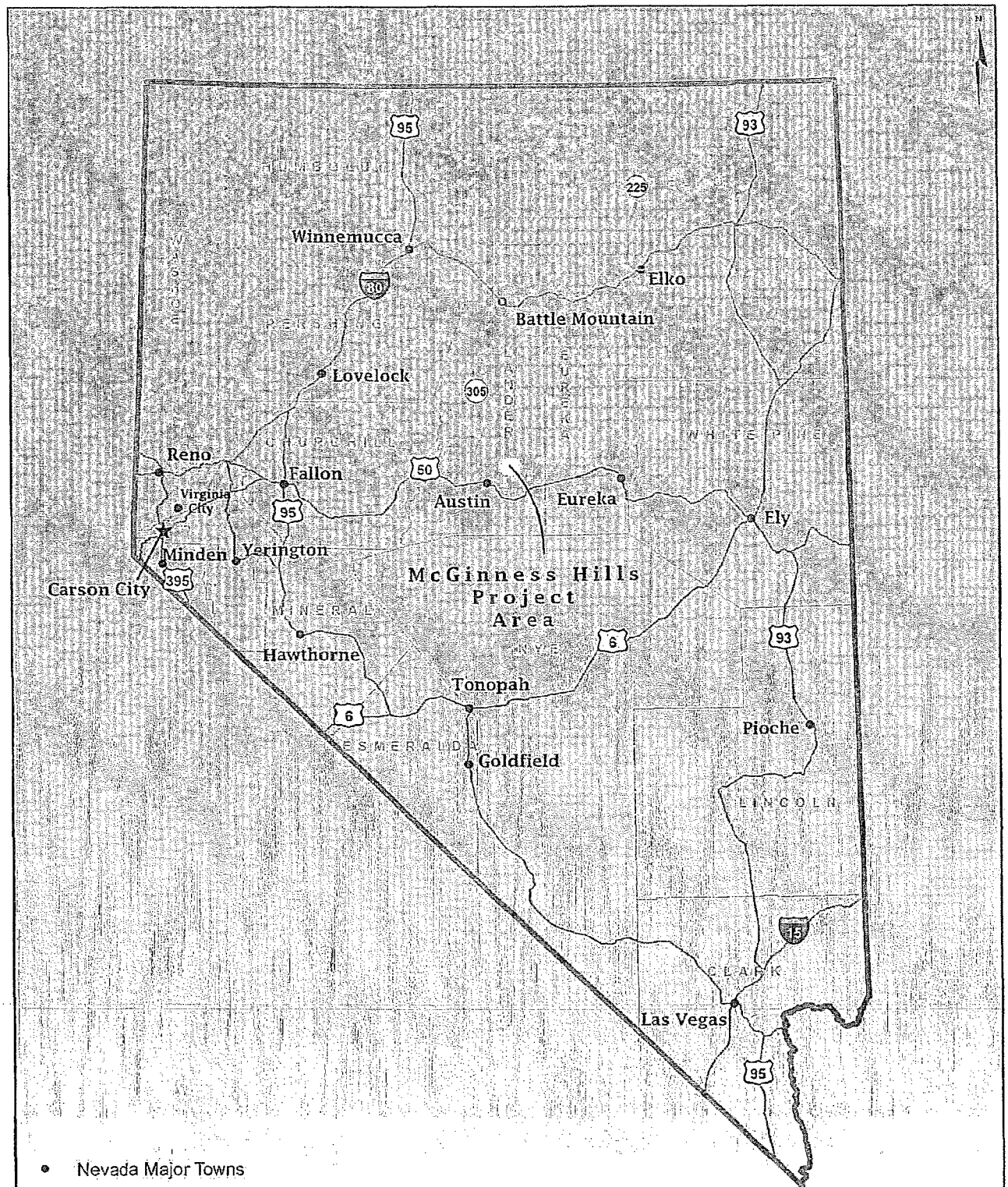
Douglas W. Furtado
District Manager
BLM Battle Mountain District Office

7/19/11
Date

EXHIBIT 3

Regional Map and Overview Maps

EXHIBIT 3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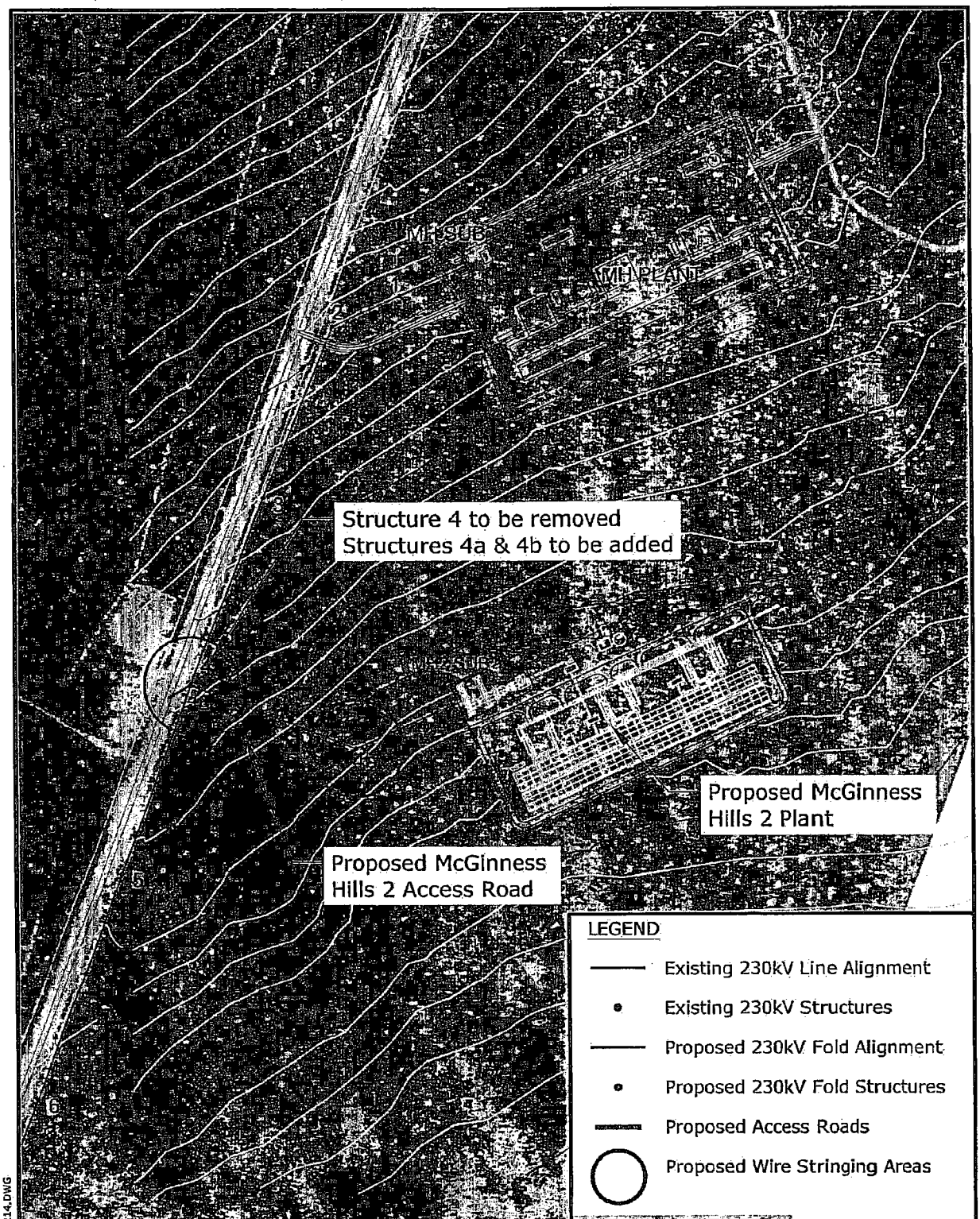
United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820
* No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.
The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection.
Map Date : 05/05/2011



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ORMAT®

McGinness Hills 2
Transmission Interconnection

REVISION NO.	DATE
Rev 1: Permit Issue	01/02/14

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PROJECT NUMBER:	MGH2
PREPARED BY:	JMB
CHECKED:	
APPROVED:	

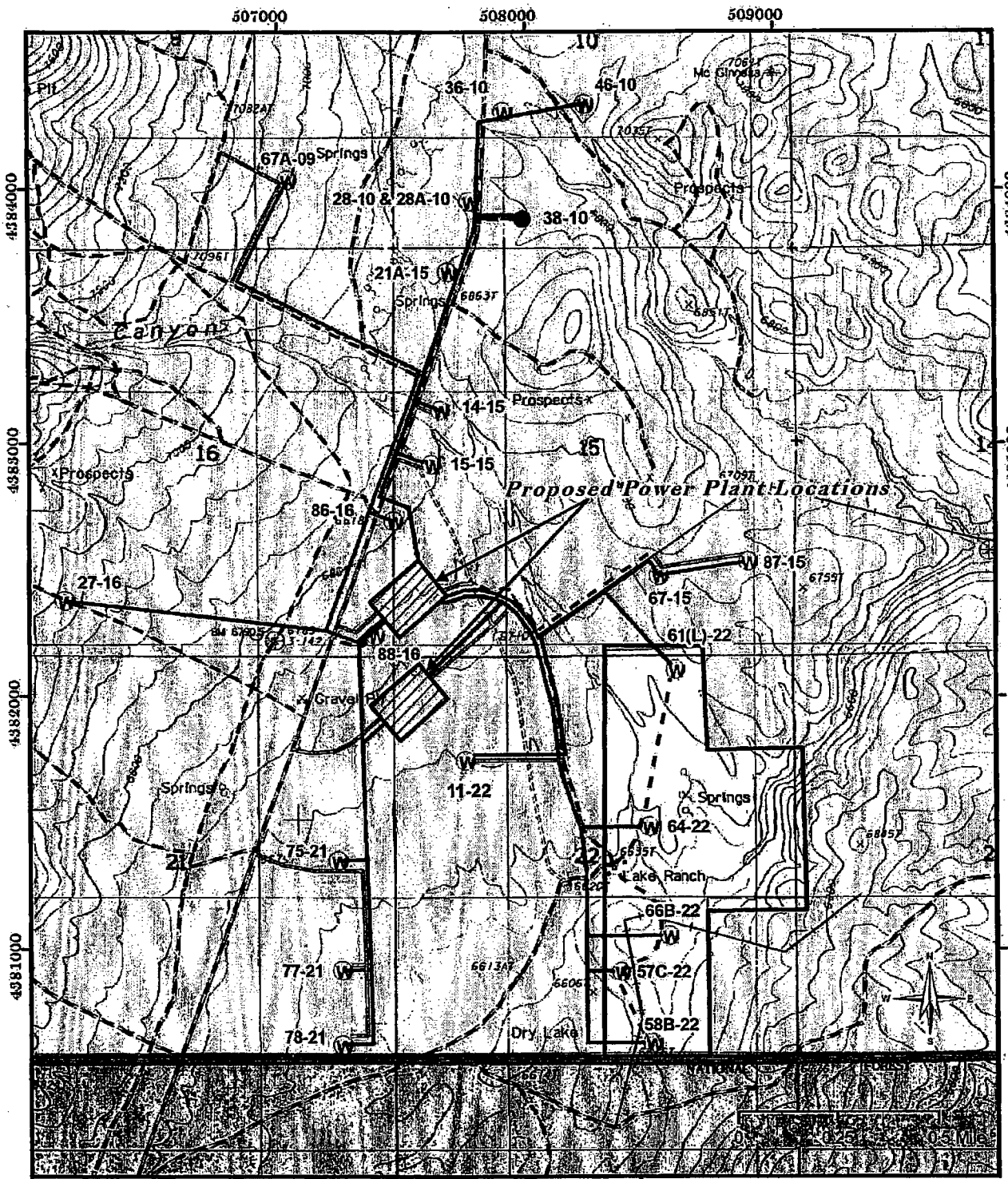
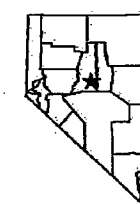


Figure 6: McGinness Hills Geothermal Development Project Components

- Production Well
- Injection Well
- Production Pipeline
- Injection Pipeline
- Proposed Access Roads
- Existing Access Roads
- Monitoring Well
- Fences
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private



United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820

* No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

The data shown on this map uses the Universal Transverse Mercator (Zone 11N) Coordinate system and uses the NAD83 projection.

Map Date : 05/03/2011

EXHIBIT 4

Legal Description of McG II

EXHIBIT 4

September 24, 2013
Ormat Nevada, Inc.
McGinness Hills Geothermal Power Plant (Phase II)

The following describes the proposed location of the McGinness Hills Phase II geothermal power plant, which is located in portions of Sections 21 and 22, T.20N., R.45E., M.D.M., in Lander County, Nevada, being more particularly described as follows:

T.20N., R.45E.

Section 21	NE¼ NE¼
Section 22	NW¼ NW¼

Containing an area of 12.2 acres, more or less.

BASIS OF BEARING: Nevada State Plane Coordinate System, Central Zone, NAD83.

PROFESSIONAL LAND SURVEYOR - STATE OF NEVADA
GLEN C. ARMSTRONG
Exp: 12-31-14
No. 16451

9-25-13

Prepared by:

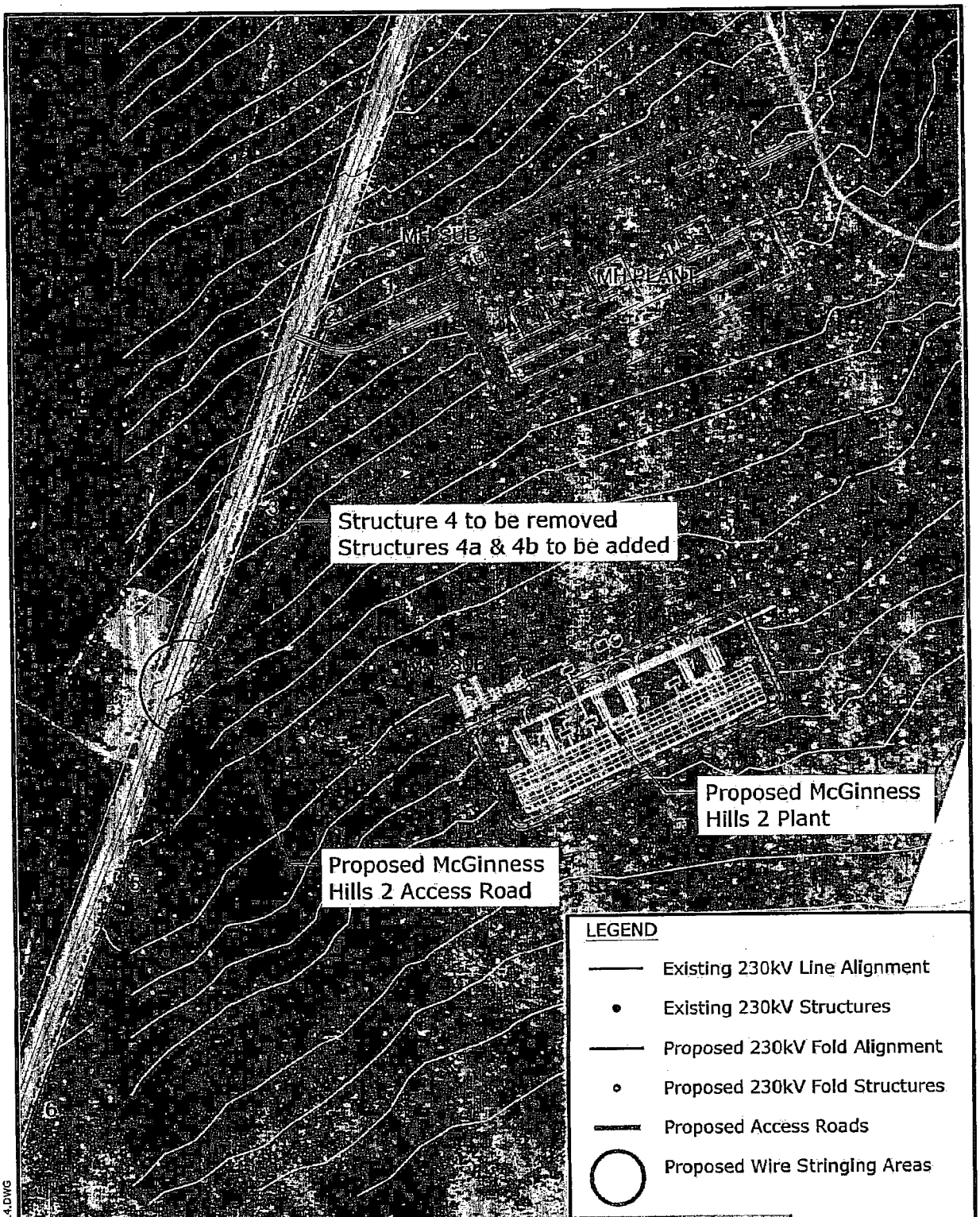
Glen C. Armstrong, PLS
Nevada Certificate No. 16451
US Geomatics
227 Vine Street
PO Box 3299
Reno, Nevada 89503

RECEIVED
SEP 26 2013
ORMAT RENO OFFICE

EXHIBIT 5

Site Plans and Layout Drawings
(Gen-Tie Extension)

EXHIBIT 5



Z:\ORMAT MGH2\MGH2 010214.DWG

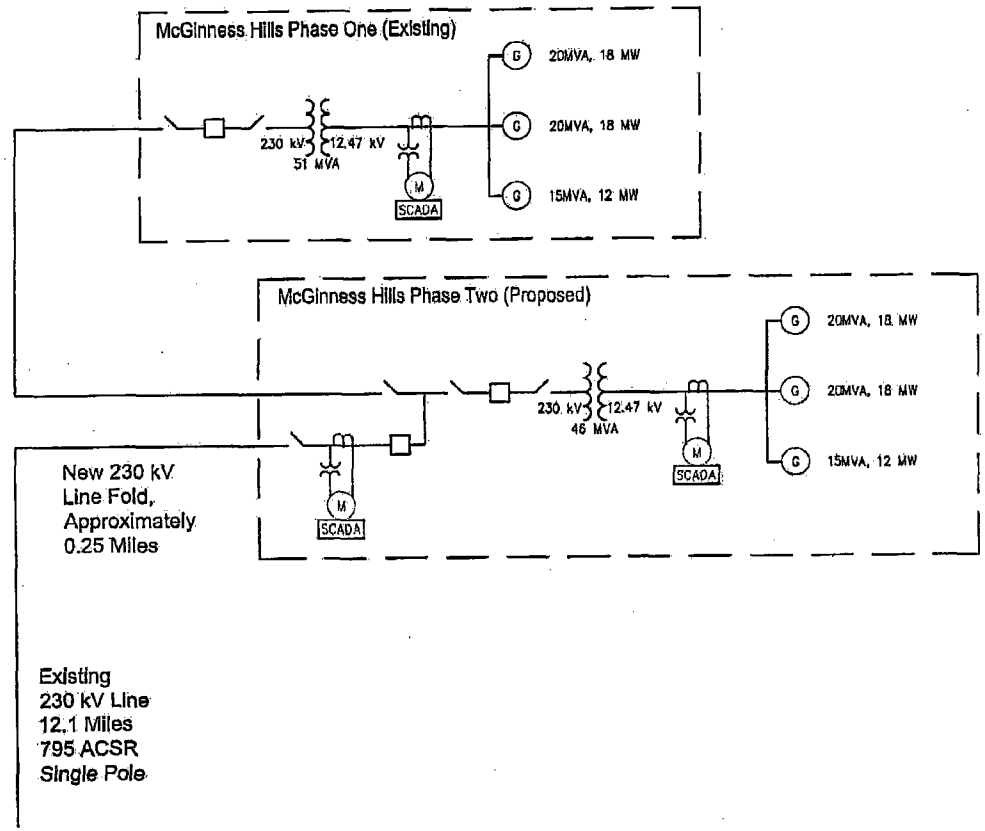
ORMAT®

McGinness Hills 2
Transmission Interconnection

REVISION NO.	DATE
Rev 1: Permit Issue	01/02/14

TRIVAGE CONSULTING
5418 Longley Lane, Suite A
Reno, NV 89511
Ph. (775) 336-1302
Fax: (775) 336-1306

ENGINEER:	Jim Bengochea
PHONE NUMBER:	(775) 336-1302
PROJECT NUMBER:	MGH2
PREPARED BY:	JMB
CHECKED:	
APPROVED:	



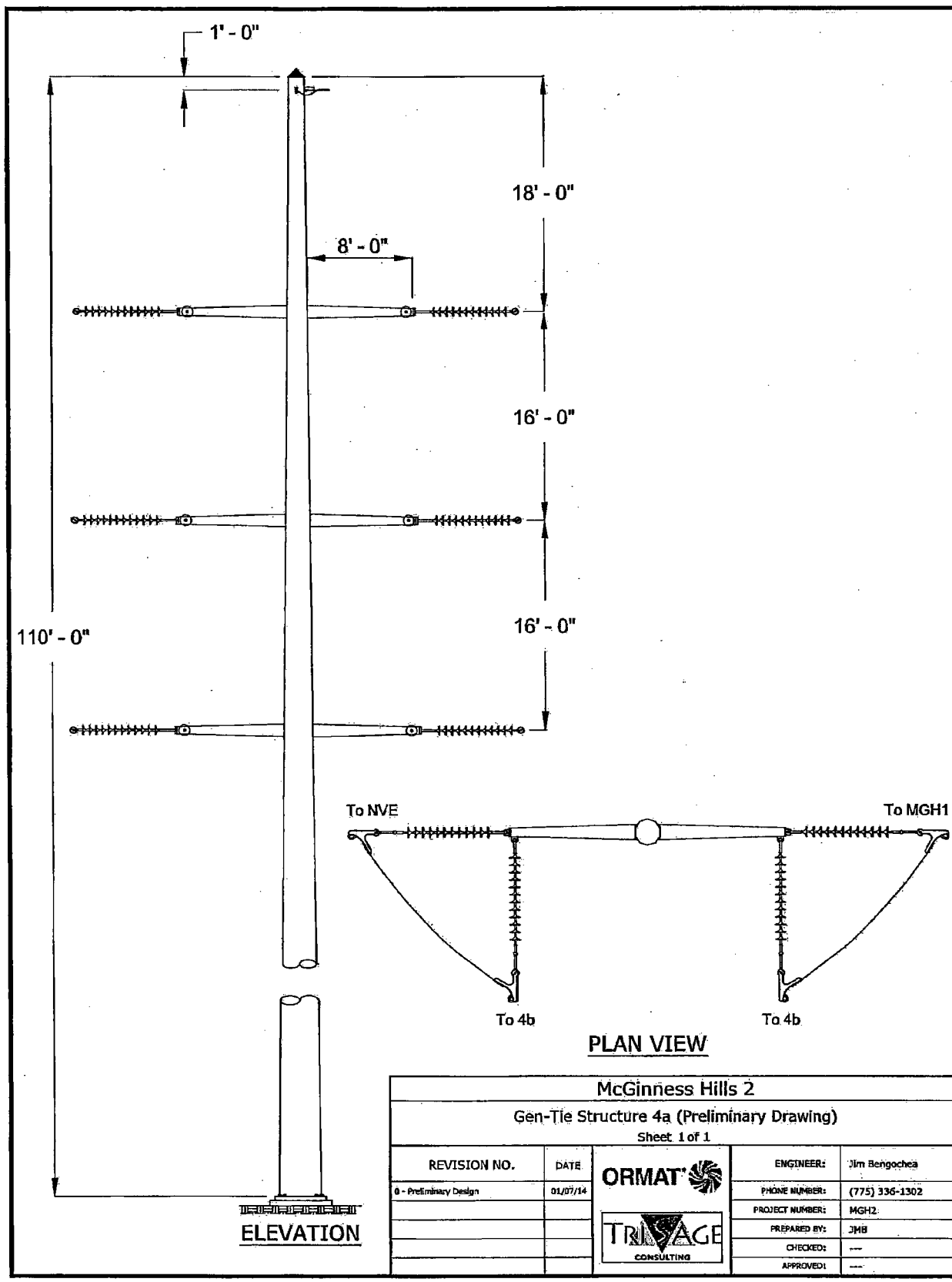
ORMAT®

September 23, 2013

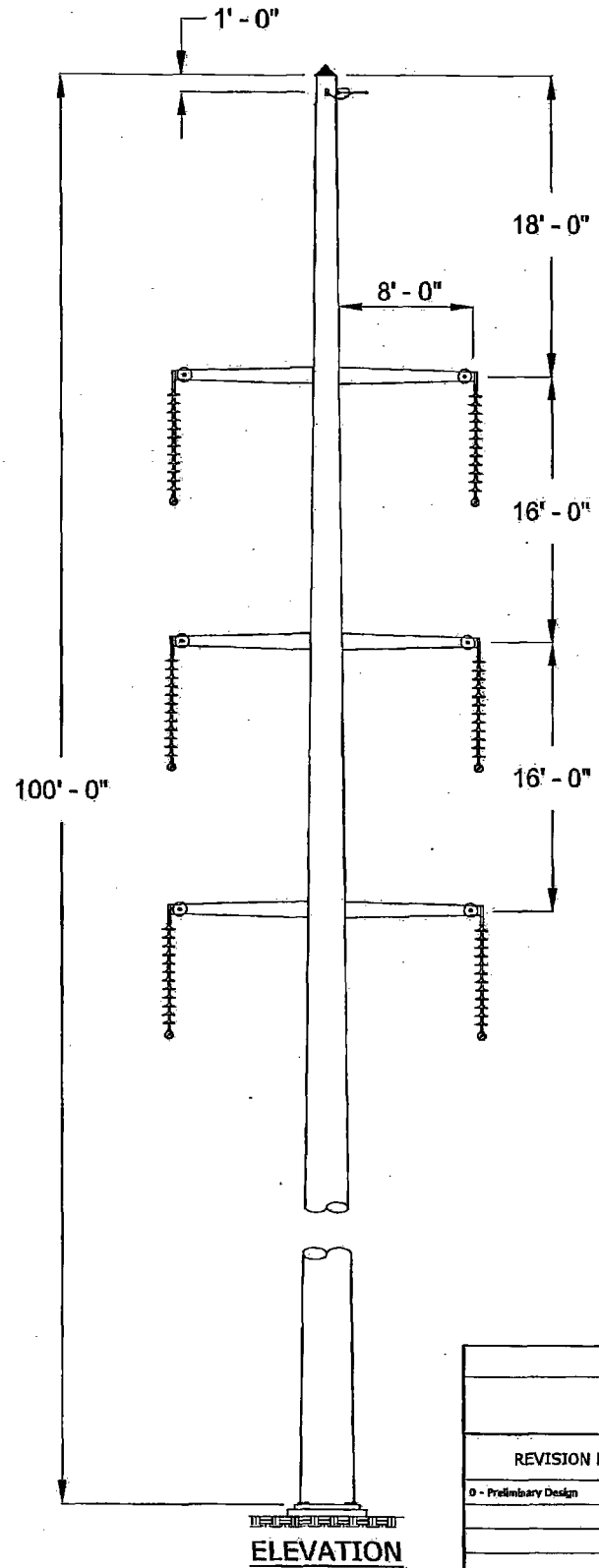
Ormat McGinness Hills Phase 2 Interconnection One-Line Diagram

Legend

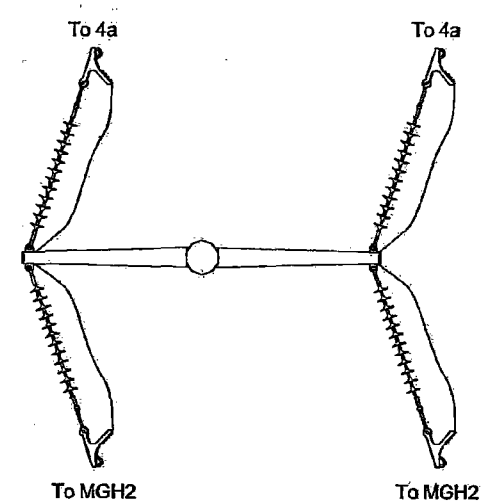
- Existing Systems
- Transmission Provider Facilities
- New Customer Facilities



McGinness Hills 2				
Gen-Tie Structure 4a (Preliminary Drawing)				
Sheet 1 of 1				
REVISION NO.	DATE	ORMAT	ENGINEER:	Jim Bengochea
0 - Preliminary Design	01/07/14		PHONE NUMBER:	(775) 336-1302
		TRIVAGE CONSULTING	PROJECT NUMBER:	MGH2
			PREPARED BY:	JMB
			CHECKED:	---
			APPROVED:	---



ELEVATION



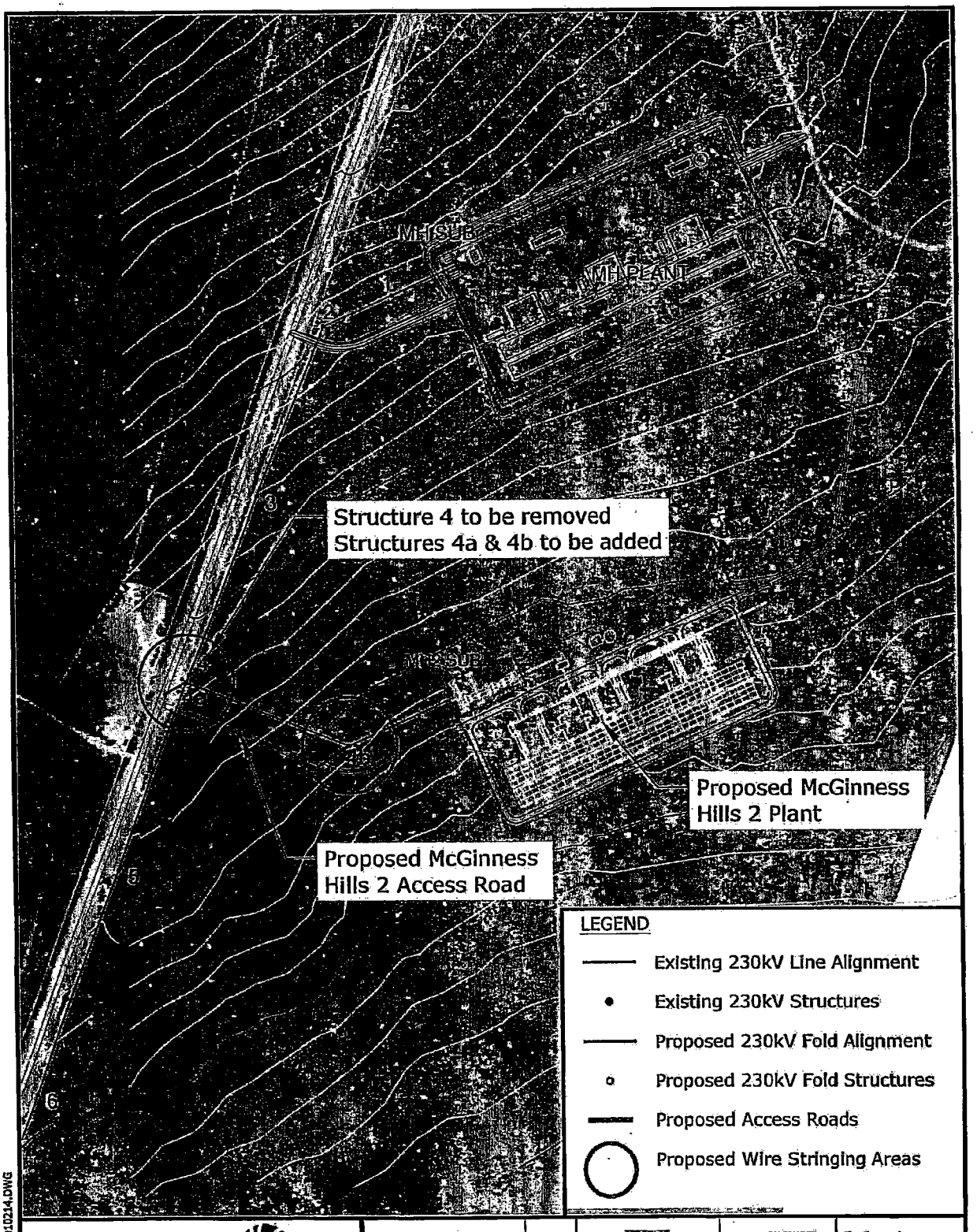
PLAN VIEW

McGinness Hills 2				
Gen-Tie Structure 4b (Preliminary Drawing)				
Sheet 1 of 1				
REVISION NO.	DATE	ORMAT	ENGINEER:	Jim Bengochea
0 - Preliminary Design	01/07/14		PHONE NUMBER:	(775) 336-1302
		TRIVAGE CONSULTING	PROJECT NUMBER:	MGH2
			PREPARED BY:	JMB
			CHECKED:	---
			APPROVED:	---

EXHIBIT 6

Layout Diagrams and Site Plans
(McGinness II)

EXHIBIT 6



Z:\ORMAT MGH2\MGH2 010214.DWG

ORMAT

McGinness Hills 2
Transmission Interconnection

REVISION NO.	DATE
Rev 1: Permit Issue	01/02/14

TRI VAGE CONSULTING
5418 Longley Lane, Suite A
Reno, NV 89511
Ph. (775) 336-1302
Fax: (775) 336-1308

ENGINEER:	Jim Bengochea
PHONE NUMBER:	(775) 336-1302
PROJECT NUMBER:	MGH2
PREPARED BY:	JMB
CHECKED:	
APPROVED:	

NOTES:

1) THIS PLAN IS PREPARED TO ILLUSTRATE TOPOGRAPHY AND FEATURES FOR ENGINEERING PLANNING AND DESIGN ONLY; NO INFORMATION SHALL BE CONSTRUED TO REPRESENT A FORMAL SURVEY OF THE SUBJECT PROPERTY.

2) BASIS OF ELEVATIONS: THE BASIS OF ELEVATIONS IS NAVD88. AS OBSERVED FROM CONTRACTOR HAS BENCHMARK (SEE CONSTRUCTION CONTROL BELOW).

3) BASIS OF BEARINGS: THE BASIS OF BEARINGS IS THE NEVADA STATE PLANE GRID, CENTRAL ZONE, NAD 83, GRID COORDINATES.

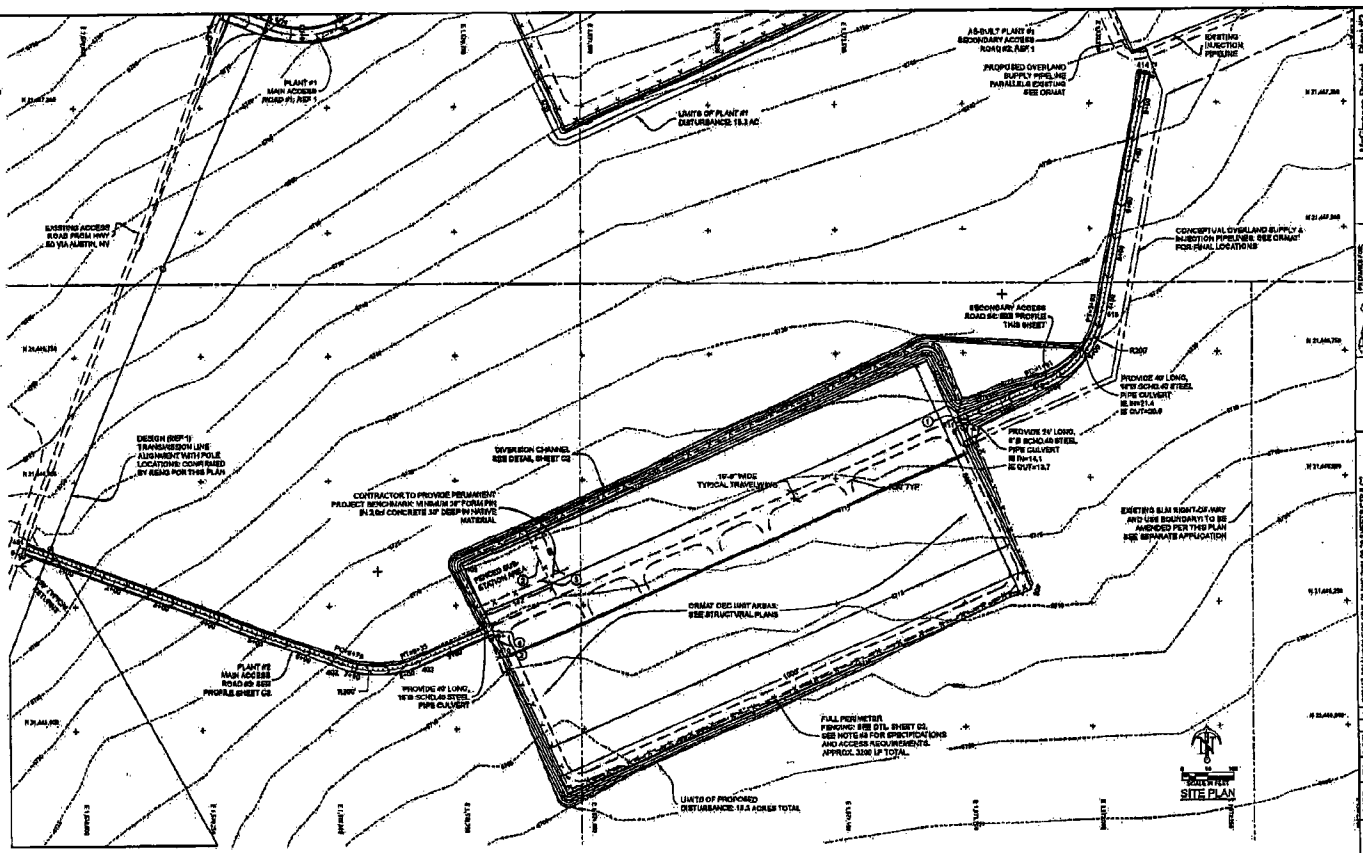
4) THESE PLANS ARE PREPARED TO SUPPORT POWER PLANT FEATURES TO BE SPECIFIED BY ORMAT, INC. MECHANICAL AND OTHER PLANS PREPARED BY ORMAT SUPERCEDE DIMENSIONS OR SPECIFICATIONS SHOWN ON THESE PLANS. ANY MATERIAL DISCREPANCY AFFECTING CONSTRUCTABILITY SHALL BE BROUGHT TO THE ATTENTION OF RUBISON ENGINEERING, NATHAN ROBISON AT (775) 623-4231.

5) EARTHWORK ESTIMATES:
- 8700cy TOPSOIL FROM 4" GRUBBED SITE WIDE
- 36,800cy MAIN PAD BALANCED CUT/FILL
- 41[illegible]cy ROAD 3 FINE GRADING
- 1700cy ROUGH EXPORT ROAD 4
- 6400cy TOTAL AGGREGATE IMPORT FOR SURFACES

6) SEE STRUCTURAL PLANS FOR FOUNDATION AND PREPARATION REQUIREMENTS.

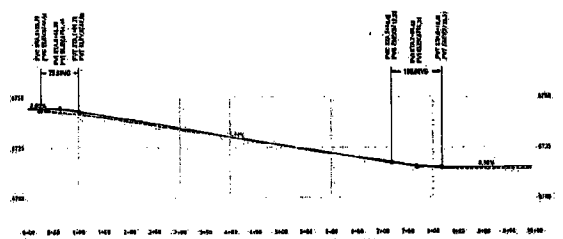
7) GRADING TOLERANCE ±0.1' AT SPOT ELEVATION LOCATIONS. SEE STRUCTURAL PLANS FOR FOOTING LOCATIONS AND ELEVATIONS (FOOTING RELATIVE ELEVATION TOLERANCE ±1/4").

8) SITE FENCING: ALL EXTERIOR FENCING SHALL BE VISUALLY OBSCURED BY THE USE OF VINYL SLATS IN "DRYWORT GREEN". PLAN KEY AT FENCING: 1 PROVIDE DOUBLE 12' WIDE LOCKABLE SWING GATES FULL FENCE HEIGHT. 2 PROVIDE 4' WIDE LOCKABLE MAN-GATE. 3 PROVIDE DOUBLE 8' WIDE LOCKABLE MANUAL SWING GATES. 4 PROVIDE 24' WIDE SIEMENS AUTOMATIC ROLLING GATE WITH KEYPAD ACCESS CONTROL. (TRUCK ARRIVAL OF PROPOSED GATE DETAILS AND FINAL LOCATIONS REQUIRED).

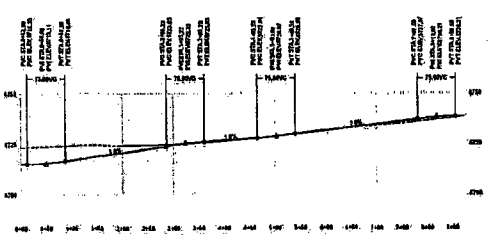


STANDARD ABBREVIATIONS

AC	ASPHALT CONCRETE
BFP	BACKFLOW PREVENTOR
BLD	BUILDING
BW	BASE OF WALL
CATV	CABLE TELEVISION
COTG	CLEAN OUT TO GRADE
E	ELECTRICAL
EL, ELEV	ELEVATION (ABOVE MEAN SEA LEVEL U.N.G.)
FG	FINISHED GRADE
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FL	DRAINAGE FLOWLINE
HP	HIGH POINT
HVAC	HEATING, VENTILATION & AIR CONDITIONING
I, INV	INVERT (INNVERT ELEV.)
LP	LIGHT POLE
MH	MANHOLE
PCC	PORTLAND CEMENT CONCRETE
P	PIPE/PIPELINE
PP	POWER/TELEPHONE POLE
RBF	(IRON/BRASS) BARCAP FOR, INT FOUND
SD	STORM DRAIN
SS	SANITARY SEWER
TP	TURNAROUND POINT (TEMPORARY CONTROL)
TW	TOP OF WALL
U.N.G.	UNLESS NOTED OTHERWISE



ROAD #3 PROFILE: 1"=100' H, 1"=50' V



ROAD #4 PROFILE: 1"=100' H, 1"=50' V

SURVEY & GEODETIC CONTROL TABLE

File: P:\Projects\314412 - McGinness Project\01\10-Plant 2 Grading Plan\Projections Plant 2 CH3.dwg

Point No.	Northing(ft)	Easting(ft)	Elev(ft)	Description
1	314471[illegible]5.00	1[illegible]9465.00	5784.87	HCS CON125
2	314[illegible]3.84	1[illegible]8066.44	7[illegible]6.00	HCS McGinness HCS041
10	314[illegible]8.63	1[illegible]9501.58	5824.36	ORMAT BENCHMARK
11	314[illegible]4.13	1[illegible]81.25	4[illegible]0.78	4"x4 FORM PIN @ LATH
20	314[illegible]0.06	1[illegible]402.15	5846.36	BM US 6 ED #1

CONSTRUCTION CONTROL TABLE

Point No.	Northing(ft)	Easting(ft)	Elev(ft)	Description
401	314[illegible]57.61	1[illegible]993.03	5747.77	PG CL ROAD A
402	314[illegible]5.86	1[illegible]877.48	5719.20	PG CL ROAD A
403	314[illegible]34.36	1[illegible]72.14	5715.64	PG CL ROAD A
404	314[illegible]96.74	1[illegible]73.36	5715.64	PG CL ROAD A
405	314[illegible]32.94	1[illegible]84.49	5715.03	PG PAD
406	314[illegible]95.87	1[illegible]614.58	5715.03	PG PAD
407	314[illegible]53.65	1[illegible]792.91	5715.03	PG PAD
408	314[illegible]276.77	1[illegible]641.49	5711.03	PG PAD
409	314[illegible]7.13	1[illegible]897.75	5711.03	PG PAD
410	314[illegible]46.32	1[illegible]48.51	5714.03	PG PAD
411	314[illegible]1.94	1[illegible]744.38	5715.63	PG CL ROAD 4
412	314[illegible]87.70	1[illegible]915.13	5720.97	PG CL ROAD 4
413	314[illegible]32.13	1[illegible]204.80	5726.75	PG CL ROAD 4
414	314[illegible]39.39	1[illegible]310.39	5729.64	PG CL ROAD 4

McGinness Project – Plant #2
GeoThermal Power Plant
Humboldt County, Nevada

PREPARED FOR: ORMAT NEVADA INC.
6225 Neil Road, Suite 300
Reno, NV 89511
775-356-9029

PREPARED BY: RUBISON ENGINEERING, INC.
P.O. Box 1777
Elko, Nevada 89801
(775) 623-4231

DRAWN: JAMES
DATE: 10/20/2010

1						
2						
3						
4						
5						

REFERENCES

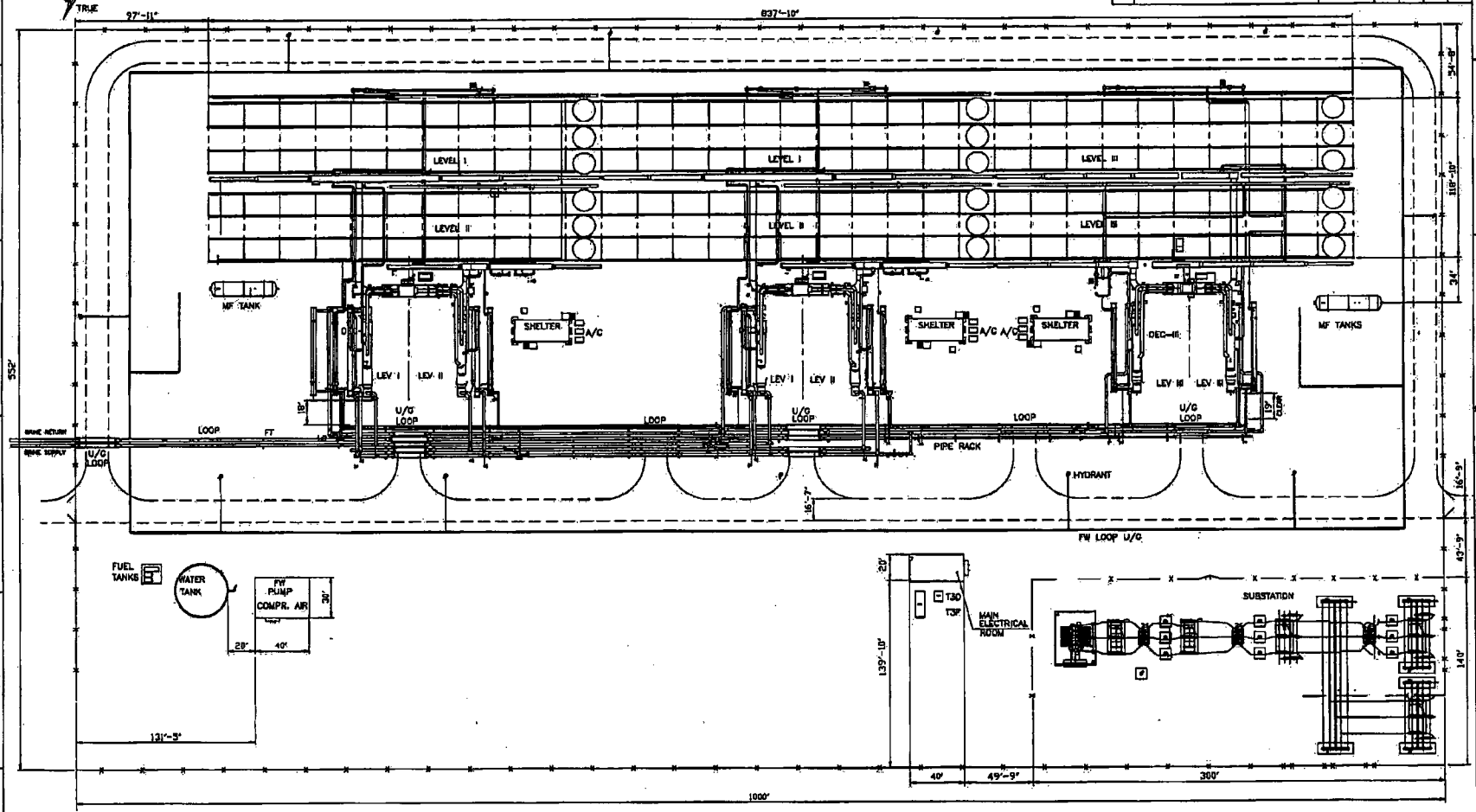
NO	DATE	BY	CHKD	REV
1	10-20-10	JM	NBR	

REVISIONS

DESCRIPTION: TO BID FOR CLIENT REVIEW, PLANNING AND CONSTRUCTION ONLY

SHEET
C1

REV	DESCRIPTION	DATE	BY	CHK	ENG	PRJ
P0	PRELIMINARY	28NOV.13.	Y.B.		I.S.	A.H.



NOTES:
1. THE ARRANGEMENT AND SIZES PRESENTED ARE PRELIMINARY AND INDICATIVE ONLY AND SUBJECT TO CHANGED ON DESIGN OPTIMIZATION , DETAILED DESIGN AND ACTUAL EQUIPMENT PURCHASED (MANUFACTURED).
2. DIMENSIONS ARE IN FEET, ELEVATIONS ARE IN FEET

DRAWING SCALE (FEET)

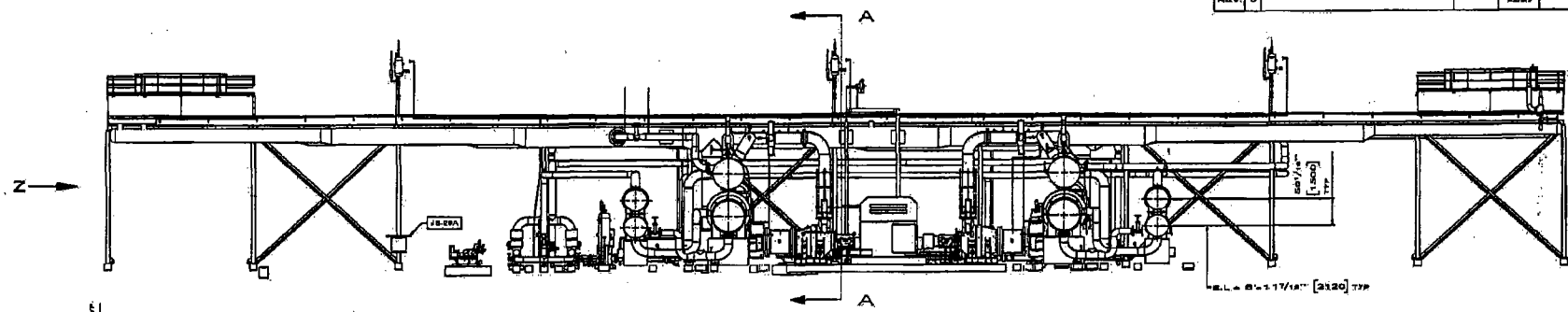
ORMAT

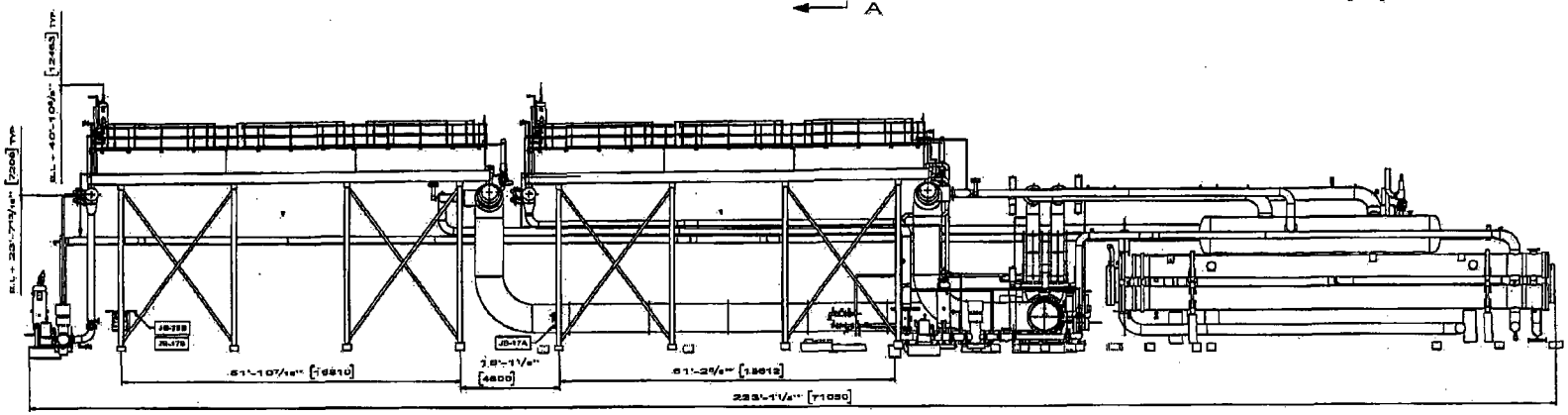
TITLE: McGINNESS HILLS PHASE 2 GENERAL ARRANGEMENT POWER PLANT

DRAWING NO. 7.840.00.001.0

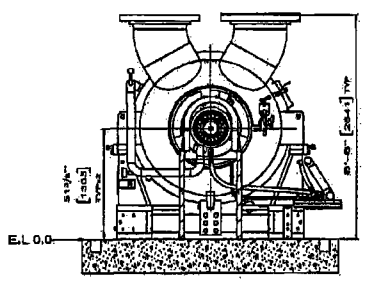
SHEET 1 OF 1 REV. P0

REV.	DESCRIPTION	DATE	BY	CHK	APP
0	N/A				

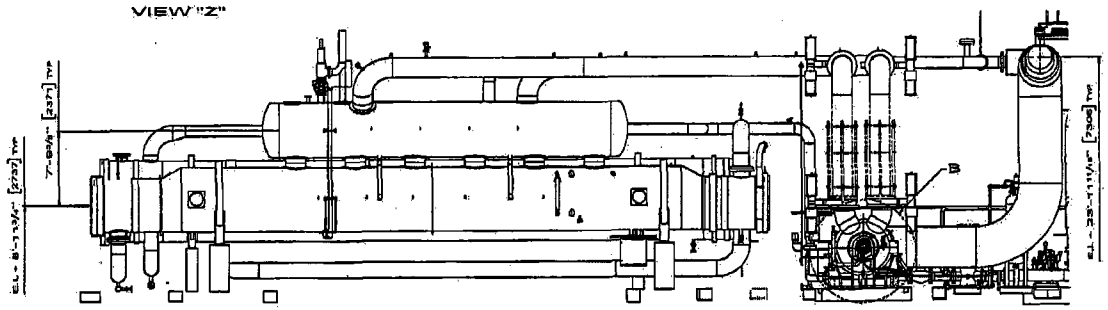




VIEW "Z"



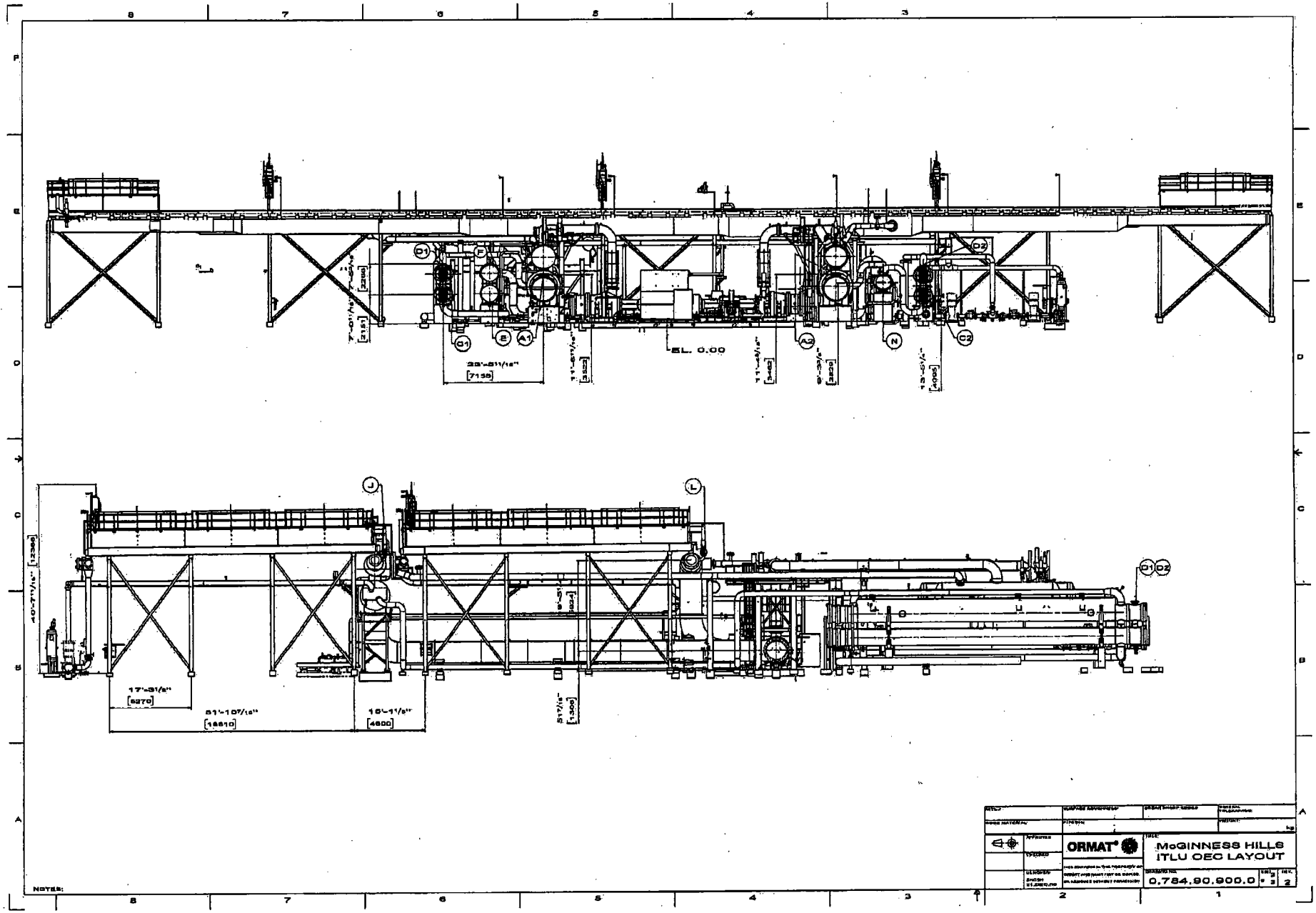
DETAIL B



SECTION A-A

APPROVED	ORMAT®	TITLE: McGinness hills OEC LEV-III - General Layout	
CHECKED			
DESIGNED		DRAWING NO. 0.784.90.901.0	SHT 2 OF 3 REV. 0

THIS DRAWING IS THE PROPERTY OF ORMAT AND MUST NOT BE COPIED OR REPRODUCED WITHOUT PERMISSION



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23'-5 11/16"
[7158]
17'-3 1/2"
[5270]
51'-10 7/16"
[16610]
15'-1 1/2"
[4600]
40'-7 11/16"
[12366]
ORMAT
McGINNESS HILLS
ITLU OEC LAYOUT
0.784.90.900.0
2
NOTES:

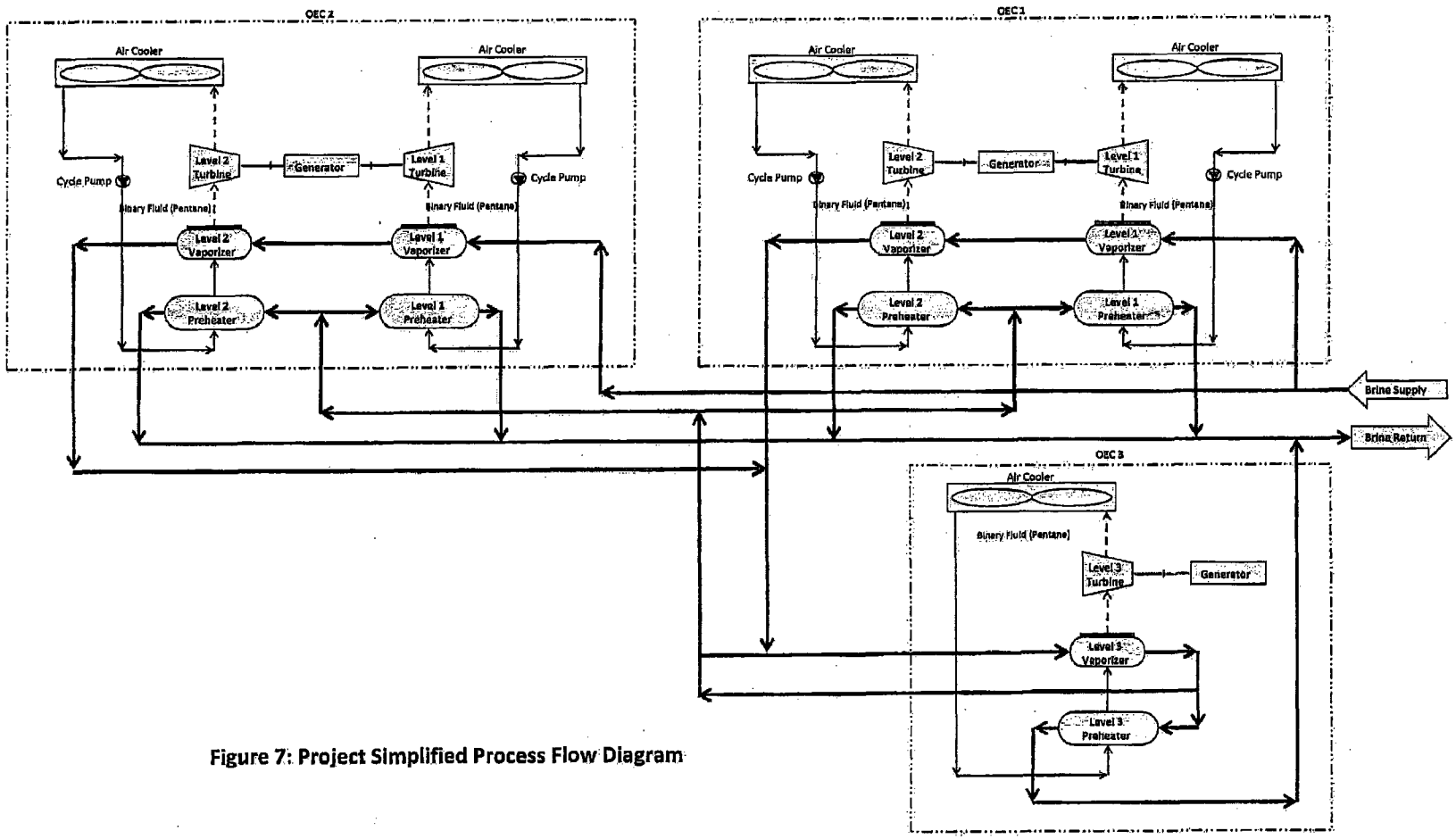

Figure 7: Project Simplified Process Flow Diagram

EXHIBIT 7

Proof of Public Notice

EXHIBIT 7

Legal Number 002061

AFFIDAVIT OF PUBLICATION

Heather Cunningham, Office Asst., for The Battle Mountain Bugle, a once weekly newspaper published in Battle Mountain, Lander County, Nevada, duly swears that the following

HOLLAND & HART LLP
2061 (ORNI 39)

a printed copy of which is affixed,

was published 1 time(s)
commencing 01/29/14
and ending 01/29/14

Heather Cunningham

State of Nevada
County of Humboldt
Signed and sworn to before me by

Heather Cunningham on January 29, 2014

Tracy Wadley

TRACY WADLEY
Notary Public - State of Nevada
Appointment Recorded in Humboldt County
No: 11-5443-9 - Expires June 28, 2015

Legal No. 2061.
BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA
NOTICE OF APPLICATION FOR A PERMIT TO CONSTRUCT UTILITY FACILITY UNDER THE UTILITY ENVIRONMENTAL PROTECTION ACT

ORNI 39, LLC ("ORNI 39") is submitting, pursuant to the Nevada Utility Environmental Protection Act ("UEPA"), an application to the Public Utilities Commission of Nevada ("PUCN") for a permit to construct a utility facility, consisting of a 230-kV transmission line and associated facilities, including a 48 megawatt ("MW") geothermal energy generating facility (collectively, the "Project"), pursuant to Nevada Revised Statutes Chapter 704.820 through 900, inclusive, and Nevada Administrative Code Chapter 703.415 through .427, inclusive (the "Application"). The Project will consist of two primary components: (1) an approximately four-tenths of a mile long 230-kV overhead mono-pole transmission line approximately 10 miles northeast of the Town of Austin in Lander County, Nevada (the "Gen-Tie Line") and (2) a 48 MW geothermal energy generating facility, also located approximately 10 miles northeast of the Town of Austin in Lander County, Nevada ("McGinness Hills II"). The Project will also include ancillary facilities typical of transmission lines and geothermal energy generating facilities, including, without limitation, fiber optic lines, geothermal production and injection wells, and an on-site substation. The purpose of the Gen-Tie Line and on-site substation is to allow the McGinness Hills II generating facility to connect with an existing 230-kV transmission line that was developed in connection with ORNI 39's existing 48 MW McGinness Hills I geothermal energy generating facility ("McGinness Hills I"). Except for one injection well to be located on a private lease, the Project is located entirely on public lands managed by the Bureau of Land Management ("BLM"). In general terms, the Project will be located approximately one-quarter of a mile south of the existing McGinness Hills I geothermal energy generating facility. The Gen-Tie Line will comprise two parallel one-fifth mile long transmission lines (for a total of one-fourth of a mile in total length) running from the McGinness Hills II portion of the Project to an existing 230-kV transmission line that terminates at the existing Frontier Substation owned by Sierra Pacific Power Company. NOTICE OF THE APPLICATION FOR A PERMIT TO CONSTRUCT UNDER UEPA FOR A 230-KV TRANSMISSION LINE AND ASSOCIATED FACILITIES, INCLUDING A 48 MEGAWATT GEOTHERMAL ENERGY GENERATING FACILITY. Notice is hereby given to persons residing in the municipalities in which any portion of the Project will be located and constructed: ORNI 39 will request a permit to construct the Project, which will consist of a transmission line that will be approximately four-tenths of a mile long, and a 48 MW geothermal energy generating facility located approximately one-fourth of a mile to the south of ORNI 39's existing McGinness Hills I geothermal generating facility, which is approximately 10 miles northeast of Austin, Nevada. Except for one injection well to be located on a private lease, the Project is located entirely on public lands managed by the BLM. The Project will also include ancillary facilities typical of transmission lines and geothermal energy generating facilities, including, without limitation, fiber optic lines, geothermal production and injection wells, and an on-site substation allowing the Gen-Tie Line to connect with McGinness Hills II. The contents of the Application to be submitted to the PUCN for the Project will include but are not limited to: 1. A description of the Project, including general and detailed descriptions of the location of the Project, appropriately scaled site plan and layout drawings, vicinity maps, and routing maps; a description of the size and nature of the Project; and, a description of the natural resources that will be used during the construction and operation of the Project; 2. A copy, and summary of the Environmental Assessment published by the BLM with respect to the environmental impact of the Project, an explanation of the nature of the probable effect of the Project on the environment; and, a description of the current environmental characteristics of the project area, the environmental impacts that the construction and operation of the Project would have on the project area before mitigation, and the environmental impacts that the construction and operation of the Project will have on the project area after mitigation; 3. A description of any reasonable alternate locations for the Project, a description of the comparative merits or detriments of each location submitted, and a statement of the reasons why the location is best suited for the Project; 4. An explanation of the extent to which the Project is needed to ensure reliable utility service to customers in this State, including a description of the extent to which the Project will provide and enhance utility service to customers in this State; 5. An explanation of how the need for the Project balances any adverse effects on the environment, and how the Project represents the minimum adverse effect on the environment; 6. An explanation of how the location of the Project conforms to applicable federal, state, and local laws and regulations; and 7. An explanation of how the Project will serve the public interest, including the economic benefits that the Project will bring to the state and the nature of the probable effect on the public health, safety, and welfare of the residents of the state if the Project is constructed. A copy of the Application will be available on the PUCN's web site following ORNI 39's filing of the Application. Additional information about the UEPA process and a person's right to participate in that process can be found in Nevada Revised Statutes Chapter 704 and Nevada Administrative Code Chapter 703. Protests and written comments about the Application and the Project must be filed with the PUCN as provided by law. DATED this ___ day of January, 2014 by ORNI 39, LLC. Published in The Battle Mountain Bugle January 29, 2014 (Lander).

EXHIBIT 8

Proof of Service to Nevada Clearinghouse

EXHIBIT 8

PROOF OF SERVICE

I hereby certify that on January 31st, 2014 pursuant to NRS 704.870.3 and 704.870.4(a), I caused to be served via hand-delivery or U.S. Mail upon the following persons and/or agencies a copy of the Application of ORNI 39 LLC for a Permit to Construct a 230-kV Transmission Line under the Utility Environmental Protection Act (UEPA).

Nevada State Clearinghouse
Nevada Dept. of Administration
209 E. Musser Street, Room 200
Carson City, NV 89701
nevadaclearinghouse@lands.nv.gov

Tammy Cordova, Staff Counsel
Regulatory Operations Staff
Public Utilities Commission of Nevada
9075 West Diablo Drive, Suite 250
Las Vegas, NV 89148
tcordova@puc.nv.gov

Eric Witkoski, Chief Deputy Attorney General
Office of the Attorney General
Bureau of Consumer Protection
555 E. Washington Avenue, Suite 3900
Las Vegas, NV 89101
bcpserv@ag.nv.gov

Leo Drozdoff
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
khoward@ndep.nv.gov

Sadie Sullivan
Lander County Clerk
315 S. Humboldt St.
Battle Mountain, NV 89820
clerk@landercountynv.org

Nevada Department of Conservation and
Natural Resources
901 S. Stewart Street, Ste. 5001
Carson City, NV 89701

Caren M Adkins
Signature of person serving

HOLLAND & HART LLP
377 S. NEVADA STREET
CARSON CITY, NV 89703

EXHIBIT 9

Permits Required for the Construction of the Project

EXHIBIT 9

Exhibit "9"

PERMITS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT

(a) Permits the Applicant has obtained, including copies thereof:[1]

PERMITS NECESSARY FOR THE GEN-TIE EXTENSION

	Permit/Approval	Approving Agency	Date Approved
FEDERAL			
	Environmental Assessment (EA)	United States Department of the Interior, Bureau of Land Management ("BLM")	July 19, 2011[2]
	Finding of No Significant Impact (FONSI)	BLM	July 19, 2011
STATE OF NEVADA			
	N/A		
LOCAL			
	Special Use Permit	Lander County	October 13, 2010

PERMITS NECESSARY FOR MCGINNESS II GENERATING FACILITY

	Permit/Approval	Approving Agency	Date Approved
FEDERAL			
	Environmental Assessment (EA)	BLM	July 19, 2011
	Finding of No Significant Impact (FONSI)	BLM	July 19, 2011
	Revised Plan of Utilization (as modified by BLM Sundry Notices)	BLM	Revision 2 approved August 23, 2013
	Notice to Proceed (Historic Properties Area CrNV-62-13551 Locus 216); BLM6-3029(P) 8100 (LLNVB0000)	BLM	September 11, 2013
	Geothermal Drilling Permit (Well 25-10)	BLM	October 13, 2013

[1] Copies of the permits that the Applicant has already received (except for the EA, which is omitted here due to size, but which was attached to the Application as Ex. 1) are attached hereto as **Appendix "A"**. Please note that certain of the permits listed in Part (a) of this listing were obtained in connection with the permitting of McGinness Hills I and its associated transmission infrastructure (including the Existing Line), and these permits are not specific to the Project itself.

[2] Due to its size, the EA is not re-attached here. A copy of the EA is provided as Ex. 1 to the Application.

	Permit/Approval	Approving Agency	Date Approved
	Geothermal Drilling Permit (Well 25A-10)	BLM	November 25, 2013
	Geothermal Drilling Permit (Well 27-10)	BLM	October 17, 2013
	Geothermal Drilling Permit (Well 27A-10)	BLM	November 25, 2013
	Geothermal Drilling Permit (Well 35-10)	BLM	October 13, 2013
STATE OF NEVADA			
	Geothermal Project Area Permit No. 901	Nevada Division of Minerals ("NDOM")	April 10, 2009
	Geothermal Injection Well Permit No. 1340 (Well 66C-22)	NDOM	July 3, 2013
	Geothermal Resource Development Permit No. 1341 (Well 25-10)	NDOM	October 22, 2013
	Geothermal Resource Development Permit No. 1342 (Well 27-10)	NDOM	October 22, 2013
	Geothermal Resource Development Permit No. 1343 (Well 35-10)	NDOM	October 22, 2013
	Geothermal Resource Development Permit No. 1344 (Well 25A-10)	NDOM	December 4, 2013
	Geothermal Resource Development Permit No. 1345 (Well 27A-10)	NDOM	December 4, 2013
LOCAL			
	Special Use Permit	Lander County	October 13, 2010

(b) Permits that the Applicant is in the process of obtaining, including an estimated timeline for obtaining same:

PERMITS NECESSARY FOR THE GEN-TIE EXTENSION

	Permit/Approval	Approving Agency	Date Anticipated
FEDERAL			
	N/A		
STATE OF NEVADA			
	Construction Stormwater Permit	Nevada Division of Environmental Protection ("NDEP"), Bureau of Water Pollution Control ("BWPC")	March 2014 (Application to be submitted early February 2014)

	Permit/Approval	Approving Agency	Date Anticipated
	Surface Area Disturbance Permit	NDEP, Bureau of Air Pollution Control ("BAPC")	March 2014 (Application to be submitted early February 2014)
LOCAL			
	Grading Permit	Lander County	March 2014 (Application to be submitted February 2014)

PERMITS NECESSARY FOR MCGINNESS II GENERATING FACILITY

	Permit/Approval	Approving Agency	Date Anticipated
FEDERAL			
	Contract for the Sale of Mineral Materials	BLM	March 2014 (Application to be submitted February 2014)
	Site License	BLM	March 2014 (Application Submitted November 27, 2013)
	Facility Construction Permit	BLM	March 2014 (Application Submitted January 31, 2014)
STATE OF NEVADA			
	Construction Stormwater Permit	NDEP BWPC	March 2014 (Application to be submitted February 2014)
	Surface Area Disturbance Permit	NDEP BAPC	March 2014 (Application to be submitted early February 2014)
	Chemical Accident Prevention Program (CAPP) Permit to Construct	NDEP BAPC	Mid-April 2014 (Application to be submitted early February 2014)
LOCAL			
	Grading Permit	Lander County	March 2014 (Application to be submitted February 2014)
	Building Permit	Lander County	Mid-April 2014 (Application to be submitted early March 2014)

	Permit/Approval	Approving Agency	Date Anticipated
	Road Encroachment Permit	Lander County	March 2014 (Application to be submitted early February 2014)

EXHIBIT 9 – Appendix A

Necessary Permits Obtained to Date

EXHIBIT 9 – Appendix A

EXHIBIT 9 – Appendix A

Findings of No Significant Impact (BLM)

EXHIBIT 9 – Appendix A

FINDING OF NO SIGNIFICANT IMPACT

FOR THE
MCGINNESS HILLS GEOTHERMAL DEVELOPMENT PROJECT
LANDER COUNTY, NEVADA
ENVIRONMENTAL ASSESSMENT
DOI-BLM-NV-B010-2011-0015-EA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
BATTLE MOUNTAIN DISTRICT - MOUNT LEWIS FIELD OFFICE

Environmental Assessment (EA) DOI-BLM-NV-B010-2011-0015-EA, dated July 2011, has been reviewed through interagency and interdisciplinary team processes, and it has been sent to the Nevada State Clearinghouse and the public for a 30-day comment period. The EA was sent to 180 individuals, organizations, companies, agencies and tribes.

After consideration of the environmental effects of the Proposed Action described in the EA and supporting documentation, it has been determined that the Proposed Action is not a major Federal action that would significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as described in 40 CFR 1508.27. Therefore, preparation of an Environmental Impact Statement is not required, per section 102(2) (c) of the National Environmental Policy Act (NEPA).

LAND USE PLAN CONFORMANCE

The BLM-managed public lands within the Project Area are administered through the Mount Lewis Field Office (MLFO). The area is subject to the BLM Shoshone-Eureka Resource Management Plan (RMP), which was approved in 1986, and its amendments. The Proposed Action is in conformance with the Shoshone-Eureka RMP.

Part II, Section E, "Management Actions Not Expressly Addressed by the Resource Management Plan," of the RMP includes the section "Minerals Objectives and Management Decisions," brought forward unaltered from the earlier BLM "Management Framework Plan" (Record of Decision, page 29). Minerals Objectives 1, 2 and 3 lead to Management Decision #2 (Leaseable Minerals - Geothermal Steam). The three objectives are:

- Objective 1: Make available and encourage development of mineral resources to meet national, regional and local needs consistent with national objectives for an adequate supply of minerals.
- Objective 2: Assure that mineral exploration, development and extraction are carried out in such a way as to minimize environmental and other resource damage and to provide, where legally possible, for the rehabilitation of lands.

- Objective 3: Develop detailed mineral resource data in areas where different resources conflict so that informed decisions may be made that result in optimum use of the lands.

Management Decision #2 (Leaseable Minerals – Geothermal Steam), states that: "All areas designated by the BLM as prospectively valuable for geothermal steam will be open for exploration and development unless withdrawn or restricted from mineral entry. All public lands disposed of in these areas will have the geothermal resources reserved to the federal government."

FINDING OF NO SIGNIFICANT IMPACT

I have reviewed Environmental Assessment DOI-BLM-NV-B010-2011-0015-EA, dated July 2011. After consideration of the environmental effects, as described in the EA and incorporated herein, I have determined that the Proposed Action, with the project design specifications including adopted environmental protection measures and required mitigation measures identified in the EA, will not significantly affect the quality of the human environment and that an Environmental Impact Statement is not required to be prepared.

This finding and conclusion is based on consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and the intensity of impacts described in the EA and summarized below.

Context

Ormat Nevada Inc. has filed a Utilization Plan for the development of two geothermal power plants, geothermal wells, associated pipelines, access roads, and transmission line Plans of Development for the McGinness Hills Geothermal Development Project. The project entails developing up to 11 geothermal production and 11 reinjection wells and building an approximately 9-mile long electrical transmission line. The McGinness Hills project is located in Lander County, Nevada. The nearest inhabited town is Austin, NV, which lies approximately 16 miles southwest of the project.

The components of the proposed Project directly related to the geothermal resource (geothermal production and injection wells, access roads, geothermal pipelines, geothermal power plants and microwave communication towers) would all be located within the McGinness Hills Geothermal Unit (NVN-84268X). This Unit is comprised of federal geothermal leases NVN-83967, NVN-83966 and the Lake Ranch lease on private land. The Unit Area encompasses approximately 7,680 acres of public lands managed by the BLM and private lands in Sections 9-16 and 21-24, Township 20 North, Range 45 East, Mount Diablo Baseline and Meridian.

The approximately 9.01 mile, 230 kV overhead transmission line and fiber optic line would be constructed, originating at the proposed new McGinness Hills substations adjacent to the power plants, trending south and east and terminating at the existing Sierra Pacific Power Company dba NV Energy Frontier substation (N-25341). Approximately 3.22 miles of the proposed 230 kV transmission line and fiber optic line (N-88978 and N-88979) would be located on public lands managed by the BLM, while the remaining 5.79 miles would be located on National Forest System lands (#AUS74).

The Proposed Action would disturb approximately 217 acres during the projected 35-year life of the project. The proposed geothermal wells would be 42 inches in diameter and each would have a total depth of approximately 7000 feet. A net total of 66 megawatts of electrical energy is projected to be generated by the Project.

Intensity

1. Impacts that may be both beneficial and adverse.

The EA considered impacts that may be both beneficial and adverse through the analysis of direct, indirect, and cumulative impacts of the Proposed Action. These impacts are described in detail in Chapter 3 and Chapter 4 of the EA.

The proposal would result in a reliable, renewable energy power supply to both Nevada and National power grids. It is anticipated that jobs created directly and indirectly by the Project will increase the Lander County payroll base.

Adverse impacts of the Proposed Action will be avoided or minimized by Adopted Environmental Protection Measures, committed to by Ormat and presented in Chapter 2 of the EA, and by BLM and USFS mitigation and reclamation measures, described in Chapter 3 and Appendices A, B, C, D and E of the EA.

None of the environmental impacts discussed in detail in Chapters 3 and 4 of the EA are considered significant.

2. The degree to which the proposed action affects public health and safety.

The effects of the proposed action on public health and safety are considered to be positive. Ormat's compliance with the EA's mitigation and the lease stipulation requirements ensure the safety of the public and Ormat work forces.

3. Unique characteristics of the geographic area such as proximity of historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

Twenty sites determined eligible for inclusion on the National Register of Historic Places and located in the proposed McGinness Hills Archaeological District may be adversely affected by the Proposed Action. Seven additional eligible sites located outside of the proposed district may also be adversely affected by the Proposed Action.

Where possible, those historic properties determined eligible for inclusion on the National Register of Historic Places and those that are unevaluated, will be avoided by the Proposed Action. Where this is not possible, such sites will be treated with an approved Historic Properties Treatment Plan (HPTP). Contributing elements/eligible sites that are near or adjacent to project activities will be buffered, and project activities will be monitored by a qualified archaeologist

monitor. Artifacts recovered from sites on federally managed lands will be curated in accordance with 36 CFR 79 at a facility in Nevada that meets federal standards.

The Propose Action would not create surface disturbance within any wetlands or riparian vegetation, and no direct impacts are anticipated. However, indirect impacts to springs and meadows from construction of pipelines and access roads and from geothermal production could be realized through changes in temperature or chemical makeup, reduced or increased flow, or stopping flow altogether. However, the water chemistry data suggests that there is essentially no interaction between the cold water springs and the geothermal fluid. To mitigate for any potential indirect impacts to wetlands or riparian areas, Ormat will be required to improve other existing nearby seeps, springs and meadows at a 4:1 acreage ratio. Improvements can include fencing, habitat improvement, or riparian enhancement through restoration efforts. This mitigation measure would allow riparian acreage to be maintained at pre-project levels and therefore minimize any adverse impacts within the mitigation zone. The mitigation projects will improve riparian habitat adjacent to the Project area to avoid a net loss of such habitat as a result of permitting geothermal activities.

There are no park lands, prime farmlands, wild and scenic rivers, or ecologically critical areas in the vicinity of the Project.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The proposed action is not expected to be highly controversial. Renewable energy projects such as the McGinness Hills Geothermal Development Project are important aspects of the Nation's goal of reducing dependence on foreign oil imports. This project will also help meet Nevada's renewable energy goals.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

Although the potential effects of the Proposed Action on wetland and riparian areas, as identified in the EA, cannot be quantified, the application of mitigation measures reduces the uncertainty of any potential effects.

There is no surface disturbance proposed within any wetlands or riparian vegetation, and no direct impacts are anticipated. In addition, the water chemistry data suggests that there is essentially no interaction between the cold water springs and the geothermal fluid. However, indirect impacts from construction of the Proposed Action to springs and meadows could be realized through changes in temperature or chemical makeup, reduced or increased flow, or stopping flow altogether.

Continuing the current program of monitoring for flow (water level), chemistry and temperature during Project construction and operation would provide data which would either confirm the absence of any connection between the cold water springs and the geothermal reservoir, or provide documentation of adverse changes and information to develop effective correction

measures. Through the monitoring program, if any adverse impacts are documented, the following mitigation would be required.

If water flows or chemistry within Springs 2-6, 8-9 and/or Meadows 1-2 are realized, the proponent would be required to modify operations to correct the impact to ensure flows are maintained at natural occurrence. If the effects cannot be corrected through operational change the proponent would be required to improve other existing seeps, springs and/or meadows within the 4:1 mitigation zone. Improvements could include fencing, habitat improvement, or riparian enhancement through restoration efforts.

This mitigation measure would allow riparian acreage to be maintained at pre-project levels and therefore minimize any adverse impacts within the 4:1 mitigation zone. The mitigation projects will improve riparian habitat adjacent to the Project area to avoid a net loss of such habitat as a result of permitting geothermal activities.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The proposed action will not establish a precedent for future actions with significant effects or represent a decision about a future consideration. Completion of this EA and approval of the Proposed Action does not establish a precedent for other assessments nor does it authorize other geothermal exploration projects or further development of this area. Any future projects within the area or in surrounding areas would be analyzed on their own merits and carried out, or not, independent of the actions currently selected.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

As currently proposed, the McGinness Hills Geothermal Development Project is a "stand alone" action. I am unaware of any other geothermal projects planned for development in the area.

Past, present and reasonably foreseeable future actions have been considered in the cumulative impacts analysis in the EA (Chapter 4). The cumulative impacts analysis examined all of the other known actions and determined that the Proposed Action would not have significant cumulative impacts or incrementally contribute to significant cumulative impacts. In addition, for any actions that might be proposed in the future, further environmental analysis, including assessment of cumulative impacts, would be required prior to authorizing surface disturbing activities.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.

The site of the proposed action, including the power plants, ancillary facilities such as the geothermal production and injection well fields, and the transmission line and associated roads has been extensively surveyed for cultural resources. Based on the findings of the cultural resource surveys, a McGinness Hills Archaeological District (MHAD) has been proposed on

selected public and private land. The district is recommended for eligibility on the National Register of Historic Places (NRHP). The surveys have identified 36 sites that have been determined to be, or are recommended as, contributing elements. Twenty eligible sites in the MHAD may be adversely affected by the Proposed Action. In addition, a number of other archaeology sites were recorded on, or partially on, National Forest System land. These were recorded and evaluated independently from the proposed MHAD.

Those historic properties determined eligible for inclusion on the NRHP, and those that are unevaluated, will be avoided by the project or else will be treated with an approved Historic Properties Treatment Plan (HPTP). Contributing elements or eligible sites that are adjacent to project activities will be buffered, and project activities will be monitored by a qualified archaeologist monitor. Artifacts recovered from sites on federally managed lands will be curated in accordance with 36 CFR 79 at a facility in Nevada that meets federal standards.

There are no other known districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP within the Project area.

If any cultural resource is discovered during project activities that might be altered or destroyed by those activities, Project operations in the vicinity of the discovery would cease, the discovery would be protected and left intact and the incident would be reported to the appropriate BLM officer.

Project activities are proposed very near one or more of three rock units within the proposed Project area determined to have the potential to produce significant fossils. Construction activities on these rock units that involve new surface disturbance could result in the disturbance or destruction of potentially important fossils. Thus, surface disturbing activities on these rock units will require pre-disturbance surveys to determine the appropriate subsequent course of action, which could include monitoring during surface disturbance activities, avoidance of identified significant fossil localitites, or no further action.

Thus, no significant scientific, cultural, or historical resources will be lost or destroyed by the Project.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

No listed Threatened or Endangered species would be affected by the Project, because none of these species are known to exist within the Project Area.

Two special status plant species, with suitable habitat in the vicinity of the Project, could occur in and be affected by the Project. These include Eastwood milkweed and Toquima milkvetch. Potential Project impacts to these species would be reduced to insignificance by implementing mitigation measures, such as pre-construction clearance surveys, buffering and avoiding identified plants, installing silt fencing or other erosion control devices, seed collection, reseeding, propagation and out-planting. These mitigation measures are described in detail in Section 3.5.2 of the EA.

Suitable habitat for several special status wildlife species exists within the Project area, and some of these species could be affected by the Proposed Action. These species include northern goshawk, golden eagle, short-eared owl, western burrowing owl, juniper titmouse, ferruginous hawk, Swainson's hawk, prairie falcon, pinyon jay, loggerhead shrike, vesper sparrow, and greater sage-grouse.

Potential impacts from Project construction and operations to these bird species include the reduction of foraging habitat. In addition, the project could result in a reduction of potential nesting habitat for some special status species. These impacts are limited to the 217 acres of habitat that will be disturbed due to Project development and the associated habitat fragmentation. The greatest impacts will occur during Project construction when increased noise and activity may deter individuals of some special status species from using the Project Area and its vicinity. These impacts are expected to affect individual birds utilizing the habitat within and around the Project, but no effect to the local or regional populations of special status species is expected. Furthermore, any potential impacts to special status species will be minimized by the implementation of mitigation measures for migratory birds. This mitigation includes conducting surface disturbing activities outside the migratory bird nesting season (15 March – 31 July), pre-construction nest surveys, establishment of species-specific no-disturbance buffer zones (as determined by the USFWS), and mapping of nest locations. These mitigation measures are described in detail in Section 3.5.2 of the EA (Migratory Birds Section).

Potential impacts to raptors will be minimized by Ormat's adoption of raptor protection measures as described by the APLIC (2006), including anti-perching devices on the transmission line (see Section 2.1.11 of the EA). In addition, the following required mitigation measures will be implemented. All ground-disturbing activities will be conducted outside the raptor nesting season (March 1–July 31), pre-construction nest surveys will be conducted, and if active nests are detected, a 0.5-mile no-disturbance buffer zone will be established, mapped, and protected. Detailed descriptions of these requirements are included in Section 3.5.2 of the EA. Implementing these mitigation measures, will avoid destruction and disturbance to any nesting raptors, especially northern goshawks, ferruginous hawks and short-eared owls.

Anticipated impacts to greater sage-grouse from the Proposed Action would include the reduction and fragmentation of foraging and nesting habitat, possible disruption of sage-grouse movement corridors between metapopulations, increases in sage-grouse mortality risks and predation to nests from increased occurrence of ravens (corvids), and seasonal displacement of sage-grouse due to effects from Project noise, construction, and human activities.

To reduce these potential impacts to sage-grouse, a suite of project-specific mitigation measures will be required. This project-specific mitigation has been developed in coordination with the NDOW. A primary component of the mitigation is habitat restoration/enhancement and improvement at a 4:1 ratio to compensate for disturbance in sage-grouse habitat in the vicinity of the Project. Specific details of this mitigation are described in Appendix C of the EA.

To address mortality and predation risks from ravens, corvid occurrence will be minimized by Ormat's utilization of a single-pole design and anti-perching devices along the entirety of the transmission line in accordance with recommended environmental protection measures (APLIC

2006), as described in Section 2.1.11 of the EA. In addition, corvid occurrence and attraction to the Project will be minimized by implementing a Common Raven Monitoring, Mitigation, and Management Plan (see Appendix D of the EA).

No surface-disturbing activities at actual lek locations will occur through Project development. Therefore, impacts to leks will be a result of indirect effects, which include visual and auditory impacts. To mitigate these impacts to leks and their associated nesting habitat, measures to monitor and limit surface-disturbing activities and sound pressure levels during the lekking season will be required (see Appendix C of the EA).

Project impacts are expected to affect individuals from the local metapopulation of sage-grouse but greater effects to the Toiyabe population or regional population are not expected. However, if through monitoring it is determined that habitat connectivity has been affected by Project development, subsequent mitigation measures will be required (see Appendix C of the EA).

Additionally, to offset potential impacts to brood-rearing habitat by Project development, compensatory mitigation consisting of habitat enhancement or restoration will also be required at a 4:1 ratio (see Appendix C).

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The Proposed Action will not violate or threaten to violate any federal, state, or local law or requirement imposed for the protection of the environment.

Douglas W. Furtado
District Manager
BLM Battle Mountain District Office

Date 7/19/11

EXHIBIT 9 – Appendix A

Special Use Permit

EXHIBIT 9 – Appendix A

SPECIAL USE PERMIT

IT HAVING BEEN MADE TO APPEAR that the application of

Ormat Nevada, Inc.

for a Special Use Permit pursuant to Lander County Code 17.14 for the following type of use:

Construction of the McGinnes Hills Geothermal Plant

Conditions: Must comply with all local, state and federal laws

IN REGARDS TO PARCELS:

APN - 005-370-03
BLM Lands - Sections 15, 16, 21 & 22, T20N, R44E

HAS BEEN DULY FILED AND IT FURTHER APPEARING that such application is in accordance with the law and not offensive to any other provision of the Lander County Master Plan, NOW THEREFORE, IT IS ORDERED that a Special Use Permit for the above and foregoing use(s) be and the same is hereby granted on the following conditions:

1.) The permit will be reviewed annually.
2.) That the permit be governed by the information stated on the application.
3.) The permit will be automatically reviewed in the event any complaints are received and could possibly be revoked.

ISSUED THIS 13th DAY of October, 2010.

Deborah Fiske

Lander County Community Development Department

EXHIBIT 9 – Appendix A

Revised Utilization Plan

EXHIBIT 9 – Appendix A

REVISED
UTILIZATION PLAN
(43 CFR SUBPART 3272)

MCGINNESS HILLS
GEOTHERMAL DEVELOPMENT PROJECT

FEDERAL GEOTHERMAL UNIT NVN-84268X

LANDER COUNTY, NEVADA

Original Submittal: May 2010
Revised: January 2011
Revised: February 2011
Revised: May 2011

Unit Operator:

ORMAT NEVADA, INC.
6225 NEIL ROAD
RENO, NV 89511

McGINNESS HILLS GEOTHERMAL DEVELOPMENT PROJECT
ORMAT NEVADA, INC.

REVISED
UTILIZATION PLAN

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1 INTRODUCTION AND ORGANIZATION

1.1 Project Summary

Ormat Nevada, Inc. (Ormat) is proposing to construct, operate, and maintain the McGinness Hills Geothermal Development Project (McGinness Hills Project or Project) within federal geothermal unit NVN-84268X in Lander County, Nevada (see Figure 1). The Project would include the construction and operation of two new 33 MW (net), 45 MW (gross), binary air- and water-cooled geothermal power plants; a microwave communication tower at each plant; a domestic water well located at one of the power plants; geothermal production and injection well pads and wells; access roads; geothermal production and injection pipelines; an electrical transmission line and co-located Optical Ground Wire (OPGW)/fiber optic line (hereafter, fiber optic line); and ancillary support facilities.

1.2 Project Background

Ormat Nevada, Inc. (Ormat) obtained federal geothermal leases in 2007 in the McGinness Hills area of Lander County, Nevada (see Figure 1). These leases were obtained and lease stipulations applied. In 2008, the federal geothermal leases were unitized. This Unit is referred to as the McGinness Hills Geothermal Unit (NVN-84268X). Following acquisition of the federal geothermal leases and formation of the Unit, Ormat began conducting exploration activities.

In April 2011, Ormat designated ORNI 39, LLC as the Unit Operator, and ORNI 39 and ORNI 49 as tenants in common on the transmission system. This redesignation was recognized by the BLM in April 2011.

In April 2009, the Bureau of Land Management (BLM), Mount Lewis Field Office (MLFO), approved an Environmental Assessment (EA) (NV063-EA08-093) for Ormat's McGinness Hills Geothermal Exploration Project. This exploration project included the drilling and testing of temperature gradient holes (TGHs), observation wells, and full-sized wells at 27 identified sites, and the building and use of access roads, as appropriate, within federal geothermal Unit NVN-84268X. (see Figure 2)

Figure 2 identifies the TGHs and observation/full-size well sites which were evaluated by the BLM in the EA. Total surface disturbance associated with this McGinness Hills Geothermal Exploration Project was approximately 68 acres. Additionally, some of the approved drill sites were relocated. To date, 8 wells have been drilled from 7 pads and associated access roads have been constructed. See Table 1 for an itemization of well status.

Subsequent to the approval of the McGinness Hills Geothermal Exploration Project, Ormat acquired the Lake Ranch lease on private land. The Lake Ranch lease is part of the McGinness Hills Unit. Within the private land lease (which is private surface and private minerals), Ormat has drilled 5 additional wells and built associated access roads (see Figure 3).

Figure 3 shows all public and private land wells and associated access roads that have been constructed to date. Surface disturbance associated with these construction activities totals 57.1 acres (33.9 acres on public lands managed by the BLM, and 23.2 acres on private land).

Based on the successful results of the exploration activities conducted on public and private lands within the McGinness Hills Unit Area, Ormat has determined that the geothermal resources within the Unit are capable of commercial production. As such, Ormat is proposing the McGinness Hills Geothermal Development Project described herein (see Figure 4 and Figure 5).

1.3 Utilization Plan Organization

The information contained in this Utilization Plan is provided as requested in 43 CFR 3272.11 (How should I describe the proposed utilization facility) and 43 CFR 3272.12 (How do I describe the environmental protection measures I intend to take), as detailed below.

This document is organized as follows:

- Chapter 1: Introduction and Organization;
- Chapter 2: Project Description, which answers the questions posed in 43 CFR 3272.11; and
- Chapter 3: Environmental Protection Measures, which answers the questions posed in 43 CFR 3272.12

Detailed information concerning the drilling and testing of the new geothermal wells to be completed for the project are contained in the Operations Plan filed with the BLM pursuant to 43 CFR 3250. Detailed information concerning the construction and operation of the electrical transmission line is contained in the SF299 forms and accompanying Plan of Development filed with the BLM (pursuant to 43 CFR 2800) and the USFS (pursuant to 36 CFR 500).

2 PROJECT DESCRIPTION

2.1 Project Location

The components of the proposed Project directly related to the geothermal resource (geothermal production and injection wells, well pads, access roads, geothermal pipelines, and the binary geothermal power plants) would all be located within the McGinness Hills Geothermal Unit (see Figure 5). This Unit is comprised of federal geothermal leases NVN-83967 and NVN-83966, and the Lake Ranch lease on private land. The Unit Area encompasses approximately 7,540 acres of public lands managed by the BLM and 140 acres of private lands in Sections 9-16 and 21-24, Township 20 North, Range 45 East (T.20N., R.45E.), Mount Diablo Baseline and Meridian (MDB&M).

The proposed Project also includes the construction and operation of an approximately 9.01-mile transmission line and fiber optic line, which would be constructed on public lands managed by the BLM and the United States Forest Service (USFS) (see Figure 4).

2.2 Geothermal Well Field

2.2.1 Description and Location

Production wells produce geothermal fluid to the surface for the extraction of heat by the power plant. Injection wells are used to inject geothermal fluid from the power plant back into the geothermal reservoir. Injection ensures the longevity and renewability of the geothermal reservoir. The number of geothermal production and injection wells required for the Project is principally dependent on the productivity (or injectivity) of the wells and the temperature and pressure of the produced geothermal fluid. Operation of the McGinness Hills power plants would co-mingle production from wells on federal leases with production from wells on the private Lake Ranch lease.

Within the McGinness Hills Unit Area, Ormat expects that together the two power plants would require 11 production wells (7 on public lands managed by the BLM and 4 on private lands) and 11 injection wells (10 on public lands managed by the BLM and 1 on private land) (see Figure 5). These sites are comprised of previously approved sites as identified in the McGinness Hills Exploration EA, relocated sites, private land sites and newly proposed sites (see Table 1 and Figure 5). Two of the production wells (28-10 and 28A-10) would be drilled from the same well pad.

The production and injection well sites identified in Figure 5 may need to be moved as a result of geologic, geophysical and geothermal reservoir information obtained as other wells are drilled.

Table 1: Well Status. Current and Historic

Kettleman No.	Type[1]	Section No. and Aliquot Part (T. 20 N., R. 45 E.)	UTM (NAD 83)		Approval		Current Status
			Easting	Northing	Date	Type[2]	
Sites Identified in McGinness Hills Geothermal Exploration EA (BLM 2009)							
22-10	T	NW1/4NW1/4, Sec. 10	507783	4385300	4/2009	EA	Not built.
57-10	T	SW1/4SE1/4, Sec. 10	508258	4384265	4/2009	EA	Not built.
83-15	T	SE1/4NE1/4, Sec. 15	508801	4383556	4/2009	EA	Not built.
57-14	T	SW1/4SE1/4, Sec. 14	509908	4382735	4/2009	EA	Not built.
47-21	T	SE1/4SW1/4, Sec. 21	506473	4380957	4/2009	EA	Not built.
88-22	T	SE1/4SE1/4, Sec. 22	508995	4380908	4/2009	EA	Not built.
33-24	T	SE1/4NW1/4, Sec. 24	511189	4381831	4/2009	EA	Not built.
17-13	T	SW1/4SW1/4, Sec. 13	510685	4382633	4/2009	EA	Not built.
11-13	T	NW1/4NW1/4, Sec. 13	510616	4383830	4/2009	EA	Not built.
62-11	T	NW1/4NE1/4, Sec. 11	510158	4385343	4/2009	EA	Not built.
65-23	T	NW1/4SE1/4, Sec. 23	510094	4381493	4/2009	EA	Not built.
54-21	T	SW1/4NE1/4, Sec. 21	506739	4381586	4/2009	EA	Not built.
77-13	T	SE1/4SE1/4, Sec. 13	511987	4382655	4/2009	EA	Not built.
27-16	F	SW1/4SW1/4, Sec. 16	506005	4382616	11/2009	Sundry/GDP	Proposed as TGH. Pad built; well drilled. Proposed for development. (see below)
67-9	T	SW1/4SE1/4, Sec. 9	506823	4384280	4/2009	EA	Not built. Proposed for development (see below)
21-15	F	NW1/4NW1/4, Sec. 15	507791	4383890	4/2009	GDP	Pad built; well drilled. Not included in development project; will be reclaimed.
35-15	T/O/F	NE1/4SW1/4, Sec. 15	507912	4383011	4/2009	EA	Not built.
18-22	T/O/F	SW1/4SW1/4, Sec. 22	507536	4380825	4/2009	EA	Not built.
86-16	F	NE1/4SE1/4, Sec. 16	507382	4382890	06/2009	GDP	Pad built; well drilled. Proposed for development (see below).
88-16	F	SE1/4SE1/4, Sec. 16	507306	4382444	10/2009	GDP	Pad built; well drilled. Proposed for development (see below).
74-16	T/O/F	SE1/4NE1/4, Sec. 16	507062	4383354	4/2009	EA	Not built.
33-22	T/O/F	SE1/4NW1/4, Sec. 22	507915	4381773	4/2009	EA	Not built.
15-14	M	NW1/4SW1/4, Sec. 14	509037	4383095	5/2009	Sundry/GDP	15-14 relocated to 38-10. Monitoring well drilled. Proposed for development (see below).
28-10	F	SW1/4SW1/4, Sec. 10	507693	4384153	02/2010	GDP	Pad built; two wells drilled on pad. Both wells proposed for development (see below).
38-15	W	SE1/4SW1/4, Sec. 15	507941	4382357	04/2009	EA	Not built
87-15	T/O/F	SE1/4SE1/4, Sec. 15	508809	4382732	4/2009	EA	Not built. Proposed for development (see below).
67-15	F	SW1/4SE1/4, Sec. 15	508452	4382677	08/2010	GDP	Pad built; well drilled. Proposed for development (see below).
Sites Constructed on Private Land							
61(L)-22	F	NW1/4NE1/4 Sec. 22	508594	4382099	01/2010	NDOM	Pad built; well directionally drilled. Proposed for development (see below).
64-22	F	SW1/4NE1/4, Sec. 22	508487	4381484	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
66B-22	F	NW1/4SE1/4, Sec. 22	508487	4381087	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
57C-22	F	SW1/4SE1/4, Sec. 22	508371	4380910	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
58B-22	F	SW1/4SE1/4, Sec. 22	508496	4380630	09/2009	NDOM	Pad built; well drilled. Proposed for development (see below).
Proposed in McGinness Hills Geothermal Development Project							
46-10	P	NE1/4SW1/4, Sec. 10	508234	4384335	NA	NA	Pad not built. To be used in development project.

Kettleman No.	Type[1]	Section No. and Aliquot Part (T. 20 N., R. 45 E.)	UTM (NAD 83)		Approval		Current Status
			Easting	Northing	Date	Type[2]	
36-10	P	NW1/4SW1/4, Sec. 10	507909	4384302	NA	NA	Pad not built. To be used in development project.
28-10	P	SW1/4SW1/4, Sec. 10	507754	4383941	NA	NA	Pad built (co-located with 28A-10) and well drilled. To be used in development project.
28A-10	P	SW1/4SW1/4, Sec. 10	507754	4383941	NA	NA	Pad built (co-located with 28-10) and well drilled. To be used in development project.
14-15	P	SW1/4NW1/4, Sec. 15	507653	4383129	NA	NA	Pad not built. To be used in development project.
15-15	P	NW1/4SW1/4, Sec. 15	507618	4382918	NA	NA	Pad not built. To be used in development project..
21A-15	P	NW1/4NW1/4, Sec. 15	507686	4383675	NA	NA	Pad not built. To be used in development project.
64-22	P	SW1/4NE1/4, Sec. 22	508487	4381484	NA	NA	Pad built and well drilled. To be used in development project.
66B-22	P	NW1/4SE1/4, Sec. 22	508487	4381087	NA	NA	Pad built and well drilled. To be used in development project.
57C-22	P	SW1/4SE1/4, Sec. 22	508371	4380910	NA	NA	Pad built and well drilled. To be used in development project.
58B-22	P	SW1/4SE1/4, Sec. 22	508496	4380630	NA	NA	Pad built and well drilled. To be used in development project.
67A-9	I	SW1/4SE1/4, Sec. 9	507036	4384033	NA	NA	Pad not built. To be used in development project
86-16	I	NE1/4SE1/4, Sec. 16	507471	4382704	NA	NA	Pad built and well drilled. To be used in development project.
27-16	I	SW1/4SW1/4, Sec. 16	506148	4382376	NA	NA	Pad built and well drilled. To be used in development project.
75-21	I	NE1/4SE1/4, Sec. 21	507238	4381351	NA	NA	Pad not built. To be used in development project
77-21	I	SE1/4SE1/4, Sec. 21	507253	4380915	NA	NA	Pad not built. To be used in development project
67-15	I	SW1/4SE1/4, Sec. 15	508532	4382477	NA	NA	Pad built and well drilled. To be used in development project.
87-15	I	SE1/4SE1/4, Sec. 15	508889	4382532	NA	NA	Pad not built. To be used in development project
78-21	I	SE1/4SE1/4, Sec. 21	507250	4380623	NA	NA	Pad not built. To be used in development project
61(L)-22	I	NW1/4NE1/4 Sec. 22	508594	4382099	NA	NA	Pad built and well drilled. To be used in development project.
11-22	I	NW1/4NW1/4, Sec. 22	507749	4381745	NA	NA	Pad not built. To be used in development project.
38-10	M	SE1/4SW1/4, Sec. 10	507985	4383882	NA	NA	Pad built and monitoring well drilled. To be used in development project.

1: Temperature Gradient Hole (T); Observation Well (O); Full-Size Well (F); Production Well (P); Injection Well (I); Monitoring Well (M)
2: Environmental Assessment (EA); Sundry Notice (Sundry); Geothermal Drilling Permit (GDP)

2.2.2 Construction and Surface Disturbance

Each drill site would be prepared to create a level pad for the drill rig and a graded surface for the support equipment. Drill pad preparation activities would include clearing, earthwork, drainage and other improvements necessary for efficient and safe operation and for fire prevention. Clearing would include removal of organic material, stumps, brush and slash, which would either be removed and taken to an approved landfill (the Austin transfer station), or stockpiled onsite. Topsoil would be stripped (typically to the rooting depth) and salvaged during the construction of all pads, as feasible. Salvaged topsoil (and cleared organic material, stumps, brush and slash, if saved) would be stockpiled on the pads for use during subsequent reclamation of the disturbed areas (see Section 2.8). The site would be graded to prevent the movement of storm water from the pad off of the constructed site.

Once drilling is complete, the shoulders of the pad could be reclaimed, but the majority of the pad must be kept clear for ongoing operations and the potential need to work on or re-drill the well. See Section 2.8 for a description of reclamation procedures.

Short and long term surface disturbance acreages association with geothermal production and injection wells can be found in Table 2.

Table 2: Surface Disturbance Associated with Geothermal Production and Injection Wells

	Number of Wells	Short Term Disturbance (acres)[1]	Long Term Disturbance (acres)[2]
Public Land Wells	17	7.6	68.0
Private Land Wells	5	1.0	20.0

[1] Short term disturbance is that surface disturbance which would undergo interim reclamation, in accordance with the Project reclamation plan (see Appendix B).
[2] Long term disturbance is that surface area which would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately 5 years to ensure that reclamation is successful, as determined by the appropriate agencies).

2.2.3 Wellfield Operation

Once a well is drilled and well head completed, an industrial grate would be placed over the hole to prevent humans and wildlife from falling into the cellar.

Each of the production wells would be equipped with a lineshaft pump to bring the geothermal fluid to the surface under pressure. The electricity to power the wellhead pump motors would be supplied via an insulated electric conductor installed from the power plant to the wellheads along the connecting pipelines.

Wellhead dimensions for the production wells are not expected to exceed a height of fifteen feet above the ground surface or four feet in diameter. Wellhead dimensions for the injection wells would be much smaller (approximately 4 ft. in height) since they would not have wellhead pump motors.

An approximately 15-foot by 15-foot by 10-foot high motor control building may be located on the well pad within approximately 50 feet of each production well to house and protect: 1) the auxiliary well control systems; 2) motor switch gear controls and sensors; 3) transmitters; and 4) geothermal fluid treatment systems. The well control systems, data transmitters and geothermal fluid treatment systems used for the injection wells would be placed inside a smaller structure located on the injection well pads.

Sensors would collect key temperature, pressure and flow rate data from each well. These data would be measured for purposes of process control, resource data acquisition, safety and environmental protection.

During normal well field operations, total geothermal fluid production rates for each power plant are expected to be approximately 6,356,000 pounds per hour (lbs/hr) (14,000 gallons per minute (gpm) at 320°F). Individual production well flow rates are expected to range from approximately 2,000 to 3,000 gpm with a wellhead pressure of about 150 to 200 pounds per square inch gauge (psig).

Total geothermal fluid injection rates for each power plant would be approximately 6,356,000 lbs/hr (13,000 gpm at 150°F). Individual injection wells are expected to receive an average of approximately 3,720 gpm of 150°F geothermal fluid with wellhead injection pressures of up to 400 psig.

2.3 Geothermal Pipelines

2.3.1 Description and Location

Geothermal production pipelines bring the geothermal fluid from the production wells to the power plant. Geothermal injection pipelines deliver the cooled geothermal fluid from the power plant to the injection wells.

Approximately 3.65 miles of production pipeline (3.28 miles on public lands managed by the BLM and 0.37 miles on private land) and 5.33 miles of injection pipeline (5.26 miles on public land managed by the BLM and 0.07 miles on private land) would be constructed within the McGinness Hills Unit Area (see Figure 5). A 60-foot wide construction corridor would be needed along the length of the pipeline. Long term disturbance associated with pipeline operation assumes a 20-foot width along the length of the pipeline, as some of the short term construction disturbance would be reclaimed flowing completion of construction.

The production and injection pipeline routes generally follow the shortest distance from each well pad to the next well pad or the power plant in order to minimize the amount of pipe required, reduce heat losses, reduce the energy required to move the fluids, and to minimize the

amount of ground disturbance. Where consistent with the shortest distance design criteria, the proposed pipeline routes also follow existing or proposed roads to facilitate construction, ongoing monitoring and future maintenance.

The final alignment of the pipeline routes would be dictated by the specific wells completed for the project and the need to match fluid characteristics and balance fluid volumes in these pipelines.

2.3.2 Construction Procedures and Surface Disturbance

The geothermal fluid pipelines would be constructed from seamless, welded-steel pipe. They are expected to range in diameter from 8 inches to 24 inches. Two to three inches of insulation and a protective aluminum sheath would jacket the steel production pipes, increasing the diameter of the finished production pipelines by up to six inches. Consistent with safety requirements, pipelines and power trays would be painted covert green to blend with the area and minimize visibility, pursuant to BLM IM 2007-021.

Horizontal and/or vertical expansion loops (a square bend in the pipeline approximately 30 feet in length by 40 feet in width) would be constructed about every 300 to 600 feet along the production pipelines. Expansion loops allow the pipeline to flex as it lengthens and shortens due to heating and cooling. Fewer expansion loops are needed along the injection pipelines, as the injection pipelines are subject to less heating and cooling.

Pipeline construction would begin by vertically auguring nominal 24-inch diameter holes into the ground about eight to ten feet deep at approximately 30-foot intervals along the pipeline route. Soil and rock removed from the holes would be cast on the ground adjacent to each hole. The steel pipe support, known as a "sleeper," would be placed in the hole and concrete poured to fill the hole slightly above the ground surface. The steel pipe sleeper would extend above the concrete, averaging approximately one foot above ground surface.

While the concrete is curing, the approximately 40-foot long steel pipe sections would be delivered and placed along the construction corridor. A small crane would lift the pipe sections onto the pipe supports and temporary pipe jacks so that they could be welded together into a solid pipeline. Once welded and the welds tested, the pipe would be jacketed with insulation and an aluminum sheath (appropriately colored, covert green, to blend with the dominant color in the area). When completed, the top of the pipelines would average less than three feet above the ground surface, and would provide adequate clearance for high-flow events, floating debris, wildlife or livestock (Gold Book, Fourth Edition, Revised 2007). Additionally, the top of some sections of the pipelines could as high as six feet above the ground surface to accommodate terrain undulations and to facilitate movement of wildlife and livestock through the wellfield. Additionally, to further facilitate livestock movement and access to water, the pipelines would be buried at the following three locations in T.20N., R.45E.: Section 10, SW1/4; Section 21, NE1/4; and Section 22, NW1/4NE1/4.

Electrical power and instrumentation cables for the wells would then be installed in steel conduit constructed along the same pipe sleepers and colored to match the pipeline sheath.

The pipelines would be constructed across roads to allow continued vehicle access. This would typically use the cut-and-fill method, where a trench would be cut through the road, a prefabricated, "U"-shaped, oversized pipe sleeve (containing the fabricated geothermal fluid pipeline with the insulation and metal cladding in place) installed in the trench, the excavated soil and rock backfilled and compacted around and above the oversize pipe sleeve, and the roadbed material repaired or replaced. Alternatively, the pipelines could be constructed across the roads on sleepers (as described above) and the roadbed run up and over the pipeline. This would entail constructing a concrete conduit over a pipeline where it crosses a road, then compacting soil on either side of the conduit sufficient to ramp the roadbed up and over the conduit to allow traffic to travel over the pipeline.

Short and long term surface disturbance acreages associated with production and injection pipelines can be found in Table 3.

Table 3: Surface Disturbance Associated with Public and Private Land Pipelines

	Length (miles)	Disturbance (acres)	
		Short Term[1]	Long Term[2]
Public Land Pipeline	8.54	41.8	20.9
Private Land Pipeline	0.44	2.1	1.1

1 Short term disturbance is that surface disturbance which would undergo interim reclamation, in accordance with the Project reclamation plan (see Appendix B).
[2] Long term disturbance is that surface area which would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately 5 years to ensure that reclamation is successful, as determined by the appropriate agencies)..

2.3.3 Operation and Maintenance Procedures

The pipelines would be periodically inspected for leak detection, safety and vandalism during normal operations. The pipelines also would be subject to periodic ultrasonic thickness testing to detect any substantial thinning of the pipe wall.

2.4 Geothermal Power Plants

2.4.1 Description and Location

Ormat will build and operate two binary air-cooled geothermal power plants, each approximately 33 MW (net), 45 MW (gross). One proposed power plant would be primarily located on an approximately 16.0-acre site in the SW1/4SW1/4 Section 15 T.20N., R.45E. The other proposed power plant would be primarily located on an approximately 16.9-acre site in the NW1/4NW1/4 Section 22 T.20N., R.45E. A substation, would be constructed within each power plant boundary and would be used to transform the generated low-voltage electrical energy to the higher voltage required for transmission to the electrical grid (see Figure 5).

Additionally, a microwave communication tower and antenna would be constructed within each of the proposed power plant sites to deliver signals from control centers and other remote locations, and to report operating status. This network also would provide voice communication from dispatchers to power plant operators and maintenance personnel. A communications tower about 40 feet high would be constructed at the proposed power plant site, with a microwave antenna aimed toward an existing communication link at Austin Peak (SW1/4NW1/4 Section 5, T.18N., R.44E.) on National Forest System lands.

2.4.2 Construction Procedures and Surface Disturbance

Power plant site preparation activities would begin with clearing, earthwork, drainage, fencing and other improvements necessary for commencement of construction. Clearing would include removal of organic material, stumps, brush and slash, and will be stockpiled onsite for interim reclamation purposes throughout the proposed Project Area. Fencing of the power plant sites would be required for security and safety during construction, and would be permanent throughout the life of the proposed Project.

A portion of the power plant sites and portions of the well pads would be devoted to equipment and materials laydown, storage, construction equipment parking, small fabrication areas, office trailers and parking. Equipment and materials laydown space is required for large turbine parts, structural steel, piping spools, electrical components, substation equipment, and building parts. Mobile trailers or similar suitable facilities (e.g., modular offices) would be brought to the site to be used as construction offices for owner, contractor, and subcontractor personnel, and would be located within the disturbed areas associated with power plant and well pad construction areas. Parking would be provided for construction workers and visitors within the power plant areas.

Temporary utilities would be provided for the construction offices, the laydown area, and the power plant sites. Temporary construction energy would be supplied by a temporary generator and, if available when the transmission line is completed, at the site by utility-furnished power. Area lighting would be provided for safety and security. Drinking water would be imported and distributed daily. Portable toilets would be provided throughout the site.

Consistent with safety requirements, power plant buildings, structures, pipe, etc. would be painted covert green to blend with the area and minimize visibility, pursuant to BLM Instructional Memorandum (IM) 2007-021.

Short and long term surface disturbance acreages associated with the power plants and substations can be found in Table 4.

Table 4: Surface Disturbance Associated with Geothermal Power Plants

	Short Term Disturbance (acres)	Long Term Disturbance (acres)
North Power Plant and Substation	0	16.0
South Power Plant and Substation	0	16.9
1 Short term disturbance is that surface disturbance which would undergo interim reclamation, in accordance with		

the Project reclamation plan (see Appendix B).
[2] Long term disturbance is that surface area which would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately 5 years to ensure that reclamation is successful, as determined by the appropriate agencies).

2.4.3 Design and Operation

The Ormat power plants will utilize an air-cooled binary geothermal design.

The geothermal fluids for the binary power plants would be produced from the production wells by pumping (see Figure 7). Once delivered to the power plants by the geothermal fluid production pipelines, the heat in the geothermal fluid would be transferred to the "binary" ("secondary" or "working") fluid in multiple stage, non-contact heat exchangers ("vaporizers"). The binary turbine units would use pentane (C_5H_{12}), a flammable but non-toxic hydrocarbon, as the binary fluid, which would circulate through each power plant in a closed loop. The heat from the geothermal fluid would vaporize the binary fluid, which would turn the binary turbine and electrical generator to make electricity.

The vaporized binary fluid would exit the turbine and be condensed back into a liquid in a air cooled condenser. The condensed binary fluid would then be pumped back to the vaporizers for re-heating and vaporization, completing the closed cycle.

The geothermal fluid exiting from the vaporizers would be pumped under pressure out to the geothermal injection wells through the injection pipelines and injected back into the geothermal reservoir. The geothermal fluid would flow through the binary power plant in a closed system, with minimal emissions of non-condensable gases to the atmosphere.

A contour map of the entire utilization site, showing production and injection well pads, pipeline routes, facility locations, and existing and planned access and lateral roads is found in Figure 5.

Air-cooled condensers are large, open structure air-cooled heat exchangers, and would be the most prominent features of the power plant, both with respect to height and mass. They range between 28 and 35 feet in height and are about two-thirds the length of the site. Large finned tube radiators lie horizontal approximately 20 feet above the ground on steel beams. Large fans (about thirteen feet in diameter) on top of the tube assemblies draw ambient air at the dry bulb temperature up through the tubes, cooling and condensing the binary vapor flowing through the inside of the tubes.

Typical power plant maintenance activities include cleaning and repairing the heat exchanger tubes, repairing or replacing the turbines, replacing pumps which move the fluid, and repainting, as necessary.

2.5 Site Access and Road Construction

The Project site is accessed from the south off US Highway 50 by traveling approximately five miles east of the community of Austin in Lander County, Nevada. Turn left onto Grass Valley Road and continue north approximately 10 miles. Proceed to the signed area on the east side of the road, between mile 10 and 11.

The proposed Project area is traversed by numerous roads and "two-tracks." New access roads associated with utilization of the geothermal resource would be constructed using a dozer and/or road grader. New access roads would be required as follows (see Figure 5):

- Approximately 1,245 feet would be constructed for pipeline access between 67-15 and 87-15;
- Approximately 2,295 feet would be constructed for pipeline access to well 67A-9;
- Approximately 990 feet would be constructed to access the northernmost power plant; and
- Approximately 1,305 feet would be constructed to access the southernmost power plant.

A typical plan view of an access road is shown on sheet C-1, Civil Site Plan and typical cross sectional views are shown on sheet C-2, Profiles and Details (see Appendix A).

Short and long term surface disturbance acreages associated with new access road construction within the McGinness Hills Unit Area as identified above can be found in Table 5.

Table 5: Access Road Surface Disturbance

	Short Term Disturbance (acres) [1]	**Long Term Disturbance (acres)** [2]
Public Land Access	0.65	2.65

[1] Short term disturbance is that surface disturbance which would undergo interim reclamation, in accordance with the Project reclamation plan (see Appendix B).
[2] Long term disturbance is that surface area which would remain disturbed during the approximately 35 year period that includes project construction and operations (30 years), project decommissioning and final reclamation (approximately 5 years to ensure that reclamation is successful, as determined by the appropriate agencies)..

Constructed access roads crossing existing drainages may require the installation of culverts. Culvert installation would follow BLM design criteria and would be constructed pursuant to standards established in the Gold Book. (Fourth Edition – Revised 2007).

2.6 Water Requirements and Source

Water required for construction of each power plant and the associated pipelines (including earthwork, erosion control, concrete, finishing subgrade and aggregate base) is estimated to be 17.6 acre feet throughout the 2 year construction period.

Water required for construction activities would be obtained from a water well (Lancaster B well) on private land at the Grass Valley Ranch (T. 21 N., R. 46 E., SE1/4NW1/4, Section 16). This water would be trucked from Lancaster B to the construction sites. Ormat has obtained a waiver from the Nevada State Water Engineer (Nevada Department of Water Resources) for the use of the Lancaster B well.

A water well, which would be used for domestic purposes only, would be drilled at each power plant site. Water consumption from each well would be approximately 2.5-3.0 af/yr throughout the life of the Project.

Portable toilets would be provided throughout the site, office and travel trailers and would connect to temporary, above-ground, septic holding systems.

2.7 Aggregate Requirements and Source

As much as possible, native materials (derived from grading to balance cut and fill) would be used for power plant site and road building materials. Approximately 45,000 yards of surfacing material may be needed for power plant and pipeline construction (engineering calculations used to determine aggregate needs are combined with the provided civil work).

Aggregate material would be obtained from the Lander County Free Use Permit located in the NW1/4NE1/4 of Section 21, T.20N., R.45E. (see Figure 3).

2.8 Surface Reclamation

The estimated life of the Project is 30 years, consistent with the issued site license (43 CFR 3273.22(a)

A complete reclamation plan is provided as Appendix B. A general description of Project reclamation activities is provided below.

Once drilling is complete, the shoulders of the pads could be reclaimed, but the majority of the pad must be kept clear for ongoing operations and the potential need to work on or re-drill the well. The portions of the cleared well sites not needed for operational and safety purposes would be recontoured to a final or intermediate contour that would blend with the surrounding topography as much as possible. Areas able to be reclaimed will be ripped, tilled, or disked on contour, as necessary. Public lands managed by the BLM would be reseeded with the appropriate seed mixes. The stockpiled topsoils will also be spread on the area to aid in revegetation.

At the end of Project operations the wells would be plugged and abandoned. Abandonment typically involves filling the well bore with clean, heavy abandonment mud and cement until the top of the cement is at ground level, which is designed to ensure that fluids would not move across these barriers into different aquifers. The well head (and any other equipment) would then be removed, the casing cut off well below ground surface and the hole backfilled to the surface.

Areas able to be reclaimed will be ripped, tilled, or disked on countour, as necessary and reseeded with certified weed-free native grasses and forb seed mixes per BLM standards.

Reclamation of the roads would include recontouring the road back to the original contour, seeding and controlling noxious weeds. Reclamation may include other techniques to improve reclamation success, such as ripping, scarifying, replacing topsoil, pitting and mulching.

Pipeline reclamation would include placing fill in the trench, compacting the fill, regrading cut-and-fill slopes to restore the original contour, replacing topsoil and revegetating in accordance with a reclamation plan.

The power plants and all other above-ground facilities and areas of surface disturbance associated with geothermal development would be removed and reclaimed. Any stormwater diversion would remain in place until successful revegetation is attained (see Sheet C2 in Appendix A for stormwater diversion details).

2.9 Workforce and Schedule

Project construction could require up to 50 workers, although substantially fewer would be on site most of the time during construction, as the construction activities would be staged. Construction of the two power plants and well field facilities would take approximately 12 to 24 months to complete once all permits are obtained and equipment orders are scheduled. It is anticipated that the construction workers would reside in Austin at either the RV Park or at a church camp facility off of Grass Valley Road.

If the power plants are remotely operated, 5-8 workers would be needed. If the power plants are not remotely operated, approximately 8-15 workers would be needed. All workers/employees would be expected to live in Austin. The plants would be operated 24 hours per day, 365 days per year. Flow, temperature and pressure would be continuously monitored. Well integrity would be tested every five years. Commercial operations are anticipated to commence at the end of the last quarter of 2011.

3 ENVIRONMENTAL PROTECTION

3.1 Adopted Protection Measures

Ormat would comply with all stipulations that are applicable to the proposed Project operations on the geothermal leases. In addition, Ormat would implement the following additional environmental protection measures:

- Water would be applied to the ground during the construction and utilization of the drill pads, access roads, and other disturbed areas as necessary to control dust.
- Portable chemical sanitary facilities would be available and used by all personnel during periods of well drilling and/or flow testing, and construction. These facilities would be maintained by a local contractor.

- To prevent the spread of invasive, nonnative species, all vehicles, heavy earth-moving construction equipment, mobile trailers and RV campers brought to and used on the Project site would go through high pressure washing of the entire vehicle/unit at a commercial wash station prior to arriving and/or being used on the Project site.
- On public lands managed by the BLM, revegetation will include site appropriate seed mixtures for various ecological site types encountered. Disturbed areas will be reseeded with a diverse mix of perennial native or introduced plant species. Noxious, invasive, and non-native seeds listed in the Nevada Designated Noxious Weed List (Nevada Administrative Code 555.010) or prohibited by the Federal Seed Act (7 CFR Part 201) will be excluded. Seed mixtures will be subject to the approval of the BLM. All construction and operating equipment would be equipped with applicable exhaust spark arresters. Fire extinguishers would be available in all vehicles/equipment, and would be available on the active sites. In addition to requirements that 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 BLM regulations.
- Cut and fill activities have been minimized through the selection of the power plant sites and pipeline routes. Off-site storm water would be intercepted in ditches and channeled to energy dissipaters as necessary to minimize erosion around the power plant. To minimize erosion from storm water runoff, access roads would be maintained consistent with the best management practices applicable to development roads. BLM best management practices for storm water would be followed, as applicable, on public lands.
- Geothermal fluids would not be discharged to the ground under normal operating conditions. Accidental discharges of geothermal fluids are unlikely because of frequent inspections, ultrasonic testing of the pipeline, flow and pressure monitoring and well pump and pipeline valve shutdown features.
- Following project construction, areas of disturbed land no longer required for operations would be reclaimed to promote the reestablishment of native plant and wildlife habitat.
- The power plant, pipelines, wellheads, pump motors and motor control buildings would each be painted covert green to blend with the area and minimize visibility.
- Ormat will obtain and comply with an Underground Injection Control (UIC) permit, as appropriate.
- Speed limits of 20-25 mph would be maintained for Project related travel through the Project Area (USDI and USDA 2007, p. 25-26).
- Noise would be minimized through operational practices using best available control technology (BACT). Vinyl fencing slats would be used, and the plant design would be reviewed for opportunities to reduce noise.
- A Wildland Fire Mitigation Plan, Spill or Discharge Contingency Plan and Hydrogen Sulfide Contingency Plan have been submitted.
- A reclamation plan describing interim and final reclamation procedures for this Project has been submitted and is provided as Appendix B.
- As a condition of approval, Ormat would obtain and comply with provisions of a waiver from the Nevada State Water Engineer (Nevada Department of Water Resources) for the

use of the Lancaster B well to obtain a maximum of 30.6 acre feet of water for construction purposes.

In addition to the environmental protection measures identified above, the following sections further describe how resources will be protected.

3.2 Fire Prevention and Control

All Federal, state, and county laws, ordinances, rules, and regulations, which pertain to prevention, pre-suppression, and suppression of fires, would be strictly adhered to. All personnel would be advised of their responsibilities under the applicable fire laws and regulations.

The contractor would be responsible for any fire started, in or out of the project area, by its employees or operations during construction. The contractor would be responsible for any costs associated with fire suppression and rehabilitation. Prior to the arrival of federal firefighting forces, the contractor would take aggressive action to prevent and suppress the spread of wildland fires caused by the contractors' employees or operations within the Project Area. When reporting a fire to CNIDC, specific information will be provided, preferably coordinates (lat./long.), size of fire, exactly what is burning, and wind speed and direction.

Wildfire suppression is the responsibility of the BLM and USFS on public lands surrounding the project area.

All construction and operating equipment would be equipped with applicable exhaust spark arresters. Fire extinguishers will be in all vehicles/equipment, and would be available on the site. In addition to requirements, 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. A water tank would also be onsite and the water would be used to fight fires, should it be necessary to do so. The facility would also have a fire monitor onsite and would have water storage associated with the back-up diesel generators which could also be used to fight fires.

A Wildland Fire Management plan is provided below.

<u>Wildland Fire Management Plan</u>

1. Any small fires which occur around the well pad during drilling and/or testing operations should be able to be controlled by rig personnel utilizing on-site firefighting equipment.

2. The Central Nevada Interagency Dispatch (CNIDC) would be notified immediately of any and all fires (775.623.1555 during business hours, 775.623.3444 after business hours). Subsequnetly, the BLM Battle Mountain District Office (775.635.4000) would be notified of any wildland fire, even if the available personnel can handle the situation or the fire poses no threat to the surrounding area.

3. A roster of emergency phone numbers would be available onsite so that the appropriate firefighting agency can be contacted in case of a fire.

4. All vehicles shall carry at a minimum a shovel and ten gallons of water (preferably in a backpack pump), in addition to a conventional fire extinguisher.

5. Adequate fire fighting equipment (a shovel, a pulaski, standard fire extinguisher(s), and at least a 100 gallon water tank with pump) shall be kept readily available at each active drill site.

6. Vehicle catalytic converters (on vehicles that would enter and leave the drill site on a regular basis) shall be inspected often and cleaned of all flammable debris.

7. All cutting/welding torch use, electric-arc welding, and grinding operations shall be conducted in an area free, or mostly free, from vegetation. At least a 100 gallon water tank with pump, and shovel shall be on hand to extinguish any fires created from sparks. A welding tent would be used, as appropriate. At least one person in addition to the cutter/welder/grinder shall be at the work site to promptly detect fires created by sparks.

8. Personnel would be responsible for being aware of and complying with the requirements of any fire restrictions or closures issued by the BLM Battle Mountain District Office (BMDO), as publicized in the local media or posted at various sites throughout the district. When conducting operations during the months of May through September, the operator must contact the BLM Battle Mountain District Office, Division of Fire and Aviation (775.635.4000) to find out about any fire restrictions in place for the area of operation and to advise the BMDO of approximate beginning and ending dates for project activities.

3.3 Prevention of Soil Erosion

To minimize erosion from storm water runoff, access roads would be maintained consistent with the best management practices to development roads. BLM best management practices for storm water would be followed, as applicable, on public lands. Existing roads would be evaluated and properly graded and repaired in areas that show evidence of enhanced erosion. All new access roads would comply with the plan to minimize erosion and off-site sedimentation. Exposed soils would be watered to minimize wind erosion. Topsoil piles would be covered to minimize wind erosion of dust during wind storms. Cut and fill activities would be minimized through the selection of the power plant site and pipeline routes.

A site drainage and runoff management plan would be prepared. Off-site storm water would be intercepted in ditches and channeled to energy dissipaters as necessary to minimize erosion around the power plant.

3.4 Surface and Ground Water Protection

Geothermal fluids would not be discharged to the ground under normal operating conditions. Accidental discharges of geothermal fluids are unlikely because of frequent inspections, ultrasonic testing of the pipeline, flow and pressure monitoring and well pump and pipeline valve shutdown features. Further, geothermal wells are cased to prevent co-mingling of the geothermal fluids with underground aquifers.

3.5 Fish and Wildlife Protection

There is no known fish habitat within the proposed project area.

Many disturbed areas can begin to be reclaimed almost immediately after construction is completed. Erosion control measures after construction would include revegetation and periodic maintenance. Disturbed areas that would not be used after construction would be revegetated with the proper seed mixture and planting procedures prescribed by the BLM. Any topsoil enriched in organic material may be stockpiled on previously disturbed areas and applied to enhance areas to be reclaimed by revegetation. Periodic maintenance of the power plant site would be conducted as needed to minimize continual erosion.

To prevent undue degradation and removal of habitat, cover and food, existing roads would be used whenever possible and cross country travel would be restricted to designated construction areas. Speed limits of 20 - 25 mph would be observed on all unpaved roads in the project area in order to minimize dust and avoid collision and incidental death of local wildlife. Furthermore, the power plant site would be fenced to prevent wildlife from entering.

3.6 Cultural Resource Protection

Cultural resource surveys have been conducted and completed. In consultation with USFS, BLM, and the State Historic Preservation Office (SHPO) concurrence, cultural resources determined eligible for inclusion on the National Register of Historic Places (NRHP) or whose eligibility for inclusion on the NRHP is unevaluated will either be avoided, or an historic properties treatment plan (HPTP) will be developed and implemented.

In the event of an unplanned discovery, activities associated with the undertaking within 100 meters of the discovery are halted and the discovery is appropriately protected, until the BLM Authorized Officer issues a Notice to Proceed (NTP).

Ormat employees, contractors, and suppliers will be notified that damage to archaeological sites will be avoided, to avoid incurring penalties associated with the Native American Graves Protection and Repatriation Act (NAGPRA: 43 CFR 10),which protects items of cultural patrimony, Native American funerary items, Native American remains and sacred objects. Additionally, the Archaeological Resources Protection Act (ARPA: 43 CFR 7.4, 7.14, 7.15, 7.16) provides for civil and/or criminal penalties for the disturbance of archaeological resources on federal lands and if such disturbance is the result of activities conducted by Ormat, they could

be liable for such damages. If cultural resources, Native American remains, funerary items, scared items, or objects of cultural patrimony are discovered, Ormat must cease operations in the vicinity of the discovery and ensure adequate protection to the discovery, then notify the BLM immediately, by telephone, with written confirmation to follow (43 CFR 10.4 (c), (d), (g); Nevada State Protocol Agreement VIII (b)). Notification should be made to Christopher J. Cook, Field Manager, Mount Lewis Field Office, 775/635-4000. No activity in the vicinity of the discovery should resume until Ormat has been issued a NTP by the Authorized Officer.

Nevada Revised Statutes 383.170 applies to Native American burials found on private lands

3.7 Visual Resource Protection

The power plant, pipelines, wellheads, pump motors and motor control buildings would each be painted an appropriate BLM-approved color (covert green) to blend with the area and minimize visibility. The fence constructed around each of the production well sites would also be painted an appropriate BLM-approved color (covert green) to blend with the area.

3.8 Noxious Weed Resource Protection

State of Nevada listed noxious weed surveys were conducted which identified noxious weeds in the Project area(s). Noxious weeds within the construction area are to be addressed by the initiation of mitigation measures in consultation with the BLM noxious weed management specialists. ROW monitoring and noxious weed abatement prior to and following construction would be required by the BLM. Initially, proposed noxious weed mitigation measures designed to avoid the spread of noxious weeds would include: 1: All vehicles, heavy earth-moving construction equipment, mobile trailers and RV campers brought to and used on the Project site(s) would go through high pressure washing of the entire vehicle/unit at a commercial wash station on private lands prior to arriving and/or being used on the Project site(s). 2: Purchase and use of certified noxious weed free hay and straw bales at all times on the Project site(s). 3: Seed mixes for the rehabilitation and/or re-vegetation of all disturbed areas related to this Project will be certified as weed-free per BLM standards.

3.9 Minimization of Air Pollution

Ormat would comply with any air quality requirements prescribed by the Nevada Division of Environmental Protection – Bureau of Air Pollution Control (NDEP-BAPC). Compaction of the power plant site and any potential new well pads during construction, and gravel placed on the access roads would alleviate a large portion of the fugitive dust emissions. In addition, watering the ground would be used to reduce dust emissions during construction. State of the art equipment and design would be used to ensure minimal emissions of pentane. The power plant would not have any air emissions during normal operation.

There would be no non-condensable gas emissions during normal operations. However, some of the binary working fluid would be released to the atmosphere from rotating seals and flanges and from the process to purge the buildup of air leaking into the binary turbine condenser. These

binary working fluid emissions would be regulated and monitored under a Class II (non-major) permit issued by the NDEP-BAPC.

Ormat would continue to maintain its Surface Area Disturbance (SAD) permit with the NDEP-BAPC, and continue to implement the required actions to minimize fugitive dust emissions, during the well drilling and construction phases of the project. Once the plant is operational, the SAD regulation would continue as a part of the Project NDEP-BAPC Air Quality Operating permit.

3.10 Minimization of Noise Pollution

To abate noise pollution, mufflers would be used on all drilling rig engines. Each well pad may have one rock muffler. Rock mufflers are approximately 30 feet tall with a diameter of about 10 feet and are used to attenuate steam venting noise during well testing. Construction and drilling noise would be minimized through operational practices (best available control technology, BACT), which would avoid or minimize practices that typically generate high noise levels or distinctive noise impacts.

3.11 Minimization of Hazards to Public Health and Safety

Construction and operation activities would be conducted in a manner to avoid creating any hazards to public health and safety. The project is remotely located and would not likely cause hazards to public health and safety. The following spill or discharge contingency plan is provided below:

<u>Spill or Discharge Contingency Plan</u>

1. Potential Sources of Accidental Spills or Discharges

a. Geothermal Fluid

Accidental geothermal fluid spills or discharges are very unlikely because the hole would be cased and blowout prevention equipment would be utilized. However, accidental discharges or spills could result from any of the following:

(1) Loss of well control (blowout);

(2) Pipeline leak or rupture;

(3) Leakage from test tank

b. Drilling Muds

Muds are a mixture of water, non-toxic chemicals and solid particles used in the drilling operations to lubricate and cool the bit in the hole, to carry cuttings out of the hole, to maintain

the hole condition and to control formation pressure. Drilling muds are prepared and stored in metal tanks at the drilling site. Waste drilling mud and cuttings are discharged into the reserve pit, which is open and is adequately sized to hold the volume necessary for the operation. Accidental discharges of drilling mud are unlikely, but could occur by:

(1) Overflow of the reserve pit;

(2) Reserve pit wall seepage or wall failure;

(3) Discharge from equipment failure on location; or

(4) Shallow lost circulation channeling to the surface.

c. Lubricating or Fuel Oils and Petroleum Products

A discharge of this type would probably be very small and be from equipment used in the field. To minimize the potential for spills, all petroleum products on site are labeled, stored and handled in conformance with applicable federal and state requirements. All materials except diesel fuel are stored in the original shipping containers. Diesel fuel is stored in on-board tanks on the drill rig and replenished from a bulk tank truck using an electric transfer pump and hard lines. Supervisors trained in spill prevention, containment and clean-up are on-site 24 hours a day. Potential locations for accidental spills are:

(1) Drilling equipment and machinery at and around the drilling location;

(2) Other miscellaneous equipment and machinery at well site and roads;

(3) Storage areas; and

(4) Equipment servicing areas.

d. Construction/Maintenance Debris

Trash shall be contained on-site and hauled to an approved landfill (the Austin transfer station). Burial of trash on-site shall not be permitted.

e. Hydrogen Sulfide Contingency Plan

1. Although there is very little chance that drilling in these moderate-temperature geothermal reservoirs would encounter substantial hydrogen sulfide, continuous hydrogen sulfide monitors would be on the rig floor and at the mud tanks and shaker to alert workers should elevated hydrogen sulfide levels be detected. Self contained air packs would be on site for use by workers in an emergency. Signs would be posted to inform workers and visitors of any potential issues.

2. Drilling parameters would be continuously monitored, and any changes in gas concentrations, formation pressures, or potential for flow are provided to the driller and supervisor. The BOPE would be in place to shut off any unexpected gas flows. In the event of any evidence of high gas concentrations are detected in the drilling fluids, the drilling fluids consultant would obtain materials and design a program to safely circulate out the gas bubble and to treat and remove any hydrogen sulfide using caustic soda, caustic soda and peroxide or other technology as appropriate.

2. Plan for Cleanup and Abatement

In the event of discharge of formation fluids, drilling muds or petroleum products, the person responsible for the operation would make an immediate investigation, then contact the Drilling Supervisor and advise him of the spill. The Drilling Supervisor would in turn regulate field operations, or do other work as applicable for control and clean up of the spill, as follows:

a. Action - Small, Containable Spill

If the spill is small (i.e., less than 5 gallons) and easily containable without endangering the watershed, the Drilling Supervisor would direct and supervise complete cleanup and return to normal operations.

b. Action - Large or Uncontainable Spill

If the spill is larger than 5 gallons, or is not easily contained, or endangers, or has entered, the watershed, the Drilling Supervisor would proceed to take necessary action to curtail, contain and cleanup the spill, as above, and notify personnel as listed below.

c. Notification

(1) The Drilling Supervisor would, as quickly as practicable:

- Call out contractor(s), as required.
- Notify the Ormat Project Manager.
- Notify the local and state law enforcement agencies if the public safety is threatened.

(2) The Ormat Project Manager would notify the following as soon as practical and work closely with them in all phases of the curtailment, containment and cleanup operations:

Division of Minerals
State of Nevada
400 W. King
Carson City, NV 89703
775.684.7040

NDEP
Bureau of Water Pollution Control
901 S. Stewart Street
Carson City, NV 89706
775.687.9428

BLM, Battle Mountain District Office

50 Bastian Road
Battle Mountain, Nevada 89820
775.635.4000

CNIDC (if spill occurs after normal business hours)
775.623.1555

National Response Center
800.424.8802

The Drilling Supervisor would also advise local population and affected property owners if spill affects residents or property.

d. Specific Procedures

(1) For geothermal fluid spills:

- Contain spillage with dikes if possible and haul to disposal site by vacuum or water trucks or dispose of in a manner acceptable to the Division of Minerals and Bureau of Land Management.

(2) For drilling mud:

- Repair reserve pit or contain with dikes. Haul liquid to another reserve pit, available tanks or approved disposal site.

(3) For petroleum products:

- Contain spill with available manpower. Use absorbents and dispose of same in approved offsite disposal area.
- Spills of petroleum products in excess of 5 gallons must be reported to the Bureau of Land Management and Nevada Division of Environmental Protection as soon as possible, but no later than the end of the first working day of the release at:
    i. In-state: 775-687-9485
    ii. Out of state: 888-331-6337

For (1) through (3) above, Ormat would have the source of spill repaired at the earliest practical time, and continue working crews and equipment on cleanup until all concerned agencies are satisfied.

e. Confirm telephone notification to agencies and regulatory bodies. Telephone notification shall be confirmed by the Ormat Project Manager in writing within two weeks of telephone notification.

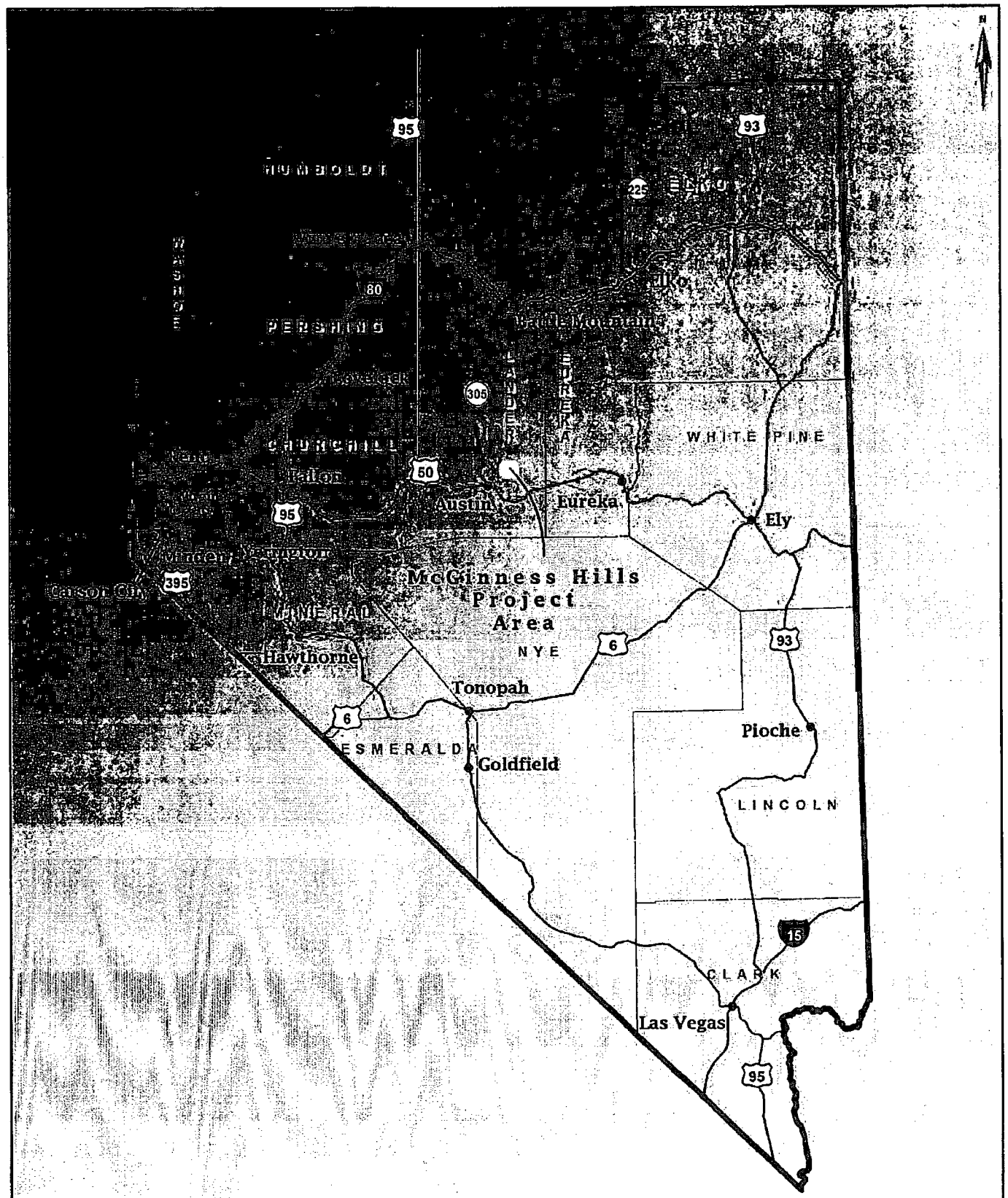
Written confirmation would contain:

(1) Reason for the discharge or spillage.

(2) Duration and volume of discharge or spillage.

(3) Steps taken to correct problem.

(4) Steps taken to prevent recurrence of problem



Nevada Major Towns

U.S. Highway

State Route

Interstate

0 10 20 40 Miles

1:3,500,000

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The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection.

Map Date : 05/12/2011

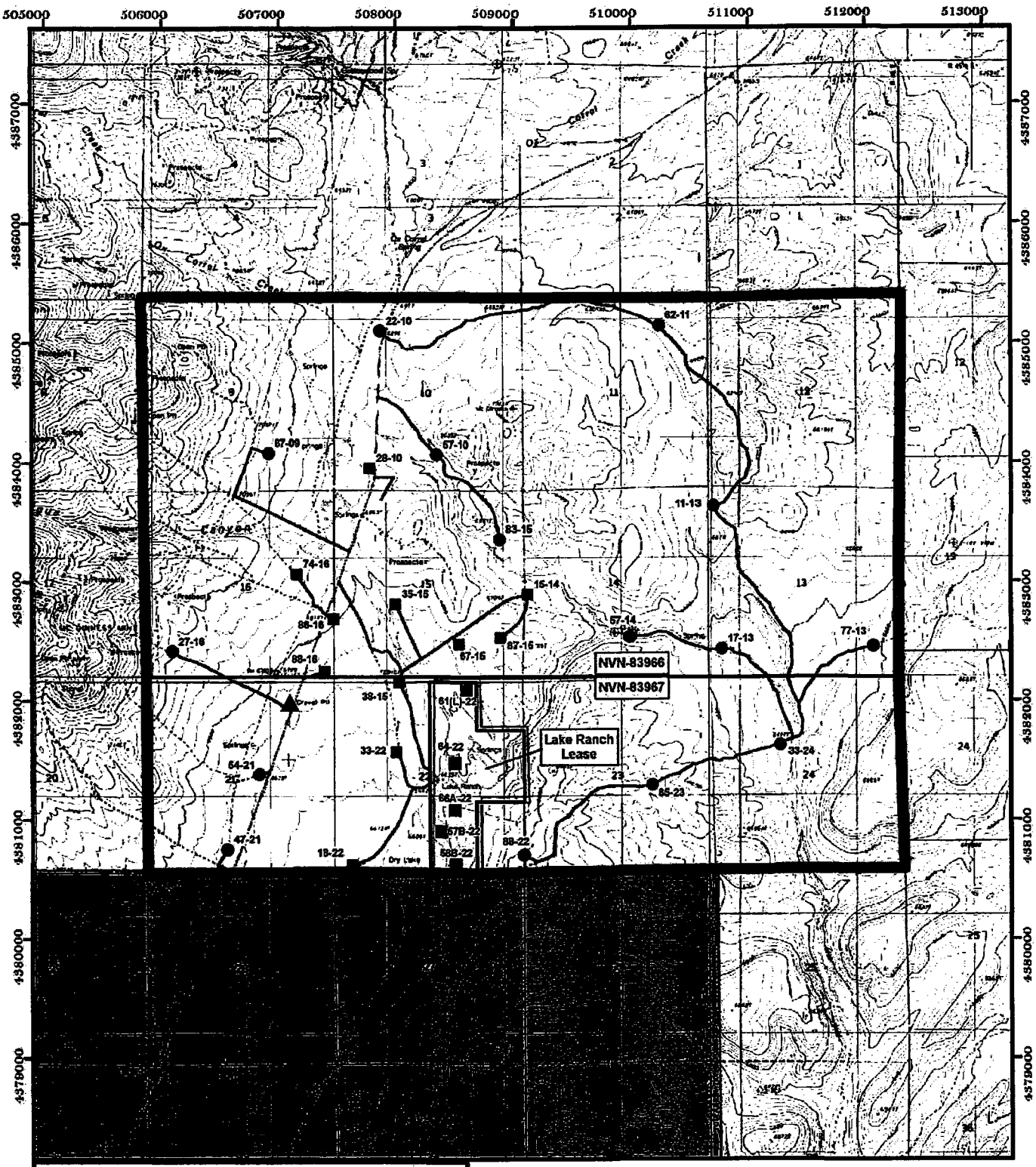
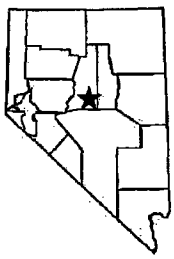


Figure 2: McGinness Hills Geothermal Exploration EA Approved Activities

- Previously Approved Access Roads
- Previously Approved Gravel Source
- Constructed Geothermal Wells
- Previously Approved Temperature Gradient Hole (TGH) Location
- Previously Approved TGH/Observation/Production Well Location
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private



N
W E
S

0 0.5 1 Mile

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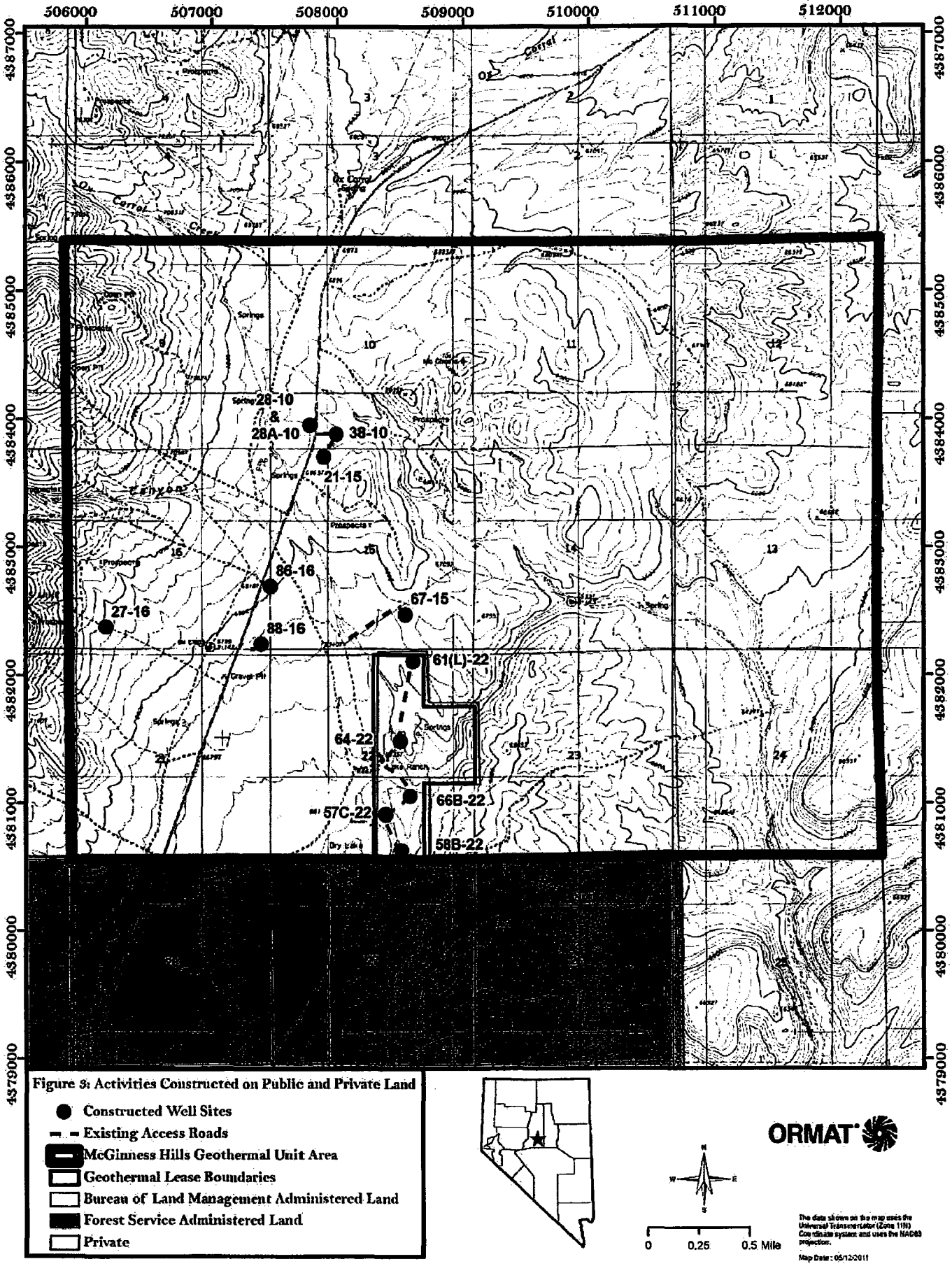

Figure 3: Activities Constructed on Public and Private Land

- Constructed Well Sites
- Existing Access Roads
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private

The data shown on the map uses the Universal Transverse Mercator (Zone 11N) Coordinate system and uses the NAD83 projection.

Map Date: 05/12/2011

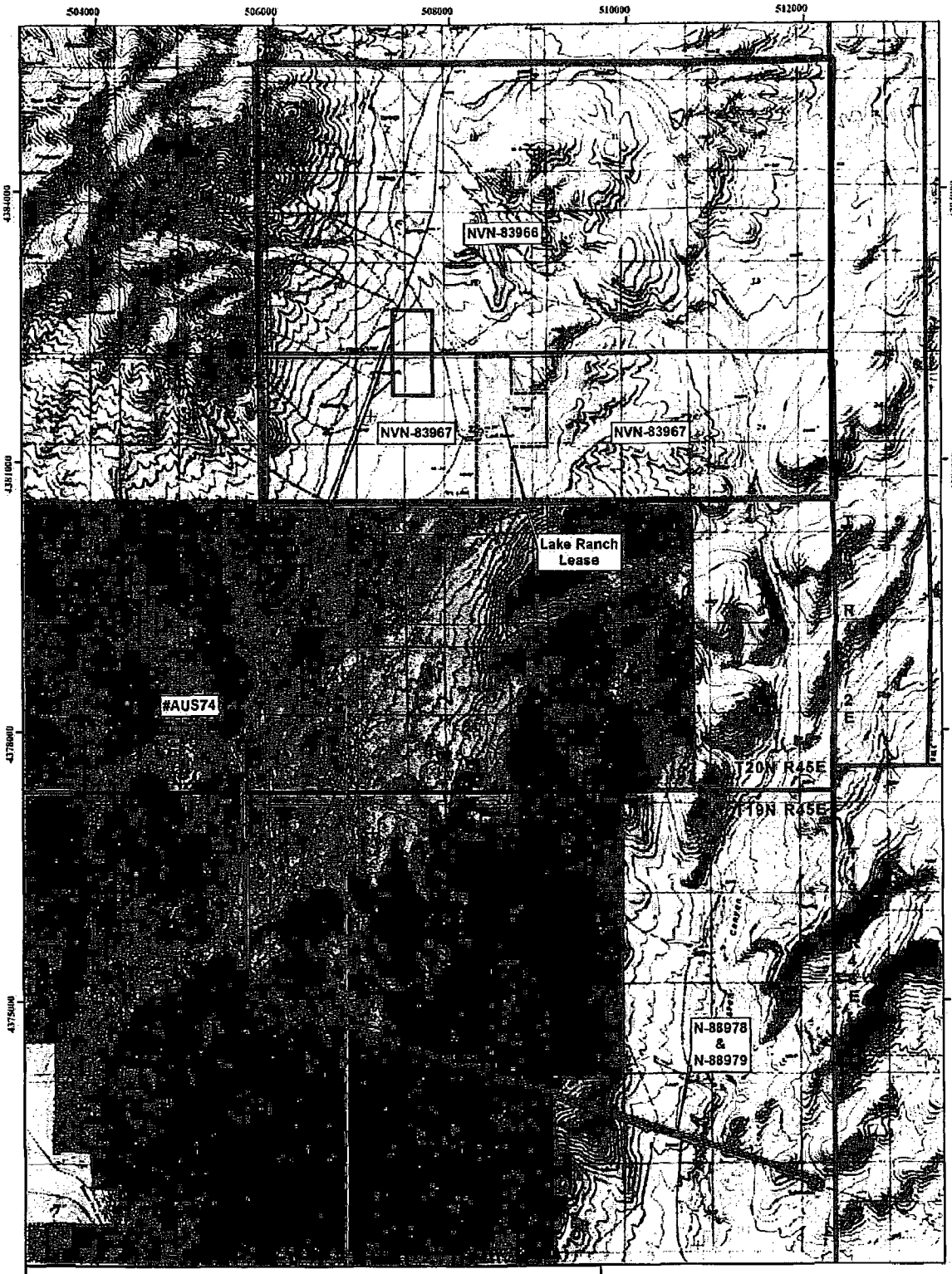

Figure 4: McGinness Hills Unit Area and Transmission Line Corridor Overview

- 230 kV Transmission Line-Proposed
- Project Area
- Development Area
- Water Pipeline-Proposed
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management
- Forest Service
- Private

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N W E S

0 0.5 1 Mile

The data shown on the map uses the Universal Transmercator (Zone 11N) Coordinate system and uses the NAD83 projection.

Map Date: 05/12/2011

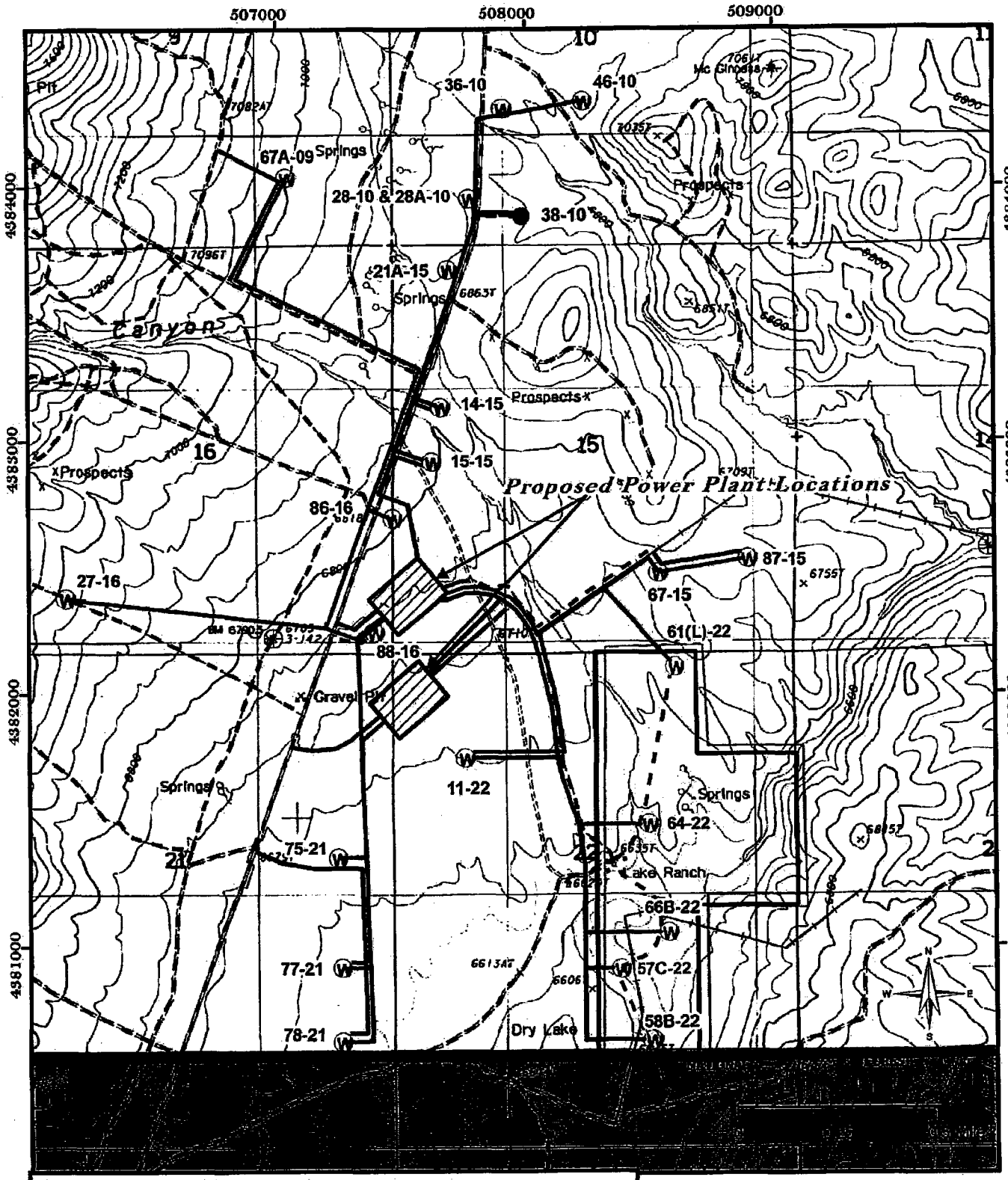
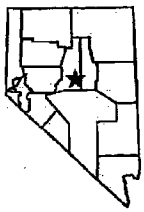


Figure 5: McGinness Hills Geothermal Development Project Components

- Production Well
- Injection Well
- Production Pipeline
- Injection Pipeline
- Proposed Access Roads
- Existing Access Roads
- Monitoring Well
- Fences
- McGinness Hills Geothermal Unit Area
- Geothermal Lease Boundaries
- Bureau of Land Management Administered Land
- Forest Service Administered Land
- Private



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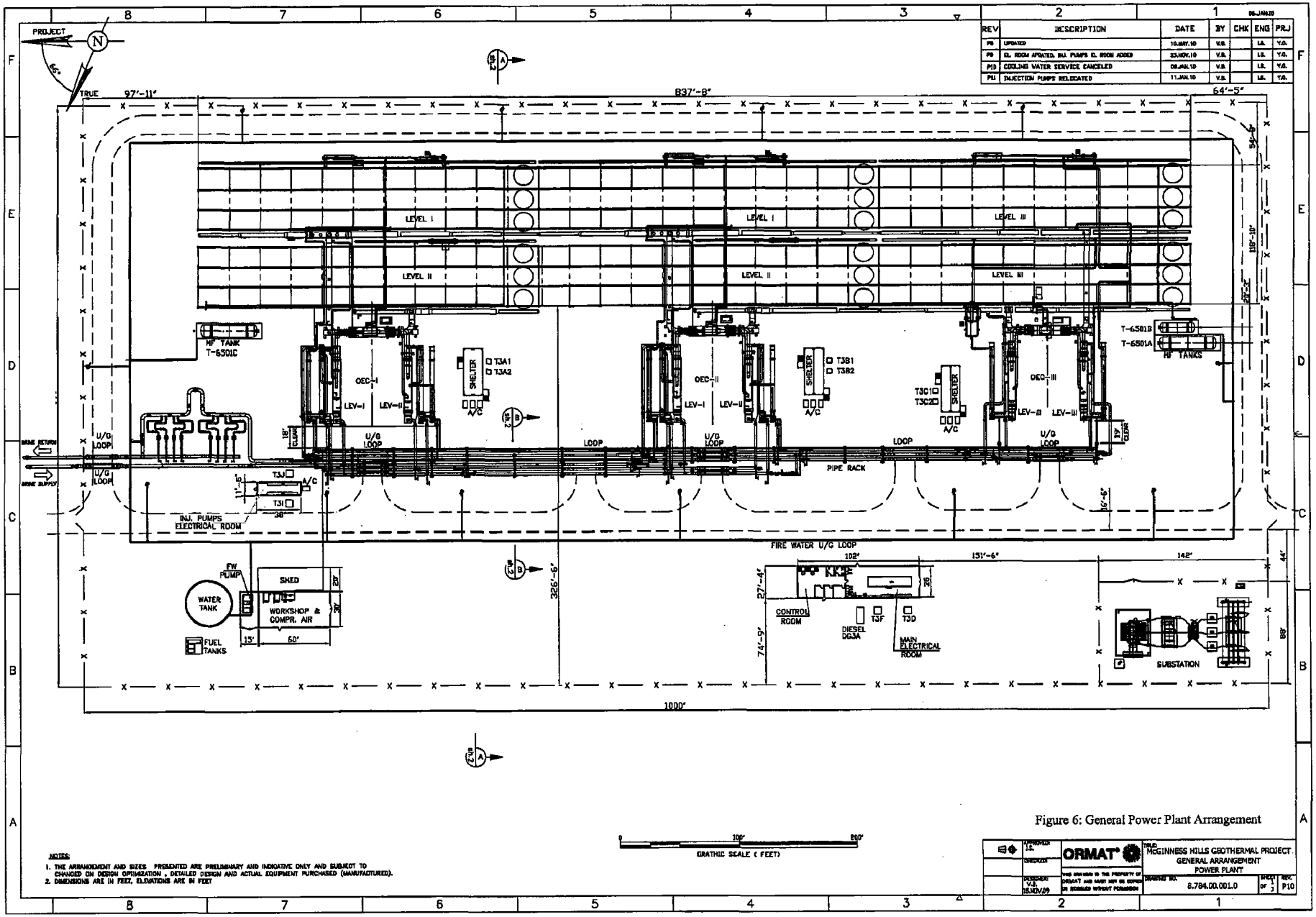


REV	DESCRIPTION	DATE	BY	CHK	ENG	PRJ
P8	UPDATED	10.MAY.10	V.S.		L.S.	Y.G.
P9	EL. ROOM APDATED, INJ. PUMPS EL. ROOM ADDED	23.NOV.10	V.S.		L.S.	Y.G.
P10	COOLING WATER SERVICE CANCELED	06.JAN.10	V.S.		L.S.	Y.G.
P11	INJECTION PUMPS RELOCATED	11.JAN.10	V.S.		L.S.	Y.G.

NOTES:
1. THE ARRANGEMENT AND SIZES PRESENTED ARE PRELIMINARY AND INDICATIVE ONLY AND SUBJECT TO CHANGED ON DESIGN OPTIMIZATION , DETAILED DESIGN AND ACTUAL EQUIPMENT PURCHASED (MANUFACTURED).
2. DIMENSIONS ARE IN FEET, ELEVATIONS ARE IN FEET

Figure 6: General Power Plant Arrangement

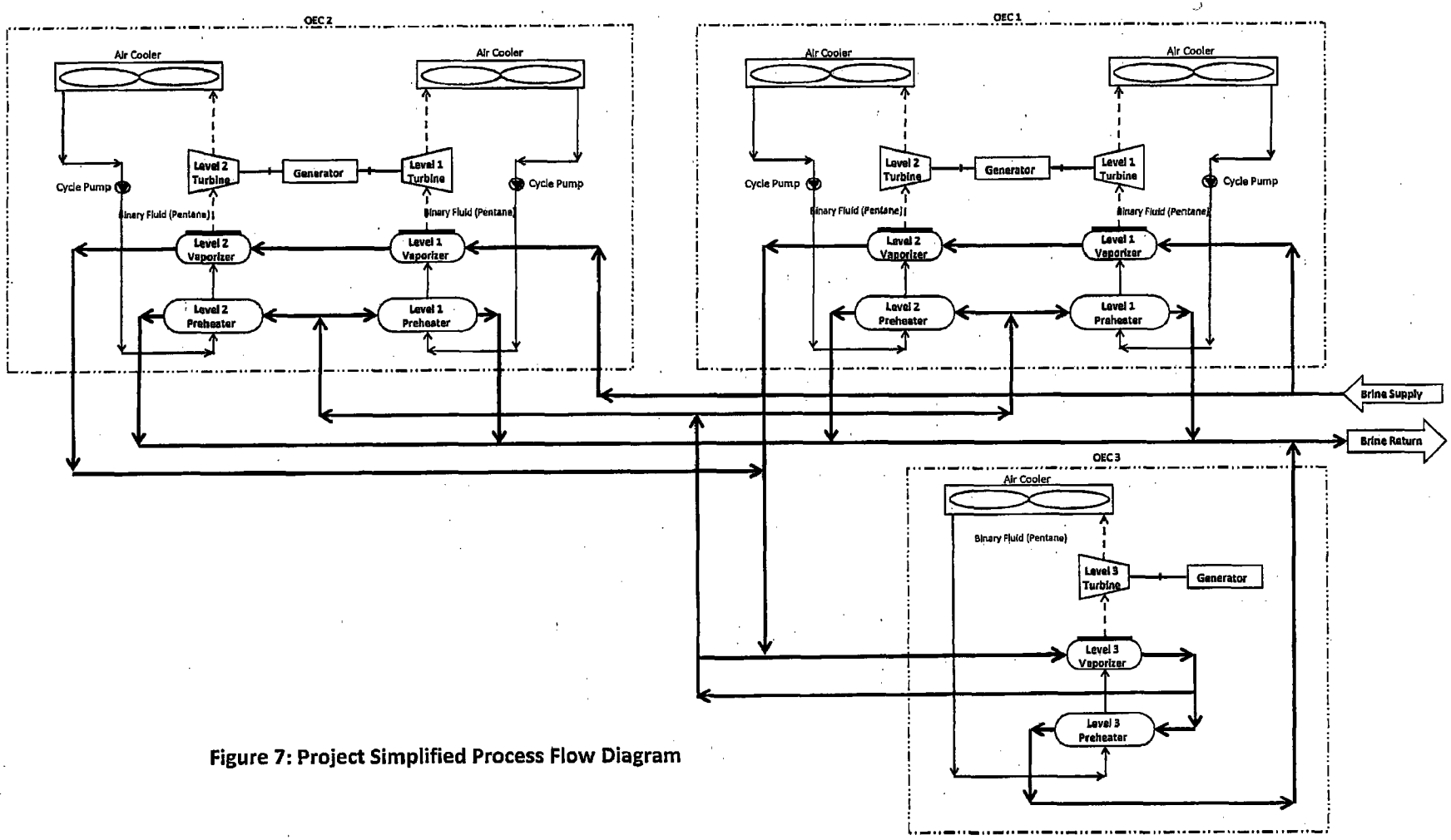
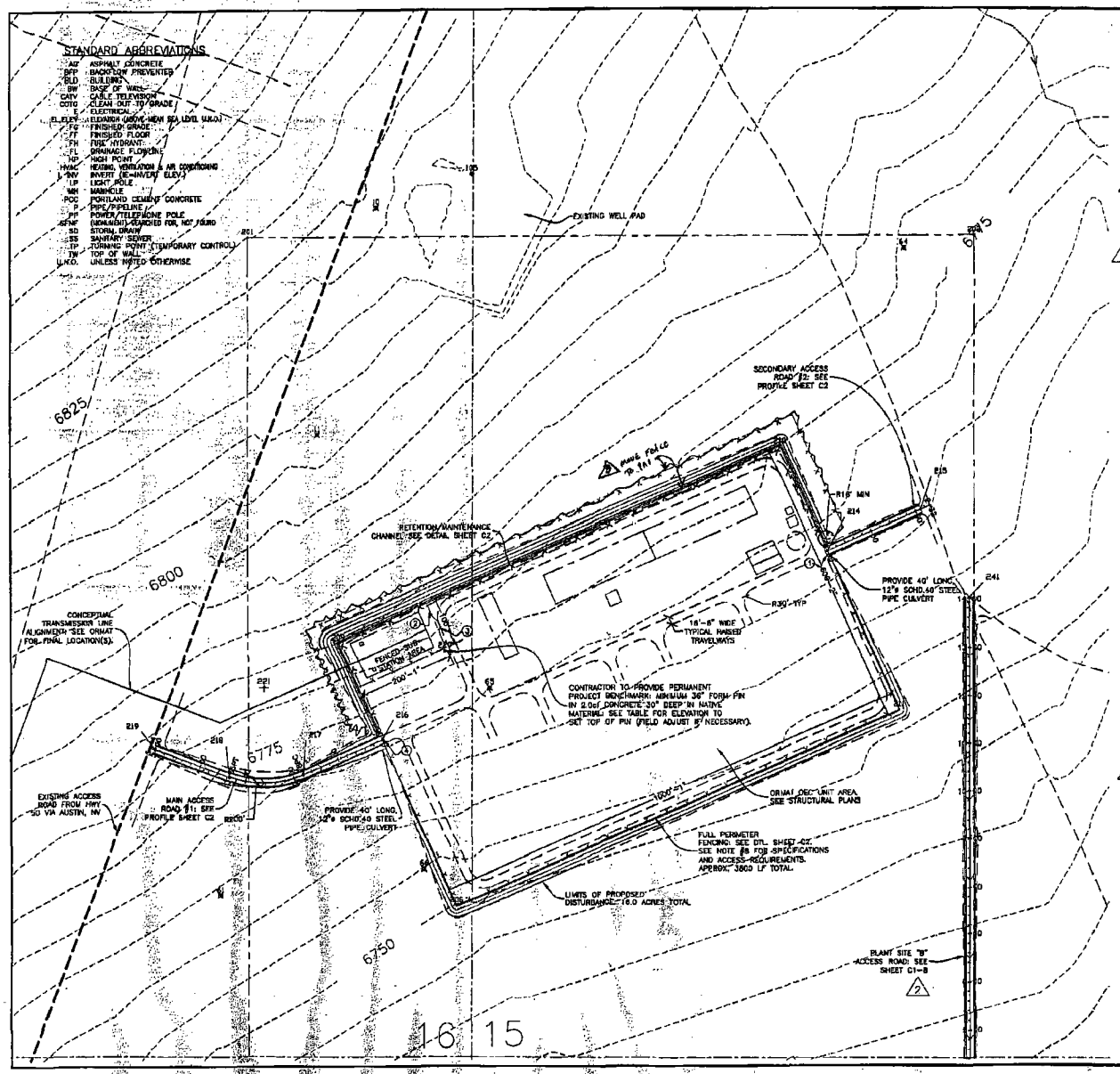


Figure 7: Project Simplified Process Flow Diagram

Appendix A: Civil Plans

STANDARD ABBREVIATIONS

AC	ASPHALT CONCRETE
BFP	BACKFLOW PREVENTER
BLD	BUILDING
BW	BASE OF WALL
CATV	CABLE TELEVISION
CO/TO	CLEAN OUT-TO-GRADE
E	ELECTRICAL
ELEV(+)	ELEVATION (ABOVE MEAN SEA LEVEL NAVD)
FG	FINISHED GRADE
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FL	DRAINAGE FLOWLINE
HP	HIGH POINT
HVAC	HEATING, VENTILATION & AIR CONDITIONING
INV	INVERT (IE=INVERT ELEV.)
LP	LIGHT POLE
MH	MANHOLE
PCC	PORTLAND CEMENT CONCRETE
P	PIPE/PIPELINE
PP	POWER/TELEPHONE POLE
SFMF	(NOM/MEDIU)-SEARCHED FOR, NOT FOUND
SD	STORM DRAIN
SS	SANITARY SEWER
TP	TURNING POINT (TEMPORARY CONTROL)
TW	TOP OF WALL
U.N.O.	UNLESS NOTED OTHERWISE



NOTES:

1) THIS PLAN IS PREPARED TO ILLUSTRATE TOPOGRAPHY AND FEATURES FOR ENGINEERING PLANNING AND DESIGN ONLY; NO INFORMATION SHALL BE CONSTRUED TO REPRESENT A FORMAL SURVEY OF THE SUBJECT PROPERTY.

2) BASIS OF ELEVATIONS: THE BASIS OF ELEVATIONS IS NAVD88, AS OBSERVED "McGINNESS" US NGS BENCHMARK (SEE CONSTRUCTION CONTROL BELOW).

3) BASIS OF BEARINGS: THE BASIS OF BEARINGS IS THE NEVADA STATE PLANE GRID, CENTRAL ZONE, NAD 83, GRID COORDINATES.

4) THESE PLANS ARE PREPARED TO SUPPORT POWER PLANT FEATURES TO BE SPECIFIED BY ORMAT, INC. MECHANICAL AND OTHER PLANS PREPARED BY ORMAT SUPERCEDE DIMENSIONS OR SPECIFICATIONS SHOWN ON THESE PLANS. ANY MATERIAL DISCREPANCY AFFECTING CONSTRUCTABILITY SHALL BE BROUGHT TO THE ATTENTION OF ROBISON ENGINEERING; NATHAN ROBSON AT (775) 882-2251.

1 5) EARTHWORK ESTIMATE:
89,000cy TOTAL PAD & ACCESS ROADS BALANCED CUT/FILL TO SUBGRADE
APPROX. 7800cy SURFACE COURSE +
APPROX. 200cy SURFACE COURSE REQUIRED FOR ACCESS ROADS

6) SEE STRUCTURAL PLANS FOR FOUNDATION SOIL PREPARATION REQUIREMENTS.

7) GRADING TOLERANCE ±0.3' AT SPOT ELEVATION LOCATIONS. SEE STRUCTURAL PLANS FOR FOOTING LOCATIONS AND ELEVATIONS (FOOTING RELATIVE ELEVATION TOLERANCE ±½")

2 8) SITE FENCING: ALL EXTERIOR FENCING SHALL BE VISUALLY OBSCURED BY THE USE OF ELM FENCING COLOR "_____". PLAN KEY AT FENCING: (1) PROVIDE DOUBLE 12' WIDE LOCKABLE SWING GATES FULL FENCE HEIGHT (2) PROVIDE 4' WIDE LOCKABLE MAN-GATE (3) PROVIDE DOUBLE 8' WIDE LOCKABLE MANUAL SWING GATES (4) PROVIDE 24' WIDE (MINIMUM) AUTOMATIC ROLLING GATE WITH KEYPAD ACCESS CONTROL: ORMAT APPROVAL OF PROPOSED GATE DETAILS REQUIRED. NOTE ALL DIMENSIONS THIS PLAN TO CENTER OF GATE.

LEGEND

- EXISTING GEOTHERMAL LEASE OR PRIVATE PROPERTY AS NOTED (REF.3)
- BLM GCDB SECTION LINES (REF.1)
- PROPOSED POWER LINE CENTERLINE (REF.3,4)
- 5' INTERVAL CONTOURS – EXISTING (SEE PLAN NOTE)
- EXISTING ROADS: MAIN ACCESS BOLD
- 61 CONSTRUCTION CONTROL: SEE TABLE
- 210 CONSTRUCTION LAYOUT POINTS: SEE TABLE

SURVEY & GEODETIC CONTROL TABLE
File> P:\Ormat\McGinness Project NV\McGinness Civil.crd

PointNo.	Northing(Y)	Easting(X)	Elev(Z)	Description
1	214471103.0	1569465.0	6794.8	NGS KD0128
2	214543182.5	1576064.4	7068.0	NGS McGinness KQ0341
3	214578311.0	1573127.0	6866.4	NGS KQ0127
4	214360114.0	1566876.0	6680.0	NGS KQ0123
10	214486865.5	1570801.8	6824.3	ORMAT BENCHMARK
11	214481941.	1570881.3	6809.8	#134 FORM PIN @ LATH
80	214513295.5	1572743.8	6921.9	CLAIM STAKE
81	214472340.0	1570478.4	6764.8	LATH MARKED "CL ROAD"
82	214485468.8	1570571.8	6706.4	CLAIM STAKE
83	214484560.0	1571895.8	6715.6	LATH MARKED "COR POWER PLANT"
84	214485777.7	1571892.0	6738.9	CLAIM STAKE
85	214475860.0	1571035.8	6771.4	CLAIM STAKE
86	214472868.4	1570900.0	6744.1	LATH MARKED "PAD CORNER"

1 CONSTRUCTION LAYOUT TABLE
File> P:\Ormat\McGinness Project NV\McGinness Civil.crd

PointNo.	Northing(Y)	Easting(X)	Elev(Z)	Description
201	214486604.0	1570538.0	6830.70	NW area ground elev
202	214486604.0	1570538.0	6775.44	NE area ground elev
203	214485504.0	1570538.0	6885.54	SE area ground elev
204	214485504.0	1570538.0	6889.12	SW area ground elev
208	214472111.0	1570967.8	6766.83	PLANT A-SW
209	214472769.3	1570723.8	6766.83	PLANT A-NW
210	214481661	1571637.4	6766.83	PLANT A-NE
211	214476178	1571881.5	6766.83	PLANT A-SE
214	214479845	1571736.1	6766.83	ACCESS RD
215	214480323.3	1571937.9	6765.63	ACCESS END
216	214478868.0	1570813.4	6768.83	ACCESS RD
217	214474885.6	1570850.4	6771.97	ACCESS PC
218	214474871.0	1570498.1	6776.22	ACCESS PT
219	214475402.2	1570341.9	6783.71	ACCESS END
220	214477427	1570944.7	6767.00	SET PLANT BENCHMARK
221	214476845.1	1570989.0	0.00	RADIUS PT
241	214478495.5	1572328.0	6757.81	ACCESS END

McGinness Project
Geothermal Power Plant
SHEET C1-A
PLANT SITE "A" CIVIL SITE PLAN
LANDCE DRAWS: 1-26-2011
PROJECT NO. 1-26-2011

PREPARED FOR:
ORMAT NEVADA, INC
6225 Neil Road
Reno, NV 89511
(775) 356-9029

Robison Engineering
Nathan Robson
Nevada Registered Professional Engineer
Nevada Registered Professional Land Surveyor
Nevada Registered Water Right Surveyor
Nevada Registered Water Right Engineer
DATE: 04-12-2010

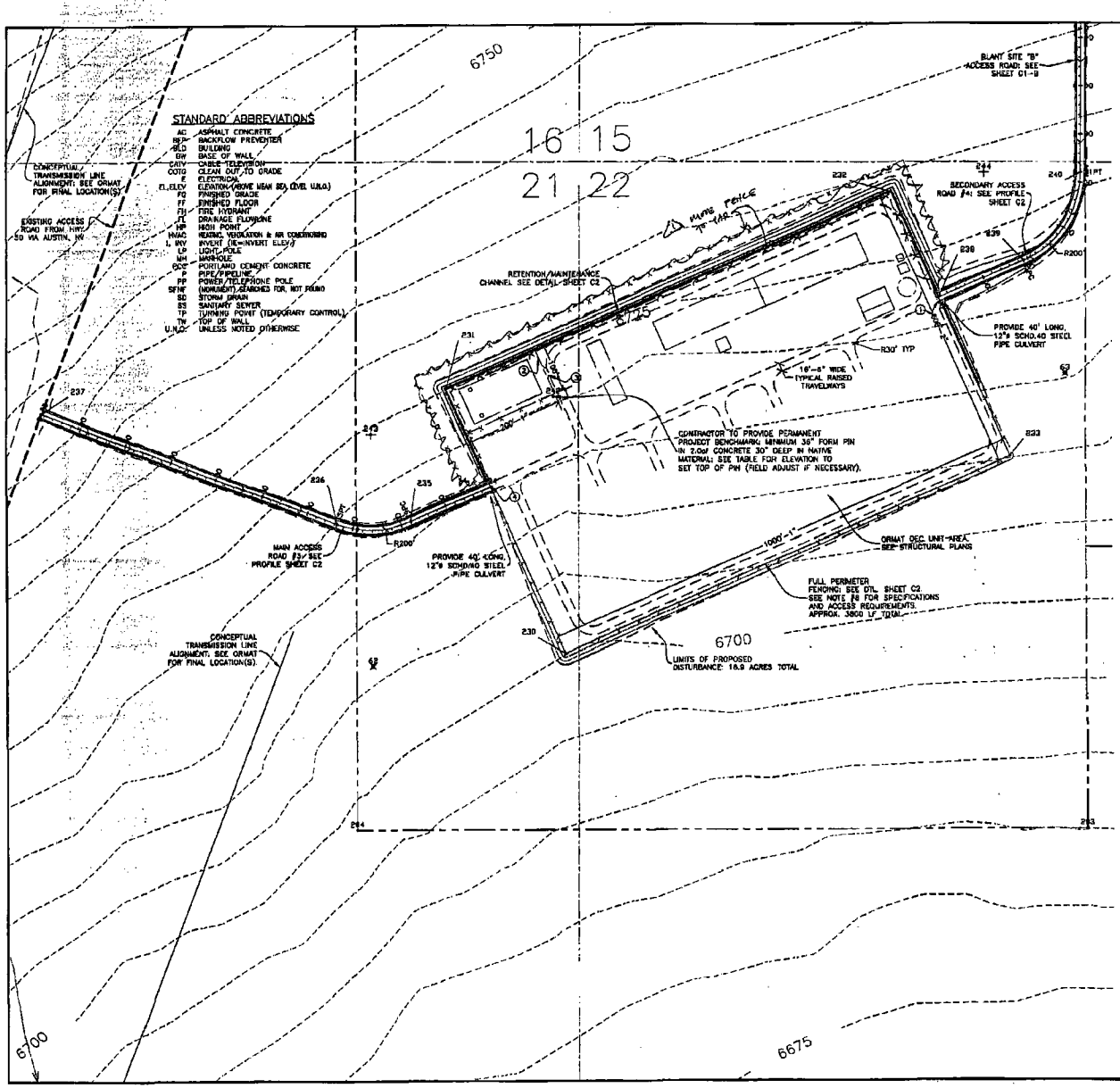
NATHAN ROBSON Exp. 6/30/11 CIVIL No. 15534
4/15/2011

NO	DESCRIPTION	DATE	BY	CH'CD
1	ORMAT PLANT LAYOUT & LOCATION FOR PERMITTING (REC'D 4/21)	5/25/10	NGR	NGR
2	NEW PLANT SITE "B" FEATURES	5/27/10	NGR	NGR
3	Executive Policy 1.11.12 PAD	4/15/11	NGR	NGR

REVISIONS

NO	REFERENCES
1	US BLM ELECTRONIC CADASTRAL DATABASE AT http://www.geocommons.com/ajax/bounds.kml
2	US NATIONAL ELEVATION DATASET AT http://seamless.usgs.gov/index.php
3	ORMAT, INC. PROJECT DRAWING 2010-01-25
4	ROBISON ENG. FIELD RECONNAISSANCE 2010-01-26
5	
6	

SHEET Cla OF 3



STANDARD ABBREVIATIONS

AC	ASPHALT CONCRETE
BFP	BACKFLOW PREVENTER
BLD	BUILDING
BW	BASE OF WALL
CATV	CABLE TELEVISION
COTG	CLEAN OUT TO GRADE
E	ELECTRICAL
EL,ELEV	ELEVATION (ABOVE MEAN SEA LEVEL U.N.O.)
FG	FINISHED GRADE
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FL	DRAINAGE FLOWLINE
HP	HIGH POINT
HVAC	HEATING, VENTILATION & AIR CONDITIONING
I, INV	INVERT (IE=INVERT ELEV.)
LP	LIGHT POLE
MH	MANHOLE
PCC	PORTLAND CEMENT CONCRETE
P	PIPE/PIPELINE
PP	POWER/TELEPHONE POLE
SFNC	(MONUMENT) SEARCHED FOR, NOT FOUND
SD	STORM DRAIN
SS	SANITARY SEWER
TP	TURNING POINT (TEMPORARY CONTROL)
TW	TOP OF WALL
U.N.O.	UNLESS NOTED OTHERWISE

NOTES:

1) THIS PLAN IS PREPARED TO ILLUSTRATE TOPOGRAPHY AND FEATURES FOR ENGINEERING PLANNING AND DESIGN ONLY; NO INFORMATION SHALL BE CONSTRUED TO REPRESENT A FORMAL SURVEY OF THE SUBJECT PROPERTY.

2) BASIS OF ELEVATIONS: THE BASIS OF ELEVATIONS IS NAVD88, AS OBSERVED "McGINNESS" US NGS BENCHMARK (SEE CONSTRUCTION CONTROL BELOW).

3) BASIS OF BEARINGS: THE BASIS OF BEARINGS IS THE NEVADA STATE PLANE GRID, CENTRAL ZONE, NAD 83, GRID COORDINATES.

4) THESE PLANS ARE PREPARED TO SUPPORT POWER PLANT FEATURES TO BE SPECIFIED BY ORMAT, INC. MECHANICAL AND OTHER PLANS PREPARED BY ORMAT SUPERCEDE DIMENSIONS OR SPECIFICATIONS SHOWN ON THESE PLANS. ANY MATERIAL DISCREPANCY AFFECTING CONSTRUCTABILITY SHALL BE BROUGHT TO THE ATTENTION OF ROBISON ENGINEERING; NATHAN ROBISON AT (775) 882-2281.

5) EARTHWORK ESTIMATE:
79,000cy TOTAL PAD & ACCESS ROADS BALANCED CUT/FILL TO SUBGRADE
APPROX. 7000cy SURFACE COURSE +
APPROX. 700cy SURFACE COURSE REQUIRED FOR ACCESS ROADS

6) SEE STRUCTURAL PLANS FOR FOUNDATION SOIL PREPARATION REQUIREMENTS

7) GRADING TOLERANCE ±0.3' AT SPOT ELEVATION LOCATIONS. SEE STRUCTURAL PLANS FOR FOOTING LOCATIONS AND ELEVATIONS (FOOTING RELATIVE ELEVATION TOLERANCE ±¾")

8) SITE FENCING: ALL EXTERIOR FENCING SHALL BE VISUALLY OBSCURED BY THE USE OF BLM FENCING COLOR "_____". PLAN KEY AT FENCING: (1) PROVIDE DOUBLE 12' WIDE LOCKABLE SWING GATES FULL FENCE HEIGHT (2) PROVIDE 4' WIDE LOCKABLE MAN-GATE (3) PROVIDE DOUBLE 8' WIDE LOCKABLE MANUAL SWING GATES (4) PROVIDE 24' WIDE (MINIMUM) AUTOMATIC ROLLING GATE WITH KEYPAD ACCESS CONTROL; ORMAT APPROVAL OF PROPOSED GATE DETAILS REQUIRED. NOTE ALL DIMENSIONS THIS PLAN TO CENTER OF GATE.

LEGEND

- EXISTING GEOTHERMAL LEASE OR PRIVATE PROPERTY AS NOTED (REF.3)
- BLM GCDB SECTION LINES (REF.1)
- PROPOSED POWER LINE CENTERLINE (REF.3,4)
- 5' INTERVAL CONTOURS – EXISTING (SEE PLAN NOTE)
- EXISTING ROADS: MAIN ACCESS BOLD
- CONSTRUCTION CONTROL: SEE TABLE
- CONSTRUCTION LAYOUT POINTS: SEE TABLE

SURVEY & GEODETIC CONTROL TABLE
File> P:\Ormat\McGinness Project NA\McGinness Civil.crd

PointNo.	Northing(Y)	Easting(X)	Elev(Z)	Description
1	214471103.0	1569485.0	6794.9	NGS KQ0126
2	214454382.5	1576064.4	7066.0	NGS McGinness KQ0341
3	214378311.0	1573127.0	6866.1	NGS KQ0127
4	214360114.0	1565676.0	6860.0	NGS KQ0125
10	214468685.5	1570801.9	6824.3	ORMAT BENCHMARK
11	214481194.1	1570881.3	6808.8	#134 FORM PIN @ LATH
60	214511325.5	1572743.3	6921.9	CLAIM STAKE
61	214472134.0	1570478.4	6764.6	LATH MARKED "CL ROAD"
62	214454846.8	1570571.8	6706.4	CLAIM STAKE
63	214465450.0	1571995.8	6715.8	LATH MARKED "COR POWER PLANT"
64	214485577.7	1571892.6	6776.6	CLAIM STAKE
65	214478868.0	1571035.8	6771.4	CLAIM STAKE
66	214472884.4	1570900.0	6744.1	LATH MARKED "PAD CORNER"

CONSTRUCTION LAYOUT TABLE
File> P:\Ormat\McGinness Project NA\McGinness Civil.crd

PointNo.	Northing(Y)	Easting(X)	Elev(Z)	Description
201	214468604.0	1570538.0	6830.7	NW area ground elev
202	214468604.0	1572038.0	6775.4	NE area ground elev
203	214453004.0	1572038.0	6885.6	SE area ground elev
204	214453004.0	1570538.0	6898.1	SW area ground elev
230	214468572.2	1570957.9	6715.30	PLANT B-SW
231	214468420.3	1570723.9	6715.30	PLANT B-NW
232	214468271.1	1571637.3	6715.30	PLANT B-NE
233	214462278.8	1571681.6	6715.30	PLANT B-SE
234	214452189.0	1570913.5	6715.30	ACCESS RD
235	214451146.3	1570850.4	6715.97	ACCESS PC
236	214451143.0	1570498.2	6721.96	ACCESS PT
237	214453372.5	1569869.8	6748.21	ACCESS END
238	214458907.5	1571739.3	6715.30	ACCESS RD
239	214468605.0	1571609.3	6719.41	ACCESS PC
240	214458867.7	1572028.0	6728.18	ACCESS PT
241	214478949.5	1572028.0	6767.81	ACCESS END
242	214454403.8	1570944.7	6716.00	PROJECT BM

McGinness Project
Geothermal Power Plant
SHEET C1-B
PLANT SITE "B" CIVIL SITE PLAN
LANDER COUNTY, NEVADA
PROJECT NO. 1-19-1-1 (DRAFT)

PREPARED FOR: ORMAT NEVADA, INC.
6225 Neil Road, Reno, NV 89511
(775) 356-9029

Robison Engineering
Reno, Nevada
(775) 882-2281
DRAWN: NAT
DATE: 04-21-2010

STATE OF NEVADA
NATHAN ROBISON
No. 10878
PROFESSIONAL ENGINEER
CIVIL
4/5/2011

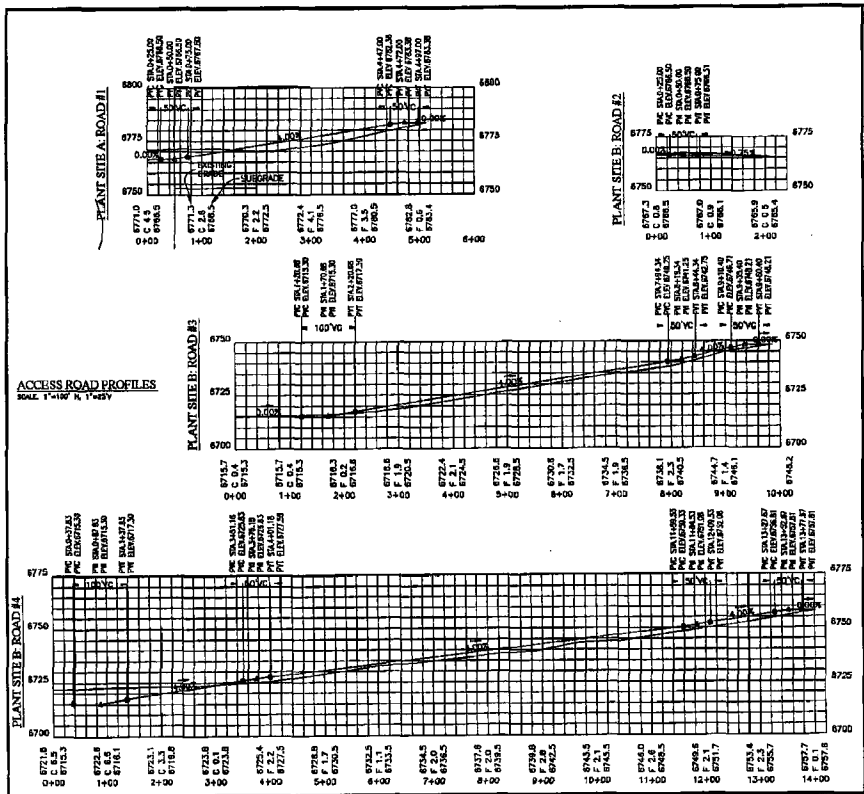
REFERENCES

1	US BLM GEOGRAPHIC COORDINATE SURVEY AT http://www.geocommunicator.gov/GeoCommo/lus.html				
2	US NATIONAL ELEVATION DATASET AT http://www.ned.usgs.gov/Ned/marvel.asp				
3	ORMAT, INC. NO. 1-19-1-1-20010-1 REV. 1				
4	ROBISON ENGINEERING FIELD RECONNAISSANCE 2010-01-28				

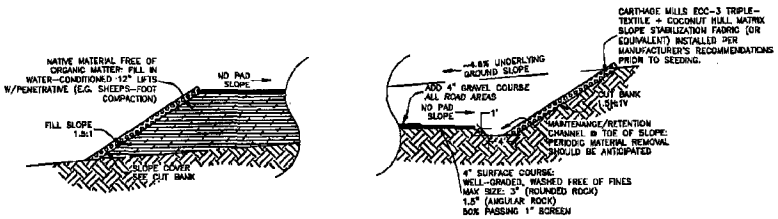
REVISIONS

NO	DESCRIPTION	BY	CHK'D	DATE
1	Fence detail			
2				
3				
4				
5				
6				

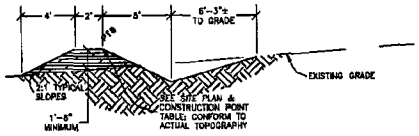
SHEET C1b OF 3



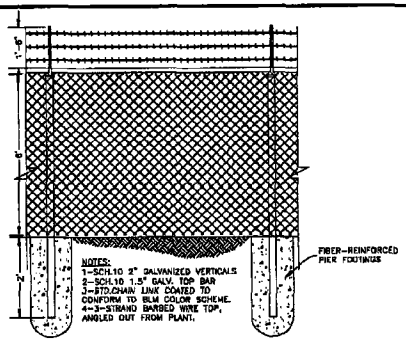
ACCESS ROAD PROFILES
SCALE: 1"=100' H, 1"=25'V



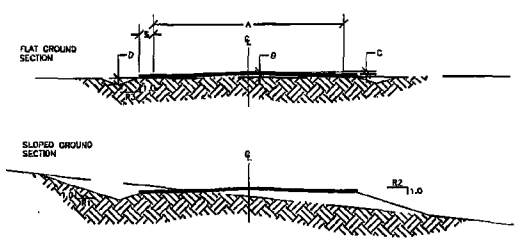
PAD CONSTRUCTION DETAILS
SCALE: 1"=8'



DIVERSION BERM DETAILS (IF USED)
SCALE: 1"=4'



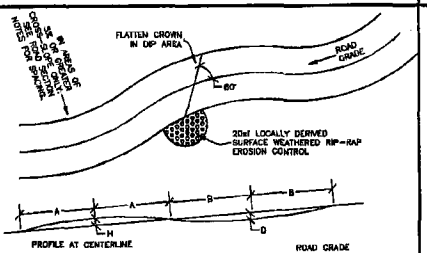
PLANT PERIMETER CHAIN LINK FENCE
SCALE: 1"=2'



KEY	DESCRIPTION	VALUE	UNITS
A	TRAVEL WIDTH	12	FT
S	SHOULDER	2	FT
D	DITCH DEPTH	12	INCHES
C	CROWN	3	INCHES
G	SURFACE (SEE NOTE)	2	INCHES
R1	CUT SLOPE RATIO	2	:1
R2	FILL SLOPE RATIO	3	:1
R3	DITCH SLOPE RATIO	3	:1

NOTES:
1) SURFACE SHALL BE PROVIDED ONLY IN AREAS REQUIRED FOR TRACTION OR EROSION CONTROL: TO BE FIELD DETERMINED.
2) SURFACE SHALL CONSIST OF 1.5" MINUS ROUNDED GRAVEL, OR ¾" MINUS CRUSHED GRAVEL, CONFORMING TO THE FOLLOWING GRADATION: 2-10% PASSING #200 (0.075mm), 25-50% PASSING #10 (2mm).
3) COMPACT FILL SECTION IN MAX.6" LIFTS
4) IN SIDE-SLOPE AREAS PROVIDE WATERDIP (SEE DETAIL THIS SHEET) AT 500 FT O/C.
5) TURNOUTS ARE NOT ANTICIPATED: IF REQUIRED, TOTAL LENGTH, INCLUDING TRANSITIONS, SHALL NOT EXCEED 150 FT. TURNOUT WIDTH SHALL NOT EXCEED 10 FT, AND SHALL CONFORM TO NATURAL LANDFORMS (E.G. FLAT AREAS)

TYPICAL ROAD SECTIONS (AFTER BLM "GOLD BOOK")
NOT TO SCALE



NOTE: A & B TRANSITION DISTANCES MAY BE EXTENDED FOR ROADS WHICH MUST ACCOMODATE EXCEPTIONALLY LONG OR LOW VEHICLES. CONTACT ENGINEER IF APPLICABLE.

	ROAD GRADE			
KEY	2%	4%	6%	8%
A	10'	14'	16'	22'
B	10'	14'	18'	24'
H	0.4'	0.8'	1.4'	2.2'
D	0.8'	1.0'	1.2'	2.0'

WATERDIP DRAINAGE FEATURE (AFTER BLM "GOLD BOOK")
NOT TO SCALE

McGinness Project
Geothermal Power Plant
SHEET C2
PROFILES AND DETAILS
ELKO COUNTY, NEVADA
PROJECT NO. 1-2-2001

PREPARED FOR: ORMAT NEVADA, INC.
Robison Engineering
6225 Neil Road, Suite 300, Reno, NV 89511
(775) 850-0300 (775) 850-0311 www.robinsonengineering.com
DRAWN: SJB
DATE: 2-12-2001

NO	DESCRIPTION	DATE	BY	CHK'D
1	ORMAT PLANT LAYOUT & LOCATION FOR PERMITTING (BLCD 8/21)	9/28/10	NER	NER
2	AOB PLANT SITE "B" FEATURES	9/27/10	NER	NER

REVISIONS

REFERENCES

SHEET C2 OF 2