BLM

Stillwater Field Office, Nevada

FINAL ENVIRONMENTAL ASSESSMENT

Ormat Technologies, Inc.
Tungsten Mountain Geothermal Exploration Project

DOI-BLM-NV-C010-2012-0029-EA

U.S. Department of the Interior
Bureau of Land Management
Carson City District
Stillwater Field Office
5665 Morgan Mill Road
Carson City, NV 89701
775-885-6000

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It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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LIST OF ACRONYMS AND ABBREVIATIONS

ARPA	Archaeological Resources Protection Act
BLM	Bureau of Land Management
BMPs	Best Management Practices
CFR	Code of Federal Regulations
CCDO	Carson City District Office
EA	Environmental Assessment
EO	Executive Order
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Protection Management Act
FONSI	Finding of No Significant Impact
FPST	Fallon Paiute-Shoshone Tribe
GDP	Geothermal Drilling Permit
IDT	Interdisciplinary Team
IM	Instructional Memorandum
MBTA	Migratory Bird Treaty Act
NDOW	Nevada Division of Wildlife
NEPA	National Environmental Protection Act
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
PEIS	Programmatic Environmental Impact Statement
RFFA	Reasonably Foreseeable Future Actions
ROD	Record of Decision
ROW	Right of Way
SFO	Stillwater Field Office
SHPO	State Historic Preservation Office
PMU	Population Management Unit
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
VRM	Visual Resource Management
WSA	Wilderness Study Area

1.0 INTRODUCTION/PURPOSE AND NEED

This Environmental Assessment (EA) analyzes the potential impacts associated with the proposed Tungsten Mountain Geothermal Exploration Project (Project), which includes the drilling and testing of geothermal exploration wells and access road construction. The Project is located in Churchill County, Nevada (see Figure 1).

Ormat Nevada, Inc. (Ormat) is proposing to explore the geothermal resource potential of the Tungsten Mountain geothermal lease area, which is located on public lands managed by the U.S. Bureau of Land Management (BLM), Carson City District Office (CCDO), Stillwater Field Office (SFO).

The Department of the Interior, consistent with Section 2 of the Mining and Mineral Policy Act of 1970 and Sections 302(a) of the Federal Land Policy and Management Act of 1976 (FLPMA), encourages the development of mineral resources, including geothermal resources on federal lands. The Geothermal Steam Act of 1970 (30 USC §1001 et seq.) and its implementing regulations (43 CFR Part 3200) provide regulatory guidance for geothermal leasing by the BLM. These regulations identify four stages of geothermal resource development within a lease: 1) exploration, 2) development, 3) production and 4) decommissioning. Each of the four stages under the lease requires separate BLM authorization and compliance with the NEPA when ground-disturbing activities are proposed.

A geothermal lease typically grants the lessee access to geothermal resources in the lease area for a period of 10 years. The terms of the lease require the lessee to show a certain level of diligence toward developing the geothermal resources within the lease area or the lease may be terminated. Once an area is developed for productive use of the geothermal energy, the lease allows the lessee use of the resource for 40 years, with a right of renewal for another 40 years. Geothermal exploration and production on federal land conducted through leases is subject to terms and stipulations to comply with all applicable federal, state, and local laws and regulations pertaining to sanitation, water quality, wildlife, safety, air quality and reclamation. Lease stipulations may be site specific and are derived from the environmental analysis process.

The geothermal leases held by Ormat for the Project contain 4,880 acres (see Figure 2 and Table 1). Ormat would limit geothermal exploration activities to a smaller area within the lease area, which is subsequently referred to as the Project Area in this EA (see Figure 2). Generally, the Project Area consists of a 20-acre area centered on each proposed well pad location, a 200-foot-wide corridor centered on proposed and existing access roads, and a 282 acre “block” area focused on the drilling area of interest. Accordingly, the Project Area is comprised of approximately 610 acres (282 block area, 120 acre well pad area, and 210 acres of linear access).

Table 1 Federal Geothermal Leases

Lease Number	Township and Range	Section Number	Acreage
NVN-86898	T.21N., R.38E.	Portions of secs. 33-34	600
NVN-85715	T.21N., R.38E.	All or portions of secs. 13, 21, 23-28	3,560
NVN-88428	T.21N., R.38E.	Portions of secs. 23, 26 and 27	320
NVN-86897	T.21N., R.38E.	Portions of sec. 22	400

An Operations Plan to drill and test up to 27 wells and construct 4.2 miles of access roads within the Project Area (see Figure 2) was submitted to the BLM, Stillwater Field Office (SFO) in January 2011. A revised Operations Plan was submitted in March 2011. Individual Geothermal Drilling Permits (GDPs) would be issued separately from this document.

A Right-of-way (ROW) application was submitted to the BLM SFO in January 2012 for off-lease access on public lands managed by the BLM (see Figure 2). Issuance of these ROWs will provide for access to certain exploration activities.

In addition, a mineral material sales contract would be required for aggregate material obtained from a BLM-managed aggregate pit, should the private pit intended to be used not contain the needed amount of aggregate material. This contract, should one be necessary, would be for less than 50,000 cubic yards of aggregate and less than 5 acres of surface disturbance.

The exploration activities, issuance of ROWs and aggregate extraction described above are referred to as the Proposed Action.

1.1 PURPOSE AND NEED

1.1.1 Purpose

The purpose of the Proposed Action is to explore the geothermal energy production potential of federal lands managed by the BLM and leased by Ormat. This EA has been prepared by the BLM in accordance with NEPA to assess the potential for environmental impacts resulting from drilling and testing of exploration wells at the Tungsten Mountain lease area, which comprises the Proposed Action. This EA serves to support the BLM in determining whether the Proposed Action, with or without any modifications required by the BLM, would result in significant environmental impacts. Based on this determination, a Finding of No Significant Impacts (FONSI) could be made. Alternatively, if significant impacts have the potential to occur, the BLM could determine that an environmental impact statement (EIS) is required. In addition, this EA has been prepared to enable BLM to determine whether to grant a ROW to Ormat for 1.08 miles of road that are needed to access the leased area from existing roads, and also for lease to lease access.

1.1.2 Need

In accordance with the BLM Programmatic Environmental Impact Statement (PEIS) for Geothermal Development (BLM 2008a) and the Churchill County Master Plan (CCPD 2010),

the expansion and development of geothermal resources is supported and promoted for federal lands in this region in support of the need "to ensure jobs for our future with secure, affordable, and reliable energy" as identified in the Energy Policy Act of 2005. Additionally, the need for the proposed action is to respond to EO 13212, which directs the BLM to process geothermal leases in a timely manner in order to support efforts to increase energy production from federal minerals, while preserving the health of public lands.

1.1.3 Authorizing Actions

Applications for geothermal drilling upon and Rights-of-way across public land submitted to BLM may be approved only after an environmental analysis is completed. BLM decision options include approving the Proposed Action as defined in the Operations Plan and ROW applications as submitted by Ormat; approving the Proposed Action with stipulations to mitigate environmental impacts; or denying the Proposed Action.

1.2 LAND USE PLAN CONFORMANCE STATEMENT

The Proposed Action described below is in conformance with the BLM Carson City Field Office Consolidated Resource Management Plan (CRMP) 2001, page MIN-1, Management Action/Decision #1 (Geothermal Exploration), page MIN-1, Management Action/Decision #1 (Mineral Material Sales), and page LND-1, Management Action/Decision #6 (Access Road Rights-of-way).

1.3 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.*). 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 2008);
- 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 (BMPs) as defined in the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition (Gold Book) (DOI and DOA 2007);
- Churchill County Master Plan (2010 Update).

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 (BLM 2008a). 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) identifies public lands that are legally and administratively open or closed for geothermal 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 Carson City CRMP (BLM 2001). Special stipulations developed in the ROD were applied to geothermal resource leases subsequently issued by the BLM.

The Proposed Action would be subject to other applicable state and local permits prior to beginning construction (see Table 2).

Table 2: List of Federal and State Permits

Regulatory Agency	Authorizing Action
BLM	Access Road Right-of-Way
BLM	Geothermal Drilling Permit
BLM	Contract for the Sale of Mineral Materials
Nevada Division of Minerals	Application for Permit to Drill an Oil and Gas and Geothermal Well
Nevada Department of Environmental Protection – Bureau of Water Protection Control	Construction Stormwater Permit
Department of Conservation and Natural Resources, Nevada Division of Water Resources	Temporary Consumptive Water Use permit
Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Air Pollution Control	Surface Area Disturbance Permit
BLM, Nevada Division of Historic Preservation and Archaeology	Section 106 compliance with the National Historic Preservation Act.

Figure 1 : Project Vicinity Map

United States Department of the Interior
Bureau of Land Management
Carson City Field Office
5665 Morgan Mill Road
Carson City, NV 89701

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

Map Date : 09/06/2011

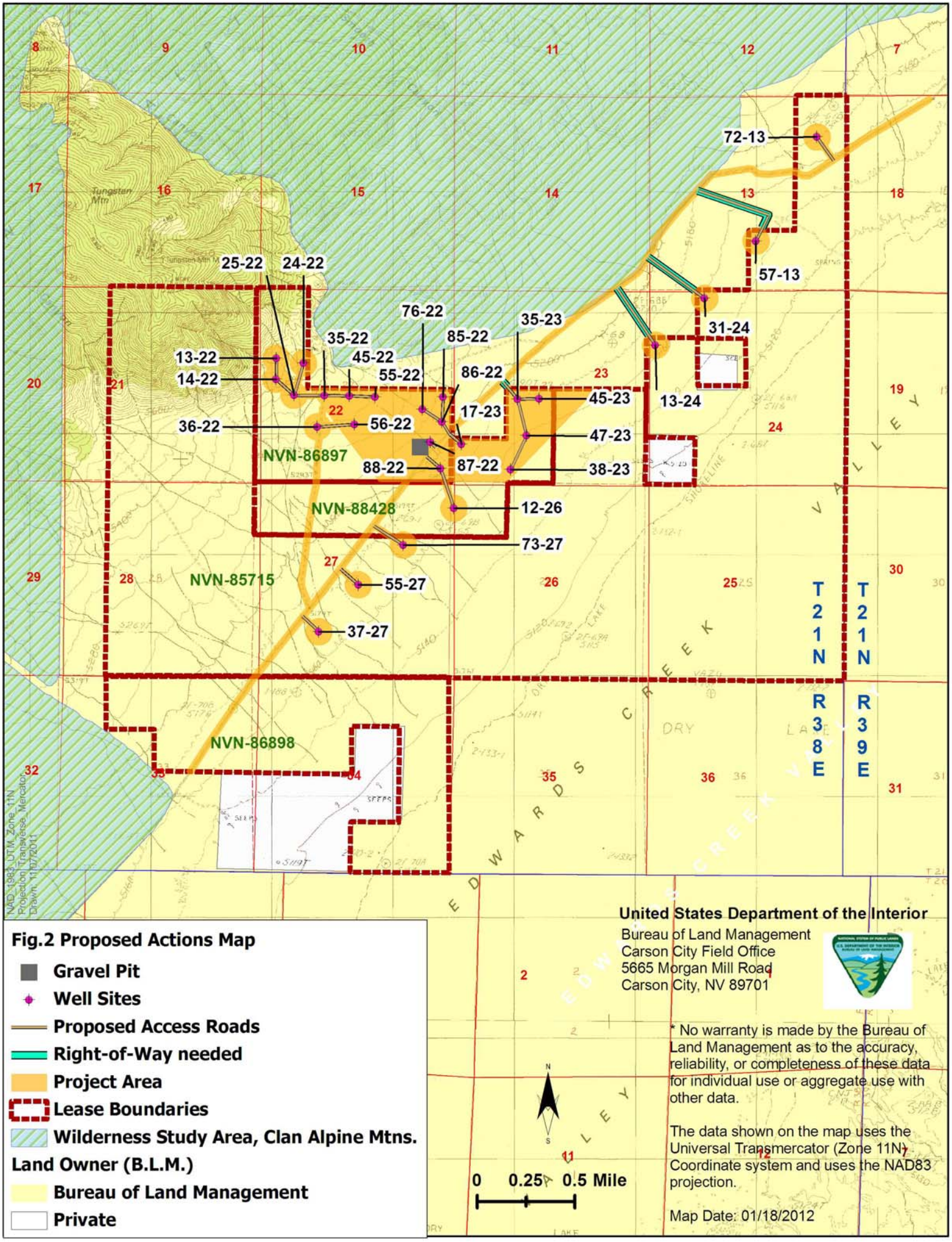

Fig.2 Proposed Actions Map

- Gravel Pit
- Well Sites
- Proposed Access Roads
- Right-of-Way needed
- Project Area
- Lease Boundaries
- Wilderness Study Area, Clan Alpine Mtns.

Land Owner (B.L.M.)

- Bureau of Land Management
- Private

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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: 01/18/2012

2.0 PROPOSED ACTION AND ALTERNATIVES

This section presents the Proposed Action and No Action Alternative.

2.1 PROPOSED ACTION

Ormat is proposing to conduct a geothermal exploration project in Churchill County, Nevada on public lands managed by the BLM (see Figure 1 and Figure 2). Specifically, the Tungsten Mountain Geothermal Exploration Project (Project) includes:

- Constructing up to 27 exploration well drill pads;
- Drilling and completing an exploration well to a depth of about 7,000 feet from each of the constructed drill pads;
- Flow-testing each exploration well to obtain samples of geothermal fluids and to collect aquifer information from the geothermal reservoir;
- Constructing, improving or maintaining access roads (both on lease and off lease);
- Constructing and maintaining a 5-acre mineral material pit on lease; and
- Drilling temporary water wells at one or more proposed drill sites.

These activities are further described below, and the EA analyzes the potential impacts from these proposed activities.

2.1.1 Well Field Location

Ormat expects that up to 27 geothermal exploration wells would be drilled and tested within the federal geothermal leases (see Figure 2 and Table 3).

Table 3: Geothermal Well Sites

Well Name (Kettleman No.)	Lease Number	Legal Description[1] (Section Number & Aliquot Part)	Approximate UTM Coordinates (NAD83)	
			Easting (m)	Northing (m)
35-23	NVN-88428	sec. 23, NE1/4SW1/4	441945.27	4391488.53
17-23	NVN-88428	sec. 23, SW1/4SW1/4	441483.23	4391115.36
38-23	NVN-88428	sec. 23, SE1/4SW1/4	441888.18	4390904.74
85-22	NVN-86897	sec. 22, NE1/4SE1/4	441330.98	4391507.36
13-24	NVN-85715	sec. 24, SW1/4NW1/4	443085.14	4391934.16
86-22	NVN-86897	sec. 22, NE1/4SE1/4	441322.12	4391299.79
87-22	NVN-86897	sec. 22, SE1/4SE1/4	441226.23	4391131.81
35-22	NVN-86897	sec. 22, NE1/4SW1/4	440350.29	4391518.29
45-22	NVN-86897	sec. 22, NE1/4SW1/4	440556.64	4391515.73
55-22	NVN-86897	sec. 22, NW1/4SE1/4	440769.79	4391505.86
36-22	NVN-86897	sec. 22, NE1/4SW1/4	440291.52	4391260.21
56-22	NVN-86897	sec. 22, NW1/4SE1/4	440598.34	4391279.95
24-22	NVN-86897	sec. 22, SW1/4NW1/4	440176.53	4391786.59
25-22	NVN-86897	sec. 22, NW1/4SW1/4	440098.90	4391520.34

Well Name (Kettleman No.)	Lease Number	Legal Description[1] (Section Number & Aliquot Part)	Approximate UTM Coordinates (NAD83)	
			Easting (m)	Northing (m)
14-22	NVN-86897	sec. 22, SW1/4NW1/4	439949.77	4391652.84
12-26	NVN-88428	sec. 26, NW1/4NW1/4	441420.01	4390587.41
47-23	NVN-88428	sec. 23, SE1/4SW1/4	442021.18	4391186.00
72-13	NVN-85715	sec. 13, NE1/4NE1/4	444420.94	4393657.17
57-13	NVN-85715	sec. 13, SW1/4SE1/4	443915.36	4392795.79
31-24	NVN-85715	sec. 24, NE1/4NW1/4	443491.15	4392321.68
45-23	NVN-88428	sec. 23, NE1/4SW1/4	442125.27	4391492.03
37-27	NVN-85715	sec. 27, SE1/4SW1/4	440303.58	4389563.80
55-27	NVN-85715	sec. 27, NW1/4SE1/4	440630.49	4389952.79
76-22	NVN-86897	sec. 22, NE1/4SE1/4	441160.98	4391404.36
73-27	NVN-85715	sec. 27, SE1/4NE1/4	441002.61	4390282.19
88-22	NVN-86897	sec. 22, SE1/4SE1/4	441309.97	4390916.21
13-22	NVN-86897	sec. 22, SW1/4NW1/4	439952.10	4391827.53

[1] All wells are located in Township 21 North, Range 38 East, Mount Diablo Baseline and Meridian

Each drill site is designed to explore a specific geophysical or geologic target. The location of each exploration well site was selected to reduce or avoid environmental issues or constraints. As Ormat conducts geothermal exploration activities and gains a better understanding of the geothermal resource, it may be necessary to relocate one or more of the intended drill sites and its associated access. Should any of the sites and/or access change, BLM would be notified and the appropriate level of environmental analyses would be conducted.

2.1.2 Site Preparation Activities

Each well pad would be about 400 feet by 450 feet (approximately 4.2 acres per pad). Actual dimensions of the well pad would be modified to best match the specific physical and environmental characteristics of the site and to minimize grading (cut and fill). Total surface disturbance associated with new well pad construction would be approximately 113.4 acres (4.2 ac./pad * 27 pads). See Figure 3 for a representative well pad layout.

Drill pad preparation activities would include clearing, earthwork, drainage and other improvements necessary for efficient and safe operation and for fire prevention. Only those drill pads scheduled to be drilled would be cleared. Clearing would include removal of organic material, stumps, brush and slash, which would be either be removed and taken to an appropriate dump site, or left 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.

Each drill pad would be prepared to create a level pad for the drill rig and a graded surface for the support equipment. Storm water runoff from undisturbed areas around the constructed drill pads would be directed into ditches surrounding the drill pad and back onto undisturbed ground,

consistent with best management practices for storm water. The site would be graded to prevent the movement of storm water from the pad off of the constructed site, and has been designed for a 100 year storm.

Reserve pits would be constructed in accordance with best management practices identified in the Gold Book (Fourth Edition – Revised 2007) on each pad for the containment and temporary storage of water, drill cuttings and circulating drilling mud during drilling operations. Geothermal fluid produced from the well during flow testing will also drain to the reserve pit.

The reserve pits would be fenced with an exclosure fence on three sides and then fenced on the fourth side once drilling has been completed to 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.For the drilling of each well, the reserve pit would measure approximately 75 feet by 200 feet by 10 feet deep.

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 2.1.9 for a description of reclamation procedures.

2.1.3 Drilling and Testing Operations

Specific drilling information is provided in Table 4.

Table 4: 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.

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 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 likely be stored at each well site for use in preventing uncontrolled well flow (“killing the well”), as necessary.

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 may be hazardous substances, 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 re-drilling may consist of: 1) reentering and re-drilling 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 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 would likely 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 to 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 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 carried by workers and hand laid either "cross country" or 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.

2.1.4 Site Access and Road Improvements

Principal access to the Project Area is from a northeast trending County Road off of U.S. 50. The Project Area is traversed by numerous roads and "two tracks." Well sites 35-22 and 36-22 are located adjacent to existing roads, and no new road construction is needed. For the remaining

sites, new roads with a 20 foot wide drivable road bed would be constructed using a dozer and/or road grader. New access roads would be required as follows (see Figure 2):

- About 790 feet of new road would be constructed to 72-13;
- About 2,815 feet of new road would be constructed to 57-13;
- About 1,880 feet of new road would be constructed to 31-24;
- About 1,850 feet of new road would be constructed to 13-24;
- About 360 feet of new road would be constructed to 86-22;
- About 455 feet of new road would be constructed to 17-23
- About 600 feet of new road would be constructed to 35-23;
- About 590 feet of new road would be constructed between 35-23 and 45-23;
- About 1,025 feet of new road would be constructed between 35-23 and 47-23;
- About 1,020 feet of new road would be constructed between 47-23 and 38-23;
- About 495 feet of new road would be constructed to 88-22;
- About 1,140 feet of new road would be constructed between 88-22 and 12-26;
- About 960 feet of new road would be constructed to 73-27;
- About 650 feet of new road would be constructed to 55-27;
- About 615 feet of new road would be constructed to 37-27;
- About 200 feet of new road would be constructed to 87-22;
- About 630 feet of new road would be constructed between 86-22 and 76-22;
- About 680 feet of new road would be constructed between 86-22 and 85-22;
- About 680 feet of new road would be constructed between 35-22 and 45-22;
- About 700 feet of new road would be constructed between 45-22 and 55-22;
- About 1,000 feet of new road would be constructed to 56-22;
- About 825 feet of new road between 35-22 and 25-22;
- About 655 feet of new road between 25-22 and 14-22;
- About 580 feet of new road between 14-22 and 13-22; and
- About 915 feet of new road between 25-22 and 24-22.

The total estimated area of surface disturbance required for new access road construction, assuming a 20 foot wide drivable road bed and 2.5 foot wide shoulders (25 foot wide total width of surface disturbance) would be about 12.7 acres (22,110 feet of road * 25 foot wide surface disturbance totals 12.7 acres).

2.1.5 Land Ownership and Rights-of-Ways

Rights-of-ways (ROWs) will be required for "off-lease" access roads to the following sites: 57-13, 31-24, 13-24 and 35-23 (see Figure 2) The specific ROW segments are described below.

An approximately 2,415 foot (0.46 mile) section of new road would allow access to proposed well site 57-13 as follows:

- Beginning at the existing County Road and traveling southeasterly through the NE1/4SW1/4 of Section 13, T21N, R38E; and
- Terminating at the SW1/4SE1/4 Section 13, T21N, R38E.

An approximately 1,550 foot (0.29 mile) section of new road would allow access to proposed well site 31-24 as follows:

- Beginning at the existing County Road and traveling southeasterly through the SW1/4SW1/4 of Section 13, T21N, R38E; and
- Terminating at the NE1/4NW1/4 Section 24, T21N, R38E.

An approximately 1,530 foot (0.29 mile) section of new road would allow access to proposed well site 13-24 as follows:

- Beginning at the existing County Road and traveling southeasterly through the NE1/4NE1/4 of Section 23, T21N, R38E; and
- Terminating at the SW1/4NW1/4 Section 24, T21N, R38E.

An approximately 185 foot (0.03 mile) section of new road would allow access to proposed well site 35-23 as follows:

- Beginning at the existing County Road and traveling southeasterly through the NE1/4SW1/4 of Section 13, T21N, R38E; and
- Terminating at the NE1/4SW1/4 Section 23, T21N, R38E.

The total length for the requested ROWs for the Project is approximately 1.08 miles. The total width for the requested ROWs for the Project is 50 feet (30-foot permanent width and an additional 20-foot temporary width required for construction).

2.1.6 Aggregate Requirements and Needs

At most, each drill pad (exclusive of the reserve pit) would be covered with up to 6 inches of gravel. Total aggregate required for well pad construction is estimated at 54,000 cubic yards (approximately 2,000 cubic yards/pad * 27 pads totals 54,000 cubic yards).

Access roads would be covered with up to 4 inches of gravel, as necessary to create an all-weather surface and to prevent the formation of ruts. Total aggregate required for access road construction is estimated at 5,404 cubic yards (approximately 4.2 miles of access roads * 20 foot width * 4 inches depth totals 5,404 cubic yards).

Total aggregate required for the well pad and access road construction is estimated at 59,404 cubic yards (54,000 cubic yards for pad construction plus 5,404 cubic yards for road construction).

Aggregate material would be obtained from one of two sources: a private pit located off of Alpine Road, approximately 5.5 miles north of U.S. 50, or from an approximately 5-acre area located within the Project Area (see Table 5). Ormat would enter into a mineral material sales contract with the BLM to obtain gravel from the aggregate site proposed on public land managed by the BLM (see Figure 2).

Table 5: Aggregate Sources

Aggregate Source Information	Township, Range, Section	Approximate UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)
Private Land Source	T.19N., R.37E., sec. 4	429052	4376767
Public Land Source	T.21N., R.38E., sec 22	441143	4391094

Should Ormat obtain aggregate material from the public land source, construction would occur incrementally as the gravel demands of the project dictate. Construction would require as many as four to five persons, a front-end loader, a bulldozer, and a dump truck. During construction, vegetation would be removed and topsoil would be salvaged where possible and stockpiled for use during reclamation. Excavation of the gravel source area would reach depths no greater than 10 feet below ground surface. A safety fence would be installed along the perimeter of the gravel source area once excavation reached depths greater than or equal to 3 feet below ground surface.

Both aggregate sources (public and private) are located adjacent to existing access and no new road construction would be required. Ormat would not locate any geothermal or water wells in the gravel source area.

2.1.7 Water Requirements and Needs

Water required for well drilling could range up to as much as 30,000 gallons per day. Water requirements for grading, construction and dust control would average substantially less. One or more portable water tank(s) holding a combined total of at least 10,000 gallons would be maintained on the well sites during drilling operations.

Water necessary for these activities would be obtained from shallow water well(s) drilled from one or more of the proposed drill sites as approved by the BLM and under a waiver for the temporary use of ground water from the Nevada Department of Water Resources. Each water well would be temporary, drilled by a licensed water well driller and cemented with 7 inch casing to provide a sanitary seal at the surface. The well would be drilled down to a productive interval of sands, gravels or fractures. A submersible electric pump on 4 inch column pipe would then be run to below the producing interval. The well would be plugged and abandoned in accordance with NAC 534.420, with cement plugs across the bottom of the casing and, if needed, with additional plugs to isolate individual producing zones if identified as present. No additional surface disturbance would be associated with the drilling of each temporary water well.

Alternatively, water would be obtained from an established private ranch source and trucked to each construction or drill site.

2.1.8 Schedule of Exploration Activities

The applicant proposes to start exploration activities as soon as possible following BLM approval and NDOM permit issuance. The exploration activities would be completed within 5

years of permit issuance. Reclamation activities would be conducted over an approximately 3-year period following completion of drilling and testing (see Section 2.1.9).

2.1.9 Plans for Surface Reclamation

If Ormat determines that a well has commercial viability, well operations would likely be suspended pending application for, and receipt of, regulatory approvals to place the well and associated access roads and other components required to operate the well into commercial service. The well would likely be monitored and exploration activities would continue in accordance with these plans while the application is processed. Interim reclamation activities would be implemented as described below. Ormat would routinely assess the usefulness of wells, and if Ormat were to judge certain wells to be unsuitable for commercial use or monitoring, upon BLM approval, the wells would be plugged and abandoned in conformance with the procedures for final reclamation outlined below.

Interim and final reclamation activities proposed in this section are consistent with BLM and Nevada State Regulatory requirements, including recommendations provided in the Gold Book.

2.1.9.1 Interim Reclamation

Disturbed areas not needed for active support of operations would undergo interim reclamation as soon as practical. Any liquids in the reserve pits would be evaporated. Solids remaining in the pit, which typically consist of non-hazardous, non-toxic drilling mud and rock cuttings, would be sampled for pH, metals, and total petroleum hydrocarbons. If analysis confirms the material to be non-hazardous and non-toxic, the solids would then be mixed with excavated material and buried under backfill in the reserve pit. Any material that is determined to be hazardous or toxic would be excavated and disposed of at an approved landfill.

During the construction and drilling process, topsoil would be salvaged and stockpiled for use during reclamation. Following completion of exploratory well testing, drilling and testing equipment would be removed from the site. With the exception of an area required to access maintained wellheads, cut and fill slopes would be graded to a final or intermediate contour that blends with the surrounding topography, and erosion control measures would be implemented. Ormat would maintain healthy, biologically active topsoil and minimize habitat and forage loss during the life of the wells by stockpiling and/or spreading any extra salvageable topsoil over the area of interim reclamation whenever possible. The area would be reseeded to within a few feet of the area required for well head access.

Surface facilities remaining on-site would consist of a wellhead, potential monitoring equipment, and the access roads necessary to access the wells. The temporary new access roads created for the project would be reclaimed by removing gravel, grading to achieve preconstruction contours, and then seeded with a BLM-approved seed mix. Following completion of well testing activities, the well would be fenced, chained and locked. Pressure and temperature sensors could be installed in the well at fixed depths to monitor any changes in these parameters over time.

Temporary water wells would either be abandoned following completion of exploration activities in accordance with Nevada State Regulatory requirements or, if exploratory data provide evidence of a productive reservoir, wells could be converted to permanent use for future geothermal energy production. If a well is suitable for long-term use, Ormat would obtain the necessary permits from the Nevada State Engineer prior to such use.

2.1.9.2 Final Reclamation

After all well operations have ceased or the geothermal leases are relinquished to the BLM, Ormat would reclaim remaining disturbance related to the proposed Project. Ormat would restore all disturbed areas to preconstruction contours or to contours similar to those of surrounding landforms where restoration of preconstruction contours is not feasible. Disturbed areas would be reseeded with a BLM approved seed mix, and invasive, non-native plants and noxious weeds would be controlled in accordance with BLM guidelines and lease stipulations. Ormat would implement erosion control measures and BMPs during reclamation.

Ormat would plug and abandon all wells compliant with BLM and Nevada State Regulatory regulations. A detailed plan for well plugging and abandonment would be addressed in Ormat's Geothermal Drilling Permit and Drilling Program. Following the abandonment of wells and roads, gravel surfacing material would be removed, and the areas would then be disked and graded to loosen compacted soils and reshaped as close as possible to preconstruction grades. The reserve pits would be back filled after liquids in them are evaporated and tests indicate pit solids are non-hazardous and non-toxic. Well pads and roads would be surfaced with stockpiled topsoil where available and planted with a BLM approved seed mix, free of noxious weeds at the time of reclamation. Access roads in existence prior to commencement of the Project would not be reclaimed.

Reclamation of the aggregate pit will consist of leveling any stockpile material, reducing the slopes in the pit to 3:1, removing all trash and debris, and re-seeding if necessary. If BLM determines there is a future need for the aggregate pit, revegetation of the pit surface will not be necessary.

2.1.10 Surface Disturbance Summary

Total surface disturbance for the Project would be approximately 131.1 acres (see Table 6).

Table 6: Surface Disturbance Summary

Activity	Maximum Surface Disturbance
Well Pad Construction	113.4 acres
New Road Construction	12.7 acres
Aggregate Pit Construction	5.0 acres

2.1.11 Adopted Environmental Protection Measures

Ormat would comply with all special lease stipulations attached to leases NVN-86898, NVN-85715, NVN-88428, and NVN-86897, which are applicable to Project operations (see Appendix A). In addition, Ormat will also institute the following:

Air Quality

- Water and/or aggregate 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;
- Equipment and vehicle idling times would be minimized to 15 minutes during construction activities;
- Prudent speed limits on unpaved roads would be observed throughout the Project Area in order to reduce dust emissions; and
- Access roads and other traffic areas would be maintained on a regular basis to minimize dust and provide for safe travel.
- All applicable county, State, and federal air quality standards would be met through the use of the available technology to control emissions.

Cultural Resources and Native American Religious Concerns

- Ormat would avoid cultural resources sites that are known to be eligible or potentially eligible for inclusion in the National Register of Historic Places through design, construction and operation of the Project;
- An approximately 100-foot buffer zone would be established and identified by placing flagging around eligible and potentially eligible cultural resource sites to help provide protection to the sites. Project equipment and facilities would not encroach into the established 100-foot buffer zone;
- Ormat employees, contractors, and suppliers would be reminded that all cultural resources are protected and if uncovered shall be left in place and reported to the Ormat representative and/or their supervisor; and
- Any unplanned discovery of cultural resources, items of cultural patrimony, sacred objects or funerary items would require that all activity in the vicinity of the find ceases, and the Field Manager, Stillwater Field Office, 5665 Morgan Mill Road, Carson City, NV 89701, be notified immediately by phone (775.885.6000) with written confirmation to follow. The location of the find would not be publicly disclosed, and any human remains must be secured and preserved in place until a Notice to Proceed is issued by the Authorized Officer.

Wildlife

- Speed limits would be posted, and if necessary, speeds would be reduced, especially when wildlife is active near access roads;
- Employees and contractors are strictly prohibited from carrying firearms on the job site discourage illegal hunting and harassment of wildlife;

- Reclamation of disturbed areas, as described in Section 2.1.9, would be completed in order to return these areas to the condition required in the drilling permit Conditions of Approval; and
- Vegetation clearing/blading would be avoided during the migratory bird nesting period. If vegetation removal is planned during this time, Ormat would have areas surveyed for active nests prior to disturbance.
- Employees are prohibited from entering abandoned mines and mine shafts. White-nose syndrome (WNS) is a disease responsible for unprecedented mortality in hibernating bats and the disease can be transmitted by human vectors. Stay Out and Stay Alive.

Invasive, Nonnative Species and Noxious Weeds

- A certified weed-free seed mix would be used during revegetation of disturbed areas;
- Concurrent reclamation would be used when feasible in order to minimize disturbed areas where weed species could establish;
- Ormat would devise and implement a weed plan in coordination with the Stillwater Field Office weed coordinator if noxious weeds were observed during reclamation monitoring. If invasive species are found in the Project Area after treatment and seeding, the sites would be identified for treatment in the field Office Annual Weed Treatment Plan.
- Growth medium and overburden stockpiles would be seeded with a weed-free seed mix as soon as possible following stockpile completion;
- Vehicle traffic would be restricted to defined roads to reduce potential mechanical transport of noxious weed seeds;
- Herbicides would be applied as per label instructions;
- All personnel applying herbicides would either be certified by the BLM and/or the State of Nevada, or they would be supervised by a BLM or State of Nevada Certified Applicator;
- Bureau or other personnel applying herbicides would use personnel protective equipment while spraying or handling herbicides;
- Herbicide application operations would be suspended when wind speed exceeds 6 mph or precipitation is imminent;
- Some treatment areas could be signed, if needed, indicating the herbicide used and the date of treatment. Areas which are isolated and/or receive very little use by human beings would not be signed;
- During herbicide treatments, a pre-application sweep of the area would be completed (ie. looking for nesting birds);
- Herbicide would not be applied during the flowering season when pollinating insects are present (fall for rabbitbrush);
- Soil disturbance would be minimized, to the extent possible, within the project area in areas with existing weed infestations; and
- Disturbed areas would be monitored for weed infestations until reclamation has been completed.

Water Resources

- Drill pads would be graded to allow stormwater diversion from potential contaminants and to prevent ponding on the pad;
- Pads would be designed to avoid drainages and to minimize required cut and fill;
- Access across drainages, seeps and springs would be avoided wherever possible. Culverts would be used if it is necessary to cross any large drainages;
- Silt fences and/or straw bales would be used in areas requiring sediment control; and
- Ormat would routinely inspect the integrity of the berm around each reserve pit to ensure it provides an effective barrier between surface waters outside of the berm and drilling/geothermal fluids inside the berm;
- Preparation of a Hydrologic Watering Program would be instituted once exploration activities commence (see Section 3.3.9); and
- Drilling activities would be kept to a minimum distance of 650 feet from surface water body, riparian area, wetlands, playas or 100 year flood plains.

Hazardous and Solid Waste, Public Safety

- 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;
- Trash and other waste products would be properly managed, and Ormat would control garbage that could attract wildlife. All trash would be removed from the Project Area and disposed of at an authorized landfill.
- A Fire Contingency Plan, Injury Contingency Plan, Spill or Discharge Contingency Plan, and Hydrogen Sulfide Contingency Plan have been produced and are contained in the Operations Plan;
- Handling, storage and disposal of hazardous materials, hazardous wastes and solid wastes would be conducted in conformance with federal and state regulations to prevent soil and groundwater contamination;
- Diesel for use in equipment would be stored on-site in proper containment for use in mobile equipment;
- Standard non-hazardous bentonite clay-water-based or polymer-water-based mud would be used for lubrication to cool the drill bit and to remove drill cuttings from the well;
- Wells would be cased and cemented in accordance with approved drilling permits to insure integrity of the well bore and to isolate the wellbore from ground water aquifers;
- Only non-hazardous additives would be used to prevent corrosion, adjust mud weight, or control lost circulation; and
- Wells would be plugged and abandoned in accordance with BLM and NDOM regulations.

Prevention and Control of Fires

- The BLM Stillwater Field Office (775.885.6000) would be notified immediately of any wildland fire, even if the available personnel can handle the situation or the fire poses no threat to the surrounding area;
- A roster of emergency phone numbers would be available at the project site so that the appropriate firefighting agency can be contacted in case of a fire;
- All vehicles would carry, at a minimum, a shovel, five gallons of water and a conventional fire extinguisher;
- All construction and operating equipment would be equipped with applicable exhaust spark arresters. Fire extinguishers would be available on the active sites. 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
- All cutting/welding torch use, electric-arc welding and grinding operations would be conducted in an area free, or mostly free, of vegetation. An ample water supply and shovel would be on hand to extinguish and fires created from sparks. At least one person in addition to the cutter/welder/grinder would be at the work site to promptly detect fires created by sparks.

Soil Erosion

- Topsoil would be salvaged, stockpiled and reused whenever possible and in a timely manner;
- Temporarily disturbed areas would be reseeded where previously vegetated, using a BLM-approved seed mixture;
- Erosion control measures, including but not limited to silt fencing, diversion ditches, water bars, temporary mulching and seeding, and application of gravel or rip rap, would be installed, where necessary, immediately after completion of construction activities to avoid erosion and runoff;
- Access roads would follow existing contours to the extent possible;
- An average of 4 inches of gravel would be used as road surface where appropriate because roads would be used during all seasons; and
- Gravel would be laid down when ground conditions are wet enough to cause rutting or other noticeable surface deformation and severe compaction. As a general rule, if vehicles or other project equipment create ruts in excess of 4 inches deep when travel cross-country over wet soils, a gravel surface would be added prior to additional vehicle use.

Visual Resources

- Water would be periodically applied on soil surfaces during construction and grading to control dust;
- Cut and fill areas would be minimized by proper placement of roads and well pads;
- Equipment placed at the well pads after drilling and testing would be removed so that only the wellhead extends above the well pad;

- Drill rig and well test facility lights would be limited to those required to safely conduct the operations and would be shielded and/or directed in a manner that focuses direct light to the immediate work area; and
- Disturbances would be reclaimed to pre-construction conditions or equivalent.

2.2 NO ACTION ALTERNATIVE

Section 1502.14(d) of NEPA's implementing regulations requires the alternatives analysis to "include the alternative of no action" as a baseline against which to assess impacts of the Proposed Action.

Under the No Action alternative, BLM would not issue geothermal drilling permits and access road ROWs for the Proposed Action. As a consequence, Ormat would not perform exploratory well drilling and testing in support of developing existing geothermal resources in conformance with existing lease conditions for the Tungsten Mountain lease area.

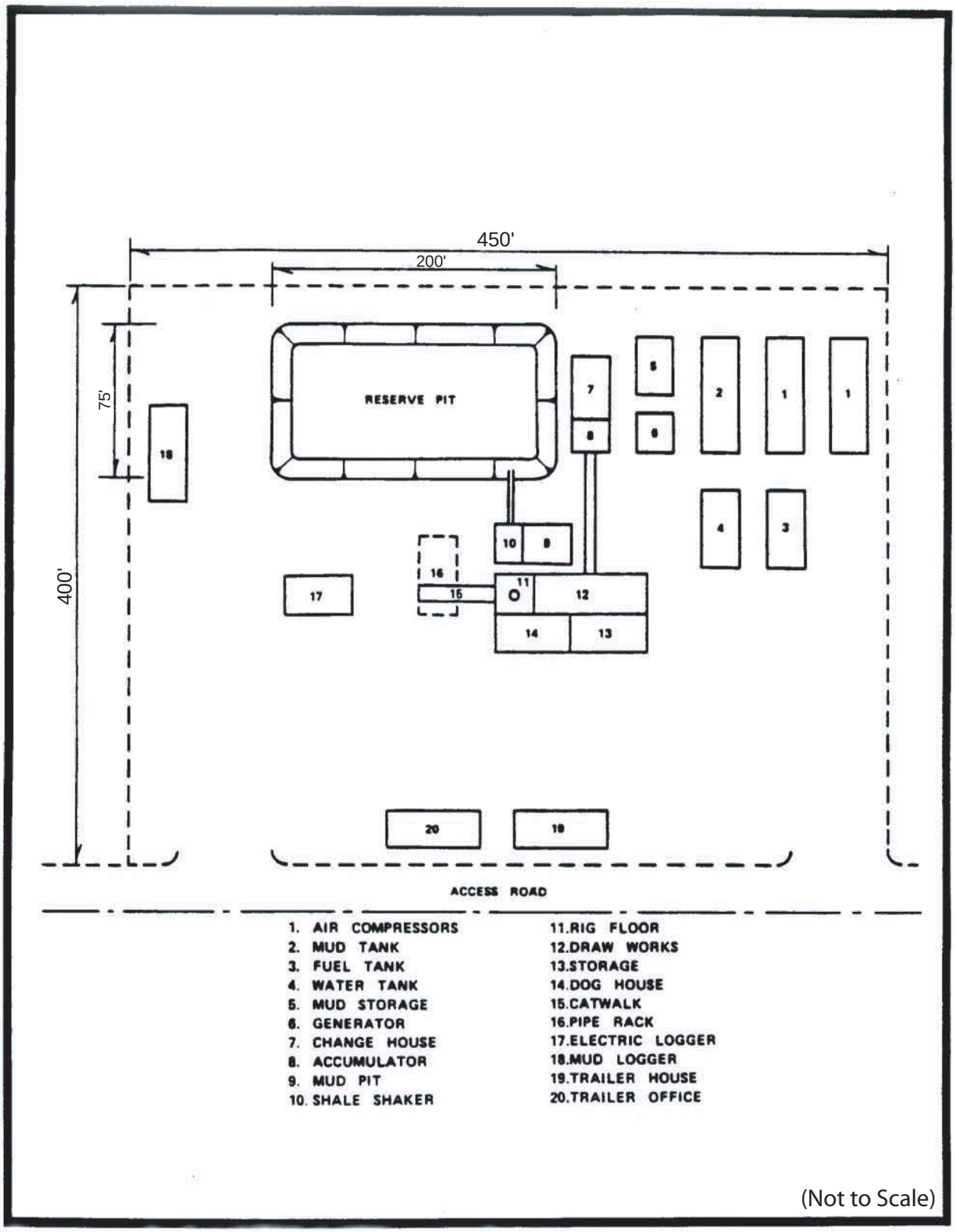

Figure 3: Typical Full-Size Well Site Layout

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter identifies and describes the current condition and trend of authorities or resources in the human environment, which may be affected by the Proposed Action or No Action Alternative and the environmental consequences or effects of the actions.

The Project Area is located in the foothills of the Clan Alpine Mountains and into Edwards Creek Valley, at elevations ranging from approximately 5,200 feet to 5,400 feet above mean sea level. The Project Area is located approximately 36 miles west of the town of Austin, NV (see Figure 1).

3.1 SCOPING AND ISSUE IDENTIFICATION

The BLM Stillwater Field Office held an interdisciplinary team (IDT) meeting in April 2011, and the following resources were identified as being present and potentially impacted by the Proposed Action:

- Cultural Resources;
- Native American Religious Concerns;
- Migratory Birds, Eagles, Wildlife and Key Habitat;
- Water Quality;
- Visual Resources;
- Wilderness;
- Invasive, Nonnative and Noxious Species; and
- Rights–of-way/Lands.

External scoping was performed with the Fallon Paiute-Shoshone Tribe regarding the possibility of Native American religious concerns or any other impacts that could result from the Proposed Action. This scoping process is detailed in Section 3.3.2.

3.2 SUPPLEMENTAL AUTHORITIES AND OTHER RESOURCES

Appendix 1 of BLM's NEPA Handbook (BLM 2008b) identifies resource elements to consider under NEPA and their associated supplemental authorities that contain procedural requirements that BLM must consider as part of its Federal action. The elements are the various resources, such as air quality and biological resources, that could be affected by Federal actions. The supplemental authorities are specified by statutes or executive orders additional to NEPA, such as the Clean Water Act and the Endangered Species Act, that must be considered in all BLM environmental documents.

The BLM's specialists evaluated the potential applicability of the supplemental authorities and the potential impact of the Proposed Actions on the resource elements. On the basis of this evaluation, the BLM has determined the elements to be analyzed in detail in this EA. Table 7 summarizes the elements listed in Appendix 1 of the BLM's NEPA Handbook and documents the BLM's determination of which elements are relevant to the analysis in this EA.

Table 7: Supplemental Authorities

Elements[1]	Not Present[2]	Present/ Not Affected[2]	Present/ May Be Affected[3]	Rationale and/or Sections Found
Air Quality		X		The Project Area is located in a very sparsely populated area with minimal sources of potential impacts to regional air quality, and the area is in attainment for air quality standards. The proposed Project would be short term, temporary and would utilize a small fleet of equipment. With implementation of the environmental protection measures outlined in Section 2.1.11, measureable impacts to air quality are not anticipated.
Areas of Critical Environmental Concern	X			
Cultural Resources			X	Carried through EA.
Environmental Justice	X			
Farm Lands (prime or unique)	X			
Forests and rangelands (Healthy Forests Restoration Area projects only)	X			
Human Health and Safety (herbicide projects)	X			
Floodplains	X			
Invasive, Nonnative, and Noxious Species			X	Carried through EA.
Migratory Birds			X	Carried through EA.
Native American Religious Concerns			X	Carried through EA.
Threatened and/or Endangered Species	X			After consulting with the BLM Wildlife Biologist and contacting the USFWS for Nevada (USFWS 2011), there are no federally listed threatened or endangered species within the Project Area.
Wastes, Hazardous or Solid		X		With the implementation of the Adopted Environmental Protection Measures described in Section 2.1.11, measureable impacts to waste, hazardous or solid, are not anticipated.
Water Quality (Surface/Ground)			X	Carried through EA.
Wetlands/Riparian Zones	X			

Elements[1]	Not Present[2]	Present/ Not Affected[2]	Present/ May Be Affected[3]	Rationale and/or Sections Found
Wild and Scenic Rivers	X			
Wilderness	X			

The BLM also determined that resource elements not included in Appendix 1 of the NEPA Handbook be considered for inclusion in this EA. Table 8 presents those additional elements and documents the BLM's determination of which elements are relevant to the analysis in this EA.

Table 8: Other Resources

Resource or Issue	Not Present	Present/ Not Affected[1]	Present/ May Be Affected[2]	Rationale
Visual Resource Management			X	Carried through EA.
Soil			X	Carried through EA.
Vegetation			X	Carried through EA.
Geology/Minerals			X	Carried through EA.
Livestock Grazing		X		Measurable impacts to livestock grazing are not anticipated.
Wilderness Study Areas			X	Carried through EA.
Lands with Wilderness Characteristics			X	Carried through EA.
Wildlife and Key Habitat			X	Carried through EA.
Special Status Species BLM Sensitive			X	Carried through EA.
Lands			X	Carried through EA.

3.3 PROPOSED ACTION

The Proposed Action would result in up to 131.1 acres of surface disturbance, as identified in Section 2.1.10, Ormat would implement environmental protection measures to minimize or eliminate impacts to the extent practicable. The potential impacts presented below account for implementation of the environmental protection measures.

3.3.1 CULTURAL RESOURCES

Affected Environment

Cultural resources include historic and prehistoric sites of interest and may include structures, archaeological sites, or religious sites of importance to Native American cultures. The U.S. National Park Service defines archaeological and historic resources as "the physical evidences of

past human activities, including evidences of the effects of that activity on the environment. Factors identifying age, location and context of a site may make it culturally significant when looked at in conjunction with its capacity to reveal information through the investigatory research designs, methods, and techniques used by archaeologists." Ethnographic resources are defined as any "site, structure, landscape, object or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (U.S. National Park Service 1998).

The National Historic Preservation Act of 1966, (NHPA) as amended, and the Archaeological Resources Protection Act of 1979 (ARPA) are the primary laws regulating preservation of cultural resources. Section 106 of the NHPA requires federal agencies to take into account the effects of their actions on properties listed or eligible for listing on the National Register of Historic Places. Regulations codified in 36 CFR 800 define how eligible properties or sites are to be dealt with by federal agencies or other involved parties. These regulations apply to all federal undertakings and all cultural resources. The ARPA sets a broad policy that archaeological resources are important to the nation, as well as locally and regionally, and should be protected. The purpose of the ARPA is to secure the protection of archaeological resources and sites that are on public lands and Native American lands. The law applies to any agency that receives information that a federally assisted activity could cause irreparable harm to prehistoric, historic, or archaeological data and provides criminal penalties for prohibited activities.

During the week of March 29 through April 1, 2011 and on May 23, 2011, Chambers Group, Inc. (Chambers Group) conducted a Class III cultural resource inventory for the proposed Project. Four hundred acres of 27 drill pads and approximately 10 miles of new and existing access roads were surveyed, and an additional block survey of approximately 282 acres (some of which overlapped the drill pads and access roads survey) was also performed. The results of the survey have been disclosed in the inventory reports submitted to the BLM (Chambers 2011). Below is a brief summary of their findings.

The field investigation resulted in the identification of 13 newly discovered archaeological sites, and the recording of 20 isolated artifacts. The newly recorded sites consist of four prehistoric lithic artifact scatters, two multi-component sites, five historic debris scatters, one historic road segment and one mill complex. The 20 isolated artifacts consist of seven prehistoric artifacts and 13 historic artifacts. No previously recorded sites are located within the proposed Project Area. None of the newly recorded archaeological sites are recommended eligible to the National Register of Historic Places. Isolated finds are categorically not eligible for inclusion on the National Register of Historic Places per the State Protocol Agreement between the Nevada State Historic Preservation Office (SHPO) and BLM. However, all recommendations for site eligibility for listing on the National Register of Historic Places are based on preliminary field recommendations and are subject to review and possible changes during BLM and SHPO consultations.

Environmental Consequences

A Class III cultural resource inventory of the Project Area was performed, and no observed sites were recommended as eligible for listing on the National Register of Historic Places.

Consultation with the SHPO on Determinations of Eligibility and Finding of Effect for cultural resources located within the proposed Project Area is ongoing. Until such determinations are made final by the BLM, construction and operation of the proposed project would avoid all known resources identified during the survey in accordance with the State Protocol Agreement between the BLM and the SHPO for Implementing the National Historic Preservation Act, 2009, Appendix G, Sections A and B (BLM and SHPO 2009). Ormat would establish a 100-foot buffer zone around cultural sites where construction would be avoided. In the event that construction must encroach on this buffer, an archaeological monitor would be present while those construction activities are performed.

Based on the avoidance of known sites and the established protocol for the discovery of any new site, there would be no impact on cultural resources discovered during operation of the proposed Project. Accordingly, implementation of the Proposed Action would not be anticipated to impact sites eligible for listing on the National Register of Historic Places.

3.3.2 NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment

Consultation with the Fallon Paiute-Shoshone Tribe (FPST) was initiated with a letter sent to Alvin Moyle, FPST Tribal Chairman, on February 15, 2011, and included a description of the Proposed Action, a map of the project location , and an invitation for comments or feedback regarding the Project. Formal face-to-face consultation was initiated through an in-person meeting held between Terri Knutson, BLM SWFO Field Manager, and the FPST Tribal Council on April 27, 2011. Field trips to the project location were attended by Jason Wright, BLM archaeologist, and Ray Stands, FPST cultural coordinator on several occasions, including March 29, 2011; May 10, 2011; and July 12, 2011.

Environmental Consequences

Native American consultation with the FPST is ongoing, but no traditional cultural properties or sacred sites have been identified within the Project Area. Ongoing consultation could result in new information and additional mitigation measures. If previously unidentified and/or undiscovered gravesites, traditional cultural properties, artifacts, or similar occur, Ormat would implement the lease stipulations and environmental protection measures described in Appendix A and 2.1.11, respectively. These measures and stipulations include following procedures set forth in 43 CFR Part 10, Native American Graves Protection and Repatriation Regulations

3.3.3 WILDLIFE AND KEY HABITAT

Affected Environment

Based on the Southwest Regional GAP Analysis Project, the Nevada Department of Wildlife's Wildlife Action Plan characterized Nevada's vegetative land cover into eight broad ecological system groups and linked those with Key Habitat types, which are further refined into Ecological Systems characterized by plant communities or associations (NDOW 2006). Along with survey

data, Key Habitats can be used to infer likely occurrences of wildlife species assemblages. Key Habitat types within the Project Area that potentially would be affected directly or indirectly by the proposed Project are: Intermountain (cold desert) scrub (Inter-mountain Basins Greasewood Flat, Inter-mountain Basins Mixed Salt Desert Scrub and Inter-mountain Basins Semi-desert Shrub Steppe); Sagebrush (Great Basin Xeric Mixed Sagebrush Shrubland and Inter-mountain Basins Big Sagebrush Shrubland); and Invasive grasslands and forblands (Invasive Annual and Biennial Forbland and Invasive Annual Grassland).

Wildland fires burned a substantial portion of the Project Area, and Project vicinity, in 2000. These burned areas are dominated by cheatgrass (*Bromus tectorum*), but also include several other weedy species, both native and non-native species.

Wildlife or wildlife signs (burrows, scat, tracks) observed during the June 2011 survey conducted by biologists from Great Basin Ecology (GBE) include: badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), desert cottontail (*Sylvilagus auduboni*), Desert packrat (*Neotoma cinerea*), ground squirrel (Spermophilus sp.), least chipmunk (*Eutamias minimus*), ord kangaroo rat (*Dipodomys ordi*), sagebrush vole (*Lemmiscus curtatus*), and the yellow-bellied marmot (*Marmota flaviventris*) (GBE 2011).

The Nevada Department of Wildlife (NDOW) provided a list of 12 reptiles that are known to occur in the general area of the proposed Project: long–nosed leopard lizard (*Bambelis wislizenii*), desert banded gecko (*Coleonyx variegates*), desert horned lizard (*Phyrnosoma platyrhinos*), great basin collared lizard (*Crotaphytus bicinictores*), great basin fence lizard (*Sceloporus occidentalis longipes*), northern desert horned lizard (*Phrynosoma platyrhinos*), western fence lizard (*Sceloporus occidentalis*), yellow-backed spiny lizard (*Sceloporus magister uniformis*), zebra tailed lizard (*Callisaurus draconoides*) and the gophersnake (*Pituophis melanoleucus*). Of these, only the long-nosed leopard lizard, desert horned lizard, western fence lizard and zebra-tailed lizard were observed (GBE 2011).

Occupied bighorn sheep and mule deer distributions exist in the Clan Alpine Mountains in the northwestern portion of the Project Area. Pronghorn antelope distribution exists throughout Edwards Creek Valley, covering the majority of the Project Area. There are no known elk distributions in the vicinity of the Project Area (NDOW 2011).

Environmental Consequences

Construction of the proposed Project would result in the direct loss of approximately 131.1 acres of wildlife habitat within the Project Area, and potential mortality for lizards and small mammals that forage within these habitats. Indirect temporary effects from noise, human presence and heavy equipment present during construction activities may lead to reduced breeding success for individuals that are not displaced but are affected by the fragmentation of the overall footprint of the Project, or to individuals displaced into surrounding areas. This in turn may affect distribution of larger mammals and raptors that forage on rodents and small mammals.

Big game species may avoid the area when traveling between mountain ranges, though would not reasonably incur additional physiological stress leading to decreased survival by avoiding the Project Area when crossing between ranges.

Because of the minimal extent and temporary nature of effects from drilling activities and the small habitat acreage loss relative to the available habitat in the Project vicinity, population viability for any one species is not expected to be in jeopardy as a result of construction of the Proposed Action. Ormat has proposed environmental protection measures which are expected to minimize and/or eliminate potential impacts to individuals (see Section 2.1.11). Additionally, following successful reclamation, habitat would be restored.

3.3.4 MIGRATORY BIRDS

Affected Environment

On January 11, 2001, President Clinton signed Executive Order 13186 (EO) placing emphasis on the conservation and management of migratory birds. Migratory birds are protected under the Migratory Bird Treaty Act of 1918 (MBTA) and the EO addresses the responsibilities of federal agencies to protect migratory birds by taking actions to implement the MBTA. BLM management for migratory bird species on BLM- administered lands is based on Instruction Memorandum (IM) No. 2008-050 (BLM 2007). Based on this IM, migratory bird species of conservation concern include "Species of Conservation Concern" and "Game Birds Below Desired Conditions." These lists were updated in 2008 (USFWS 2008).

Golden Eagle

The Bald and Golden Eagle Protection Act (1940 as amended 1959, 1962, 1972 and 1978) prohibits the take or possession of bald and golden eagles with limited exceptions. Take, as defined in the Eagle Act, includes, "to pursue, shoot, shoot at, poison, would, kill, capture, trap, collect, molest or disturb." Disturb means, "to agitate or bother a bald or golden eagle 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."

Important eagle-use area is defined in the Eagle Act as an eagle nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles.

BLM requires consideration and NEPA analysis of golden eagles and their habitat for all renewable energy projects (BLM 2010).

No golden eagle nests were observed in the Project Area. However, the valley vegetation is suitable for prey species and it is likely that the area is used for hunting. No suitable nesting habitat exists within the survey area, but nesting habitat is likely available in the Clan Alpine Mountains. NDOW also indicated that a golden eagle nest had been recorded approximately

eight miles from the lease boundary on the other side of Edwards Creek Valley in the New Pass Range (GBE 2011).

Key Habitat types within the Project Area that potentially would be affected directly or indirectly by the proposed Project are: Intermountain (cold desert) scrub, Sagebrush, and Invasive grasslands and forblands. Wildland fires burned a substantial portion of the Project Area, and Project vicinity. These burned areas are dominated by cheatgrass (*Bromus tectorum*), but also include several other weedy species, both native and non-native species.

Migratory bird species that would likely utilize these Key Habitat types include the American robin (*Turdus migratorius*), black-billed magpie (Pica hudsonia), green-tailed towhee (*Pipilo chlorurus*), sage thrasher (*Oreoscoptes montanus*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), prairie flacon (*Falco mexicanus*), American kestrel (*Falco sparverius*), killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), western kingbird (*Tyrannus verticalis*), horned lark (*Eremophila alpestris*), common raven (*Corvus corax*), rock wren (*Salpinctes obsoletus*), loggerhead shrike (*Lanius ludovicianus*), Western meadowlark (*Sturnella neglecta*), Brewer's blackbird (*Euphagus cyanocephalus*), Brown-headed cowbird (*Molothrus ater*), lark sparrow (*Chondestes grammacus*), sage sparrow (*Amphispiza belli*), Breweer's sparrow (*Spizella breweri*), northern harrier (*Circus cyaneus*) and the burrowing owl (*Athene cunicularia*). With exception of the American robin, black-billed magpie, green-tailed towhee and sage thrasher, the remaining migratory birds were observed within the Project Area or vicinity (GBE 2011).

Environmental Consequences

Surface disturbance associated with Project construction would result in up to 131.1 acres of direct habitat loss. Heavy equipment associated with roads and drilling could also result in direct mortality from birds strikes. Indirect temporary effects from noise, human presence and heavy equipment present onsite during construction activities may lead to reduced nesting success for individuals that are not displaced but are affected by the fragmentation and/or overall footprint of the Project, or to individuals displaced into surrounding areas. This in turn may affect foraging opportunities for species that prey on adults, nestlings or eggs. Raptor species, such as the prairie falcon, that prey on rodents and lizards may also be affected by these activities.

However, because of the minimal extent and temporary nature of effects from the drilling activities and the small habitat acreage loss relative to the hundreds of thousands of acres of available of habitat in the Project vicinity, population viability for any one species is not expected to be in jeopardy as a result of Project construction and operation. Pre-construction migratory bird surveys and other adopted environmental protection measures (see Section 2.1.11) are expected to minimize and/or eliminate potential impacts to individual birds. Additionally, because no known golden eagle nests are within the Project Area or the immediate vicinity, there are hundreds of thousands of acres of available habitat for foraging in the area, and negligible prey impacts are expected, no "Take" or disturbance to "Important Eagle Use Areas" is reasonably expected.

3.3.5 SPECIAL STATUS SPECIES – BLM SENSITIVE

Affected Environment

Sensitive species are defined in BLM Manual 6840 (Special Status Species Management) as native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management and either one of the following:

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or
2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.

Key Habitat types within the Project Area that potentially would be affected directly or indirectly by the proposed Project are: Intermountain (cold desert) scrub, Sagebrush, and Invasive grasslands and forblands. Wildland fires burned a substantial portion of the Project Area, and Project vicinity. These burned areas are dominated by cheatgrass (*Bromus tectorum*), but also include several other weedy species, both native and non-native species.

The sensitive species that may occur within the Project Area were identified through consultation with the Nevada Natural Heritage Program and species lists for Churchill County. The Nevada BLM Sensitive Species List (BLM 2011) was also reviewed. BLM sensitive plant and animal species with potential habitat and potential to occur in the Project Area are presented in Table 9.

Table 9: Nevada BLM Sensitive Species and Presence/Absence of Suitable Habitat in the Project Area

Common Name	Scientific name	Presence/Absence of Suitable Habitat
Pygmy rabbit	*Brachylagus idahoensis*	Limited habitat present.
Greater sage-grouse	*Centrocercus urophasianus*	Sage grouse distribution habitat present. No known core breeding areas or lek sites in the vicinity of the Project Area.
Golden eagle	*Aguila chrysetos*	May forage in the Project Area. No suitable nesting habitat exists in the Project Area, but is likely available in the Clan Alpine Mountains.
Burrowing owl	*Athene cunicularia*	Habitat present; species observed in Project vicinity.
Prairie falcon	*Falco mexicanus*	Foraging habitat is present, though nesting habitat is not; species observed in Project Area.
Ferruginous hawk	*Buteo regalis*	May forage in the Project Area.

Common Name	Scientific name	Presence/Absence of Suitable Habitat
Northern harrier	*Circus cyaneus*	May forage in the Project Area; species observed south of the Project Area.
Mourning dove	*Zenaida macroura*	Habitat present; species observed near the mouths of the Stone and Augusta canyon.
Loggerhead shrike	*Lanius ludovicianus*	Habitat present; species observed in the Project Area.
Brewer's sparrow	*Spizella breweri*	Habitat present; species observed, though habitat is limited due to conversion of the sagebrush community to a community dominated by cheatgrass with some salt desert shrubs.
Sage sparrow	*Amphispiza belli*	Habitat present; species observed, though habitat is limited due to conversion of the sagebrush community to a community dominated by cheatgrass with some salt desert shrubs.

The Project Area is within the Clan Alpine Sage-grouse Population Management Unit (PMU) and NDOW has delineated the northwestern-most portion of the Project Area as nesting and winter distribution habitat. However, the wildfire removed most of the sagebrush habitat from the piedmont and toe slopes of the mountains. The remaining sagebrush habitat is fragmented and occurs in three "islands" that are too small to provide year-long habitat needs. The areas of the Clan Alpine Mountains that are adjacent to the lease boundary and did not burn are generally supporting stands of pinyon-juniper, which is not sage-grouse nesting or winter habitat (GBE 2011).

Environmental Consequences

Environmental consequences are expected to be the same for BLM designated Sensitive Species as is described for the wildlife and migratory birds sections (see Sections 3.3.3 and 3.3.4). Surface disturbance from construction of the Proposed Action would result in the direct loss of approximately 131.1 acres of habitat, and sensitive bird species may experience mortality from collisions with the drill rig derrick. Because of the minimal extent and temporary nature of effects from drilling activities, the small habitat acreage loss relative to the hundreds of thousands of acres of similar habitats that are available in the vicinity of the Project Area, and the fragmented and degraded habitat due to fires, population viability for any one species is not expected to be in jeopardy as a result of construction and operation of the proposed Project. Environmental protection measures adopted by Ormat are expected to minimize and/or eliminate potential impacts to individuals.

Additional impacts would include the potential for introduction and spreading of invasive non-native weed species on the 131.1 acres of disturbed ground and displacement of native species. These impacts would occur as long as exploration activities are occurring. Potential impacts to golden eagles are discussed in Section 3.3.4.

3.3.6 VEGETATION

Affected Environment

Land cover types have been mapped as part of the U.S. Geological Survey (USGS) Southwest Regional Gap Analysis Project. Within the Project Area there are 7 land cover types (ecological systems), and each are described below:

- Inter-Mountain Basins Big Sagebrush Shrubland (S054),
- Inter-mountain Basins Greasewood Flat (S096),
- Inter-mountain Basins Mixed Salt Desert Scrub (S065),
- Inter-mountain Basins Semi-desert Shrub Steppe (S079),
- Great Basin Xeric Mixed Sagebrush Shrubland (S055),
- Invasive Annual and Biennial Forbland (D09), and
- Invasive Annual Grassland (D08).

Additionally, the current or present vegetation has been altered from the potential vegetation. Much of the Project Area and vicinity have been burned and converted to annual vegetation. These burned areas are dominated by cheatgrass (*Bromus tectorum*), but also included several other weedy species, both native and non-native species.

Inter-Mountain Basins Big Sagebrush Shrubland

This ecological system typically occurs in broad basins between mountain ranges, plains and foothills between elevations of 4,900 and 7,550 feet throughout much of the western U.S. Soils are typically deep, well-drained, and non-saline. The shrublands are dominated by basin big sagebrush (*Artemisia tridentate* ssp. *tridentate*) and/or Wyoming big sagebrush (*Artemisia tridentate* ssp. *wyomingensis*). Scattered juniper (*Juniperus* spp.), greasewood (*Sarcobatus vermiculatus*), and saltbush (*Atriplex* spp.) may be present in some areas. Rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush (*Chrysothamnus viscidiforus*), antelope bitterbrush (*Purshia tridentate*), or mountain snowberry (*Symphoricarpos oreophilus*) may codominate disturbed stands. Perennial herbaceous components typically contribute less than 25 percent of the total vegetative cover. Common graminoid species include Indian ricegrass (*Achnatherum hymenoides*), blue grama (*Bouteloua gracilis*), thickspike wheatgrass (*Elymus lanceolatus*), Idaho fescue (*Festuca idahoensis*), needle and thread grass (*Hesperostipa comata*), basin wildrye (Leymus cinereus), James' galleta (*Pleuraphis jamesii*), western wheatgrass (*Pascopyrum smithii),* Sandberg bluegrass (*Poa secunda*), or bluebunch wheatgrass (*Pseudoroegneria spicata*) (NatureServe 2004).

Inter-mountain Basins Greasewood Flat

This ecological system occurs throughout much of the western U.S. in Intermountain basins and extends onto the western Great Plains. It typically occurs near drainages on stream terraces and flats or may form rings around playas. Sites typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing seasons. This system usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or codominated by greasewood (*Sarcobatus vermiculatus)*. Fourwig saltbrush (*Atriplex canescens)*, shadscale saltbush (*Atriplex confertifolia)*, or winterfat (*Krascheninnikovia lanata)* may be present to codominant. Occurrences are often surrounded by mixed salt desert scrub. The herbaceous layer, if present, is usually dominated by graminoids. There may be inclusions of alkali sacaton grass (*Sporobolus airoides)*, desert saltgrass (*Distichlis spicata)* (where water remains ponded the longest), or common spikerush (*Eleocharis palustris)* herbaceous types (NatureServe 2004).

Inter-mountain Basins Mixed Salt Desert Scrub

This extensive ecological system includes open-canopied shrublands of typically saline basins, alluvial slopes, and plains across the inter-mountain U.S. This type also extends in limited distribution into the southern Great Plains. Substrates are often saline and calcareous, medium- to fine-textured, alkaline soils but include some coarser-textured soils. The vegetation is characterized by a typically open to moderately dense shrubland composed of one or more Atriplex species such as shadscale saltbush, fourwing saltbush, cattle saltbush (*Atriplex polycarpa*), or spinescale saltbush (*Atriplex spinifera*). Other co-dominant shrubs present may include Wyoming big sagebrush, yellow rabbitbrush, rubber rabbitbrush, Mormon tea (Ephedra *nevadensis*), spiny hopsage (*Grayia spinosa*), winterfat, desert-thorn (*Lycium* spp.), bud sagebrush (*Picrothamnus desertorum*), or horsebrush (*Tetradymia* spp.). Greasewood is generally absent but if present does not co-dominate. The herbaceous layer varies from sparse to moderately dense and is dominated by perennial graminoids such as Indian ricegrass, blue grama, thickspike wheatgrass, western wheatgrass, James galleta, big gallet (*Pleuraphis rigida*), Sandberg bluegrass, or alkali sacaton grass. Various forbs are also present (NatureServe 2004).

Inter-mountain Basins Semi-desert Shrub Steppe

This ecological system occurs throughout the Intermountain western U.S., typically at lower elevations on alluvial fans and flats with moderate to deep soils. This semi-arid shrub-steppe is typically dominated by graminoids (>25% cover) with an open shrub layer, but includes sparse mixed shrublands without a strong graminoid layer. Characteristic grasses include Indian ricegrass, blue grama, desert saltgrass, needle and thread grass, James' galleta, Sandberg bluegrass, and alkalai sacaton grass. The woody layer is often a mixture of shrubs and dwarf-shrubs. Characteristic species include fourwig saltbrush, sand sagebrush (*Artemisia filifolia)*, Greene's rabbitbrush (*Chrysothamnus greenei*), yellow rabbitbrush, Mormon tea, rubber rabbitbrush, broom snakeweed (*Gutierrezia sarothrae*), and winterfat. Scattered sagebrush may be present but does not dominate. The general aspect of occurrences may be either open shrubland with patchy grasses or patchy open herbaceous layer (NatureServe 2004).

Great Basin Xeric Mixed Sagebrush Shrubland

This ecological system occurs in the Great Basin on dry flats and plains, alluvial fans, rolling hills, rocky hill slopes, saddles and ridges at elevations between 1000-2600 m. Sites are dry, often exposed to desiccating winds, with typically shallow, rocky, non-saline soils. Shrublands are dominated by black sagebrush (*Artemisia nova*) (mid and low elevations), little sagebrush (*Artemisia arbuscula*) (higher elevation), and may be codominated by Wyoming big sagebrush or yellow rabbitbrush. Other shrubs that may be present include shadscale saltbush, spiny hopsage, Shockley's desert-thorn (*Lycium shockleyi*), bud sagebrush, greasewood, and horsebrush. The herbaceous layer is likely sparse and composed of perennial bunch grasses such as Indian ricegrass, desert needlegrass (*Achnatherum speciosum*), Thurber's needlegrass (Achnatherum thurberianum), squirreltail (*Elymus elymoides*), or Sandberg bluegrass (NatureServe 2004).

Invasive Annual and Biennial Forbland

This ecological system occurs in areas that are dominated by introduced annual and/or biennial forb species such as saltlover (*Halogeton glomeratum),* Kochia (*Kochia scoparia)*, and invasive tumbleweed (*Salsola* spp.) (NatureServe 2004).

Invasive Annual Grassland

This ecological system occurs in areas that are dominated by introduced annual grass species such as wild oats (*Avena* spp.), brome grasses (*Bromus* spp.), and Mediterranean grass (*Schismus* spp.) (NatureServe 2004).

Environmental Consequences

The Proposed Action would result in a maximum disturbance of approximately 131.1 acres of surface disturbance, and would include the removal of vegetation within the above ecological systems. Additional impacts to vegetation would be the potential for introduction and spreading of non-native species on the 131.1 acres of disturbed ground. With the abundance of these non-native species in surrounding areas, it is likely these species will invade the disturbed areas. With implementation of the adopted protection measures discussed in Section 2.1.11 and successful reclamation, impacts to vegetation would be minimal.

3.3.7 SOILS

Affected Environment

Soil types in the Project Area were identified using the "Churchill County Area, Parts of Churchill and Lyon Counties" soil survey prepared by the U.S. Department of Agriculture Natural Resource Conservation service (NRCS). There are 2 soil associations mapped within the Project Area (NRCS 2001), and their descriptions are found below.

Mazuma-Bluewing Association

Soil unit 643 is the Mazuma-Bluewing Association. Mazuma soils occur on 0-2 percent slopes, are well drained and never flood or pond. The typical profile includes fine sandy loam and stratified gravelly coarse sand to silt loam. Bluewing soils occur on 2-8 percent slopes, are excessively drained and never flood or pond. The typical profile includes very gravelly sandy loam and stratified very gravelly sand to extremely gravelly loamy coarse sand.

Trocken-Hessing-Pineval Association

Soil unit 422 is the Trocken-Hessing-Pineval Association. Trocken soils occur on 2-4 percent slopes, are well drained and never flood or pond. The typical profile includes gravelly very fine sandy loam and stratified extremely gravelly loamy coarse sand to very cobbly loam. Hessing soils occur on 2-4 percent slopes, are well drained and never flood or pond. The typical profile includes silt loam, very fine sandy loam, gravelly loam and stratified extremely gravelly sand to very gravelly loamy coarse sand. Pineval soils occur on 4-8 percent slopes, are well drained, rarely flood and never pond. The typical profile includes gravelly loam, very gravelly sandy clay loam, stratified extremely gravelly sand to very gravelly sandy loam.

Environmental Consequences

A maximum of 131.1 acres of surface disturbance would result from the implementation of the proposed Project. This surface disturbance may impact soil associations 422 (Trocken-Hessing-Pineval Association) and 643 (Mazuma-Bluewing Association), depending on which access roads and wells are finally constructed within the Project Area. Available growth medium would be salvaged for subsequent use in reclamation activities. In general, removal of vegetation and disturbance to the soil surface resulting from the proposed Project would increase the potential for erosion of soils. Soils would also be compacted by heavy equipment and gravel placement. Soil productivity would decrease in the areas of soil disturbance. In locations where aggregate material has been placed on roads or well pads, material would be mixed with the soil during reclamation, changing the texture and structure of the soil.

The soil disturbance would be dispersed spatially as drill sites and roads are developed during exploration. Existing roads would be used whenever possible to avoid additional disturbance. With the implementation of Ormat's adopted environmental protection measures (see Section 2.1.11) and following the completion of successful reclamation (see Section 2.1.9), impacts to soil resources would be minimal.

3.3.8 INVASIVE, NON-NATIVE SPECIES

Affected Environment

The BLM defines a noxious weed as, "a plant that interferes with management objectives for a given area of land at a given point in time". The BLM Carson City District recognizes the current noxious weed list designated by the State of Nevada Department of Agriculture statue (NDA, 2009). An invasive species is defined as a non-native or alien plant or animal that has

entered into an ecosystem. Invasive species are likely to cause economic harm or harm to human health (Executive Order 13112). Noxious weeds, invasive and non-native species are highly competitive, aggressive and easily spread.

Burned portions of the project area are dominated by the annual invasive species cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola* sp.), and halogeton (*Halogeton glomeratus*).

Environmental Consequences

The proposed disturbance has the potential to create conditions favorable for invasive, non-native, and noxious species. Proposed disturbance would directly impact approximately 131.1 acres leaving these disturbed areas susceptible to invasive, non-native, and noxious species. In addition, transport of weed species to other proposed exploration sites could occur. With the implementation of the EPMs discussed in Section 2.1.11 and successful reclamation, impacts from invasive, non-native, and noxious weeds is expected to be minimal.

3.3.9 WATER QUALITY, SURFACE AND GROUND

Affected Environment

Surface Water

The Project Area is located in the Edwards Creek Valley Hydrographic Area (Number 133 of 256 in the State of Nevada). This Hydrographic Area is part of the Central Hydrographic Region (Number 10 of 14 in the State of Nevada), which is by far the largest Hydrographic Region in Nevada at nearly 30 million acres. The Edwards Creek Valley Hydrographic Area is relatively small, only 266,240 acres, or less than one percent of the Central Hydrographic Region. The Edwards Creek Valley Hydrographic Area is not a "designated" area or groundwater basin (NDCNR-DWR 2011).

The USGS 7.5-minute topographic map shows ephemeral washes flowing southeast across the Project Area. During the biological survey (GBE 2011), there was one flowing creek observed in Stone Canyon. There was no riparian vegetation associated with the drainage after it exited the canyon. This may be an indication that the creek is ephemeral outside of the canyon; flowing only in response to large storm events or spring runoff events (GBE 2011).

There are no Federal Emergency Management Agency (FEMA) Flood Insurance Program Mapping (FIRM) special flood hazard areas or floodway areas within the Project Area. No hot springs or steam vents are known to occur in the area (NBMG 2007). USGS mapping shows a few seeps mapped on private land within the lease area (see Figure 2).

Groundwater

In coordination with the Great Basin Center for Geothermal Energy, hot water from two wells was collected in the field by Derek Amen of Newcrest Resources, Inc. and analyzed at the Desert Research Institute laboratory in 2006. One of those samples produced a significant orange brown

precipitate (iron hydroxide) upon cooling and yielded a poor analytical charge balance. Consequently, the chemistry is not considered accurate. However, the second sample was of clear, 82.2°C water that produced no precipitate and a good charge balance. The Mg-corrected Na-K-Ca geothermometer temperature is 174°C and the quartz (no steam loss) geothermometer temperature is 177°C (NBMG 2007). The analysis is listed below in Table 10:

Table 10: Groundwater Concentration

Substance	Concentration Mg/L	Substance	Concentration Mg/L	Substance	Concentration Mg/L
pH	9.38	Ca	3.48	Mg	0.12
HCO_3	63.4	Fe	1.38	Mn	0.010
CO_3	72.1	K	10.5	Na	156
B	1.09	L	2.7	SiO_2	190
F	12.2	Cl	38.9	SO_4	93.9

Environmental Consequences

The project would have little potential for adversely affecting the quality of either surface waters or ground waters in the Project Area because:

- Each well would be cased with steel casing cemented into the ground which is designed to prevent contamination of any ground waters by the drilling, workover and geothermal fluids and prevent the loss of any geothermal resource into other aquifers.
- In addition to steel casing, each well would be drilled using non-toxic drilling mud, lost circulation materials, and other mud additives to prevent the loss of drilling fluids into the rock.
- Any injection test conducted on a well would only inject produced geothermal fluid through the cased well back into the geothermal reservoir from which it was produced, ensuring that there would be no affect on the quality of ground waters. Chemical analyses of the produced geothermal fluid would be conducted to characterize the geothermal fluids.
- Reserve pits would be constructed at each site for the containment and temporary storage of drilling mud, drill cuttings, geothermal and workover fluids and storm water runoff from the constructed well pad.
- Storm water runoff from undisturbed areas around the constructed well pads would be directed into ditches surrounding the well pad and back onto undisturbed ground consistent with best management practices for storm water.
- To prevent overtopping of the reserve pit, a minimum two foot freeboard would be maintained at all times.

There are 18 springs within 2.5 miles of the lease area. Seventeen of these springs are located in the Clan Alpine Mountains to the west of the lease area, at elevations substantially higher and, therefore, well up-gradient of the proposed Project. These springs are likely the result of groundwater (from precipitation or snow melt) moving down the mountain being forced to the

surface by an impermeable, or relatively impermeable, natural barrier. Because they are substantially up-gradient and highly unlikely to share the same water source, there is very little possibility that the geothermal exploration activity proposed for down in the valley floor to have any impact on these springs.

One spring is located on the east side of the lease area near the edge of the Edwards Creek Valley playa (dry lake bed). It is located approximately 0.5 miles from the closest proposed geothermal exploration well (57-13). To ensure that there is no impact to this spring, Ormat has committed to monitor this spring, consistent with the mitigation measure described below.

Lessee shall monitor and collect the following hydrologic data from the spring located in the SE¼ of the SE¼ of Section 13:

- **Representative temperature, flow or stage, and basic thermal water chemistry – once immediately prior to the commencement of drilling and once immediately following the completion of drilling;**
- **During the drilling or flow testing of well 57-13 – Representative temperature and flow or stage – once each week until drilling or flow testing is completed;**
- **Each year following the drilling of the first well until all wells have been abandoned – Representative temperature, flow or stage, and basic thermal water chemistry – once per year.**

Collected data shall be reported to the BLM Stillwater Field Office Project Lead and Hydrologist in written form within one week of receipt by the lessee.

Following implementation of this mitigation measure, impacts to this spring are not anticipated

No effects to the seeps from production of the temporary water well are anticipated, and monitoring to identify any effects would be conducted, pursuant to the mitigation measure below.

Mitigation Measure:

A hydrologic monitoring program would be instituted once exploration activities commence; the details of which are to be site specific and the intensity commensurate with the level of exploration. Monitoring activities would include reporting the number of aquifers encountered, their quality and their saturated thickness. This information would be submitted to the BLM SFO in a timely manner.

Following implementation of this mitigation, no impacts are anticipated.

3.3.10 GEOLOGY/MINERALS

Affected Environment

Stratigraphy

The Tungsten Mountain prospect is located along alluvial fans that flank the eastern side of the Clan Alpine Mountains near Stone Canyon in T21N R38E in western Edwards Creek Valley. Remnants of calcareous tufa are located in Section 22 along the range front and contain nodules of amorphous silica. Adjacent to the tufa, outcrops of Tertiary ash-flow tuffs exhibit hematite-clay-chlorite-silica alterations. Local bedrock in the Clan Alpine Mountains consists of a ~1000 ft sequence of at least 10 late-Oligocene rhyolitic ash-flow tuffs that mantle a sequence of mid-Oligocene andesite and andesite breccias that may be +2000 ft thick. These Tertiary volcanic rocks that comprise the northeastern part of the Clan Alpine Mountains dip generally ~18°NW. Jurassic tonalite that locally comprises Tungsten Mountain along the eastern range front intrudes and a thick sequence of Permian-Triassic marine siltstones, which includes lesser interbedded limestone, chert, shale and argillite. These sedimentary rocks dip ~60-70°NE.

Structure

A NW-striking fault in Stone Canyon bounds the NE flank of Tungsten Mountain and separates Tertiary andesites in the hanging wall to the NE from pre-Tertiary tonalite and siltstone of the footwall on the SW side that comprises Tungsten Mountain. This fault zone appears to pre-date deposition of the ash-flow tuffs and marks the southwestern margin of a paleovalley in which the sequence of ash-flow tuffs were deposited on top of the andesite sequence. Beginning near the trace of the NW-striking fault in Stone Canyon, a sequence of synthetic NE-striking faults exist in the northeastern part of the range, cut the ash-flow tuffs along the eastern range front as they step down towards the basin, dip steeply ~80 to 85 degrees southeast, and exhibit left-oblique sense of offset. At Stone Canyon a right step in the NE-trending range front appears to be accommodated by WNW-striking faults. The tufa remnants are located at the intersection of NE- and WNW-striking faults along the eastern range front. Complex fracture deformation within the Stone Canyon area reflects the interaction between the NE-striking range front faults with the older NW-striking fault zone as uplift of the eastern Clan Alpine Mountains has progressed.

Minerals

A mining notice (NVN-089415) was filed by Clan Alpine Mining LLC which authorized the sampling of tailings at the “Stone Canyon Mine” in Section 22, T21N, R38E.

Environmental Consequences

The existing notice does not overlap any of the proposed Project activities, and there is little potential for future conflict between the Proposed Action and Clan Alpine Mining LLC. Neither Ormat nor Clan Alpine Mining LLC may proceed with operations on leased or claimed public lands without notice to the BLM. Should operations be proposed which would result in potential

conflict between the two parties, the BLM would attempt to assist the two parties to reduce or eliminate the conflict.

3.3.11 VISUAL RESOURCE MANAGEMENT

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 project is located within an area where VRM classification has not occurred. Pursuant to guidelines established under the Carson City District's Standard Operating Procedures in the Consolidated Resource Management Plan (BLM 2001), interim visual management objectives must be established where a project is proposed and there are no approved VR M objectives.

Assessment of the Project Area determined that the VRM Classification would be designated as an Interim Class III Visual Resource Management area. The proposed exploration drilling would be consistent with the Interim Class III objectives. The objective for this class is to partially retain the existing character of the landscape and the level of change to the characteristic landscape can be moderate. Management activities in an interim Class III category may attract attention but should not dominate the view of the casual observer. Every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of basic landscape elements.

Environmental Consequences

Drilling operations, including construction of reserve pits, access roads, equipment placement and lighting would have the greatest impacts to visual resources.

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, and lights used when drilling at night would increase rig visibility, and also affect nighttime darkness. Impacts to visual resources from drilling operations would primarily affect the elements of line and color. Drilling operations will be temporary and short-term, therefore impacts associated with drilling operations will also be temporary.

Impacts can be minimized through the use of best management practices. Lighting would be kept to a minimum with care taken on direction of lights to reduce reflection, exposure to areas outside of the work area and unneeded light pollution of the night skies. Road construction would be kept to a minimum to meet access requirements and would be designed to utilize the natural contours of the local topography. The project can also be implemented in phases so that the landscape can be reclaimed once a particular phase has been completed to avoid long term visual disturbance in the Project Area.

3.3.12 LANDS WITH WILDERNESS CHARACTERISTICS

Affected Environment

All public lands within the Carson City District were analyzed and summarized in 1979 wilderness inventory decisions performed pursuant to the Federal Lands Policy Management Act of 1976. Public lands to the west of the Project Area were determined to be suitable for wilderness and were subsequently designated as the Clan Alpine Wilderness Study Area in 1980. The public lands within and surrounding the eastern and southern edges of the proposed Project Area were found not to have opportunities for solitude or primitive and unconfined recreation opportunities that were outstanding. The 1979 inventory results also determined that public lands within the Project Area did not contain the requisite wilderness characteristics and therefore, this area was not identified as a potential wilderness area.

Other imprints of man degrading wilderness character remain at 1979 levels or have increased since the original inventories. No changes have occurred that would warrant changing the conclusion of the finding that wilderness characteristics were not present in the area. This determination was based upon review of the files for the original and intensive wilderness inventories conducted in the late seventies and early eighties; the analysis of Roadless areas and Rights-of-ways; current and historic impacts from mining activities; and other disturbances using GIS data and aerial photographs. The Project Area was found to contain roads which have been improved and maintained by mechanical means and roads that receive regular and continuous use. Other geothermal exploration activity has been ongoing in this area for several years further reducing the potential for wilderness characteristics to exist in this area.

Environmental Consequences

Pursuant to section 201[a] of the FLPMA the 1979 wilderness characteristic inventory was updated for all lands that could be impacted by the Proposed Action. No changes have occurred that would warrant a change of the 1979 finding that wilderness characteristics were not present in the Project Area.

3.3.13 WILDERNESS STUDY AREAS

Affected Environment

The north and northwest boundary of the proposed geothermal exploration activity in T21N, R38E, is located along eastern edge of the Clan Alpine Wilderness Study Area (WSA) in Edwards Creek Valley.

Environmental Consequences

Since the Project Area occurs outside of the WSA there would be no impact to address from exploration activities. The Interim Management Policy and Guidelines for lands under Wilderness Review does not provide for a setback or buffer for development adjacent to a WSA and does not address impacts to a WSA from activities outside of the WSA itself.

It is the proponent's responsibility to ensure that exploration activities remain outside of the established WSA. In situations where a WSA boundary road is present, the official WSA boundary is the inside edge of disturbance of the boundary road or the border line of the legal right-of-way granted for construction of the road. If no boundary road, section or patent line, description or annotation exists, the official WSA boundary is the center line of the weighted boundary line drawn on the Nevada State Office master set of 7.5 minute US Geological Survey quadrangle maps. The lease boundary for the geothermal project should have taken this into consideration, in which case the establishment of the boundary should not be an issue.

3.3.14 LANDS

Affected Environment

There are several land use authorizations granted on public lands within the Tungsten Mountain Geothermal lease area (see Table 11).

Table 11: Land Use Authorizations

Holder	ROW/Activity	Case File No.	Location
Navy Facility Engineering Command - Real Estate	Five Mobile Threat Emitter Sites	NVN-073748	21N 38E, sec. 23
ORNI 43 LLC	Geothermal Lease	NVN-085715	21N 38E, sec. 13, 21, 23-28
ORNI 43 LLC	Geothermal Lease	NVN-086897	21N 38E, sec. 22
ORNI 43 LLC	Geothermal Lease	NVN-086898	21N 38E, sec. 33, 34
ORNI 43 LLC	Geothermal Lease	NVN-088428	21N 38E, sec. 23, 26, 27
Clan Alpine Mining LLC	Notice of Intent - Gold	NVN-089415	21N 38E, sec. 22

Environmental Consequences

Project facilities and activities within the Project Area would be located away from the authorized ROWs, so there would be no impacts to lands within the Project Area. Any Rights-of-way holders in the Project Area will be notified by the SFO of the Proposed Action.

3.4 NO ACTION ALTERNATIVE

Affected Environment

The effected environment described for the Proposed Action would be the same for the No Action Alternative.

Environmental Consequences

The environmental consequences described above under each resource would not occur under the No Action Alternative.

4.0 CUMULATIVE IMPACTS

This section analyzes the potential cumulative impacts to the resources from past, present and reasonably foreseeable future projects combined with the Proposed Action within the Project Area. A cumulative impact has been identified as the impact which results from the incremental impacts of the action, decision, or project when added to other past, present and reasonably forseeable future actions (RFFAs), regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The cumulative effects study area is the Tungsten Mountain lease area, and encompasses approximately 4,880 acres as shown in Figure 2.

4.1 PAST, PRESENT AND REASONABLY FORESEEABLE FUTURE ACTIONS

The primary activities from the past, present and reasonably foreseeable future actions that would contribute to cumulative impacts from adding the impacts from the Proposed Action include: existing transportation network, proposed geothermal exploration and development activities, wildland fire, and miscellaneous administrative Rights-of-way. These projects are described further below:

- Existing dirt and gravel roads – There are 6.5 miles of existing dirt, gravel and "two track" roads within the lease area. Assuming the roads are 15 feet wide, existing roads within the lease area account for 11.8 acres of disturbance on public lands. These roads are devoid of vegetation and do not provide productive soils and habitat for plant and wildlife species.
- Geothermal leases – Past, present and reasonably foreseeably future activities on the geothermal leases may include geophysical surveys and temperature gradient hole drilling, in addition to the Proposed Action. Energy production from the geothermal resource would include construction of a power plant, wellfield, pipelines, ancillary facilities and a transmission line. Disturbance associated with the Proposed Action accounts for 131.1 acres of disturbance with an estimated 100 acres of disturbance for potential future activities.
- Wildland fire – Past, present and future wildland fires occur both naturally and through human activities within the lease area. Approximately 500 acres of the lease area has been burned by wildland fire.
- Miscellaneous administrative Rights-of-ways – Most ROWs issued within the lease area are related to geothermal resource leasing, though one gold mining notice of intent (approximately 0.25 acres) has been authorized, as has the authorization of five mobile threat emitter sites (approximately .50 acres total).

Within the study area, there are approximately 12.6 acres of existing disturbance, not including land that has been burned by wildland fires. Including the disturbance associated with the Proposed Action and other reasonably foreseeable future actions within the geothermal lease area, there would be approximately 236.2 acres of disturbance, or approximately 5% of the lease area.

4.2 CUMULATIVE IMPACTS TO AFFECTED RESOURCES

The following sections discuss the cumulative effects of the Proposed Action when combined with past, present, and reasonably foreseeable future projects within the lease area as described above. Impacts to the following resources are analyzed in the cumulative effects sections below:

- Wildlife and Key Habitat;
- Special Status Species;
- Migratory Birds;
- Vegetation;
- Soils; and
- Visual Resource Management

4.2.1 Biological Resources (Including Wildlife and Key Habitat, Special Status Species, Migratory Birds and Vegetation)

The Proposed Action would have impacts to biological resources. Vegetation and habitat would be disturbed and removed, and invasive, nonnative species may spread as a result of the Proposed Action. Other development as described in Section 4.1 in the area may also remove vegetation and increase growth of invasive species. However, Ormat's adopted protection measures, which include reseeding of disturbed areas and monitoring of invasive species would reduce potential impacts. Wildlife habitat, including habitat for migratory birds and BLM sensitive species, could be disturbed or removed due to other development in the area. Human activity and noise could displace wildlife to surrounding areas. However, similar abundant habitat is found in the area and region, and reseeding of disturbed areas could re-establish wildlife habitat. Overall, the Proposed Action would have a negligible contribution to the cumulative effects on biological resources within the lease area.

4.2.2 Soils

Soil erosion and soil compaction could be caused by the combination of the Proposed Action along with other current and potential future activities. The contribution of the Proposed Action to soil erosion and compaction would be minimized through the use of environmental protection measures, as have been adopted by Ormat (see Section 2.1.11).

4.2.3 Visual Resource Management

The past, present and reasonably forseeable future actions within the lease area, in combination with the Proposed Action, would result in potential impacts to visual resources. Visual impacts associated with the Project would be limited to the period of active construction and drilling through final reclamation. Concurrent reclamation, where possible, in the lease area would reduce the intensity of the impact during this period. The Proposed Action would contribute only minimal impacts to visual resources because disturbed surfaces would be reclaimed and project equipment and personnel would be removed from the site following completion of the project,.

5.0 CONSULTATION AND COORDINATION

5.1 PUBLIC INVOLVEMENT

Comments were accepted on the Environmental Assessment ORMAT Technologies, Inc. tungsten Mountain Geothermal Exploration Project DOI-BLM-NV-C010-2012-0029-EA, for a 30 day period from January 30 until February 28, 2012. Hard copies of the EA were available at the Carson City District Office. The EA is posted at: http://www.blm.gov/nv/st/en/fo/carson_city_field/blm_information/nepa/nepa_archives.html

Comments were received from State of Nevada Division of Environmental Protection – Bureau of Water Pollution Control, Nevada Department of Transportation, Nevada Department of Wildlife, Nevada Division of State Lands and the State Land Use Planning Agency, United States Department of Energy, the United States Environmental Protection Agency and one private citizen. All comments received were reviewed, considered and responded to by the BLM Stillwater Field Office, Carson City District. Additional analysis, environmental data and explanations have been included in the Final EA in response to public review and comments received.

5.2 LIST OF PREPARERS

U.S. Bureau of Land Management

Linda Appel	Air Quality Specialist
Jill Devaurs	Weed Coordinator
Carla James	Supervisory Geologist
Edward Klimasauskas	Geologist, Project Lead
Steve Kramer	Planning and Environmental Coordinator
Erik Pignata	Realty Specialist
Gabriel Venegas	Hydrogeologist
Dan Westermeyer	Outdoor Recreation Planner
John Wilson	Biologist
Jason Wright	Archaeologist

Environmental Management Associates

Heather Altman	Senior Environmental Specialist
Dwight Carey	Principal
Erin Wielenga	Environmental Specialist

5.3 PERSONS, GROUPS, OR AGENCIES CONSULTED

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Great Basin Ecology, Inc.

Stephanie Adams	Technical Editor
Gary Back	President

Rachel Olson	GIS Coordinator

Fallon Paiute-Shoshone Tribe

Alvin Moyle	Chairman

Nevada Division of Wildlife

Timothy Herrick	Conservation Aide III, Wildlife Diversity Division
Chet VanDellen	GIS Coordinator

Nevada Natural Heritage Program

Eric S. Miskow	Biologist III/Data Manager

Ormat Nevada, Inc.

Kyle Snyder	Environmental Compliance Specialist

U.S. Fish and Wildlife Service

Jill A. Ralston	Acting State Supervisor

6.0 REFERENCES

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Appendix A: Federal Geothermal Lease Stipulations

NOTICE

Washington Office Instruction Memorandum No. 2010-171, dated March 5, 2010, supplements the Bureau of Land Management's 2004 National Sage-Grouse Habitat Conservation Strategy and provides the following guidance pertaining to the sale of parcels for oil & gas/geothermal development:

"Attach a lease notice to new leases alerting the lessee that additional conditions will be applied to approvals to develop the lease, including Applications for Permit to Drill (APDs), sundry notices and associated rights-of-way, if future sage-grouse conservation efforts are appropriate."

ENDANGERED SPECIES ACT
SECTION 7 CONSULTATION STIPULATION

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 statutes 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 to 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.

Riparian Areas Stipulation

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

No surface occupancy or disturbance will be allowed within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas, or 100-year floodplains to protect the integrity of these resources (as delineated by the presence of riparian vegetation and not actual water). Exceptions to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site mitigation will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources.

PARCEL	DESCRIPTION OF LANDS
PARCEL NV-10-05-006 THRU PARCEL NV-10-05-008	ALL LANDS
PARCEL NV-10-05-011 THRU PARCEL NV-10-05-018	ALL LANDS
PARCEL NV-10-05-021 THRU PARCEL NV-10-05-022	ALL LANDS
PARCEL NV-10-05-024 THRU PARCEL NV-10-05-036	ALL LANDS
PARCEL NV-10-05-040 THRU PARCEL NV-10-05-044	ALL LANDS
PARCEL NV-10-05-052	ALL LANDS
PARCEL NV-10-05-057	ALL LANDS
PARCEL NV-10-05-058	ALL LANDS

Native American Consultation Stipulation

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources of concerns to tribes potentially effected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as, change in the ways in which developments are implemented.

PARCEL	DESCRIPTION OF LANDS
PARCEL NV-10-05-006 THRU PARCEL NV-10-05-008	ALL LANDS
PARCEL NV-10-05-011 THRU PARCEL NV-10-05-018	ALL LANDS
PARCEL NV-10-05-021 THRU PARCEL NV-10-05-022	ALL LANDS
PARCEL NV-10-05-024 THRU PARCEL NV-10-05-036	ALL LANDS
PARCEL NV-10-05-040 THRU PARCEL NV-10-05-044	ALL LANDS
PARCEL NV-10-05-052	ALL LANDS
PARCEL NV-10-05-057	ALL LANDS
PARCEL NV-10-05-058	ALL LANDS

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 statutes 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 to 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.

ENDANGERED SPECIES ACT
SECTION 7 CONSULTATION STIPULATION

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.

NATIVE AMERICAN CONSULTATION STIPULATION

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources of concerns to tribes potentially effected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as, change in the ways in which developments are implemented.

	Description of Lands
PARCEL NV-08-08-001	T. 20 N., R. 26 E., MDM, Nevada sec. 04, lots 5-12, S2; sec. 08, all; sec. 16, all; sec. 20, lots 1-8, N2; sec. 28, all.
PARCEL NV-08-08-006	ALL LANDS
PARCEL NV-08-08-007	ALL LANDS.
PARCEL NV-08-08-008	ALL LANDS
PARCEL NV-08-08-010	ALL LANDS
PARCEL NV-08-08-011	ALL LANDS
PARCEL NV-08-08-016	ALL LANDS
PARCEL NV-08-08-021	T. 22 N., R. 40 E., MDM, Nevada sec. 04, portion within Carson City; sec. 05, lots 1-4, S2N2, S2; T. 23 N., R. 40 E., MDM, Nevada sec. 28, portion within Carson City; sec. 29, all; sec. 31, lots 1-4, E2, E2W2; sec. 32, all.
PARCEL NV-08-08-022	ALL LANDS
PARCEL NV-08-08-023	ALL LANDS

RIPARIAN AREAS STIPULATION

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

No surface occupancy or disturbance will be allowed within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas, or 100-year floodplains to protect the integrity of these resources (as delineated by the presence of riparian vegetation and not actual water). Exceptions to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site mitigation will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources.

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PARCEL NV-08-08-001	T. 20 N., R. 26 E., MDM, Nevada sec. 04, lots 5-12, S2; sec. 08, all; sec. 16, all; sec. 20, lots 1-8, N2; sec. 28, all.
PARCEL NV-08-08-006	ALL LANDS
PARCEL NV-08-08-007	ALL LANDS.
PARCEL NV-08-08-008	ALL LANDS
PARCEL NV-08-08-010	ALL LANDS
PARCEL NV-08-08-011	ALL LANDS
PARCEL NV-08-08-016	ALL LANDS
PARCEL NV-08-08-021	T. 22 N., R. 40 E., MDM, Nevada sec. 04, portion within Carson City; sec. 05, lots 1-4, S2N2, S2; T. 23 N., R. 40 E., MDM, Nevada sec. 28, portion within Carson City; sec. 29, all; sec. 31, lots 1-4, E2, E2W2; sec. 32, all.
PARCEL NV-08-08-022	ALL LANDS
PARCEL NV-08-08-023	ALL LANDS

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Description of Lands	
PARCEL NV-09-07-007 THRU PARCEL NV-09-07-008	ALL LANDS
PARCEL NV-09-07-015 THRU PARCEL NV-09-07-017	ALL LANDS
PARCEL NV-09-07-020	ALL LANDS
PARCEL NV-09-07-025	
PARCEL NV-09-07-027 THRU PARCEL NV-09-07-028	ALL LANDS
PARCEL NV-09-07-032 THRU PARCEL NV-09-07-033	ALL LANDS
PARCEL NV-09-07-040 THRU PARCEL NV-09-07-051	ALL LANDS
PARCEL NV-09-07-055 THRU PARCEL NV-09-07-057	ALL LANDS
PARCEL NV-09-07-060 THRU PARCEL NV-09-07-067	ALL LANDS
PARCEL NV-09-07-074	ALL LANDS

NATIVE AMERICAN CONSULTATION STIPULATION

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources of concerns to tribes potentially effected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as, change in the ways in which developments are implemented.

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PARCEL NV-09-07-015 THRU PARCEL NV-09-07-017	ALL LANDS
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PARCEL NV-09-07-025 THRU PARCEL NV-09-07-028	ALL LANDS
PARCEL NV-09-07-032 THRU PARCEL NV-09-07-033	ALL LANDS
PARCEL NV-09-07-040 THRU PARCEL NV-09-07-051	ALL LANDS
PARCEL NV-09-07-055 THRU PARCEL NV-09-07-057	ALL LANDS
PARCEL NV-09-07-060 THRU PARCEL NV-09-07-067	ALL LANDS
PARCEL NV-09-07-074	ALL LANDS
PARCEL NV-09-07-079	ALL LANDS

ENDANGERED SPECIES ACT
SECTION 7 CONSULTATION STIPULATION

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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 statutes 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 to 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.

RIPARIAN AREAS STIPULATION

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PARCEL NV-09-07-015 THRU PARCEL NV-09-07-017	ALL LANDS
PARCEL NV-09-07-020	ALL LANDS
PARCEL NV-09-07-025	
PARCEL NV-09-07-027 THRU PARCEL NV-09-07-028	ALL LANDS
PARCEL NV-09-07-032 THRU PARCEL NV-09-07-033	ALL LANDS
PARCEL NV-09-07-040 THRU PARCEL NV-09-07-051	ALL LANDS
PARCEL NV-09-07-055 THRU PARCEL NV-09-07-057	ALL LANDS
PARCEL NV-09-07-060 THRU PARCEL NV-09-07-067	ALL LANDS
PARCEL NV-09-07-074	ALL LANDS

NATIVE AMERICAN CONSULTATION STIPULATION

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

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	Description of Lands
PARCEL NV-09-07-007 THRU PARCEL NV-09-07-008	ALL LANDS
PARCEL NV-09-07-015 THRU PARCEL NV-09-07-017	ALL LANDS
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PARCEL NV-09-07-055 THRU PARCEL NV-09-07-057	ALL LANDS
PARCEL NV-09-07-060 THRU PARCEL NV-09-07-067	ALL LANDS
PARCEL NV-09-07-074	ALL LANDS
PARCEL NV-09-07-079	ALL LANDS

ENDANGERED SPECIES ACT
SECTION 7 CONSULTATION STIPULATION

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 statutes 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 to 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.