ENVIRONMENTAL ASSESSMENT

GERLACH GEOTHERMAL WELL 68-3 PROJECT

WASHOE COUNTY, NEVADA

JULY 2006

EA NUMBER: NV-020-06-EA-12

Lead Agency:

BUREAU OF LAND MANAGEMENT
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1 INTRODUCTION

1.1 Location and Summary of Proposed Action

Gerlach Green Energy LLC (GGE) is proposing to drill and test a geothermal resource well on public lands leased to GGE (Project) in Washoe County, Nevada (Figure 1). The Project is located within Section 3, Township 32 North, Range 23 East (T32N, R23E), Mount Diablo Baseline and Meridian (MDB&M), on federal geothermal lease NV-75228 (see Figure 2). The Project (Proposed Action) includes constructing a drill pad and an approximately 1,000-foot access road; then drilling, completing, flow-testing and monitoring geothermal well 68-3 to a true vertical depth (TVD) of approximately 6,000 feet. The total estimated area of new surface disturbance required for Project construction would be less than about 1.75 acres (see Figure 2).

1.2 Purpose and Need

GGE's purpose for the Project is to conduct a geothermal resource exploration program. The need for the Project is to confirm the existence of a commercial geothermal reservoir at the proposed drill site within this federal geothermal lease.

As required by the Geothermal Steam Act and the federal geothermal lease regulations, GGE has filed the required operations plan and geothermal drilling permit with the BLM for the access road, drill pad construction and the drilling and completing of the proposed geothermal well. BLM must respond to the plans and programs submitted by the lessee or the lessee's designated operator and either approve, require modification, or deny these applications. BLM's purpose in preparing this EA is to comply with the requirements of the National Environmental Policy Act (NEPA) to evaluate the potential environmental consequences of the actions proposed and determine if an Environmental Impact Statement would be required. Consistent with requirements of NEPA, this EA will serve as a decision-making tool to assist BLM in its determination to approve, modify or reject the proposed action.

1.3 Plan Conformance

At the time federal geothermal lease NV-75228 was issued in 2001, the public land within the lease area was administered by the BLM through the Winnemucca Field Office. At that time, the entire lease was subject to the Sonoma-Gerlach Management Framework Plan (MFP), which was adopted in 1982.

On December 21, 2000, President Bill Clinton signed the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area Act of 2000 (NCA Act) into law. The NCA Act created the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area (NCA) and ten associated wilderness areas. The NCA Act directed the Secretary of the Interior, through the BLM, to manage the NCA and associated wilderness areas in a way that conserved and protected the resources identified, and required that a comprehensive land use plan be prepared for these lands.

In 2004 the BLM Winnemucca and Surprise Field Offices jointly adopted the Black Rock-High Rock Resource Management Plan (RMP) for the 1.2 million acre Black Rock-High Rock planning area (planning area), which consisted of the NCA, the wilderness areas and several small contiguous areas. No portion of the geothermal lease is within the NCA or any of the wilderness areas. The eastern portion of the geothermal lease (including the well pad and eastern half of the access road) is within the South Playa Area (one of the small [14,671 acre] contiguous areas) of the Black Rock-High Rock planning area.(see Figure 3). In the planning area (including the eastern portion of the geothermal lease), the adopted RMP replaced the MFP.

The Record of Decision and Resource Management Plan for Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area and Associated Wilderness, and other Contiguous Lands in Nevada (July 2004, page 2-44, Leasable Minerals Management) states that geothermal leases in the South Playa will be administered under the terms of the leases and applicable laws and regulations.

> "The existing geothermal leases would be extended for: 1) five years if drilling over the end of the primary lease term (10 years) or production of byproducts occurs, 2) up to two 5-year periods if diligent development occurs, and 3) for as long as unit commitment occurs. If geothermal resources are produced, or are capable of being produced in commercial quantities, the lease continues. If at the end of the additional term, the land is not needed for other purposes and production is ongoing, the lessee would have a preferential right to renew the lease for an additional 40-year period under the terms and conditions applied."

The Proposed Action is in conformance with the MFP and the RMP, as applicable to the appropriate portions of the geothermal lease.

1.4 Relationship to Laws, Regulations, Policy, Plans or Other Environmental Analyses

1.4.1 Geothermal Steam Act

The Project is proposed to be conducted on a federal geothermal lease issued by the United States of America to GGE. This lease conveys to the lessee the "exclusive right and privilege to drill for, extract, produce, remove, utilize, sell, and dispose of geothermal steam and associated geothermal resources." To maintain this right, the lessee must "diligently explore the leased lands for geothermal resources until there is production in commercial quantities" applicable to this lease. The lessee must pay annual rentals to the federal government, and must expend increasing amounts to have these funds qualify as diligent exploration expenditures, until the production of geothermal resources in commercial quantities is achieved.

The Geothermal Steam Act of 1970 (Act) (30 USC 1001-1025) gives the Secretary of the Interior the responsibility and authority to manage geothermal operations on lands leased for geothermal resource development by the United States of America, and the Secretary has delegated this authority to the Bureau of Land Management (BLM). Pursuant to the regulations adopted to implement applicable portions of the Act (43 CFR 3251.12), the BLM will review the drilling and completion programs submitted by a federal geothermal lessee and will approve the programs if they comply with the Act, the regulations adopted pursuant to the Act (43 CFR 3200 *et seq*.), other directives issued by the BLM (Geothermal Resource Operational (GRO) Orders, Notices to Lessees, etc.), any special stipulations applicable to the federal geothermal leases, and any other applicable laws and regulations. All operations conducted on the geothermal

lease by the geothermal lessee are subject to the approval of the BLM under the Geothermal Steam Act. The BLM must also comply with the requirements of the National Environmental Policy Act (NEPA) prior to approving the operations plan and geothermal drilling permit.

The federal geothermal lease that would be explored as part of the Proposed Action was issued in 2001. GGE is required to comply with both the general and special geothermal lease stipulations applied to this lease. The special stipulations attached to this lease are included in this Environmental Assessment (EA) as Appendix A, and the Project's compliance with each of these stipulations is assessed in the applicable sections of this EA.

1.4.2 2005 Energy Policy

The 2005 Energy Policy Act was signed by President George W. Bush on August 8, 2005. This act contains several provisions aimed at making geothermal energy more competitive with fossil fuels in generating electricity. In May 2001, the President adopted a National Energy Policy to respond to the nation's increasing energy needs. This policy recognizes the importance the federal government's affect on the supply and use of energy. In response to the policy, the BLM developed an implementation strategy titled: *BLM Implementation of the National Energy Policy*.

1.4.3 Previous Environmental Assessments

In 1993 the BLM Winnemucca Field Office completed Environmental Assessment NV-020-04-02 for the "San Emidio Resources Inc. Geothermal Exploration Drill Holes" project. This project consisted of a proposal to drill four geothermal exploration wells in Section 10, immediately south of proposed well 68-3. One of the wells was located on public land managed by the BLM; the other three wells were located on "split-estate" land, the surface of which was private land while the mineral estate remained with the United States. None of the wells were subsequently drilled.

1.5 Other Geothermal Activities in the Project Vicinity

Geothermal resource exploration activities began on private land in the Project vicinity in 1993 when San Emidio resources drilled observation well 38-10 in the southwest quarter of Section 10, T32N, R23E. In 1994, observation well GTG-3 and thermal gradient hole GTG-2 were drilled in the northwest quarter of Section 10; thermal gradient hole GTG-7 was drilled in the northeast corner of Section 10; and full size production well 18-10 was drilled in the southwest quarter of Section 10. Well 38-10, and holes GTG-3 and GTG-7, are still being monitored. Hole GTG-2 and Well 18-10 were plugged and abandoned in 1995.

1.6 Identified Issues

This EA was prepared in accordance with BLM geothermal regulations (43 CFR 3200 *et. seq.*), the Council of Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500 *et. seq.*); and BLM guidelines for implementing NEPA (USDI 1988). This EA was prepared with the assistance of Environmental Management Associates, Inc. (EMA), using information gathered from the BLM, other federal agencies, state agencies, local agencies, GGE, and publicly available literature. The scope of this EA is based upon specific issues and concerns identified by BLM and EMA staff. These issues and concerns include:

- The National Conservation Area (NCA);
- Introduction of invasive, nonnative species;

- Visual Impacts; and
- Recreation.

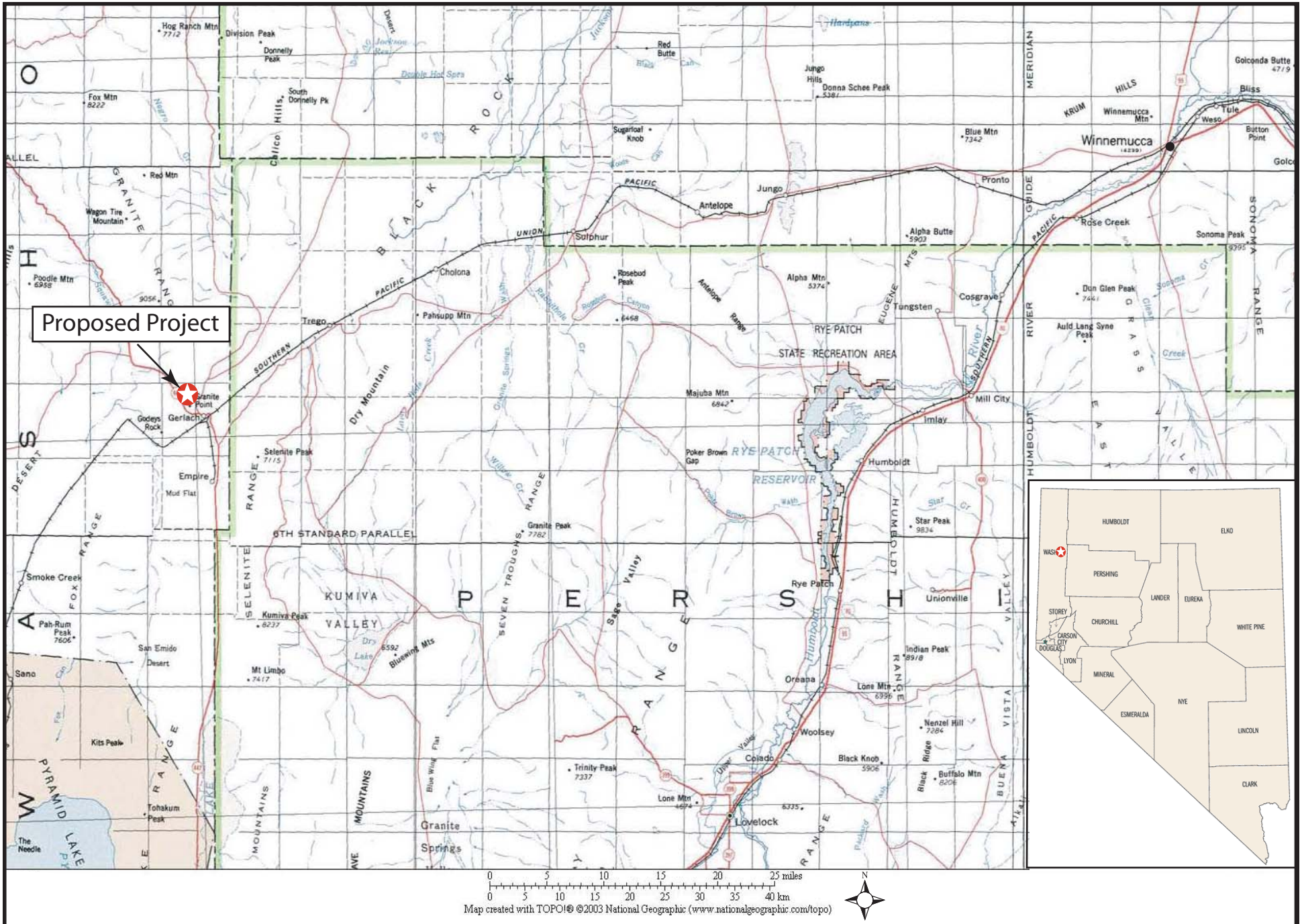

Figure 1: Project Vicinity Map

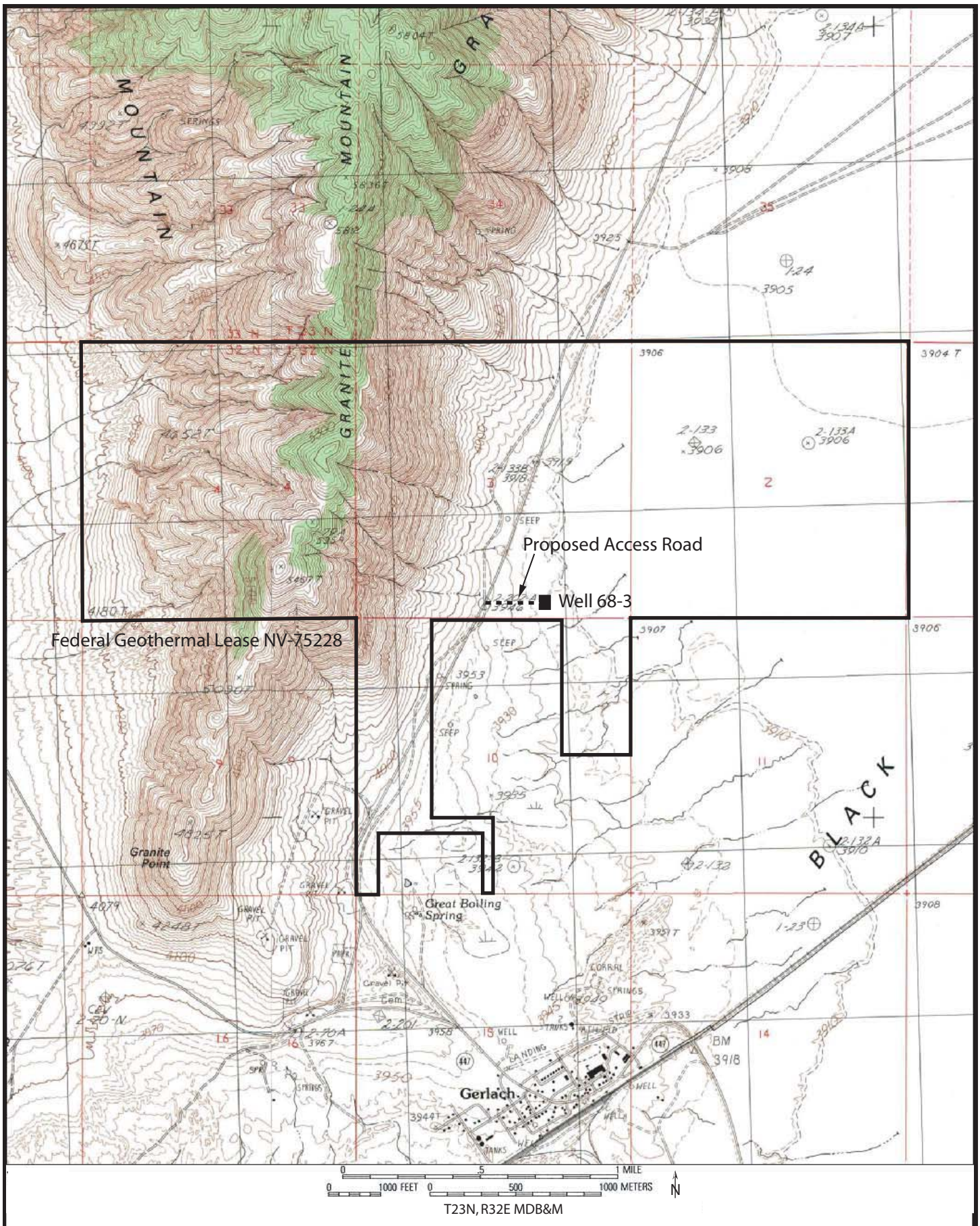

Figure 2: Proposed Actions Map

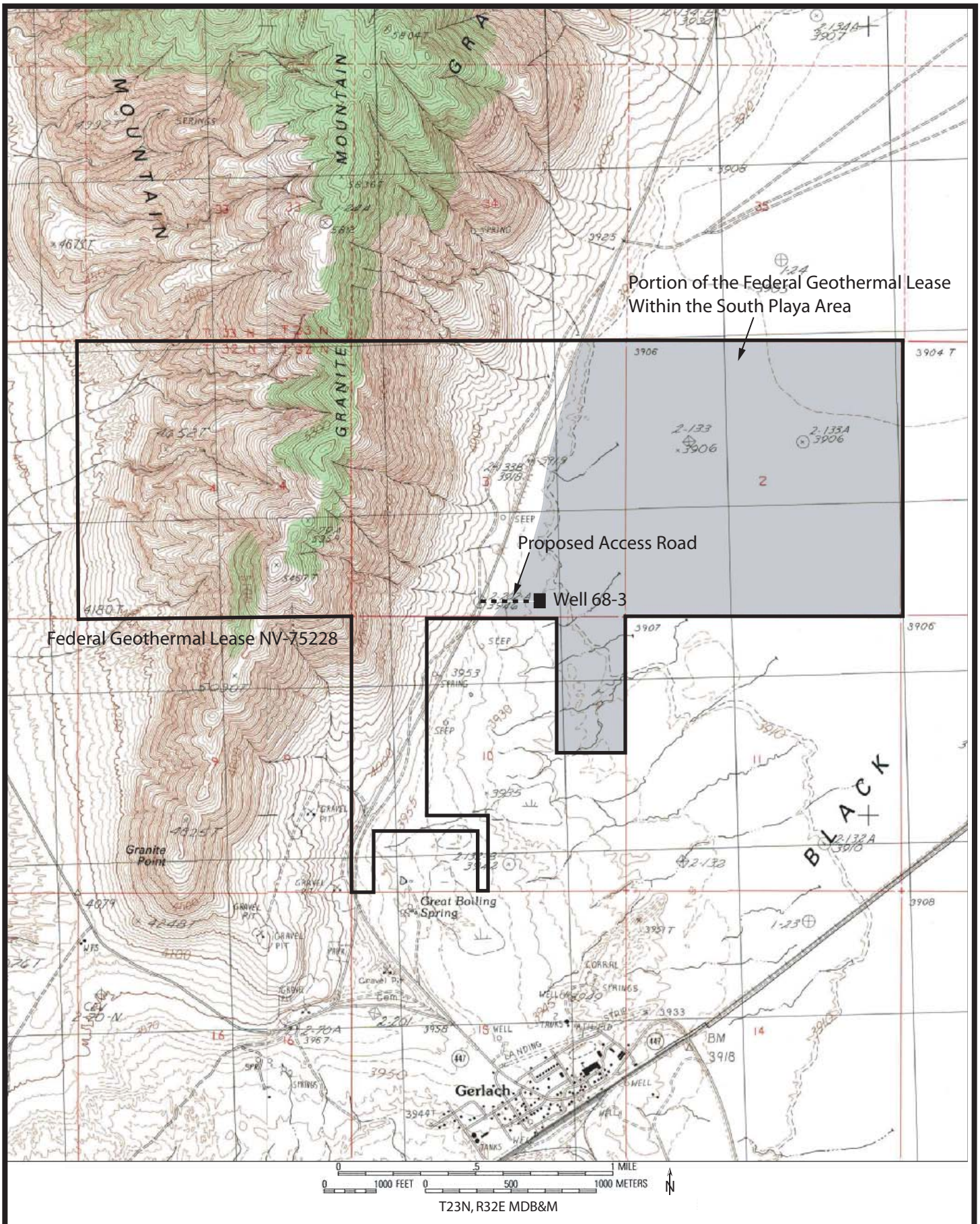

Figure 3: Portion of Federal Geothermal Lease NV-75228 within the South Playa Area

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

2.1.1 Overview and Location of Proposed Project

GGE has proposed to drill, complete, flow-test and monitor one geothermal well on federal geothermal lease NV-75228 in Washoe County, Nevada (see Figure 2). The Project is located within Section 3, Township 32 North, Range 23 East (T32N, R23E), Mount Diablo Baseline and Meridian (MDB&M), approximately 2 miles due north of the town of Gerlach, Nevada (see Figure 2).

The proposed well, named 68-3, is located approximately 3,630 feet east and 280 feet north of the southwest corner of Section 3. This drill site is designed to explore a specific geophysical or geologic target, identified during previously completed geophysical exploration and surface geologic mapping. The location of the drill site was then adjusted to reduce or avoid known environmental issues or constraints.

2.1.2 Schedule of Exploration Activities

GGE proposes to initiate activities as soon as the required Project permits and approvals are obtained, most likely by early 2006. This Project would be implemented over the next two years.

2.1.3 Site Access and Road Improvements

Principal access to the Project is from Washoe County Route 34, a paved Washoe County road. An approximately 1,000-foot long access road would be constructed due east from County Route 34 to provide direct access to the 68-3 drill site (see Figure 2).

The access road would be constructed and maintained as needed to safely accommodate the traffic required for the specific exploration activity. Because 18-wheeled trucks would be used to deliver supplies for the drilling and testing of the well, the road used to access the well drill site would require an all-weather surface, consistent with the BLM best management practices (BMP) for road construction applicable to temporary roads (see APPENDIX C). The road bed would be up to fourteen feet wide (with five-foot shoulders) with up to 12 inches of clean gravel and 8 inches of road base, as necessary. A ten-foot wide, 100-foot long turnout may be constructed at the road mid-point. A FLPMA ROW is not required for this access road because the proposed access road would be constructed and utilized within the leased public land being explored by the associated drilling activity, and so can be authorized under the geothermal lease for these activities on the lease.

2.1.4 Site Preparation Activities

A well pad approximately 200 feet by 250 feet, with a total surface area of about 50,000 square feet, would be constructed on the drill site. A typical well pad layout is provided as Figure 4. Actual dimensions of the well pad would be modified to best match the specific physical and environmental characteristics of the drill site and to minimize grading (cut and fill). The total estimated area of new surface disturbance required for construction of the access road and drill pad would be about 1.75 acres.

Drill pad preparation activities would include clearing, earthwork, drainage and other improvements necessary for efficient and safe operation and for fire prevention. Clearing would

include removal of organic material, stumps, brush and slash. All areas of disturbance will be reclaimed, including re-contouring as necessary to blend with the surrounding topography, using appropriate methods to seed with a diverse perennial seed mix. A minimum of 12 inches of topsoil would be salvaged during the construction of the pad and access road, as feasible, and stockpiled for use during subsequent reclamation of the disturbed areas.

The well pad would be constructed to create a level pad for the drill rig and a graded, graveled surface for the support equipment. Storm water runoff from undisturbed areas around the constructed drill pad would be directed into ditches surrounding the drill pad and back onto undisturbed ground consistent with best management practices for storm water. A reserve pit measuring 75 feet by 150 feet by 5 feet deep would be constructed for the containment and temporary storage of drill cuttings, waste drilling mud and storm water runoff from the constructed pad. All machinery, drilling platforms, and oil and fuel storage areas on the drill pad would drain to the reserve pit in order to prevent the offsite release of spills or storm water runoff from these source areas.

2.1.5 Aggregate and Water Requirements

About 5,000 cubic yards of aggregate would be required to surface the new access road and well pad with 20 inches of aggregate. This material would be purchased from the existing BLM Red Mountain Pit, located about 15 miles north of the Project, or from a closer existing BLM or private source if one becomes available.

Water required for well drilling could range up to as much as 20,000 gallons per day. Water requirements for site and road grading, construction, and dust control would average substantially less. Water necessary for all of these activities would be from local private sources. One or more portable water tank(s) holding a total of at least 5,000 gallons would be maintained on the site during drilling operations.

2.1.6 Geothermal Well Drilling, Testing and Monitoring

The geothermal well is designed to drill into and flow test the geothermal reservoir to confirm the existence of the geothermal reservoir and the characteristics of the geothermal resource.

The geothermal well would be drilled with a truck-mounted rotary drilling rig. The drilling rig would include diesel engines, hydraulic pumps, fuel and drilling mud storage tanks and mud pumps. Other auxiliary equipment, such as air compressors, could be used during drilling. During drilling, the top of the drill rig mast would be as much as 70 feet above the ground surface.

On average two to three large tractor-trailer trucks (delivering drilling supplies and equipment), and about 10 to 15 small trucks/service vehicles/worker vehicles, would be driven to the site each day throughout the typical 20- to 40-day drilling process. Difficulties encountered during the drilling process, including the need to work over or to re-drill the well, could double the time necessary to successfully complete a geothermal well. Drilling would be conducted 24-hours per day, 7-days per week by a crew of six to nine workers. During short periods, the number of workers on site during drilling would be as high as 15. The drilling supervisor may sleep in a trailer on the drill site while supervising the drilling, but none of the other workers would be living on location.

Geothermal well 68-3 would be drilled and cased to the design depth of 6,000 feet, or the depth selected by the project geologist. Figure 5 provides a typical geothermal well completion profile of this well design. After cementing the surface casing, blowout prevention equipment (BOPE), which is typically inspected and approved by the BLM and/or the Division of Minerals of the Nevada Commission on Mineral Resources (NDOM), as applicable, would be installed, tested and ready for use while drilling to ensure that any geothermal fluid encountered does not flow uncontrolled to the surface. During drilling operations, cool water and inert, non-toxic, non-hazardous barite (barium sulfate) would be stored at the 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 (the polymer-water mix is a very dilute mixture of water (99.75%) and a partially hydrolyzed polyacrylamide/polyacrylate (PHPA) copolymer (0.25%) which is often used in drilling drinking water wells and is degradable). Variable concentrations of additives would be added to the drilling mud as needed to prevent corrosion, increase mud weight, and prevent mud loss. Some of the mud additives would be hazardous substances, 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.

In the event that very low pressure areas are encountered, compressed air may be added to the drilling mud, or used instead of drilling mud, to reduce the weight of the drilling fluids in the hole and assist in carrying the cuttings to the surface. The air, any drilling mud, rock cuttings, and any reservoir fluids brought to the surface would be diverted through a separator/muffler to separate and discharge the air and water vapor to the atmosphere and the drilling mud and cuttings to the reserve pit.

The well may need to be worked over or re-drilled if mechanical or other problems are encountered while drilling or setting casing which prevent proper completion of the well in the targeted geothermal reservoir. Work over or re-drilling may also be required if the well does not exhibit the anticipated permeability, productivity or injectivity. 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: (a) reentering and re-drilling the existing well bore; (b) reentering the existing well bore and drilling and casing a new well bore; or (c) sliding the rig over a few feet on the same well pad and drilling a new well bore through a new conductor casing. Each of these actions would, however, require additional approvals from the BLM.

Once the slotted liner has been set in the bottom of the well bore, and while the drill rig is still over the geothermal well, the residual drilling mud and cuttings would be flowed from the well bore and discharged to the reserve pit. This would be followed by one or more short-term flow tests conducted while the drill rig is over the well. Each of the short-term flow tests would typically last from two to four hours. The geothermal fluid in the well would be bailed by either lifting with a mechanical bailer or by lifting the water out with air pumped into the well bore. Alternatively, if the well is capable of flowing, the well may be flowed to the surface through a small steam separator/muffler to separate the steam from the geothermal water. The separated steam and non-condensable gases (potentially including any small amounts of hydrogen sulfide) would be released to the atmosphere while the geothermal water would be discharged into steel tanks or the reserve pit from which the geothermal water can be sampled. Geothermal fluid temperatures, pressures, flow rates, chemistry and other parameters would be monitored.

After drilling and flow-testing operations are completed, the liquids from the reserve pit would be evaporated. The solid contents remaining in the reserve pit; typically consisting of non-hazardous, non-toxic drilling mud and rock cuttings; would be mixed with the excavated rock and soil and buried by backfilling the reserve pit.

Following completion of geothermal well testing, all of the drilling and testing equipment would be removed from the site. The surface facilities remaining on the site would likely be a wellhead consisting of only several valves on top of the surface casing, which would be chained and locked. The wellhead may also be surrounded by an approximately 12-foot by 12-foot by 6-foot high fence to further prevent unauthorized access and vandalism. Pressure and temperature sensors may be installed in the hole at fixed depths to monitor any changes in these parameters over time. A temperature profile of the well may also be run. Well monitoring may be continued indefinitely.

When the well is no longer required for monitoring, testing, production or injection, it would be abandoned in accordance with the submitted abandonment plan. This would consist of filling the hole with heavy, clean abandonment mud and cement until the top of the cement is at ground level, then cutting off the casing and tubing below ground level. The site would then be graded, if necessary, to restore grade, and the stockpiled topsoil (if any) would be placed back over the site. GGE would re-vegetate the disturbed areas with a diverse perennial seed mix free of invasive, nonnative species, and would maintain an invasive, nonnative species control program, consistent with BLM directions.

2.1.7 Adopted Environmental Protection Measures

GGE has proposed to carry out the following environmental protection measures not otherwise identified above as part of the Proposed Action or required under the special lease stipulations attached to Lease NV-75228 (see Appendix A) which are applicable to the Project:

- In order to avoid the potential for violation of the Migratory Bird Treaty Act of 1918, initial ground disturbing activities would not be conducted during the migratory bird nesting season (March through July) unless necessary, and then only after inventories for migratory birds and nests were conducted by a qualified biologist acceptable to the authorized officer. This survey would be conducted to identify either breeding adult birds or nest sites within the specific areas to be disturbed. If active nests are present within these areas to be disturbed, GGE would coordinate with the authorized officer to develop appropriate protection measures for these sites, which may include avoidance, construction constraints, and/or the establishment of buffers.

- Water would be applied to the ground during the construction and utilization of the drill pads and access roads as necessary to control dust.

- Prior to first entering the Project area, all trucks and construction equipment would be washed to remove soil and plant parts. A central washing facility would be provided for this purpose on private land within the town of Gerlach.

- GGE would provide reasonable efforts to obtain access and monitor the hot spring west of Washoe County Route 34 and the Great Boiling Spring. Baseline data will be collected one week prior to beginning the drilling operations. Monitoring data would be collected once a week during the drilling phase of the operations and daily during the testing phase of the operations. Baseline and monitoring data would include:

photographs, temperature, flow rate, pH, and specific conductivity. All data would be submitted to BLM, Nevada State Office and Winnemucca Field Office. GGE would also conduct visual inspections of the three seeps in order to detect changes in the seeps.

2.2 Alternatives to the Proposed Action

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

Alternatives to the Proposed Action must be considered and assessed whenever there are unresolved conflicts involving alternative uses of available resources [BLM NEPA Handbook H-1790-1, page IV-3 (USDI 1988)]. No unresolved conflicts involving alternative uses have been identified to drive the creation of any alternatives which would still meet GGE's purpose for the Project: to determine subsurface temperatures within the federal geothermal lease comprising the Project. Therefore, no alternatives (other than the required "No Action Alternative") will be analyzed in this Environmental Assessment.

2.3 No Action Alternative

Under the No Action Alternative, no geothermal exploration would take place.

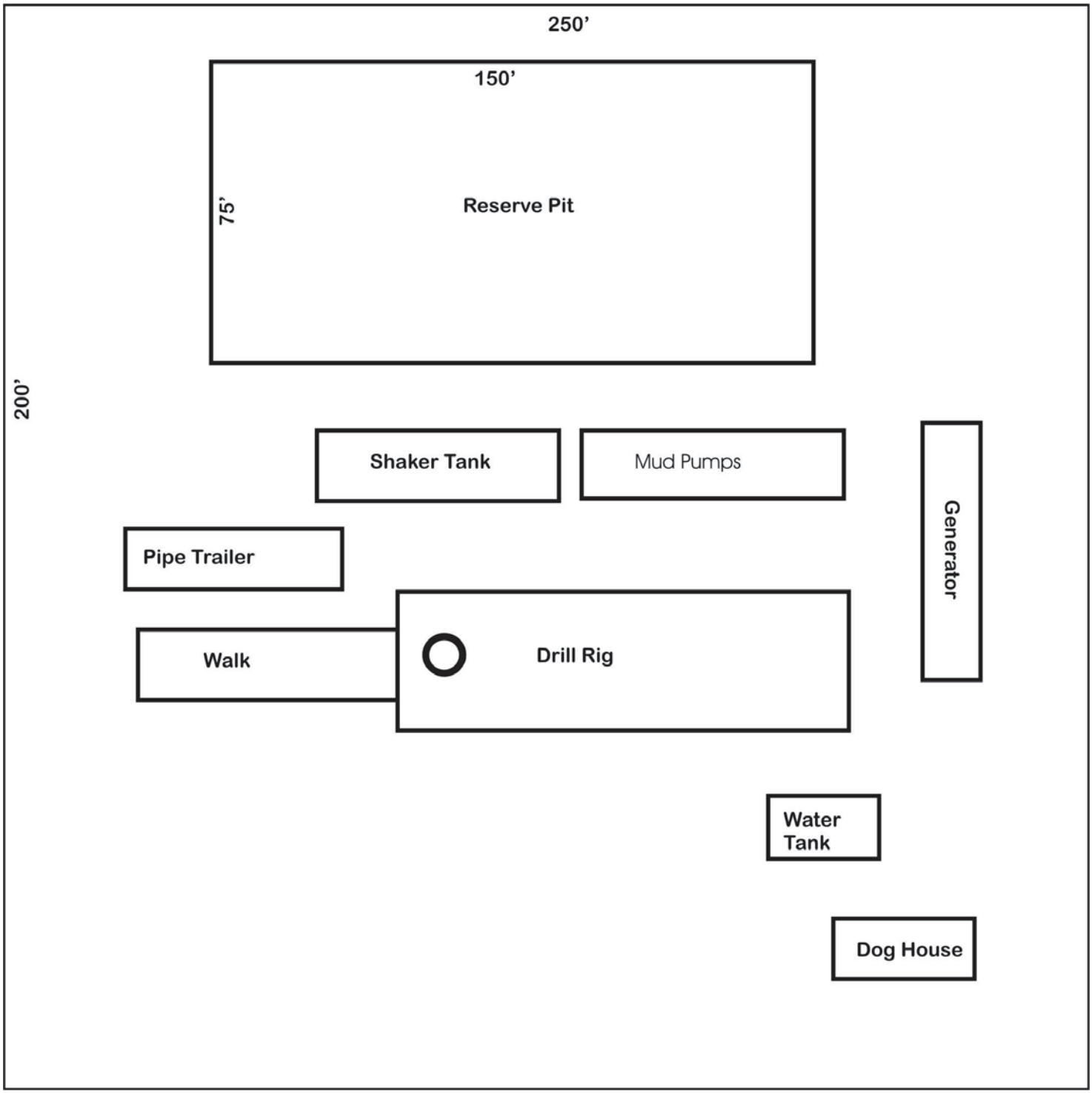

Figure 4: Typical Geothermal Production Well Drill Pad Layout

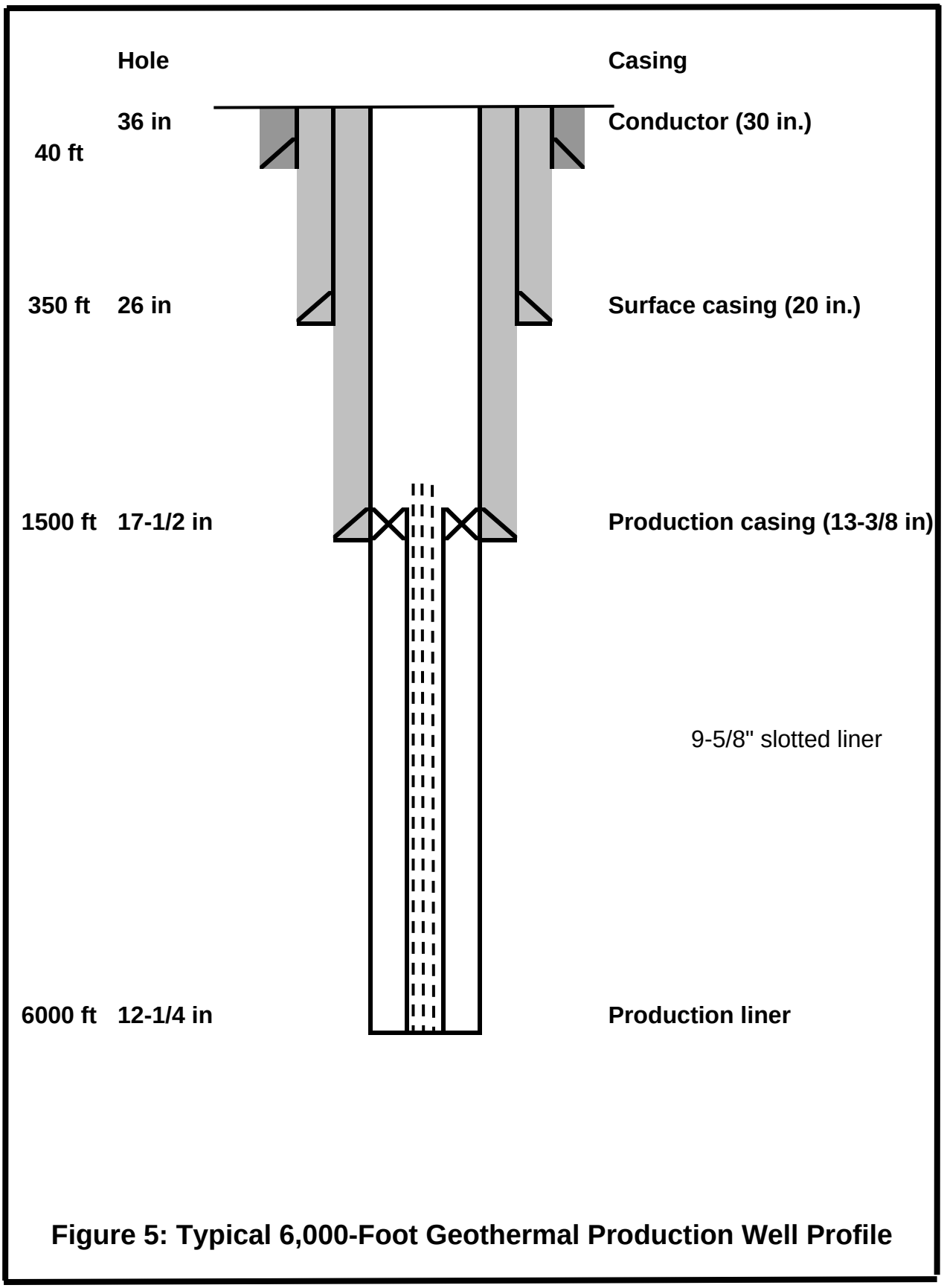

Figure 5: Typical 6,000-Foot Geothermal Production Well Profile

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Critical Elements

Critical elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be addressed in any document prepared pursuant to NEPA. The BLM NEPA Handbook (H-1790-1), as updated (USDI 1988), stipulates that if the resource or value is not present or is not affected by the Proposed Action or Project Alternatives, this may be documented in the EA as a negative declaration. The Proposed Action has been analyzed to assess direct, indirect, and cumulative impacts to the critical elements of the human environment and the other important resources listed below in Table 1.

Those elements or resources marked as “not present” in Table 1 are not present within or adjacent to the Project area. Those elements or resources marked as “present not affected” may be present within or adjacent to the Project area but would not be impacted by the Proposed Action. Those elements or resources marked as “present affected” may be found within or adjacent to the Project area and may be impacted by the Proposed Action. Elements or resources discussed further in this EA are identified in the column marked as “reference section,” with the appropriate section listed for the affected environment and environmental consequences analysis. Elements or resources which contain information in the “comment” column reflect any negative findings and are not discussed further in this EA.

3.2 Air Quality

Air quality in the Project area has been designated as “attainment/unclassified” (which means it either meets, or is assumed to meet, the applicable federal ambient air quality standards) for all standard (“criteria”) air pollutants except for PM_{10} (particulate matter less than or equal to 10 microns in diameter) (U.S. Environmental Protection Agency 2005). The Washoe County District Health Department (WCDHD), Air Quality Management Division (AQMD), has been delegated responsibility by both the federal Environmental Protection Agency (USEPA) and the State of Nevada to regulate air pollution and emissions of air pollutants in the Project area. The proposed Project is not located in or adjacent to any mandatory Class I (most restrictive) Federal air quality areas, U.S. Fish and Wildlife Service Class I air quality units, or American Indian Class I air quality lands (BLM WFO 2002).

Table 1: Critical Elements and Other Resources Affected by the Proposed Action

Critical Elements	Not Present	Present Not Affected	Present Affected	Reference Section	Comments
Air Quality			X	3.2; 4.1.1	
Areas of Critical Environmental Concern (ACECs)	X			N/A	The proposed Project is not located in or near any ACECs (BLM WFO 2002).
Cultural Resources			X	3.3; 4.1.2	
Environmental Justice	X			N/A	There are no environmental justice issues associated with the proposed Project (BLM WFO 2002).
Floodplains	X			N/A	The proposed Project is not located in or near any no FEMA-designated 100-year floodplains.
Invasive, Nonnative Species			X	3.3; 4.1.3	
Migratory Birds			X	3.5; 4.1.4	
Native American Consultation	X			N/A	No Native American Consultation is necessary for this Project (Cates 2006).
Prime or Unique Farmlands	X			N/A	The proposed Project is not located in or near any prime or unique farmlands (BLM WFO 2002).
Threatened and Endangered Species			X	3.6; 4.1.5	
Wastes, Hazardous or Solid			X	3.7; 4.1.6	
Water Quality (Surface and Ground)			X	3.8; 4.1.7	
Wetlands and Riparian Zones	X			N/A	The proposed Project is not located in or near any wetlands and/or riparian zones.
Wild and Scenic Rivers	X			N/A	The proposed Project is not located in or near any wild and scenic rivers (BLM WFO 2002).
Wilderness	X			N/A	The proposed Project is not located in any wilderness areas or wilderness study areas (BLM WFO 2002).

Other Resources	Not Present	Present Not Affected	Present Affected	Reference Section	Comments
Geology, Minerals, and Geologic Hazards			X	3.9; 4.1.8	
Soils			X	3.10; 4.1.9	
Vegetation			X	3.11; 4.1.10	
Wildlife Resources			X	3.12; 4.1.11	
Fisheries Resources	X			N/A	The proposed Project is not located in or near any fisheries.
Range Resources			X	3.13; 4.1.12	
Recreation			X	3.14; 4.1.13	
Visual			X	3.15; 4.1.14	
Social Values	X			N/A	No social values would be affected by the Project.
Economic Values			X	3.16; 4.1.15	
Water Quantity			X	3.8; 4.1.7	
Lands and Realty			X	3.17; 4.1.16	

3.3 Cultural Resources

The BLM "Geothermal Resources Leasing Programmatic Environmental Assessment," completed in 2002, contains a cultural history of the BLM-WFO area (BLM WFO 2002). This EA also presented a model of high sensitivity areas for National Register of Historic Places (NRHP)-eligible cultural resource properties, which was created in order to develop a better understanding of the occurrence of significant cultural resources. The model focused on three factors associated with recorded NRHP-eligible properties: distance to permanent / semi-permanent water, elevation (as reflective of environment) and slope. An additional sensitivity for viewshed associated with historic trails was also created and mapped.

Based on Figure 3.15-1 of the Geothermal Resources Leasing Programmatic EA, no portion of the proposed drill site area and access road was identified as a high-sensitivity area for NRHP-eligible cultural resources. However, the same figure shows that the Project area is located within the 5-mile wide viewshed sensitivity area of a trail. The proposed access road and well pad would be located within 0.5 miles of the Nobles Route, a cutoff from the Applegate-Lassen Trail, and a part of the California National Historic Trail. The Nobles Route was established in 1851, primarily for emigrant traffic. Eventually, this portion was improved and subsequently referred to as the Black Rock and Idaho Wagon Road (1865).

A cultural resource survey of the proposed Project drill site area and access road was conducted by BLM staff on July 27, 2005. No cultural resources were found during this survey.

3.4 Invasive, Nonnative Species

Invasive nonnative species spread from infested areas by people, equipment, livestock/wildlife and the wind. They represent a legal classification in which their spread is controlled by the state. Because of their aggressive growth and lack of natural enemies, these species can be highly destructive, competitive, or difficult to control. These exotic species can reduce crop yields, destroy native plant and animal habitat, damage recreational opportunities, clog waterways, lower land values, create erosion problems and fire hazards, and poison humans and livestock. These species may proliferate to the point of crowding out other plants that benefit wildlife and domestic animals. Wildlife and grazing animals do not often eat invasive nonnative species because their thorns, spines or chemical content make them unpalatable.

The state of Nevada lists 45 noxious weed species that require control (Nevada Administrative Code 555.10, effective 10-31-05). BLM lists eleven of these invasive nonnative species that have been inventoried and are known to occur within the Winnemucca Field Office District (BLM WFO 2002). Weed inventories conducted along County Road 34 documented several occurrences of the noxious weed Russian knapweed (*Acroptilon repens*). Perennial pepperweed (*Lepidium latifolium*) has been documented within a few miles of the proposed Project along State Route 447 (Farschon 2005a).

3.5 Migratory Birds

Migratory birds may be found in the vicinity of the Project as either seasonal residents or as migrants. Provisions of the Migratory Bird Treaty Act (16 USC 701-718h) prohibit the killing of any migratory birds, including the taking of any nest or egg, without a permit. Executive Order 13186, titled "Responsibilities of Federal Agencies to Protect Migratory Birds," was signed on October 1, 2001 to further enhance and ensure the protection of migratory birds. All birds in the Winnemucca Field Office district are considered neotropical migratory birds except for all the

Gallinaceous birds (California quail, sage grouse, chukar partridge, gray partridge, ring-necked pheasant, mountain quail, and sharp-tailed grouse) [BLM WFO 2002].

3.6 Threatened and Endangered Species

Pursuant to the requirements of Section 7(c) of the Endangered Species Act of 1973, as amended, which requires that federal agencies consult with the U.S. Fish and Wildlife Service (USFWS) concerning species listed under the Act, a letter requesting information regarding threatened and endangered species which may occur in the sections comprising the proposed Project was sent to the USFWS. The USFWS responded in a letter that, to the best of its knowledge, no endangered, threatened, proposed or candidate species existed in the vicinity of the proposed Project (APPENDIX B).

A Sensitive Taxa Record Search compiled by the Nevada Natural Heritage Program (NNHP) in November 2005 at the request of EMA identified no “at risk” taxa recorded within the vicinity of the proposed Project. The NNHP search report stated that habitat may be available for the alkaline sandhill skipper, (*Polites sabuleti alkaliensis*), a taxon determined to be “vulnerable” by the NNHP (NNHP 2005). Habitat for the alkali sandhill skipper is primarily alkali grasslands, moist meadows, lawns, salt marshes, sand dunes, sagebrush flats, and alpine fell-fields (USGS 2005).

3.7 Wastes, Hazardous and Solid

There are no commercial vehicle fueling or hazardous material storage facilities in the vicinity of the proposed Project and no hazardous materials are known to be routinely used. There is a low occurrence and frequency of wildland fires in the NCA planning area (USDI BLM 2003). There are no farms or ranches in the vicinity of the proposed Project that could use bulk quantities of fuel, fertilizers or pesticides. The transport and handling of hazardous materials in Nevada are subject to numerous federal and state laws and regulations.

3.8 Water Quality (Surface and Ground) and Water Quantity

The Project is located in the Black Rock Desert Hydrographic Area (Number 28 of 232 in the State of Nevada) of the Black Rock Desert Hydrographic Region (Number 2 of 14 in the State of Nevada), which covers nearly 5.5 million acres (NDCNR-DWR 2005a). The Black Rock Desert Hydrographic Area is by far the largest Hydrographic Area (at about 1,394,560 acres) in the Black Rock Desert Hydrographic Region. This Hydrographic Area is a “non-designated” area or groundwater basin.

The U.S. Geological Survey (USGS) 7.5 minute topographic map of the area (Gerlach, NV Quadrangle 1988) shows one spring and three seeps located within one mile of the proposed drill site. The spring is located along the west side of the paved Washoe County road in the NW1/4 of Section 10. Hot water flows out of the spring at 198^{o}F at a rate of approximately 30 gallons per minute (Cates 2006). Two of the seeps are located on the east side of the county road and are indicated by tall, grassy vegetation (Cates 2006). A third seep is located on the west side of the county road and is also indicated by an abundance of vegetation. No temperature or flow data is available for the seeps (Cates 2006). Great Boiling Spring is located approximately 1.25 mile south-southwest of the drill site. The temperature of the spring is approximately 187^{o}F and the flow rate is about 200 gallons per minute (Cates 2006).

Only a few ephemeral drainages, which would not support any riparian vegetation and only flow in direct response to precipitation, are shown on this same map within the vicinity of the proposed Project (see Figure 2). None of these ephemeral drainages would be crossed by any Project facilities, though one lies immediately west of the proposed area of surface disturbance. No well driller logs are reported to have been filed with NDCNR-DWR within the vicinity of the proposed Project (NDCNR-DWR 2005b), and the USGS reports no information for either ground or surface water sites within the Project vicinity (USGS 2005a).

3.9 Geology, Minerals, and Geologic Hazards

The Project area is located at the south end of the Granite Range on the down-thrown side of a major north-northeast-trending basin and range fault zone that separates the granitic rocks on the west from the alluvial, lacustrine, and playa sediments on the east. The Project area is located within the Gerlach Known Geothermal Resource Area (KGRA). The KGRA was designated because of the occurrence of several hot springs in the vicinity, including Great Boiling Spring, which is located on private land, approximately one mile south-southwest of the Project area. Most of the other hot springs are also located on private lands.

The eastern slope of the Granite Range is prone to mass wasting events (such as landslides, rock falls, or debris flows) because of its steep slopes. Mass wasting events are caused by gravity in combination with a variety of geologic, climatic and, in some cases, human factors. The last mass wasting event in the Project vicinity was on June 26, 2005 in response to a large scale thunderstorm.

There are no active mining claims within the Project area (Cates 2005b). There are no known deposits of salable or leaseable minerals within the vicinity of the proposed Project other than the geothermal resources leased to GGE (Cates 2005a). Previous geothermal exploration activities have occurred immediately south of the proposed Project area on private land (see Section 1.4.3 and Section 1.5).

3.10 Soils

Soil types in the Project vicinity were identified in the Washoe County, Nevada, Central Part soil survey by the National Resources Conservation Service (NRCS). Two soil units exist within the Project vicinity. Soil unit 210 is comprised of the Veta-Langston association (Farschon 2005a). Based upon landscape placement, it is likely that the portion of the map unit within the area of surface disturbance is entirely within the Veta unit. The Veta unit soil has a slow runoff potential, and a slight erosion hazard by water and wind. Soil unit 1446 is the Umberland association. Runoff for Umberland soil is rated very slow with slight erosion hazards from both wind and water.

3.11 Vegetation

Dominant vegetation associated with the identified soil types is Wyoming big sagebrush (*Artemisia Tridentata Wyomingensis)*, spiny hopsage *(Grayia spinescens),* bottlebrush squirreltail *(Elymus elymoides),* Iodine bush *(Allertolfea occidentalis)*, inland saltgrass *(Distchlis spicata),* black greasewood *(Sarcobatus vermiculatus)*, and basin wildrye *(Elymus cinereus)* (Farschon 2005a).

3.12 Wildlife Resources

There have been no general wildlife species inventories within the Project vicinity. Based upon observations in similar type habitats, common species would include antelope ground squirrel (*Ammospermophilus leucurus*), black-tailed jackrabbit *(Lupus californicus)*, horned lark *(Eremophila alpestris)*, Great basin whip-tail *(Cnemidophorus tigris tigris)*, and the gopher snake *(Pituophis catenifer)*. Prairie falcons *(Falco mexicanus)*, red-tailed hawks *(Buteo jamaicensis),* and northern harriers *(Circus cyaneus)* would be expected to regularly forage for prey. Big game use is minimal, although California bighorn sheep *(Ovis canadensus California)* or pronghorn antelope *(Antilocaptra americanana)* may be found in the vicinity (Farschon 2005a).

3.13 Range Resources

The Project is located in the Buffalo Hills Allotment. As of 2004, this allotment comprised 483,725 acres and supported 4,120 (Black Rock-High Rock RMP 2004) animal unit months (AUMs) (an AUM is the amount of forage necessary for the sustenance of one cow or it equivalent for a period of one month) (43 CFR 4100.0-5). Within this allotment, one AUM is equal to approximately 117 acres (Sheeler 2006).

3.14 Recreation

The entire Black Rock-High Rock planning area is administered as a Special Recreation Management Area and is subdivided into three management zones: the Front Country Zone, the Rustic Zone, and the Wilderness Zone. Zones are designations representing landscapes, visitor use patterns, and management philosophy. The South Playa area in which the Proposed Action is located is in the Front Country Zone (USDI, BLM, 2003).

The Front Country Zone corresponds to the drivable playa and adjacent dune and hummock uplands. The Front Country receives most of the visitor use in the Black Rock Desert area. This zone is where most large commercial permits would be issued, and is where other BLM management actions would be most noticeable. Subject to area and route designations, access to and within the zone would generally not be limited. Visitors to the Front Country Zone would almost certainly encounter other visitors throughout the peak season, but would still find solitude during off-season periods. Though primarily a natural area, the sights and sounds of other users and BLM management activity would be evident within this zone, especially on the playa during high use periods (USDI, BLM 2003).

The Black Rock Desert playa is a favorite recreation place for people from local surrounding communities; other areas in Nevada; and neighboring states (California, Oregon, Idaho, and Utah). Most visitors to the playa come during the time when the playa is dry (typically June through September), with the largest numbers of people participating in organized special recreation events. Off Highway Vehicle (OHV) use is high across the desert playa. Some people participate in recreation individually or in small groups for casual or dispersed activities; others participate in organized events, either as participants or as spectators (USDI, BLM 2003).

3.15 Visual Resources

The Bureau of Land Management 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 in a VRM Class II area (Cates 2005a). The objective of VRM Class II is to retain the existing landscape character. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract a casual observer's attention. Any changes must repeat the basic elements of line, form, color and texture found in the predominant natural features of the characteristic landscape (BLM 1986).

The Project site is situated at approximately 3,930 feet above sea level, in a relatively flat vegetated zone that transitions into the Black Rock Desert Playa. The Project area is most visible from the north and south along Washoe County Route 34, the main paved road accessing the Project area. The foreground consists of the paved County road that provides access along the eastern range front of the Granite Range. The road travels along the base of the mountain range and creates a horizontal line that blends in with the natural horizontal lines of the setting where the playa meets the base of the mountain. The middle ground consists of the Project site, including the access road. The road and well site would be constructed in the thickly vegetated area between the road and the playa. The vegetated area is relatively flat, consisting of several species discussed in Section 3.11. The vegetation ranges in color from dark to light green, and yellows, in the spring and summer. In the fall and winter the colors are light to dark browns, yellows, tans and grays.

As viewed from the south, the predominant feature of the background landscape is the playa, a flat, un-vegetated, smooth, white to gray surface. The Granite Range is also very prominent and rises abruptly from the playa to the north and northwest of the Project site. The colors of the Granite Range are the light to medium gray of the rocks, and the scattered greens of the juniper trees that occur in the higher elevations visible from Route 34. The higher slopes of the Granite Range are rounded at the top, and most of the drainage lines are diagonal. The lower slopes of the Granite Range display very prominent horizontal lines that are remnants of the high levels of Pleistocene Lake Lahontan. Mass wasting of granitic rocks has formed several gullies on the steep slopes that have partially obliterated the lake terraces. The gullies are much lighter than the surrounding material because the vegetation has been stripped.

3.16 Economic Values

As of the year 2000 census, Washoe County had a total population of 339,486. The Gerlach-Empire Census Designated Place (CDP), in which the Project is located, is a population center within Washoe County having a year 2000 population of 499 (U.S. Census Bureau 2005a and 2005b).

As of the year 2000 census, Washoe County had 143,908 housing units. Approximately 92 percent of these units were occupied. The median value of owner-occupied units was $161,600 (U.S. Census Bureau 2005a). The Gerlach-Empire CDP had 305 housing units. Approximately 79 percent of these units were occupied. The median value of owner-occupied units in the Gerlach-Empire CDP was $82,500 (U.S. Census Bureau 2005b).

The labor force for Washoe County was estimated in the year 2000 to be 180,963 persons. Washoe County's leading employers included the management, professional and related industries (29.5 percent); the sales and office industry (28.9 percent) and the service

occupations (19.9 percent) (U.S. Census Bureau 2005a). The labor force for the Gerlach-Empire CDP was estimated in the year 2000 to be 394 persons. The leading employers included the construction, extraction, and maintenance trades (24.8 percent), the production, transportation, and materials moving industries (24.3 percent), and service occupations (19.3 percent) (U.S. Census Bureau 2005b).

3.17 Lands and Realty

There are three active rights-of-way (ROW) in the Project lease area: N-57442 granted an 80-foot wide ROW for a road; N-13103 granted a 20-foot wide ROW for two buried telephone cables; and N-60994 granted a 100-foot wide ROW for a road (Trost 2005).

4 ENVIRONMENTAL CONSEQUENCES (DIRECT, INDIRECT, SHORT-TERM, AND LONG-TERM)

4.1 Proposed Action

4.1.1 Air Quality

Fugitive dust would be generated from earth-moving activities; production and laying of the aggregate required for surfacing the access road and well pad; and travel on unpaved roads during drill pad and road construction and drilling activities. The WCDHD-AQMD requires projects which disturb more than one acre of land to obtain and comply with a dust control permit/plan to minimize the amount of fugitive dust generated. The permit requires the implementation and monitoring of measures to control fugitive dust emissions and to reduce the track out of mud and dirt onto paved roads from unpaved areas. Environmental protection measures proposed by GGE as part of the Proposed Action require that water would be applied to the ground during the construction and utilization of the drill pad and access road as necessary to control dust.

Combustion emissions of criteria air pollutants (NO_2, SO_2, CO and PM_{10}), criteria air pollutant precursors (VOCs) and air toxics (small quantities of diesel PM, acetaldehyde, benzene, and formaldehyde) would be released from the diesel engines used during drill pad and road construction and drilling activities. Small quantities of noncondensible gases (including hydrogen sulfide) would also be emitted from the geothermal fluid during flow tests.

No residual air quality impacts are expected.

4.1.2 Cultural Resources

No cultural resources were found during the survey conducted. The field inventory produced no physical evidence of the Nobles Route. The proposed action is a temporary, small-scale, and short-term project and no impacts are anticipated.

4.1.3 Invasive, Nonnative Species

Project activities could contribute to the spread of invasive, nonnative species within the Project vicinity through from the proposed surface disturbing activities. See also the discussion on vegetation in Section 4.1.10. GGE has proposed to wash trucks and construction equipment when first entering the Project area to decrease the potential for the spread of invasive, nonnative species into the Project area. The following mitigation measure is also recommended to minimize the spread of invasive, nonnative species.

Mitigation Measure:

Project sites would be inventoried by GGE for the presence of invasive, nonnative species and treated with BLM certified pesticides following BLM approval of a pesticide use proposal if species are present.

Following the implementation of this mitigation measure, there would still be the potential for the spread of invasive, nonnative species within the Project area, which would be a residual impact.

4.1.4 Migratory Birds

GGE has proposed an environmental protection measure applicable to all Project operations to conduct inventories for migratory bird nests and limit ground disturbing activities if conducted during the migratory bird-nesting season (see Section 2.1.7). Implementation of this measure would avoid the potential for violation of the Migratory Bird Treaty Act.

Project construction (regardless of the season constructed) would result in the direct loss of approximately 1.75 acres of potential migratory bird habitat. This Project is temporary and short-term. Project-generated construction and drilling noise (estimated at an average 83 decibels (dBA) at a distance of 50 feet) could also keep some migratory birds away from areas generating this noise (typically areas of new surface disturbance). Other indirect effects could result from general human activity, which could displace individuals or reduce breeding success of species that are sensitive to human activity. The indirect effects would be temporary and short-term. In addition, migratory birds would be able to re-occupy the disturbed areas upon completion of these short-term operations, which would prevent residual impacts.

4.1.5 Threatened, Endangered, and Special Status Species

No federal endangered, threatened, proposed or candidate species or state “at risk” taxa would be affected by the proposed Project. Habitat for the state-identified “vulnerable” taxon alkali sandhill skipper (*Polites sabuleti alkaliensis*) does not appear to occur in the areas proposed for surface disturbance (USDI BLM 2003).

4.1.6 Wastes, Hazardous or Solid

Substantial quantities of diesel fuel; and smaller quantities of lubricants, hydraulic fluids and drilling chemicals (drilling mud, caustic soda, barite, etc.); would be transported to, stored on and used by the Project at the proposed drill site (see Table 2). The Project must conform to both federal and state requirements for handling these hazardous materials. Typical of most construction projects, the storage and use of these materials may result in minor, incidental spills of diesel fuel or oil to the ground during fueling of equipment, filling of fuel storage tanks, and handling lubricants. All machinery, drilling platforms, and oil and fuel storage areas on the drill pad would drain to a constructed reserve pit in order to prevent the offsite release of spills or storm water runoff from these source areas. The following mitigation measure is proposed to reduce the potential of hazardous materials spills.

Mitigation Measure:

GGE would develop a hazardous material spill and disposal contingency plan describing the methods for cleanup and abatement of any petroleum hydrocarbon spill, and submit the plan to the authorized officer prior to field operations.

Table 2: Materials and Chemicals Commonly Used During Well Drilling

Product	Quantity Used	Quantity Stored
Drilling Mud Gel (Bentonite Clay)	200,000 lbs	100 lb sacks on pallets
Salt (NaCl)	80,000 lbs	50 lb sacks on pallets
Barite (BaSO4)	12,000 lbs	50 lb sacks on pallets
Tannathin (Lignite)	2,500 lbs	50 lb sacks on pallets
Lime (Calcium Hydroxide)	2,000 lbs	50 lb sacks on pallets
Caustic Soda (Sodium Hydroxide)	1,000 lbs	50 lb sacks on pallets
Diesel Fuel	30,000 gals	6,000 gal tank
Lubricants (Motor Oil, Compressor Oil)	1,000 gals	55 gal drums
Hydraulic fluid	200 gals	55 gal drums
Anti-Freeze (Ethylene Glycol)	100 gals	55 gal drums
Liquid Polymer Emulsion (partially hydrolyzed polyacrylamide / polyacrylate (PHPA) copolymer)	100 gals	5 gal buckets

The Project must comply with BLM requirements to ensure that any geothermal fluid encountered during the drilling does not flow uncontrolled to the surface. These include the use of “blow-out” prevention equipment during drilling and the installation of well casing cemented into the ground.

After drilling operations are completed, the liquids from the reserve pit would be evaporated and the non-hazardous, non-toxic residual solid contents of the basin mixed with the excavated rock and soil and buried by backfilling the reserve pit. The small quantities of solid wastes (paper trash and garbage) generated by the Project would be transported offsite to an appropriate landfill facility. Portable chemical toilet wastes would be removed by a local contractor. The proper offsite disposal of these wastes would avoid residual impact from the Project.

4.1.7 Water Quality (Surface and Ground) and Water Quantity

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

- The well would be constructed in conformance with BLM requirements to prevent the loss of control of the well and leakage between geothermal and non-geothermal subsurface aquifers (e.g., the well would be cased with steel casing cemented into the ground which is designed to prevent contamination of any ground waters by the geothermal fluid and prevent the loss of any geothermal resource into other aquifers).

- The well would be drilled using non-toxic drilling mud to prevent loss of drilling fluids into the rock.

- A reserve pit would be constructed at the site for the containment and temporary storage of drilling mud, drill cuttings and storm water runoff from the constructed well pad.

- Storm water runoff from undisturbed areas around the constructed well pad would be directed into ditches surrounding the well pad and back onto undisturbed ground consistent with best management practices for storm water.

- To minimize erosion from storm water runoff, the access road would be constructed and maintained consistent with the best management practices for road construction applicable to temporary roads (see APPENDIX C).

The following mitigation measure is provided to ensure that the construction, improvement or reclamation of the Project road is properly conducted to minimize erosion, sedimentation or soil loss.

Mitigation Measure:

The roads to be constructed and reclaimed as part of the Project would be reviewed by the BLM and required to conform to the requirements of BLM Manual 9113 and the "Gold Book" ("Oil and Gas Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development"), as applicable to the intended Project use.

The Project would also have no affect on the quantity of either surface waters or ground waters in the area because a relatively small amount of water, averaging approximately 20,000 gallons (about 0.06 acre-feet) per day for the exploration well drilling, would be obtained from local private sources, which could include geothermal fluid from the hot springs located south of the drill site on private lands. No new local (on lease) ground or surface water sources would be developed or disturbed.

GGE has committed to make reasonable efforts to obtain access to, and then monitor, the hot springs and seeps in the vicinity of the Project when operations are being conducted. The following mitigation measure details the monitoring BLM would expect to be implemented. There would be no residual impacts to either surface or ground waters.

Mitigation Measure:

GGE would monitor the hot spring west of the County paved road and the Great Boiling Spring, unless access is denied by the private landowners and GGE provides to BLM documentation from the private landowner that access for monitoring has been denied. Baseline data will be collected one week prior to beginning the drilling operations. Monitoring data would be collected once a week during the drilling phase of the operations and daily during the testing phase of the operations. Baseline and monitoring data would include: photographs, temperature, flow rate, pH, and specific conductivity. All data would be submitted to BLM, Nevada State Office and Winnemucca Field Office. GGE would also conduct visual inspections of the three seeps in order to detect changes in the seeps. Alternatives for monitoring this data may be requested by BLM.

4.1.8 Geology, Minerals and Geologic Hazards

The proposed Project is located east of the eastern slope of the Granite Range, outside of areas most prone to mass wasting events. The BLM Red Mountain Pit contains sufficient salable aggregate to supply the estimated 5,000 cubic yards required for surfacing the access road and well pad.

4.1.9 Soils

Because of the slight erosion potential of the soil units to be disturbed, and because the areas proposed for disturbance have very little slope, construction of the drill pad and access road would create little water erosion potential. The potential for wind erosion would be minimized by the use of water for dust control on all disturbed surfaces. Geothermal lease regulations require, and GGE has proposed specific measures, to reclaim the disturbed areas.

Because the areas proposed for disturbance have very little slope, little or no re-contouring should be necessary.

Soil productivity would be reduced in the 1.75 acres to be disturbed. To reduce soil erosion and enhance the recovery of soil productivity on disturbed areas, GGE has proposed, as part of the Project, to salvage topsoils during construction and stockpile for subsequent reclamation.

4.1.10 Vegetation

Surface-disturbing activities from the Project would result in the loss of up to 1.75 acres of these common vegetation communities. See also the discussion of invasive, nonnative species and special status plant species in Sections 4.1.3 and 4.1.5, respectively.

Geothermal regulations require, and GGE has proposed specific measures, to reclaim and re-vegetate the disturbed areas. The following mitigation measure is recommended to specify the native seed mixture to be applied to disturbed areas.

Mitigation Measure:

Seeding of disturbed areas would be completed using the following seed mixture and application rate. Any variance in the mix would be coordinated first with the BLM Winnemucca Field Office.

Species	***PLS LBS./Acre***	***Bulk LBS./Acre***	***PLS/sq. ft.***
Black greasewood	***3.00***	***5.00***	***12***
Inland saltgrass	***3.00***	***4.00***	***33***
Alkali sacaton*	***0.50***	***0.75***	***20***
Totals	***6.50***	***9.75***	***65***
****extremely small seed PLS = Pure Live Seeds***			

Following the implementation of this mitigation measure, indigenous vegetation should return to the area disturbed by the Project.

4.1.11 Wildlife Resources

The Project would result in the loss of less than 1.75 acres of wildlife habitat. The direct displacement of wildlife would result from the surface disturbance required for construction of the drilling pad and access road. A slight reduction in wildlife carrying capacity would be expected to occur for some species, but most wildlife would be expected to be displaced to comparable habitat that is abundant in the Project vicinity. Over time, and subsequent to site reclamation, wildlife habitat would be restored. This Project is short-term and temporary, and there is an abundance of comparable habitat in the area.

Project-generated noise and human activity could also keep some animals at some additional distance away from areas directly affected by surface disturbance during the on-site Project construction and drilling activities. Wildlife would be able to re-occupy the disturbed areas upon completion of these short-term operations. There should be no long-term residual impacts to wildlife resources.

4.1.12 Range Resources

This Project would disturb approximately 1.75 acres, or about 0.00036 percent of the 483,725 acres within the allotment, and reduce the 4,120 AUMs within the allotment by substantially less than one AUM. All Project activities are located away from sources of water in the vicinity and would not prevent livestock access to the available sources of water in the area.

After drilling and testing activities are completed, any surface facilities remaining on the drill pad may be surrounded by an approximately 12-foot by 12-foot by 6-foot high fence to prevent unauthorized access. This small fenced area would not affect grazing of the rest of the allotment. There should be no long-term residual impacts to range resources from the Project.

4.1.13 Recreation

The Project does not propose any activity which would prevent continued access by recreational users to the public lands within the lease area or to the playa. Project operations should also not affect the ability of hunters to access previous hunting grounds, or affect the abundance of game animals.

Air quality impacts to recreation users could include dust from vehicle traffic on unpaved roads and exhaust from construction vehicles. As discussed in Section 4.1.1, these would be short-term and temporary. GGE would also apply water to the disturbed ground during the construction and utilization of the drill pads and access roads as necessary to control dust.

Project-generated noise and traffic could cause some conflict with dispersed recreational use of the Project area during the Project construction and drilling activities. These indirect effects would be temporary and short-term. The Project should have no long-term residual impacts on recreation.

To prevent recreational vehicles from attempting to access the playa via the proposed temporary access road, the following mitigation measure is recommended.

Mitigation Measure:

"No thru access" signs would be located on the access road to prevent recreational vehicles from attempting to utilize the access road as a means of entering the playa.

4.1.14 Visual

The total estimated area of new surface disturbance required for construction of the drilling pad and access road would be less than 1.75 acres. Negligible cut or fill would be required because the existing surface is relatively level. Reclamation of the well pad and access road when no longer needed is required by geothermal regulations and included as part of the Proposed Action.

During the approximately twenty- to forty-day well drilling process, the top of the truck-mounted drill rig mast could be as much as 70 feet above the ground surface. The well drilling would be conducted 24-hours a day, so that the lights used when drilling at night would be visible at a distance.

The Proposed Action would be consistent with the Class II VRM classification of the area. Impacts to visual resources would be temporary, and would primarily affect the elements of form, line, and color. All activities are proposed in the low, flat foreground of the County road and would not be visible at a distance except during the drilling activities, when the vertical drill rig would contrast with the horizontal lines of the road and where the playa meets the base of the mountain. Once reclamation activities are implemented, there should be no residual visual impacts from the Project.

This Project is short-term and temporary. However, the following mitigation measure is recommended to further reduce the potential for the long-term impacts of the Project on visual resources.

Mitigation Measure:

Wellhead equipment left on the drill site following the completion of drilling would be painted a color, subject to approval by the authorized officer that would blend with the landscape. Prior to painting, GGE would contact the Winnemucca Field Office project lead.

4.1.15 Economic Values

The road and pad construction/well drilling workforce is expected to consist of up to 15 workers. Some of these workers could be recruited locally, though most would be specialized workers from outside of the local area. Typically, non-local skilled workers do not bring families with them on these short-term construction/drilling assignments. Therefore, most are expected to stay in local hotels or rental housing units. Drilling of the exploration well is anticipated to last approximately 20 to 40 days.

The Project is short-term and temporary, and would not induce any population growth in the area. Neither does the Project create or provide any infrastructure which would indirectly induce substantial population growth.

Non-local construction/drilling workers typically are paid a *per diem* rate for daily housing and meal costs. Workers normally spend the *per diem* on motel accommodations or RV campground space rent, restaurants, groceries, gasoline, and entertainment. In addition, a portion of the construction equipment and supplies needed for the Project (i.e., grading equipment, fuel and tools) would typically be purchased or rented from local suppliers. This spending activity associated with the Project construction and drilling would have a small but positive effect on local businesses in Washoe County.

4.1.16 Lands and Realty

Holders of the existing ROWs would be notified of the proposed activities. GGE would coordinate their activities with the existing holders and would be required to obtain all applicable authorizations or permits.

Mitigation Measure:

GGE would be responsible for notifying the three rights-of-way holders that would be affected by the proposed action, and inform them of GGE's proposed activities. GGE would notify the rights-of-way holders in writing a minimum of 14 days prior to beginning activities across the rights-of-way, and would send the BLM Winnemucca Field Office copies of the correspondence. It would be GGE's responsibility to coordinate with the other authorized users to resolve conflicts, and to inform BLM of the ongoing coordination activities.

4.2 The No Action Alternative

No activities would be undertaken if the No Action Alternative were selected. There would be no effects on air quality; cultural resources; invasive, nonnative species; migratory birds; Native Americans; special status species; wastes (hazardous or solid); water quality (surface and ground); geology and minerals; soils; vegetation; wildlife; range resources; recreation; visual resources; economic values; lands and realty; and water quantity from implementation of the No Action Alternative.

5 CUMULATIVE IMPACTS ANALYSIS

The CEQ regulations for implementing NEPA (40 CFR 1508.7) define cumulative impacts as:

> *". . . the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time"*

The following analysis identifies other past, present or reasonably foreseeable future actions which, together with the Project, may incrementally impact the environment, and addresses the potential cumulative impacts of these actions and the Project.

5.1 Cumulative Impacts Assessment Area

The cumulative impact assessment area for this environmental assessment is the Gerlach KGRA. The Gerlach Known Geothermal Resources Area (KGRA) encompasses approximately 9,600 acres (15 square miles) in Sections 1-4, 9-16, and 21-23 in T36N, R34E (see Figure 6). Of this, about 2,925 acres are within the South Playa Area of the Black Rock-High Rock planning area.

5.2 Past and Present Actions

Past and present activities within the cumulative impact assessment area consist principally of dispersed recreation and geothermal resource exploration. The cumulative impact assessment area is centered on the unincorporated town of Gerlach, which lies approximately 2 miles south of the Project. The population of Gerlach is approximately 170 persons (Williams 2005). Gerlach has limited retail services, a motel, three restaurants, several bars, and a gas station (USDI, BLM 2003).

Geothermal resource exploration activities began on private land in the Project vicinity in 1993 when San Emidio resources drilled observation well 38-10 in the southwest quarter of Section 10, T32N, R23E. In 1994, observation well GTG-3 and thermal gradient hole GTG-2 were drilled in the northwest quarter of Section 10; thermal gradient hole GTG-7 was drilled in the northeast corner of Section 10; and full size production well 18-10 was drilled in the southwest quarter of Section 10. Well 38-10, and holes GTG-3 and GTG-7, are still being monitored. Hole GTG-2 and Well 18-10 were plugged and abandoned in 1995.

5.3 Reasonable Foreseeable Future Actions

For this analysis it is assumed that the "foreseeable future" is the anticipated two-year period for implementation of the Proposed Action plus a subsequent three-year period for reclamation. It is reasonable to assume that additional, similar geothermal exploration may occur on the federal geothermal lease in the foreseeable future. It is also reasonable to assume that recreational activities associated with the cumulative impact assessment area would continue into the reasonable foreseeable future in the same manner as they have been conducted in the present and recent past.

It is also assumed that geothermal development may occur on the federal geothermal lease or private lands in the cumulative impact assessment area in the foreseeable future. Should the lessee determine that the geothermal drilling was “successful,” the next phase would likely be to conduct additional drilling and develop the geothermal well field and construct and operate a geothermal resource utilization facility. This could include the development of a geothermal electric generating plant; direct use facilities (such as an ethanol plant, green houses or dehydration plants); or a combination of the two. The producing limits of the geothermal field would be determined by the developmental drilling. Surface disturbance to construct additional roads and drill pads would occur. Drilling of production wells would be initiated. Other facilities that could be constructed during development include a power plant; greenhouses or an ethanol or dehydration plant; a railroad spur line; an electric transmission line; geothermal fluid pipelines; geothermal fluid ponds; and warehouse and maintenance facilities.

There are no other actions with the potential for creating cumulative impacts either known or anticipated in the reasonably foreseeable future.

5.4 Cumulative Impacts for the Proposed Action

5.4.1 Air Quality

Fugitive dust would be generated from any surface-disturbing activities and travel on unpaved roads, although all projects would have to comply with the WCDHD-AQMD requirements to limit fugitive dust emissions. The operation of diesel engines during construction and production operations would also emit small quantities of criteria air pollutants (NO_2, SO_2, CO and PM_{10}), criteria air pollutant precursors (VOCs) and air toxics (small quantities of diesel PM, acetaldehyde, benzene, and formaldehyde).

5.4.2 Cultural Resources

Most impacts to cultural resources would be prevented through the Section 106 process of the National Historic Preservation Act. Impacts to the integrity of setting of any subsequently identified National Register listed/eligible sites where integrity of setting is critical to their listing/eligibility could occur from construction of roads or well drill site development. Roads could increase the likelihood of vandalism and illegal collecting/excavation of cultural sites. Mitigation measure(s) requiring surveys for cultural resources prior to surface disturbing activities would help reduce the potential impacts to cultural resources, if implemented for the other actions.

5.4.3 Invasive, Nonnative Species

Past and present actions may have introduced and contributed to the spread of invasive, nonnative species within the area of cumulative effect, and the same may be expected from the reasonable foreseeable future actions. The geothermal development phase would cause the most extensive surface disturbance and would present the greatest opportunity for invasive, nonnative species introduction and proliferation. The number and size of construction vehicles and construction activities could lend themselves to transporting invasive, nonnative species to areas where they had not previously existed. Mitigation measure(s) to inventory and treat newly disturbed areas, as proposed for the Project, would help reduce the potential effects if also implemented for the other actions.

5.4.4 Migratory Birds

The amount of surface disturbance which may be created within the cumulative impact area by the geothermal operations would likely be a very small portion of the cumulative impact area. The geothermal development phase would create impacts very similar to the geothermal exploration phase, though they would last longer and create more potential for disruption to migratory birds. Mitigation measure(s) requiring inventories for migratory bird nests and limiting ground disturbing activities if conducted during the migratory bird nesting season, as proposed for the Project, would help reduce the potential effects if also implemented for the other actions.

5.4.5 Threatened, Endangered, and Special Status Species

Impacts of the geothermal development phase on special status species would be very similar to the geothermal exploration phase, although they would last longer and create more potential for disruption. In most cases, geothermal development would not be allowed in areas where these activities could have a clear negative impact on special status species. Mitigation measure(s) to survey for special status species would help reduce the potential effects if also implemented for the other actions.

5.4.6 Wastes, Hazardous and Solid

The transportation, use, storage and disposal of hazardous materials and wastes are subject to numerous federal, state and local laws and regulations. These requirements are intended to protect the public and the environment and are applicable to each and all of these foreseeable future actions. Hazardous materials similar to those used by the Project are expected to be used by the projects anticipated within the cumulative impact assessment area, including petroleum hydrocarbon fuels (principally diesel fuel), hydraulic fluid, lubricants and drilling chemicals and materials.

Impacts from the development phase of geothermal activity would be the same as from the exploration phase, but the quantities of hazardous materials, hazardous wastes, or solid wastes used and generated could be greater. Additional non-hazardous solid waste and liquids could also be generated by these cumulative projects, increasing the potential for contamination of water and soil, and possible impacts to wildlife.

5.4.7 Water Quality (Surface and Ground) and Water Quantity

Development of the geothermal resource would entail the drilling and completion of additional geothermal well(s) very similar to the current Project. The geothermal development production phase, during which the geothermal fluid would be produced and injected, may also begin during the “foreseeable future.” These additional activities would not be expected to create any direct cumulative impacts to water quality. Storm water runoff from geothermal development could create additional erosion and sedimentation if not controlled through the implementation of standard best management practices.

5.4.8 Geology, Minerals and Geologic Hazards

The geothermal reservoir may be temporarily affected by the drilling and testing operations .

5.4.9 Soils

Additional impacts to soils would be expected to occur from the geothermal development activities. Additional roads may be constructed; geothermal wells drilled; and geothermal pipelines, a power plant or direct use facility, and electrical transmission lines constructed. Each of these activities would disturb the soils in the affected areas, which would be “lost” until reclaimed following completion of the projects. Mitigation measure(s) requiring the salvaging of topsoil, as proposed for the Project, would help reduce the potential effects if implemented for the other actions.

5.4.10 Vegetation

Additional impacts to vegetation would also be expected to occur from the geothermal development activities and other cumulative activities. Each of these activities would disturb and/or remove vegetation in the affected areas. Mitigation measure(s) requiring timely reclamation and re-seeding of disturbed areas, as proposed for the Project, would reduce impacts to vegetation.

5.4.11 Wildlife Resources

Additional wildlife habitat would be disturbed by the potential geothermal development activities and other cumulative activities through the creation of roads, geothermal production and injection wells, geothermal pipelines, a power plant or direct use facility, and an electric transmission line. Wildlife habitat directly disturbed by these activities would be “lost” until reclaimed. General human activity and generated noise could also keep some animals away from habitat not directly affected by surface disturbance. The amount of this direct and indirect surface disturbance expected from the cumulative projects is likely a small portion of the cumulative impact assessment area. There is abundant comparable wildlife habitat in the vicinity and region, and wildlife are normally able to move away from small areas of direct and indirect disturbance and into adjacent suitable habitat. Reclamation of directly disturbed areas, as proposed for the Proposed Action, would re-establish habitat for wildlife.

5.4.12 Range Resources

All of the past, present, and reasonably foreseeable future actions would be located within the Buffalo Hills allotment. These actions would create additional, though small, reductions in grazing through the loss of forage from surface disturbance. Some of this reduction in forage would be temporary, until reclaimed, though some (like a power plant or direct use facility and well sites) could be long term. Only small, specific areas would be fenced (like the direct use facility and well sites), and no cumulative activities are expected to prevent livestock access to available sources of water in the area.

5.4.13 Recreation

None of cumulative activities would prevent continued access by recreational users to the public lands within the cumulative impact assessment area, nor restrict access to the playa. None should also affect the ability of hunters to access previous hunting grounds, or affect the abundance of game animals.

Fugitive dust from vehicle traffic on unpaved roads, as well as noise and traffic from cumulative activities, could cause some recreational users to avoid those active portions of the cumulative

assessment area during the construction and drilling activities. These indirect effects would be temporary and short-term.

5.4.14 Visual Resources

Within the cumulative impact assessment area, public lands north and west of the railroad tracks are located in a VRM Class II, like the Project area; and public lands south and east of the railroad tracks are located in a VRM Class III. Numerous man-made features are currently visible within the cumulative impact assessment area. During the development phase of geothermal activities, the construction of roads, drill pads, pipelines, a power plant or direct use facility, and electrical transmission lines would result in long-term modifications to the line, form, color, and texture of the characteristic landscape. Roads, drill pads and pipelines could create strong horizontal and linear contrasts. Vegetation and soil removal could create color, textural and linear contrasts with adjacent areas that could be visible long after all the drilling and development facilities were removed. Constructed structures could have strong geometric and linear shapes, and solid colors, all contrasting with the natural landscapes and continuing throughout the life of the projects.

All of the contrasts could be mitigated on a case-by-case basis in order to maintain the area consistent with VRM Class II. Roads and pipelines could be sited and colored to blend in with the natural and existing horizontal features of the landscape. Disturbed areas could be revegetated to obliterate the contrasts. Larger structures could be painted with colors that would blend in with the surrounding landscape.

5.4.15 Economic Values

Positive economic impacts would be expected from the development phase of geothermal activity, although these would occur subsequent to the beneficial impacts of the Proposed Action. Some of the geothermal development construction work would likely be contracted out to local contractors and builders, and some of the required supplies and construction materials could also be purchased from local merchants. Some positive impacts could also be realized from the rental of hotel rooms and purchase of meals and entertainment by construction workers.

5.4.16 Lands and Realty

Granting of new rights-of-way for non-geothermal development would need to take into consideration existing geothermal leases. No other impacts to land use or realty are expected to occur.

5.5 The No Action Alternative

No activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on air quality; cultural resources; invasive, nonnative species; migratory birds; special status species; wastes (hazardous or solid); water quality (surface and ground) and water quantity; geology and minerals; soils; vegetation; wildlife resources; range resources; recreation; visual; economic values; and lands and realty from implementation of the No Action Alternative.

5.6 Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitment of resources is expected.

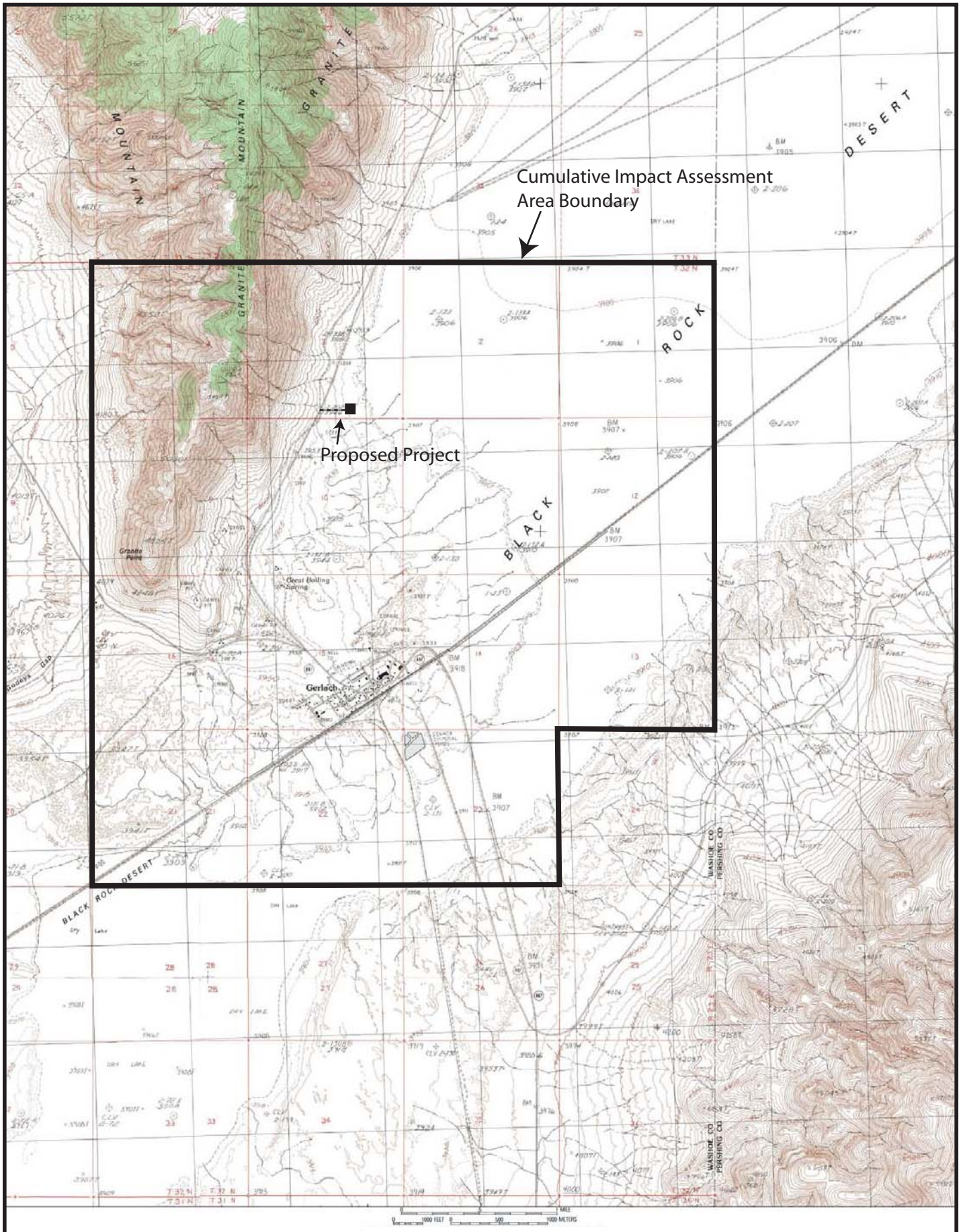

Figure 6: Cumulative Impacts Assessment Area

6 MITIGATION AND MONITORING

The following recommended mitigation and monitoring measures were developed through the analysis conducted in this Environmental Assessment.

- Project sites would be inventoried by GGE for the presence of invasive, nonnative species and treated with BLM certified pesticides following BLM approval of a pesticide use proposal if species are present.

- GGE would develop a hazardous material spill and disposal contingency plan describing the methods for cleanup and abatement of any petroleum hydrocarbon spill, and submit the plan to the authorized officer prior to field operations.

- The roads to be constructed and reclaimed as part of the Project would be reviewed by the BLM and required to conform to the requirements of BLM Manual 9113 and the "Gold Book" ("Oil and Gas Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development"), as applicable to the intended Project use.

- GGE would monitor the hot spring west of the County paved road and the Great Boiling Spring, unless access is denied by the private landowners and GGE provides to BLM documentation from the private landowner that access for monitoring has been denied. Baseline data will be collected one week prior to beginning the drilling operations. Monitoring data would be collected once a week during the drilling phase of the operations and daily during the testing phase of the operations. Baseline and monitoring data would include: photographs, temperature, flow rate, pH, and specific conductivity. All data would be submitted to BLM, Nevada State Office and Winnemucca Field Office. GGE would also conduct visual inspections of the three seeps in order to detect changes in the seeps. Alternatives for monitoring this data may be requested by BLM.

- Seeding of disturbed areas would be completed using the following seed mixture and application rate. Any variance in the mix would be coordinated first with the BLM Winnemucca Field Office.

Species	PLS LBS./Acre	Bulk LBS./Acre	PLS/sq. ft.
Black greasewood	3.00	5.00	12
Inland saltgrass	3.00	4.00	33
Alkali sacaton*	0.50	0.75	20
Totals	6.50	9.75	65
*extremely small seed PLS = Pure Live Seeds			

- "No thru access" signs would be located on the access road to prevent recreational vehicles from attempting to utilize the access road as a means of entering the playa.

- GGE would be responsible for notifying the three rights-of-way holders that would be affected by the proposed action, and inform them of GGE's proposed activities. GGE would notify the rights-of-way holders in writing a minimum of 14 days prior to beginning activities across the rights-of-way, and would send the BLM Winnemucca Field Office copies of the correspondence. It would be GGE's responsibility to coordinate with the

other authorized users to resolve conflicts, and to inform BLM of the ongoing coordination activities.

- Wellhead equipment left on the drill site following the completion of drilling would be painted a color, subject to approval by the authorized officer, thatofficer that would blend with the landscape. Prior to painting, GGE would contact the Winnemucca Field Office project lead.

7 LIST OF PREPARERS

Bureau of Land Management, Winnemucca Field Office
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Delores Cates, Geologist, Project Lead, and Visual Resources
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Regina Smith, Cultural Resources Specialist
Lynn Trost, Realty Specialist

Bureau of Land Management, Surprise Field Office
Roger Farschon, Ecologist

Environmental Management Associates, Inc.

Terry R. Thomas, D.Env. — Principal – Project Principal, Project Oversight and document Review.

Education: Doctor of Environmental Science and Engineering, University of California at Los Angeles; Master of Science in Plant Sciences, University of California at Riverside; Bachelor of Science in Biology, University of California at Los Angeles.

Experience: Over 25 years experience of project management in the preparation of environmental impact assessments and permit acquisition and compliance documents, and regulatory affairs for the geothermal energy, mining, and other natural resource development industries.

Dwight L. Carey, D.Env. — Principal — Project Manager, Introduction; Proposed Action, and Alternatives.

Education: Doctor of Environmental Science and Engineering, University of California at Los Angeles; Master of Science in Geology, University of California at Los Angeles; Bachelor of Science in Geology, California Institute of Technology.

Experience: Over 25 years of experience in providing comprehensive environmental services to industrial and natural resource development clients and government agencies, including the preparation of environmental assessments (EAs) and Environmental Impact Statements (EISs) in compliance with NEPA.

Heather T. Altman	Environmental Specialist — Air Quality; Invasive, Nonnative Species; Cultural Resources; Migratory Birds; Special Status Species; Wastes, Hazardous or Solid; Wildlife; Range Resources; Recreation; Visual Resources; Water Quality (Surface and Ground); Water Quantity; Economic Values; Lands and Realty; and Cumulative Impacts. Education: Master of Science in Environmental Management, University of San Francisco; Bachelor of Science in Environmental Science, University of California at Riverside. Experience: Five years experience in the preparation of environmental impact assessments, environmental impact reports (EIRs) and Initial Studies (ISs) in compliance with CEQA and EAs in compliance with NEPA.

8 AGENCIES, GROUPS, AND INDIVIDUALS CONTACTED

United States Fish and Wildlife Service, Nevada Fish and Wildlife Office
Robert D. Williams, Field Supervisor

Nevada Natural Heritage Project
Eric S. Miskow, Biologist III/Data Manager

Gerlach General Improvement District
Victoria Williams, Chief Financial Office

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APPENDIX A: Lease Stipulations for Federal Geothermal Lease N-75228

CONTINGENCY RIGHTS STIPULATION

The Bureau of Land Management has reviewed existing information and planning documents and, except as noted in other attached stipulations, knows of no reason why normal development, subject to the controls of applicable laws and regulations and the lease terms and conditions, can not proceed on the leased lands. However, specific development activities could not be identified prior to lease issuance since the nature and extent of geothermal resources were not known and specific operations have not been proposed. The lessee is hereby made aware that consistent with 43 CFR 3200.4, all post lease operations will be subject to appropriate environmental review and may be limited or denied only if unmitigatable and significant impacts on other land uses or resources would result.

Sage Grouse Stipulations for Geothermal Operations: These stipulations are based on the Interim Sage grouse Management Guidelines for Nevada and in all cases refer to known habitat except as noted.

Known Breeding habitat and Leks: February through June, but may vary on site specific basis. Avoid all activity within 3.3 km. (2 miles) of known leks during the mating season B March through May, or as determined by Field Office and Wildlife Personnel. NSO within 1km (0.6 mile) of known leks all times.

Nesting Habitat and Brood rearing habitats: (April through August per Interim NV Guidelines) Within 6 miles of lek, maximum of 12 miles per guidelines:
Known: Avoid all development or exploration activity during the nesting and brood rearing season with 1 km (0.6 mile) of known habitat. Where possible, NSO of any sort on such sites during the specified period.
Potential: Avoid permanent occupancy of potential habitat where possible.

Winter Habitats: (October through March)
Known: Avoid all development or exploration activity during the winter range season with 1 km. (0.6 mile) of known habitat. Where possible, NSO of any sort on such sites during the specified period.
Potential: Avoid permanent occupancy of potential habitat where possible.

General Sage Grouse Stipulations: Prior to entry on any lease areas that include known or potential habitat, the lessee (operator) shall contact the appropriate BLM Authorized Officer to discuss any proposed activities. All power poles and potential raptor perches will be designed or retrofitted to eliminate use by raptors. All surface disturbance that occurs in potential or known habitat shall be reclaimed as soon as possible in such a way as to result in conditions suitable for sage grouse habitat.

RECEIVED
Bur. of Land Management
7:30 A.M. OCT 24 2001
NEVADA STATE OFFICE
RENO, NEVADA

George Vranes
Signature

10/19/01
Date

Archaeological Stipulation

Antiquities and objects of Historic Value

To secure specific compliance with the stipulations under Sec. 6, paragraph (2) of the geothermal resources lease form, the lessee shall, prior to operations, furnish to the Bureau of Land Management's authorized officer a certified statement that either no archaeological values exist or that they may exist on the leased lands to be disturbed or occupied, to the best of the lessee's knowledge and belief, and that they might be impaired by geothermal resource operations. Such certified statement must be completed by a qualified archaeologist acceptable to the authorized officer.

If the lessee furnishes a statement that archaeological values may exist where the land is to be disturbed or occupied, the lessee will engage a qualified archaeologist, acceptable to the authorized officer, to survey and salvage, in advance of any operations, such archaeological values on the lands involved. The responsibility for the cost for the certificate, survey and salvage will be borne by the lessee, and such salvaged property shall remain the property of the lessor or the surface owner.

The lands subject to this stipulation are described as:

PARCEL NO. NV-GT-01-09-007
PARCEL NO. NV-GT-01-09-008
PARCEL NO. NV-GT-01-09-009
PARCEL NO. NV-GT-01-09-010
PARCEL NO. NV-GT-01-09-011
PARCEL NO. NV-GT-01-09-012
PARCEL NO. NV-GT-01-09-013
PARCEL NO. NV-GT-01-09-014
PARCEL NO. NV-GT-01-09-015

RECEIVED
Bur. of Land Management
7:30 A.M. OCT 24 2001
NEVADA STATE OFFICE
RENO, NEVADA

George V Sams
Signature of Lessee

10/19/01
Date

Lease Stipulation No. 2

APPENDIX B: U.S Fish and Wildlife Service Consultation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
Ph: (775) 861-6300 ~ Fax: (775) 861-6301

September 14, 2005
File No. 1-5-05-SP-243

Dwight L. Carey
Principal
Environmental Management Associates
588 Explorer Street
Brea, California 92821-3108

Dear Mr. Carey:

Subject: Species List for Gerlach Green Energy LLC Geothermal Exploration Project, Washoe County, Nevada

This responds to your letter received on August 12, 2005, requesting a species list for the proposed Gerlach Green Energy LLC Geothermal Exploration Project in Washoe County, Nevada. To the best of our knowledge, no listed, proposed, or candidate species or critical habitat occur in the subject project area. This response fulfills the requirement of the Fish and Wildlife Service to provide a list of species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended, for projects that are authorized, funded, or carried out by a Federal agency.

Please reference File No. 1-5-05-SP-243 in future correspondence concerning this species list. If you have questions regarding this correspondence or require further information, please contact me or Selena Werdon at (775) 861-6300.

Sincerely,

for Robert D. Williams
Field Supervisor

TAKE PRIDE IN AMERICA

APPENDIX C: BLM Best Management Practices for Road Construction

Best Management Practices for Road Construction

General Guidelines

Evaluate the erosion potential for the project to determine the level and extent of highly erodible areas requiring coordination between engineering, soils and hydrology. Recognize the cost of road construction will be significantly greater in erodible terrains.

Soils that have a low bearing strength tend to rut readily when wet, which leads to water concentration and erosion. This low bearing strength results in water quality impacts. Roads constructed in these soils should be designed to withstand wet weather traffic or traffic should be restricted in wet seasons.

If there is a potential for wet weather use, a stable road bases should be designed. For long term all weather use, the road should have a structural section designed to mitigate rutting.

Road Slope and Spoil Disposal Area Stabilization

Identify soil environmental site factors and their variance along the roadway. Determine the proper seed/fertilizer mixture to stabilize roadway slopes and waste spoil areas.

Mechanical stabilization should be accomplished in highly erodible soils using geotechnical materials, jute netting, punched straw or other proven technique.

In areas of highly erodible soil, windrow clearing debris at the base of the fill slopes to mitigate erosion.

Road Slope Stabilization

For cut slopes, allow them to be left as steep as possible to minimize the surface area subject to erosion. Do not lay the slopes back.

Control of Road Drainage

For roads within highly erodible areas, use insloped roads only in cases where maintenance can be performed on a regular basis. All other roads should be outsloped.

For highly erodible soils, inslope and ditch fill sections with culverts in order to prevent water from flowing down the face of fills.

Berms may be used to direct water to overside drains, if available.

Culvert headwalls should be constructed for perennial or intermittent stream crossings in highly erodible soil areas using riprap, soil cement, concrete, in order to prevent erosion.

Energy dissipators should be used in areas of water concentration, where significant erosion will result.

Construction of Stable Embankments (Fills) and Culvert Backfill

In highly erodible soil areas, the larger and more critical fills should be compacted to 95% of AASHTO T-99 specification. Fillslopes should be constructed at 1½ to 1. For fills compacted through layer placement along, fillslopes should be constructed at 1¾ to 1. No fills will be constructed on side slopes exceeding 55%.

For areas designed to have compacted fills and having slopes exceeding 40%, terrace the natural slope to key in the fill.

Care should be taken to compact the outer edge of the fill in highly erodible soil areas using a sheeps-foot type roller or other approved techniques.

Maintenance of Roads

In highly erodible soil areas, special attention should be paid to maintaining road drainages, including surface drainage configuration, culverts and overside drains for roads having all levels of maintenance. Cut slopes should not be undercut and drainages should be kept open, clean and functioning.

Road Surface Treatment to Prevent Loss of Materials

For road construction in areas having highly erodible soils, full-width stabilization, including the ditch, should be performed using aggregate, asphalt concrete, penetration oil treatment or other approved methods that will achieve long term stabilization of the road bed. Stabilization methods should be designed to exceed normal use so erosion control devices remain effective well past the intended use. Stabilization should be considered for road segments adjacent to or crossing sensitive streams, grades exceeding 6% and for areas having sideslopes in excess of 30%.