Finding of No Significant Impact

Glass Buttes Geothermal Exploration EA
DOI-BLM-OR-P040-2011-0021-EA
US Department of the Interior, Bureau of Land Management
Prineville Field Office and Burns District Office, Oregon

Introduction

The Bureau of Land Management (BLM) has completed an Environmental Assessment (EA) entitled Glass Buttes Geothermal Exploration DOI-BLM-OR-P040-2011-0021-EA. This EA was completed in response to operations plans, drilling programs, and geothermal drilling permit applications submitted to the BLM by Ormat Nevada Inc. ("Proponent") in September 2010. The BLM analyzed three alternatives in the EA including the proponent proposed action, briefly described below, one that responded to issues raised during scoping regarding sage-grouse and other wildlife, and a no action alternative.

Located approximately 70 miles southeast of Bend, Oregon and 50 miles northwest of Burns, Oregon, the proposed Projects would involve the maintenance and temporary construction of access roads, construction of two quarries, and drilling, testing, and monitoring of up to 13 geothermal exploratory wells on public lands administered by the Bureau of Land Management (BLM) and up to 3 geothermal exploratory wells on private lands located near Glass Buttes, Oregon. The objective of the proposed Projects is to evaluate the potential for the geothermal resources in the Glass Buttes area.

The Council on Environmental Quality (CEQ) regulations state that the significance of impacts must be determined in terms of both context and intensity (40 CFR 1508.27).

Context

Given that the physical effects of the projects would be limited to the local geographic area, many of the design features of the projects are common to both action alternatives, and the Habitat Mitigation Plan includes direction on improving at least twice as much sage-grouse habitat as the projects would disturb, I find that the EA has not identified any direct, indirect, or cumulative effects of sufficient size or duration to be significant at the local, regional, or national level.

Intensity

I have considered the potential intensity and severity of the impacts anticipated from implementation of a Decision on this EA relative to each of the ten areas suggested for consideration by the CEQ. With regard to each:

1. **Would any of the alternatives have significant beneficial or adverse impacts (40 CFR 1508.27(b)(I)? No.**

   Rationale: The action alternatives would impact resources as described in Chapter 3 and Appendix A of the EA. Impacts identified in the EA include possible impacts to recreation (EA, p. 3-6), biological resources (EA, p. 3-17), visual resources (EA, p. 3-37), cultural resources and traditional practices (EA, p. 3-48), wilderness characteristics (EA, p. 3-50), public safety (EA, p. 3-51), wetlands (EA, p. 3-52), biological soil crust (A-3), and groundwater and water rights (EA, p.3-55). The design features of the projects were incorporated in the design of the action alternatives to reduce potential adverse impacts to these resources and to ensure that the effects do not rise to a level considered significant. None of the environmental effects analyzed and discussed in detail in the EA are considered significant due to the design features of the projects.

2. **Would any of the alternatives have significant adverse impacts on public health and safety (40 CFR 1508.27(b)(2)? No.**

   Rationale: The EA identifies two potential impacts that the proposed projects could have on public health and safety – release of solids and natural gas during drilling and remaining in the reserve pits after liquids were evaporated (EA, p. 3-51). With respect to the release of natural gas, the Hazardous Gas Contingency Plan (EA, p. 2-41), which includes Lower Explosion Limit monitoring, minimizes the risk to worker safety from the presence of natural gas. Solids remaining in reserve pits, which typically consist of non-hazardous, non-toxic drilling mud and rock cuttings, would be sampled for pH, metals, and total petroleum hydrocarbons for confirmation of non-toxicity and non-hazardousness. The non-hazardous solids would then be mixed with the excavated rock and soil and buried by backfilling the reserve pit. If the material is determined to be hazardous per The Gold Book, then the material would be removed from the site with post-removal site testing to confirm that all hazardous material was removed. Therefore, the risk of the projects exposing the public to any hazardous and/or toxic chemicals would be minimal.

3. **Would any of the alternatives have significant adverse impacts on unique geographic characteristics (cultural or historic resources, park lands, prime and unique farmlands, wetlands, wild and scenic rivers, designated wilderness or wilderness study areas, or ecologically critical areas (ACECs, RNAs, significant caves)) (40 CFR 1508.27(b)(3)? No.**

   Rationale: There are no park lands, prime and unique farmlands, wild and scenic rivers, designated wilderness or wilderness study areas or ecologically critical areas that would be affected directly or indirectly from the proposed projects. There are wetlands identified in the National Wetland Inventory in Ormat's leased areas, but these wetlands are located in areas that would not experience disturbance from projects activities.

The projects are designed to avoid disturbance to all cultural resources eligible or potentially eligible and those currently unevaluated for listing the National Register of Historic Properties (EA, p. 3-48). Additionally, any new discoveries of cultural resources would temporarily stop activities related to the projects and a cultural resources specialist would be contacted. The projects would resume upon completion of assessment and coordination.

The projects would not limit Indian tribal members' access to the projects area and would not physically prevent tribes from practicing their traditional activities. Through multiple Consultation discussions (which included person to person meetings, phone calls, email exchanges, and field trips with the Klamath Tribes and the Confederated Tribes of the Warm Springs council members and staff to the projects area) the BLM has been informed by Tribal staff that the proposed Projects, even though they would occupy only a very small portion of the overall Glass Buttes area, would destroy "sacred and holy" areas; however, the tribes have not demonstrated how the Projects would do so. The tribes have not provided the BLM with a method to quantify or mitigate effects of the Projects to sacred and holy areas. The tribes have also not shown that the Projects would coerce tribal members to act contrary to their religious beliefs. Therefore, the BLM cannot find that there would be significant effects to historic structures or cultural resources as a result of the projects, and thus concludes that there are no significant effects to historic structures or cultural resources as a result of the projects.

4. **Would any of the alternatives have highly controversial effects (40 CFR 1508.27(b)(4)? No.**

   Rationale: Geothermal exploration drilling, temporary road construction, road improvements, quarry operation, and water well drilling are activities whose effects have been well documented and studied. A full suite of BLM and contract specialists (EA, p. 5-1) with expertise and knowledge on all of the proposed activities provided input on the analysis of effects (EA, Chapter 3) and have not identified any anticipated effects from the proposed activities that are undocumented and/or unstudied, thus the projects would not have highly controversial effects.

5. **Would any of the alternatives have highly uncertain effects or involve unique or unknown risks (40 CFR 1508.27(b)(5)? No.**

   Rationale: There are no parts of these projects that involve any new technology or that would use existing technology in a manner that it has not already been used. Due to this, there are no uncertain effects or unique or unknown risks associated with these projects.

6. **Would any of the alternatives establish a precedent for future actions with significant impacts (40 CFR 1508.27(b)(6)? No.**

   Rationale: No alternative would establish a precedent for future actions. Any further proposals for geothermal exploration and/or development would be analyzed as a completely separate action in a new environmental analysis.

7. **Are any of the alternatives related to other actions with potentially significant cumulative impacts (40 CFR 1508.27(b)(7)? No.**

   Rationale: The BLM evaluated the proposed projects in the context of past, present, and reasonably foreseeable future actions within the defined geographic scope for the proposed projects (EA Section 3.12).

8. **Would any of the alternatives have significant adverse impacts on scientific, cultural, or historic resources, including those listed or eligible for listing on the National Register of Historic Resources (40 CFR 1508.27(b)(8)?**

   Rationale: The projects are designed to avoid disturbance to all cultural resources eligible or potentially eligible and those currently unevaluated for listing the National Register of Historic Properties (EA, p. 3-48). Additionally, any new discoveries of cultural resources would temporarily stop activities related to the projects and a cultural resources specialist would be contacted. The projects would resume upon completion of assessment and coordination.

9. **Would any of the alternatives have significant adverse impacts on threatened or endangered species or their critical habitat (40 CFR l508.27(b)(9)?**

   Rationale: No listed fish, animal, or plant species or their critical habitat occurs within the range of direct or indirect effects of the projects.

10. **Would any of the alternatives have effects that threaten to violate Federal, State, or local law or requirements imposed for the protection of the environment (40 CFR l508.27(b)(lO)? No.**

    Rationale: The projects would follow all of the laws and requirements specifically listed in the EA (EA Section 1.5.3) as well as any other Federal, State, or local law or requirement imposed for the protection of the environment.

Finding

On the basis of the information contained in the EA, the consideration of intensity factors described above, all other information available to me, it is my determination that: (1) implementation of the alternatives would not have significant environmental impacts beyond those already addressed in the Brothers/La Pine and Three Rivers Resource Management Plan EISs; (2) the alternatives are in conformance with the Brothers/La Pine and Three Rivers Resource Management Plans; and (3) neither alternative would constitute a major federal

action having a significant effect on the human environment. Therefore, an EIS or a supplement to the existing EIS is not necessary and will not be prepared.

Brendan Cain

Brendan Cain
District Manager, Burns District

July 10, 2013

Date

USDI, Bureau of Land Management
Three Rivers Resource Area, Burns District
DECISION RECORD
Midnight Point Geothermal Exploration Project, Glass Buttes, Oregon Area
Environmental Assessment
DOI-BLM-OR-P040-2011-0021-EA

BACKGROUND

The Applicant has secured leasing rights to approximately 37,500 acres of Bureau of Land Management (BLM) lands in south central Oregon to conduct exploratory drilling for potential geothermal resources. These leasing rights, effective from February 1, 2009 until February 1, 2019, were issued by BLM to the Applicant through an open bid auction process which concluded on December 19, 2008. On September 27, 2010, the Applicant filed Geothermal Drilling Permit Applications with the BLM Oregon State Office for the Midnight Point Geothermal Exploration Project, located west and east (respectively) of Glass Butte in Lake and Harney Counties in Oregon. Alternative B (EA pages 2-2 to 2-30) in the Midnight Point and Mahogany Geothermal Explorations Projects, Glass Buttes, Oregon Environmental Assessment (EA) contains the details of the Applicant's proposal.

Compliance

With the exception of an access road, the Midnight Point project is located on BLM administered lands subject to the provisions and stipulations of the Three Rivers Resource Management Plan (RMP). Access to the project will occur across the Prineville District and thus, the access road is subject to the provisions and stipulations of the Brothers/LaPine RMP.

The two action alternatives (Alternatives B and C) are in conformance with the Three Rivers and Brothers La/Pine RMPs:

Three Rivers RMP

- Provide maximum leasing opportunities for oil, gas, and geothermal exploration and development by utilizing the least restrictive leasing categories necessary to protect sensitive resources (page 2-156).
- Allocate a total of approximately 1,499,000 acres as open to oil, gas, and geothermal leasing subject to standard terms and conditions (page 2-156).
- Protect or enhance groundwater quality on public lands (page 2-10).
- Minimize erosion from roads, mines and other human activities by controlling runoff concentration and velocity (page 2-20).
- Apply approved weed control methods to prevent the invasion of noxious weeds into areas presently free of such weeds and to improve the ecological status of sites which have been invaded by weeds (page 2-53).
- Ensure that BLM-authorized actions within the Resource Area (RA) do not result in the need to list special status species (pages 2-59).
- Protect, maintain, enhance, or rehabilitate the visual resource values as inventoried and evaluated by managing all public lands in accordance with the Visual Resource Management (VRM) System (page 2-148).

- Protect the cultural and paleontological values in the RA from accidental or intentional loss (page 2-152).
- Meet public needs for use authorizations such as rights-of-way, leases and permits (page 2-182).

Brothers La/Pine RMP

- Approximately 910,000 acres of public lands will be open to exploration subject to standard lease requirements and stipulations (page 107).
- Seasonal restrictions will be applied to mitigate the impacts of human activities on important seasonal wildlife habitat (page 97).
- Soils will be managed to maintain productivity and to minimize erosion (page 121).

Relationship to Statutes, Regulations, or Other Plans and Projects

The project is consistent with the Energy Policy Act of 2005, BLM's 2001 National Energy Policy Implementation Plan, and other federal policies that relate to the use of renewable energy. Furthermore, the Geothermal Steam Act of 1970, as amended by the Energy Policy Act of 2005; the Mining and Mineral Policy Act of 1970; the Federal Land Policy and Management Act of 1976 (FLPMA); and the National Materials and Mineral Policy, Research and Development Act of 1980 directed the Federal government to foster and encourage private enterprise to develop renewable energy resources with appropriate environmental constraints. The project is consistent with these national goals.

A United States Department of Interior policy, consistent with Section 2 of the Mining and Mineral Policy Act of 1970 and sections 102(a)(7), (8), and (12) of FLPMA, is to encourage the development of mineral resources, including geothermal resources, on Federally managed lands. The Secretary of the Interior has the authority and responsibility to lease public lands and certain other Federal lands for geothermal development. The Secretary has delegated this responsibility to BLM. Under the terms of the Geothermal Steam Act (and the Energy Policy Act) and subsequent implementing regulations, BLM must respond to the plans and programs submitted by the lessee and either approve, require modification, or deny an application.

The following list of applicable Federal laws and regulations serves as the regulatory framework for the project:

Geothermal Exploration

- The Geothermal Steam Act of 1970 (Act) (30 USC §1001-1025);
- The Energy Independence and Security Act of 2007;
- 43 CFR 3200, Geothermal Resources Leasing and Operations; Final Rule, May 2, 2007;
- The Energy Policy Act of 2005; The National Energy Policy, Executive Order 13212, and Best Management Practices (BMPs) as defined in Surface Operating Standards and Guidelines for Oil and Gas; and,
- BMPs as defined in the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition (Gold Book) (BLM, 2007a).

Mineral Material Contract Sales

- The Minerals Act of July 31, 1947, as amended (30 USC §601 *et seq.*);
- 43 CFR 3601.6, Mineral Material Disposals; and Section 304 of FLPMA (43 USC §1734) and the Independent Offices Appropriation Act of 1952 (31 USC §9701) authorize the U.S. Government to collect fees and to require reimbursement of its costs.

Access Road Rights-of-Way

- Federal Land Policy and Management Act of 1976, as amended, section 501 (43 USC §1761); and,
- The Federal Land Policy and Management Act of 1976 (PL 94 579, 43 USC §1761 (*et seq.*); 43 CFR 2800, Rights-of-Way, Principles and Procedures; Rights-of-Ways under the Federal Land Policy and Management Act and the Mineral Leasing Act; final Rule, April 22, 2005.

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

- The National Environmental Policy Act of 1969, as amended (Public Law [PL] 91-190, 42 USC §4321 (*et seq.*); 40 CFR 1500 (*et seq.*); Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act;
- U.S. Department of Interior (DOI) requirements (Departmental Manual 516, Environmental Quality [DOI 2004]);
- National Historic Preservation Act (16 USC §470 *et seq.*);
- Native American Graves Protection Act (PL 101-601; 25 USC §3001 *et seq.*);
- Archaeological Resource Protection Act (PL 96-95; 16 USC §470 *et seq.*);
- Endangered Species Act (7 USC §136, 16 USC §1531 *et seq.*);
- The Bald and Golden Eagle Protection Act (16 USC §668(a); 50 CFR 22);
- Migratory Bird Treaty Act of 1918 (16 USC §703-712);
- Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds (66 CFR 3853, January 17, 2001);
- Memorandum of Understanding between BLM and U.S. Fish and Wildlife Service (USFWS) to Promote the Conservation of Migratory Birds (BLM MOU WO-230-2010-04);
- Greater Sage-Grouse Interim Management Policies and Procedures (BLM Instruction Memorandum No. 2012-043);
- BLM National Greater Sage-Grouse Land Use Planning Strategy (BLM Instruction Memorandum No. 2012-044);
- BLM NEPA Handbook (H-1790-1), as updated (BLM 2008a);
- Considering Cumulative Effects under the National Environmental Policy Act [CEQ 1997];
- BMPs as defined in the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (Gold Book);
- The Geothermal Energy Research, Development, Demonstration Act of 1974;
- BLM Mineral Materials Disposal handbook (H-3600); and,
- Use; Rights-of-Way, Code of Federal Regulation 43 CFR 2800.

DECISION

Based on the analysis documented in the EA and Finding of No Significance (FONSI) it is my decision to select Alternative C (EA, pages 2-31 to 2-42) with the exception of the extended timing restriction for testing activities from December 1 through March 1. The Applicant will be allowed to perform geothermal exploration from August 16 to February 28 and take water samples and well readings year round. The Potato Hills Quarry is approved as a Community Pit and Ormat is approved to do five acres of disturbance for drilling, blasting, and crushing operations from July 15 through February 28 at the Potato Hills Quarry. The approval would allow the retrieval of material under a mineral material issued by BLM and authorized by the appropriate officer that could extend throughout the full year with the approval of the BLM Biologist for appropriateness based upon actual impacts at that time.

I am approving: Geothermal wells 15-33, 46-33, 62-33, 86-33, 28-34, 18-34, 52-3 and water wells (limited to three between this project and the Mahogany project on the Prineville District); .07 miles of disturbance alongside existing access roads for truck turnarounds and truck pull outs; and 4.09 miles of new temporary access road. I am also approving five acres of use of the Potato Hills rock quarry and mining plan, however, a right-of-way for the Potato Hill road will be needed in order to obtain a mineral material permit for the quantities requested.

I am requiring the installation of cattle guards where access roads will cross grazing allotments. The Applicant may use either temporary or permanent cattle guards, but if temporary cattle guards are used, they must be in place while the road is being used by the Applicant for project related activities. I am allowing the Applicant to minimally and temporarily improve access roads by leveling and spot graveling them and to widen access roads through the installation of truck pull-outs and truck turn around areas, to accommodate project vehicles traveling to the proposed well pads. These improvements will be made to closely resemble the existing profile of the access road. Spot graveling and leveling will only be done in locations that will result in four inch ruts if improvements are not performed. Roads will not be widened beyond their existing prism, except in locations where truck pull-outs or truck turn around areas are constructed. Road maintenance of access roads related to this project will only be performed from August 16 to February 28. Prior to beginning any work, I am going to require the Applicant to provide the BLM with funding to thin 88 acres of juniper for sage-grouse impacts and 241 acres for wintering big game habitat as off-site mitigation (a total of 329 acres for off-site mitigation). The habitat mitigation plan (HMP) for sage-grouse is completed and is part of the EA (Appendix B) and the HMP for wintering mule deer and elk will be completed within two weeks of signing of this Decision Record.

There are 88 acres of sage-grouse habitat mitigation and 241 acres of wintering mule deer and elk habitat mitigation (Table 1) that is covered under this Decision. The cost formula is $80 per acre for sage-grouse and $80 per acre for winter big game habitat. This results in a total of $26,320 for mitigation costs that would need to be received by BLM prior to the Notice to Proceed being issued. Please note that wintering big game habitat mitigation measures may likely be different than that for sage-grouse habitat and will be discussed in the wintering deer and elk HMP.

Table 1: Mitigation calculation ***(compilation from tables 3-7, 3-11, and 3-22 for the actual area approved in this Decision)***

Test Drilling Activity	**Disturbed Acres***	**Mitigation Acres**
Drill Pads	33.1	33.1 x 2 = 66.2
Temporary Access Road Construction, Truck Pull-Outs, and Truck Turn Around Areas	5.8	6.4 x 2 = 12.8
Quarry	5	5 x 2 = 10
Direct Subtotal	43.9	**88**
Indirect impacts for disturbance to wintering mule deer and elk during the extended drilling time frame	0.2 mile buffer around 3 approved well sites – Habitat disturbance factor of 1.0	**241**
Indirect Subtotal		241
Direct & Indirect Total		329

Design Features

These stipulations are in addition to the project design features that were common to both Alternatives (EA pages 2-35 to 2-42). Note that the stipulations within the EA were revised to reflect comments, conditions, and organized for clarity, and understanding, however, revisions were not substantive or material in nature that would require further comment. The complete and clarified stipulations are the following:

General

- A Pre-construction meeting will be required at a time mutually acceptable to the Applicant and BLM, but prior to approval of the Notice to Proceed.
- Flagging of proposed work by Applicant will be required to allow final clearance by BLM.
- Provide an update, if needed, to the Operation Plan, Schedule of Operations, and any changes made for the Geothermal Drilling Permit for approval within the Notice to Proceed.
- Mitigation cost must be received and in place at BLM prior at the time of soil disturbance and will be required for a Notice to Proceed to be issued.
- Provide to the BLM, all information submitted to other Federal and state (unless requested otherwise, this would not include Department of Energy (DOE)) government agencies (which includes Department of Geology and Mineral Industries (DOGAMI)).
- Must follow all conditions of the DOGAMI and BLM Geothermal Drilling Permit (GDP) and compliance requirements as issued.

Prevention and Control of Fires

- The BLM District Office would be notified immediately of any wildland fire, even if the available personnel can handle the situation or the fire poses no threat to the surrounding area.
- A roster of emergency phone numbers would be available at the project site so that the appropriate firefighting agency could be contacted in case of a fire.
- All vehicles would carry at a minimum, a shovel, five gallons of water (preferably in a backpack pump), and a conventional fire extinguisher.
- Adequate fire-fighting equipment (a shovel, a pulaski, standard fire extinguisher(s), and an ample water supply) would be kept readily available at each active drill site. Water that would be used for construction and dust control would also be available for fire suppression.
- Vehicle catalytic converters (on vehicles that would enter and leave the drill site) would be inspected daily and cleaned of all flammable debris.
- All cutting/welding torch use, electric-arc welding, and grinding operations would be conducted in an area free, or mostly free, from vegetation. An ample water supply would be available onsite from the proposed 10,000 gallon water tank (see Ancillary Facilities above) and shovel would be on hand to extinguish any fires created from sparks. At least one person in addition to the cutter/welder/grinder would be at the work site to promptly detect fires created by sparks.
- The Applicant would be responsible for being aware of and complying with the requirements of any fire restrictions or closures issued by the BLM District, as publicized in the local media or posted at various sites throughout the field office district. The Applicant would be responsible for notifying personnel of these restrictions or closures.
- Personnel would be allowed to smoke only in designated areas and would be required to follow applicable BLM regulations regarding smoking.

Soil Erosion

- Topsoil would be salvaged, stockpiled, and reused for reclamation; however, stumps, brush, and other organic material would be hauled off-site after site clearing.
- Temporarily disturbed areas that were previously vegetated would be reseeded using a grass and sagebrush seed mix that is in compliance with BLM and Oregon seed policies. The seed would meet the requirements of the Federal Seed Act (P.L. 76-354; 1939) and the Oregon Certified Seed Handbook (2012). Only seed certified as "noxious weed free" would be used. In addition, the seed would be appropriate to the geographic and elevation characteristics of the area to be seeded (4,000 to 6,500 feet above mean sea level).
- Erosion control measures, including but not limited to silt fencing, diversion ditches, water bars, temporary mulching and seeding, and application of aggregate and rip rap, would be installed within well pads and access roads, where evidence of erosion exists.
- Access roads would follow existing contours to the maximum extent possible. In areas where new access roads would need to be constructed across slopes, erosion control measures such as silt fence, surface roughening, and slope stabilization would be provided as necessary.
- Up to six inches of aggregate would be used as road surface where appropriate because roads would be used during all seasons.

- Aggregate would be laid down when ground conditions are wet enough to cause rutting or other noticeable surface deformation and severe compaction. As a general rule, if vehicles or other project equipment create ruts in excess of four inches deep when traveling cross-country over wet soils, an aggregate surface would be added prior to additional vehicle use.
- In areas of very soft soils, up to three feet of aggregate would be used during construction.

Hydrology - Surface Water and Groundwater

Surface Water

- Where proposed, new access roads would need to cross ephemeral washes, rolling dips would be installed. The rolling dips would be designed to accommodate flows from at least a 25-year storm event. Culverts would be used wherever rolling dips are not feasible.
- Silt fences and/or straw bales would be used in areas requiring sediment control.
- Roads and well pads not required for further geothermal development purposes would be re-contoured to preconstruction conditions and seeded to prevent erosion.
- Access roads would follow existing contours to the maximum extent possible. In areas where new access roads would need to be constructed across slopes, erosion control measures such as silt fence, surface roughening of slopes, and slope stabilization would be provided as necessary.

Groundwater

- Excavation into native soil during construction of well pad reserve pits would be minimized to the maximum extent possible.
- Drill pad reserve pits would be compacted during construction and settled bentonite clay from drilling mud would accumulate on the bottom of the drill pad reserve pits to act as an unconsolidated clay liner, reducing the potential for drilling fluid to percolate to groundwater.
- A BLM-approved cementing and casing program for the drilling of observation wells would be implemented to prevent water quality effects on groundwater during or after completion of the wells.
- Borehole geophysics analyses (cement bond logs) would be conducted to document that well casing cementing activities provide an effective seal isolating the geothermal aquifer from shallow alluvial aquifers, therefore minimizing potential impacts on surface springs or streams.
- The use of "blow-out" prevention equipment during drilling and the installation of well casing cemented into the ground would ensure that any geothermal fluid encountered during the drilling would not flow uncontrolled to the surface.
- Any well on the leased land that is not in use or demonstrated to be potentially useful would be promptly plugged and abandoned in accordance with lease stipulations. No well would be abandoned until it has been demonstrated to the satisfaction of the BLM that it is no longer capable of producing in commercial quantities, and would not serve any other useful purpose such as for injection of geothermal fluids or monitoring of the geothermal reservoir or groundwater.

- No water wells would be installed within a 5,000-foot radius of existing water wells on BLM lands.

Biological Resources

- Trash and other waste products would be properly collected and disposed of, with the objective of eliminating any litter. The Applicant would use air-tight containers for any garbage that could attract wildlife. All trash would be removed from the project area and disposed of at an authorized landfill.
- Speeds would be reduced from 25 mph to 15 mph when workers/drivers observe terrestrial wildlife (i.e. deer, sage-grouse) near project activities, especially near/on access roads and posted with signage.
- Employees and contractors would be prohibited from carrying firearms on the job site.
- Reclamation of the disturbed areas, as described earlier in this document, would be completed in order to return these areas to the condition required in the drilling permit Conditions of Approval.
- Areas that become infested with invasive species/noxious weeds during construction would be mapped, reported to BLM, physically (i.e. disking, mowing) and/or chemically (i.e. herbicide) treated, and then seeded with certified weed-free seed and mulching materials.
- Existing weed infestations would be avoided or treated before disturbance.
- All weed prevention and control practices performed on BLM lands would be done so in accordance with all applicable BLM regulations and procedures.
- A Weeds Management Plan must be submitted and approved prior to the issuance of the Notice to Proceed. The Weed Management Plan should address the following:

    - Mineral material aggregate applied to Federal lands will be from a pit certified by Harney County to be free of weeds.
    - Plan of Operations (who, what, when, where, and how) for monitoring and treating any noxious weeds infestations in the work area, especially in areas of activities of disturbance.
    - Spraying products used can only be those allowed within the Burns District.
    - Consultation of with the BLM District prior to treatments.
    - Will need to provide the BLM with a Pesticide Applicator Record for each treatment each year.
    - For three years following final reclamation, reclaimed sites would be monitored for weeds, and if found, would be treated.
- There would be no surface operations during sage-grouse lekking and nesting season (March 1 to August 15), however, based upon clearances conducted by BLM Wildlife Biologist, the initial quarry entry could start on July 15.
- All surface operations (including drilling) and surface construction activities (drill rigs, wellheads, and power plants) would not be visible from leks.
- Where sagebrush is present to begin with, sagebrush would be used in the re-vegetation seed mixes applied during reclamation, or sagebrush planted to ensure sagebrush returns to the site.

- Fencing reserve pits would include fencing all four sides of the pit as well as applying netting over the top of the pit. A ramp would be placed in the reserve pit as a safeguard in the event that the fencing/netting fails and an animal or human falls in.
- All surface operations (i.e. well drilling and resource testing) would be less than 40 decibels (db) or less than 10 db above ambient sound at surrounding leks.
- Well pad sites and rock quarries would be surveyed for Threatened and Endangered and Special Status plant species in May prior to project implementation. Threatened and Endangered and Special Status plant sites would be avoided if found.
- Surveys for burrowing owls would be performed during breeding/nesting season (April 15 - August 1) before any proposed ground disturbing activities (i.e. well pad construction, drilling, road construction/improvements, rock quarries) later in the year. If burrowing owls are discovered within 0.25 miles of a proposed disturbance area, the Applicant would monitor burrows for collapse during drilling operations or other disturbance. Should the burrows collapse, artificial burrows would be constructed by the Applicant greater than 0.25 miles away as an alternate site for owls to nest the following year based on recommendations from Green (2006).
- Reserve pits would be overbuilt to accommodate a greater volume of water than is discharged. This would result in un-vegetated and muddy shorelines that breeding mosquitos (Cx. tarsalis), which may carry West Nile virus avoid. Steep shorelines would be used in combination with this technique.
- Reserve pit slopes would be built steep to reduce shallow water (>24 in) and aquatic vegetation around the perimeter of reserve pit impoundments.
- The water level of the reserve pits would be maintained below that of rooted vegetation for a muddy reserve pit that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Terrestrial vegetation would not be flooded in flat terrain or low lying areas.
- The channel where discharge water flows into the reserve pit would be lined with crushed rock, or a horizontal pipe would be used to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
- The overflow spillway would be lined with crushed rock, and the spillway would be constructed with steep sides to preclude the accumulation of shallow water and vegetation.

Air Quality

- All access roads would be surfaced with aggregate materials, as needed.
- Dust abatement techniques, such as watering on unpaved, unvegetated surfaces would be used to minimize airborne dust, as needed.
- Dust abatement techniques (such as watering, requiring loader buckets to be emptied slowly, and minimizing drop heights) would be applied to earthmoving, excavating, trenching, grading, and aggregate crushing and processing activities.
- Equipment and vehicle idling times during construction activities would be kept to the necessary minimum.
- A speed limit of 25 mph will be observed on all access roads by project vehicles to minimize potential collisions with recreationists/visitors, other project vehicles/workers,

wildlife and reduce dust emissions. Signage will be used to control vehicle speed and provide an enforceable limit (i.e. 25 mph).

- Access roads, project area roads and other traffic areas would be maintained on a regular basis to minimize dust and provide for safe travel conditions.

Noise

- Noise suppression devices would be utilized on all compressors.

Visual Resources

- Periodic application of water would be used on soil surfaces during construction and grading to control dust.
- Cut-and-fill areas would be minimized by proper placement of roads and well pads.
- Equipment placed at the well pads would be removed after drilling and testing so that only the wellhead extends above the well pad.
- Drill rig and well test facility lights would be limited to those required to safely conduct the operations, and would be shielded and/or directed in a manner that focuses direct light to the immediate work area.
- If aggregate is applied to roads or well pads it would be earth-toned (i.e., brown, tan, green) in color at any location that is visible from Highway 20.
- Aggregate applied to the portion of access road R2B that is visible from KOP 11 would be earth-toned in color.
- Disturbances would be reclaimed to preconstruction conditions or equivalent and all rehabilitation work on proposed improved access roads, temporary access roads, and well pads would be performed in such a way that when completed, the color, contours, and planted or seeded vegetation would match the visual characteristics of the surrounding area.

Cultural, Archaeological, Native American and Other Natural Resources

- Known eligible and potentially eligible cultural resource sites would be avoided.
- A 100-foot buffer zone would be established around eligible and potentially eligible cultural resource sites to help provide protection to the sites. Project facilities and disturbance would not encroach into the established 100-foot buffer zone.
- The Applicant would limit vehicle and equipment travel to existing and proposed roads, well pads, construction areas, and aggregate source areas.
- All construction equipment and vehicles used for the Proposed Project would be kept off access roads when not in use.
- Any unplanned discovery of cultural resources, items of cultural patrimony, sacred objects or funerary items would cause all activity in the vicinity of the find to cease, and the BLM would be notified immediately by phone with written confirmation to follow. The location of the find would not be publicly disclosed, and any human remains would be secured and preserved in place until a Notice to Proceed is issued by the authorized officer.

Waste Disposal

- A project hazardous material spill and disposal contingency plan would be prepared that would describe the methods for cleanup and abatement of any petroleum hydrocarbon or

other hazardous material spill. The hazardous material spill and disposal contingency plan would be submitted to and approved by the BLM and made readily available onsite before operations begin.

- Secondary containment structures would be provided for all chemical and petroleum/oil storage areas during drilling operations. Additionally, absorbent pads or sheets would be placed under potential spill sources and spill kits would be maintained onsite during construction and drilling activities to provide prompt response to accidental leaks or spills of chemicals and petroleum products.
- Handling, storage, and disposal of hazardous materials, hazardous wastes, and solid wastes would be conducted in conformance with Federal and state regulations to prevent soil, groundwater, or surface water contamination and associated adverse effects on the environment or worker health and safety.
- Portable chemical sanitary facilities would be available and used by all personnel during periods of well drilling and/or flow testing. These facilities would be maintained by a local contractor

Public Safety

- All environmental soil and ground water sampling will be consistent with industry standards, The Gold Book (i.e., publication for 'Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development'), and in coordination with the BLM.

Quarries and Pits

- The Quarry Design criteria can be found in Appendix A and applied to the Public Lands quarry (i.e., Potato Hills Quarry).
- In order to receive a mineral material permit from the Potato Hills Quarry, a right-of-way application and permit will be required (note that this permit may include conditions from the Oregon Department of Transportation (ODOT) for access onto highway 20).

Safety Plans

- A summary of the safety plans that would apply to the Projects is presented below:

Injury Contingency Plan

In the event injuries occur in connection with the operations of the Projects, specific and immediate attention will be given to proper transportation as the nearest medical facility is the Harney District Hospital in Burns, Oregon.

Blowout Contingency Plan

Blowout prevention equipment will be kept in operating condition and tested in compliance with BLM regulations, DOGAMI regulations, and industry standards. In addition, cold water and barite will be stored at the well pad for use in killing (i.e., preventing the continued flow of) the well in case of an emergency. In the event of an emergency, such as a blowout, immediate efforts will be taken to shut surface valves and blowout preventer system. If the means to shut-in or control the flow from the well are lost, the Blowout Contingency Plan contains procedures that will be implemented to completely contain the well and initiate steps to return the area to its normal state prior to the blowout or fluid flow.

Spill or Discharge Contingency Plan
In the event of discharge of formation fluids, drilling muds, petroleum products, or construction debris, the person responsible for the operation will make an immediate investigation, then contact the Drilling Supervisor and advise him of the spill. The Drilling Supervisor will in turn callout equipment, regulate field operations, or do other work as applicable for control and clean-up of the spill.

The Spill or Discharge Contingency Plan contains specific procedures for responding to geothermal fluid, drilling mud, and petroleum product spills:

- Geothermal fluid spills - Contain spillage with dikes if possible and haul to disposal site by vacuum or water trucks or dispose of in an acceptable manner.
- Drilling mud - Repair sump or contain with dikes. Haul liquid to another sump, available tanks or approved disposal site.
- Petroleum products - Contain spill with available manpower. Use absorbents and dispose of same in approved disposal area. Clean up surface staining on soil on a regular basis.

The Applicant will notify agencies and regulatory bodies, and will also advise the local population and affected property owners if a spill affects residents or property. The Applicant will have the source of the spill repaired at the earliest practical time, and continue working crews and equipment on cleanup until all concerned agencies are satisfied.

Hazardous Gas Contingency Plan
All personnel will be trained in warning signs, signals, first aid, and responsibilities in case of hazardous gases. The site will have two briefing areas so that one is upwind from the well and containment basin at all times. Before drilling or testing commences, all personnel will be advised of escape routes. Weekly drills will be conducted. In addition, automatic H2S detectors will be stationed around the rig. Safety precautions will include the possibility for encountering natural gas (as noted within a nearby well log) during drilling. Lower Explosive Limit (LEL) monitoring will be installed on the drill rig to monitor natural gas levels. The Hazardous Gas Contingency Plan contains emergency procedures that will be followed in the event that hazardous gas is detected. Vapor monitoring logs will be maintained and made available to BLM and safety inspectors on request. This plan will be submitted to BLM prior to the commencement of project activities and amended according to agency discretion.

An Air Containment Discharge Permit (ACDP) from the Oregon Department of Environmental Quality (DEQ) will not be required because a.) the drill rig engines are non-road engines and do not count towards toward stationary source emissions; b.) each well will release not more than 10 tons per year of a regulated pollutant; and, c.) the wells will be sufficiently far apart such that each well will be considered a separate "stationary source" as defined in OAR 340-200-0020(134).

FONSI Reference
In addition to the EA, a FONSI has been completed for the proposed Midnight Point and Mahogany Geothermal Exploration Projects, Glass Buttes, Oregon (DOI-BLM-OR-P040-2011-

0021-EA). The Midnight Point project has been found to have no significant impacts, thus an Environmental Impact Statement (EIS) is not required. See the attached signed FONSI.

COMMENTS RECEIVED

A scoping notice entitled "Notice of Intent to Conduct Geothermal Resource Exploration Operations" was published on March 11, 2011 in *The Oregonian*, *Central Oregonian*, and *Bend Bulletin*. The scoping notice included a detailed project description and procedures for submitting comments on the Proposed Projects and issues of concern. In addition, on March 9, 2011, BLM sent a letter to 76 interested parties containing the same types of information included in the scoping notice. Publication of the scoping notice initiated a 30-day public scoping period which was formally concluded on April 11, 2011.

Comments from governmental agencies, environmental organizations, and concerned citizens submitted during the scoping period helped frame the issues considered in the EA.

Following the release of the EA for comment on April 17, 2013, a notice of the availability of the EA was published in the Burns Times-Herald. On April 17, 2013, letters signed by the Prineville District Manager were sent to those individuals that provided comments during the scoping period notifying them of the completion of the EA and the beginning of the comment period. Additionally, on April 17, 2013, over 80 post cards were mailed to individuals, adjacent landowners, organizations, and state and local government agencies notifying the recipients of the completion of the EA and the beginning of the comment period for the EA. On April 19, 2013, the EA and unsigned FONSI were posted online on the Prineville and Burns BLM websites, as well as the DOE's Web site. Finally, a press release was released on April 19, 2013 and posted on Prineville BLM's Web site notifying the public of the completion of the EA and the beginning of the comment period for the EA.

Between April 17 and April 19, 2013 Prineville and Burns BLM Managers informed the Tribal Chairpersons and staff of the Confederated Tribes of the Warm Springs, the Klamath Tribes, and the Burns Paiute Tribe by phone and mailings that the EA was completed and that the BLM was seeking comments on the EA.

In response to comments, the Prineville and Burns BLM District Managers and staff engaged in discussions pertaining to both the existing sage-grouse HMP and a forthcoming Big Game Winter Habitat Mitigation measures as it pertains to this Decision Record. These discussions resulted in changes and additions to the EA.

In response to comments about road maintenance, I am requiring the installation of cattle guards where access roads will cross grazing allotment fences. The Applicant may use either temporary or permanent cattle guards, but if temporary cattle guards are used, they must be in place while the road is being used by the Applicant for project related activities. I am allowing the Applicant to minimally and temporarily improve access roads by leveling and spot graveling them and to widen access roads through the installation of truck pull-outs and truck turn around areas, to accommodate project vehicles traveling to the proposed well pads. These improvements will be made to closely resemble the existing profile of the access road. Spot graveling and leveling will only be done in locations that will result in four inch ruts if improvements are not performed.

Roads will not be widened beyond their existing prism, except in locations where truck pull-outs or truck turn around areas are constructed. Road maintenance of access roads related to this project will only be performed from August 16 to February 28. Prior to beginning any work, I am going to require the Applicant to provide the BLM with funding for a total of 329 acres (88 for sage-grouse and 241 for wintering big game) mitigation for disturbance to BLM identified sage-grouse Preliminary General Habitat (PGH).

Rationale for the Decision

Chapter 2 of the EA described three alternatives: Alternative A, the "No Action" alternative; Alternative B, the Applicant's proposal; and Alternative C, the Applicant's proposal with additional stipulations.

The rationale for the approval of the Applicant's proposal with the additional stipulations but not the additional timing restriction in Alternative C includes:

- The Decision is consistent with the purpose for which lands were leased by the United States to Ormat.
- The Geothermal Steam Act of 1970, as amended, 30 U.S.C. 1001-1028, provides the authority for the BLM to allow for the exploration of geothermal resources on BLM-managed public lands.
- The Decision is consistent with the surface use stipulations that were made part of the leases OR-65722, OR-65721, OR-65725, and OR-65726 which Ormat acquired, which allowed them to apply to the BLM to perform geothermal exploration.
- The exploration of the geothermal resource is consistent with initiatives of the National Energy Policy and supports the National Renewable Energy Initiative by providing more information about the energy production from geothermal resources.
- No impacts were identified in the EA that will not be adequately mitigated by design features built into the project.

Alternative C's additional timing restriction stipulation from December 1 to March 31, was not selected because the BLM has learned, through comments submitted on the EA, and in discussions with the DOE on June 23, 2013, that the additional timing restriction would decrease the viability of the project by making it economically and technically infeasible. While Alternative C, with the additional timing restriction stipulation from December 1 to March 31, would have technically allowed some geothermal exploration while also providing protection from disturbance to wintering mule deer, elk, and sage-grouse, I weighed the potential elimination of the project against the fact that the reduced number of wells in Alternative C will result in fewer disturbance acres and less access road use to access those wells, thus, there will be a reduced amount of disturbance to wintering mule deer, elk, and sage-grouse. Additionally, through the use of off-site mitigation, impacts from utilizing the operating window from Alternative B) will provide a net improvement to mule deer and elk winter range. This was evaluated with Oregon Department of Fish and Wildlife (ODFW) for wintering Big Game (i.e., mule deer and elk). It was determined that utilizing the mitigation methods as analyzed in Alternative B of the EA was appropriate, however, was recalculated to reflect the actual approved conditions using the ODFW mitigation framework. The Big Game Winter Habitat Plan is in preparation with input from ODFW and will be available after the Decision Record is signed.

The allowance of additional time for the Potato Hills Quarry was determined by the BLM Biologists resurveying the area and updating the impacts, including confirmed the Raptor nest has not been utilized. The concept of allowing some removal of material within the sage-grouse PGH is based on actual impacts through time that would be time dependent and addressed with current sage-grouse and Raptor information for the time of the permit.

BLM received seven comment letters from the public and other agencies on the EA, which resulted in the need for some changes to the EA to add better clarification or modify the outcome. The comments to the EA and responses from BLM are as follows:

Comment: We anticipate an increase in the use of certain roads by the public, both in numbers of vehicles using the road and by extending the season of use when the current road system may be impassable. Please review Project access roads to determine if any will likely experience increased public use due to Project road improvements and then update the EA and HMP to reflect these impacts and any proposed mitigations to offset these road impacts.

Response: BLM does not anticipate that any Project access roads would experience increased public use due to the proposed improvements. The rationale for this assumption is: existing roads would not be widened beyond their current prism, except where pull-outs or truck turn around areas are constructed; graveling and leveling would only be done in areas necessary to prevent unacceptable (i.e., greater than four inch ruts) road conditions; and road maintenance of access roads would only be performed during the window that each Alternative provides for exploration and testing activities to be performed. Summarizing our evaluation, the following bullet items would be applicable:

- Recreational use has been and is expected to continue to increase without Ormat action.
- We do not anticipate any increase in traffic due to new roads or road improvements as that is not the driving mechanism for traffic flow.
- Road maintenance is for those areas that have a four inch rut (page 2-36 of stipulations)... thus minimal action is expected. Additionally, the volume of rock speculated that they will need is roughly the same that they will need for the drilling pads, thus the volume added to existing roads is not expected to upgrade the roads to any great extent.
- There would be some increase in traffic directly related to vehicle trips in performing the work by the Applicant, and it is our understanding that this vehicle traffic was taken into considered when the mitigation plan were prepared. To provide further clarification in the EA, the first paragraph in the Access Roads section on page 2-22 will be changed to:

"The Applicant proposes to use existing roads as much as possible, but some of these existing roads would be minimally and temporarily improved by leveling and spot graveling and widened, to accommodate project vehicles traveling to the proposed well pad and mineral material quarry locations. These improvements would be made to closely resemble the existing profile of the access road and would only be done in locations that would result in unacceptable road damage if improvements were not performed. Roads would not be widened beyond their existing prism, except in locations where truck pull-outs or truck turn around areas are constructed. Road maintenance of access roads related to this project would only be performed

when exploration and testing activities where being performed. The Applicant has placed the proposed well pads as close to existing roads as possible to minimize the amount of required new road construction. Figure 1-2 shows the locations of access roads that would be used by the Projects.

Comment: Since it is unclear if mitigation ratios for direct effects associated with road construction and widening impacts are already into the ODFW Framework's impact analysis and mitigation ratio formulae, please consult with ODFW to ensure Alternative C's mitigation ratios for the Project's direct and indirect impacts are consistently applied per the Framework's guidance.

Response: While the Tables C-1 and C-2 on page C-1 of the EA do not state that the disturbed and mitigated acres are for temporary road construction, truck pull-outs, and truck turn around areas, the row titled "Access Roads" Table 1 refers of this DR to all three activities.

Comment: What assurances of long-term protections are provided to ensure that ongoing or future management at the mitigation sites will not degrade, delay, or otherwise undermine establishment and long-term maintenance of the Project's mitigation attributes?

Response: Placing designations (e.g. creating Areas of Critical Environmental Concern or other such designations that could limit ongoing or future management decisions) that would prevent the disturbance to the proposed mitigation areas does not meet the BLM's Purpose and Need for the proposal and would not conform to the Brothers/La Pine or Three Rivers Resource Management Plans, thus this is not an option for this project. Avoidance of mitigation project areas would be considered if future projects are proposed in these areas. If future projects are proposed to go through previous areas used for mitigation, the project proponent would be notified that they would be responsible for replacing lost mitigation acreage plus any new mitigation that would be required for the new project. It should be noted that the threats to habitat of most concern are fire and weeds, which the BLM has limited control regardless of the land use designation. Furthermore, placing a land use designation on the mitigation areas would require an RMP amendment.

Comment: What monitoring and adaptive management actions are provided to ensure that targeted benefits are maintained and future management actions are undertaken as necessary to maintain benefits over the life of Project effects?

Response: This is covered in the Monitoring and Evaluation and Adaptive Management Section on page B-6 of the sage-grouse HMP.

Comment: Since similar juniper treatment projects are already underway near the Project area on public lands, is the Project's mitigation additional to the existing and ongoing public land management program?

Response: While similar juniper treatment projects are already underway and while the proposed mitigation areas have already had an environmental review for juniper thinning performed on them, there is currently no funding to perform juniper thinning in the mitigation area. As described in the sage-grouse HMP in the EA, "The Applicant will be required to provide a lump sum for the entire amount of any ground disturbance that they may be authorized

to perform, prior to any ground disturbance taking place." (EA, pg. C-6) These funds will then allow the BLM to implement juniper thinning in the proposed mitigation areas.

Comment: How were known or potentially conflicting development or management actions considered when designating the mitigation sites?

Response: At the time of preparation of the HMP, there were no other projects proposed for this area. The project as displayed in the Cumulative Effects section (Fig. 3.9A, p 3-61) is a proposal that will or could be analyzed; but may change. Multiple mitigation sites are identified in the HMP in different locations so that whenever BLM receives funds from the Applicant for mitigation, the BLM, in coordination with USFWS and ODFW, can determine which mitigation site will receive juniper thinning. Also, because the NEPA for these mitigation projects has already been completed, there is flexibility in modifying the mitigation area to better meet the needs for this project. The focus of consideration that was used in determining the mitigation sites is discussed in the sage-grouse HMP on page B-4.

Comment: We recommend prioritizing mitigation areas so that areas with the highest potential for success are improved first and those of lower potential only receive treatment if all the work in higher priority areas is complete. The Department further recommends that the polygon that is bisected by Highway 20 be removed from consideration as a mitigation area because of its proximity to the highway as well as its potential area for a transmission line route associated with wind energy development near Wagontire Mountain.

Response: The areas proposed for mitigation in the sage-grouse HMP were selected in coordination with the ODFW and the USFWS and prioritization of completing work in these areas could be changed based on additional input. The sage-grouse HMP provides good rationale for the prioritization of the work based on ODFW's and USFWS's previous input. This could be given a lower priority but will not be dropped from the list of planned actions at this time. If another area is determined to provide similar benefits for mitigation, it will be considered. All information obtained is that the powerline for the proposed wind project will not be placed in that mitigation area utilized for this project. This was a preliminary proposal from the project proponent and could be changed again, or considered at a later time, based on public, other government agencies, and internal input.

Comment: Utilize the Department's sage-grouse Mitigation Framework to determine the amount of mitigation for road improvements by calculating the difference in mitigation acres between low traffic and moderate traffic roads with the appropriate habitat disturbance ratings. This difference would be the increased area of impact for mitigation calculations.

Response: The wording of how much work will be done in "improving" roads has been clarified in the EA to reflect ruts in the road four inch in depth result in roadwork (page 2-22 in the July EA) that could include adding aggregate – see response comments above. No increase of use, based on improved roads other than what is already occurring, is anticipated in the project area, thus no additional mitigation will be required.

Comment: The Department recommends that a Technical Advisory Committee (TAC) be utilized to identify specific mitigation sites and treatments. This will assure all interested parties that mitigation is taking place in the best available areas to offset impacts from the Proposed Project.

Response: The BLM will not convene a TAC for this project due to the limited amount of work and mitigation proposed, but will continue to work with ODFW on the mule deer and elk winter HMP.

Comment: Juniper treatment should not be the sole means of mitigation for the projects. There remains disagreement in the scientific literature on the question of whether potential benefits of juniper treatment for sage-grouse habitat outweigh other ecological impacts. BLM should consider other, additional activities that are specific to the habitat in the Glass Buttes area and will improve habitat quality such as wildfire risk reduction, invasive weed treatment and prevention, sagebrush habitat improvement, fence removal, fence marking and closures to access in and around the site to limit noise and surface disturbance.

Response: BLM considered other, additional activities, but in cooperation with ODFW and the USFWS, the action that was selected that would provide the best off-site mitigation for the effects of the project was juniper thinning. The rational for selecting juniper thinning is discussed in the sage-grouse HMP on pages C-5 and C-6. Juniper treatment, while still not documented well in literature, is still an effective method for reducing tall structures which sage-grouse will avoid if tree canopy is closer than 400m in winter habitat (Doherty et al 2008) and closer than 100m in nesting habitat (Doherty et al 2010). Canopy closure equivalent to Phase I to Phase II juniper stands (Miller et al 2005) which still have sufficient understory vegetation to recover quickly (< 5 years) after treatment would be chosen for the mitigation. Other treatments such as weed treatments and fire threat reduction activities have been occurring in the area and have been funded in the past and continue to be funded so these projects would not fit with mitigation standards.

Comment: Alternative B would Result in Unacceptable Impacts to Priority habitat.

Response: BLM did not select alternative B for this project.

Comment: Alternative C is the Only Viable Action Alternative

Response: BLM selected alternative C with an extended operating time period (August 16 through February 28) to allow for a longer time frame for drilling (with corresponding mitigation measures as provided in Alternate B of the EA).

Comment: Require any development to be placed at the most distal part of the lease from the lek, or, depending on topography and other habitat aspects, in an area that is less demonstrably harmful to sage-grouse. Apply a seasonal restriction on exploratory drilling that prohibits surface-disturbing activities during the nesting and early brood-rearing season in all priority sage-grouse habitat during this period. The surface disturbance cannot exceed 3 percent for that permitted Application for Permit to Drills (APDs) within the lease area, but can consider

exceptions. Make applicable BMPs mandatory as conditions of Approval within priority sage-grouse habitat.

Response: BLM agrees that planning for future actions and mitigation work should be forward thinking and anticipating possible future actions. Alternative C and the approved time restrictions allow seasonal restrictions on drilling for sage-grouse breeding and brood rearing season.

Comment: BLM must mitigate impacts from the proposed activities in Alternative C and work with ODFW and USFWS.

Response: BLM directs your attention to Appendix C of the EA and BLM continues to work with ODFW and USFWS.

Comment: Because the Proposed Action will impact preliminary priority sage-grouse habitat (PPH), BLM must prepare an EIS for the project. This is consistent with the National Environmental Policy Act ("NEPA") regulations (at 40 CFR 1502.27(b))…. Unless the BLM can demonstrate that the Proposed Projects will not have a significant impact on the human environment, the agency much prepare an EIS.

Response: The Decision approved seven geothermal wells on public lands that are not within PPH habitat (i.e., priority sage-grouse habitat). The attached FONSI concluded that an EIS is not warranted. The BLM considers the EA to be sufficient to demonstrate that the Proposed Actions, as approved, will not have a significant impact on the human environment with the mitigation measures in place. BLM does not agree that there are substantial questions remaining about if this project will cause significant degradation of the human environment.

Comment: The Proposed Project would drill 16 wells, each with 2-4 acre well pads, and build associated roads on lands managed by BLM. How does this proposal relate to the March 2011 proposal? Has that been implemented? Is this a second phase or a change of direction?
Response: The proposal that the commenter is referring to is the scoping that the BLM did for the proposal that was analyzed in Alternative B of the EA.

Comment: We favor a preliminary analysis which would evaluate whether large scale development is feasible at Glass Buttes. There are many factors indicating that such large scale development will not be feasible here. Those include limited water, sage-grouse habitat, cultural resources, undeveloped landscapes, roads, waste disposal, and weeds.

Response: BLM is limited to evaluating the specific request of geothermal exploration and it does not include "large scale development". BLM evaluated all of the areas of concern for the Proposed Action and the Decision provides conditions which are intended to limit impacts and does provide mitigating measures. If additional request are made in the future they will be evaluated on their own merits.

Comment: The additional December 1 through March 31 winter operational blackout period, included in Alternative C for sage-grouse and big game winter habitats, is unwarranted and the

NEPA document lacks technical justification and analysis explaining why this extended period is needed. The winter blackout period from December 1 through March 31, when added to the existing 5 ½ month blackout period (March 1 through August 15), creates an 8 ½ month window in which no exploration operations can occur. From a practical standpoint, a 3 ½ month period for drilling limits exploration efforts to one well per year, which both economically and technically decreases, if not eliminates, the viability of the proposed exploration project.

Response: The additional timing restrictions for well drilling were evaluated in the EA so that a range of alternatives would be analyzed just as the "No Action" alternative is analyzed. It is documented in the literature that disturbance to big game species such as mule deer during the winter can have detrimental effects to the survival of certain animals based on the condition of the animal when it entered into the winter period (page 3-23 of the EA). Many species of big game are on a decreasing energy diet so extra disturbance during the winter reduces fat reserves more quickly and can cause mortality if the disturbance is continuous. This coupled with changing weather conditions which causes the animals to expend more energy may weaken animals even further and cause mortality. While big game species are more likely to move from disturbance, the areas being disturbed may provide more protections from weather than areas where they are moving to. This would also be the case with sage-grouse. Depending on the severity of the winter and the condition of the birds when the winter starts, disturbance in areas where they would normally spend the winter would move them to other areas which may not provide the same amount of forage and cover reducing their ability to survive winter conditions.

Comment: When will cattle guards need to be installed and what type of cattle guards will need to be installed?

Response: It was the intention of BLM that cattle guards would only need to be placed on access roads that the Applicant was going to use and that they only needed to be there as long as the Applicant was using the road. If the cattle Guards are to be removed, the road needs to be repaired and gate rebuilt to BLM specifications. To add clarity to the EA, page 2-32 of the EA will be changed to,

"Cattle guards would be installed to prevent livestock passage at locations designated by the BLM Authorized Officer, primarily where any improved or new roads cross grazing allotment boundaries/fences. Cattle guards could be permanent or temporary, but would be in place while the road is being used by the Applicant for project related activities. Cattle guards would maintain the integrity of allotments and pasture boundary fencing for the purpose of livestock management. Cattle guards shall be heavy enough to support the weight and wide enough to accommodate well rigs, trucks, and other equipment required for well drilling and testing. If cattle guards or fences are damaged by the Applicant or their contractors, facilities would be promptly repaired or replaced to maintain the function of the affected fence and allow safe vehicle passage. If the cattle Guards are to be removed, the road needs to be repaired and gate rebuilt to BLM specifications. For the purpose of this analysis, three cattle guards would be installed under Alternative C at the locations shown in Figure 2-9."

Comments: The HMP for Greater Sage-Grouse (Appendix C of the EA) requires Ormat to provide an upfront lump sum for the entire amount of any ground disturbance that may be

authorized based upon the mitigation ratios that were determined by BLM. Depending on the alternative that is selected, this could result in a large sum of money. It would be more reasonable, and economically feasible, to use an up-front bond approach, with actual disturbance used to calculate the total mitigation costs that would ultimately have to be paid for by the Applicant. For example, if the total project disturbance is eight acres, only those eight acres should be used to determine the amount of funding needed for juniper thinning at the associated habitat ratio, instead of the entire project approved disturbance.

Response: The administrative costs and time needed in calculating surface disturbance with phase funding approach would extract needed funds that could be used for mitigation. As the area of mitigation is relatively small in size as it is, the BLM will need to be creative in managing an efficient and effective mitigation project as the small size will most likely result in increased per acre costs by a contractor and\or bundling with other projects. As such the BLM expects a one-time lump sum upfront payment.

Comment: To make clear that ALL water testing samples should be COLLECTED, documented and tested by an Independent lab or when the water samples are being collected by the "company" they be accompanied by an Environmental Protection Agency (EPA)/USFS/BLM/DEQ employee or an Independent Third Party Lab personnel that have no personal or financial associations with the company or its employees, The documentation of the collections of water samples is critical to our environment and should not be left in the hands of the "company" whom is hoping to profit or gain from the findings. Including wells.

Response: The BLM agrees that Quality Control \ Quality Assurance (QA\QC) is important and standard industry practices will be followed, including chain-of-custody forms, sample seals, holding times adhered to, and the EPA and industry standard sampling protocol methods. BLM is anticipating being present during sampling and reviewing monitor logs as part of its inspection process.

Comment: Videotaping of water collection process should also be considered to be used as "Profit" that the samples were collected within the correct perimeters and that the independent third party personnel where present.

Response: Videotaping is not a typical QA/QC protocol and it is not part of the anticipated inspection process. However, digital still pictures will likely be included as part of the inspection and oversight process.

Comment: I do not feel it is appropriate to allow any fracking/hydroshearing/gas/energy/ oil/electric/drilling/mining company to send water samples they have collected with their paid staff to a lab and then call it an Independent test, I feel it is a conflict of interest by allowing the "for profit" company to do any water collection without a third party independent credible source being present for the collection.

Response: Consistent with the prior comment, industry standard QA/QC sampling protocol is anticipated to be used regardless of who takes the samples. Please note that there is no fracking or hydroshearing involved in the Proposed Project.

Comment: According to the unconfined Darcy equation used in calculating potential groundwater drawdown it is not expected to occur. Furthermore, considering that no water wells would be installed within 5,000 feet of an existing well there is a low likelihood that existing wells that also utilize the aquifer would be affected. What exactly does low likelihood mean? Certainly doesn't rule it out as possible happening. My question is do they honestly have a clue about the size of the area that is being affected by pumping all of this water out of the ground?

Response: Please note that there will be ground water drawdown, and the radius of influence was the dominate concern as it deals with the issue of impacts to existing water rights (page 3-56 of the EA). There is little information on the type of aquifer characteristics in the area and BLM has examined the available driller's well logs for the area as well as looked as water level trends (i.e., wells going dry or changing water levels through time). Based upon the best available information reviewed, BLM utilized assumptions for a 'worst case scenario' of all the water being pumped from one well rather than from up to three wells (as proposed). This scenario was chosen as it was as included in the proposal and realistically plausible. The determination using the 'worst case scenario' and best available information, utilized the Darcy equation as an initial first past quantitative guide to determine the possible effect on neighboring wells from a "radius of influence" perspective, which resulted in using the evaluation to determine a possible well spacing distance. Clearly, a full hydrologic evaluation was not conducted in the area and the BLM determined that it was not justified (even with inhomogeneous and anisotropic subsurface conditions). However, it is correct that the possibility of the 'cone of depression' following an extended preferential pathway and impacting a well in the area is possible, but not likely and no evidence was observed or reviewed that would suggest those unusual or atypical conditions are present in the area. Please note that the 'worst case scenario' evaluated is not anticipated or is considered unlikely to be realized and the Oregon water right laws will prevail on this issue.

APPEAL PROCEDURES

The Decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR 3256.11, 43 CFR, Part 4 and Form 1842-1. If an appeal is filed, your notice of appeal must be received in the Prineville District Office, 3050 NE Third Street, Prineville, Oregon 97754 within 30 days of receipt of the Decision but no later than August 9, 2013. The appellant has the burden of showing the Decision appealed is in error.

A copy of the appeal, statement of reasons, and all other supporting documents should also be sent to the Regional Solicitor, Pacific Northwest Region, U.S. Department of the Interior, 805 SW Broadway, Portland, Oregon 97205. If the notice of appeal did not include a statement of reasons for the appeal, it must be sent to the Interior Board of Land Appeals, Office of Hearings and Appeals, 801 North Quincy Street, Arlington, Virginia 22203. It is suggested appeals be sent certified mail, return receipt requested.

This Geothermal Management Decision is issued under 43 CFR Part 3256.11 and is immediately effective and will remain in effect while appeals are pending unless a stay is granted in accordance with §4.21(b) of this title. If you wish to file a petition of Stay, pursuant to regulation 43 CFR 4.21, for a stay of the effectiveness of this Decision during the time your

appeal is being reviewed by the Board, the petition for stay must accompany your notice of appeal. A petition for stay is required to show sufficient justification based on the standards listed below. Should you wish to file a motion for stay pending the outcome of an appeal of this Decision, you must show sufficient justification based on the following standards under 43 CFR 4.21:

- The relative harm to the parties if the stay is granted or denied,
- The likelihood of the appellant's success on the merits,
- The likelihood of immediate and irreparable harm if the stay is not granted, and
- Whether or not the public interest favors granting the stay.

As noted above, the motion for stay must be filed in the office of the authorized officer.

Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this Decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Brendan Cain

Brendan Cain
District Manager

July 10, 2013
Date

Appendix A: Design Criteria for Community Pit
Potato Hills Quarry

Design Criteria
for
Potato Hills Quarry (OROR 067726) with Community Pit Designation

Operator Information

Bureau of Land Management
28910 Highway 20 West
Hines, Oregon 97738

Point of Contact

Mr. Rick Wells
266 South Date Avenue
Burns, Oregon 97720
Tel: (541) 573-4484
Fax: (541)573-4411

Community Pit\Quarry

The operation of the quarry would be under a Community Pit designation and consistent with 43 CFR 3600. The material source would be for the purpose of supplying mineral materials for various non-Federal Highway funded projects in the general area of the rock quarry.

Method and Equipment

The proposal is to drill, blast, crush, stockpile, and haul material on an as needed basis for road and other uses, including longer-term road maintenance. The equipment used would include, but not limited to, drill rigs, a variety of heavy earth moving equipment (bulldozer, backhoe, loaders, levelers, etc.), trucks (spectrum of sizes), pickup, service trucks, water trucks, crushing equipment (including conveyers, hoppers, etc.), portable electrical generator, temporary fuel storage, equipment and office trailers (during active operation), and miscellaneous equipment and supplies needed to perform the operation of drilling, blasting, crushing, stockpiling, and hauling (including temporary water storage tanks and pumps during active operation). Temporary facilities may be located on site under a special use permit.

Location

The site is located within W.M. (Willamette Meridian) T. 23 S., R. 24 E., sec 18, S1/2NW1/4SW1/4NE1/4, SW1/4SW1/4NE1/4, SE1/4SE1/4SE1/4NW1/4, and E1/2SE1/4SE1/4NW1/4. The location is also referenced as latitude 43°34'42.15"N., Longitude 119°53'02.01"W. The Proposed Project is located approximately 1 mile north of Highway 20 and on the west side of Potato Hills Road in Harney County, Oregon. The location can be found on

the United States Geological Survey's Hat Butte 7.5 minute topographic quadrangle. The adjacent roadway (i.e., Potato Hills Road) is a BLM administered road (road number 7241-00). The road is assigned the functional classification, "Local", and managed as Maintenance Intensity 3. The approximate elevation is 4,640 feet above mean sea level. For permits covering larger quantities, a road right-of-way permit would be required (a SF-299 Application with Plan-of-Development (POD) would be needed). See provided map (Figure B-1).

Mining Method

The method of mining would be to drill and blast from the surface, move the material to a rock crusher (which may include the use of a grizzly), and then pile the crushed rock for transport off-site. The transportation of the material off-site would be as the material is used in the road construction or maintenance, as well as other possible uses. Stock piles would not have a greater than 3:1 slope. The top soil, waste rock, overburden, and usable crushed rock may be stored separately (size dependent). The conditions of use and development are provided below. Note that reclamation occurs during development as well as some post-use reclamation.

- Remove the top soil and overburden (ranges from 0-3 feet in depth) and stock pile for possible future use in reclamation and act as a buffer along Potato Hills Road and\or visible perimeter of the quarry in a 3 (horizontal): 1 (vertical) slope, contour, and seeded in the fall with a mixture of native and nonnative perennial grasses, shrubs, and forbs as identified by BLM. The minimum 20-foot buffer along Potato Hills Road and 10-foot site buffer would be maintained for the remaining sides of the proposed location;
- Side walls shall be left in a stable condition as well as bermed when a vertical side wall of greater than four feet exists;
- All fencing changes and site securing shall be the responsibility of BLM, however, may be included within conditions of negotiated sale contracts and part of initial entry conditions. Note that fencing can be expanded and located on the top of the berm (which is less than eight feet in height), consistent with the development of the quarry;
- Remove the mineral material from the ground by the use of rock drills, blasting, and mechanical equipment (crawlers, loaders, etc.);
- Unless specified otherwise in a permit, rock crushing operations will utilized less than 16 employees working up to 12 hours per day with portable toilets provided;
- Operational slopes would be ¼ :1 with a final overall surface rehabilitation grade of 3:1 and quarry grade of 2:1 (or 40 foot vertical slopes with 60 foot blenches), which could be completed as the quarry advances, and specified in negotiated sale contracts. Note that steeper vertical slopes can remain after reclamation if requested by a competent person and approved by BLM that the rock type is stable at the steeper slope;
- Interim seeding may be needed if dust becomes a concern of the neighbors and included in conditions of negotiated sale contracts;
- Rock and overburden stockpiles may be separate and may be utilized as berms as long as visually appropriate for the surrounding area.

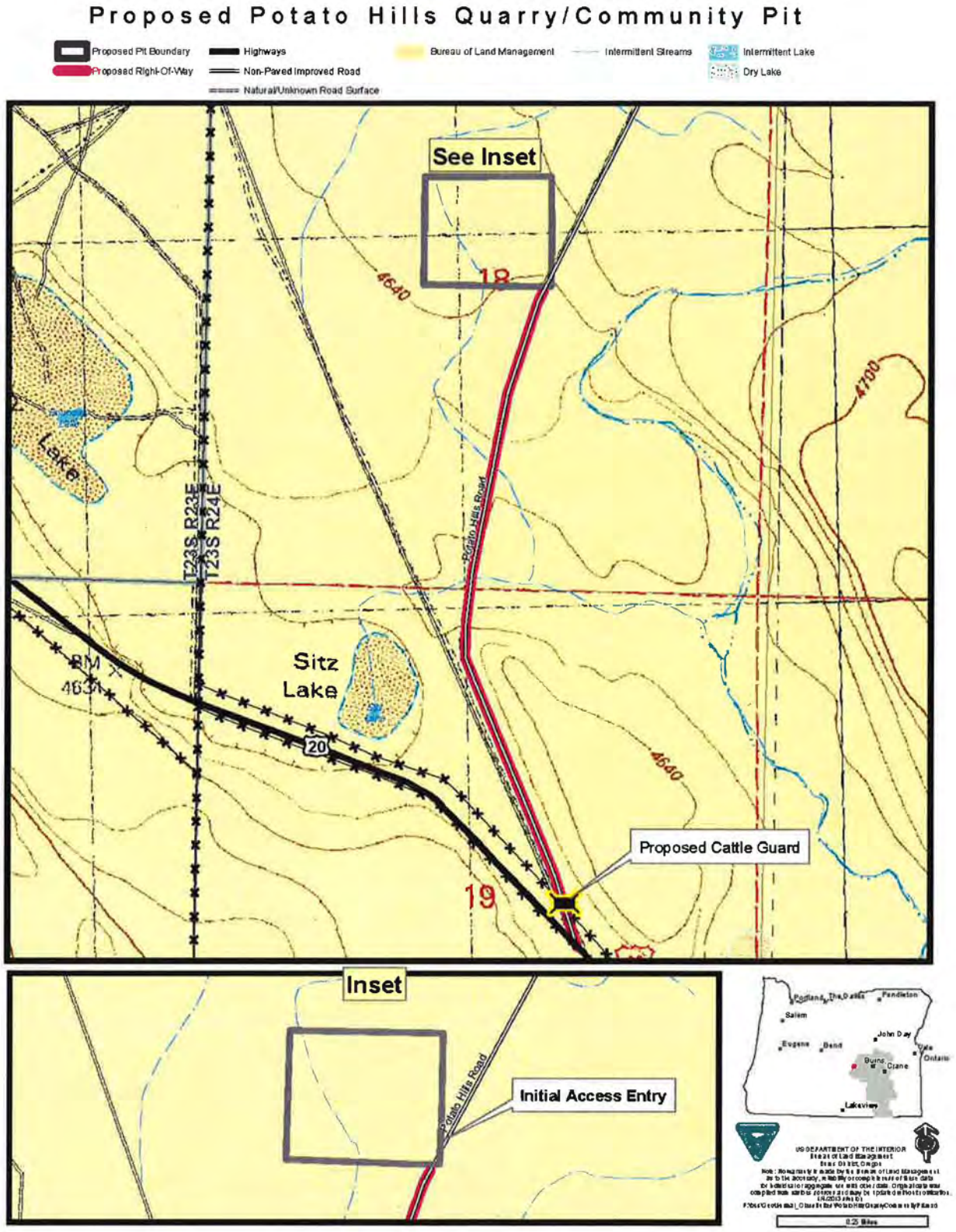

Figure B-1 **Potato Hills Quarry/Community Pit**

- Reclaimed areas would be seeded with a native/nonnative weed-free seed mixture dependent upon availability and approval by BLM. Reclamation would occur when an area of the quarry has been exhausted or contains rock for which a need no longer exists. Final reclamation would include re-contouring the disturbed area to blend with the surrounding landscape surface contours, as approved by BLM and considering the rock basin and bench style reclamation (i.e., vertical rock exposure would remain unseeded). The surface area that is compacted may require scarifying prior to seeding;
- Aggregate stockpiles would be located on-site with slopes 3:1. Oversized material may be placed in a separate stockpile within the quarry area so that it is available for use as riprap or berming around the pit as needed;
- Water shall be used during the crushing and hauling (of greater than 50 tons of materials a day) to control fugitive dust, unless permitted otherwise;
- Place the overburden as a berm to buffer it from the roadway and for safety purposes around the quarry (which would include boulders larger than 3 feet in diameter). The depth of the quarry shall not extend into the static ground water with enough source material above the high static water level to allow drainage of a 100-year storm event within a reasonable amount of time (less than 1 week). Approvals for entry for blasting will include a condition to overshoot in blasting to increase the permeability of the quarry floor and allow for storm water drainage;
- Storm water and sediment shall be controlled to prevent from flowing off-site and into the natural landscape, consistent with storm water standards;
- All material and work within the quarry will be performed under a permit from BLM prior to initiation of work. All equipment and material left on-site after the permit has expired becomes the property of the BLM after 90 days per 43 CFR 3601.52;
- In the event cultural or paleontological resources are encountered during any activity within the community pit, work at that site would immediately cease and appropriate BLM personnel would be notified;
- The site will not be used as a disposal location for trash, asphalt, concrete, construction debris, or other non-native debris;
- BLM may visit the site unannounced for inspection visits that will include purposes such as to monitor and ensure proper compliance with the law and regulations, policy, as well as mine and reclamation plans. Site visits may or may not be in coordination with other Federal agencies and State and local governments.

The following are the expected Standard Operating Procedures (SOPs) for the community pit:

- Spray for weeds prior to use within roadways. If standing water is present, weed spraying shall not be co-mingled with the water and BLM should be consulted;
- Any herbicide treatments shall be consistent with the Burns District Noxious Weed Management Program EA/DR OR-020-98-05;
- Monitor the roads and material site annually to ensure no new noxious weeds become established. Should noxious weeds be found, appropriate control treatments would be

performed in conformance with the Burns District Noxious Weed Management Program EA/DR OR-020-98-05;

- Equipment would be washed prior to being brought to the site to prevent the spread of noxious weeds, if noxious weeds are present;
- Water shall be used during the crushing and hauling (of greater than 50 tons of materials a day) to control fugitive dust, unless permitted otherwise;
- Utilize above-ground containment and proper procedures for fuel, herbicides, and other hazardous materials stored or used on the property;
- Permittee shall be responsible to remove all dumping of debris or backfilling unless approved by BLM within the issued permit;
- Spilled hazardous materials and petroleum-based materials would be reported to BLM and promptly cleaned up and disposed of properly by the Contractor or permittee;
- Operational hours shall be between 7 a.m. and 7 p.m. with up to 15 employees and portable toilets would be provided;
- Toilet facilities shall be made available for all larger scale multi-day operations;
- Permittee shall institute BMPsD which would include at least weekly and end of permit cleanup of trash and oil drips;
- Avoid storing liquids over fractured substrate due to the increased risk of contaminating the ground water in the event of a spill;
- Grazing would be allowed to occur within the quarry boundary and is the responsibility of the operator to notify grazing permittee of entry and ensuring fencing is appropriate, if needed;
- Prudent care and diligence is expected to be the standard for operation.
- Blasting, crushing and other activities at the quarry site would not be permitted during March 1 to July 31 to avoid sage-grouse breeding, nesting and brood rearing activity as well as Swainson's hawk nesting and other migratory bird activity.

A *Quarry* is used to denote the blasting and crushing is aspects to obtain the mineral material source. A Community Pit is defined as a relatively small, defined area from which BLM can make disposals of mineral materials to many persons. The surface disturbance is usually extensive in the confined area is a BLM designation for the quarry that can allow a variety of contractors or permittee to obtain and utilize the quarry. Trespass is a designation used to describe unauthorized use or activity outside of the Community Pit boundary.

Water Management Plan

All water used on site for worker and dust suppression would be hauled onto the site from an off-site source.

Surface Water

Site layout for operation shall take into the slope of the land to control the surface flow of water. The on-site soil does not show obvious signs of storm water erosional characteristics. This may suggest that the soil absorption capacity or permeability is high enough to absorb or retain

typical storm precipitation volumes, thus limiting the flow of water over the land surface. This is also important in site specific mining plan design as sediment problems would not be expected to degrade the natural landscape. The disturbed area would likely results in compaction of the surface soil and increasing the potential of surface water impacts. Berms could be utilized to prevent off-site water flow in the locations that are needed, with the interaction of BLM, and with a goal of minimizing the visual resource impacts.

Ground Water

The depth of the quarry shall not extend into the static ground water with enough earth material above the high static water level to allow drainage of a 100-year storm event within a reasonable amount of time (less than 1 week). Fractured rock on the quarry floor (overshoot in blasting) may be needed to increase the permeability of the quarry floor and thus should be utilized if needed.

Geologic Condition

The dominate rock type is volcanic as observed in quarry locations within the general location.

Power Supply

The electrical power supply would be from portable equipment on-site.

Quality Assurance Plans

To aid in efficient and safe mining activities, a site specific mining plan and\or permit conditions should be discussed and coordinated with employees. The mining plan and\or permit conditions discussion would include the pit limits and extents, location of stockpiles (waste and usable), as well as topsoil and overburden difference and storage locations. It should be noted that the mining plan would need to be flexible to allow for unforeseen geologic and economic conditions. There will be a relatively small number of employees on site at any given time (less than 16 on-site) and shall be under the control and care of the permittee, which will have the responsibility of compliance. One item that would aid in not crossing boundaries would be to clearly mark the boundaries with posts and flagging and described within the permit from BLM.

Spill Contingency Plans

All liquid storage would be temporary and only during active use of the quarry. In the event of a fuel or oil spill, the initial response would be to contain the release as rapidly as possible. The next step would be to notify all required regulatory agencies if the release meets or exceeds reportable quantities. Outside of normal drips, all spills would be reported to BLM within 48 hours. Care would be taken to not store the bulk liquids on top of fractured rock. Weekly and end of project inspections and cleanup and removal of drips onto the soil from operating equipment would occur.

The reportable quantity for fuel oil is 25 gallons. Oregon reportable quantity (RQ) rules are found in the Oregon Administrative Rules Division 142 §340-142. The EPA RQ table is found in 40 CFR 302, Table 302.4.

General Operation Schedule
The blasting and rock crushing activities are expected to start in 2013. Hauling of the material from the site is expected to start after July 15, 2013 (determined by BLM on a case by case basis and dependent upon actual conditions). Timing of operation would be specific to each permit provided by BLM and prior to each permit quarry use restrictions should be evaluated based upon the most recent data available.

Access Road Plan
Access to the quarry will be directly from Potato Hills Road and will not require an additional right-of-way within the pit boundaries. Improvement and maintenance would be on an as needed basis. Road construction would be within Mine Safety and Health Administration (MSHA) regulations under 30 CFR 1-199. The access road should be controlled by a gate to restrict access to the quarry area as it expands.

Equipment and Material Staging\Storing
The staging of equipment and material storage would be within the proposed quarry boundary. All equipment and material not removed 90 days of the termination of the permit shall become the property of the BLM per 43 CFR 3601.53.

Initial Entry
The initial entry to the quarry must consider the access point and possible future expansion of the quarry. The source rock is expected to be olivine basalt but have areas with higher amounts of iron, and thus red color. Furthermore, the quarry location should not be within the egress\ingress to the quarry and the first blasting should be set back within the quarry boundary. It would be understood that the top soil may not be hauled to the eastern boundary (or other berm) at that time, but rather gradually be moved as the quarry expands. The entry point would be at the point which the quarry boundary intersects Potato Hills Road; however, the initial blast point would be more westerly and proximal to the western boundary of the five-acre site.

Prior to groundbreaking and subsequent uses, a description and exact location of proposed disturbances on a site map would be provided by BLM within a permit. This information would include a setback between the disturbed area and the quarry boundary and topography. Furthermore, the access road would incorporate an all-weather surface and would be maintained. As such the visual buffer and top soil set aside for reclamation use would move through time, but reseeded as needed. As the quarry is developed and areas no longer needed, they would be remediated, including a buffer zone around the quarry.

General Reclamation Plan
The general reclamation plan is incorporated into the operation conditions above. As noted, the surface soil would be scraped and stored in a berm that doubles as a site obscuring or vision fence along Potato Hills Road, and also along parts of Highway 20. Overburden not suitable for final reclamation should be stored separately in opening and expanding the quarry for use as a base or within the quarry floor during final reclamation work. The staging area may require scarifying with the reseeding due to compaction of the soil. The overall slopes would be 3:1 for surface (including berms) and 2:1 for the quarry that would include 40 foot maximum vertical with 60 foot horizontal benches (unless inspected, recommended an alternative, and approved by BLM in writing). The quarry boundary and\or quarry basin would be secured with a

combination of fencing or boulders as it expands. The base of the quarry would be over drilled and fractured to allow drainage of a 100-year storm event within one week.

Interim Management Plan
The location would be secured by fencing between uses. The site should have a gate to restrict entry. Fencing would be advanced consistent with the advancement of the quarry outward.

Reclamation Costs (Bonding)
Consistent with 43 CFR 3600, bonding and\or reclamation fees and conditions will be considered and utilized as part of all permits issued for BLM for the use of the quarry.

Appendix B: Sage Grouse Habitat Mitigation Plan

Introduction

Ormat Nevada, Inc. (Applicant) submitted a proposal to drill up to 16 geothermal test wells, build temporary access roads, maintain or widen some existing roads, and use or construct two mineral materials quarries/pits in northeastern Lake and Harney Counties, Oregon. The Proposed Project would occur within a 41,909 acre geothermal lease area and portions of adjacent private lands. Up to three of the wells and one aggregate pit would be located on private owned surface and subsurface lands, up to one well on privately owned surface and BLM managed subsurface lands, and up to nine wells and one mineral materials quarry would be located on BLM managed surface and subsurface lands in the Glass Buttes area of the Prineville and Burns BLM Districts (BLM) (**Figure 1**). The NEPA approval is for 7 wells on the Burns BLM managed land (21-30, 63-19, 15-33, 46-33, 62-33, 86-33, 28-34, 18-34, and 52-3, 0.07 miles of turnouts along existing roadways, 4.09 miles of new temporary roads, the Potato Hills Quarry for salable mineral material. Table 2-3 from the Environmental Assessment summarizes the land disturbance that is approved includes 43.84 acres.

Table 1 Summary Table of Potential Surface Disturbance under Alternative C

Lease Area & BLM District	Project Component	Disturbance (Acres)	Total Disturbance (Acres)
Mahogany Lease in BLM Prineville District	Slim Well Pads (2x)	4.14	4.52
	Widening of Existing Roads	0.38	
For Midnight Point Lease on BLM Prineville District	Truck Turnouts/Pullouts and Turnarounds	1.25	1.25
Midnight Point Lease and Public Domain Lands in BLM Burns District	Full-Size Well Pads (7x)	28.91	38.07
	New Access Roads	4.09	
	Truck Turnouts/Pullouts	0.07	
	Aggregate Source (Community Pit)	5.0	
(from EA Table 2.3)	**TOTAL DISTURBANCE TO BLM LANDS**		**43.84 (rounded 43.9)**

The Lease Area is comprised of sagebrush steppe vegetation and contains a mixture of greater sage-grouse (hereafter sage-grouse) habitats classified by ODFW as Core (PPH), Low Density and Non-Core (PGH), sage-grouse habitats (Hagen 2011) (**Figure 1**). The approved test drilling area included 43.9 acres of Habitat Category 2 sagebrush steppe habitat (Rod Klus, personal communication). Timing restrictions planned as part of the test drilling proposal would avoid impacts to sage-grouse during the critical breeding and brood rearing period; therefore, mitigation for temporary noise impacts is not necessary. This HMP describes mitigation actions for the direct impacts from the proposed test drilling and associated ground disturbing actions on greater sage-grouse habitat. This Mitigation Plan is based on ODFW's Greater Sage-grouse Conservation Assessment and Strategy for Oregon (Hagen 2011) and the revised Mitigation Framework for Sage-grouse Habitats (ODFW 2012). ODFW, USFWS, the Applicant, and the BLM worked together to develop this plan.

The Mitigation Plan identifies general areas to be mitigated and describes mitigation actions and priority locations for mitigation (**Figure 2**). This Mitigation Plan provides a general timeline and funding of mitigation work for impacts to sage-grouse habitat.

The main participants in implementing mitigation for the Applicant's test drilling are the proponent, the Applicant, and the BLM. The Applicant will be responsible for providing funding for mitigation to the BLM. The BLM is the responsible land management agency for the proposed off-site mitigation on public land and will be responsible for implementing off-site mitigation using the funding that the Applicant provides. At the time the drilling permits are issued the mitigation payment to BLM is expected to be received for the total area of disturbance provided in the above table. The one-time payment will complete the off-site mitigation obligation of Ormat and BLM will determine the specific timing, locations, and types of mitigation actions, as well as determine when mitigation is successful. The ODFW and USFWS have and may continue to provide technical information pertaining to greater sage-grouse, effective measures to mitigate impacts, potential mitigation areas, and would review the results. All organizations will cooperate and coordinate in the effective implementation of all parts of the Mitigation Plan. Note that reclamation and bonding for surface reclamation will remain a requirement for Ormat and the mitigation issues described here are for off-site not on-site. Please note that this plan was amended after public comment to remove discussion on mitigation to PPH as it does not reflect the Decision Record, as well as clear up discrepancies in numbers for clarity.

Description of the Mitigated Impacts

The test drilling and associated actions are described in detail in the EA (EA Chapter 2). Ground disturbing actions that would be mitigated are the areas (pads) cleared for test drilling, quarry construction, and the construction of new or widening of existing access roads to these areas.

Test Drilling: The main ground disturbing activity, geothermal test drilling, includes removal of vegetation and stockpiling of overburden and top soil (growth media) for reclamation at each drill site (2.07 acres or 4.13 acres, depending on whether it is a slim well or full-sized well), followed by 15 to 90 days of drilling and 5 to 30 days of testing of the geothermal resource. When drilling and testing is completed, interim reclamation (seeding and re-contouring) of the cleared areas not needed to access the well would take place. Final reclamation would take place when the well is deemed to be unnecessary or the geothermal lease is relinquished back to the BLM. Final reclamation would include seeding and re-contouring all remaining unseeded disturbed areas, filling in of the reserve pits, and capping of the well heads, unless retained by BLM for future use (consistent with NEPA analysis). During the implementation phase of the Proposed Project, the immediate and surrounding area around the drill pad would have little or no habitat value for wildlife, including sage-grouse (EA Section 3.5). Reclamation work would reduce the lengthy period of recovery required for shrub steppe communities to mature into the late seral stage (EA Section 2.3.3). However, it is expected that grasses and forbs would recover within two years and sagebrush would recover within 20 years to pre-disturbance stature.

G.I. Ranch Pit and Community Pit Construction: Two sources of aggregate were evaluated in the EA for use in pad construction and road maintenance; however, obtaining material from a private source remains an option to Ormat. Each pit (one on private and one on public land) would directly impact up to five acres each. Reclamation activities for both pits would be in accordance with the criteria provided in Section 2.5 of the EA, and the Potato Hills Quarry would also be subject to the criteria provided in Appendix A of this document and conditions of a material sales or free use permit.

Access Road Construction: New temporary roads would be constructed to provide access to some of the sites (Figure 1). A description of the new temporary access roads is incorporated by reference from the EA (EA Section 2.3.2). In summary the total temporary disturbance from the access roads would total 4.1 acres. Once test drilling is complete and\or the site is no longer needed for this project, the newly constructed access roads would be reclaimed to the standards provided in the BLM Gold Book and BLM standards.

Calculation of the Size of the Mitigation Area

One of the primary threats to sage-grouse habitat in the Glass Buttes area is juniper encroachment into open sagebrush habitat (Hagen 2011). Juniper control treatments have been effectively used to reduce juniper cover to maintain and restore sage-grouse habitat in this area. Since juniper control is one of the primary threats in the Glass Buttes area and treatments are highly effective, the required mitigation action would be to continue juniper control in the Glass Buttes area to expand ongoing control efforts.

The habitat mitigation area must be large enough to achieve, within a reasonable time, the habitat mitigation goals and standards of the ODFW's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0025). For Habitat Category 2 impacts, ODFW recommends mitigation to achieve "no net loss" and a "net benefit" in habitat quantity or quality. Sagebrush steppe communities mapped as PGH habitat in the project area have been determined by ODFW to be Category 2. A mitigation ratio of 2:1 (two acres of mitigation treatment for every acre of disturbance) for direct disturbance in Category 2 Habitat would be in effect for this Mitigation Plan to achieve the "no net loss" with "net benefit" goal (Table 1).

The proposed test drilling is a temporary, seasonally restricted, activity and there is no proposal for energy development or other large scale industrial-commercial developments. Activity associated with test drilling would cease once testing of the geothermal resource is completed.

Table 2: Mitigation calculation for Category 2 Sage-Grouse Habitat

Test Drilling Activity	Disturbed Acres*	Mitigation Acres
Drill Pads	33.1	33.1 x 2 = 66.2
Temporary Access Road Construction, Truck Pull-Outs, and Truck Turn Around Areas	5.8	6.4 x 2 = 11.6
Quarry	5	5 x 2 = 10
Total	**43.9(direct)**	87.8 Rounded to 88

Description of Offsite Mitigation Areas

The ODFW Mitigation Policy recommends mitigation for Habitat Category 2 impacts to be "in proximity" to a project, and the mitigation area should be located where habitat protection and enhancement are feasible consistent with this plan. Mitigation actions would occur on BLM lands.

Priority mitigation areas are identified in Figure 2. These areas are in sagebrush steppe communities with some juniper encroachment, but are of similar habitat potential as sites

proposed for test drilling. Based on past telemetry data, mitigation actions in the priority mitigation areas would benefit sage-grouse using the Parmele Ridge lek, Ryegrass lek complex, and the Glass Butte lek complex.

A more detailed description of the rationale for the selection of the offsite mitigation areas is as follows:

- Telemetry work shows that sage-grouse in the Glass Buttes area may use a very large (600+ square miles) annual use area; therefore all three offsite mitigation treatment areas would benefit sage-grouse in this area.
- The nearest proposed offsite mitigation area to both sage-grouse PPH Habitat and a Conservation Opportunity Area (ODFWs highest priority areas) would be two miles southwest of the Parmele Ridge lek; however, juniper treatment in the other proposed offsite mitigation areas would also have beneficial effects to sage-grouse.

Details about the offsite mitigation polygons in Figure 2 are as follows:

- The polygons encompassing highway 20 are in sage-grouse PPH Habitat, contain phase 2 juniper encroachment, and would expand the beneficial impacts of an ongoing juniper treatment. The polygons are between or near two lek complexes that have a combined average of about 37 male birds over the last 5 years; the Parmele lek was recently discovered and had a high count of five males in 2011. Also, the polygons contain known sage-grouse telemetry points.
- The polygon west of the proposed disturbance areas is in sage-grouse PPH Habitat and contains phase 1 juniper encroachment.
- The polygon that is on the Lake and Harney County boundary and is southeast of the proposed disturbance areas is in sage-grouse PGH Habitat, contains phase 1 and phase 2 juniper encroachment, and would expand the beneficial impacts of an ongoing juniper treatment. The polygon is between or near two lek complexes that have a combined average of about 37 male birds over the last five years and the Parmele lek was fairly recently discovered and had a high count of five males last year. Also, the polygon contains known sage-grouse telemetry points.

Mitigation Actions

The goal of mitigation actions in this plan is to improve sagebrush steppe plant communities near the geothermal test drilling area (Figure 2). Several past impacts and current threats to sagebrush steppe communities are present in the Glass Buttes area, including but not limited to wildfires, presence of noxious weeds and annual grasses, power line right-of-way, and juniper encroachment. However, juniper encroachment is considered one of the more immediate concerns in this area (Hagen 2011). Control of juniper expansion (phase 1 - phase 2) into sage-grouse habitat has a high success rate with immediate benefits because the juniper canopy has not closed to the extent that it degrades the understory vegetation (Miller et al 2005). Since juniper encroachment is a primary threat in the Glass Buttes area (Hagen 2011) and due to the limited amount of mitigation acres required to offset the direct disturbance in this Mitigation Plan, only juniper control is considered for mitigation actions. Juniper control, especially of phase 1 and phase 2 juniper areas, would be usable sage-grouse habitat within a short period (<5yrs) of time and at a relatively inexpensive cost compared to other possible projects such as

burial of distribution powerlines which would cost around $12/foot with at least 10 miles of line to bury in this area. Also, environmental documents for juniper control in this area have been completed but future funding for these projects is unreliable at best.

The objective of this juniper control mitigation is to remove encroaching juniper from treatment areas, while maintaining the understory sagebrush-native grassland community. Treatment would include cutting trees with chainsaws then cutting and scattering the branches until the cut tree does not stick more than four feet above the ground. This selective treatment would leave the existing sagebrush cover intact and release understory plants especially grasses and forbs.

Cutting and scattering of the branches would be the dominate method used for the 88 acres of mitigation

Mitigation Schedule

The Applicant will be required to provide a lump sum for the entire amount of any ground disturbance that they may be authorized to perform, prior to any ground disturbance taking place. The Applicant needs to budget mitigation costs when calculating costs for exploration. As soon as BLM receives funding from the Applicant for offsite mitigation, BLM would begin the process to implement juniper cutting for any ground disturbance that the Applicant may be authorized to do. On average, the process of implementing juniper cutting projects takes approximately three months.

The mitigation schedule is flexible in that a wildfire could burn a planned juniper cutting project which would require the BLM to move the juniper cutting to another mitigation area, which would extend the completion time of mitigation activities. Any alternative mitigation areas chosen will be within a 10 mile radius of the project area. Depending on the size and intensity of the wildfire, revegetation activities such as planting sagebrush or other grasses and forbs could be part of the mitigation included to restore suitable habitat in a shorter period of time than natural revegetation.

Monitoring

Monitoring would indicate whether the mitigation was implemented, if it was effective, and if it achieved the goals and objectives. The goal of the mitigation projects is to improve sagebrush steppe plant communities in the area of the geothermal exploration so they can provide greater sage-grouse habitat. The objective is to improve the condition of native plant communities by removing encroaching juniper. Implementation monitoring would be an annual Mitigation Report submitted to ODFW by BLM each December describing what mitigation was completed, including materials, methods, cost, and area during the previous field season.

Effectiveness monitoring may be conducted by either of the participants, but is BLM's responsibility to ensure monitoring is completed. The BLM conducts lek counts each spring in coordination with ODFW. The BLM would continue this monitoring and the data would be used in evaluating mitigation effectiveness. Photo monitoring would be established that shows plant composition and ground cover to monitor the effects of the treatment(s). The method and intensity of monitoring as well as the timing, frequency, and duration of monitoring would be determined based on the specific project's objectives and treatments. Monitoring data would be

compared to the site's ecological site description and the treatment objectives to determine success. Monitoring would continue for the life of the geothermal exploration project.

Evaluation and Adaptive Management

In February 2016, there would be an evaluation meeting with ODFW, USFWS, the Applicant, and the BLM. While cooperation is preferred, the BLM is responsible for the evaluations. The purpose for this meeting is to evaluate mitigation to date.

As the land manager, the BLM is responsible for ensuring that the offsite mitigation achieves the mitigation goals.

Citations

ODFW. 2012. Mitigation Framework for Sage-grouse Habitats. Oregon Dept. of Fish and Wildlife, Salem, USA.

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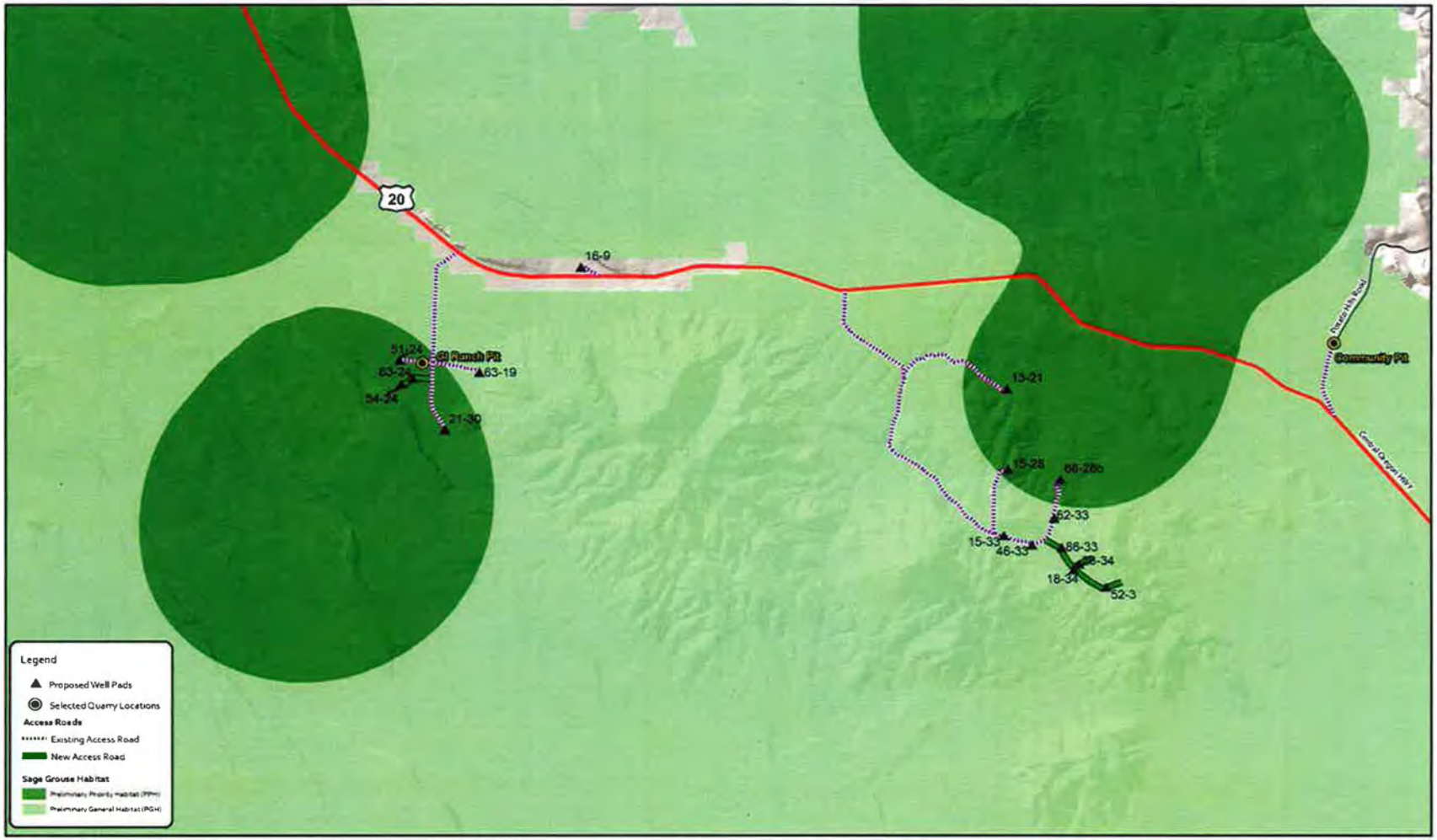
Hagen, C.A. 2011. Greater Sage-grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat. Oregon Dept. of Fish and Wildlife, Salem, USA.

Miller, R. F., J.D Bates, T.J. Svejcar, F.B.Pierson, and L. L. Eddleman. 2005. Biology, Ecology and Management of Western Juniper. Oregon State University Agricultural Experiment Station Technical Bulletin 152.

U.S. Bureau of Land Management (BLM). 2010. Record of Decision, Ruby Pipeline Project, Decision to Grant Rights of Way and Temporary Use Permits. Bureau of Land Management, Nevada State Office, Reno: http://www.blm.gov/style/medialib/blm/nv/nepa/ruby_pipeline_project/rod.Par.4896.File.dat/rod.pdf



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ENVIRONMENTAL ASSESSMENT

Figure 1

Sage Grouse Habitat

N W E S

Coordinate System: NAD 1983 UTM Zone 11N feet

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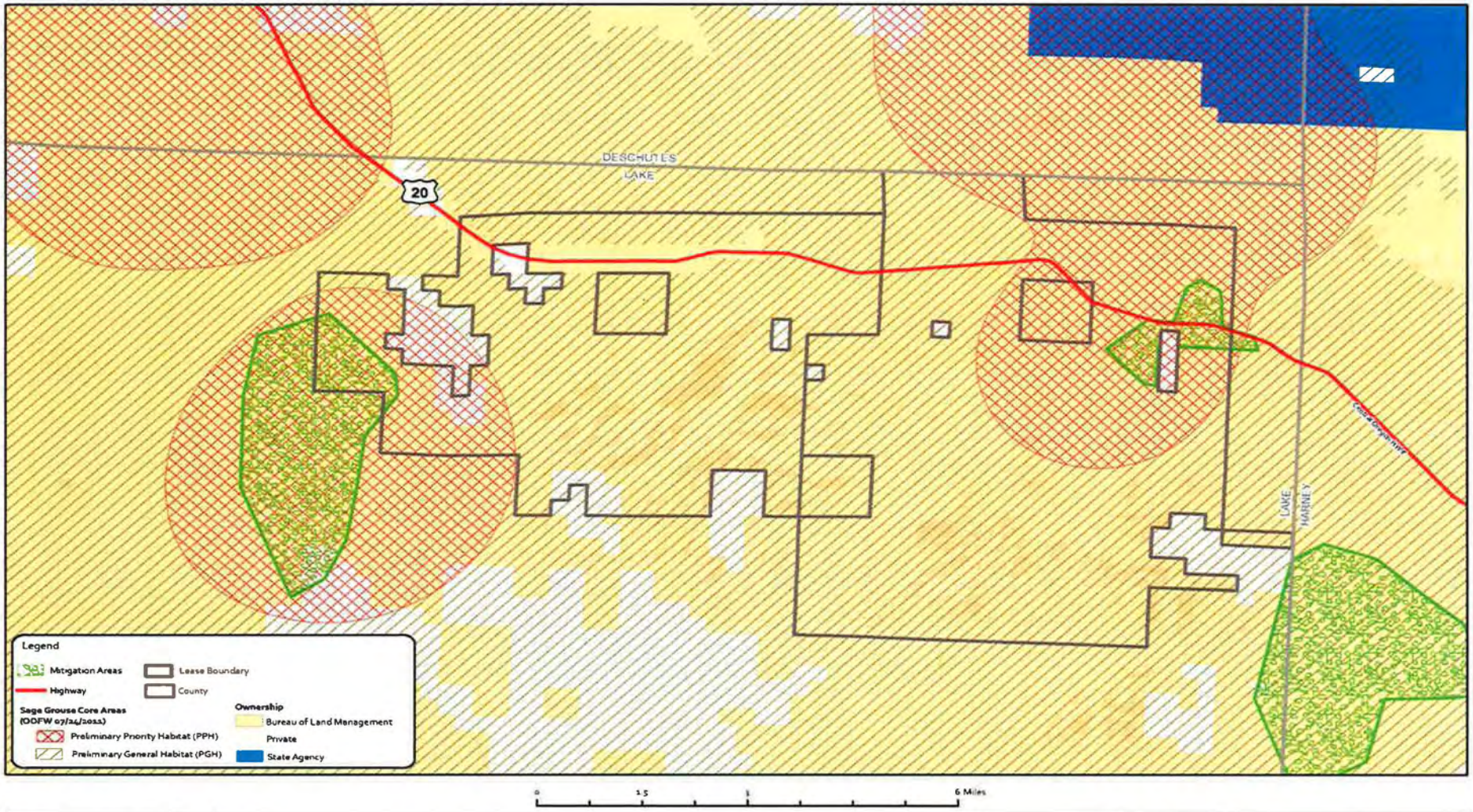

0 2.5 5 6 Miles

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ENVIRONMENTAL ASSESSMENT

Figure 2

Glass Buttes Geothermal Exploration Proposal Habitat Mitigation Locations

N W E S

Coordinate system: NAD 1983 UTM Zone 11N feet

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