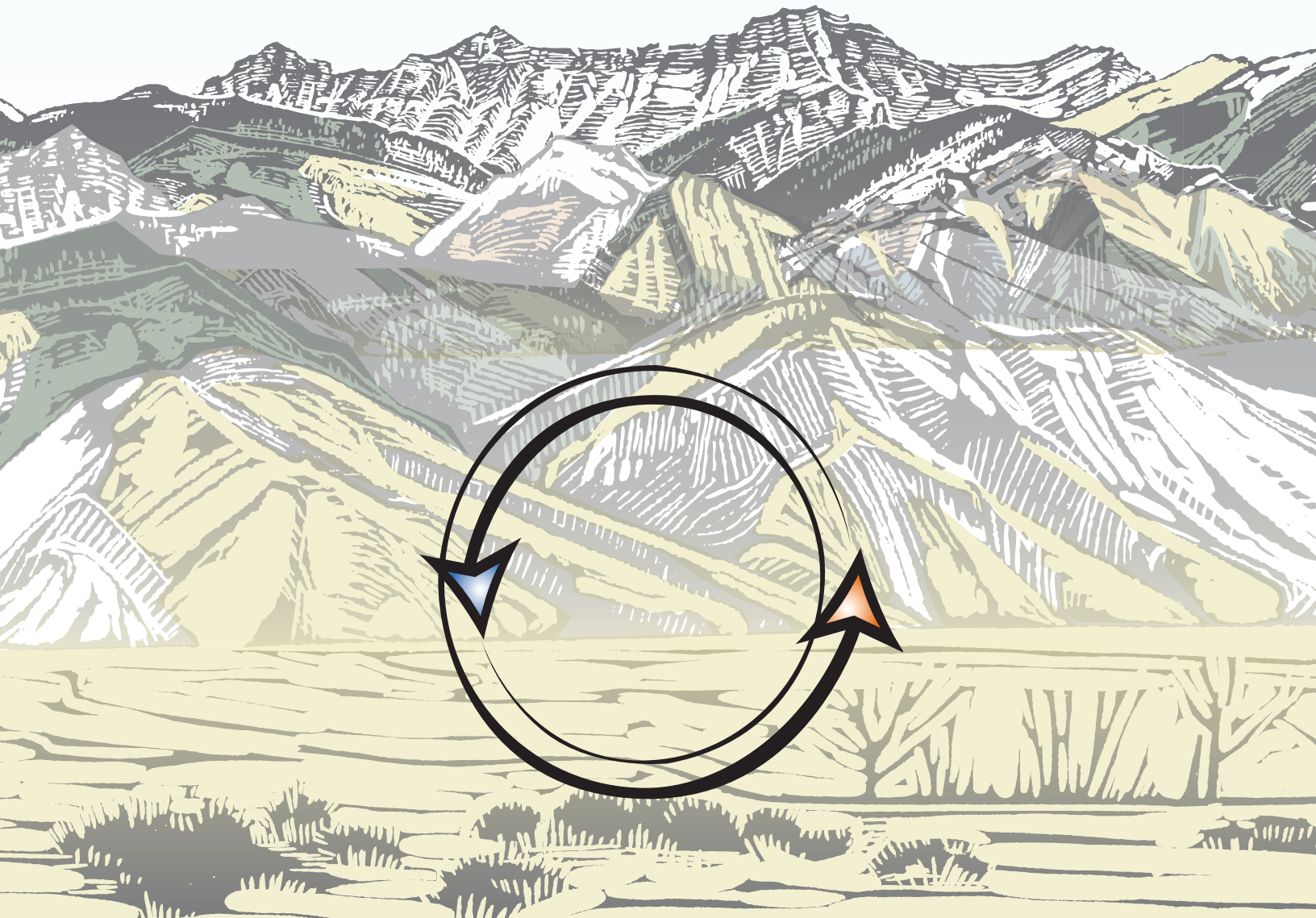
Record of Decision and

Resource Management Plan Amendments for

Geothermal Leasing

in the Western United States

December 2008



Mission Statement

It is the mission of the Bureau of Land Management (BLM), an agency of the Department of the Interior, to manage BLM-administered lands and resources in a manner that best serves the needs of the American people. Management is based upon the principles of multiple use and sustained yield, taking into account the long-term needs of future generations for renewable and nonrenewable resources.

BLM-WO-GI-09-003-1800

FES – 08-44

ABSTRACT

This Record of Decision (ROD) approves the US Department of the Interior, Bureau of Land Management's (BLM's) decision to facilitate geothermal leasing of the federal mineral estate in the 12 western states of Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. This decision (1) allocates BLM lands as open to be considered for geothermal leasing or closed for geothermal leasing, and identifies those National Forest System lands that are legally open or closed to leasing; (2) develops a reasonably foreseeable development scenario that indicates a potential for 12,210 megawatts of electrical generating capacity from 244 power plants by 2025, plus additional direct uses of geothermal resources; and (3) adopts stipulations, best management practices, and procedures for geothermal leasing and development. These actions will be implemented as BLM resource management plan amendments (Plan Amendments) for 114 land use plans; the decision does not amend any US Forest Service land use plans. The proposed action and Plan Amendments were evaluated through the preparation of the *Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States*, which was prepared jointly by the BLM and US Forest Service in accordance with the National Environmental Policy Act (NEPA) of 1969, the Federal Land Policy and Management Act of 1976, and the National Forest Management Act of 1976. This ROD does not authorize any ground-disturbing activities or waive the environmental review and NEPA compliance requirements for subsequent geothermal exploration, drilling, utilization, and reclamation permits.

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BLM DIRECTOR RECOMMENDATION

Having considered a full range of reasonable alternatives, associated effects, and public input, I recommend adoption and implementation of the attached Resource Management Plan Amendments and Record of Decision for Geothermal Leasing in the western United States.

James L. Caswell, Director,
Bureau of Land Management

12/17/08
Date

ASSISTANT SECRETARY APPROVAL

In consideration of the foregoing, I approve the Resource Management Plan Amendments and Programmatic Environmental Impact Statement for Geothermal Leasing in the western United States.

C. Stephen Allred
Assistant Secretary - Land and Minerals Management
Department of the Interior

Dec 17, 2008
Date

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USDA

United States Department of Agriculture

Office of the Secretary
Washington, D.C. 20250

DEC 12 2008

Honorable C. Stephen Allred
Assistant Secretary, Land and Minerals Management
U.S. Department of the Interior
1849 C Street NW
Washington DC, 20240

Dear Mr. Secretary:

In response to Section 225, Public Law 109-58 (Energy Policy Act of 2005) the Bureau of Land Management and the Forest Service, in cooperation with the Department of Energy, jointly prepared the Programmatic Environmental Impact Statement (PEIS) for Geothermal Leasing. The PEIS provides a framework to facilitate Forest Service efforts regarding pending geothermal lease applications and future determinations for projects on National Forest System lands. The Department of Agriculture supports and adopts the "Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States."

If you have any questions about the Forest Service role in preparing or the intended use of the PEIS by the agency, please contact Tony Ferguson, Director, Minerals and Geology Management, (703) 605-4785.

Sincerely,

Mark Rey
Under Secretary

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LIST OF ACRONYMS

ACHP – Advisory Council on Historic Preservation

BLM - United States Department of the Interior, Bureau of Land Management

BMPs - Best Management Practices

CFR - Code of Federal Regulations

CRMP – Cultural Resource Management Plan

DNA - Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy

DOI - Department of the Interior

EPA – Environmental Protection Agency

ESA – Endangered Species Act

FLPMA - Federal Land Policy and Management Act of 1976 (43 United States Code 1701 et seq.)

FS - United States Department of Agriculture, Forest Service

GIS - Geographic Information System

MFP - Management Framework Plan

NDAA – National Defense Authorization Act

NEPA - National Environmental Policy Act of 1969

NFMA - National Forest Management Act of 1976

NFS - National Forest System

NHPA - National Historic Preservation Act

NMFS - National Marine Fisheries Service

NRHP - National Register of Historic Places

NSO - No Surface Occupancy

OSHA - Occupational Safety and Health Administration

PEIS - Programmatic Environmental Impact Statement

RMP - Resource Management Plan

ROD - Record of Decision (for an EIS)

SHPO – State Historic Preservation Officer

US - United States

USC - United States Code

USFWS - United States Department of Interior, Fish and Wildlife Service

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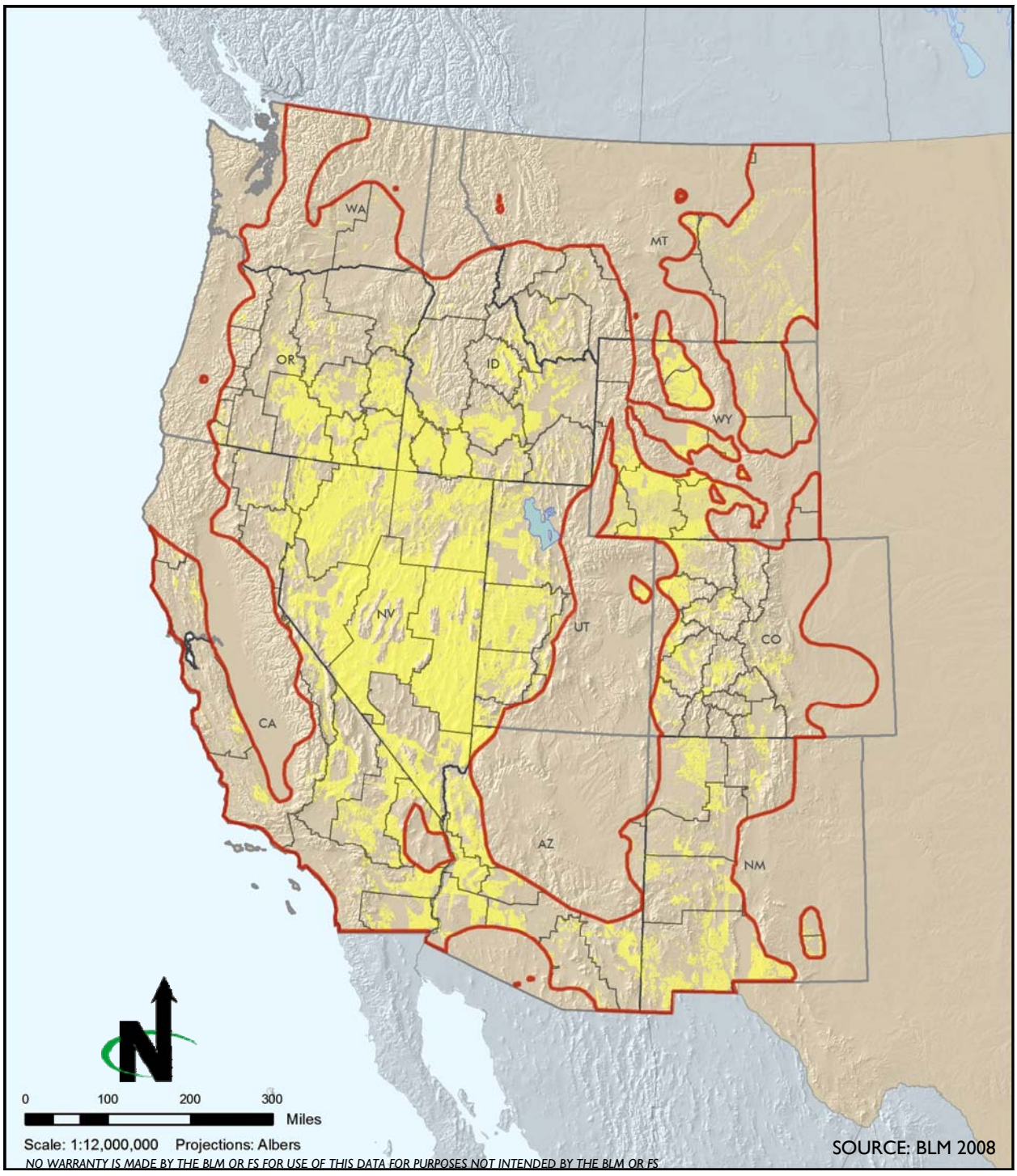
CHAPTER 1
RECORD OF DECISION

1.1 INTRODUCTION

This Record of Decision (ROD) describes the United States (US) Department of the Interior (DOI), Bureau of Land Management's (BLM's) decision to allocate lands as open or closed to geothermal leasing and to adopt stipulations, best management practices (BMPs), and procedures for leasing by amending 114 land use plans in the 11 western states and Alaska (Appendix A). Figures 1 and 2 show the BLM field office boundaries of the 11 western states in the planning area and Alaska, respectively. The BLM is responsible for leasing geothermal resources on the federal mineral estate, including National Forest System (NFS) lands. A geothermal lease is for the earth's heat resource where there is federal mineral estate. The BLM currently administers approximately 480 geothermal leases that cover over 700,000 acres of the federal mineral estate (fiscal year 2007 data). Of those, 57 are producing geothermal energy—54 for electrical generation (termed indirect use), and 3 for direct use (such as for heating buildings, spas, and greenhouses).

As discussed above, the BLM is proposing to facilitate geothermal leasing of the federal mineral estate by allocating lands as open or closed to leasing, developing a reasonably foreseeable development scenario, and adopting stipulations, BMPs, and procedures for leasing. These actions are implemented as resource management plan (RMP) amendments (Plan Amendments). The proposed action and Plan Amendments were evaluated through the preparation of the *Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States* (BLM 2008a). This Programmatic Environmental Impact Statement (PEIS) was prepared jointly by the BLM and United States Forest Service (FS) in accordance with the National Environmental Policy Act of 1969 (NEPA), the Federal Land Policy and Management Act of 1976 (FLPMA), and the National



C://EMPSi/GeothermalPEIS/Figures

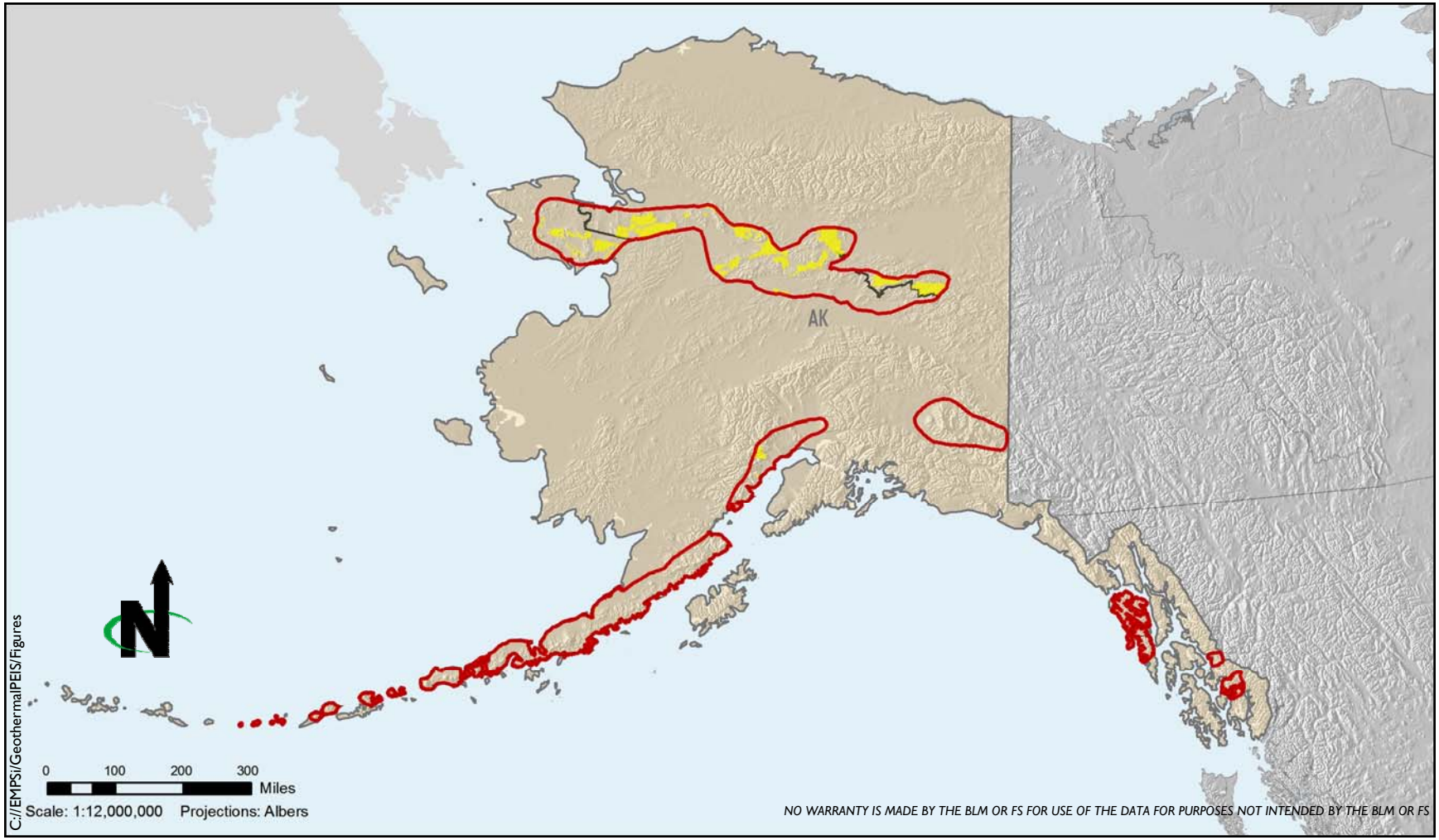
About 137 million acres of public land are within the geothermal potential area in the 11 western states and are administered by 97 field offices.

LEGEND:

- Potential Geothermal Area
- BLM Field Office Boundary
- BLM Public Land

BLM Field Office Boundaries within the Planning Area of the 11 Western States

Figure 1



Almost six million acres of public land in Alaska have geothermal potential.

LEGEND:

- Potential Geothermal Area
- BLM Field Office Boundary
- BLM Public Land

BLM Administrative Boundaries in the Planning Area of Alaska

Figure 2

Forest Management Act (NFMA) of 1976. The BLM has the delegated authority to issue geothermal leases on the federal mineral estate, including that underlying lands administered by the FS.

1.1.1 Purpose and Need of the Federal Action

As identified in the Final PEIS, the purpose of the Federal action is threefold:

1. To complete the processing of active pending geothermal lease applications and nominations by deciding whether, and under what stipulations, to issue geothermal leases on NFS and public lands.
2. To amend BLM land use plans to allocate BLM-administered lands with geothermal resource potential as closed, open, or open with major or moderate constraints to geothermal leasing. This includes establishing a projected new level of potential geothermal development with existing planning level decisions (termed reasonably foreseeable development scenario), and identifying appropriate stipulations, best management practices, and procedures to protect other resource values and uses while providing sufficient pre-leasing analysis to enable the BLM to make future competitive geothermal leasing availability decisions.
3. To provide suitable information to the FS to facilitate its subsequent consent decision to the BLM for leasing on NFS lands, and to provide environmental analysis to assist future National Forest System land use decisions by providing possible land use allocations and stipulations for geothermal leasing.

As identified in the Final PEIS, the need for the Federal action is also threefold:

1. To issue decisions on pending lease applications in accordance with the Energy Policy Act of 2005. Specifically, Section 225 requires that the Secretary of the Interior and Secretary of Agriculture establish a program for reducing by 90 percent the backlog of geothermal lease applications that were pending as of January 1, 2005. The Energy Policy Act of 2005 mandates that action be taken by August 8, 2010.
2. To address other provisions of the Energy Policy Act of 2005 (Sections 211 and 222[d][1]); respond to other policy directives calling for clean and renewable energy (see Section 1.8 of the PEIS, Renewable Energy Policies); and to meet the increasing energy demands of the nation while reducing reliance on foreign energy imports, reducing greenhouse gas emissions, and improving national security.
3. To facilitate geothermal resource leasing in an environmentally responsible manner to help meet the increasing interest in

geothermal energy development on public and NFS lands in the western US (Energy Policy Act Section 211).

Based on the stated purpose of and need for action, two scopes of analysis were addressed in the PEIS: the programmatic analysis to facilitate leasing (Purpose and Need statements (2) and (3), which are covered by this ROD); and the site-specific analysis of the backlogged lease application areas (Purpose and Need statements (1), which are not covered by this ROD). See Section 1.2, Scope of Analysis and Decisions, for more information.

1.1.2 Federal Actions Covered by this ROD

This ROD incorporates the programmatic analysis of the PEIS and provides the decision to amend 114 BLM land use plans to take the following actions:

- Identify public lands that are administratively and legally closed or open to leasing, and under what conditions.
- Develop a comprehensive list of stipulations, BMPs, and procedures to serve as consistent guidance for future geothermal leasing and development on public and NFS lands.
- Provide a reasonably foreseeable development scenario for geothermal development on Federal lands.
- Amend BLM land use plans to adopt the resource allocations, reasonably foreseeable development scenario, stipulations, BMPs, and procedures.

Additionally, the ROD identifies public and NFS lands with geothermal potential as being legally open or closed to leasing (see Figures 2-5 and 2-6 in Chapter 2 of the Final PEIS). The decision does not amend any FS land use plans.

1.2 SCOPE OF ANALYSIS AND DECISIONS

Section 225 of the Energy Policy Act of 2005 requires that the US Department of the Interior and the FS reduce the backlog of geothermal lease applications pending as of January 1, 2005, by 90 percent (by August 8, 2010). Section 222(d) dictates that it be a priority for the BLM and the FS to ensure timely completion of actions such as amendments to land use plans necessary to process lease applications pending on August 8, 2005, and that all future forest plans and RMPs in areas of geothermal resource potential consider geothermal leasing and development. To respond to these directives and the stated need for action, the PEIS incorporated two different scopes for analysis. The first scope covered the programmatic analysis to allocate lands as open or closed for leasing and development of geothermal resources and to apply stipulations (Volume I of the PEIS). The second scope covered the site-specific analysis of 19 backlogged lease applications that are grouped and analyzed in seven distinct geographic areas

(Volume II of the PEIS). Separate decisions will be issued for each scope, as discussed below.

1.2.1 Programmatic ROD

This ROD incorporates the programmatic analysis of the PEIS and amends BLM land use plans. As such, it allows the BLM to make future decisions on whether or not to issue geothermal leases in conformance with the amended land use plan on the basis of the analysis in the PEIS. It is the intent of the BLM that, upon receipt of future nominations or applications for leases, affected BLM offices would be able to conduct a Documentation of Land Use Plan Conformance and National NEPA Adequacy (DNA) evaluation to make lease sale decisions without further plan amendments or NEPA analysis, unless new information or special circumstances require additional environmental evaluation. Prior to issuing leases, the BLM and FS would conduct additional environmental reviews, as appropriate, to comply with other laws, including but not limited to the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA). In addition, prior to making a leasing decision on lands in proximity to a National Park System unit, the BLM or other surface management agency must determine if there would be any impacts to thermal or hydrological features within the unit, in accordance with the Geothermal Steam Act Amendments (30 USC Section 1026).

The FS is not proposing to amend its land use plans or allocate any lands as administratively closed; therefore, the FS does not have a decision to issue on the programmatic analysis.

1.2.2 Pending Lease Applications RODs

As of January 1, 2005, there were 194 pending lease applications; 130 on BLM public lands and 64 on NFS lands. Since January 1, 2005 the BLM and FS have processed or resolved many of the lease applications. In June 2007 there were 55 remaining pending leases. This list was vetted as part of the PEIS process which identified 34 leases as still pending. Of those, 15 are being actively being addressed (see Table 10-2, Volume II of the Final PEIS). The remaining 19 lease applications, grouped together in seven geographic areas, were evaluated in Volume II of the PEIS. The BLM and FS will issue separate decisions for each of the seven areas associated with the pending lease applications. This requires execution of RODs separate from the programmatic action. The decision maker for the pending application areas will be the field office manager or forest supervisor. In some cases, one ROD will cover multiple lease applications (e.g., one decision for each of the seven geographical clusters with leasing applications). The decisions will be issued independently as issues are addressed and other compliance actions are completed (e.g., tribal consultation).

1.3 OVERVIEW OF THE ALTERNATIVES

The project area is defined as the 12 western states of Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The planning area is defined as the 530 million acres within the 12 western states that have the potential for geothermal resources.

The planning area includes BLM- and FS-administered surface lands with minerals under federal ownership that have geothermal potential and the subsurface federal geothermal mineral estate on other lands (termed split-estate). The BLM administers about 143 million surface acres of public land, and the FS administers about 104 million acres of NFS lands. Surface lands administered by other federal agencies, such as the National Park Service and US DOI, Fish and Wildlife Service (USFWS), and by state agencies are not assessed in this document unless their administrative boundaries overlap with BLM- or FS-administered lands. If these lands have subsurface federal geothermal mineral estate, the BLM would apply the management direction provided in the PEIS, with the surface management agency's consent, for lease nominations or applications. Lands that are not administered by the BLM or FS, or that are closed to geothermal leasing by statute, are not part of the analysis, including National Park System lands.

Leasing geothermal resources by the BLM vests with the lessee a nonexclusive right to future exploration and an exclusive right to produce and use the geothermal resources within the lease area subject to existing laws, regulations, formal orders, and the terms, conditions, and stipulations in or attached to the lease form or included as conditions of approval in permits. Lease issuance alone does not authorize any ground-disturbing activities to explore for or develop geothermal resources without site-specific approval for the intended operation. Such approval could include additional environmental reviews and permits, as appropriate.

1.3.1 Alternative A – No Action: Continuation of Current Management

Under this alternative, no BLM land use plans would be amended and the existing plan decisions, stipulations, and allocations would not change. Therefore, any plans that do not address geothermal leasing would not be amended, and the public and NFS lands would not be allocated as open or closed to geothermal leasing.

Processing of pending geothermal lease applications would continue; however, they would be evaluated on a case-by-case basis using analysis in the existing land use plans. Likewise, future lands nominated for leasing would be evaluated using analysis in existing land use plans. This could require additional NEPA analysis and possibly amendments to the plans.

Rationale for Non-Selection: Taking no action would not facilitate the leasing process and does not meet the stated purpose and need.

1.3.2 Alternative B – Proposed Action and Amendments

Alternative B was identified as the Proposed Action in the Draft PEIS. As a result of public comment, internal review, and agency coordination, Alternative B was clarified and slightly modified to become the preferred alternative and proposed plan amendments in the Final PEIS. With the minor adjustments and clarifications described in Section 1.8 of this ROD, Alternative B has been selected as the approved plan amendments (see Chapter 2 and Appendix A of the ROD).

Under Alternative B, 122 land use plans were originally proposed to be amended to allocate approximately 118 million acres of BLM public land as open to geothermal leasing, subject to existing laws, regulations, formal orders, stipulations attached to the lease form, and the terms and conditions of the standard lease form. Based on public comment and internal review of the Final PEIS, the proposal in Alternative B has been slightly modified. Under this ROD approving the Plan Amendments, 114 land use plans are amended to designate about 111 million acres of BLM public land as available for nominations and applications for geothermal leasing, and to adopt stipulations, BMPs, and procedures to serve as consistent guidance for future geothermal leasing and development (see Section 1.8, Notice of Modifications Made to the Preferred Alternative). Split-estate lands under the amended plans would also be available for leasing. In addition, about 79 million acres of NFS lands would remain legally open for leasing.

While these lands are allocated as open, compliance with laws and regulations could nevertheless prohibit some lands from leasing. For example, if the BLM or FS determines that subsequent exploration, development, or utilization of nominated lands would likely result in a significant adverse effect on a significant thermal feature within a unit of the National Park System, the lease would not be issued pursuant to the Geothermal Steam Act Amendments of 1988 (30 USC Section 1026[c]).

The closed BLM lands include those that are legally closed (e.g., non-discretionary closures) and those that are administratively unavailable to leasing (e.g., discretionary decision by the BLM). A comprehensive list of closed lands is provided in Chapter 2.

On the open lands, the authorized BLM officer retains the discretion as to whether a lease should be issued and may issue stipulations that impose moderate to major constraints on use of surface of any leases in order to mitigate the impacts to other land uses or resources objectives as defined in the guiding resource management plan. The specific stipulations are included in Section 2.3, Stipulations and BMPs.

Reasonably Foreseeable Development Scenario

Projected Power Plant Development (Indirect Use)
It is estimated that the 12 states in the project area have 5,540 MW of geothermal potential considered viable for commercial development by 2015, with a further 6,660 to 6,670 MW being forecast by 2025. This capacity is expected to be realized through approximately 111 additional power plants by 2015, and a further 133 power plants by 2025. Using these values, it is estimated that the average viable capacity at any particular site is 50 MW by 2025 (Western Governors' Association 2006). This projection is in addition to existing and plan capacity for the given locations.

Direct Use
Direct uses include agricultural uses (controlling environmental conditions for growing crops, flowers, or trees), aquacultural uses (controlling environmental conditions for raising fish or other animals), direct heating and cooling systems, public safety uses (eliminating ice and snow on sidewalks), food processing (dehydration, washing, and processing), and recreational uses (hot tubs, steam baths, and mud baths). Direct use applications are distributed across the project area, with the greatest number being in California, Idaho, Oregon, and Colorado. Quantitative estimates of the thermal energy of likely-to-be-developed direct use applications over the 2015 to 2025 timeframe are not available for the western US in the way that they are for indirect uses; however, for the US as a whole, the DOE National Renewable Energy Laboratory has developed estimates of thermal megawatts that are developable. It is estimated that by 2015, direct use applications could be developed in the amount of 1,600 thermal megawatts, and by 2025, this number is estimated to be 4,200 thermal megawatts (NREL 2006).

Rationale for Selection: Alternative B was selected as the proposed plan amendment based on: (1) its consistency with the requirements of the Energy Policy Act of 2005, (2) its balanced use and protection of resources, (3) the Final PEIS's analysis of potential environmental impacts, and (4) the comments and recommendations from agencies, states, stakeholders, and the public. Alternative B is structured to be consistent with the congressional mandate of the Energy Policy Act to facilitate geothermal leasing by amending land use plans to allocate geothermal resources and adopt stipulations and procedures for leasing.

1.3.3 Alternative C – Leasing Lands near Transmission Lines

Under Alternative C, the BLM and FS would only consider geothermal leasing of lands for commercial electrical generation if they are within a 20-mile corridor (10-mile from centerline) from existing transmission lines and lines currently under development at 60kV to 500kV. All lands within this corridor would be designated as closed or open with moderate to major constraints to leasing using the criteria outlined for Alternative B - Proposed Action. Under this

alternative, Island Park Geothermal Area would also be closed (as with Alternative B); however, the area would be expanded to include no leasing within 15 miles from the boundary of Yellowstone National Park. Given the limited transmission line grid and demand for localized power sources for remote communities, the lands available for geothermal leasing in Alaska would be the same as for Alternative B - Proposed Action. Leases for direct use would be considered for the entire planning area and would not be constrained by the location of transmission lines. Therefore, direct-use leasing would be the same as Alternative B.

Under this alternative, approximately 61 million acres of BLM-administered public land and 31 million acres of NFS lands would be open for geothermal leasing for commercial electrical generation.

Due to the limited locations of transmission lines, this alternative would increase the amount of land that would be unavailable for geothermal leasing within the planning area; specifically, about 80 million acres of public land and 75 million acres of NFS lands would be closed. Other lands outside the corridor would not be allocated by this action as either open or closed to leasing. Any geothermal lease applications or nominations would have to be evaluated on a case-by-case basis as described under the No Action Alternative and would be subject to the limitations of existing land use plans. This alternative was developed in response to written and verbal recommendations during public scoping.

Rationale for Non-Selection: Alternative C was not selected for the following reasons: (1) Alternative C would allocate about 61 million acres of BLM-administered lands as open to leasing, which is about 57 million acres less than Alternative B. While it is not possible to quantify the precise corresponding reduction in producible megawatts of electrical power generation due to subsurface considerations in the location of geothermal resources, limiting development to narrow corridors of available lands would significantly reduce the ability of the BLM to meet the stated purpose and need for facilitating geothermal leasing and alternative energy development on public lands; and (2) it was determined that the proposed 15-mile buffer around Yellowstone National Park would not be the most effective or necessary means (as a matter of science and engineering) to protect the subsurface hydrogeology of the region. The BLM worked closely with the National Park Service between the Draft and Final PEIS to clarify and expand the discussion of procedures to jointly ensure the continued protection of significant thermal features on National Park System lands.

1.4 THE DECISION

Preparation of the Plan Amendments was done under the authority of the FLPMA and in accordance with BLM planning regulations (43 CFR Part 1600). The Plan Amendments are consistent with the requirements of the Geothermal Steam Act and the Energy Policy Act of 2005 and provide a balanced use and protection of resources. A PEIS was prepared to analyze and provide support for the approval of these Plan Amendments in compliance with NEPA.

The Plan Amendments in this ROD are identical to the Proposed Plan Amendments presented in the PEIS with the following three exceptions:

1. Removal of the East San Diego County RMP from the list of plans for amendment. On October 2008, a ROD was signed revising this plan. The revision provided allocations and management direction for geothermal leasing and therefore does not require amendment.

2. Addition of BMPs to address groundwater quality in response to the Environmental Protection Agency's (EPA's) comments on the Final PEIS (see ROD Appendix B).

3. The BLM is deferring the decision to amend seven land use plans in accordance with the provisions of the National Defense Authorization Act (NDAA § 2815 [a and d], 113 Stat. 512, 852 [1999]). These plans are the Box Elder RMP, House Range Resource Area RMP, Iso-tract Management Framework Plan (MFP), Park City RMP, Pony Express RMP, Randolph RMP, and Warm Springs Resource Area RMP. The NDAA provided in § 2815(d) that the Secretary of the Interior may not proceed with any amendment of any individual resource management plan adjacent to or near the Utah Test and Training Range and Dugway Proving Grounds or beneath Military Operating Areas, Restricted Areas, and airspace that make up the Utah Test and Training Range until the Secretary of Defense submits a study to Congress evaluating the impact of any proposed changes to land management plans upon military training, testing, and operational readiness. As of the date of this ROD, the Secretary of Defense has not submitted the required study; therefore, the plans are not available for amendment. Once the report is submitted, the BLM will reevaluate the decision to amend these plans.

Based on these changes, the decision is to amend 114 BLM land use plans to adopt the allocations, reasonably foreseeable development scenario, stipulations, BMPs, and leasing procedures provided in Appendix B – Proposed Action in the PEIS and as attached in Chapter 2 and Appendix A of this ROD.

1.5 WHAT THE DECISION TO AMEND THE RMPS PROVIDES

The decision serves as the first step in the process to develop geothermal resources to meet the intent of the Energy Policy Act of 2005. The Plan Amendments allocate BLM-administered lands with geothermal resource potential as closed or open to geothermal leasing, establish a projected new level of potential geothermal development (termed reasonably foreseeable development scenario), and identify appropriate stipulations, best management practices, and procedures to protect other resource values and uses while providing sufficient pre-leasing analysis to enable the BLM to make future competitive geothermal leasing availability decisions.

Based on the Plan Amendments, the BLM can make decisions whether or not to issue geothermal leases in conformance with the amended land use plan on the basis of this PEIS. Following this amendment process, it is the intent of the BLM that, upon receipt of future nominations or applications for direct use, affected BLM offices would be able to conduct a DNA evaluation (Documentation of Land Use Plan Conformance and National NEPA Adequacy) to make lease sale decisions without further plan amendments or NEPA analysis, unless new information or special circumstances require additional environmental evaluation. Prior to issuing leases, the BLM and FS would conduct additional environmental reviews, as appropriate, to comply with other laws, including but not limited to the Endangered Species Act and National Historic Preservation Act.

Although the BLM expects to be able to rely upon the analysis in the PEIS, combined with DNA evaluations to document NEPA adequacy, to make lease issuance decisions in the near term, the issuance of a lease does not give the lessee the right to proceed with exploration or development (i.e., any surface-disturbing activities beyond casual use) in the absence of further site-specific permits and associated environmental review. This document does predict a general level of anticipated future geothermal development in BLM areas that have geothermal potential, but it is not intended to provide full analysis of all phases of development. There are several stages of decision making necessary to approve geothermal resource development, each with its own environmental compliance requirements, and this document covers only the land use planning and lease issuance stages.

1.6 GEOTHERMAL LEASING DECISIONS

The decision incorporates the following actions and is subject to existing Federal, State, and local laws and regulations, as well as established BLM policies. These actions are detailed in Chapter 2.

- Identifies about 143 million acres of BLM-administered public lands as having geothermal resources with potential for indirect or direct applications.

- Designates about 111 million acres BLM-administered public lands with geothermal potential as open to geothermal leasing subject to existing laws, regulations, formal orders, stipulations attached to the lease form, and the terms and conditions of the standard lease form. While these lands are allocated as open, compliance with laws and regulations or the exercise of BLM discretion in response to site-specific considerations could nevertheless prevent some lands from being leased.

- Establishes a reasonably foreseeable development scenario for geothermal development based on BLM planning areas.

- Adopts a comprehensive list of stipulations and procedures to serve as consistent guidance for future geothermal leasing on BLM-administered public lands, NFS lands, and other lands within the federal mineral estate.

- Provides a list of recommended BMPs that may be applied for subsequent exploration, drilling, development, and reclamation activities. Specifically, the BMPs can be incorporated, as appropriate, into the permit application by the lessee or can be included in the approved use authorization by the BLM as conditions of approval.

- Recognizes that prior to making a leasing decision on lands in proximity to a National Park System unit, the BLM or other surface management agency must determine if there would be any impacts to thermal or hydrological features within the unit, in accordance with the Geothermal Steam Act Amendments (30 USC Section 1026).

1.7 WHAT THE DECISION TO AMEND THE RMPS DOES NOT PROVIDE

- The Plan Amendments do not authorize the leasing of any of the 19 pending lease applications evaluated as part of the PEIS (see Volume II of the Final PEIS). Separate RODs will be issued for these lease applications.

- The Plan Amendments do not authorize any ground-disturbing activities or waive the environmental review and NEPA compliance requirements for subsequent geothermal lease issuance or exploration, drilling, utilization, and reclamation permits.

- The Plan Amendments do not contain decisions for minerals other than geothermal resources for the 114 plans indentified in Appendix A.

- The Plan Amendments do not authorize leasing on federal lands that are legally closed to geothermal leasing, including lands managed as part of the National Wildlife Refuge System (16 USC 668 [dd]) and lands within units of the National Park System.

- The Plan Amendments do not amend the plans of the FS or any other agency.

- The Plan Amendments do not affect valid existing rights.

- The decisions contained herein also will not:

    - Change the BLM's responsibility to comply with applicable laws, rules, and regulations.

    - Change BLM's obligation to conform to current or future National policy, as established by BLM itself, the Department, the President, or Congress.

    - Affect funding levels and budget allocations, which are determined annually at the national level and are beyond the control of the field office.

1.8 NOTICE OF MODIFICATIONS MADE TO THE PREFERRED ALTERNATIVE

After careful review of the information provided during the Governor's Consistency Review, continued internal review, and comments from the EPA, the BLM has incorporated the following modifications and clarifications to the BLM's preferred alternative:

Modification: Remove the Eastern San Diego County RMP from the listed plans for amendment. Rationale: The BLM issued a ROD for the Eastern San Diego RMP on October 2008. This ROD revised the previous plan that was proposed for amendment in the PEIS. The revised plan provides detailed allocations and management actions for geothermal resources; therefore, the plan does not require amendment.

Modification: Defer amending the following plans: Box Elder RMP, House Range Resource Area RMP, Iso-tract MFP, Park City RMP, Pony Express RMP, Randolph RMP, and Warm Springs Resource Area RMP. Rationale: On October 5, 1999, Congress enacted Section 2815 of the NDAA, which affected Utah's public lands "adjacent or near to the Utah Test and Training Range and Dugway Proving Grounds or beneath Military Operating Areas, Restricted Areas, and airspace that make up the Utah Test and Training Range." NDAA § 2815(a), 113 Stat. 512, 852 (1999). The NDAA provided in § 2815(d) that "the Secretary of Interior may not proceed with any amendment of any individual resource management plan"

until the Secretary of Defense submits a study to Congress evaluating the impact of any proposed changes to land management plans upon military training, testing, and operational readiness (NDAA § 2815[d], 113 Stat. 512, 852 [1999]). As of the date of this ROD, the Secretary of Defense has not submitted the required study; therefore, the plans are not available for amendment. Once the report is submitted, the BLM will reevaluate the decision to amend these plans.

Modification: Add additional BMPs that may be applied to subsequent permits for all phases of geophysical exploration and development in order to protect surface and groundwater. Rationale: While the PEIS only evaluates the action of leasing lands, it is presumed that development could occur in the future. A comprehensive list of BMPs will facilitate future development and ensure a consistency in resource protection.

Clarification: Add Valles Caldera National Preserve to the list of areas legally closed to geothermal development. Rationale: By statute, the FS is required to acquire outstanding mineral rights within the Preserve and withdraw them from mineral entry. The Preserve was noted as being closed in the Final PEIS, but the Preserve is added to the list of closed areas in the ROD to address comments from the State of New Mexico.

1.9 MANAGEMENT CONSIDERATIONS IN SELECTING THE PREFERRED ALTERNATIVE

The preferred alternative has been selected on the basis of the following factors: consistency with federal legal requirements, policy, and directive, the stated purpose and need (see Chapter 1 of the PEIS), a balanced use and protection of resources based on the analysis of potential environmental impacts as presented in the Final PEIS, and consideration of formal comments and recommendations from agencies and the public.

1.9.1 Policy and Directive

On May 18, 2001, the President signed Executive Order 13212, *Actions to Expedite Energy-Related Projects*, which states that, "the increased production and transmission of energy in a safe and environmentally sound manner is essential." Executive departments and agencies are directed to "take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy." Executive Order 13212 further states that, "For energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. The agencies shall take such actions to the extent permitted by law and regulation and where appropriate." The BLM recognizes the importance of energy development as directed in the above Executive Order, as well as stewardship and proper management of all of the Nation's resources as a matter of positive domestic policy and national security.

The Energy Policy Act of 2005 amended the Geothermal Steam Act to encourage the leasing and development of geothermal resources on Federal lands. Specifically, Section 211 of the Energy Policy Act of 2005 provides a ten-year goal for the Secretary of the Interior to seek approval of non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity, including electricity from geothermal resources. Section 223 gives the Secretary of the Interior authority to identify areas that could be leased exclusively for direct use of geothermal resources.

Section 222(d)(1) of the Energy Policy Act of 2005 states that, "It shall be a priority for the Secretary to ensure timely completion of administrative actions, including amendments to applicable forest plans and RMPs, necessary to process applications for geothermal leasing pending on the date of enactment of this subsection." This section also contains the requirement that, "All future forest plans and RMPs for areas with high geothermal resource potential shall consider geothermal leasing and development."

The Geothermal PEIS and the amendment of multiple land use plans to adopt the leasing program will effectively support the directives of Executive Order 13212 and congressional policy provided in the Energy Policy Act of 2005 regarding geothermal energy development on public lands.

In accordance with the Energy Policy Act, the BLM and FS will make geothermal leasing decisions on pending lease applications submitted prior to January 1, 2005; however, decisions to approve pending lease applications are identified under separate RODs.

1.9.2 Balanced Use and Environmental Protection

The BLM considered whether the Plan Amendment would improve and sustain properly functioning resource conditions, while considering the need and demand for existing or potential geothermal resources for direct and indirect use. Consideration was given to whether there was an appropriate balance of resource use to meet resource, social, and economic concerns in the planning area. The proposed leasing process and stipulations are designed to protect sensitive resources and resource uses. The amendment of the land use plans does not authorize any ground-disturbing activities, and there are no direct irreversible or irretrievable commitments of resources. Permits are required for any drilling or utilization of geothermal resources, subsequent to leasing. During the permitting process, site-specific environmental review will be carried out and the environmental consequences to specific resource values and uses within the areas and any alternative actions will be analyzed.

The BLM has considered the wealth of information on the full range of consequences resulting from geothermal leasing and potential subsequent development activities. The BLM used comparable data and the BLM's

professional experience managing development of geothermal resources to determine that the BLM had sufficient information on the nature of the effects for an allocation decision to be made. The analysis of potential impacts associated with geothermal development is described in Chapters 4 and 5 of the PEIS.

1.9.3 Comments and Recommendations

The BLM received approximately 500 discrete comments on the Draft PEIS. Most comments favored geothermal energy development if carried out in an environmentally responsible manner. The BLM considered the concerns expressed by the states, tribal and local governments, industry, special interest groups, and the public throughout the process. Consideration was given as to whether the BLM action would jeopardize other resources found on public lands. During this process, the BLM coordinated closely with federal agencies, including the US Geological Survey, Department of Energy, National Park Service, and EPA, in addition to tribes, the states, and others with special expertise.

In addition, all comments received during the comment period on the Draft PEIS were reviewed and considered. Modifications to the Draft PEIS were made, as appropriate, to form the Final PEIS and Plan Amendments.

Future site-specific geothermal development activities in the planning area are implementation-level decisions. Upon receipt of an application for these types of projects, the BLM would require a site-specific environmental analysis before ground-disturbing actions could be approved. Specific impacts of such actions would be analyzed at that time, along with the identification of possible mitigation measures. Site-specific environmental analysis would include the opportunity for additional public participation and coordination with county and state land and resource managers. Proposed site-specific activities would also be required to comply with other laws and regulations, including but not limited to the ESA and the NHPA.

1.10 CONSISTENCY AND CONSULTATION REVIEW

1.10.1 Governor's Consistency Review

On October 14, 2008, the BLM initiated the 60-day Governor's Consistency Review of the PEIS in accordance with FLPMA (43 USC §1712(c)(9)), which states that the Secretary of the Interior shall "coordinate the land-use inventory, planning, and management activities of or for such lands with the land-use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located." It further states that "the Secretary shall assure that consideration is given to those State, local and tribal plans that are germane in the development of land-

use plans for public lands [and] assist in resolving, to the extent practical, inconsistencies between Federal and non-federal government plans…." Thus, FLPMA does not require the BLM to adhere to or adopt the plans of other agencies or jurisdictional entities, but rather to give consideration to this plan and make an effort to resolve inconsistencies to the extent practical. In the event that State plans conflict with Federal law, however, there may be an inconsistency that cannot be resolved or reconciled. While State and Federal planning processes are required to be as integrated and consistent as practical, the Federal agency planning process is not bound by or subject to State plans, planning processes, or planning stipulations.

The State of Alaska provided a letter finding that the preferred alternative and plan amendments are consistent with state interests, plans, policies, and programs. The States of New Mexico and Utah provided comments and recommended changes to the preferred alternative and plan amendments. The BLM responded to and resolved these questions and has incorporated relevant and appropriate comments to improve the proposed plan amendments (see Section 1.8 Notice of Modifications Made to the Preferred Alternative). Based on the BLM's review, no inconsistencies concerning other State or local plans, policies, and programs have been identified.

1.10.2 Agency Coordination

The PEIS was prepared in close coordination with several federal agencies regarding the purpose and need for the proposed action and the scope of the analysis. The US Department of Agriculture, Forest Service served as a joint-lead federal agency to help address geothermal leasing on NFS lands. The US Department of Energy participated on the project core team and provided technical expertise on geothermal development and potential. The US Geological Survey worked closely with the core team to provide technical guidance in defining areas of geothermal development potential for electrical generation. The BLM coordinated closely with the EPA regarding air quality, noise, cultural resources, wetlands, water resources, and other natural resources (see Section 1.12 of this ROD for more information on EPA comments on the PEIS). The BLM worked closely with the National Park Service to protect resources in and around National Park System lands. Prior to making a leasing decision on lands in proximity to a National Park System unit, the BLM or other surface management agency must determine if there would be any impacts to thermal or hydrological features within the unit, in accordance with the Geothermal Steam Act Amendments (30 USC Section 1026)

The BLM solicited input from the State Historic Preservation Offices (SHPOs) and the Advisory Council on Historic Preservation (ACHP) in accordance with the NHPA. The PEIS indentifies a phased consultation process related to historic, traditional, and cultural resources.

Dialogues were initiated with key state agencies involved in the promotion, analysis, and permitting of geothermal development projects, including state geological surveys, state energy offices, and state energy regulatory bodies. The BLM will continue to cooperate with State, local, and tribal governments to promote consistency with their land use plans.

1.10.3 Government-to-Government Consultation

The BLM worked directly with tribal governments on a government-to-government basis. The Federal/tribal government-to-government relationship was reaffirmed by the Federal government on May 14,1998, with Executive Order 13084, and strengthened on November 6, 2000, with Executive Order 13175 (US President 1998, 2000).

The BLM coordinates and consults with tribal governments, Native communities, and individual members of tribes whose interests might be directly and substantially affected by activities on public lands. It strives to provide the tribal entities sufficient opportunities for productive participation in BLM planning and resource management decision making. In addition, Section 106 of the NHPA requires Federal agencies to consult with Indian tribes for undertakings on tribal lands and for historic properties of significance to the tribes that may be affected by an undertaking (36 CFR 800.2 (c)(2)). BLM Manual 8120 (BLM 2004a) and Handbook H-8120-1 (BLM 2004b) provide guidance for Native American consultations.

The BLM developed a process to offer specific consultation opportunities to "directly and substantially affected" tribal governments, as required under the provisions of Executive Order 13175, and to Indian tribes as defined under 36 CFR 800.2(c)(2). Letters were mailed in September 2007 to each tribal executive official of over 400 tribes and pueblos in the western US and Alaska from the Deputy Director of the BLM and Deputy Chief of National Forest Systems of the FS (see Table 6-1 in the Final PEIS). The letters documented the PEIS process and detailed the pending lease applications that are being assessed in the PEIS, and invited tribal governments to participate in the consultation process. Seven tribes provided a response letter. One letter noted that no lease applications were in their area of interest, four letters requested consultation if any lease applications would fall in their areas of interest, and two letters requested consultation and to help participate in the PEIS process.

The Draft PEIS was sent to over 400 tribes and pueblos in the western US and Alaska. Follow-up contacts were made with the two tribes that had requested consultation on the PEIS. Of these, one tribe was not interested in direct government-to-government consultation at this time; one tribe is still considering requesting a meeting but has not provided any comments on the PEIS or plan amendments.

1.10.4 National Historic Preservation Act — Section 106 Consultation

As stated under agency coordination above, the BLM solicited input from the SHPOs and the ACHP in accordance with the NHPA. The PEIS identifies a phased consultation process related to historic, traditional, and cultural resources.

The BLM and FS will continue to work with the ACHP and the SHPOs in all 12 western states to address future development that may affect historic properties on public lands. Each phase of leasing and development will require an appropriate level of Section 106 analysis. Under the PEIS, the BLM is analyzing an allocation decision, the amendment of land use plans to designate certain public lands as open for application for future geothermal leasing. Geothermal development on these lands would require subsequent 106 consultation and analysis of historic resources.

1.10.5 Endangered Species Act — Section 7 Compliance

Section 7 of the ESA directs each Federal agency, in consultation with the Secretary of the Interior and the Secretary of Commerce, as appropriate, to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any listed threatened or endangered species or result in the destruction or adverse modification of critical habitat[1].

Under Section 7 of the ESA, those agencies that authorize, fund, or carry out a Federal action are commonly known as "action agencies." If an action agency determines that its Federal action "may affect" listed species or critical habitat, it must consult with the USFWS of the DOI or the National Marine Fisheries Service (NMFS) of the Department of Commerce (collectively known as the "Services") or both, whichever has jurisdiction over the species or habitat that may be affected[2].

If an action agency determines that the Federal action will not cause any effects on listed species or critical habitat, the action agency does not initiate consultation with the Services, and its obligations under Section 7 are complete. In order to make this determination, an action agency must consider the effects of the action at issue. Regulations implementing NEPA and the ESA each use the terms "direct effect," "indirect effect," and "cumulative effect," but the definitions of these terms are not identical under the statutes. Regulations at 40 CFR 1508.8 and 50 CFR 402.02 highlight these differences. Under NEPA, and as

[1] See ESA § 7; 16 USC 1536. The standard for determining when Federal agencies must consult under the ESA is different from the standard for determining when Federal agencies must prepare an environmental impact statement under NEPA.

[2] See 50 CFR 402.02, 402.13-14.

demonstrated in the PEIS, an agency will examine the direct, indirect, and cumulative impacts of a proposed action. Indirect effects are those caused by the action, later in time, and reasonably foreseeable. Under the ESA, however, the effects of an action are evaluated by a stricter standard. Regulations implementing the ESA define the term "effects of an action" at 50 CFR 402.02 to include direct and indirect effects (and the effects of interrelated or interdependent activities), but limit indirect effects to those that are caused by the action, later in time, and reasonably certain to occur. In addition, ESA regulations limit the term "cumulative effects" to those effects of future state or private activities; NEPA regulations are not so limited.

The "reasonably certain to occur" standard used in the ESA regulations is more demanding than the "reasonably foreseeable" standard used in the NEPA regulations (see 40 CFR 1508.8). Thus, it is possible that a proposed action may have "no effect" under the ESA standard but will have multiple effects under NEPA. The Endangered Species Act standard has been part of interagency regulations at 50 CFR Part 402 since 1986 and is the subject of proposed rules recently promulgated by USFWS and NMFS[3].

Agency Status under ESA Section 7

The DOI (BLM) has concluded that it is the action agency for Endangered Species Act purposes because the BLM manages Federal land where leasing and development of geothermal resources may take place. In particular, the BLM is an action agency for purposes of the land use plan amendments to allocate land as available for leasing, as analyzed in the PEIS and future lease applications that may be submitted. A separate document will contain decisions pertaining to the pending lease applications.

"No Effect" Determination under Section 7

In complying with its duties under Section 7 of the ESA, the action agency has examined the effects on listed species and critical habitat both from allocating land as available for leasing of geothermal resources through land use plan amendments and from issuing leases. As a result of this examination, the action agency has determined that amending land use plans would not cause any effect on a listed species or on critical habitat. This determination is based on the following.

1. Allocation Decisions Do Not Cause Effects on Species or Habitats

   The first proposed action, allocation of BLM-administered lands with geothermal resource potential as closed, open, or open with major or moderate constraints to geothermal leasing through amendment of land

[3] Interagency Cooperation Under the Endangered Species Act, 73 Fed. Reg. 47868 (Aug. 15, 2008) (to be codified at 50 CFR pt. 402).

use plans, fulfills BLM's obligations under FLPMA and would not cause any impact, direct or indirect, as cognizable under the ESA, to listed species or critical habitat. The land use plan amendments identify and allocate such areas, adopt reasonable foreseeable development scenarios, and adopt a list of stipulations, best management practices, and procedures to be applied for the protection of resources.

This proposed action does not establish a precedent or create any legal right that would allow ground-disturbing activities within any of the areas allocated for geothermal leasing. Following lease issuance, when an application to conduct activities involving surface disturbance is submitted that could affect a listed species or critical habitat at a particular location within one of these areas, it would be subject to full policy and legal review at the time it is filed. This includes review and coordination under the ESA and other applicable statutes of the applicability of the stipulations, best management practices, and procedures for the protection of other resources.

Similarly, providing suitability information to facilitate the FS's subsequent consent decision to the BLM for leasing on NFS lands, to the extent this providing of information could be construed to be an action under the Endangered Species Act, is an administrative task that would not cause any impact, direct or indirect, as cognizable under the Endangered Species Act, to listed species or critical habitat.

2. Lease Issuance Does Not Cause Effects on Species or Habitats

The decision to issue a lease is a separate and discretionary decision from the allocation decision made through land use plan amendment. With respect to the pending lease applications analyzed in Volume II, BLM has determined that the issuing of a geothermal lease similarly does not cause any effect on listed species or critical habitat under the ESA. Moreover, there is no guarantee that any particular authorization or lease will be granted, or, even if granted, as explained below, that any development will ever take place on such lease.

This second proposed action, therefore, to complete processing of active pending lease applications and nominations by deciding whether, and under what stipulations, to issue geothermal leases on NFS and public lands, is an action that, in itself, and on the condition that the stipulation addressing ESA matters is incorporated in any lease issued, would not cause any impact, direct or indirect, as cognizable under the ESA, to listed species or critical habitat. Lease rights are always limited by the requirements of other laws, as illustrated in the geothermal regulations at 43 CFR 3200.4.

As explained in Section 2.2.2 of the PEIS, in accordance with BLM Instruction Memorandum No. 2002-174, the BLM will apply the following ESA-related stipulation on any leases where threatened, endangered, or other special status species or critical habitat is known or strongly suspected:

> "The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to the lease terms or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended, 16 USC 1531 et seq., including completion of any required procedure for conference or consultation."

Additionally, the BLM will provide a separate notification through a lease notice to prospective lessees identifying the particular special status species that are present on the lease parcel offered. For agency-designated sensitive species (e.g., sage grouse), a lease stipulation would be imposed for those portions of high value/key/crucial species habitat where other existing measures are inadequate to meet agency management objectives.

Moreover, even without the ESA-related stipulation, lease issuance, by itself, does not afford lessees the right to engage in any ground-disturbing activity. Under the regulations applicable to geothermal development, permits, with associated environmental reviews and coordination, are required at every stage of exploration, drilling, and utilization before the applicant may proceed. Even before lease issuance, pre-leasing exploration cannot take place without approval, which may include protective "Conditions of Approval" (43 CFR 3251.10). The geothermal regulations include prohibitions such as "Do not start activities that will result in surface disturbance until we approve your drilling permit and Sundry Notice" (43 CFR 3261.14). Similar language appears in relation to the regulations that correspond to each stage of geothermal development, including the sections related to drilling (43 CFR 3261.11(b)), utilization, and site licenses: "Do not begin site investigations…" (43 CFR 3271.12(b)); "Do not start construction of pipelines…" (43 CFR 3271.13); "Do not start delivery of geothermal resources to a facility…" (43 CFR 3271.14(b)); "Do not start building or

testing your facility…" Each of these stages provides the BLM with opportunities to decide whether the next stage should be approved, denied, or approved with conditions such as protective measures. See, for example, 43 CFR 3273.12 (e). Each subpart also contains general standards and environmental requirements. See, for example, 43 CFR 3260.11 and 3272.12. Moreover, the agencies must verify that leasing on the applicant's parcel has been adequately addressed in a NEPA document.

Using the ESA stipulation above, as well as the many distinct decision points described in the geothermal development regulations, the agencies have retained the authority post-lease issuance to condition, and even to deny, the use of the leased property if required by the Endangered Species Act. Therefore, even the decision to lease does not result in any effect on listed species or critical habitat. For this reason, the agencies have made a "no effect" determination for the proposed allocation decisions in the land use plan amendments, as well as for the decision to issue leases.

It is important to note that the effects of any future development-stage activities that might occur subsequent to the issuance of a lease would be allowed only following additional site-specific compliance with the ESA and other applicable laws and are not included in the scope of this action. Thus, the effects of development-stage activities are not to be considered effects, direct or indirect, caused by the proposed action (lease issuance) at issue here. The regulations governing geothermal leasing and development provide for several decision stages prior to any ground-disturbing activities taking place and contemplate further compliance with applicable authorities during these decision stages. Therefore, both under the regulatory scheme, and as a practical matter, until BLM receives an application for a permit to drill, or other authorization, that includes specific information about particular projects (i.e., location, scale, technology, etc.), and adjudicates it, it is impossible to determine what effects on listed species or critical habitat might be "reasonably certain to occur" (see 50 CFR Part 402). It is at that time that consultation under Section 7 with NMFS or the USFWS may be appropriate and useful.

For the above reasons, the action agency has determined that amending land use plans to allocate areas as available for geothermal leasing, providing information for later FS decision making, and issuing geothermal leases would have no effect on listed threatened or endangered species or critical habitat.

The action agency reached their "no effect" determination not because listed species and critical habitat are unlikely to be present. To the contrary, Appendix H of the PEIS identifies numerous listed species that occur in the 12 western states where land use plans will be amended and leases may be issued. Areas that may eventually be leased would likely include areas occupied by listed species or within critical habitat.

The action agency considered preparing a biological assessment and initiating consultation with USFWS and NMFS under Section 7(a)(2). After discussing various approaches, the action agency determined that the administrative actions of allocating lands as available for leasing of geothermal resources and issuing leases for these resources would have no effect on listed species or critical habitat. Preparing a biological assessment before a site-specific application for permit to drill has been filed with BLM would be based largely on conjecture and speculation. There would be no way to know before such a site-specific proposal is made whether the impacts to be assessed would be from one or another specific type of geothermal plant or facility, or associated transmission line, etc., or some combination of uses. Further, without knowing the specifics of when and where a project would occur, it would be impossible to know what species, if any, would be affected by these future projects. The agency considered whether it made sense to make assumptions for the purposes of a biological assessment, but were left with no credible basis on which to make such assumptions. The agency determined that such assumptions would be speculative and not linked to the Federal action of allocating lands as available for geothermal leasing through land use plan amendments, or even issuing such leases. Any biological assessment would be a speculative assessment of effects from future site-specific projects, not of the proposed actions addressed in this PEIS as a whole.

This is not to say that there would be no Section 7 consultations (including preparation of biological assessments or biological opinions where appropriate) on future actions that may affect listed species or critical habitat. On the contrary, as explained above, the action agency fully expects that Section 7 compliance, including consultations if necessary, will be appropriate as applications for permits to drill on particular leaseholds are submitted for decision making by the BLM, with FS concurrence, as necessary. That is, if an application for a permit or other authorization is received by an action agency for lands allocated as open for leasing, further compliance with Section 7 of the Endangered Species Act would be initiated at that time.[4] This may take the form of a biological assessment by the action agency and issuance of a biological opinion by USFWS and/or NMFS; a "may affect, not likely to adversely affect" determination by the action agency with Service concurrence; or a "no effect" determination by the action agency. At such time, any biological assessment, biological opinion, concurrence, or "no effect" determination would be based on a detailed application describing the project, site, and method of construction – all features lacking at the present time.

[4] Further, if a future, site-specific proposal may adversely affect essential fish habitat, the action agencies would consult with NMFS, as required by the Magnuson Stevens Fishery Conservation and Management Act, 16 USC 1855(b)(2), prior to approval.

In reaching their "no effect" determination, the action agency found no causal connection, whether direct or indirect, between the mere allocation of areas as available for geothermal leasing (through land use plan amendment), or issuance of such leases, and any effect on a listed species or critical habitat. Allocation of areas as available for leasing of geothermal resources neither guarantees that a lease within such an area will be granted, nor, even if a lease is granted (assuming that the ESA stipulation is incorporated in such lease), that an application for a permit to drill will be granted. Any effects to a listed species or critical habitat that might occur in any of the areas allocated through this planning action or lease issuance in the future are simply unknown at this time and, in any event, would be caused by the grant of a permit, or other site-specific authorization, following full policy and legal review, including compliance (and consultation if appropriate) under Section 7 of the ESA.

1.11 MITIGATION MEASURES

A primary purpose of the PEIS for Geothermal Leasing is the establishment of stipulations and BMPs to ensure that potential adverse impacts associated with the development of geothermal resources on BLM-administered public lands are minimized to the greatest extent possible. Geothermal resource leases are subject to the standard stipulations and lease terms. The current lease terms, which are subject to change, are found on Form 3200-24 (Appendix C). The right to explore, develop, and utilize leased geothermal resources is inherent in the lease, subject to stipulations, legal requirements, and terms and conditions on permits. Specific conditions of approval and other mitigation measures would be required during subsequent authorizations. These include timing and location of activities during the development phases (see Section 2.5 of the PEIS, Reasonably Foreseeable Development Scenario). In addition, BLM and other governmental agencies may require specific permits.

To minimize adverse impacts on resources and uses in the proposed action area, appropriate BMPs and mitigation measures would be applied to future site-specific Plans of Operation, which are required for surface-disturbing activities. The BMPs provide guidance for lessees on how to meet Section 6 of the standard lease terms. Depending on site-specific conditions and individual development plans, the BMPs provided in Appendix B and other mitigation measures may be required. Additional BMPs and mitigation measures could be identified during site-specific analyses.

1.12 MONITORING

Mitigation measures, including lease stipulations and conditions of approval as well as the general operation of geothermal developments, would be monitored by the lessee or the appropriate Federal agency to ensure their continued effectiveness through all phases of development. Using adaptive management strategies, where mitigation measures are determined to be ineffective at

meeting the desired resource conditions, the BLM and FS would take steps to determine the cause and require the operator to take corrective action. This information would also be used to inform future geothermal leasing and development.

1.13 PUBLIC INVOLVEMENT

One of the BLM's primary objectives during development of the PEIS was to understand the concerns and issues of various members of the public by providing opportunities for meaningful participation in the resource management planning process. The PEIS is the result of an extensive and collaborative process with tribal governments, federal agencies, states, stakeholders, and the public.

1.13.1 Scoping

To achieve this, the BLM published the Notice of Intent to prepare a PEIS to evaluate geothermal leasing in the 12 western states, including Alaska, on lands administered by the BLM and the FS in the Federal Register (72 FR 113) on June 13, 2007. The Notice of Intent initiated the public scoping process and invited public comments on the content and issues that should be addressed in the PEIS. The BLM and the FS conducted scoping from June 13, 2007 through August 13, 2007. During that period, the BLM and the FS invited the public and interested groups to provide information and guidance, suggest issues that should be examined, and express their concerns and opinions on geothermal leasing in eleven western states and Alaska on public lands administered by the BLM and the FS. Public meetings were held in ten cities in July 2007: Anchorage, Alaska; Boise, Idaho; Denver, Colorado; Missoula, Montana; Phoenix, Arizona; Portland, Oregon; Reno, Nevada; Sacramento, California; Salt Lake City, Utah; and Santa Fe, New Mexico.

Approximately 175 people attended the scoping meetings, and 101 verbal comments were identified and cataloged from these meetings. A total of 79 written comments were received in the form of comment cards submitted at the public meetings (2); letters by US Mail or by hand delivery (16); and by electronic mail (63).

The BLM and FS published a scoping report on the project Web site that summarized and categorized the major themes, issues, concerns, and comments expressed by private citizens, government agencies, private firms, and nongovernmental organizations. The BLM and FS considered the comments in developing the alternatives and analytical issues that are contained in the PEIS. Summaries of the individual letters, facsimiles, and electronic comments received during scoping are available within the scoping report (www.blm.gov/geothermal_eis).

1.13.2 Public Comments on the Draft PEIS

The EPA published a Notice of Availability of the Draft PEIS in the Federal Register on June 13, 2008 (73 FR 115). The Notice of Availability initiated the 90-day public comment period provided for planning actions.

The BLM Project Web site contained the Draft PEIS in its entirety for download. Copies of the document were sent to a mailing list of over 1,000 recipients. In addition, over 100 copies of the CD-ROM or hardcopies of the document were mailed in response to document requests. In preparing the Final PEIS, the BLM and FS considered all comments received or postmarked during the public comment period.

During the 90-day public comment period, the BLM and FS held 13 public meetings in the 12-western-state-project area in July 2008. Meeting locations included Albuquerque, New Mexico; Anchorage, Alaska; Boise, Idaho; Denver, Colorado; Fairbanks, Alaska; Helena, Montana; Portland, Oregon; Reno, Nevada; Sacramento, California; Salt Lake City, Utah; Seattle, Washington; and Tucson, Arizona. Over 200 people attended the public meetings.

1.13.3 Release of the PEIS

The EPA published the Notice of Availability of the Final PEIS in the Federal Register on October 24, 2008 (73 FR 207). As BLM continues to implement its geothermal program, it will continue to actively seek the views of the public using outreach techniques such as news releases and Web site information to offer opportunities for public participation and to inform the public of new and ongoing project proposals, site-specific planning, and opportunities and timeframes for comment. The BLM will also continue to coordinate, both formally and informally, with the numerous State, Federal, tribal, and local agencies and officials interested and involved in the management of geothermal resources on public lands within the 12-state planning area.

1.13.4 Comments on the Final PEIS and Proposed Plan Amendments

The BLM received one comment letter on the Final PEIS from the EPA. The letter noted that the BLM had adequately addressed the EPA's comments on the Draft PEIS but expressed concern related to groundwater quantity and quality, especially where there are sole-source aquifers and protected geothermal resources. In particular, EPA felt there is a potential for the mixing of geothermal fluids from reinjection with surface or groundwater by connections through an existing underground fault system, and requested that the BLM include a process to incorporate the results from any existing groundwater flow analyses into the decision-making process before leasing potential geothermal resource areas and to complete groundwater flow analysis for site-specific projects before drilling. In addition, EPA requested that the ROD include mitigation measures to protect sole-source aquifers.

In response to EPA's concern, the ROD clarifies that drilling of temperature gradient wells and the subsequent slim-hole or full-diameter wells will be conducted to protect surface- and groundwater from contamination by drilling fluids and geothermal fluids. This is accomplished by requiring all well bores to be cased and cemented from the top of the production liner to the surface to prevent cross contamination and mixing between aquifers. Site-specific impacts on water resources, including groundwater and water quality, would be addressed as part of the environmental analysis for the permitting process. These evaluations will result in site-specific stipulations that will condition the lease for possible future permitting activities to assess and develop the geothermal resource. Subsequent periodic mechanical integrity testing of the wells, monitoring of groundwater resources, and other appropriate environmental monitoring will assure the maximum protection to water resources. Appendix B of the ROD provides BMPs to address methods to minimize water contamination. An additional clarifying BMP was added to this ROD in Appendix B, Section B.1.3 to further address EPA's concerns. Additionally, Federal, State, and local regulations ensure that operators will conduct drilling in a prudent manner.

Comments on the Final PEIS were also received from New Mexico, and inquiries were made by Utah as part of the Governor's Consistency Review process. In both cases, conversations between the BLM and the States were held and resolutions with the states were reached. These comments were discussed in Section 1.10.1 of this ROD.

1.13.5 Availability of the Record of Decision

Paper and electronic copies of the ROD with the Plan Amendments are available for review at any BLM State Office or Field Office. Copies are also available by request to geothermal_eis@blm.gov or by writing to Idaho State Office, 1387 South Vinnell Way, Boise, Idaho 83709, Attention: Jack Peterson.

Interested persons may also review the ROD and the Final PEIS on the Internet at www.blm.gov/geothermal_eis.

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CHAPTER 2
RESOURCE MANAGEMENT PLAN AMENDMENTS

2.1 INTRODUCTION

The US Department of the Interior, Bureau of Land Management, develops land use plans to guide activities, establish management goals and approaches, and establish land use allocations within a planning area. Current land use plans are called resource management plans; in the past, such plans were called management framework plans, and some of these MFPs are still in use. Analyses conducted for Alternative B, Proposed Action in the PEIS support the amendment of specific land use plans in those field offices where geothermal resources are located.

The Plan Amendments amend 114 plans (See Appendix A) to do the following:

- Identify public lands that are administratively and legally closed or open to leasing, and under what conditions.

- Develop a comprehensive list of stipulations, BMPs, and procedures to serve as consistent guidance for future geothermal leasing and development on public and NFS lands.

- Provide a reasonably foreseeable development scenario for geothermal development on Federal lands (see Section 1.3.2 of this ROD for a description of the reasonably foreseeable development scenario).

The amendments only affect allocations and management of geothermal resources. These plans continue to outline the decisions or protocols for the management of the other resource uses or values within the appropriate planning areas.

2.2 LAND USE ALLOCATIONS

The allocations by land use plan and field office are provided in Table A-1 (see ROD Appendix A). In total, approximately 111 million acres[5] of BLM public land are allocated as open to geothermal leasing subject to existing laws, regulations, formal orders, stipulations attached to the lease form, and the terms and conditions of the standard lease form (see ROD Appendix C). In addition, about 79 million acres of FS lands are legally open (see Figures 2-5 and 2-6 in the Final PEIS). While these lands are allocated as open, compliance with laws and regulations could nevertheless prohibit some lands from leasing. For example, if it is determined that subsequent exploration, development, or utilization of nominated lands would likely result in a significant adverse effect on a significant thermal feature within a unit of the National Park System, the lease would not be issued pursuant to the Geothermal Steam Act Amendments of 1988 (30 USC Section 1026[c]).

2.2.1 Closed Lands

Areas identified as closed to leasing included non-discretionary closures based on existing laws, regulations (see 43 CFR 3201.11), and Executive Orders, and discretionary closures. Non-discretionary closures include the following lands administered by the BLM and FS:

- National Monuments.
- National Conservation Areas and similar designations with the exception of King Range National Conservation Area and Steese National Conservation Area.
- Wilderness Areas and National Wilderness Areas.
- Wilderness Study Areas.
- Lands within areas allocated for wilderness or further planning in Executive Communication 1504, Ninety-Sixth Congress (House Document 96-119), unless such lands are allocated to uses other than wilderness by a land and resource management plan or are released to uses other than wilderness by an act of Congress.
- National Recreation Areas.
- Designated Wild Rivers under the Wild and Scenic River Act.
- The Island Park Geothermal Area (includes NFS lands in Idaho and Montana).

[5] The Final PEIS identified about 118 million acres of BLM public land as being open for geothermal leasing. The ROD removed or deferred making an amendment decision on eight plans, which contained about seven million acres classified as open for leasing. (see ROD section Notice of Modifications Made to the Plan Amendments).

- Withdrawn lands under Section 17(d)(1) of the Alaska Native Claims Settlement Act.[6]

- Valles Caldera National Preserve, New Mexico.

In addition, there are other lands administered by other Federal agencies that are legally closed to leasing, including lands managed as part of the National Wildlife Refuge System (16 USC 668 [dd]) and lands within units of the National Park System. Prior to making a leasing decision on lands in proximity to a National Park System unit, the BLM or FS must determine if there would be any impacts to thermal or hydrological features within the unit, in accordance with the Geothermal Steam Act Amendments (30 USC Section 1026).

In addition to non-discretionary closures, the BLM has administratively designated the following areas as unavailable for leasing:

- The California Desert Conservation Area[7].
- Areas of Critical Environmental Concern where the BLM determines that geothermal leasing and development would be incompatible with the purposes for which the Area of Critical Environmental Concern was designated, or those whose management plans expressly preclude new leasing or development for oil and gas or geothermal resources. A list of Areas of Critical Environmental Concern that are currently open and closed to fluid mineral leasing is provided in Appendix C of the PEIS.[8] No new closures are proposed.
- Other lands within BLM's National Landscape Conservation System, such as National Historic and Scenic Trails.
- National Landmarks and Research Natural Areas.
- Military reservations encompassing public lands are open for development except in instances where geothermal development

[6] Section 17(d)(1) of the Alaska Native Claims Settlement Act of 1971 authorized the Secretary of the Interior to withdraw and reserve lands for study and classification. These withdrawals closed the lands to disposal and appropriation under public land laws, including mining and mineral leasing laws. The withdrawals remain in effect on about 50 million acres of public land in Alaska. The BLM makes recommendations for revocation of the withdrawals through the planning process, and the Secretary makes the final determination. The PEIS recognized that most land administered by the BLM in Alaska is withdrawn from geothermal leasing; however, these lands were included for analysis because the Secretary could revoke lands from withdrawal in the future. The PEIS did not make any recommendations on what lands are recommended for revocation from withdrawal; such determinations will be made in the appropriate BLM land use plans.

[7] Geothermal leasing and development is allowed in designated portions of the California Desert Conservation Area in accordance with the California Desert Conservation Area Plan, 1980, as amended (BLM 1999).

[8] Information regarding the terms of allowable uses was not available for every ACEC in the project area. For purposes of analysis in this document, where information was unavailable it was presumed the areas were closed to geothermal leasing; however, this information is available from individual Field Offices.

conflicts directly with the terms of the reservation or the mission as identified by the military.

- Areas previously closed to fluid minerals development in approved land use plans.

2.3 STIPULATIONS AND BMPS

The Plan Amendments adopt stipulations for geothermal leasing and BMPs that could be applied to subsequent applications for geothermal exploration, drilling, utilization, and reclamation. Lease stipulations are provided below, and BMPs are listed in the ROD Appendix B.

2.3.1 Lease Stipulations

This section provides the list of constraints that would be applied as appropriate by the authorized officer to any new leases for lands that are available for geothermal leasing. Lease stipulations are major or moderate constraints applied to a new geothermal lease. A lease stipulation is a condition of lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or at certain locations or by mitigating unacceptable impacts, to an extent greater than standard lease terms or conditions. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the BLM's regulatory authority to protect resources or resource values.

Local land use plans take different approaches to protect resources depending on the circumstances in those planning areas. The geothermal stipulations herein have been developed to address a wide variety of landscapes, climates, and ecosystems, without disrupting the management approach of local land use plans. Where the agency determines that particular stipulations may be inappropriate for a planning area, the procedures for waivers, exception, and modifications would be followed as discussed in the Final PEIS.

The following stipulations serve as the minimal level of protection and are adopted as applicable to each plan. The authorized officer retains the discretion to issue stipulations in order to mitigate the impacts on other land uses or resource objectives as defined in the guiding resource management plan. For example, if an administrative unit has eligible wild and scenic rivers, the wild river stipulation would apply. If an existing land use plan offers more protective measures or has resource-specific commitments (e.g., a memorandum of understanding for cultural resources), those more-protective measures would apply instead.

2.3.2 No Surface Occupancy Lease Stipulations

No Surface Occupancy (NSO) stipulations are considered a major constraint, as they do not allow for surface development. An NSO is appropriate when the standard terms and conditions, other less restrictive lease stipulations (see below), and best management practices for permit approval are determined to be insufficient to achieve the resource protection objectives.

- Designated or proposed critical habitat for listed species under the Endangered Species Act of 1973 (as amended) if it would adversely modify the habitat. For listed or proposed species without designated habitat, NSO would be implemented to the extent necessary to avoid jeopardy.
- Within the boundary of properties designated or eligible for the National Register of Historic Places, including National Landmarks and National Register Districts and Sites, and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.
- Areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.
- Water bodies, riparian areas, wetlands, playas, and 100-year floodplains.
- Developed recreational facilities, special-use permit recreation sites (e.g., ski resorts and camps), and areas with significant recreational use with which geothermal development is deemed incompatible, excluding direct use applications.
- Designated National Scenic and Recreational Rivers under the Wild and Scenic River Act.
- Segments of rivers determined to be potentially eligible for Wild and Scenic Rivers status by virtue of a Wild and Scenic River inventory, including a corridor of 0.25 mile from the high water mark on either side of the bank[9].

[9] A number of land use plans are currently undergoing revision, and as part of that process Wild and Scenic River inventories have been undertaken. Where a river or river segment has been found to be "eligible" for inclusion in the Wild and Scenic River system as part of one of these inventories, the BLM has the obligation to protect the lands along the eligible segment until a "suitability" determination has been made as part of the land use planning process. If the river or river segment is found to be "non-suitable," the lands along the river then would be available for other uses. If a river or river segment is determined to be suitable for inclusion in the Wild and Scenic River system, the BLM will forward that recommendation to Congress for action and will continue to protect the lands along the river.

- Designated important viewsheds, including (1) public lands designated as VRM Class I, and (2) NFS lands with a Scenery Management System integrity level of Very High.
- Slopes in excess of 40 percent and/or soils with high erosion potential.
- Areas that are defined as having special resource values for subsistence needs in Alaska.

Additional NSO stipulations could be applied in conformance with the local land use plan to address site-specific resource concerns.

2.3.3 Timing Limitations and Controlled Surface Use Lease Stipulations

Where standard lease terms and permit-level decisions are deemed insufficient to protect sensitive resources, but where an NSO is deemed overly restrictive, the BLM and FS would apply seasonal or time limited stipulations or controlled surface use stipulations to leases. In general, timing limitations are used to protect resources that are sensitive to disturbance during certain periods. Such stipulations are generally applicable to specific areas, seasons, and resources. They are commonly applied to wildlife activities and habitat, such as winter range for deer, elk, and moose; nesting habitat for raptors and migratory birds; and breeding areas. Buffer zones are also used to further mitigate impacts from any human activities. The size of buffers can also be specific to species and location, and can change based on findings of science or movement of species. Therefore, timing limitations would be applied by the authorizing officer as appropriate for the specific lease areas and in compliance with the unit's resource management plan. The BLM would consult with the appropriate agencies (e.g., state wildlife agencies) in establishing the periods and extent of area for timing limitations.

A controlled surface use stipulation allows the BLM to require that any future activity or development be modified or relocated from the proposed location if necessary to achieve resource protection. The project applicant will be required to submit a plan to meet the resource management objectives through special design, construction, operation, mitigation, or reclamation measures, and/or relocation. Unless the plan is approved, no surface occupancy would be allowed on the lease. The following controlled surface use stipulations would be applied by the authorizing officer as appropriate for the specific area and site conditions.

- ***Protection of riparian and wetland habitat.*** This stipulation would be applied within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected.

- ***Protection of visual resources.*** This stipulation would be applied to BLM Visual Resource Management Class II areas (Visual Resource Management Class III management objectives would be met through conditions of approval applied during the permit approval process, and may be referenced in a lease notice); NFS lands with a Scenery Management System integrity level of High; and other sensitive viewsheds such as within the visual setting of National Scenic and Historic Trails or near residential areas.
- ***Protection of recreational areas.*** This stipulation would be applied to minimize the potential for adverse impacts to recreational values, both motorized and non-motorized, and the natural settings associated with the recreational activity.
- ***Compatibility with urban interface.*** This stipulation would be applied to minimize the potential for adverse impacts to residential areas, schools, or other adjacent urban land uses.
- ***Protection of erosive soils and soils on slopes greater then 30 percent.*** This stipulation would be applied to minimize the potential for adverse impacts to erosive soils as defined as severe or very severe erosion classes based on Natural Resources Conservation Service mapping.
- ***Protection of important habitat and migration corridors***. This stipulation would be applied to protect the continuity of migration corridors and important habitat.

2.3.4 Other Lease Stipulations

Protection of Geothermal Features

Under the following situations, the BLM or FS would apply stipulations to protect the integrity of geothermal resource features, such as springs and geysers. If it is determined that geothermal operations are reasonably likely to result in a significant adverse effect to such a feature, then BLM would decline to issue the lease.

- The BLM or FS would include stipulations to protect any significant thermal features of a National Park System unit that could be adversely affected by geothermal development. These stipulations will be added, if necessary, when the lease or permit is issued, extended, renewed, or modified (43 CFR 3201.10[b]).
- Any leases that contain thermal features (e.g., springs or surface expressions) would have a stipulation requiring monitoring of the thermal features during any exploration, development, and production of the lease to ensure that there are no impacts to water quality or quantity.

Endangered Species Act Stipulation

In accordance with BLM Instruction Memorandum No. 2002-174, the BLM will apply the following stipulation on any leases where threatened, endangered, or other special status species or critical habitat is known or strongly suspected. Additionally, the BLM will provide a separate notification through a lease notice to prospective lessees identifying the particular special status species that are present on the lease parcel offered.

> "The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 USC 1531 et seq., including completion of any required procedure for conference or consultation."

Sensitive Species Stipulation

For agency-designated sensitive species (e.g., sage grouse), a lease stipulation (NSO, controlled surface use, or timing limitations) would be imposed for those portions of high value/key/crucial species habitat where other existing measures are inadequate to meet agency management objectives.

Cultural Resources Stipulation

In accordance with BLM Instruction Memorandum No. 2005-003, the BLM will apply the following stipulation to protect cultural resources:

> "This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated."

Roadless Area Stipulation

The FS manages about 51,477,000 acres of land in the planning area that is designated as inventoried roadless areas. The BLM will issue a non-discretionary restriction on any leases within NFS inventoried roadless areas. Specifically, no new road construction or reconstruction would be allowed in designated roadless areas. If future legislation or regulations change the roadless area designation, the restriction would be revised, along with any appropriate environmental review.

2.4 MANAGEMENT PROCEDURES FOR GEOTHERMAL LEASING

To ensure compliance with regulations and Federal laws, the following procedures would be implemented prior to any lands being included in a competitive lease sale. Stipulations listed above would also be used to help achieve resource protection in accordance with laws and regulations and the guiding land use plan. Given the scope of the leasing program, there will be leasing on FS-administered lands; therefore, the procedures include FS actions as applicable.

- The FS will be consulted and will provide a consent determination (including terms and conditions or stipulations) to the BLM prior to any parcels on NFS lands being offered for lease sale. As a condition of consent to the issuance of any lease, the FS would be consulted on the development of a surface use plan.
- The authorized officer of the BLM or FS would consult with the appropriate Native American tribal governments and Alaska Natives to identify tribal interests and traditional cultural resources or properties that may be affected by the Federal land leases and potential for geothermal energy development. Tribal interests include economic rights such as Indian trust assets and resource uses and access guaranteed by treaty rights. Traditional cultural resources or properties include areas of cultural importance to contemporary communities, such as sacred sites or resource gathering areas. There may be issues related to the presence of cultural properties, access rights, disruption to traditional cultural practices, cultural use of hot springs and water sources and impacts to visual resources important to tribes. Areas proposed for leasing may include lands where there are tribal interests and traditional cultural resources that are not currently identified. Consultations on leases should include a full disclosure of the lease as a commitment of the land that may eventually involve future development that could preclude other tribal uses. Consideration and research should be directed to determine if there are other ethnic and social groups that may have traditional uses or ties to the lands proposed for leases.

- The authorized officer of the BLM or FS would consult with the appropriate Native American Tribes, Alaska Natives, and State Historic Preservation Officers regarding historic and cultural resources per Section 106 of the National Historical Preservation Act. The presence of archaeological sites and historic properties would be determined on the basis of a records search and literature review of recorded sites and properties in the proposed lease area and a buffer around the lease area, if appropriate. The BLM or FS would assess the adequacy of the cultural resource identification and evaluation effort for the leasing stage. Additional historical, cultural or ethnographic research, consultation and/or inventories may be required to identify resources, determine effects, mitigate adverse effects and complete the Section 106 process. This PEIS addresses the Section 106 process at a programmatic level and serves as a basis for the phased consultation process. All existing memorandums of understanding and agreements regarding the identification and protection of cultural resources would remain valid.
- The authorized officer of the BLM or FS would determine if any listed or proposed threatened or endangered species or critical habitat is present on nominated lease parcels. If so, the authorized officer would comply with Section 7 of the Endangered Species Act, which may include consultation or conferencing with the US Fish and Wildlife Service and/or National Oceanic and Atmospheric Administration Fisheries. Additional compliance activities, which may include consultation, would occur during the site-specific project permitting process.
- The authorized officer of the BLM or FS would review the lands for any other sensitive resources (e.g., paleontological, BLM sensitive status species, and FS species of local concern) and provide for the necessary stipulations to protect these resources and ensure compliance with the land use plan. Assessment of the resource would include consulting with agency experts, coordinating with other appropriate agencies, and site surveys if warranted.
- During the processing of any lease nomination or application in Alaska, the authorized officer of the BLM or FS would conduct and document a site-specific analysis of the effects of the lease on subsistence uses and needs in accordance with Section 810(a) of the Alaska National Interest Lands Conservation Act.
- Prior to making a leasing decision on lands in proximity to a National Park System unit, the BLM or FS would coordinate with the National Park Service to determine if there would be any impacts to thermal or hydrological features within the unit. In accordance with the Geothermal Steam Act Amendments (30 USC

Section 1026), if it is determined based on scientific evidence that exploration, development, or utilization of the lands subject to the lease application or nomination is reasonably likely to result in a significant adverse effect on a significant thermal feature within the National Park System, the lease would not be issued. In the event that development is reasonably likely to adversely affect a significant thermal feature, the BLM would apply the appropriate stipulations to protect the park units (see Protection of Geothermal Features stipulations above).

- Prior to making leasing decisions, the BLM will assess the adequacy of existing NEPA documentation and ensure that the proposed action is in conformance with the approved land use plan (i.e., through completion of a DNA) to determine if there is new information or new circumstances that warrant further analysis. For example, additional NEPA analysis may be required in light of new information, or a potential change in management approach regarding resources identified for special management (e.g., travel management planning or areas under consideration by BLM for management for wilderness characteristics).
- The level of environmental analysis to be required under NEPA for subsequent individual exploration, development, and production permits will be determined at the Field Office and FS unit level. In certain instances, it may be determined that a tiered environmental assessment is appropriate in lieu of an environmental impact statement. To the extent that land use plans or the PEIS anticipated issues and concerns associated with individual projects, including potential cumulative impacts, the BLM and FS will tier from land use plans and/or the PEIS analysis and decisions; thereby limiting the required scope and effort of additional project-specific NEPA analysis.
- The authorized officer of the BLM or FS would collaborate with appropriate state agencies, especially in the case of geothermal energy, as the states manage and typically have regulatory authority for water quality, water rights, and wildlife.
- Applicants for geothermal development and production on public or NFS lands will develop a project-specific operations plan that incorporates the applicable mitigation and best management practices provided in ROD Appendix B and, as appropriate, the requirements of other existing and relevant BLM and FS mitigation guidance. Additional mitigation measures will be incorporated into the operations plan and into the conditions of approval or project stipulations. The operations plan will include site plans, location of facilities, wells, pipelines, transmission lines, roads, and other infrastructure.

2.5 CONSIDERATION OF OTHER BLM PLANS AND POLICIES

The ROD for the Plan Amendments amends the land use plans existing at the time the ROD is implemented and identifies those areas designated as open or closed for nomination and applications for geothermal leasing. The resource management plan amendments are listed in Table A-1. These plans continue to outline the decisions or protocols for the management of the other resource uses or values within the appropriate planning areas.

In the event there are inconsistencies or discrepancies between previously approved plans and these Plan Amendments, the decisions contained in the Plan Amendments for geothermal resources will be followed. The affected Field Offices will continue to tier to statewide, national, and programmatic environmental impact statements and other NEPA and planning documents, as well as to consider and apply BMPs or other management protocols contained in other planning documents after appropriate site-specific analysis.

All future resource authorizations and actions will conform to, or be consistent with, the decisions contained in these Plan Amendments. All existing operations and activities authorized under permits, contracts, cooperative agreements or other authorizations will be modified, as necessary, to conform to this plan within a reasonable timeframe. However, this plan does not impact valid existing rights on public lands. If such authorizations come up for review and can be modified, they will also be brought into conformance with the plan.

2.6 PLAN IMPLEMENTATION

General Implementation Schedule

The decisions of the Plan Amendments go into effect upon signature of the ROD.

Data Refinement

The available GIS data and maps used for the analysis in the Final PEIS are available at the project Web site (www.blm.gov/geothermal_eis). Additional data are available at the BLM and FS geocommunicator Web site (www.geocommunicator.gov). Data used in development of the Plan Amendments are dynamic. GIS boundary data were incomplete for some planning areas. Thus, please note that all acreages presented in the Plan Amendments (and shown in Appendix A) are estimations, even when presented to the nearest acre. The data and maps used throughout the Plan Amendments are for land use planning purposes only and will be refined as on-the-ground implementation occurs.

Maintaining and Monitoring the Plan

Land use plan decisions and supporting information associated with the amended land use plans can be maintained to reflect minor changes in data, but maintenance is limited to refining, documenting, and/or clarifying previously approved plan decisions. Minor updates of data are considered plan maintenance, which will occur over time as the RMP is implemented. Maintenance will not result in expansion in the scope of resource uses or restrictions, or change the terms, conditions, and decisions of the approved plan.

In addition, the BLM expects that new information gathered from field inventories and assessments, research, other agency studies, and other sources will update baseline data and/or support new management techniques, best management practices, and scientific principles. Where monitoring shows land use plan actions or best management practices are not effective, modifications or adjustments may occur without amendment or revision of the plan as long as assumptions and impacts disclosed in the analysis remain valid, and broad-scale goals and objectives are not changed. Plan maintenance will be documented in supporting records.

Changing the Plan

The Plan Amendments may be changed, should conditions warrant, through a plan amendment process. A plan amendment may become necessary if changes in circumstances or actions come under consideration that may result in a change in the scope of resource uses or a change in the terms, conditions, or decisions of the approved plan (e.g., significant new information is available, or a proposal or action comes under consideration that is not in conformance with the plan). The results of monitoring, evaluation of new data, or policy changes and changing public needs might also provide the impetus for an amendment. Generally, an amendment is issue-specific. If the plan amendments become outdated or otherwise obsolete, a further plan amendment may become necessary. Plan amendments are accomplished with public input and the appropriate level of environmental analysis and NEPA compliance.

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CHAPTER 3
REFERENCES

BLM 2008a. *Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States.* Prepared by US DOI BLM, USDA Forest Service, and EMPSi. October 2008.

BLM 2004a. BLM Manual 8120. *Tribal Consultation Under Cultural Resources Authorities*.

BLM 2004b. Handbook H-8120-1. *General Procedural Guidance for Native American Consultation*.

NREL 2006. *Geothermal – The Energy Under our Feet: Geothermal Resources Estimates for the United States*. Technical Report NREL/TP-840-40665. By Bruce Green and Gerald Nix. November 2006.

Western Governors' Association 2006. Clean and Diversified Energy Initiative. Geothermal Task Force Report. January 2006. Available at: http://www.westgov.org/wga/initiatives/cdeac/geothermal.htm.

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APPENDIX A
RESOURCE MANAGEMENT PLAN AMENDMENTS FOR GEOTHERMAL LEASING

The following table lists all the plans that are being amended by this decision. Allocations and reasonably foreseeable development scenarios for electrical generation (projected megawatts [MW]) are provided for each affected administrative unit (field office or districts). Specific allocations for each plan will be calculated and applied by the individual administrative units. Specific areas of BLM-administered lands have not been identified for electrical production in Colorado, Montana, or Wyoming; however, it is expected that up to 50 MW of capacity could occur in these states. In addition to electrical generation, all the affected administrative units have the potential for direct use of geothermal resources. In addition to allocations, the amendments adopt the stipulations and leasing procedures provided in Chapter 2 and the BMPs provided in Appendix B.

Table A-1
Resource Management Plan Amendments

District or Field Office†	Land Use Plan(s)	Acres Open	Acres Closed	Projected MW	
				2015	2025
Alaska					
Anchorage	Ring of Fire RMP Kobuk-Seward RMP	992,786	--[1]	20	150
Fairbanks	Central Yukon RMP Kobuk-Seward RMP	4,867,749	1,444,835[1]	--	--
Arizona					
Arizona Strip	Arizona Strip RMP	626,291	328,799	--	--

Table A-1
Resource Management Plan Amendments

District or Field Office†	Land Use Plan(s)	Acres Open	Acres Closed	Projected MW	
				2015	2025
Hassayampa	Lower Gila North MFP* Phoenix RMP*	701,670	88,515	--	--
Kingman	Kingman RMP	2,219,911	373,299	--	--
Lake Havasu	Lake Havasu RMP	1,352,613	178,621	--	--
Lower Sonoran	Phoenix RMP* Lower Gila South RMP*	860,793	344,285		
Safford	Safford RMP	1,270,987	90,893	20	50
Tucson	Safford RMP Phoenix RMP*	520,812	172,746	--	--
Yuma	Lower Gila South RMP* Yuma RMP*	1,289,013	186,006	--	--
California					
Alturas	Alturas RMP Cedar Creek/Tule Mountain Integrated RMP*	502,188	89,093	480	490
Arcata	Arcata RMP Headwaters RMP	83,436	56,341	--	--
Bakersfield	Caliente RMP* Hollister RMP	560,591	330,725	--	--
Barstow	West Mojave RMP	2,892,852	1,488,168	--	--
Bishop	Bishop RMP	747,823	284,029	120	240
Eagle Lake	Eagle Lake RMP	1,041,655	407,959	10	10
El Centro	E. San Diego County RMP	1,236,466	853,632	1,355	3,063
Hollister	S. Diablo Mountain Range and Central Coast RMP	273,622	29,240	--	--
Palm Springs-S. Coast	South Coast RMP*	1,555,386	1,017,252	--	--
Redding	Redding RMP	51,209	2,954	0	50
Surprise	Surprise RMP	1,430,221	397,653	30	60

Table A-1
Resource Management Plan Amendments

District or Field Office†	Land Use Plan(s)	Acres Open	Acres Closed	Projected MW	
				2015	2025
Colorado					
Columbine	San Juan/San Miguel RMP* Glenwood Springs RMP*	63,001	2,795	--	--
Delores	San Juan/San Miguel RMP*	427,661	143,103	--	--
Glenwood Springs	Glenwood Springs RMP*	567,172	27,717	--	--
Grand Junction	Grand Junction RMP*	420,016	66,622	--	--
Gunnison	Gunnison RMP	614,233	164,408	--	--
Kremmling	Kremmling RMP*	367,370	13,807	--	--
Little Snake	Little Snake RMP*	962,205	4,457	--	--
Pagosa Springs	San Juan/San Miguel RMP*	5,777	699	--	--
Royal Gorge	Northeast RMP Royal Gorge RMP	661,011	73,627	--	--
Uncompahgre	Uncompahgre Basin RMP* San Juan/San Miguel RMP*	800,861	130,462	--	--
White River	White River RMP	884,343	22,415	--	--
Idaho					
Bruneau	Bruneau MFP	1,604,986	316,553	--	--
Four Rivers	Cascade RMP* Kuna MFP* Jarbidge RMP*	1,340,695	562,196	138	275
Burley	Cassia RMP Twin Falls MFP Monument RMP	849,597	70,471	263	425
Challis	Challis RMP	908,313	139,652	--	--
Cottonwood	Chief Joseph MFP*	90,128	13,963	--	--
Jarbidge	Jarbidge RMP*	1,565,165	131,547	113	225
Owyhee	Owyhee RMP	1,497,330	303,451	--	--

Table A-1
Resource Management Plan Amendments

District or Field Office†	Land Use Plan(s)	Acres Open	Acres Closed	Projected MW	
				2015	2025
Pocatello	Malad MFP* Pocatello RMP*	554,115	44,554	100	200
Salmon	Lemhi RMP	520,764	60,464	10	20
Shoshone	Bennett Hills/ Timmerman Hills MFP Magic MFP Monument RMP Sun Valley MFP	1,904,389	428,425	113	225
Upper Snake	Big Desert MFP* Big Lost MFP* Little Lost-Birch MFP* Medicine Lodge RMP*	1,881,331	237,801	120	300
Montana					
Billings	Billings Resource Area RMP*	149,410	6,768	--	--
Butte	North Headwaters RMP*	272,708	35,014	--	--
Dillon	Dillon RMP	910,199	165,583	--	--
Lewistown	Judith Valley Phillips RMP*	183,749	133	--	--
Malta	West HiLine RMP*	4,076	0	--	--
Miles City	Big Dry RMP* Powder River Resource Area RMP*	1,863,245	84,618	--	--
Missoula	Garnet Resource Area RMP	55,344	2,564	--	--
Nevada					
Battle Mountain	Shoshone-Eureka RMP Tonopah RMP	10,419,122	933,196	306	586
Carson City	Carson City Consolidated RMP	4,988,877	677,456	536	971
Elko	Elko RMP Wells RMP	7,505,351	536,717	238	488
Las Vegas	Las Vegas RMP	3,426,674	709,582	--	--

Table A-1
Resource Management Plan Amendments

District or Field Office†	Land Use Plan(s)	Acres Open	Acres Closed	Projected MW	
				2015	2025
Winnemucca	Paradise-Denio MFP* Sonoma-Gerlach MFP*	8,232,520	546,952	405	781
New Mexico					
Carlsbad	Carlsbad RMP	186,375	0	--	--
Farmington	Farmington RMP	1,421,241	113,860	--	--
Las Cruces	MacGregor Range RMP Mimbres RMP* White Sands RMP	5,000,939	523,188	80	170
Rio Puerco	Rio Puerco RMP*	978,622	362,255	--	--
Roswell	Roswell RMP	119,750	0	--	--
Soccoro	Socorro RMP*	1,267,174	299,915	--	--
Taos	Taos RMP*	533,041	144,066	--	--
Oregon					
Burns†	Three Rivers RMP	3,268,606	1,055,056	0	50
Eugene†	Eugene District RMP*	0	0	--	--
Medford†	Medford RMP*	209,513	52,764	--	--
Prineville†	Two Rivers RMP* Brothers/LaPine RMP* John Day RMP* John Day River MP* Lower Deschutes RMP	1,652,041	295,084	295	1,040
Roseburg†	Roseburg RMP*	0	0	--	--
Salem†	Salem RMP*	138,070	19,008	--	--

Table A-1
Resource Management Plan Amendments

District or Field Office†	Land Use Plan(s)	Acres Open	Acres Closed	Projected MW	
				2015	2025
Utah					
Cedar City	Cedar Beaver Garfield Antimony RMP Pinyon MFP	2,102,417	23,739	160	370
Kanab	Paria MFP* Vermilion MFP* Zion MFP*	145,417	15,519	--	--
Richfield	Mountain Valley MFP* Henry Mountain MFP* Parker Mountain MFP*	400,725	49,649	20	50
St. George	St. George (formerly Dixie) RMP	468,886	63,378	--	--
Vernal	Book Cliffs MFP* Diamond Mountain RMP*	272,862	0	--	--
Washington					
Spokane†	Spokane RMP	251,096	14,415	50	600
Wyoming					
Buffalo	Buffalo RMP	571,425	12,301	--	--
Casper	Platte River RMP*	517,576	9,160	--	--
Cody	Big Horn Basin RMP Cody RMP*	722,834	39,317	--	--
Kemmerer	Kemmerer RMP*	693,806	83,508	--	--
Lander	Lander RMP*	1,201,201	32,423	--	--
Newcastle	Newcastle RMP	132,922	0	--	--
Pinedale	Pinedale RMP* Snake River RMP	704,239	39,119	--	--

Table A-1
Resource Management Plan Amendments

District or Field Office†	Land Use Plan(s)	Acres Open	Acres Closed	Projected MW	
				2015	2025
Rawlins	Great Divide RMP* Green River RMP*	2,308,513	72,173	--	--
Rock Springs	Green River RMP*	3,356,775	338,172	--	--
Worland	Grass Creek RMP* Waskakie RMP*	1,537,942	91,803	--	--

[1] Most of the land administered by the BLM within the planning area of Alaska is withdrawn from mineral leasing under Section 17(d)(1) of the Alaska Native Claims Settlement Act of 1971. The closed acres in this table represent the acreage that would remain closed to geothermal leasing if the Secretary of the Interior revoked the withdrawal from all public lands in the planning area.

* Plans are under revision but the record of decision for these plans has not been signed. These field offices elect to amend their existing RMP/MFP with the decisions in this PEIS until their RMP record of decision is signed.

† Oregon and Washington Districts manage RMPs in their respective states.

MP = Management Plan
MFP = Management Framework Plan
RMP = Resource Management Plan

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APPENDIX B
BEST MANAGEMENT PRACTICES – MITIGATION MEASURES

Best Management Practices are state-of-the-art mitigation measures applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts. They are applied to management actions to aid in achieving desired outcomes for safe, environmentally responsible resource development, by preventing, minimizing, or mitigating adverse impacts and reducing conflicts.

This appendix provides a list of sample BMPs that have been collected from various BLM and FS documents addressing geothermal and fluid mineral leasing and development, including resource management plans, forest plans, and environmental reports for geothermal leasing and development. The purpose of this appendix is to provide a list of recommended BMPs that would be incorporated as appropriate into the permit application by the lessee or would be included in the approved use authorization by the BLM as conditions of approval. When implementing new BMPs, offices are encouraged to work with an affected lessee early in the process, to explain how BMPs may fit into their development proposals and how BMPs can be implemented with the least economic impact to the lessee. Offices should discuss potential resource impacts with the lessee and seek the operator's recommended solutions. The office should also encourage the lessee to incorporate necessary and effective BMPs into their project proposal. BMPs not incorporated into the permit application by the lessee may be considered and evaluated through the environmental review process and incorporated into the use authorization as conditions of approval or rights-of-way stipulations.

All offices will incorporate appropriate environmental BMPs into proposed use authorizations after appropriate environmental review. Environmental BMPs to be considered in nearly all circumstances include the following:

- Interim reclamation of well locations and access roads soon after the well is put into production;
- Painting of all new facilities a color that best allows the facility to blend with the background, typically a vegetated background;
- Design and construction of all new roads to a safe and appropriate standard, "no higher than necessary" to accommodate their intended use; and
- Final reclamation recontouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography.

Other environmental BMPs are more suitable for consideration by an administrative unit on a case-by-case basis, (1) depending on their effectiveness, (2) the balancing of increased operating costs vs. the benefit to the public and resource values, (3) the availability of less restrictive mitigation alternatives that accomplish the same objective, and (4) other site specific factors. Examples of typical, case-by-case BMPs are identified below.

Guidelines for applying and selecting project-specific requirements include determining whether the measure would (1) ensure compliance with relevant statutory or administrative requirements, (2) minimize local impacts associated with siting and design decisions, (3) promote post construction stabilization of impacts, (4) maximize restoration of previous habitat conditions, (5) minimize cumulative impacts, or (6) promote economically feasible development of geothermal energy on BLM-administered or FS-administered land.

The following typical BMPs provide the BLM, FS, industry, and stakeholders a menu of improved practices for developing geothermal energy and minimize impacts to the biophysical and cultural landscape. The list is extensive but is not meant to be all inclusive given the constant development of improved practices, diversity of the western states, and potential for unique site-specific conditions. Local land use plans may contain other BMPs that better address such unique situations. Where the BMPs presented here are inconsistent with or incompatible with those developed under a specific land use plan, the staff will conduct an environmental review to determine the appropriate practices.

Only those individual mitigation measures reasonably necessary to ensure environmentally responsible geothermal development should be selected from the list below. Not all of the individual mitigation measures below will apply in most situations and selection of appropriated BMPs and mitigation measures should be dependent on factors such as the project size, location, site specific characteristics, and potential resource impacts. Prior to inclusion into a permit, the measures may be further modified to meet site-specific situations and agency requirements.

A menu of typical BMPs can also be found on the BLM Washington Office Fluid Minerals Web site at: www.blm.gov/bmp.

Note: Commenters to the Draft PEIS noted that the list of BMPs and mitigation measures appeared to be redundant, contradictory, confusing, and placed extensive emphasis on certain resources while deemphasizing others. The following list has been consolidated and updated to address those concerns. The BMPs and mitigation measures are arranged from Information Collection and Monitoring to Final Reclamation and have been further subcategorized. While many of the BMPs and mitigation measures will apply to all phases of geophysical exploration and development; to avoid duplication, the measures are listed only once.

B.1 INFORMATION COLLECTION & MONITORING

B.1.1 General

- Prior to geothermal exploration and development, a complete subsurface geotechnical investigation will be conducted to analyze the soil and geologic conditions. The investigation will evaluate and identify potential geologic hazards and would provide remedial grading recommendations, foundation and slab design criteria, and soil parameters for the design of geothermal power infrastructure.
- The operator will collect available information describing the environmental and socio-cultural conditions in the vicinity of the proposed project and will provide the information to the agency.
- A monitoring program will be developed by the operator to ensure that environmental conditions are monitored during the exploration and well drilling, testing, construction, and utilization and reclamation phases. The monitoring program requirements, including adaptive management strategies, will be established at the project level to ensure that potential adverse impacts of geothermal development are mitigated. The monitoring program will identify the monitoring requirements for each major environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into ongoing activities. The operator will provide results of the monitoring program to the agency in an annual report.
- The operator will comply with the Secretary of Agriculture's rules and regulations for all use and occupancy of the NFS lands prior to approval of an exploration plan by the Secretary of Interior and for uses of all existing improvements, such as forest development roads,

within and outside the area permitted by the Secretary of Interior; and use and occupancy of the NFS lands not authorized by an exploration plan approved by the Secretary of Interior.

B.1.2 Paleontological and Cultural Resources

- Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, archival, and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of effects. The BLM will make determinations of eligibility and effect and consult with SHPO as necessary based on each proposed lease application and project plans. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by approval of a detailed research design, Native American Consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act (BLM 2007a).
- If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could

be required during all excavation and earthmoving in the high-potential area. A report will be prepared documenting these activities. The CRMP also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land (BLM 2005).

- Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.
- If paleontological resources are present at the site, or if areas with a high potential to contain paleontological material have been identified, a paleontological resources management plan will be developed. This plan will include a mitigation plan for avoidance, removal of fossils, or monitoring. If an area exhibits a high potential but no fossils were observed during survey, monitoring by a qualified paleontologist may be required during excavation and earthmoving in the sensitive area. The operator will submit a report to the agency documenting these activities. The paleontological resources management plan also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

B.1.3 Water Resources

- In coordination with State regulatory agencies the operator will comply with all State and Federal surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.
- Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion.
- Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.
- Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.

- Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.

- Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

B.1.4 Vegetation and Fish and Wildlife

- The operator will conduct surveys for plant and animal species that are listed or proposed for listing as threatened or endangered and their habitats in areas proposed for development where these species could potentially occur, following accepted protocols and in consultation with the USFWS or NMFS, as appropriate. Particular care should be taken to avoid disturbing listed species during surveys in any designated critical habitat. The operator will monitor activities and their effects on ESA-listed species throughout the duration of the project.
- The operator will identify important, sensitive, or unique habitat and biota in the project vicinity and site and should design the project to avoid (if possible), minimize, or mitigate potential impacts on these resources. The design and siting of the facilities will follow appropriate guidance and requirements from the BLM, FS, and other resource agencies, as available and applicable.

B.1.5 National Scenic and Historic Trails

- When any right-of-way application includes remnants of a National Historic Trail, is located within the viewshed of a National Historic Trail's designated centerline, or includes or is within the viewshed of a trail eligible for listing on the NRHP, the operator will evaluate the potential visual impacts to the trail associated with the proposed project and identify appropriate mitigation measures for inclusion in the operation plan.

B.1.6 Air Quality and Climate

- The operator will coordinate with the [State Air Quality Division] to develop and implement an air quality monitoring plan.

B.2 PLANNING, LOCATION, AND DESIGN

B.2.1 Traffic Planning

- Operators will consult with local planning authorities regarding increased traffic prior to the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) will be identified and addressed in the traffic management plan.

B.2.2 Roads & Pads

- To plan for efficient use of the land, necessary infrastructure will be consolidated wherever possible.
- Existing roads and pad sites will be used to the maximum extent feasible, but only if located in a safe and environmentally sound location. No new roads and pad sites will be constructed without agency authorization. If new roads and pad sites have been authorized, they will be designed and constructed by the operator to the appropriate agency standard, no higher than necessary to accommodate their intended function. Roads and pad sites will be routinely maintained by the operator maintain public safety and to minimize impacts to the environment such as erosion, sedimentation, fugitive dust, loss of vegetation.
- An access road siting and management plan will be prepared incorporating existing Agency standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual and the *Surface Operating Standards for Oil and Gas Exploration and Development* (i.e., the Gold Book, 4th Edition, 2007).
- A traffic management plan will be prepared for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan will incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration.
- Where possible, access roads will be located to follow natural contours and minimize side hill cuts and fills. Excessive grades on roads, road embankments, ditches, and drainages will be avoided, especially in areas with erodible soils.
- Roads will be designed so that changes to surface water runoff are minimized and new erosion is not initiated.

- Access roads will be located to minimize stream crossings. All structures crossing streams will be located and constructed so that they do not decrease channel stability or increase water velocity. Operators will obtain all applicable federal and state water crossing permits.
- Roads will be located away from drainage bottoms and avoid wetlands, if practicable.

B.2.3 Geotechnical Analysis

- The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

B.2.4 Visual Mitigation

- The operator will incorporate visual design considerations into the planning and design of the project to minimize potential visual impacts of the proposal and to meet the Visual Resource Management objectives of the area and the agency.

B.2.5 Visual Design Considerations

- Construct low-profile structures whenever possible to reduce structure visibility.
- Select and design materials and surface treatments to repeat or blend with landscape elements.
- Site projects outside of the viewsheds of publically accessible vantage points, or if this cannot be avoided, as far away as possible;
- Site projects to take advantage of both topography and vegetation as screening devices to restrict views of projects from visually sensitive areas;
- Site facilities away from and not adjacent to prominent landscape features (e.g., knobs and water features);
- Avoid placing facilities on ridgelines, summits, or other locations such that they will be silhouetted against the sky from important viewing locations;
- Collocate facilities to the extent possible to use existing and shared rights-of-way, existing and shared access and maintenance roads, and other infrastructure to reduce visual they do not bisect ridge tops or run down the center of valley bottoms.

- Site linear features (aboveground pipelines, rights-of-way, and roads) to follow natural land contours rather than straight lines (particularly up slopes) when possible. Fall-line cuts should be avoided.
- Site facilities, especially linear facilities, to take advantage of natural topographic breaks (i.e., pronounced changes in slope) to avoid siting facilities on steep side slopes.
- Where available, site linear features such as rights-of-ways and roads to follow the edges of clearings (where they will be less conspicuous) rather than passing through the centers of clearings.
- Site facilities to take advantage of existing clearings to reduce vegetation clearing and ground disturbance, where possible.
- Site linear features (e.g., trails, roads, rivers) to cross other linear features at right angles whenever possible to minimize viewing area and duration.
- Site and design structures and roads to minimize and balance cuts and fills and to preserve existing rocks, vegetation, and drainage patterns to the maximum extent possible.
- Use appropriately colored materials for structures or appropriate stains and coatings to blend with the project's backdrop. Refer to the Standard Environmental Colors chart available from the BLM.
- Use non-reflective or low-reflectivity materials, coatings, or paints whenever possible.
- Paint grouped structures the same color to reduce visual complexity and color contrast.
- Design and install efficient facility lighting so that the minimum amount of lighting required for safety and security is provided but not exceeded and so that upward light scattering (light pollution) is minimized. This may include, for example, installing shrouds to minimize light from straying off-site, properly directing light to only illuminate necessary areas, and installing motion sensors to only illuminate areas when necessary.
- Site construction staging areas and laydown areas outside of the viewsheds of publically accessible vantage points and visually sensitive areas, where possible, including siting in swales, around bends, and behind ridges and vegetative screens.
- Discuss visual impact mitigation objectives and activities with equipment operators prior to commencement of construction activities.

- Mulch or scatter slash from vegetation removal and spread it to cover fresh soil disturbances or, if not possible, bury or compost slash.
- If slash piles are necessary, stage them out of sight of sensitive viewing areas.
- Avoid installing gravel and pavement where possible to reduce color and texture contrasts with existing landscape.
- Use excess fill to fill uphill-side swales resulting from road construction in order to reduce unnatural-appearing slope interruption and to reduce fill piles.
- Avoid downslope wasting of excess fill material.
- Round road-cut slopes, vary cut and fill pitch to reduce contrasts in form and line, and vary slope to preserve specimen trees and nonhazardous rock outcroppings.
- Leave planting pockets on slopes where feasible.
- Combine methods of re-establishing native vegetation through seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas and staging of construction enabling direct transplanting.
- Revegetate with native vegetation establishing a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape."
- Provide benches in rock cuts to accent natural strata.
- Use split-face rock blasting to minimize unnatural form and texture resulting from blasting.
- Segregate topsoil from cut and fill activities and spread it on freshly disturbed areas to reduce color contrast and to aid rapid revegetation.
- Bury utility cables in or adjacent to the road where feasible.
- Minimize signage and paint or coat reverse sides of signs and mounts to reduce color contrast with existing landscape.
- Prohibit trash burning; store trash in containers to be hauled off-site for disposal.
- Undertake interim restoration during the operating life of the project as soon as possible after disturbances. During road maintenance activities, avoid blading existing forbs and grasses in ditches and along roads.

- Randomly scarify cut slopes to reduce texture contrast with existing landscape and to aid in revegetation.
- Cover disturbed areas with stockpiled topsoil or mulch, and revegetate with a mix of native species selected for visual compatibility with existing vegetation.
- Restore rocks, brush, and natural debris whenever possible to approximate preexisting visual conditions.

B.2.6 Air Quality and Climate

- The operator will prepare and submit to the agency an Equipment Emissions Mitigation Plan for managing diesel exhaust, An Equipment Emissions Mitigation Plan will identify actions to reduce diesel particulate, carbon monoxide, hydrocarbons, and nitrogen oxides associated with construction and drilling activities. The Equipment Emissions Mitigation Plan will require that all drilling/construction-related engines are maintained and operated as follows:
    - Are tuned to the engine manufacturer's specification in accordance with an appropriate time frame.
    - Do not idle for more than five minutes (unless, in the case of certain drilling engines, it is necessary for the operating scope).
    - Are not tampered with in order to increase engine horsepower.
    - Include particulate traps, oxidation catalysts, and other suitable control devices on all drilling/construction equipment used at the project site.
    - Use diesel fuel having a sulfur content of 15 parts per million or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area.
    - Include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include drilling equipment, work over and service rigs, mud pumps, generators, compressors, graders, bulldozers, and dump trucks.

B.2.7 Health and Safety

- Operators will develop a hazardous materials management plan addressing storage, use, transportation, and disposal of each hazardous material anticipated to be used at the site. The plan will identify all hazardous materials that would be used, stored, or transported at the site. It will establish inspection procedures, storage requirements, storage quantity limits, inventory control, nonhazardous product substitutes, and disposition of excess materials. The plan will also identify requirements for notices to federal and local emergency response authorities and include emergency response plans.
- Operators will develop a waste management plan identifying the waste streams that are expected to be generated at the site and addressing hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. This plan will address all solid and liquid wastes that may be generated at the site.
- Operators will develop a spill prevention and response plan identifying where hazardous materials and wastes are stored on site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.
- A safety assessment will be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.
- A health and safety program will be developed to protect both workers and the general public during construction and operation of geothermal projects.
- Regarding occupational health and safety, the program will identify all applicable federal and state occupational safety standards; establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses; Occupational Safety and Health Administration standard practices for safe use of explosives and blasting agents; and measures for reducing occupational electric and magnetic fields exposures); establish fire safety evacuation procedures; and define safety performance standards (e.g., electrical system standards and lightning protection

standards). The program will include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies will be established.

- Regarding public health and safety, the health and safety program will establish a safety zone or setback for generators from residences and occupied buildings, roads, right-of-ways, and other public access areas that is sufficient to prevent accidents resulting from the operation of generators. It will identify requirements for temporary fencing around staging areas, storage yards, and excavations during construction or rehabilitation activities. It will also identify measures to be taken during the operation phase to limit public access to hazardous facilities (e.g., permanent fencing would be installed only around electrical substations, and facility access doors would be locked).
- Operators will consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) will be identified and addressed in the traffic management plan.
- Operators will develop a fire management strategy to implement measures to minimize the potential for a human-caused fire.

B.2.8 Livestock Grazing

- The operator will coordinate with livestock operators to minimize impacts to livestock operations.

B.2.9 Noxious Weeds and Pesticides

- Operators will develop a plan for control of noxious weeds and invasive species, which could occur as a result of new surface disturbance activities at the site. The most recent recommendations at the state and local level should be incorporated into any operating plan for the geothermal exploration and development. The plan will address monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulching will be required. If trucks and construction equipment are arriving from locations with known invasive vegetation problems, a controlled inspection and cleaning area will be established to visually inspect construction equipment arriving at the project area and to remove

and collect seeds that may be adhering to tires and other equipment surfaces.

- If pesticides are used on the site, an integrated pest management plan will be developed to ensure that applications would be conducted within the framework of all Federal, State, and local laws and regulations and entail only the use of EPA-registered pesticides.

B.2.10 Vegetation and Fish and Wildlife

- The operator will prepare a habitat restoration plan to avoid (if possible), minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan will identify revegetation, soil stabilization, and erosion reduction measures that will be implemented to ensure that all temporary use areas are restored. The plan will require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.

B.3 CONSTRUCTION

B.3.1 Traffic Management

- Traffic will be restricted to the roads developed for the project. Use of other unimproved roads will be restricted to emergency situations.
- Signs will be placed along roads to identify speed limits, travel restrictions, and other standard traffic control information. Signs directing vehicles to alternative park access and parking will be posted in the event construction temporarily obstructs recreational parking areas near trailheads. Whenever active work is being performed, the area will be posted with "construction ahead" signs on any adjacent access roads or trails that might be affected.
- Project personnel and contractors will be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions, to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and fugitive dust.
- When practical, construction activities will be avoided during high recreational use periods.

B.3.2 Roads & Pads

- The operator will obtain agency authorization prior to borrowing soil or rock material from agency lands.

- Road use will be restricted during the wet season if road surfacing is not adequate to prevent soil displacement, rutting, etc., and resultant stream sedimentation.
- Access roads and on-site roads will be surfaced with aggregate materials where necessary to provide a stable road surface, support anticipated traffic, reduce fugitive dust, and prevent erosion.
- Dust abatement techniques will be used before and during surface clearing, excavation, or blasting activities. Dust abatement techniques will be used on unpaved, unvegetated surfaces to minimize fugitive dust. Speed limits (e.g., 25 mph [40 kph]) will be posted and enforced to reduce fugitive dust. Construction materials and stockpiled soils will be covered if they are a source of fugitive dust.
- Culvert outlets will be rip-rapped to dissipate water energy at the outlet and reduce erosion. Catch basins, roadway ditches, and culverts will be cleaned and maintained regularly.

B.3.3 Pipelines

- Pipelines constructed above ground due to thermal gradient induced expansion and contraction will rest on cradles above ground level, allowing small animals to pass underneath. Projects should be analyzed to ensure adequate passage for all wildlife species. The pipeline will be raised higher to allow wildlife passage where needed. Because pipeline corridors through certain habitat types can alter local predator-prey dynamics by providing predators with lines of sight and travel corridors, large projects should be analyzed to ensure there will be no significant changes to predator-prey balance.

B.3.4 Utilities

- Underground utilities will be installed to minimize the amount of open trenches at any given time, keeping trenching and backfilling crews close together. Avoid leaving trenches open overnight. Where trenches cannot be back-filled immediately, escape ramps should be constructed at least every 100 feet.

B.4 SPECIFIC RESOURCES

B.4.1 Cultural and Paleontological Resources

- Unexpected discovery of cultural or paleontological resources during construction will be brought to the attention of the responsible BLM authorized officer immediately. Work will be

halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed.

B.4.2 Noise

- The operator will take measurements to assess the existing background noise levels at a given site and compare them with the anticipated noise levels associated with the proposed project.
- Within [2] miles of existing, occupied residences, geothermal well drilling or major facility construction operations will be restricted to non-sleeping hours (7:00 am to 10:00 pm).
- All equipment will have sound-control devices no less effective than those provided on the original equipment. All construction equipment used will be adequately muffled and maintained.
- All stationary construction equipment (i.e., compressors and generators) will be located as far as practicable from nearby residences.
- If blasting or other noisy activities are required during the construction period, nearby residents will be notified by the operator at least 1 hour in advance.
- Explosives will be used only within specified times and at specified distances from sensitive wildlife or streams and lakes, as established by the federal and state agencies.

B.4.3 Noxious Weeds and Pesticides

- The use of certified, weed-free mulch will be required when stabilizing areas of disturbed soil.
- If trucks and construction equipment are arriving from locations with known invasive vegetation problems, a controlled inspection and cleaning area will be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.
- Fill materials and road surfacing materials that originate from areas with known invasive vegetation problems will not be used.
- Revegetation, habitat restoration and weed control activities will be initiated as soon as possible after construction activities are completed.
- Use of pesticides must be approved by the agency. Pesticide use will be limited agency approved pesticides and will only be applied in

accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.

B.4.4 Waste Management

- All refueling will occur in a designated fueling area that includes a temporary berm to limit the spread of any spill.
- Drip pans will be used during refueling to contain accidental releases.
- Drip pans will be used under fuel pump and valve mechanisms of any bulk fueling vehicles parked at the construction site.
- Any containers used to collect liquids will be enclosed or screened to prevent access to contaminants by wildlife, livestock, and migratory birds.
- Spills will be immediately addressed per the spill management plan, and soil cleanup and removal initiated as soon as feasible.

B.4.5 Wild Horses and Burros

- The operator will ensure employees, contractors, and site visitors avoid harassment and disturbance of wild horses and burros, especially during reproductive (e.g., breeding and birthing) seasons. In addition, any pets will be controlled to avoid harassment and disturbance of wild horses and burros.
- Observations of potential problems regarding wild horses or burros, including animal mortality, will be immediately reported to the agency.

B.4.6 Wildlife

- The operator will ensure that employees, contractors, and site visitors avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. In addition, pets will be controlled or excluded to avoid harassment and disturbance of wildlife.
- Ponds, tanks and impoundments (including but not limited to drill pits) containing liquids can present hazards to wildlife. Any liquids contaminated by substances which may be harmful due to toxicity, or fouling of the fur or feathers (detergents, oils), should be excluded from wildlife access by fencing, netting or covering at all times when not in active use. Liquids at excessive temperature should likewise be excluded. If exclusion is not feasible, such as a large pond, a hazing program based on radar or visual detection, in conjunction with formal monitoring, should be implemented. Clean

water impoundments can also present a trapping hazard if they are steep-sided or lined with smooth material. All pits, ponds and tanks should have escape ramps functional at any reasonably anticipated water level, down to almost empty. Escape ramps can take various forms depending on the configuration of the impoundment. Earthen pits may be constructed with one side sloped 3:1 or greater lined ponds can use textured material; straight-sided tanks can be fitted with expanded metal escape ladders.

B.5 OPERATIONS/UTILIZATION

- "Good housekeeping" procedures will be developed by the operator to ensure that during all phases of exploration and operation the site will be kept clean of noxious weeds, debris, litter, garbage, fugitive trash or waste, and graffiti. Scrap heaps and dumps are prohibited. Storage yards are to be minimized to that which is absolutely necessary.

B.6 RECLAMATION

The following objectives, performance standards, and recommended reclamation BMPs and mitigation measures are based on the standards and guidelines found in the BLM and Forest Service Gold Book, 4th Edition, updated in 2007.

[ ] Indicates site-specific values to be filled in by the authorized officer.

B.6.1 Reclamation Objectives

- The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat, visual, and forage loss during the life of the well or facilities.
- The long-term objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.

B.6.2 Reclamation Performance Standards

The following reclamation performance standards will be met:

Interim Reclamation

Includes disturbed areas that may be redisturbed during operations and will be redisturbed at final reclamation to achieve restoration of the original landform and a natural vegetative community.

- Disturbed areas not needed for active, long-term production operations or vehicle travel have been recontoured, protected from erosion, and revegetated with a self-sustaining, vigorous, diverse, native (or as otherwise approved) plant community sufficient to minimize visual impacts, provide forage, stabilize soils, and impede the invasion of noxious, invasive, and non-native weeds.

Final Reclamation

Includes disturbed areas where the original landform and a natural vegetative community have been restored.

- The original landform has been restored for all disturbed areas including well pads, production facilities, roads, pipelines, and utility corridors.
- General: A self-sustaining, vigorous, diverse, native (or otherwise approved) plant community is established on the site, with a density sufficient to control erosion and invasion by non-native plants and to reestablish wildlife habitat or forage production. At a minimum, the established plant community will consist of species included in the seed mix and/or desirable species occurring in the surrounding natural vegetation.
- Specific: No single species will account for more than [30]% total vegetative composition unless it is evident at higher levels in the adjacent landscape. Permanent vegetative cover will be determined successful when the basal cover of desirable perennial species is at least [80]% of the basal cover on adjacent or nearby undisturbed areas where vegetation is in a healthy condition; or [80]% of the potential basal cover as defined in the National Resource Conservation Service Ecological Site(s) for the area. Plants must be resilient as evidenced by well-developed root systems and flowers. [Shrubs, will be well established and in a "young" age class at a minimum (therefore, not comprised mainly of seedlings that may not survive until the following year).]
- In agricultural areas, irrigation systems and soil conditions are reestablished in such a way as to ensure successful cultivation and harvesting of crops.
- Erosion features are equal to or less than surrounding area and erosion control is sufficient so that water naturally infiltrates into

the soil and gullying, headcutting, slumping, and deep or excessive rills (greater than 3 inches) are not observed.

- The site is free of State- or county-listed noxious weeds, oil field debris and equipment, and contaminated soil. Invasive and non-native weeds are controlled.

B.6.3 Reclamation Actions

- During initial well pad, production facility, road, pipeline, and utility corridor construction and prior to completion of the final well on the well pad, pre-interim reclamation stormwater management actions will be taken to ensure disturbed areas are quickly stabilized to control surface water flow and to protect both the disturbed and adjacent areas from erosion and siltation. This may involve construction and maintenance of temporary silt ponds, silt fences, berms, ditches, and mulching.
- When the last well on the pad has been completed, some portions of the well location will undergo interim reclamation and some portions of the well pad will usually undergo final reclamation. Most well locations will have limited areas of bare ground, such as a small area around production facilities or the surface of a rocked road. Other areas will have interim reclamation where workover rigs and fracturing tanks may need a level area to set up in the future. Some areas will undergo final reclamation where portions of the well pad will no longer be needed for production operations and can be recontoured to restore the original landform.
- The following minimum reclamation actions will be taken to ensure that the reclamation objectives and standards are met. It may be necessary to take additional reclamation actions beyond the minimum in order to achieve the Reclamation Standards.

B.6.4 Reclamation - General

Procedure:

- The agency will be notified 24 hours prior to commencement of any reclamation operations.

Housekeeping:

- Immediately upon well completion, the well location and surrounding areas(s) will be cleared of, and maintained free of, all debris, materials, trash, and equipment not required for production.
- No hazardous substances, trash, or litter will be buried or placed in pits. Upon well completion, any hydrocarbons in the pit will be remediated or removed.

Vegetation Clearing:

- Vegetation removal and the degree of surface disturbance will be minimized wherever possible.
- *[Example of site-specific requirement*: During vegetation clearing activities, trees and woody vegetation removed from the well pad and access road will be moved aside prior to any soil disturbing activities. Care will be taken to avoid mixing soil with the trees and woody vegetation. Trees left for wood gathering will be cut [twelve inches or less from the ground], delimbed, and the trunks, six (6) inches or more in diameter will be removed and placed either by the uphill side of the access road, or moved to the end of the road, or to a road junction for easy access for wood gatherers and to reduce vehicle traffic on the well pad. Trees with a trunk diameter less than six (6) inches and woody vegetation will be used to trap sediment, slow runoff, or scattered on reclaimed areas to stabilize slopes, control erosion, and improve visual resources.]

Topsoil Management:

- Operations will disturb the minimum amount of surface area necessary to conduct safe and efficient operations. When possible, equipment will be stored and operated on top of vegetated ground to minimize surface disturbance.
- In areas to be heavily disturbed, the top [eight (8)] inches of soil material, will be stripped and stockpiled around the perimeter of the well location to control run-on and run-off, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil may include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils.
- Earthwork for interim and final reclamation will be completed within 6 months of well completion or plugging unless a delay is approved in writing by the BLM authorized officer.
- Salvaging and spreading topsoil will not be performed when the ground or topsoil is frozen or too wet to adequately support construction equipment. If such equipment creates ruts in excess of four (4) inches deep, the soil will be deemed too wet.
- No major depressions will be left that would trap water and cause ponding.

Seeding:

- Seedbed Preparation. Initial seedbed preparation will consist of recontouring to the appropriate interim or final reclamation standard. All compacted areas to be seeded will be ripped to a minimum depth of 18 inches with a minimum furrow spacing of 2

feet, followed by recontouring the surface and then evenly spreading the stockpiled topsoil. Prior to seeding, the seedbed will be scarified and left with a rough surface.

If broadcast seeding is to be used and is delayed, final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to loosen up the soil and create seed germination micro-sites.

- Seed Application. Seeding will be conducted no more than 24 hours following completion of final seedbed preparation. A certified weed-free seed mix designed by BLM to meet reclamation standards will be used.

  No seeding will occur from [May 15 to September 15]. Fall seeding is preferred and will be conducted after [September 15] and prior to ground freezing. [Shrub species will be seeded separately and will be seeded during the winter.] Spring seeding will be conducted after the frost leaves the ground and no later than [May 15].

Erosion Control and Mulching:

- Mulch, silt fencing, waddles, hay bales, and other erosion control devices will be used on areas at risk of soil movement from wind and water erosion.
- Mulch will be used if necessary to control erosion, create vegetation micro-sites, and retain soil moisture and may include hay, small-grain straw, wood fiber, live mulch, cotton, jute, or synthetic netting. Mulch will be free from mold, fungi, and certified free of noxious or invasive weed seeds.
- If straw mulch is used, it will contain fibers long enough to facilitate crimping and provide the greatest cover.

Pit Closure:

- Reserve pits will be closed and backfilled within **sixty (60)** days of release of the rig. All reserve pits remaining open after **sixty (60)** days will require written authorization of the authorized officer. Immediately upon well completion, any hydrocarbons or trash in the pit will be removed. Pits will be allowed to dry, be pumped dry, or solidified in-situ prior to backfilling.
- Following completion activities, pit liners will be completely removed or removed down to the solids level and disposed of at an approved landfill, or treated to prevent their reemergence to the surface and interference with long-term successful revegetation. If it was necessary to line the pit with a synthetic liner, the pit will not

be trenched (cut) or filled (squeezed) while containing fluids. When dry, the pit will be backfilled with a minimum of 5 feet of soil material. In relatively flat areas the pit area will be slightly mounded above the surrounding grade to allow for settling and to promote surface drainage away from the backfilled pit.

Management of Invasive, Noxious, and Non-Native Species:

- All reclamation equipment will be cleaned prior to use to reduce the potential for introduction of noxious weeds or other undesirable non-native species.
- An intensive weed monitoring and control program will be implemented prior to site preparation for planting and will continue until interim or final reclamation is approved by the authorized officer.
- Monitoring will be conducted at least annually during the growing season to determine the presence of any invasive, noxious, and non-native species. Invasive, noxious, and non-native species that have been identified during monitoring will be promptly treated and controlled. A Pesticide Use Proposal will be submitted to the BLM for approval prior to the use of herbicides.

B.6.5 Interim Reclamation Procedures - Additional

Recontouring:

- Interim reclamation actions will be completed no later than 6 months from when the final well on the location has been completed, weather permitting. The portions of the cleared well site not needed for active operational and safety purposes will be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Sufficient semi-level area will remain for setup of a workover rig and to park equipment. In some cases, rig anchors may need to be pulled and reset after recontouring to allow for maximum interim reclamation.
- If the well is a producer, the interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.
- Roads and well production equipment will be placed on location so as to permit maximum interim reclamation of disturbed areas. If equipment is found to interfere with the proper interim reclamation of disturbed areas, the equipment will be moved so proper recontouring and revegetation can occur.

Application of Topsoil & Revegetation:

- Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including road cuts & fills and to within a few feet of the production facilities, unless an all-weather, surfaced, access route or small "teardrop" turnaround is needed on the well pad.
- In order to inspect and operate the well or complete workover operations, it may be necessary to drive, park, and operate equipment on restored, interim vegetation within the previously disturbed area. Damage to soils and interim vegetation will be repaired and reclaimed following use. To prevent soil compaction, under some situations, such as the presence of moist, clay soils, the vegetation and topsoil will be removed prior to workover operations and restored and reclaimed following workover operations.

Visual Resources Mitigation for Reclamation:

- Trees, if present, and vegetation will be left along the edges of the pads whenever feasible to provide screening.
- To help mitigate the contrast of recontoured slopes, reclamation will include measures to feather cleared lines of vegetation and to save and redistribute cleared trees, debris, and rock over recontoured cut and fill slopes.
- To reduce the view of production facilities from visibility corridors and private residences, facilities will not be placed in visually exposed locations (such as ridgelines and hilltops).
- Production facilities will be clustered and placed away from cut slopes and fill slopes to allow the maximum recontouring of the cut and fill slopes.
- All long-term above ground structures will be painted [Covert Green] (from the "Standard Environmental Colors" chart) to blend with the natural color of the late summer landscape background.

B.6.6 Final Reclamation Procedures - Additional

- Final reclamation actions will be completed within 6 months of well plugging, weather permitting.
- All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends indistinguishably with the surrounding landscape. Resalvaged topsoil will be respread evenly over the entire disturbed site to ensure successful revegetation. To help mitigate the contrast of

recontoured slopes, reclamation will include measures to feather cleared lines of vegetation and to save and redistribute cleared trees, woody debris, and large rocks over recontoured cut and fill slopes.

- Water breaks and terracing will only be installed when absolutely necessary to prevent erosion of fill material. Water breaks and terracing are not permanent features and will be removed and reseeded when the rest of the site is successfully revegetated and stabilized.
- If necessary to ensure timely revegetation, the pad will be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species become firmly established, whichever comes later. Fencing will meet standards found on page 18 of the BLM/FS Gold Book, 4th Edition, or will be fenced with operational electric fencing.
- Final abandonment of pipelines and flowlines will involve flushing and properly disposing of any fluids in the lines. All surface lines and any lines that are buried close to the surface that may become exposed in the foreseeable future due to water or wind erosion, soil movement, or anticipated subsequent use, must be removed. Deeply buried lines may remain in place unless otherwise directed by the authorized officer.

B.6.7 Reclamation Monitoring and Final Abandonment Approval

- Reclaimed areas will be monitored annually. Actions will be taken to ensure that reclamation standards are met as quickly as reasonably practical.
- Reclamation monitoring will be documented in an annual reclamation report submitted to the authorized officer by [March 1]. The report will document compliance with all aspects of the reclamation objectives and standards, identify whether the reclamation objectives and standards are likely to be achieved in the near future without additional actions, and identify actions that have been or will be taken to meet the objectives and standards. The report will also include acreage figures for: Initial Disturbed Acres; Successful Interim Reclaimed Acres; Successful Final Reclaimed Acres. Annual reports will not be submitted for sites approved by the authorized officer in writing as having met interim or final reclamation standards. Monitoring and reporting continues annually until interim or final reclamation is approved. Any time 30% or more of a reclaimed area is redisturbed, monitoring will be reinitiated.

- The authorized officer will be informed when reclamation has been completed, appears to be successful, and the site is ready for final inspection.

APPENDIX C

Form 3200-24a: Offer to Lease and Lease for Geothermal Resources and Form 3203-1: Nomination of Lands for Competitive Geothermal Leasing

Print Reset

Form 3200-24a
(September 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OFFER TO LEASE AND LEASE FOR GEOTHERMAL RESOURCES
(For New Leases Issued Under the Energy Policy Act of 2005 [August 5, 2005])

Serial No.

The undersigned (see page 2) offers to lease all or any of the lands in item 2 that are available for lease pursuant to the Geothermal Steam Act of 1970, as amended (30 U.S.C. 1001-1025).

READ INSTRUCTIONS BEFORE COMPLETING

1. Name	1a. Street	
1b. City	1c. State	1d. Zip Code

2. Surface managing agency if other than BLM: _____ Unit/Project: _____

Legal description of land requested (segregate by public domain and acquired lands): Enter T., R., Meridian, State and County

Total Acres Applied for _____

Percent U.S. interest _____

Amount remitted: Processing Fee $ _____ Rental Fee $ _____ Total $ _____

DO NOT WRITE BELOW THIS LINE

3. Land included in lease: Enter T., R., Meridian, State and County

Total Acres in Lease _____

Rental Retained $ _____

In accordance with the above offer, or the previously submitted competitive bid, this lease is issued granting the exclusive right to drill for, extract, produce, remove, utilize, sell, and dispose of all the geothermal resources in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon, for a primary term of 10 years and subsequent extensions thereof in accordance with 43 CFR subpart 3207. Rights granted are subject to: applicable laws; the terms, conditions, and attached stipulations of this lease; the Secretary of the Interior's regulations and formal orders in effect as of lease issuance; and, when not inconsistent with the provisions of this lease, regulations and formal orders hereafter promulgated.

Type of Lease:

- ☐ Competitive
- ☐ Noncompetitive
- ☐ Noncompetitive direct use (43 CFR subpart 3205)

Comments:

THE UNITED STATES OF AMERICA

BY _____
(Signing Official)

_____
(Printed Name)

_____ _____
(Title) (Date)

EFFECTIVE DATE OF LEASE _____

Check if this is a converted lease ☐

EFFECTIVE DATE OF LEASE CONVERSION _____

(Continued on page 2)

4. (a) The undersigned certifies that:
(1) The offeror is a citizen of the United States; an association of such citizens; a municipality; or a corporation organized under the laws of the United States, any State or the District of Columbia; (2) All parties holding an interest in the offer are in compliance with 43 CFR part 3200 and the authorizing Act; (3) The offeror's chargeable interests, direct and indirect, do not exceed those allowed under the Act; and (4) The offeror is not considered a minor under the laws of the State in which the lands covered by this offer are located.

(b) The undersigned agrees that signing this offer constitutes acceptance of this lease, including all terms, conditions and stipulations of which the offeror has been given notice. The offeror further agrees that this offer cannot be withdrawn, either in whole or part, unless the withdrawal is received by the proper BLM State Office before this lease, an amendment to this lease, or a separate lease, whichever covers the land described in the withdrawal, has been signed on behalf of the United States.

This offer will be rejected and will afford the offeror no priority if it is not properly completed and executed in accordance with the regulations or if it is not accompanied by the required payments. Title 18 U.S.C. § 1001 makes it a crime for any person knowingly and willfully to make to any Department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

Duly executed this _____ day of _____, 20____. _____ _____

(Printed Name of Lessee or Attorney-in-fact) (Signature of Lessee or Attorney-in-fact)

LEASE TERMS

Sec. 1. Rentals—Rentals must be paid to the proper office of the lessor in advance of each lease year. Annual rental rates per acre or fraction thereof, as applicable, are:
(a) Noncompetitive lease (includes post-sale parcels not receiving bids, a direct use lease or a lease issued to a mining claimant): $1.00 for the first 10 years; thereafter $5.00; or
(b) Competitive lease: $2.00 for the first year; $3.00 for the second through tenth year; thereafter $5.00.
Annual rental is always due by the anniversary date of this lease (43 CFR 3211.13), regardless of whether the lease is in a unit or outside of a unit, the lease is in production or not, or royalties or direct use fees apply to the production.
Rental may only be credited toward royalty under 43 CFR 3211.15 and 30 CFR 218.303. Rental may not be credited against direct use fees. Failure to pay annual rental timely will result in late fees and will make the lease subject to termination in accordance with 43 CFR 3213.14.

Sec. 2. (a) Royalties—Royalties must be paid to the proper office of the lessor. Royalties are due on the last day of the month following the month of production. Royalties will be computed in accordance with applicable regulations and orders. Royalty rates for geothermal resources produced for the commercial generation of electricity but not sold in an arm's length transaction are: 1.75 percent for the first 10 years of production and 3.5 percent after the first 10 years. The royalty rate is to be applied to the gross proceeds derived from the sale of electricity in accordance with 30 CFR part 206 subpart H.
The royalty rate for byproducts derived from geothermal resource production that are minerals specified in section 1 of the Mineral Leasing Act (MLA), as amended (30 U.S.C. 181), is 5 percent, except for sodium compounds, produced between September 29, 2006 and September 29, 2011 (Pub. L. No. 109-338, §102; note to 30 U.S.C. 362) for which the royalty rate is 2 percent. No royalty is due on byproducts that are not specified in 30 U.S.C. § 181. (43 CFR 3211.19.)
If this lease or a portion thereof is committed to an approved communitization or unit agreement and the agreement contains a provision for allocation of production, royalties must be paid on the production allocated to this lease.
(b) Arm's length transactions—The royalty rate for geothermal resources sold by you or your affiliate at arm's length to a purchaser is 10 percent of the gross proceeds derived from the arm's-length sale (43 CFR 3211.17, 3211.18).
(c) Advanced royalties—In the absence of a suspension, if you cease production for more than one calendar month on a lease that is subject to royalties and that has achieved commercial production, your lease will remain in effect only if you make advanced royalty payments in accordance with 43 CFR 3212.15(a) and 30 CFR 218.305.
(d) Direct use fees—Direct use fees must be paid in lieu of royalties for geothermal resources that are utilized for commercial, residential, agricultural, or other energy needs other than the commercial production or generation of electricity, but not sold in an arm's length transaction (43 CFR 3211.18; 30 CFR 206.356). This requirement applies to any direct use of federal geothermal resources (unless the resource is exempted as described in 30 CFR 202.351(b) or the lessee is covered by paragraph (e), below) and is not limited to direct use leases. Direct use fees are due on the last day of the month following the month of production.
(e) If the lessee is a State, tribal, or local government covered by 43 CFR 3211.18(a)(3) and 30 CFR 206.366, check here: ☐. A lessee under this paragraph is not subject to paragraph (d), above. In lieu of royalties, the lessee under this paragraph must pay a nominal fee of
$ _____.

Sec. 3. Bonds—A bond must be filed and maintained for lease operations as required by applicable regulations.

Sec. 4. Work requirements, rate of development, unitization, and drainage--Lessee must perform work requirements in accordance with applicable regulations (43 CFR 3207.11, 3207.12), and must prevent unnecessary damage to, loss of, or waste of leased resources. Lessor reserves the right to specify rates of development and production and to require lessee to commit to a communitization or unit agreement, within 30 days of notice, if in the public interest. Lessee must drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in the amount determined by lessor. Lessor will exempt lessee from work requirements only where the lease overlies a mining claim that has an approved plan of operations and where BLM determines that the development of the geothermal resource on the lease would interfere with the mining operation (43 CFR 3207.13).

Sec. 5. Documents, evidence, and inspection—Lessee must file with the proper office of the lessor, not later than (30) days after the effective date thereof, any contract or evidence of other arrangement for the sale, use, or disposal of geothermal resources, byproducts produced, or for the sale of electricity generated using geothermal resources produced from the lease. At such times and in such form as lessor may prescribe, lessee must furnish detailed statements and all documents showing (a) amounts and quality of all geothermal resources produced and used (either for commercial production or generation of electricity, or in a direct use operation) or sold; (b) proceeds derived therefrom or from the sale of electricity generated using such resources; (c) amounts that are unavoidably lost or reinjected before use, used to generate plant parasitic electricity (as defined in 30 CFR 206.351) or electricity for lease operations, or otherwise used for lease operations related to the commercial production or generation of electricity; and (d) amounts and quality of all byproducts produced and proceeds derived from the sale or disposition thereof. Lessee may be required to provide plats and schematic diagrams showing development work and improvements, and reports with respect to parties in interest.
In a format and manner approved by lessor, lessee must: keep a daily drilling record, a log, and complete information on well surveys and tests; keep a record of subsurface investigations; and furnish copies to lessor when required.
Lessee must keep open at all reasonable times for inspection by any authorized officer of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee must maintain copies of all contracts, sales agreements, accounting records, billing records, invoices, gross proceeds and payment data regarding the sale, disposition, or use of geothermal resources, byproducts produced, and the sale of electricity generated using resources produced from the lease, and all other information relevant to determining royalties or direct use fees. All such records must be maintained in lessee's accounting offices for future audit by lessor and produced upon request by lessor or lessor's authorized representative or agent. Lessee must maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor.

Sec. 6. Conduct of operations—Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee must take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with leased rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses will be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee. Prior to disturbing the surface of the leased lands, lessee must contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessor may require lessee to complete minor inventories or short term special studies under guidelines provided by lessor. If, in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee must immediately contact lessor. Lessee must cease any operations that are likely to affect or take such species, or result in the modification, damage or destruction of such habitats or objects.

Sec. 7. Production of byproducts—If the production, use, or conversion of geothermal resources from these leased lands is susceptible of producing a valuable byproduct or byproducts, including commercially demineralized water for beneficial uses in accordance with applicable State water laws, lessor may require substantial beneficial production or use thereof by lessee.

Sec. 8. Damages to property—Lessee must pay lessor for damage to lessor's improvements, and must save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Sec. 9. Protection of diverse interests and equal opportunity—Lessee must maintain a safe working environment in accordance with applicable regulations and standard industry practices, and take measures necessary to protect public health and safety. Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly. Lessee must comply with Executive Order No. 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto. Neither lessee nor lessee's subcontractor may maintain segregated facilities.

Sec. 10. Transfer of lease interests and relinquishment of lease—As required by regulations, lessee must file with lessor any assignment or other transfer of an interest in this lease. Subject to the requirements of 43 CFR subpart 3213, lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which will be effective as of the date BLM receives it, subject to the continued obligation of the lessee and surety to be responsible for: paying all accrued rentals and royalties; plugging and abandoning all wells on the relinquished land; restoring and reclaiming the surface and other resources; and complying with 43 CFR 3200.4.

Sec. 11. Delivery of premises—At such time as all or portions of this lease are returned to lessor, lessee must place all wells in condition for suspension or abandonment, reclaim the land as specified by lessor, and within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells or continued protection of the environment.

Sec. 12. Proceedings in case of default—If lessee fails to comply with any provisions of this lease or other applicable requirements under 43 CFR 3200.4, and the noncompliance continues for 30 days after written notice thereof, this lease will be subject to termination in accordance with the Act and 43 CFR 3213. This provision will not be construed to prevent the exercise by lessor of any other legal and equitable remedy or action, including waiver of the default. Any such remedy, waiver, or action will not prevent later termination for the same default occurring at any other time. Whenever the lessee fails to comply in a timely manner with any of the provisions of the Act, this lease, the regulations, or other applicable requirements under 43 CFR 3200.4, and immediate action is required, the lessor may enter on the leased lands and take measures deemed necessary to correct the failure at the lessee's expense.

Sec. 13. Heirs and successors-in-interest—Each obligation of this lease will extend to and be binding upon, and every benefit hereof will inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

(Continued on page 3)

INSTRUCTIONS

A. General

1. Items 1 and 2 need to be completed only by parties filing for a noncompetitive lease. The BLM will complete the front of the form for other types of leases. The BLM may use the "Comments" space under Item 3 to identify when: the lessee has elected to make all lease terms subject to the Energy Policy Act of 2005 under 43 CFR 3200.7(a)(2) or 43 CFR 3200.8(b) (box labeled "converted lease" must also be checked); the lease is being issued noncompetitively to a party who holds a mining claim on the same lands as is covered by the lease under 43 CFR 3204.12; the lease is a direct use lease issued to a State, local, or tribal government (box at section 2(e) under Lease Terms must also be checked); the lease is a competitive lease with direct-use-only stipulations attached; or other special circumstances exist. A lessee who seeks to convert only the royalty rate of a lease under 43 CFR 3212.25 or who qualifies for a case-by-case royalty rate determination under 43 CFR 3211.17(b)(1)(i) should not use this form, but should instead use an addendum to the existing lease.

2. Entries must be typed or printed plainly in ink. The offeror must sign the form (Item 4) in ink.

3. An original and two copies of this offer must be prepared and filed in the proper BLM State Office. See regulations at 43 CFR 1821.10 for office locations.

4. If more space is needed, additional sheets must be attached to each copy of the form submitted.

B. Specific

Item 1—Enter the offeror's name and billing address.

Item 2—Indicate the agency managing the surface use of the land and the name of the unit or project of which the land is a part. The offeror may also provide other information that will assist in establishing status of the lands. The description of land must conform to 43 CFR 3203.10. Total acres applied for must not exceed that allowed by regulations (43 CFR 3203.10; 43 CFR 3206.12).

Payments: For noncompetitive leases, the amount remitted must include the processing fee for noncompetitive lease applications (43 CFR 3204.10; 43 CFR 3000.12) and the first year's rental at the rate of $1 per acre or fraction thereof. If the United States owns only a fractional interest in the geothermal resources, you must pay a prorated rental under 43 CFR 3211.11(d). The BLM will retain the processing fee even if the offer is completely rejected or withdrawn. To maintain the offeror's priority, the offeror must submit rental sufficient to cover all the land requested. If the land requested includes lots or irregular quarter-quarter sections, the exact acreage of which is not known to the offeror, rental should be submitted on the assumption that each such lot or quarter-quarter section contains 40 acres. If the offer is withdrawn or rejected in whole or in part before a lease issues, the BLM will return the rental remitted for the parts withdrawn or rejected.

The BLM will fill in the processing fee for competitive lease applications (43 CFR 3203.17; 43 CFR 3000.12) and the first year's rental at the rate of $2 per acre or fraction thereof.

Item 3—The BLM will complete this space.

NOTICES

The Privacy Act of 1974 and the regulation at 43 CFR 2.48(d) provide that you be furnished with the following information in connection with information required by this geothermal lease application.
AUTHORITY: 30 U.S.C. 1000 et seq.
PRINCIPAL PURPOSE—The information is to be used to process geothermal lease applications.
ROUTINE USES: (1) The adjudication of the lessee's rights to the land or resources. (2) Documentation for public information in support of notations made on land status records for the management, disposal, and use of public lands and resources. (3) Transfer to appropriate Federal agencies when concurrence is required prior to granting uses or rights in public lands or resources. (4) Transfer to the appropriate Federal, State, local, or foreign agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions.

Form 3203-1

(September 2008)

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

NOMINATION OF LANDS FOR COMPETITIVE GEOTHERMAL LEASING

READ INSTRUCTIONS BEFORE COMPLETING

1. Name	1a. Street	
1b. City	1c. State	1d. Zip Code

2. Surface managing agency if other than BLM:_____Unit/Project:_____

Legal description of land requested (segregate by public domain and acquired lands):

T.	R.	Section	Meridian	State	County

3. ☐ Check if this nomination is part of a block nomination. Include supporting information (see instructions).	3a. Total Acres Nominated: _____

4. Amount Remitted (43 CFR 3203.12): Filing Fee: $_____ + Acres x $0.10: $_____ = Total: $ _____

5. Nominated lands cannot be included in a lease sale until BLM confirms that leasing conforms to the land use plan and all National Environmental Policy Act requirements have been met.

_____ _____ _____

(Printed Name of Nominator or Attorney-in-Fact) (Signature of Nominator or Attorney-in-Fact) (Date)

Title 18 U.S.C. Sec. 1001 makes it a crime for any person knowingly and willfully to make to any Department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

INSTRUCTIONS

A. General

1. Entries must be typed or printed plainly in ink. The nominator must sign the form (item 5) in ink.

2. This offer must be filed in the proper BLM State Office serving the nominated lands. See regulations at 43 CFR 1821.10 for office locations.

3. Submit only one nomination per form.

4. If more space is needed, additional sheets must be attached to each copy of the form submitted.

5. Two or more nominations may be requested to be sold as a block (43 CFR 3203.11). Check the box in Item 3. Block nominations must include information to support your request and whether the lands requested will be identified with a project or unit.

B. Specific

Item 1—Enter the nominator's name and billing address.

Item 2—Indicate the agency managing the surface use of the land and, for a block nomination, the name of the unit or project of which the land is a part. The nominator may also provide other information that will assist in establishing status of the lands being nominated. The description of land must conform to 43 CFR 3203.10. Each nomination may not exceed 5,120 acres, unless the area to be leased includes an irregular subdivision (43 CFR 3203.10).

Payments: Each nomination must include a filling fee that is found in the fee schedule at 43 CFR 3000.12. If the total acreage nominated contains fractional acreage, the per-acre fee must be rounded up to the next whole acre.

NOTICE

The Privacy Act of 1974 and the regulation at 43 CFR 2.48(d) provide that you be furnished with the following information in connection with information required by this geothermal lease nomination.

AUTHORITY: 30 U.S.C. 1000 et seq.

PRINCIPAL PURPOSE—The information is to be used to process geothermal lease nominations.

ROUTINE USES: (1) The adjudication of the nomination for leasing of geothermal resources. (2) Documentation for public information in support of notations made on land status records for the management, disposal, and use of public lands and resources. (3) Transfer to appropriate Federal agencies when concurrence is required prior to granting uses or rights in public lands or resources. (4) Transfer to the appropriate Federal, State, local, or foreign agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION—If all the information is not provided, the nomination may be rejected. See regulations at 43 CFR Part 3200.

(Form 3203-1, Page 2)

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