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U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION

RECIPIENT: Ormat Nevada Inc. **STATE:** NV

PROJECT TITLE: Comparative Analysis of Three Sequential Near-Field Well Stimulations at Three Operating Geothermal Fields in Nevada

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002227	DE-EE0009180	GFO-0009180-001	

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:
Description:

A9 Information gathering, analysis, and dissemination	Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)
B3.1 Site characterization and environmental monitoring	Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: (a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; (b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); (c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; (d) Aquifer and underground reservoir response testing; (e) Installation and operation of ambient air monitoring equipment; (f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes); (g) Sampling and characterization of water effluents, air emissions, or solid waste streams; (h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); (i) Sampling of flora or fauna; and (j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Ormat Nevada, Inc. to use comparative analysis to assess the effectiveness of similar stimulations in different geologic and reservoir management environments. The proposed project would center around sequentially stimulating three separate wells at three operating geothermal fields in Nevada utilizing existing, off-the-shelf zonal isolation technologies from the oil and gas industry.

The three operating geothermal fields and proposed target wells are as follows:
- Don A. Campbell/Wild Rose (Luning, NV), Idle well 68-1RD or idle well 65-11
- Tungsten Mountain (Tungsten, NV), Injection well 24-22 or idle well 24A-23
- Jersey Valley (Battle Mountain, NV), Injection well 14-34 or idle well 46-28

The proposed project would be performed in three Budget Periods (BP) over an expected period of performance of three years. BP1 activities would include logging of the target wells at each project site, updates of numerical models, design and installation of seismic networks, design of well stimulation plans, permitting, design of the Induced Seismicity Mitigation Plan (ISMP), and reporting. BP2 would involve stimulation of the target wells utilizing hydraulic stimulation, matrix acidizing, and zonal isolation using packers and chemical diverters. BP3 would involve installation of pipelines to the target wells, installation of a submersible pump at the Don A. Campbell site, an optional well perforation operation at Tungsten Mountain, flow and temperature monitoring, and tracer testing.

This NEPA Determination reviews all activities associated with BP1 (Tasks 1.0-1.4). A first project “Go/No-Go” decision would be made at the end of BP1 based on the outcome of initial work. There is insufficient information available at this time to complete a thorough review of project activities and any potential impacts beyond BP1; if the project receives approval to proceed, BP2 and BP3 will be reviewed once associated Tasks/Subtasks have been fully defined.

Analytical, planning, permitting, and reporting activities would be conducted at the offices of Ormat and various subrecipients. Details of the stimulation plans for each well would be developed early in the project (Task 1.2) alongside permitting and the completion of an Induced Seismicity Mitigation Plan (ISMP) for each site (Task 1.3). Reporting and publication of BP1 results (Task 1.4) is anticipated to be completed within 11 months of project initiation.

Field-based activities during BP1 are associated with Task 1.1 (“Site/Wellbore Readiness”) and would include the following: Prior to the planned stimulations each well would be investigated for site readiness and wellbore integrity. This would potentially include the moving in and out of diesel-powered trucks mounted with equipment to perform work on each well. A micro-seismic and GPS array would be installed, which may involve temporary minor site disturbances and the emplacement of shallow boreholes. All seismic monitoring boreholes would be located along existing roadways or well pads, and not within drainages. If a site is selected that does not fit these parameters, the recipient is required to submit additional site information for further NEPA review and must receive approval from the DOE Contracting Officer prior to initiating these Task 1.1 activities. Installation and maintenance of the seismic monitoring systems for each project site would be coordinated between DOE, Ormat, Lawrence-Berkeley National Laboratory (LBNL), and Sandia National Laboratory (SNL). In general, SNL would oversee the drilling of shallow monitoring wells at project sites, and LBNL would install the geophones and maintain the monitoring network.

All three project sites are on federal leases held by Ormat located on lands managed by the Bureau of Land Management (BLM). These sites are currently fully permitted; no modifications to, or new, permits are expected to be required for the proposed BP1 activities. Each of the three planned stimulations in BP2 would be subject to appropriate additional permitting requirements of the BLM (stimulation actions and environmental impacts), the Nevada Department of Environmental Protection (underground injection control), and the Nevada Division of Minerals. Any needed modifications to existing permits would be identified and obtained during BP1 in consultation with the aforementioned agencies.

The three field sites are purpose-built for the type of activities being proposed and no change in the use, mission, or operation of the geothermal fields would arise out of BP1 efforts. The proposed project does not involve any physical modifications of existing facilities or construction of new facilities. The deployment of equipment outdoors would be temporary and short-term; no permanent installations of equipment or infrastructure would occur during BP1. All ground disturbing activities would be conducted in accordance with existing site policies and procedures that guide such work. Ground disturbance would occur in areas of previous development and any requirements associated with existing permits would be followed at all times during the course of the project. Minor amounts of non-hazardous waste generated by BP1 activities would be reused, recycled, or disposed of in accordance with established procedures. Air emissions resulting from the operation of vehicles on-site would be de minimis.

Proposed work would occur in and around hot geothermal wells. Safety briefings would be held for all personnel working on-site, emphasizing the use of Personal Protective Equipment (e.g., hardhat, gloves, safety glasses) and limiting personnel at the well sites during certain activities. BP1 activities would not introduce any unique health and safety hazards beyond those typical of an operating geothermal field; existing site policies as well as industry best practices would be followed at all times by project personnel.

BP1 activities would not affect cultural resources, threatened or endangered species , critical habitats, wetlands, floodplains, or prime farmlands. The U.S. Fish and Wildlife Service Endangered Species Program website (IPaC) identifies one candidate species, the Monarch Butterfly, with a potential geographical range that includes the three project sites. However, considering that the proposed field work would be conducted on ground that has been previously disturbed or developed, the project would not have the potential to meaningfully impact monarch habitat.

NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

Budget Period 1

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

Budget Period 2 and Budget Period 3

Include the following condition in the financial assisstance agreement:

All seismic monitoring boreholes shall be located along existing roadways or well pads, and not within drainages. If a site is selected that does not fit these parameters, the recipient is required to submit additional site information for further NEPA review and must receive approval from the DOE Contracting Officer prior to initiating these Task 1.1 activities.

Notes:

Geothermal Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss Donoghue, 5/20/2021

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 5/20/2021

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☑ Field Office Manager review not required
☐ Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager