

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Board of Regents of the University of Wisconsin System**STATE:** WI

PROJECT TITLE: WHOLESCALE — Water & Hole Observations Leverage Effective Stress Calculations and Lessen Expenses

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002083	DE-EE0009032	GFO-0009032-001	GO9032

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.
- B3.6 Small-scale research and development, laboratory operations, and pilot projects** Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to University of Wisconsin (UW) to develop a protocol for simulating the spatial distribution and temporal evolution of stress in geothermal systems. UW and its project partners would develop a multi-physics modeling technology that would interpret data from hydrological,

thermal, and mechanical processes over varied spatial and temporal scales. Once developed, the modeling technology could be used to optimize the placement of injection and production wells. Data for the model would be obtained, in part, from the San Emidio geothermal site, operated by Ormat Technologies, in Nevada. The project would be completed over three Budget Periods (BPs), with a Go/No Go Decision Point in between each BP.

Proposed project activities would largely consist of computer modeling and data analysis. Much of the data used to develop the modeling technology would be historical data or data acquired from simulations. As mentioned above, a portion of the data would come from measurements taken from Ormat Technologies' San Emidio geothermal site, using sensors that would be deployed for the purposes of the project. Additionally, data would be obtained from routine drilling operations performed at the site, (e.g. mud and wireline logging). These operations would be performed by Ormat, and would not be adapted/performed for the project. UW would solely acquire data from these operations.

All project work would be coordinated by UW and performed at existing, purpose-built locations. UW would perform computer based modeling/analysis and laboratory-based material characterization at its campus in Madison, WI. UW's project partners University of Nevada Reno (UNR – Reno, NV), the National Renewable Energy Laboratory (NREL – Golden, CO), and the Lawrence Livermore National Laboratory (LLNL – Livermore, CA), would solely perform work that is intellectual, academic, or analytical in nature.

All field work would be performed at the San Emidio geothermal site in Nevada. Field work would include geological sample collection and seismic data collection via outdoor sensor equipment. Geological samples would be taken at approximately 50 different locations at the San Emidio site. At each location, the ground would be disturbed over a volume no larger than one cubic foot. Existing roads and footpaths would be used to access each of these locations. Seismic data would be collected using a variety of sensor/measurement equipment. This would include the temporary deployment of approximately 16 pressure sensors, 450 passive seismic sensors, and 3 GPS stations. These deployments are discussed further below:

The pressure sensors would be deployed into existing boreholes. The devices consist of a pressure recorder on the surface, a 1/8" diameter stainless steel tube filled with nitrogen fed from the ground surface to below the water level, and a 1.5-inch-diameter by 10-foot-long chamber to maintain constant water level below the nitrogen. Pressure sensor deployments would be performed over a period lasting approximately 4 weeks.

The passive seismic sensors would each consist of a cylinder measuring approximately 8 inches in diameter x 12 inches in length. Each seismic sensor would be installed in a hole dug into the soil with a depth no greater than 18 inches. The sensor would be removed after approximately 4 weeks, at which time the hole would be refilled with soil and the ground surface regraded to roughly its previous level. Existing roads and footpaths would be used to access each location.

The GPS stations would consist of a monument, an antenna, a suitcase-sized enclosure, and a solar panel. Each GPS stations would be installed at an existing well. The site would be surrounded by a fence (approximate area of 10 ft. x 10 ft.) measuring approximately 4 ft. in height. The GPS stations and surrounding fencing would remain in place throughout the duration of the project (i.e. approximately three years).

The precise locations for the deployments listed above are not yet known, and would be determined upon commencement of the project. Deployments would be limited to sensor/measurement equipment. No new facilities, physical modifications to existing facilities, or changes in the use, mission, or operation of existing facilities would result from the project.

U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) database shows that there are two (2) endangered fish species and six (6) migratory bird species that have the potential to occur within the project area. Considering that no work would occur in or near water sources and the deployments would consist of the temporary installation of small-scale measuring devices and equipment in small holes in the ground and at previously disturbed locations (e.g. wellheads), DOE has determined that the project would have no effect on Endangered Species Act listed species or critical habitats.

At the San Emidio site, there are several small cultural sites in the area (lithic scatter) that have previously been recorded. To ensure protection of cultural resources, the following will be required as part of best management practices for the project: The project team must maintain at least a 30 meter buffer between proposed project work and any known cultural site. If any previously unknown cultural or archaeological artifacts are encountered during the installation of field equipment, the recipient or their staff must stop the installation immediately and inform the

DOE Project Officer of the finding within 48 hours. The affected installation must be relocated to another area that would maintain at least a 30 meter buffer around the newly discovered cultural site.

If any locations fall on land administered by the Bureau of Land Management (BLM), UW/Ormat Technologies would coordinate with BLM prior to deploying any equipment. If any locations fall on private land not owned by Ormat, then appropriate sundries (e.g., landowner permission) would be completed prior to deploying any equipment.

At the San Emidio site project work, including equipment deployment, removal, and data collection, would involve the use of lightweight tools such as hammers and shovels. Ormat Technologies' established health and safety policies and procedures would be followed, including personnel training and the use of personal protective equipment. All laboratory work and/or research performed by UW, UNR, NREL, and LLNL would be performed in adherence to each entity's established health and safety policies and procedures. UW and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

The project team must maintain at least a 30 meter buffer between proposed project work and any known cultural site. If any previously unknown cultural or archaeological artifacts are encountered during the installation of field equipment, the Recipient or their staff must stop the installation immediately and inform the DOE Project Officer of the finding within 48 hours. The affected installation must be relocated to another area that would maintain at least a 30 meter buffer around the newly discovered cultural site.

Notes:

Geothermal Technologies Office
This NEPA determination requires a tailored NEPA Provision
NEPA review completed by Jonathan Hartman, 05/12/2020

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.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  _____
NEPA Compliance Officer

Date: 5/12/2020

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: _____
Field Office Manager

Date: _____