

PMC-ND

(1.08.09.13)

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



RECIPIENT: West Virginia University Research Corporation

STATE: WV

PROJECT TITLE: Analysis of Geothermal Deep Direct-Use Combined with Reservoir Thermal Energy Storage on the Wet Virginia University Campus-Morgantown, WV

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002219	DE-EE0009597	GFO-0009597-001	

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.
- 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 federal funding to the West Virginia University Research Corporation (WVU) to perform a second phase feasibility analysis for the development of an integrated Geothermal District Heating and Cooling (GDHC) and underground thermal energy storage (UTES) system for the WVU campus. The objective of the proposed project is to drill an exploratory well to better characterize thermal energy and geologic target strata for a potential production well. In addition, the project would better characterize surface loads/demands at the WVU campus, to aid in evaluating the technical and economic feasibility of a geothermal district heating system.

The proposed project would consist of two 18-month Budget Periods (BP) and a final 12-month BP. Drilling and well measurements would occur in BP1. Fieldwork is expected to last for the full duration of BP1 and would be followed by

another 30 months of office- and laboratory-based modeling, analysis, design, engineering, and reporting. This NEPA Determination applies to all Tasks of BP1, BP2, and BP3 as defined in the current Statement of Project Objectives.

Initial activities would be to utilize flow meters to measure and evaluate the steam energy consumption data for key buildings on the WVU campus. Facilities work, including installation of flow meters and campus energy system data collection, would be performed at the Health Sciences Center, Evansdale, and Downtown facilities served by the current district heating and cooling system. Surface facilities characterization would not result in any change to the use, mission, or operation of existing facilities.

A sampling plan for the scientific well would be developed using geologic, geophysical, and engineering data from other wells that have reached the target depth horizons in the surrounding region. Project management and oversight activities would be performed by WVU. Laboratory and analytical work to support campus energy analysis and rock geochemistry analysis would occur at dedicated WVU research facilities (Morgantown, WV). The West Virginia Geological and Economic Survey (WVGES; Morgantown, WV) would assist with core/rock sample analysis, core storage, and geologic science support. All facilities in which laboratory tasks would occur are purpose-built for the type of research being proposed; therefore, no modifications or new permits, additional licenses, and/or authorizations would be necessary.

Proposed drilling and sampling activities would include the following:

- Drill a vertical scientific observation well to a depth of approximately 15,000 ft. The project would evaluate multiple-stacked reservoirs existing from approximately 1,000 ft to the proposed total depth of 15,000 ft in the Ordovician Utica-Pt. Pleasant Formation.
- Prior to setting shallow, intermediate, and deep casings, perform a full logging and conventional coring program to measure the geothermal gradient, petrophysics, geochemistry, and drilling parameters at the proposed site.
- Perform geochemical and flow analysis of various working fluids (including brine and CO₂) on the subsurface geothermal source and storage reservoirs using core samples.

The proposed drill site is owned and operated by J&L Energy (Morgantown, WV). Drilling would occur using a wellpad that is currently under development for the independent drilling of two Marcellus Shale production wells. Activities related to pad construction are outside of the scope of the proposed project; WVU would utilize the J&L Energy facilities when constructed. Project-related activities at this site would not expand the area of ground disturbance beyond the cleared well site or lead to an increase in the physical footprint of planned J&L facilities. The site is accessible via existing roadways. The drilling period would be around 90 days. Upon completion of the proposed research, the project team would discuss any other potential scientific applications of the well. If no other activities are identified, the well would be plugged and capped in accordance with applicable State of West Virginia (WV) regulations.

The type of exploratory borehole that would be drilled is not classified as an injection well under U.S. Environmental Protection Agency regulations. Permitting and approval of the proposed project would be at state level. The proposed project would proceed in compliance with WV Code 22-6 and 22-6A and associated regulations governing site construction, well drilling, and well completion activities. Permits issued by the West Virginia Department of Environmental Protection (WVDEP) would be required for the drilling and completion well work activities. Project partner Hewitt Energy Strategies would hold the permit for the proposed well. Before undertaking any Task 2.2 ("Drill and core a vertical scientific observation well") activities, WVU is required to ensure that all requisite permits and approvals have been obtained. Further, WVU is required to submit a copy of all WVDEP permits to the DOE Project Officer prior to commencing Task 2 activities, and must comply with any and all associated terms and conditions.

During drilling, the site would be occupied by members of the project team and sub-contractors responsible for site oversight and drilling. Well development activities are an industrial process requiring awareness and safety protocols for the prevention of accidents on site. Individuals working at this location could be exposed to physical hazards associated with drilling and well construction. Potential health and safety risks would be managed through a site-specific worker safety and emergency response plan developed and overseen by expert personnel with experience in substantial drilling operations.

Borehole construction would have limited impacts to the surface environment beyond the footprint of drilling operations, which would be confined to the previously developed J&L Energy wellpad and cleared adjacent areas. Project activities would not affect cultural resources, wetlands, floodplains, or prime farmlands. The project would produce an estimated 500 tons of non-hazardous drill cuttings. These solid wastes would be disposed of in a state-approved landfill facility in accordance with any permit conditions set forth by the WVDEP. The project would use synthetic-based drilling mud (the same drilling mud used by J&L for their operations) which would be rented and returned when the job is complete.

The U.S. Fish and Wildlife Service Endangered Species Program website (IPaC) identifies three federally listed species, the Northern Long-eared Bat, Indiana Bat, and Running Buffalo Clover, believed to occur in the project area.

There are no critical habitats at this location. Bald Eagles in addition to seven migratory bird species of conservation concern, as identified in IPaC, may be present seasonally within the project area. Since the site has already been cleared and will undergo extensive additional development prior to the initiation of the proposed project, DOE has determined that no effects to sensitive resources are to be expected as a result of the proposed drilling activities at this location.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

Before undertaking any Task 2.2 ("Drill and core a vertical scientific observation well") activities, the Recipient is required to ensure that all requisite permits and approvals have been obtained. Further, the Recipient is required to submit a copy of all WVDEP permits to the DOE Project Officer prior to commencing Task 2.2 activities and must ensure compliance with any and all associated terms and conditions.

Notes:

Geothermal Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss Donoghue, 8/18/2021

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.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:

 Electronically Signed By: Casey Strickland
NEPA Compliance Officer

Date: 8/18/2021

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: _____