

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



RECIPIENT: OXY USA, Inc

STATE: CO

PROJECT TITLE : Geothermal Limitless Approach to Drilling Efficiencies (GLADE)

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002656	DE-EE0010444	GFO-0010444-002	GO10444

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.)

B5.15 Small-scale renewable energy research and development and pilot projects

Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Occidental Petroleum USA Inc. (OXY) to drill twin high-temperature geothermal wells in the Denver-Julesburg Basin of Colorado using existing and novel drilling technologies. OXY and its partners from industry, national laboratories, and academia plan to drill to deeper and hotter depths than most existing geothermal operations and at a faster rate.

The proposed project is comprised of two Budget Periods (BPs) separated by a Go/No-Go Decision Point. BP1 and BP2 each have a discrete scope and expected outcomes. An initial NEPA determination for this award (GFO-0010444-001; CXs A9, B3.6; completed on 5/23/2023) reviewed all activities associated with BP1: "Planning and Preparation." GFO-0010444-001 conditioned BP2: "Construction, Drilling Execution, Optimization, Intercept and Close Out" on further NEPA review of well construction and drilling activities and the targeted location. Since that time, OXY has identified and mapped where these activities would occur and the extent of related disturbance. This final NEPA determination reviews all activities associated with BP2.

The overarching scope of BP2 would be to drill two slant wells to a target depth of ~20,000 feet (ft.) into the basement crystalline rock and use magnetic ranging to connect the toes at depth to create a loop. Drilling would occur on a private geothermal lease held by OXY at the Western Midstream Latham Gas Plant (Weld County, CO). Analysis of drilling performance would be conducted by subrecipient Texas A&M University at the Harold Vance Department of Petroleum Engineering (College Station, TX). The proposed project would require a drilling permit for each well from the Colorado Department of Natural Resources Division of Water Resources, in addition to a "Use by Special Review" permit from Weld County.

Project activities from spud to rig release are expected to take no more than 120 days. The total area of surface disturbance related to construction and drilling would be approximately 13 acres. An approximately 6.3 acre well pad and short access road would be constructed on industrial zoned land adjacent to the natural gas processing facility. Both wellheads would be located on the same pad although exact spacing is yet to be determined. A cut/fill plan has been developed to indicate the level of earth removal and redistribution to construct a flat area for locating a rig capable of drilling to the designed depths of the proposed project. The area of disturbance associated with the new access road would be approximately 0.8 acre. The proposed roadway would be crowned and ditched and constructed with approximately 24-ft. wide graveled surfaces with a graded road embankment and ditch slopes. Cross-drain culverts would be installed. Existing roads at the site would be maintained in a safe and usable condition. Road maintenance would continue until final abandonment and reclamation, and may include blading, ditch cleaning, gravel surfacing, filling ruts and low spots, installation of erosion controls, dust control, snow removal, and culvert replacement or cleanout. Dust control may be managed by watering, landowner-approved magnesium chloride

application, and observing posted speed limits. Storm water Best Management Practices (BMP) would consist of the following: a perimeter ditch/berm surrounding the entire area of disturbance, the installation of a number of sediment traps, the installation of at grade spillway, and the installation of storm water storage outlet pipes as needed. Active construction locations would be regularly inspected for BMP integrity, efficiency, and maintenance and within 24 hours following threshold storm events and winter season melt.

The proposed project would not involve the permanent deployment of equipment or facilities at the well pad. Following completion of the proposed drilling program, the well pad would be reclaimed according to an interim plan to be developed. The wells would be temporarily abandoned and secured using at least two downhole barriers, likely either retrievable bridge plugs or composite plugs set in intermediate casing. Additionally, a night cap with back pressure valve would be installed at the wellhead. The drilling rig and ancillary equipment would be demobilized from location and the pad liner would be removed. Any staining that is discovered on location would be disposed of and replaced with topsoil/suitable subsoil.

The currently estimated quantities of commercially available products to be used for the water- and oil-based drilling fluids are routine for this type of drilling operation. Materials used and generated by drilling would not require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities. A rubber liner would be used to create a barrier to the ground in the event any oil-based fluids are released. The wells would be constructed using conventional drilling techniques, resulting in the extraction of a small diameter of cuttings from the wellbore. These cuttings would be disposed of per the applicable requirements of Weld County, the Colorado Energy and Carbon Management Commission (ECMC; formerly the Colorado Oil & Gas Conservation Commission), and the U.S. Environmental Protection Agency (EPA). No potentially adverse materials or substances would be left on site.

The drilling rig and ancillary equipment would be powered by a combination of diesel and natural gas generators and mobilized to location for the proposed short-term and temporary operation. Estimated emissions from project activities range from 2090-2892 tons of carbon dioxide, depending on the type of drilling rig utilized the proposed project. OXY would select the lowest emission option if feasible. Weld County is within an EPA non-attainment area for ozone. All of the emission points at the well sites would be accounted for in the project permitting process, where required.

OXY would deploy strategies to mitigate potential hazards at each well site in accordance with existing corporate environment, safety, and health policies and procedures, including the use of personal protective equipment, engineering controls, job safety analyses, and continual job monitoring. Project work performed by the geothermal company, drilling contractor, and various service companies would be conducted in accordance with the respective safety rules and regulations in effect at the time of performance. External procedures in place for drilling and logging would be subject to additional review by OXY project personnel during the planning of site operations.

OXY has designed a comprehensive community engagement plan to proactively inform and consult with members of the public before and during the project. Various techniques would be implemented to mitigate any impacts of concern to surrounding communities. Visual impacts would be limited to the temporary presence of the drilling rig and sound walls, which may be visible to those who live or work near the location or drive on the adjacent state road. Noise impacts would be negligible based on the project's distance from the nearest residential building unit and sensitive receptor. Sound levels on site would be continuously monitored to verify compliance with applicable state and local noise ordinance requirements. The project is not expected to negatively impact the low-income or housing burden of the nearest Disproportionately Impacted Community as defined by the ECMC. A traffic management plan is required as part of the permitting process for the proposed project. There would be no changes to traffic patterns on nearby state and county roads, although a minor increase in traffic is anticipated during site operations.

The U.S. Fish and Wildlife Service (USFWS) Information Planning and Consultation tool and Colorado Parks and Wildlife's (CPW) threatened and endangered species list were reviewed to identify sensitive biological resources that may be present within or near the project area. There are several federally listed threatened or endangered, or proposed endangered, species with an expected range that includes Weld County. However, these species either do not occur, or are unlikely to occur, in the project area based on known habitat types. Monarch butterfly (*Danaus plexippus*), a candidate species for federal listing, may occur in the project area. One (1) state listed threatened species may occur in the project area: the Burrowing owl (*Athene cunicularia*). Three (3) species of state special concern may occur in the project area: Black-tailed prairie dog (*Cynomys ludovicianus*), Mountain plover (*Charadrius montanus*), and Ferruginous hawk (*Buteo regalis*). Mountain plover and Ferruginous hawk are also both designated by USFWS as a Bird of Conservation Concern and protected under the Migratory Bird Treaty Act. Various other migratory bird species have an estimated range overlapping the project area.

OXY is required by the ECMC to prepare a Wildlife Protection Plan. Prior to submitting the well permit application, OXY will have a qualified third-party biological consultant conduct a reconnaissance wildlife survey. The following BMPs will be included in the Wildlife Protection Plan regarding Burrowing owls: A qualified biological consultant will conduct another field survey two (2) weeks prior to the start of pad construction and, if suitable habitat is determined to be present and work falls within CPW seasonal timing guidance of March 15 - August 31, OXY will follow CPW survey protocol of three additional surveys over two weeks. If Burrowing owls are determined to be present prior to

construction and are within the recommended buffer of .25 miles from the project area, work will be delayed until August 1 or until the absence of Burrowing owl is confirmed using CPW survey protocol.

A migratory bird nesting survey conducted no more than seven (7) days prior to ground-disturbing activities occurring between March 15 and September 15. If active nests or eggs are found, an appropriate spatial buffer would be applied per USFWS and/or CPW guidelines.

There are no designated or proposed critical habitats present within or near the project area. Historical land use within the footprint of the proposed project is primarily agricultural, with the dominant modern land cover consisting of introduced herbaceous grassland. According to the Natural Resources Conservation Services (NRCS), the project area largely overlaps with a soil series unit classified as farmland of statewide importance, although other mapped soils present or in the immediate vicinity do not meet federal, state, or local farm class criteria. The proposed project is sited in a densely drilled region for oil and gas production. Areas of developed open space (several existing well pads, access roads, and industrial facilities) surround the proposed well pad. The gas processing plant is approximately 1000 ft. from the northwest corner of the proposed well pad. Due to the extent of human activity within and adjacent to the project area in conjunction with the relatively small-scale and impermanent project footprint, short duration of proposed activities, site reclamation plan, and ECMC wildlife requirements, DOE has determined that the proposed project does not have the potential to affect protected species or other sensitive ecological resources. Further, given the aforementioned factors, DOE has determined that the proposed project does not include any activities that would irreversibly convert farmland to nonagricultural uses.

There are no properties listed in the National Register of Historic Places within 5 miles of the project area. On behalf of OXY, a qualified archaeological consultant reviewed restricted-access data maintained by the Colorado Office of Archaeology and Historic Preservation, including six cultural resource inventories previously completed for nearby oil and gas infrastructure, and examined relevant historical plats, maps, and aerial images for information related to the project area. This report did not identify any historical resources of concern that could be impacted by the proposed activities and further concluded that substantial modern disturbance observed in this area limits the potential for intact and significant cultural resources (precontact or historic) to be present.

DOE has considered the scale, duration, and nature of the proposed activities to determine potential impacts on other environmentally sensitive resources of concern and found no effects that would be expected to result from the project.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

A migratory bird nesting survey shall be conducted no more than seven (7) days prior to ground-disturbing activities occurring between March 15 and September 15. If active nests or eggs are found, an appropriate spatial buffer would be applied per U.S. Fish and Wildlife Service or Colorado Parks and Wildlife guidelines.

If the recipient or other project participants encounter cultural or archaeological artifacts during project activities, all activities must immediately cease in the vicinity of the discovery. The recipient must notify the DOE Project Officer and the Colorado State Historic Preservation Office of the discovery within forty-eight hours of the discovery. Project activities in the vicinity of the discovery must cease until an evaluation of the discovery is completed by the appropriate officials and the DOE Contracting Officer provides written authorization to resume the activities. If the recipient seeks to relocate the affected work to another nearby site, the recipient must first obtain written authorization from the DOE Contracting Officer.

Notes:

Geothermal Technologies Office (GTO)

This NEPA determination requires legal review of the tailored NEPA provision.

Review completed by Whitney Donoghue on 04/01/2024.

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:  _____ Date: 4/2/2024
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