U.S. Department of Energy
Categorical Exclusion Determination Form

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Proposed Action Title: Mining Innovations for Negative Emissions Resource Recovery (MINER) Program (FOA No. DE-FOA-0002707 and DE-FOA-0002708)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Arlington, Texas; Los Angeles, California

Proposed Action Description:

The MINER Program seeks to increase the U.S. domestic supplies of copper, nickel, lithium, cobalt, and other rare earth elements. Specifically, projects funded under the MINER Program Specifically, projects funded under the MINER Program aim to (1) decrease comminution energy by 50% compared to state-of-the-art; (2) increase yield of energy-relevant minerals by reducing unrecovered energy-relevant minerals in the tailings by 50% compared to state-of-the-art; and (3) enable the negative emissions production of key minerals by sequestering >10 wt.% CO2e per metric ton of carbon dioxide-reactive ore processed. If successful, the commercial-ready technologies developed under the MINER projects will decrease energy use of mineral processing and increase the yield of energy-relevant minerals via novel net-zero or negative emission technologies.

The MINER Program is composed of 16 small-scale research and development projects that will be conducted by universities, for-profit entities, and federal laboratories. This Determination covers 1 of the 16 projects (University of Texas - Arlington) (see Attachment A). This project is covered by and fits within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.15 - Small-scale indoor research and development projects using nanoscale materials

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of 10 CFR Part 1021.

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

☑ The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

☑ The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: Approved via email

Date Determined: December 20, 2022

(This form will be locked for editing upon signature)

Attachment A: Projects in the MINER (FOA No. DE-FOA-0002707 and DE-FOA-0002708) Program

Prime Recipient (Control No.)	Project Title	Project Description	Categorical Exclusion
University of Texas – Arlington (2707-1507)	RECLAIM: Electrochemical Lithium and Nickel Extraction with Concurrent Carbon Dioxide Mineralization	The University of Texas at Arlington will develop acoustic stimulation and electrolytic proton production to produce lithium (Li) and nickel (Ni) from CO2-reactive minerals and rocks that contain calcium (Ca) and magnesium (Mg), while sequestering CO2 in the form of carbonate solids. First, an electric potential will be applied to water to simultaneously produce acidity and alkalinity. Then, solid feedstocks (Li/Ni/Ca/Mg-rich igneous and sedimentary minerals) will be dissolved in the acidic anolyte under acoustic stimulation. This project is limited to bench-scale laboratory activities, with no outdoor or field-testing component, and has already obtained the required EH&S (Environmental, Health and Safety) approvals necessary for use of all the materials that it will need over the course of this project.	A9, B3.6, B3.15