PMC-ND
(1.08.09.13)

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

RECIPIENT: University of Wyoming **STATE:** WY

PROJECT TITLE: Generation of Rare Earth Metals from Rare Earth Oxides Using Microwave Plasmas

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002322	DE-EE0009432	GFO-0009432-001	GO9432

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.)
B3.6 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 Wyoming (UW) to develop a novel process for the conversion of rare-earth oxides (REOs) to rare-earth metals (RE-metals). The process would be developed so as to achieve an increase in energy efficiency and reduction in emissions, as compared to the current state of technology. UW would develop the process using an existing microwave plasma reactor that would be modified for the purposes of the project. UW would perform laboratory testing utilizing REO samples to verify the conversion process. The project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Proposed project activities would include material characterization, REO processing, assembly of pilot REO conversion setup, performance testing of REO conversion/RE-metal synthesis process, computer modeling, technoeconomic analysis, and stakeholder engagement.

UW would coordinate all project work and perform REO processing, REO/RE-metal conversion testing, and material characterization at laboratory facilities at its campus in Laramie, WY. The pilot REO conversion setup to be used for performance testing would consist of a bench-scale (approximately 1.7m x 1m x 1m) microwave plasma reactor device assembled from commercial off-the-shelf (COTS) hardware. As noted above, a microwave plasma reactor device currently exists at UW. This device would be modified for the purposes of the project. Modifications would be limited to adjustments to the configuration of the hardware and the incorporation of additional COTS components. All REO/RE-metal conversion would be performed at laboratory scales (i.e., approximately 100 g of input materials). In addition to the work to be performed at UW, project partners Colorado School of Mines (CSM) and Ames Laboratory would perform data analysis and computer modeling at their facilities in Golden, CO and Ames, IA, respectively.

No physical modifications to existing facilities, ground disturbance, or changes to the use, mission, or operation of existing facilities would be required at any of the project locations. No additional permits or authorizations would be required.

Project work at UW's facilities would involve the use and handling of metals, pressurized gases, and powered laboratory equipment. All such handling would be performed in controlled laboratory environments that routinely work with these materials/equipment as part of their regular course of business. In order to mitigate potential hazards, UW would adhere to established institutional health and safety policies and procedures. Protocols would include personnel

training, the use of personal protective equipment, monitoring, and internal evaluations. All waste materials would be handled and disposed of by qualified waste management service providers. No physical experiments would be performed at the site locations of CSM or Ames Laboratory. 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.

Notes:

Advanced Manufacturing Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 04/30/2021

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 Date: 5/4/2021
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