

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



RECIPIENT: MIT

STATE: MA

PROJECT TITLE: Iron Production by Molten Sulfide Electrolysis

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002997	DE-EE0011211	GFO-0011211-001	GO11211

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.)

B1.31 Installation or relocation of machinery and equipment

Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

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 Massachusetts Institute of Technology (MIT) for the design, development, fabrication and field testing of sulfidation and electrolysis equipment for iron production.

Project activities at MIT's main campus in Building 5 (55 Massachusetts Ave.) Cambridge, Massachusetts would include testing of chemical reaction rates between project materials, materials analysis and characterization as well as equipment fabrication to include machining and joining of equipment parts. Project prototyping and testing of a sulfidation and electrolysis reactor would occur at the Bates Laboratory warehouse (21 Manning Ave.) in Middleton, Massachusetts, as would the pilot scale demonstration engineering, manufacturing, assembly, and testing.

The project would involve the use and handling of various hazardous materials, including metals, inorganic chemicals and toxic gases. The toxic gas associated with the project would be scrubbed, then released outdoors following all federal, state and local environmental regulations. All hazardous materials would be properly handled and disposed of following all federal, state and local environmental regulations. Existing MIT and Bates Laboratory health and safety policies and procedures would be followed, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. Additional policies and procedures would be implemented as necessary as new health and safety risks are identified.

Emissions associated with project implementation at both MIT main campus and the Bates warehouse would largely be comprised of inert gas (dinitrogen, argon). Toxic gas emissions associated with the project would include carbon monoxide, carbon dioxide, sulfur dioxide, disulfur and hydrogen sulfide. These gases would be scrubbed and filtered before being release to the environment.

No ground disturbances activities and no changes to the mission at the existing facilities would occur as part of this award. Outdoor retrofits would occur on the roof of the Bates Laboratory to accommodate extra power and ventilation supporting the presence of several operators for the pilot. None of the project activities are expected to require applying for new or modified permits, licenses, or authorizations.

There are two locations listed on the National Register of Historic Places within approximately half a mile of the Bates Laboratory, where roof work would occur to install a seven-foot-tall heating, ventilation and air conditioning (HVAC) system and/or inert gas supply. They include the Preston House (0.5 miles to the south of the site) and the Elisha Putnam-Colonel Benjamin Peabody House approximately 0.5 miles northwest of the site. Given the prevalence of mature forested stands surrounding the facility, it is unlikely that there would be visual impacts associated with the rooftop retrofits proposed for the Bates Laboratory on these two historic properties.

While the Bates Laboratory is a 54-year-old structure, it does not exhibit any historical significance, either by being associated with important events or people needed for National Register of Historic Places listing eligibility. DOE has determined that currently no additional Section 106 review is required per 36 § 800.3(a)(1); this federal legal citation addresses no potential to cause effects to historic properties assuming such historic properties are present within a project's area of potential effect.

If the scope of work changes, additional Section 106 review, pursuant to the National Historic Preservation Act, may be required for this project. If the Recipient anticipates a scope of work change, they are required to contact their DOE Project Officer prior to initiating any construction activities which have not been reviewed by DOE NEPA staff for potential impacts to natural and cultural resources.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Industrial Efficiency & Decarbonization Office
NEPA review completed by Chris Akios, 10/11/2024

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: _____



Electronically Signed By: Andrew Montano

NEPA Compliance Officer

Date: 10/15/2024

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: _____