PMC-ND
(1.08.09.13)

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

RECIPIENT: NREL **STATE:** CO

PROJECT TITLE: NREL-19-035 LLNL Gas Fermentation Process Intensification - Livermore, CA

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-AC36-08GO28308	NREL-19-035	GO28308

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:

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.
DOE/EA-1968 (NREL STM)	SITEWIDE ENVIRONMENTAL ASSESSMENT, U.S. DOE NATIONAL RENEWABLE ENERGY LABORATORY, SOUTH TABLE MOUNTAIN CAMPUS, GOLDEN, COLORADO

Rationale for determination:

The U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) proposes to partner with Lawrence Livermore National Laboratory (LLNL) to design, build, and test 3D-printed biocatalytic materials that would be used to convert methane to liquid fuels using engineered microorganisms.

Research activities at NREL would occur at NREL's Integrated Biorefinery Research Facility (IBRF) located in Golden, Colorado. NREL would cultivate a bacteria, Methylococcus capsulatus, to produce engineered strains of non-growing methanotrophic biocatalysts that can be used to convert methane.

LLNL, located in Livermore, California, would develop 3D-printed matrices that contain the biocatalyst developed by NREL to produce microbe-embedded polymers. LLNL would evaluate both natural and genetically modified catalysts in the polymeric matrices for cellular viability, methane uptake rate, and target product biosynthetic rate. LLNL would fabricate a bench-scale reactor to evaluate select biocatalysts up to a volume of 1 L, and would also conduct reactor lifetime baselining by completing a continuous bioreactor run for a period up to 6 months.

Laboratory tasks associated with the project would involve chemicals and materials typically used in biological work. Cell cultures would be sterilized prior to disposal, and the resulting non-hazardous material would be disposed of in accordance with NREL and LLNL policies and procedures. Work with this bacteria is considered to be safe and pose little to no threat of infection in healthy adults. Existing safety and environmental procedures would be followed, including safe handling of organisms, proper disposal, and the use of employee personal protective equipment. The project has been reviewed by biosafety officers at NREL and LLNL and approved by the respective Institutional Biosafety Committees. At LLNL, the use of low pressure flammable gasses has been evaluated by LLNL Industrial Hygienists and would follow existing safety procedures, including limiting the amount of flammable gas used, eliminating ignition sources, and reducing the concentration of flammable gas.

All research activities would occur in existing laboratories using existing laboratory equipment, and no new equipment or infrastructure would be needed to support the experiments. No change in the use, mission, or operation of existing facilities would result from the proposed project. If required, the responsible researchers at both sites will obtain any United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS) permits needed for the work. Any work associated with this proposed project shall not proceed until all required

permits have been received.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assisstance agreement:

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.

If required, the responsible researchers will obtain any United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS) permits needed for the work. Any work associated with this proposed project shall not proceed until all required permits have been received.

Notes:

NREL
Nicole Serio 5/23/2019

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: Kristin Kerwin Date: 5/28/2019

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