

PMC-ND

(1.08.09.13)

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



RECIPIENT: LanzaTech, Inc

STATE: IL

PROJECT TITLE: Ultra-lowSulfur Winterized Diesel

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001926	DE-EE0008508	GFO-0008508-001	

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.

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 LanzaTech to design and develop plans for a demonstration-scale integrated biorefinery to convert feedstocks to paraffinic diesel through an ethanol based alcohol-to-diesel process by optimizing an alcohol-to-jet process.

Activities will include: initial design of the production process; bench scale production of test samples; testing of samples; design of an enhanced alcohol-to-diesel production unit; procurement and integration of equipment into an existing alcohol-to-diesel production unit; large scale test (500 gallon) production run with the enhanced unit; testing of samples from the production run; and, economic analysis of the process.

Design of the initial process and of the enhanced unit would include data analysis; computational modeling and preliminary engineering and design and would occur at LanzaTech's dedicated R&D laboratories in Skokie, Illinois. Bench scale production of test samples would also occur at this location. This activity would include the production of a small amount (greater than 1 gallon) of alcohol-to-diesel paraffinic diesel samples. Portions of these samples would then be delivered to the Pacific Northwest National Lab (PNNL) in Richland, Washington for analysis as well as the diesel engine testing facility at Colorado State University in Fort Collins, Colorado for engine testing.

Based on the results of the initial testing a pilot scale unit would be designed at LanzaTech's laboratories in Skokie, IL. The design would lead to the fabrication of a new pilot scale diesel production unit which would utilize some equipment from an existing unit. Fabrication of the unit would be limited to integration of off-the-shelf equipment into a unit for diesel production. The unit would include multitubular fixed-bed reactors with water cooling on the shell side, pressure vessels (gas-liquid separators), distillation columns, pumps, compressors, and shell-and-tube heat exchangers. The unit would be fabricated by a professional fabricator which engages in fabrication in their normal

course of business.

Once fabricated the unit would be installed at LanzaTech's Freedom Pines pilot plant in Soperton, GA. The Freedom Pines facility is an existing bio-refinery. The unit would be modular and built upon multiple skids that would be placed on site and connected to existing electrical and plumbing infrastructure. The unit would be placed in a previously disturbed area adjacent to other refinery equipment. The total size of the unit would be approximately 45 feet by 60 feet.

No groundbreaking, enlargement of or modifications to facilities, or new permits would be required. Existing corporate health and safety procedures would be utilized for the fabrication, installation, and operation of the unit.

The unit would utilize commercially available catalyst and grain ethanol to produce diesel. An initial production run of approximately 500 gallons of paraffinic diesel would be conducted on the unit. Samples of the product would then be sent to PNNL and Colorado State for analysis and testing. An additional run of approximately 500 gallons of paraffinic diesel would then be conducted to verify commissioning and testing.

LanzaTech would then utilize the information gained to develop a basic engineering design package for a larger scale unit as well as complete a techno-economic analysis and life cycle analysis regarding the process. This work would be completed at LanzaTech's Skokie facility.

All activities would occur entirely within previously developed, purpose-built facilities, including laboratories and/or pilot plants. No change to the use, mission or operation of existing facilities would arise out of these efforts.

LanzaTech would coordinate the occasional transport of diesel between project locations using approved freight companies to ensure compliance with shipping laws and regulations.

The proposed project would involve the use and handling of hazardous materials. These include toxic, flammable and compressed gases, diesel, ethanol and various hazardous chemicals. Such materials are routinely employed at the respective facilities for the types of activities being proposed, and activities would not present materials or risks beyond the scope of current operations at those facilities. All work would be conducted within designated areas by trained employees following existing corporate health and safety policies and procedures, including personal protective equipment, engineering controls, and lab safety audits. No new permits, licenses or authorizations would be required.

Small quantities of hazardous and non-hazardous waste would be generated. Disposal methods are subject to project location, but all waste would be properly treated and disposed of following standard practices in accordance with local and state ordinances. Efforts would be made to reduce and recycle select byproducts and spent chemicals.

Minor and temporary air emissions during process validation activities would be well below allowable limits issued for these facilities. No siting, construction or major expansion of waste storage, disposal, recovery, or treatment actions/facilities would be required.

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:

Bio Energy Technology Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Roak Parker, June 9, 2020

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: _____



Casey Strickland

NEPA Compliance Officer

Date: 6/11/2020

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: _____