PMC-ND
(1.08.09.13)

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

RECIPIENT: Air Products & Chemicals, Inc. **STATE:** PA

PROJECT TITLE: Ultra-Cryopump for High Demand Transportation Fueling

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002044	DE-EE0008819	GFO-0008819-001	GO8819

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.
B3.11 Outdoor tests and experiments on materials and equipment components	Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Air Products & Chemicals (Air Products) to develop and test a prototype liquid hydrogen pump capable of refueling buses and trucks. The pump would be developed with sufficient flow and pressure capacity, so as to enable this type of fueling. The pump would be tested using liquid nitrogen (LIN) as a stand-in for liquid hydrogen.

The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP. BP1 would focus on design development for the device and each of its subcomponents. Proposed project activities for this BP would include the definition of pump requirements (e.g. interface requirements, heat leak mitigation equipment requirements, etc.), engineering analysis (e.g. investigations of thermal mass cooling, LIN shield cooling, clutch system analysis), and development of the system configurations and layout design. BP2 activities would center on optimization of the pump design and the development of manufacturing drawings. During this period, system requirements and configurations would be finalized, further engineering analysis would be performed, a safety & hazard review would be conducted on the final pump design, and a testing plan would be developed. BP3 would consist of all fabrication/assembly, installation, and testing activities. These would include component procurement (e.g. pump, tooling components, controls), development of an assembly manual, pump

assembly, controller integration, on-site equipment installation, safety reviews, and performance testing using LIN.

All analysis, testing, and fabrication would be performed at production facilities operated by Air Products. Air Products' corporate headquarters and manufacturing facilities are currently located in Allentown, PA. These facilities would be used throughout the initial stages of the project, and would likely be used through BP2. Air Products will construct a new headquarters and manufacturing facility in Macungie, PA, near its current facilities (<5 miles). Air Products anticipates that fabrication and testing would be performed at this new facility, as operations are expected to be transferred to the new site in 2021. The new facility would be larger than Air Products' current facility and would have expanded manufacturing capabilities. Some fabrication and testing may be performed at Air Products' current facilities. However, it's anticipated that most of these tasks would be performed at the new headquarters, likely starting in BP2. The construction of the new facility is not being undertaken for the purpose of completing this project and will take place regardless of DOE funding. Accordingly, DOE has determined that the construction of the new manufacturing facility is not a connected action and therefore will not be included in this review.

Testing of the pump prototype would primarily be performed outside, within a suitable area designated for testing, with minor bench-scale testing of components to be performed indoors, within the manufacturing facility. The outdoor testing area would have controlled access and would be closed off via fencing. A concrete pad measuring approximately 20x10 ft. and 2-3 ft. deep, would be installed to serve as the foundation for the pump prototype. This pad would be installed within the outdoor testing area. It is expected that the concrete pad would be installed at the new manufacturing facility. Installation would occur on land within the property of Air Products' new manufacturing facility. This land will already have been developed before the concrete pad would be installed for testing. Because installation would occur on developed land, used for industrial purposes, and considering the small scale of the installation, DOE has determined that this action would have no effect to special status species and/or migratory birds.

Project work would involve the use and handling of industrial chemicals. This would include the use of liquid nitrogen (LIN). Handling of LIN entails certain inherent risks, including exposure to cryogenic temperatures and oxygen displacement. In order to mitigate the risks associated with the handling of LIN and other project materials, established corporate health and safety policies and procedures would be adhered to at all times. Protocols would include training of personnel, regular performance of safety checks, the use of personal protective equipment, engineering controls and regular monitoring of processes and procedures. Air in the testing area in which LIN would be handled would be monitored to ensure the presence of breathable oxygen. LIN would be routed through the test pump and vented in gaseous form to the atmosphere. Nitrogen, as released, would not constitute a criteria air pollutant, as defined by the Environmental Protection Agency. Air Products would observe all applicable Federal, state, and local health, safety, and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Fuel Cell Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 11/22/2019

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: Casey Strickland Date: 11/22/2019

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] 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