

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



RECIPIENT: Dow Chemical for Subtask 5.7 (sub to AICHe)

STATE: LA

PROJECT TITLE: Energy-Efficient Separation of Olefins and Paraffins through a Membrane

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|--|--------------------------------------|-------------------------------|-------------------|
| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
| DE-FOA-0001578 | DE-EE0007888 | GFO-0007888-BP3-5 Subtask 5.7 | GO7888 |

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 American Institute of Chemical Engineers for the Rapid Advancement in Process Intensification Deployment (RAPID) Institute. RAPID is a consortium established under a Cooperative Agreement with the DOE and with participation from sub-recipients of the award, large and small private companies, universities, as well as national laboratories, and non-governmental organizations. Although all five budget periods have NEPA determinations, (GFO-0007888-BP1, 3/16/2017; GFO-0007888-BP2, 12/12/2017; GFO-0007888-BP2-OSU; 7/30/2018/21/2018; GFO-0007888-Task 10.6; GFO-0007888-BP3-BP5; 12/20/2018), some specific tasks/projects had not been fully defined so a NEPA review was not completed for those specific tasks/projects. This NEPA determination is specific to Subtask 5.7 activities by Dow Chemical Company, and their partners, to conduct laboratory testing, economic modelling, and field testing of a continuous membrane area (CMS) module using a stream of C2 and C3 olefins/paraffins.

The Dow Chemical Company proposes to perform a laboratory test of a CMS module on a stream of C2 and C3 olefins/paraffins. The laboratory test would be evaluated by computer modelling to determine the economic viability of the membrane. Researchers from the University of Minnesota would collaborate on the economic modelling analysis. Dependent on the results of the initial laboratory tests and economic modelling, the membrane may be field tested in an actual process stream at an existing Dow Chemical Company ethylene production site in Plaquemine, LA, or Oyster Creek, TX. Field testing would include testing with plant gas as feed to the membrane. The field test would expose the CMS to plant stream for an extended period of time to see the impact of a process stream on membrane performance for 90-100 days.

If the project progresses to field testing, the current test system in the field would require minimal modification to accommodate the CMS module and hydration membrane. Since the testing would occur at an existing production site, no new permits would be required. The field testing would require excess gases to be routed back to the process or to

a flare header for destruction.

The project would involve the use and handling of various hazardous materials, including industrial solvents. All laboratory and field facilities follow OSHA and company health and safety policies and procedures, which are regularly audited/assessed internally to ensure such compliance is maintained and would be adhered to throughout the project. All work would be in accordance with pertinent Federal, state and local environmental regulations. No change in the use, mission, or operation of existing facilities would arise out of these efforts.

NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

Budget Periods 3 through 5:

Subtask 5.7.4 Dow Chemical
Subtask 5.7.8 - Dow Chemical
Subtask 5.7.14 - Dow Chemical

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

Budget Periods 3 through 5:

Subtask 5.8.14 - Lubrizol Corp
Subtask 5.8.16 - Lubrizol Corp
Subtask 5.8.18 - Lubrizol Corp
Subtask 8.8.11 - Apache
Subtask 9.3.16 - Shell
Subtask 9.3.17 - Shell
Subtask 10.5.8 - HTRI

Any activities or projects not currently defined within the BP3-BP5 SOPO's or additional activities/projects prior to a review by DOE to establish whether or not those additional activities/project conform to the rationale and CXs applied in this NEPA Determination.

Include the following condition in the financial assistance 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.

Notes:

This NEPA determination does require a tailored NEPA provision.
Advanced Manufacturing Office
NEPA review completed by Diana Heyder on 5/8/2019

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.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____



Electronically Signed By: **Casey Strickland**

NEPA Compliance Officer

Date: 5/8/2019

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: _____