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

**RECIPIENT:** Texas A&M Agrilife Research **STATE:** TX

**PROJECT TITLE :** Multi-stream Integrated Biorefinery

| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
|---|---|---|---|
| DE-FOA-0001689 | EE0008250 | GFO-0008250-001 | |

**Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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. |

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Texas A&M Agrilife Research (hereafter 'Texas A&M') to develop processes for converting lignin-containing biorefinery waste into value-added bioproducts.

The proposed project would encompass data analysis, computer modeling, pilot-scale engineering and design, and laboratory scale research and development activities. In particular, fractionation, conversion, and processing technologies would be developed to produce carbon fiber, asphalt binder modifier, and lipids for the production of biodiesel from existing pilot-scale biorefinery waste streams. Proposed work activities would include waste composition analysis, process development of fractionation, extraction and fermentation methods, techno-economic and life cycle analyses, and pilot-scale integration of multi-stream integrated biorefinery technologies into a preexisting test facility.

Project sub-recipients would include the University of Tennessee, Knoxville ('UTK' - Knoxville, TN), Washington State University ('WSU' - Richland, WA), and ICM Technology Development ('ICM' - Joseph, MO). Laboratory-scale research and analysis would be conducted at Texas A&M, UTK and WSU. ICM's facilities would be used for process scale-up and testing. ICM owns and operates a dedicated, purpose-built pilot plant for fermentation and bioprocess testing. The pilot plant is structured to test and scale up biorefinery processes. All laboratory, research and testing facilities are equipped to undertake the proposed research and processing activities. No physical modifications to existing facilities or ground disturbing activities would be undertaken as part of the proposed project. No change in the use, mission or operation of existing facilities would arise out of these efforts.

Testing facilities would have a production capacity of approximately one (1) dry ton of biomass (~200 kg of biorefinery waste) per day. Additionally, industrial chemicals would be used for biomass processing, including (amounts approximated) 40 kg sulfuric acid, 80 kg anhydrous ammonia, 5 kg potassium hydroxide, 1000 kg process water, and 8kg cellulose enzyme.

At all locations, the proposed project activities would involve the use of hazardous materials, including chloroform, and other concentrated acids, bases and organic solvents for compound extraction, as noted above. At all sites, industry-standard environmental and chemical safety procedures would be adhered to, including proper treatment of chemical waste and use of chemical hoods, gloves and glasses. All personnel have been trained in the proper use, storage,

handling, and disposal of all hazardous materials that would be used. All work activities would comply with all relevant Federal, State, and local health, safety and environmental regulations.

Throughout the project, bacteria transformation would be performed in controlled laboratory settings, involving the use and handling of genetically modified organisms. Three genetically modified strains of the bacteria genus Rhodococcus would be used. Texas A&M, UTK, and WSU have already obtained the requisite permits needed to cover two of the modified Rhodococcus strains proposed to be used, per Biosafety Level 1 (BSL 1) guidance, as issued by the Centers for Disease Control and Prevention and the National Institutes of health. These permits would need to be expanded to cover Rhodococcus jostii RHA1 before undertaking any project-related activities with this specific strain.

Because ICM is a dedicated pilot-testing facility, equipment used for pilot scale-up testing would not need to be decommissioned at the conclusion of the project, but would instead remain in place for future operations.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410 (2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

**NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:
The recipient is required to submit copies of all permits needed for completion of the activities contemplated under this award, including relevant biosafety and environmental permits, and/or written approvals to the DOE Project Officer prior to commencing the covered activities, and must comply with any associated terms and conditions set forth by Federal, State or local government entities.

Note to Specialist :

Bioenergy Technologies Office
This NEPA determination requires a tailored NEPA Provision
NEPA review completed by Jonathan Hartman, 5/4/2018

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 5/7/2018
NEPA Compliance Officer

**FIELD OFFICE MANAGER DETERMINATION**

☐ Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: _____ Date: _____

Field Office Manager