PMC-ND
(1.08.09.13)

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

RECIPIENT: University of California, San Diego **STATE:** CA

PROJECT TITLE: Advanced Algal Biofoundries for the Production of Polyurethane Precursors

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE FOA 0001916	DE-EE0008491	GFO-0008491-001	GO8491

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 federal funding to the University of California, San Diego (UCSD) to design and construct genetic tools for enhanced algal production of target chemicals in order to develop novel green algae and cyanobacteria bioproduction platforms. The proposed project is aimed at optimizing future yields of desired products through expanding knowledge of metabolic and regulatory systems that control or inhibit biosynthesis of polymer precursors in promising strains of algae.

The proposed project is limited to bench-scale research on the feasibility of genetically and metabolically engineering algae and cyanobacteria to produce polyurethane precursor molecules. Associated activities would involve the growth of optimized production strains in fermentation devices up to 100L with a target yield of 20 g/L. Strain development and scaled growth would occur in specialized laboratories in addition to a contained greenhouse at UCSD (La Jolla, CA). The University of California, Davis (UCD; Davis, CA) would perform data analysis, computer modeling, and laboratory development of production platform algal strains. Georgia Institute of Technology (GIT; Atlanta, GA) would conduct laboratory research to develop biosensors for the detection of chemical products.

The Pacific Northwest National Laboratory (PNNL; Richland, WA) and Lawrence Berkeley National Laboratory (LBNL; Berkeley, CA) would support the proposed project by carrying out various modeling and data management tasks. Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

The proposed project would involve the use and/or development of genetically modified algae and cyanobacteria. Modifications would include the insertion of exogenous DNA into wild-type or previously genetically engineered strains to produce the chemicals of interest, and in some cases, previously genetically engineered strains would be used and further modified in the same manner. Strains modified to produce the chemicals of interest would be further modified through deletion of genes or insertion of expression enhancing modifications to optimize production.

Genetically modified strains would be handled and disposed of in accordance with all applicable regulatory agency rules and requirements. None of the precursor molecules to be generated from these strains are considered hazardous; however, the proposed project may involve the use and handling of small quantities of hazardous chemicals such as solvent for the processing and analysis of algal strains. All such handling would occur in-lab following policies and protocols required by the responsible Environmental Health and Safety divisions at each institute, which ensure compliance with federal, state, and local regulations.

Based on current project plans, a minimum of 18 iterations of cultures at the maximum scale of 100 L fermentations would be performed during scaled growth experiments (at UCSD only). This task would result in the largest quantities of materials used and generated by the project, but the volumes of culture media and scale of production are not expected to exceed the scope of prior and ongoing small-scale research operations at this facility. No modifications or new waste management procedures, services, and/or treatment actions would be required.

No change in the use, mission or operation of existing facilities would arise out of project efforts at any location. UCSD and subrecipients have all necessary permits in place, and would not need additional permits for the proposed activities. The facilities in which project work would occur were purpose-built for the type of activities being proposed; therefore, no adverse impacts to sensitive resources are expected as a result of the proposed activities at any location.

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:
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

Bioenergy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 10/18/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 10/23/2018

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