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 : Developing Advanced Genetic and Synthetic Biology Tools for Improved Algae Productivity

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-001628	DE-EE0008246	GFO-0008246-001	GO8246

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.
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 the University of California, San Diego (UCSD) to develop a process for making advanced genetic tools, high throughput screening methods, and breeding technologies that will enable the advancements required for economical biofuel production from algae.

The proposed project would involve data analysis, computer modeling, laboratory scale research and development (R&D) of metabolic engineering tools in commercially available green algae and cyanobacteria, and testing of the working strains in greenhouses followed by an outdoor field trial. Initial process and data validation tasks, in-lab development of genetic tools and protocols, genome sequencing, growth of algal/bacterial strains at bench scale in addition to greenhouse cultivation experiments, and various associated biomass testing/screening activities would occur at UCSD's dedicated research facilities (La Jolla, CA). Data studies and modeling efforts including techno-economic and life-cycle analyses would be performed in computing facilities at the University of California, Davis (Davis, CA). Growth and treatment of modified algal strains would be undertaken by subrecipient Global Algae Innovations at their established industrial facility (San Diego, CA). No change in the use, mission or operation of existing facilities would arise out of these efforts.

It is anticipated that the proposed project may culminate in an outdoor pilot scale demonstration to evaluate the performance of unmodified and/or genetically modified (GM) strains under field conditions. Field trial activities would take place entirely at UCSD's specially designed field station (La Jolla, CA) using existing algae testbeds, the location of previously conducted work related to the proposed project. No new equipment installations or substantial physical alterations to these facilities would be necessary. In order to run any outdoor algae field trials using GM organisms, a Toxic Substances Control Act (TSCA) Environmental Release Application (TERA) permit is required from the U.S. Environmental Protection Agency (EPA). The recipient would apply for a TERA permit in the final year of this award, depending upon what algal strains generated in the initial research phase are selected to advance to the outdoor trials – EPA approval is not required for algae modified by mutagenesis or breeding, which are both techniques proposed to

be implemented and assessed alongside genetic engineering during the initial R&D phase of this award. A TERA approval must be received prior to conducting outdoor testbed activities with genetically modified algae at UCSD.

Proposed R&D activities would involve the use and development of recombinant DNA technologies and GM organisms. All project-related work would be conducted under the university Institutional Review Board to ensure regulatory compliance, including the proper treatment and disposal of waste biomass. The proposed project would also involve the use and management of hazardous chemicals, specifically solvents used for lipid extraction and conversion. UCSD facilities employ proper storage of these chemicals and have dedicated hazardous material disposal practices in place to handle the minor amounts of waste that would be generated by project activities. The UCSD Environmental Health and Safety department regulates such activities in accordance with all applicable federal, state and local regulations.

The proposed outdoor field trials may use more than 160,000 liters of water for the production pond media. (The largest ponds at UCSD's testbed contain 8,000 liters, and these ponds may be run more than 20 times during the course of this work.) Because the project would employ only formerly constructed ponds in which past trials were similar to those proposed, the quantities of water used by the project are not expected to exceed the scale of standard operations at UCSD's facility such that new sources are required, nor produce waste streams beyond the capacity of existing infrastructure and resources. Algal culture media would be disposed into the UCSD sewer system or dried in a retention pond following routine facility procedures; no siting, construction or major expansion of waste storage, disposal, recovery, or treatment actions/facilities would be required. Algal ponds may produce limited amounts of normal biological emissions into the ambient air, but there are no known hazards associated with these emissions nor would they fall into any regulated category.

At the conclusion of the proposed project, no equipment would need to be decommissioned or re-sited and would instead continue to be used by these purpose-built research facilities to accommodate ongoing and future work.

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:
A Toxic Substances Control Act (TSCA) Environmental Release Application (TERA) approval must be received from the EPA prior to conducting outdoor testbed activities with genetically modified algae at UCSD.

Note to Specialist :

Bioenergy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 1/11/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 1/11/2018

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