

PMC-ND
(1.08.09.13)

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



RECIPIENT: Arizona State University - AzCATI

STATE: AZ

PROJECT TITLE: Decision-Model Supported Algal Cultivation Process Enhancement

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002029	DE-EE0008906	GFO-0008906-001	GO8906

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.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Arizona State University (ASU) to study ways to improve biomass productivity and composition for the production of biofuels from wild-type algae.

ASU plans to develop four key strategies and conduct tests of the strategies in a lab setting as well as their outdoor algae experimentation lab. These four strategies are: (1) direct comparison of batch vs. semi-continuous cultivation modes; (2) integrated pest management; (3) tightly coupled indoor-outdoor-indoor experimentation; and, (4) novel sensor development and deployment.

In the first strategy, ASU would conduct trials to measure crash rates for different batch vs semi-continuous cultivation methods, using wild-type algae, with a goal to increase cultivation run trials from 30 to 60 days in length. Work would be conducted by ASU at their dedicated inside laboratory facility in Mesa AZ, as well as at Los Alamos National Laboratory (LANL) in Los Alamos, NM. Additional testing would be conducted by ASU at their pre-existing AzCATI outdoor testing site in Mesa, AZ. The existing test site contains small (1000 liter) algae ponds designed for and used for growing and testing algae.

In the second strategy ASU would conduct experiments at their indoor lab and outdoor test site incorporating pest management. This would include the use of a fungicide. ASU has obtained appropriate permissions from the State of Arizona to utilize the fungicide. Fungicide application would be conducted by to a licensed pesticide handler.

In the third strategy ASU would be establishing key metrics and success through running tightly coupled indoor-outdoor-indoor experimentation – more specifically Integrated Lab to Field to Lab. The goal of this strategy is to optimize performance and iterate improvement through a variety of conditions including high-throughput microscopy, UV/Vis/fluorescence spectroscopy, flow cytometry, and risk-agent culturing and isolation and identification. Work in this strategy could occur at ASU and LANL.

In the fourth strategy ASU would deploy novel bio-sensors that offer real-time monitoring of algal cultures. Sensors would be developed by Burge Environmental (Tempe, AZ) and Quantitative Biosciences Inc. (Solana Beach, CA). Sensors would be deployed at both ASU and LANL.

In addition to work conducted under the four strategies, ASU would conduct model design, verification, data analysis, and develop a techno-economic assessment as well as a levelized cost of energy assessment. This work would be limited to data gathering and analysis and would occur at ASU, LANL, or at Colorado State University in Fort Collins, CO.

All inside and outside lab work would take place at pre-existing algae research facilities. Work would include the handling of algal strains and small amounts of hazardous materials. Interior lab work would also include working with compressed CO₂, glass beakers, and general laboratory chemicals. Algae cultivation would occur both inside labs and in outdoor algae ponds. All work would follow existing corporate health and safety policies and procedures including proper training and wearing of protective equipment. Small amounts (up to 1 liter per week of experimentation) of hazardous waste (e.g., used chemicals) would be produced through interior lab experiments. All waste, including algal waste, would be appropriately decontaminated and disposed of in accordance with proper procedures and in compliance with all federal, state and local regulations and EH&S safety and biosafety protocols. Work at ASU would include the use of a fungicide. Application of any fungicide would be in compliance with all federal, state, and local regulations, with permission from the state of Arizona, and would be conducted only by licensed personnel. All appropriate health and safety procedures would be followed. No new permits or modification to any facilities would be required.

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.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Bio Energy Technology Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Roak Parker, 5/27/2020

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: _____



Casey Strickland

NEPA Compliance Officer

Date: 5/28/2020

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: _____