

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



**RECIPIENT:** MicroBio Engineering Inc

**STATE:** CA

**PROJECT TITLE:** Attached Algae Flow Ways for Biofuels Production Utilizing Air-CO2

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002638	DE-EE0010458	GFO-0010458-001	GO10458

**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.

**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 funding to MicroBio Engineering, Inc. (MBE) to produce liquid biofuel suitable to be upgraded to transportation fuels, specifically Sustainable Aviation Fuels (SAF). The award proposes to produce algal biomass using CO2 from the air and nutrients from contaminated waters, i.e., Attached Algae Flow Ways (AAFW). The algal biomass would then be used to produce liquid biofuel precursors via Hydrothermal Liquefaction (HTL) and upgraded to SAF.

Award activities would include bench-scale cultivation of algae cultivars, construction of flow ways for outdoor algal productivity, lab characterization of water and algal samples, comparison with raceway pond experiments, greenhouse and field trials of algal biomass biostimulants and biofertilizers, and the conversion of harvested algal biomass by HTL. Additional award activities would include those of an intellectual, academic, and analytical nature. Such activities would support the completion of a life cycle analysis (LCA) and techno-economic analysis (TEA).

Analyses and office activities would take place at HydroMentia Technologies LLC (HMT; Ocala, FL) and AECOM (Fort Lauderdale, FL). HMT would also carry out water quality analyses and algal sample collection at their water treatment system (Vero Beach, FL), which also operates the Osprey Marsh Algal Turf Scrubber system. Harbor Branch Oceanographic Institute of Florida Atlantic University (North Fort Pierce, FL) would carry out water analyses in a dedicated laboratory facility. Cal Poly State University (CPSU; San Luis Obispo, CA) would carry out monitoring and algal productivity testing at existing algal raceway ponds and flow ways located at a dedicated field site at the San Luis Obispo Water Resource Recovery Facility. MBE would be responsible for assembling the AAFWs for CPSU and the conducting the LCA/TEA. Heliae Development, LLC (Heliae; Gilbert, AZ) would carry out greenhouse trials and laboratory analyses. Pacific Northwest National Laboratory (Richland, WA) would carry out HTL experiments using a bench-scale continuous flow system, pre-treatment processes for algal flow-way biomass, and hydroprocessing of the HTL biocrudes within the Bioproducts, Sciences, and Engineering Laboratory on campus. Sandia National Laboratories (Livermore, CA) would carry out algae cultivation within a dedicated facility for algae cultivation and characterization.

Raceway ponds are already existing at CPSU. AAFWs would be installed above ground on a former parking lot at CPSU and would occupy a site approximately 10x10 meters. No ground disturbance or facility modification would take place aside from this installation. Heliae has existing greenhouses and field trials, and award activities would be carried out as routine testing. All facilities are preexisting field sites and purpose-built facilities for the type of work to be conducted for this award.

Award activities would involve hazardous materials, such as algal biomass, solvents, chemicals, reagents, chemical fertilizers, and buffers. HTL systems would operate at high pressure and high temperature by trained operators and would require strict adherence to standard operating procedures. Existing health and safety policies and procedures including employee training, proper personal protective equipment, engineering controls, monitoring, and internal assessments would be followed to mitigate hazards to acceptable levels. Mitigated hazards would pose negligible risks to the public and environment. All activities would comply with existing federal, state, and local laws and regulations.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

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:

Bioenergy Technologies Office (BETO)  
NEPA review completed by Alex Colling on 08/02/2023.

## 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:



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NEPA Compliance Officer

Date: 8/3/2023

**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: \_\_\_\_\_