PMC-ND

(1.08.09.13)

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

RECIPIENT: Ginkgo Bioworks, Inc. **STATE:** MA

PROJECT TITLE : Integrated pest management-inspired approach to algal crop protection based on laboratory evolution and engineered antimicrobial peptides

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002910	DE-EE0011059	GFO-0011059-001	GO11059

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 Ginkgo Bioworks, Inc. (Gingko) to develop biological solutions for algal crop protection. The development of antimicrobial peptides (AMP) treatments would be part of a holistic approach to reducing the pest-induced pond growth slowdown events.

Award activities would include outreach, education, training, laboratory research, and on-site characterization. Ginkgo (Boston, MA) would carry out the design and production of AMPs, the use of adaptive laboratory evolution (ALE), analyzing algal samples, and increasing algal strain tolerance in-lab. Global Algae Innovation's Kauai Algae Facility (GAI KAF; Lihue, HI) would provide algal samples. Pond samples would be collected from KAF during times of poor algal growth, healthy algal growth, weather events, and other events. Pacific Northwest National Laboratory (PNNL; Richland, WA) would carry out fungal pest characterization, biomarker identification, and model algal-pest systems. PNNL would use cultivated algae and pest species in solar-simulating environments, and carry out quantification, analyses, and microscopy. Colorado School of Mines (Mines; Golden, CO) would demonstrate antifungal activity in existing outdoor raceways using existing algal strains. Mines would quantify biomass productivity and pest levels using microscopy and cytometry.

Award activities would include analyzing pond samples, identifying algal pests, identifying biotic and abiotic stressors, and the generation of an AMP library. Pond samples taken from KAF would be sequenced during various events. A total of 90 samples would be taken from raceway ponds. ALE hardware and software would be used to produce sufficient amounts of AMP to cultivate algae under differing conditions. Algae would be grown in mini raceways to demonstrate crop production in the presence and absence of specific antimicrobial peptides, and to test increasing tolerance of algal strains to pest treatments as part of long-term ALE experiments.

Additional award activities would include a diversity, equity, and inclusion (DEI) strategic plan. A DEI fellowship would be implemented to develop an outreach plan to reach diverse populations and backgrounds and choose a fellow from an underrepresented group in Science, Technology, Engineering, and Math (STEM).

Award activities would involve potential hazards including commercial chemicals, biological materials, and rotating and electrical equipment. All liquid biological waste would be chemically disinfected and disposed of according to federal, state, and local requirements. All handling and storage of waste would occur within controlled settings and would follow existing policies and procedures for handling and disposal of these materials. Existing corporate health, safety, and environmental policies and procedures would be followed at all facilities, including personnel training, proper personal protective equipment, laboratory fume hoods, and autoclaves for biological waste.

There would be no physical modifications, ground disturbing activities, or changes in facility uses. All award activities would be carried out in existing laboratory environments. All field activities would take place in pre-existing raceway pond environments at Mines and GAI.

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
NEPA review completed by Alex Colling on 11/20/2023.

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: Electronically Signed By: Andrew Montano Date: 11/29/2023

NEPA Compliance Officer

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: _____ Date: _____

Field Office Manager