



U.S. Department of Energy Categorical Exclusion Determination Form

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Proposed Action Title: Umarm Foods -- Continuous High Yield Kelp Production

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Alameda, Berkeley, San Francisco, and Santa Barbara, California

Proposed Action Description:

AMENDED NEPA DETERMINATION: (See attached original Determination, dated November 4, 2019). This Amended Determination follows the approval of additional funds and extended period of performance to support the project team's small-scale, research and development activities to design an integrated kelp cultivation and harvesting system using remotely operated vehicles (ROV) in an offshore environment under the Macroalgae Research Inspiring Novel Energy Resources (MARINER) program. Specifically, the project team will (1) build an ROV for installation of screw anchors, (2) install and verify torque and strength of anchors, and (3) make modifications and correct issues to the complete system for installation of anchors in deep water. If successful, the system will dramatically lower a barrier to entry into large-scale offshore kelp cultivation by enabling screw anchor installation at varying depths at greater speeds and significantly reduced costs and energy use compared to traditional anchoring systems. Project activities will be conducted at existing facilities at Umarm Foods (formerly Trophic, LLC) (Berkeley, CA), Otherlab, Inc. (San Francisco, CA) and field sites in Alameda, CA and at Ocean Rainforest (Santa Barbara, CA) designed for the proposed work. Project tasks continue to fit within the class of actions identified under the DOE Categorical Exclusions identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the project. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the project. Project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and local regulatory requirements. No modifications will be made to the existing facilities to accommodate the proposed work.

Categorical Exclusion(s) Applied:

- A9 - Information gathering, analysis, and dissemination
- B3.16 - Research activities in aquatic environments
- B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE
Date: 2023.11.01 15:36:42 -04'00'

Date Determined:



U.S. Department of Energy Categorical Exclusion Determination Form

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Proposed Action Title: Trophic LLC -- Continuous, High Yield Kelp Production

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Albany & San Francisco, CA; Waimanalo, HI; Durham, NH; New Castle, NH; 1.4 m. south of White Island, NH

Proposed Action Description:

Funding will support the project team's small-scale research and development activities to design a pilot scale of an integrated kelp cultivation and harvesting system in an offshore environment that can demonstrate and derisk key components of a full-scale version of the system. Specifically, the project team will (1) develop, deploy and validate performance of a nutrient upweller in offshore conditions; (2) develop and deploy the system structure to validate performance in offshore conditions; and (3) test and improve components, along with multi-line anchor system in the field. If successful, the system will use renewable energy to lift nutrients from deeper water to fertilize crops at the surface, resulting in system for seaweed farming that will produce high yields of seaweed at a cost of less than \$60 per dry metric ton.

Project activities will be conducted at existing facilities at Trophic (Albany, CA), OtherLab (San Francisco, CA), Makai Ocean Engineering (Waimanalo, HI), and University of New Hampshire (Durham, NH; New Castle, NH; 1.4 m. south of White Island, NH) designed for the applicable activities. Project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and local regulatory requirements. No modifications will be made to existing facilities to accommodate the proposed work. The project team, under the terms of Trophic's ARPA-E Cooperative Agreement, is prohibited from commencing applicable project work (including, but not limited to, all field deployments and testing) before (1) obtaining necessary permits and approvals and providing them to ARPA-E for review and (2) receiving an amended NEPA Determination from ARPA-E.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

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Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

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Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined: 11/04/2019