

PMC-ND

(1.08.09.13)

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



RECIPIENT: Arizona Board of Regents on behalf of Arizona State University

STATE: AZ

PROJECT TITLE: Membrane Carbonation for 100% Efficient Delivery of Industrial CO2 Gases

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001908	DE-EE0008517		GO8517

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.
- B1.31 Installation or relocation of machinery and equipment** Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Arizona State University (ASU) to design, develop, fabricate and test membrane carbonation delivery systems for photo-bioreactors and raceway pond algae cultivation systems. The membrane carbonation (MC) delivery systems would boost microalgae growth productivity. The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

A NEPA Determination was completed for this award on 1/24/2019 (GFO-0008517-001; CX's A9 and B3.6). Since that time, the scope of work has been modified so as to include additional cultivation trials. Accordingly, this NEPA Determination will review the new work activities being proposed.

Specifically, ASU proposes to perform an additional series of cultivation trials at the City of Mesa North West Water Reclamation Facility (NWWRF) in Mesa, AZ. These trials would be performed over approximately 6-weeks in 2021. Three portable raceway ponds, measuring approximately 2 m x 12.5 m, would be transported from ASU's Arizona Center for Algae Technology and Innovation (AzCATI) facility and temporarily installed at the NWWRF. These ponds would then be used for algae cultivation trials, in which MC systems would be used for delivery of raw biogas.

The raceway ponds would be transported to the NWWRF via a flatbed truck or van and installed in a 50' x 50' outdoor area adjacent to an existing biogas storage tank. The installation area consists of previously disturbed land within the NWWRF that is currently not in use. This land area is devoid of vegetation and consists of dirt and gravel. Installation would consist of levelling the ground with sand and gravel and covering the area with a pond liner to contain any spills. The raceway ponds would then be set up and connected to the existing power supply at the NWWRF. Raw biogas would be fed into the ponds utilizing the existing biogas storage tank. Water in the raceways would also be replenished using existing water tanks. Temporary piping would be established for the raw biogas and water

connections. All temporary connections would be established above ground. Upon completion of the cultivation trials at the NWWRF, the ponds would be drained, packaged, and transported back to their originally installed location at AzCATI for further cultivation trials.

ASU has obtained support from the City of Mesa to perform the cultivation trials at the NWWRF. Additional approval may need to be obtained from the Maricopa County Air Quality Department in order to release residual biogas processed by the MC system to the. ASU would work with NWWRF to obtain this and any other applicable permits/authorizations prior to initiating associated project activities.

Considering that all project activities would occur within the bounds of a closed-access facility and installation of the raceway ponds would occur on previously disturbed land within the outdoor area of a facility actively used for commercial purposes, DOE has determined that the project would have no impact on Endangered Species Act listed species or critical habitats.

Algal strains and various chemical compounds (e.g. nutrients for cultivation) would be used and handled during the cultivation trials. All such handling would occur in accordance with established corporate health and safety policies and procedures. Synthetic and sampled biogas would be handled in quantities below Occupational Safety and Health Administration (OSHA) permissible exposure limits and American Conference of Governmental Industrial Hygienists threshold limit values. Carbon monoxide in flue gas stacks would also be within OSHA and American Society of Heating, Refrigerating and Air-Conditioning Engineers limits. Cultivation with biogas would occur in a well ventilated area during outdoor cultivation. The NWWRF is a restricted-access facility that regularly handles biogas and associated materials. All biomass would be bleached prior to disposal. ASU and its project partners would adhere to all applicable Federal, state, and local health, safety, and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

Arizona State University must obtain any and all necessary local, State and Federal permits prior to commencing project work at the North West Water Reclamation Facility.

Notes:

Bioenergy Technologies Office
This NEPA determination requires a tailored NEPA provision.
Review completed by Jonathan Hartman, 12/07/2020

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 is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____

 Electronically
Signed By: **Roak Parker**
NEPA Compliance Officer

Date: 12/7/2020

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: _____