

PMC-ND
(1.08.09.13)

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



RECIPIENT: University of California, San Diego

STATE: CA

PROJECT TITLE: Degradable Biocomposite Thermoplastic Polyurethanes

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002245	DE-EE0009296	GFO-0009296-001	G09296

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 the University of California, San Diego (UCSD) to design, synthesize, and manufacture polymer composites incorporating bacterial spores in an effort to promote biodegradation. The project would be completed over three Budget Periods (BPs) with a Go/No-Go Decision Point between each BP. This NEPA review is applicable to all three BPs.

The recipient and project partners propose to incorporate bacterial spores into thermoplastic polyurethane based materials. These spores would serve as a durable filler and as a catalyst to promote biodegradation at the end of the material's lifecycle. Bacterial strains would be optimized to accelerate degradation and improve byproducts of the degradation process. Generated materials will be evaluated for biodegradation (including break down products, gaseous evolution, and degeneration rate and yield), mechanical properties (both tensile and compression with a specific focus on increasing toughness), and activation of encapsulated bacterial spores under biodegradation conditions. The final polymer composite would be evaluated using lifecycle assessment (LCA) and techno-economic analysis (TEA) tools.

Proposed project activities by location are listed below:

UCSD – San Diego, CA

- Design, synthesis, manufacturing and mechanical testing of biological composites.
- Evolution of bacterial spores and simple degradation assays

BASF – San Diego, CA and Wyandotte, MI

- Selection and production of bacterial strains
- Synthesis and manufacture of biocomposites
- LCA and TEA analysis

University of Georgia – Athens, GA

- Respirometry studies of biocomposite materials to determine degradation rate and byproduct formation

Project activities would involve the use and handling of toxic chemicals and evolved bacteria strains. Any risks associated with the handling of these materials would be mitigated through adherence to established health and

safety policies and procedures. Protocols would include personnel training, the use of personal protective equipment, and engineering controls. All waste products would be disposed of by licensed waste management service providers. UCSD and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations. No modifications, new permits, or change in the use, mission, or operation of any facility would be required.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Advanced Manufacturing Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Shaina Aguilar on 3/11/21.

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:



Signed By: Casey Strickland

NEPA Compliance Officer

Date: 3/15/2021

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: