

PMC-ND

(1.08.09.13)

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



RECIPIENT: The Regents of the University of California; University of California, San Diego **STATE:** CA

PROJECT TITLE : Understanding and Overcoming Water-Induced Interfacial Degradation in Si Modules

| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
|--|--------------------------------------|----------------------------|-------------------|
| DE-FOA-0001654 | DE-EE0008160 | GFO-0008160-001 | GO8160 |

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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 federal funding to the University of California, San Diego (UCSD) to develop and test a moisture characterization tool for silicon solar panels in order to quantify the effects of water on photovoltaic performance and failure.

The proposed project would be comprised of laboratory research involving the design, development, and preliminary engineering of a short wave infrared reflectometer. Associated activities would include data analysis, computer modeling, fabrication of tool prototypes, and preparation of sample solar panel materials for testing the method. Design, sample preparation, tool prototyping, testing and data analysis would occur in the Fenning research group's facilities at UCSD (San Diego, CA). Design, small scale fabrication of solar cells and modules, and optical and electrical characterization of these materials would take place in the Bertoni laboratory and the Solar Power Laboratory at Arizona State University (Tempe, AZ). Computational studies would be undertaken at Argonne National Laboratory (Lemont, IL).

Project work would be conducted entirely within existing research facilities that were purpose-built for the type of activities being proposed. No change in the use, mission or operation of existing facilities would arise out of this effort. UCSD and subrecipients have all applicable permits in place, and would not need additional permits for the proposed activities.

The proposed project would involve the use and handling of various hazardous materials used for sample preparation, including corrosives and solvents (approximately 20L each of acids, bases, and solvents over the course of the project). All such handling would occur in-lab at UCSD and ASU. Both institutions are dedicated to proper hazardous material handling and disposal practices to mitigate risks to human health and safety. Employees would be provided with personal protective equipment and thoroughly trained with regard to fume hood work and implementation of engineering controls. Hazardous materials would be managed in accordance with applicable federal, state, and local environmental regulations.

Small quantities of routine laboratory hazardous waste would be disposed of according to established university protocols. Non-hazardous wastes such as paper towels and non-contaminated sharps (e.g. broken solar cell wafers) would be removed by standard refuse removal as administered by the respective university facilities departments. Equipment and materials remaining at the end of the project would be retained for further use. No siting, construction

or major expansion of waste storage, disposal, recovery, or treatment actions/facilities would be required

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

Solar Energy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 9/28/2017

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Date: 9/29/2017
Electronically Signed By: Kristin Kerwin
NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____
Field Office Manager