PMC-EF2a
(2.04.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: Colorado School of Mines **STATE:** CO

PROJECT TITLE : Hot Carrier Collection in Thin Film Silicon with Tailored Nanocrystalline/Amorphous Structure

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000387	DE-EE0005326	GFO-0005326-001	0

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:

B3.15 Small-scale indoor research and development projects using nanoscale materials
Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

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.

Rational for determination:

DOE proposes to provide federal funding to the Colorado School of Mines (CSM) to conduct research on the synthesis and testing of nanocrystalline/amorphous, hybrid, thin film silicon. This material has application in photovoltaic cells. The goal would be to commercialize a machine that would meet market and certification requirements, and reduce the cost of energy. The work will take place at several existing facilities: Hill (HH) and Meyer Halls (MH) on the campus of CSM, and laboratories at the National Renewable Energy Laboratory (NREL), both located in Golden, CO 80401. The project involves design, purchase, and installation of a multi-chamber, plasma-enhanced, chemical vapor deposition cluster tool that would allow growth of hybrid films, training of graduate students, measurements and data analysis, device design, and computational modeling.

Several laboratories at CSM and NREL would be used to conduct this research. HH 302 is a laboratory specifically designed for use with hazardous gases (e.g. silane, germane, diborane). Chemical sample processing would occur in HH 323; lithographic processing in MH 425; and material characterization analyses in MH 466, -175, -463, -163, and HH 172. CSM maintains an overarching environmental health and safety department which provides guidance to facility managers and performs laboratory safety inspections. The Renewable Energy Materials Research Science and Engineering Center (REMRSEC) at CSM has a facilities manager and staff who develop, train, and monitor safety procedures at these laboratories. Characterization laboratories are managed by the individual faculty responsible for the facilities in these laboratories. Laboratories undergo a chemical inspection on a weekly basis.

Research activities conducted at NREL are addressed by the Final Site-Wide Environmental Assessment of the National Renewable Energy Laboratory's South Table Mountain Complex (DOE/EA 1440) and FONSI.
Although there is no U.S. standard for nanoparticle releases or exposure, research facilities involved in this project would maintain containment through use of high-efficiency particluate air-filtered hoods, containment chambers at the reactor outlet, and glove boxes when using nanoparticles.

No ground disturbance will occur as a result of this research, all activities would be conducted inside existing

structures. No threatened/endangered species would be affected as a result of this project; nor would any cultural resources be affected. Proper hazardous waste procedures, training, and accumulation sites, collection contractors, and disposal facilities would be utilized.

The proposed project comprises research and development of thin film silicon fabrication techniques using nanoparticles for use in the solar photovoltaic industry. As such, CX A9, B3.6, and B3.15 apply.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

John DuWaldt 11-28-2011

DOE Funding: $ 1,412,364
Cost Share: $ 0
Total Funding:$ 1,412,364

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 12/5/2011
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