CATEGORICAL EXCLUSION (CX) DESIGNATION FORM

NETL F 451.1-1-1 P.1
Revised: 08.27.2024
Reviewed: 08.27.2024
(previous editions obsolete)

Funding Authority (Base, BIL, IRA, CDS): BIL

DOE Funding Office (FECM, EERE, OE, etc.): FECM

Solicitation (FOA) Number: FOA-0003105

Award Number: DE-FE0032642

Prime Recipient Name and Location(s):

Pennsylvania State University (PSU)
University Park, PA16802

Sub-recipient Name and Location(s):

QuantCAD, LLC - Iowa City, IA, 52245-5729 & Chicago, IL
University of Iowa - Iowa City, IA 52242
The Ohio State University - Columbus, Ohio 43210

NETL Org.: FECM/TDC/RS/Minerals Sustainability

NETL Project Manager: Christian Robinson

Title of Proposed Action: Hexagonal Boron Nitride: A Sustainable Alternative to Gallium Nitride for Power Electronics

Brief Description of Proposed Action:

This project will focus on the development of a potential alternative material to GaN. GaN is a wide band gap semiconductor of importance in multiple areas of power generation in the US. The team will contribute to the development of a fundamental physical understanding of the materials science and engineering of boron nitride, with a primary focus on hexagonal boron nitride (hBN). The work taking place will be largely theoretical and computer modeling work, with some limited laboratory testing.

THE PROPOSED ACTION FALLS WITHIN THE FOLLOWING CATEGORICAL EXCLUSION(S) FROM APPENDICES A AND B TO SUBPART D OF DOE NEPA IMPLEMENTING PROCEDURES (10 CFR 1021):

General Agency Actions

- [ ] A1 - Routine DOE business actions
- [x] A9 - Information gathering, analysis, and dissemination
- [ ] A11 - Technical advice and assistance to organizations

Facility Operation

- [ ] B1.3 - Routine maintenance
- [ ] B1.7 - Electronic equipment
- [ ] B1.13 - Pathways, short access roads, and rail lines
- [ ] B1.15 - Support buildings
- [ ] B1.31 - Installation or relocation of machinery and equipment

Safety and Health

- [ ] B2.1 - Workplace enhancements
- [ ] B2.2 - Building and equipment instrumentation
- [ ] B2.3 - Personnel safety and health equipment

Site Characterization, Monitoring, and General Research

- [ ] B3.1 - Site characterizations and environmental monitoring
- [ ] B3.2 - Aviation activities (aerial survey and mapping)
- [x] B3.6 - Small-scale research and development, laboratory operations and pilot projects
- [ ] B3.7 - New terrestrial infill exploratory and experimental wells
- [ ] B3.9 - Projects to reduce emissions and waste generation
- [ ] B3.11 - Outdoor tests and experiments on materials and equipment components

Electrical Power and Transmission

- [ ] B4.4 - Power marketing services and activities
- [ ] B4.6 - Additions and modifications to transmission facilities
- [ ] B4.11 - Electric power substations and interconnection facilities
- [ ] B4.12 - Construction of powerlines (up to 10 miles, or up to 20 miles if within previously disturbed or developed powerline or pipeline rights-of-way)
- [ ] B4.13 - Upgrading and rebuilding existing power lines
- [ ] B4.14 - Construction and operation of electrochemical-battery or flywheel energy storage systems

Conservation, Fossil, and Renewable Energy Activities

- [ ] B5.1 - Actions to conserve energy or water
- [ ] B5.3 - Modification or abandonment of wells
- [ ] B5.4 - Repair or replacement of pipelines
- [ ] B5.5 - Short pipeline segments (up to 20 miles)
- [ ] B5.13 - Experimental wells for injection of small quantities of carbon dioxide (up to 500,000 tons per geologic formation)
- [ ] B5.14 - Combined heat and power or cogeneration systems
- [ ] B5.15 - Small-scale renewable energy research and development and pilot projects
- [ ] B5.16 - Solar photovoltaic systems
- [ ] B5.18 - Wind turbines
- [ ] B5.21 - Methane gas recovery and utilization systems
- [ ] B5.22 - Alternative fuel vehicle fueling stations
- [ ] B5.23 - Electric vehicle charging stations

- [ ] **Other**

Specify category/categories in space below:

This action (1) would not present any extraordinary circumstances such that the action might have a significant impact upon the human environment; (2) is not connected to other actions with potentially significant impacts; (3) is not related to other actions with cumulatively significant impacts; and (4) is not inconsistent with 10 CFR 1021.211 - Interim Actions or 40 CFR 1506.1 - Limitations on actions during the NEPA process.

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SELECT ONE OF THE FOLLOWING:

☑ This Categorical Exclusion includes all tasks, phases, recipients, and locations for the proposed action.

☐ This Categorical Exclusion does not includes all tasks, phases, recipients, and locations for the proposed action. Only the following tasks, phases, recipients, or locations specified below are included as part of this Categorical Exclusion:

NCO Comment Only: The following comment is provided for the consideration of the Contract Specialist or Contracting Officer:

The NETL Project Manager acknowledges the responsibility to obtain a NEPA determination prior to initiating or modifying any activities outside the scope of this Categorical Exclusion.

DOE Project Manager Signature: CHRISTIAN ROBINSON Digitally signed by CHRISTIAN ROBINSON Date: 2024.11.20 14:46:43 -05'00' Date: 11 / 20 / 2024
month day year

NEPA Compliance Officer Signature: STEPHEN WITMER Digitally signed by STEPHEN WITMER Date: 2025.01.08 16:26:34 -05'00' Date: 01 / 08 / 2025
month day year

NETL F 451.1-1-1 P.3
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U.S. DEPARTMENT OF ENERGY – NATIONAL ENERGY TECHNOLOGY LABORATORY

CATEGORICAL EXCLUSION (CX) DESIGNATION FORM

The purpose of this form is to request and obtain approval for a Categorical Exclusion (CX) determination under the National Environmental Policy Act (NEPA) for National Energy Technology Laboratory activities and extramural awards.

Instructions

Provide the following information:

- Funding Authority
- DOE Funding Office
- Solicitation (FOA) Number
- Award Number
- Prime Recipient Name and Location(s)
- Sub-recipient Name and Location(s)
- NETL Organization
- NETL Project Manager
- Title of Proposed Action
- Brief Description of Proposed Action

Check all the boxes that apply; be sure to include anything not listed using the Other category blanks that are provided.

Acquire the signature of the initiator as well as the NEPA Compliance Officer.

In the space above the signatures, a place is provided to list any considerations that you think would be valuable to the contracting officer.