

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Neutron irradiation station at the NSL – University of Notre Dame

SECTION B. Project Description

The University of Notre Dame (UND) proposes to procure, construct and test a neutron irradiation station (NIS) at its Nuclear Science Laboratory (NSL). The development of NIS will enable: 1) Measurements of n-induced cross sections crucial for reactor designs and fuel cycle concepts; 2) Testing of thin actinide targets and ceramic fuels for new reactor designs; and 3) Expansion of partnerships between the NSL and National Laboratories (NLs) in applications ranging from nuclear energy to stockpile stewardship and homeland security. The NIS setup will consist of an ion beam line with complete beam optics and a vacuum system, a neutron production target with a target cooling system and neutron shielding, and an array of neutron detectors with a dedicated DAQ. In addition to NIS providing new research and educational venues to UND's students and faculty, it is identified as a potential Nuclear Science User Facilities (NSUF) partner facility.

SECTION C. Environmental Aspects / Potential Sources of Impact

Standard sealed calibration sources will be used for calibration of the detectors. Radiation induced by accelerator beams will be minimal and any radioactive materials produced by beam irradiation will be stored in a sealed container after the experiment to allow for the activity to decay below measurable levels. All the materials will be handled within the Nuclear Science Laboratory following the procedures established by the Risk Management and Safety Office at the University of Notre Dame.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not "connected" nor "related" (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B1.31 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.

B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale 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). For purposes of this category, "demonstration actions" means actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment. Demonstration actions frequently follow research and development and pilot projects that are directed at establishing proof of concept.

Justification: The activity consists of procuring, constructing, and testing a facility to provide detailed characterizations of a neutron beam profile and properties, and establish an experimental setup for future measurements of cross sections relevant to nuclear energy applications.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer, on 07/23/2021.