DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-17-011

SECTION A. Project Title: Focused Ion Beam for Advanced Specimen Preparation, 3D Microstructural Characterization, and Simulated Irradiation – Utah State University

SECTION B. Project Description

Utah State University proposes to purchase a state-of-the-art Focused Ion Beam (FIB) microscope primarily for the milling capabilities that will enable advanced specimen preparation and 3D microstructural characterization through electron backscatter diffraction (EBSD). In addition to these uses, the FIB will be used to simulate rapid neutron irradiation in the near surface region that can be used to study irradiation damage in the reactor environment. Combining these techniques allows rapid investigation of the irradiation-microstructure-property relation of nuclear materials.

SECTION C. Environmental Aspects / Potential Sources of Impact

The proposed system will be housed in the USU Microscopy Core Facility (MCF), which is a university-supported core facility established in 2013 and has full-time staff to maintain, operate, and support research and educational efforts on other instruments like a scanning electron microscopes (SEM) with energy dispersive X-ray spectroscopy (EDS) and EBSD capabilities. The action consists of purchasing equipment to be used in research and teaching. The action would not create additional environmental impacts above those already occurring at the university.

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: B3.10 Siting, construction, modification, operation, and decommissioning of particle accelerators, including electron beam accelerators, with primary beam energy less than approximately 100 million electron volts (MeV) and average beam power less than approximately 250 kilowatts (kW), and associated beamlines, storage rings, colliders, and detectors, for research and medical purposes (such as proton therapy), and isotope production, within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible), or internal modification of any accelerator facility regardless of energy, that does not increase primary beam energy or current. In cases where the beam energy exceeds 100MeV, the average beam power must be less than 250 kW, so as not to exceed an average current of 2.5 milliamperes (mA).

Justification: The activity consists of purchasing and installing equipment for teaching and research purposes.

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

Approved by Jason Sturm, DOE-ID NEPA Compliance Officer on 4/6/2017