

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: U₃Si₂ Fabrication and Testing for Implementation into the BISON Fuel Performance Code – University of South Carolina

SECTION B. Project Description

The University of South Carolina proposes to fabricate, test, and model a high uranium density, advanced nuclear fuel (U₃Si₂). Tasks include fabrications of samples, characterizing to understand their microstructure, creep testing, and design, fabrication, and usage of four-point bend testing fixture and high temperature flexure creep testing rig.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use – Approximately 1milliCurie of samples of U₃Si₂ will be used during experiments to test material creep.

Radioactive Waste Generation – Approximately 2 microCurie of radioactive waste will be generated through the handling and testing of samples and the preparation of samples for microanalysis such as scanning electron microscopy and x-ray diffraction. This waste will be in the form of contaminated gloves and related disposable laboratory items for cleanup and contamination control. This waste is collected in the existing radioactive materials laboratory using procedures and disposed of using existing procedures on campus by Radiation Safety and Environmental Health and Safety.

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: B3.6 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). 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 development.

Justification: The activity consists of fabrication and testing of a high uranium density fuel for 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 Deputy NEPA Compliance Officer on 11/25/2013