

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Integrating multi-modal microscopy techniques and the MOSAIC simulation environment to assess changes in the physical properties and chemical durability of concrete following radiation exposure – University of California, Los Angeles**

**SECTION B. Project Description**

The University of California, Los Angeles (UCLA) proposes to develop comprehensive protocols for diagnostic and forensic analysis of pristine samples and aged concrete cores harvested from existing nuclear power plants. The tasks associated with this project are (1) Selection and multi-modal characterization of aggregates before and following irradiation; (2) Molecular dynamics studies of amorphization and volume expansion at the atomic scale; (3) Exploiting multi-modal characterization to establish sensitivity to chemical degradation; (4) MOSAIC-based simulations of micro-mechanical response and concrete properties resulting from irradiation-induced aggregate alterations and damage; and (3) Informing and empowering SLRs by technology transfer. Existing laboratory facilities will be used.

**SECTION C. Environmental Aspects / Potential Sources of Impact**

Chemical Use/Storage and Chemical Waste Disposal – The management and disposal of small quantities of acid and bases (<1 L) is overseen by the UCLA Environmental Health and Safety (EH&S) Office.

**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.

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 university-scale research activities to aid in developing bounding estimates for evaluating and assessing irradiation-induced concrete damage.

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 08/07/2019