

**SECTION A. Project Title: Improving the Understanding of the Coupled Thermal-Mechanical-Hydrologic Behavior of Consolidating Granular Salt – University of New Mexico****SECTION B. Project Description**

The University of New Mexico proposes to improve the understanding of key aspects of the coupled thermal-mechanical-hydrologic response of granular salt used as a seal material for shafts, drifts, and boreholes in mined repositories in salt.

Specific objectives of the project are:

1. Measure the consolidation (pore volume reduction) and corresponding changes in hydrologic and thermal properties of granular rock at the critical range of conditions expected for nuclear waste repositories.
2. Interpret deformation mechanisms as a function of moisture, temperature and stress conditions from microstructural observations on consolidated samples.
3. Extend an existing constitutive model to include coupled thermal-mechanical-hydrologic behavior of consolidating granular salt for application in simulations of repository performance.

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

Hazardous Waste Generation – Sheet Lead will be used for jacketing of salt specimens. Cut off pieces of lead, not suitable for jackets will need to be disposed. An estimated 5 pounds of lead waste will be generated during the course of this project.

Chemical Use/Storage – Anhydrous isopropanol is used for cleaning and wet sanding of lead jacket ends. Typically, this will be purchased in 4 gallon case. Individual bottles will be stored in the lab area in a flame-resistant cabinet.

**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 evaluating the behavior of consolidating granular salt for research purposes.

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

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 11/7/2013