

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Development of Novel Porous Sorbents for Extraction of Uranium from Seawater – The University of Chicago

SECTION B. Project Description

The University of Chicago proposes to develop highly porous sorbents for the extraction of uranium from seawater. This will be accomplished through design and investigation of new multifunctional uranyl chelators and engineering on nanoporous supports that facilitate cooperative sorbent interactions. Once candidate materials have been synthesized, they will be evaluated for uranium binding capacities, selectivity, uptake and elution kinetics, durability, and reusability.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use – It is expected that 2 grams of depleted uranium will be used each year. The depleted uranium is commercially available and proper precautions will be taken to avoid exposure to the trace radioactivity.

Radioactive Waste Generation – It is expected that about 1 liter of waste stream containing 2 grams of depleted uranium will be generated each year. The waste will be stored in the lab inside a vented hood and disposed of by the University of Chicago Environmental Health and Safety (EHS) staff according to regulations.

Chemical Use/Storage – It is expected that common laboratory chemicals and solvents will be used. The chemicals and solvents will be handled inside ventilated hoods according to EHS regulations and guidelines.

Chemical Waste Disposal – The chemical wastes will be stored in the lab inside a vented hood and disposed of by the University of Chicago EHS staff according to regulations.

Hazardous Waste Generation – Each year, it is expected that about 1 liter of waste stream that contains 2 grams of depleted uranium and other chemicals will be generated. The waste will be stored in the lab inside a vented hood and disposed of by the University of Chicago EHS staff according to regulations.

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 uranium extraction from seawater 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 11/14/2013