DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-15-061

SECTION A. Project Title: Understanding the Interactions of Seawater Ions with Amidoxime through X-Ray Crystallography – The University of Alabama

SECTION B. Project Description

The University of Alabama (UA) proposes to understand how metal ions from seawater bind to uranium-selective amidoxime functionalized sorbents by experimentally determining the structures of metal complexes with molecules simulating the possible binding sites and characterizing these binding sites spectroscopically to produce spectroscopic signatures which can be used to identify particular metal coordination modes on actual seawater sorbents. Based on this new understanding, UA also aims to develop a method for recovering the metals and recycling the sorbent by hydroxylammonium salts as stripping agents which mimic the chemical character of the sorbent.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use/Radioactive Waste Generation/Mixed Waste Generation – Radioactive material will be used in radiotracer experiments. Less than one milliCurie of total activity is expected to be used over the life of the project. Contaminated solid waste and low-activity liquid waste will be generated on the milligram and milliliter scale, respectively. The University of Alabama (UA) is licensed under the State of Alabama for the use of radioactive material. Acquisition, inventory, and disposal of radioactive material are overseen by the UA Office of Enviromental Health and Safety's Radiation Safety Program. All experiments, safety precautions, material storage, and disposition will be conducted in accordance with the published UA Radiation Safety Manual.

Chemical Use/Storage / Chemical Waste Disposal / Hazardous Waste Generation – Chemicals will be used on the laboratory scale for chemical synthesis. Purchase, inventory, use, and disposition of unwanted chemicals are all conducted under the UA Office of Environmental Health and Safety Hazardous Materials Management program. All experiments, safety precautions, material storage, and disposition will be conducted in accordance with the published UA Chemical Hygiene Plan.

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 university-scale research aimed at investigation of uranium-selective sorbents for binding metal ions from seawater.

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 06/25/2015