

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Optimizing Polymer-Grafted Amidoxime-based Adsorbents for Uranium Uptake from Seawater - Georgia Institute of Technology**

**SECTION B. Project Description**

Georgia Institute of Technology will conduct laboratory scale research on metal ion adsorption from aqueous solutions to provide a better understanding of the performance of amidoxime-grafted polymer fibers in uranium uptake from seawater through experiments and modeling. The objectives of the proposed work are to:

1. Optimize the adsorbent morphology and synthesis variables to maximize the uranium uptake kinetics and capacity of amidoxime-based adsorbents developed at National Lab 1 (NL1).
2. Devise and perform experiments to obtain basic transport and kinetic information.
3. Quantify the relative importance of transport and complexation reaction resistances and provide a better understanding of the uptake rate-limiting mechanism.
4. Develop a predictive algorithm for the uranium uptake rate based on interparticle and intraparticle transport rates and complexation kinetics of various species with the amidoxime ligand.
5. Provide feedback to the cost analysis effort to improve the cost and energy-intensity predictions.

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

Small quantities of chemical reagents will be used. Georgia Tech will use existing processes and procedures for managing chemicals and hazardous waste. The action will not create additional environmental impacts above those already occurring at the university.

**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 conducting university laboratory scale research.

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 08/12/2014