DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-20-075

SECTION A. Project Title: Functionalized clay buffer materials for the long-term sequestration of iodine and technetium

SECTION B. Project Description

The University of Florida (UF) proposes to develop key data on a novel buffer material for the sequestration of two particularly mobile contaminants, iodine (I) and technetium (Tc) in support of nuclear waste disposal options. The main task is to develop, test and model the sequestration of TcO4-, IO3- and I- by a new functionalized clay material. The proposed specific actions are; (1) develop new functionalized clays to sequester the various anionic species of I and Tc; (2) test the influence of key parameters on the sequestration of I and Tc by the functionalized clay; and (3) model the sequestration of I and Tc by the functionalized clay.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use: UF is licensed to handle radioactive materials. All UF employees handling radioactive materials are required to pass the appropriate UF Radiation Safety Office trainings. All members of the laboratory own dosimeters (badge and ring). Research employees are specifically trained to handle radioactive materials. Examples of requirements for working with radioactive materials include (but are not limited to): wearing dosimeters; wearing designated gloves, lab coats, and goggles; frequent monitoring of hands; performing radioactive work in designated areas; frequent surveys of working areas; clear labelling of containers. Laboratories undergo weekly swipes and surveys to detect any contamination; in the unlikely event of radioactive contamination, the area is immediately decontaminated.

Hazardous Waste Generation: Hazardous wastes include aqueous solution of pH less than 2 or greater than 12.5. In this respect, hazardous wastes will be generated during the course of the work, due to range of solution pH to be studied. Efforts are made to minimize chemical waste generation through prudent purchasing practices, product substitution, recycling or reducing the amount of chemicals used.

Radioactive Waste Generation: Radioactive isotopes will be used during the course of the work; therefore, radioactive waste (liquid and solid) will be generated. Radioactive wastes are segregated in specific labelled boxes and containers, until ready for disposal. Efforts are made to minimize radioactive waste generation through prudent purchasing practices, product substitution, recycling or reducing the amount of chemicals used.

Mixed Waste Generation: Acidic and basic radioactive aqueous solutions will be prepared; therefore, mixed wastes will be generated during the course of the work. Mixed waste containers will be clearly labelled as such and segregated, until waste disposal. Efforts are made to minimize mixed waste generation through prudent purchasing practices, product substitution, recycling or reducing the amount of chemicals used.

Chemical Waste Disposal: Chemical wastes will be collected in appropriate labeled containers. Label inscriptions include chemical identification, dates of collection, username, and major hazards associated with the wastes. Non-radioactive wastes will be collected, upon request, by the UF Health and Safety responsible party. Radioactive Wastes will be collected, upon request, by the UF Radiation Safety Office – radioactive waste container label inscriptions specifically identify isotope(s) contained in the waste and level of radioactivity (in addition to chemical waste label inscriptions described above).

Chemical Use/Storage: Chemicals will be stored in appropriate containers and secure storage locations. Examples of chemical storage practices include: segregation incompatible chemicals (flammable and combustible segregated from oxidizing agents); segregation by hazard class (e.g. radioactive materials, flammable materials, oxidizing materials, caustics); physically separation (e.g. cabinets, trays); use of approved flammable storage lockers.

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 activities to develop key data on a novel buffer material for the sequestration of two particularly mobile contaminants, iodine (I) and technetium (Tc) in support of nuclear waste disposal options.

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 8/6/2020