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# U.S. DEPARTMENT OF ENERGY
# OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
# NEPA DETERMINATION

**RECIPIENT:** Clarkson University **STATE:** NY

**PROJECT TITLE:** Nutrient Recovery from Anaerobic Digestion Dewatering Sidestream using Bipolar Membrane Electrodialysis

| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
|---|---|---|---|
| DE-FOA-0002336 | DE-EE0009503 | GFO-0009503-001 | GO9503 |

**Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:**

**CX, EA, EIS APPENDIX AND NUMBER:**
Description:

| | |
|---|---|
| **A9 Information gathering, analysis, and dissemination** | Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.) |
| **B3.6 Small-scale research and development, laboratory operations, and pilot projects** | Siting, construction, modification, operation, and decommissioning of facilities for smallscale 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 deployment. |

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Clarkson University to design, develop, fabricate, and field test a Bipolar Membrane Electrodialysis (BMED) based approach to recover nutrients from water resource recovery facilities (WRRF). The system would be pilot tested at an existing WRRF. The project would be completed over three Budget Periods (BPs) with a Go/No-Go decision point between each BP. This NEPA determination is applicable to all three BPs.

Lab and bench scale development and testing would be conducted to determine key operating parameters necessary to achieve desired energy and resource recovery from WRRFs. Multiple units would be developed, including a BMED, a membrane contactor, and a crystallizer. Strategies to mitigate fouling and scaling would be developed and implemented. The conditions that would result in the most effective separation and recovery of nutrients would be identified and the units would be optimized accordingly. This information would be used to design and validate a scaled-up, skid-mounted pilot system which would be designed and assembled at Clarkson University and installed and tested at the City of Cortland WRRF. Techno-economic analysis and life cycle assessment would be run throughout. After completion of the project, all equipment and piping modifications would be removed from the Cortland Wastewater Treatment Facility and transported to Clarkson University.

Proposed project activities by location are listed below:

Clarkson University – Potsdam, NY

• Design, development, and fabrication of lab and bench scale systems. Electrochemical characterizations, monitor water properties, measure the amount of nutrients, and analyze water/membrane samples at the University's dedicated laboratories and analytical facilities.
• Design and fabricate skid mounted pilot scale system.
• Computer modeling for life-cycle assessment and techno-economic analysis.

The Cortland Wastewater Treatment Facility – Cortland, NY

• Installation and testing of pilot system which would consist of main nutrient recovery units and a holding tank.
• Daily monitoring of the system by facility operators who would collect and provide samples to research team.

Wright-Pierce Engineering Consultants, PC – Clifton, NY

• Computer modeling

There would be no modifications made to facilities, excluding those temporarily made to the Cortland Wastewater Treatment Facility for system installation. No changes in the use, mission, or operation of existing facilities would be required as part of this project and no additional permits would be required in order to conduct any of the work activities.

Project activities would involve the use and handling of various hazardous materials, including acids/bases, other chemicals, and analytical test kits. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, maintenance, monitoring, and regular internal assessments. All waste products would be disposed of by licensed waste management service providers. Clarkson University and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

**NEPA PROVISION**

DOE has made a final NEPA determination.

Notes:

Advanced Manufacturing Office
This NEPA determination does not require a tailored NEPA provision.
Review completed by Shaina Aguilar on 7/19/21.

**FOR CATEGORICAL EXCLUSION DETERMINATIONS**

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 7/19/2021

NEPA Compliance Officer

**FIELD OFFICE MANAGER DETERMINATION**

☑ Field Office Manager review not required
☐ Field Office Manager review required

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: _____ Date: _____

Field Office Manager