

PMC-ND

(1.08.09.13)

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



RECIPIENT: RTI International

STATE: NC

PROJECT TITLE: Advanced, Energy-Efficient Hybrid Membrane System for Industrial Water Reuse

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000560	DE-EE0005758	GFO-0005758-002	GO5758

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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.
- B3.11 Outdoor tests and experiments on materials and equipment components** Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to RTI International to increase sustainability of the advanced manufacturing sector by developing an advanced, cost-effective, hybrid membrane-based water treatment system that can improve the energy efficiency of industrial wastewater treatment by at least 50% relative to current state-of-the-art technology, while allowing at least 50% water reuse efficiency.

This award previously received a NEPA determination (GFO-0005758-001; CX-A9, CX-B3.6; 08/27/2012) for activities associated with Budget Period 1 (Tasks 2-6) which included hydrophobic ceramic membrane distillation (MD) membrane development, membrane process evaluation and optimization, preliminary techno-economic and environmental evaluations, definition of model framework and specifications, preliminary system design, and project management. BP2 (Tasks 7-11) was reviewed in November 2013 and previously established holds on the associated activities were lifted on 11/25/2013 as it was decided that the original determination applied to these tasks as well. The purpose of this NEPA determination is to review activities associated with Budget Period 3 (Tasks 12-16) including MD membrane development, hybrid process model development, performance testing of bench-scale integrated system, field testing of prototype integrated system, and final techno-economic, environmental, and manufacturability analyses.

Membrane development would continue at Duke University's Hudson Hall in Durham, NC. Hybrid process model

development, bench-scale performance testing, and final analyses would be completed by RTI International at their facility in Research Triangle Park, NC. Both of these facilities are designed for such activities and would require no physical modifications or additional or modified permits and/or authorizations. Field testing of the prototype system would be undertaken by RTI at Aera Energy's existing industrial Dehy/Water Plant facility in Kern County, CA. Field testing would involve outdoor installation of a skid-mounted prototype unit roughly 16 feet long by 8 feet wide x 8 feet high and would last no more than 6 months. The proposed pilot location would be in an area roughly 100 feet long by 80 feet wide in an unclassified area within Aera Energy's Dehy/Water Plant facility, which is bounded by existing oilfield process equipment on all sides. There would be no physical modification of existing facilities, except for utilities connections and tie-ins for produced water inlet and no additional ground disturbance is anticipated as the proposed test-site area is already flat and free of vegetation. There would be no change in the use, mission, or operation of this existing facility. Due to the proposed activities location at an existing industrial facility and the temporary nature of the field testing, DOE has determined that there would not be any adverse effects to visual resources, threatened and endangered species, wetlands, or cultural resources as a result of the proposed project.

Process streams to the project's field prototype would include briny streams containing a high salt content (mainly sodium chloride) and effluents from various pretreatment stages of a process system treating the raw produced/flowback waters generated by one of the site's wells. Products of this treatment would include a concentrated brine and clean water. The process water streams may contain small amounts of hazardous metals, hydrocarbon, or volatile organic contaminants that would be handled, disposed of, and managed in accordance with federal, state, and local environmental, health, and safety regulations. Host site Aera Energy has existing corporate health and safety policies and procedures that would be followed by all personnel on-site. These policies and procedures include personnel training, personal protective equipment, engineering controls, monitoring, HAZOP review, and other internal assessments to minimize health and safety risks to personnel and the public and ensure compliance with regulations.

There would be minimal generation of air emissions associated with this work; liquid effluent would be stored in approved containers and discharged back into the sewer system according to local regulations; toxic and non-toxic waste generated would be disposed of properly; health and safety guidelines are in place specific to OSHA and Duke Occupational and Employee Health Safety Office (OEHSO) standards, as the Chemical Safety Coordinator and OEHSO Office monitors the lab facilities and guidelines with government audits; emergency showers, eye wash stations, ventilation hoods, and chemical storage cabinets are present and available at the laboratory.

Based on review of the project information and the above analysis, DOE has determined the proposed project would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined that this project is consistent with actions outlined in DOE categorical exclusion A9 "Information gathering, analysis, and dissemination" and B3.6 "Small-scale research and development, laboratory operations, and pilot projects" and B3.11 "Outdoor tests and experiments on materials and equipment components" and is therefore categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

Advanced Manufacturing Offices

This NEPA determination does not require a tailored NEPA provision.

Review completed by Rebecca McCord, 06/22/2015

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:



Electronically Signed By: Kristin Kerwin

NEPA Compliance Officer

Date: 6/24/2015

FIELD OFFICE MANAGER DETERMINATION