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PMC-EF2a

(204.02)

**U.S. DEPARTMENT OF ENERGY  
EERE PROJECT MANAGEMENT CENTER  
NEPA DETERMINATION**



RECIPIENT: United Technologies Research Center

STATE: CT

**PROJECT TITLE :** Tailored Working Fluids for Enhanced Binary Geothermal Power Plants

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000075	DE-EE0002770	GFO-10-107	2770

**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 (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.
- B3.6** Siting, construction (or modification), operation, and decommissioning of facilities for indoor bench-scale research projects and conventional laboratory operations (for example, preparation of chemical standards and sample analysis); small-scale research and development projects; and small-scale pilot projects (generally less than two years) conducted to verify a concept before demonstration actions. Construction (or modification) will be within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible).
- B5.1** Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

Rational for determination:

United Technologies Research Center (UTRC) would design and increase the geothermal energy conversion efficiency. The work would take place at the existing laboratories:

North Avenue Research Area  
505 Techway  
Georgia Institute of Technology  
Atlanta, GA 30318  
United Technologies Research Center  
1411 Silver Lane  
East Hartford, CT

Thermophysical Properties Division  
National Institute of Standards and Technology  
325 Broadway  
Boulder, CO 80305

The project is divided into five tasks.

- Task 1 Screen and Evaluate Potential Working fluids for Subcritical, Supercritical, and Trilateral Binary Geothermal Power Plans
- Task 2 Design and Optimize Enhanced Geothermal Systems Utilizing Alternative Working Fluids
- Task 3 Characterize Thermodynamic and Transport Properties of Down-Selected Working Fluids
- Task 4 Characterize heat Transfer and Pressure Drop Performance of Down-Selected Working Fluids
- Task 5 Project Management and Reporting

The labs claim no additional permits are needed and there would be no generation of air emissions associated with this work. Vented gas cabinets and fumehoods are used with scrubbers to prevent release of air pollutants. The laboratories claim all liquid effluent, hazardous, and toxic waste is disposed of according to local, state, and federal regulations. According to all the labs, safety protocols are in place for instruments, chemicals and waste monitored by an Environmental Health and Safety team.

This project comprises information gathering, bench-scale research projects, and conventional laboratory operations to conserve energy; therefore the DOE has categorized this proposal into Categorical Exclusions A9, B3.6 and B5.1.

**NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

None Given.

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

NEPA Compliance Officer Signature:



NEPA Compliance Officer

Date:

12/28/09

**FIELD OFFICE MANAGER DETERMINATION**

Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

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

Field Office Manager's Signature:

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Field Office Manager

Date:

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