PMC-EF2a

(2.04.02)

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

RECIPIENT: Trabits Group, LLC **STATE:** AK

PROJECT TITLE: Development Of An Improved Cement For Geothermal Wells

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-EE0000075	DE-EE0002785	GFO-10-132	EE2785

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:

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).

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.

B3.11 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 that would not involve source, special nuclear, or byproduct materials. Covered activities may 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

Rational for determination:

Trabits Group, LLC (Trabits) would build on existing zeolite-containing cement technology to develop a new high temperature, high pressure (HTHP) cement with improved tensile qualities suitable for conventional geothermal and Enhanced Geothermal Systems (EGS) wells. Laboratory work would be performed at the University of Alaska Fairbanks (Fairbanks, AK), ThermaSource Cementing, Inc. (Arbuckle, CA), and The Jet Pulverizer Company (Moorestown, NJ). Field demonstrations are planned at Chena Hot Springs in Fairbanks, Alaska and an undetermined Ormat geothermal well.

The project is divided into five tasks:

1. Research – This includes a comprehensive review of the literature of current technology in cementing of HTHP oil, gas, and geothermal wells and of current cementing materials and placement methods. A review of the processes of geothermal well failure resulting from cement breakdown would also be completed.

2. Design – Research findings from Task 1 would be compiled and Tasks 3 & 4 would be modified to take advantage of any improvements in additives, methods and testing procedures.

3. Develop – Four zeolite types would be crushed and uniformly sized, zeolite type samples would be then be submitted for studies to confirm zeolite percentage and type. Each zeolite type would be prepared to three different particle sizes and a large number of cement samples would be prepared using various permutations of zeolite species, particle size, percent zeolite by weight of cement and certain additives.

4. Test – Comprehensive testing of cement samples that met the minimum criteria of the initial screening would be performed. It is anticipated that two cement blends would be presented for final stage development. During final stage development, samples would be subjected to a test cell bath of steam and formation fluid from a known geothermal field.

5. Demonstrate

a. Laboratory Scale – Cement samples would be subjected to conditions of heat and brine for 3 month and 6 month exposures.

b. Logistics and Ease of Use Field Demonstration – A local contractor at the Chena Hot Springs location would be provided with the pre-blended cement and instructed on how to use the cement. The contractor would use their normal and customary methods and equipment to place the cement. The operation would be observed to note any issues that might arise.

c. High Temperature EGS Well Demonstration – The cement would be tested in one of Ormat's wells that are under development in a "real world" situation.

According to the R&D Laboratory Questionnaire, all permits are in place and no additional permits are anticipated. No

hazardous waste would be produced and all liquid effluent would be handled and disposed of appropriately according to standard operating procedures and Environmental Health and Safety programs that are in place. Air filtration and collection systems are in place to address nuisance dust that could occur.
This project is comprised of information gathering, data analysis, conventional laboratory operations, and outdoor tests for the development, quality assurance, or reliability of materials; therefore the DOE has categorized this proposal into Categorical Exclusions A9, B3.6 and B3.11.

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: _____ Date: 3/23/10
NEPA Compliance Officer

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: _____ Date: _____
Field Office Manager