PMC-EF2a
(2.04.02)

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

RECIPIENT: Texas Engineering Experiment Station **STATE:** TX

PROJECT TITLE : Development of a Geological and Geomechanical Framework for the Analysis of MEQ in EGS Experiments

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000075	DE-EE0002757	GFO-10-278	2757

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).

Rational for determination:

Texas A&M University (TAMU) (also known as Texas Engineering Experimentation Station (TEES)) proposes to use ARRA funds to develop a framework for investigating processes that contribute to the occurrence of seismicity in enhanced geothermal systems. TAMU/TEES would use an integrated geological and geomechanical approach to identify the causal mechanisms of micro-earthquakes (MEQs), and to relate their occurrence to the resulting changes in rock mass characteristics. To complete this project, TAMU would conduct a combination of information gathering and dissemination, analysis of a sample collection from new and preexisting field demonstration projects, and laboratory experimentation/analysis on the collected raw data.

The tasks to be performed are as follows:

Phase 1: Geologic and Geomechanical Studies of EGS Sites
Task 1: Analyze core samples from the Geysers to develop a preliminary stress model and stimulation design for use as a baseline for Newberry.
Task 2: Use standard uniaxial and triaxial tests to determine the rock mechanical properties of core samples.
Task 3: Study the dilatancy and mechanisms of deformation of natural fractures during shearing using literature review, core experimentation, and numerical simulations.

Phase 2: Geological Analysis of Core Area; Drill Core
Task 4: Characterize mechanisms of porosity formation using laboratory experiments on core samples and analysis of drilling data.
Task 5: Investigate how rock mechanical properties depend on environmental conditions using laboratory experiments on core samples.
Task 6: Develop laboratory injection experimentation protocols and perform a pilot test based on the data collected from the preceding tasks.

Phase 3: Investigate MEQ/Porosity/Permeability in Injection Experiments
Task 7: Conduct laboratory injection experiments on core samples.
Task 8: Integrate the data to catalog a set of geological and geomechanical condition that are responsible for the generation of induced micro-seismic events based on the results from all preceding tasks. This task will involve information analysis and dissemination.
Task 9: Project management and reporting.
**Note: Prior to this NEPA determination, a Limited Release of Funds was authorized via STRIPES req 10EE002015: "This action modifies the Special Terms and Conditions of this award to incorporate the Limited Availability of Funds Clause to authorize DOE funds in the amount of $106,125 for expenditure by the Recipient." The following tasks were

partially covered by the blanket CX for the Limited release of Funds modification:
Task 1 – Planning and development only, no core experimentation
Task 3 – Literature review and numerical simulations only, no core experimentation

All tasks within the SOPO consist of a combination of information gathering and dissemination, data analysis, and/or indoor bench-scale research and conventional laboratory operations. Therefore the proposed project is hereby categorical excluded as A9 "Info gathering, analysis, documentation, dissemination and training" and B3.6 "R&D or pilot facility construction/operation/decommissioning."

**As part of the project documentation, a R&D Laboratory Environmental Impact Questionnaire was included. The activities described in this document fully addressed waste handling, safety protocols, and environmental health and safety department standards that would be in place. These activities fall under the categorical exclusion of B3.6 regarding R&D small-scale research and development projects. All laboratory work will take place at TAMU facilities as described in the attached laboratory questionnaire.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

EF2a prepared by Lizelle Espinosa

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 5/11/10

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