

PMC-EF2a

(2.04.02)

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



RECIPIENT: Novatek, Inc.

STATE: UT

**PROJECT TITLE :** Drill Bits with Novel Cutting Insert and Central Jackhammer

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-EE0000075 EGS R&D	DE-EE0002784	GFO-10-157	0

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).

## Rational for determination:

Novatek, Inc. (Novatek) would design, engineer, and improve drill bits for Enhanced Geothermal Systems (EGS). The work would take place at Novatek, Inc., 2185 South Larsen Parkway, Provo, UT 84606; Terra Tek, 1935 South Fremont Drive, Salt Lake City, UT 84104

The project is divided into four phases with multiple tasks.

## Phase I

1. Engineer, design, test, and manufacture pointed PCD cutters, and assemble the cutters into fixed bladed bits and roller cone bits suitable for EGS applications.
2. Engineer, design, test, and manufacture an enhanced, fixed bladed JackBits suitable for drilling deep, hot, hard rock formations of EGS.
3. Engineer, design, test, and manufacture enhanced roller cone bits incorporating high-load Kalsi thrust bearings, high-temperature metal-to-metal seals, precision journals and journal bearings, and a continuous lubrication system in order to extend the life of the bit in EGS environments.
4. Engineer, design, test, and manufacture a turbine driven, JackHammer mechanism for both fixed bladed and roller cone bits.
5. A successful demonstration of the hammer assisted, fixed bladed bit, and roller cone bit represents the go/no-go decision point for Phase I of this project.

## Phase II

1. Continue design, engineering and manufacture of the Stinger enhanced bits based upon the experience gained in Phase I
2. Test the hammer assisted fixed bladed bits and roller cone bits.
3. Test the hammer assisted bits at the Terra Tek test facility (indoor laboratory). Successful tests would determine the go/no-go decision point for Phase II.

## Phase III

1. Continue design, engineering and manufacture of the enhanced bits based upon the experience gained in Phase I and Phase II.

Phase III Task 2 is not Categorical Excludable since the geothermal well location has not been identified and therefore cannot be analyzed at this time.

2. Partner with a geothermal company to utilize the hammer assisted bits in an actual EGS well. The EGS well location has not been selected. However, the design of this bit would target the geothermal industry drilling 30,000 feet deep or more. Successful drilling tests in an actual EGS well would be the go/no-go decision point for Phase III leading to commercialization of the bits of this proposal.
3. Commercialize the enhanced bits through Novatek's own capital funding resources, or through venture capital funding, or through funding provided by industry partners.

PHASE IV

1. Project Management and Reporting

Reports and other deliverables would be provided in accordance with the Federal Assistance Reporting Checklist, including the Final Report and Technology Transfer.

According to the Novatek and Tera Tek Research and Development laboratory questionnaire, 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. Both companies, claim the liquid effluent, hazardous, and toxic waste would be disposed of according to local, state, and federal regulations. According to the companies, safety protocols are in place for instruments, chemicals and waste monitored by a Health and Safety officer.

At this time, the location of drilling the geothermal well has not been identified, and therefore cannot be analyzed. Therefore, Phase III Task 2 is not authorized. Phase III Task 2 would be analyzed once the location of the geothermal well is identified and submitted to the DOE.

Condition of Approval: Allowable: Phase I, II, III Tasks 1, and 3, Phase IV; Prohibited: Phase III, Task 2. This project comprises bench-scale research projects, conventional laboratory operations, and testing equipment; therefore the DOE has categorized this proposal into Categorical Exclusions B3.6 and B3.11.

NEPA PROVISION

DOE has made a conditional NEPA determination for this award, and funding for certain tasks under this award is contingent upon the final NEPA determination.

Insert the following language in the award:

You are restricted from taking any action using federal funds, which would have an adverse affect on the environment or limit the choice of reasonable alternatives prior to DOE/NNSA providing either a NEPA clearance or a final NEPA decision regarding the project.

Prohibited actions include:

Prohibited: Phase III, Task 2

This restriction does not preclude you from:

Allowable: Phase I, II, III Tasks 1, and 3, Phase IV

If you move forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the final NEPA decision, you are doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:

  
NEPA Compliance Officer

Date:

3/30/10

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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