PMC-EF2a

(2/04/02)

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

RECIPIENT: US Synthetic Corporation **STATE:** UT

PROJECT TITLE : The Development of Open, Water Lubricated Polycrystalline Diamond Thrust Bearings For use in Marine Hydrokinetic (MHK) Energy Machines

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000293	DE-EE0003633	GFO-0003633-001	EE3633

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:

US Synthetic Corporation is proposing to use federal funding to design, fabricate and test polycrystalline diamond (PCD) thrust bearings for marine hydrokinetic (MHK) systems. A key design element in most MHK strategies would be robust bearings, which can operate for extended periods of time in the harsh marine environments. The goal of the proposed project is to demonstrate how PCD thrust bearings would reduce the cost of electricity and improve the reliability and the efficiency of MHK energy machines.

All work would be performed at the US Synthetic Bearing manufacturing facility located at 1260 South 1600 West, Orem, Utah 84058. US Synthetic uses a safety program developed by DuPont called "STOP." The program is monitored internally, with formal audits by the US Synthetic safety department. US Synthetic is subject to the provisions of OSHA, the EPA and local and state regulations.

The lab test facility at US Synthetic is located on the shop floor of the building. There is an existing bearing test stand, which would be used in conjunction with a newly purchased water cooling system. In the system, cooling fluids would circulate through the bearings and parts of the test apparatus. These fluids would consist of a heat transfer fluid (light oil) and a water/glycol mixture. In all cases, these fluids would be contained and disposed of by an outside contractor, Phillips Service Companies.

The scope of the proposed project would involve designing, fabricating and testing three generations of PCD bearing prototypes, with each prototype building on the last. The prototype would be "worn-in," meaning that the test stand would be run at a constant load and speed until the bearing surfaces become smooth and polished. Data from the worn-in bearings would be collected using a friction test, which varies speed and time. The data collected during this project would allow US Synthetic to create two final sets of bearings specific to a particular MHK device. These sets of bearings would be given to an MHK machine builder for use in its MHK device. The machine builder would report its findings back to US Synthetic and the results would be included in the final report.

In view of the information provided by the State and the recipient, DOE has determined that the impacts related to the proposed project are anticipated to have negligible affects on the human and natural environment. The proposed project is consistent with actions outlined in A9 (information gathering) and B3.6 (indoor bench-scale research and laboratory operations) 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:

Note to Specialist :

Cristina Tyler: 01/12/2010.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 1/28/11

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