

PMC-ND
(1.08.09.13)

**U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION**

**RECIPIENT:** Quidnet Energy**STATE:** TX**PROJECT
TITLE:** Geomechanical Pumped Storage

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001836	DE-EE0008780	GFO-0008780-001	GO8780

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

A9 Information gathering, analysis, and dissemination Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)

B3.6 Small-scale research and development, laboratory operations, and pilot projects Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Quidnet Energy to design, fabricate, and test an injector-generator system for a novel geomechanical pumped storage (GMS) application. The injector-generator system would be designed to pump water into a storage well and generate electricity from the pumped water, in a manner similar to traditional hydro pumped storage systems. A prototype device, the Injector-Generator (INGEN), would be fabricated and assessed for durability/performance. Testing of the INGEN device would be performed in a laboratory setting.

Proposed project activities would include the following:

Task 1 – INGEN Detailed Design and Engineering: Task would consist of design work for the 1st generation INGEN prototype. Activities would include computer modeling/simulations and component design/selection.

Task 2 – Balance of System Design and Engineering: Task would consist of balance of system/powerhouse design and engineering. Priming considerations, process control and process safety procedures would be developed.

Task 3 – Finalize INGEN Design and Engineering: Task would consist of the finalization of the design/engineering of the INGEN prototype. Activities would include computer modeling/simulations, design work, and manufacturing cost estimation. An engineering model and an engineering cost estimate would be completed as part of this task.

Task 4 – INGEN prototype manufacturing and testing plan: Task would consist of the development of a manufacturing and testing plan. These would cover vendor/material selection, design of the test loop setup, testing procedures, and targeted results.

Task 5 – INGEN Prototyping and Characterization: This task would consist of the fabrication and assembly of a 2MW laboratory-scale prototype INGEN device (56 x 80 x 100 in; 20,000 lbs). Performance testing (e.g. pumping

and electrical generation) would also be carried out using an existing indoor hydraulic test-loop. Sensors would be installed on the loop and prototype to measure parameters including pressure, temperature, power, and flow. Testing scenarios would vary these parameters (e.g. hot start, cold start, full rate, low rate, high pressure, low pressure, etc.). A commercialization plan would also be developed as part of this task.

Quidnet Energy would serve as the project lead and would coordinate all project activities. Quidnet would performing engineering and project administration tasks at its office facilities in Houston, TX. Mechanical Solutions would perform design, modeling, and engineering tasks at its office facilities in Whippany, NJ. All project tasks performed by Quidnet and Mechanical Solutions would be limited to office work and desk studies. Hydro Inc. would perform fabrication, assembly, and testing activities at its laboratory facilities in Chicago, IL. No outdoor testing would be performed as part of this project. All project activities would be performed in existing, purpose-built facilities. No physical modifications to existing facilities, ground disturbing activities, or changes to the use, mission or operation of existing facilities would be required to complete project activities. Likewise, no additional permits or authorizations would be required.

Fabrication and testing activities at the Hydro Inc. facility would involve the use and handling of high power machinery, high pressure water, and industrial chemicals. Hydro Inc.'s facilities regularly perform work similar in nature to that included as part of this project. Risks associated with the handling of laboratory equipment and materials would be mitigated through adherence to established health and safety policies and procedures. Quidnet and its project partners would observe all applicable health, safety, and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Water Power Technologies Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Jonathan Hartman, 07/23/2019

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____

 Electronically Signed By: Kristin Kerwin

Date: 7/29/2019

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

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

Field Office Manager's Signature: _____

Field Office Manager

Date: _____