PMC-ND
(1.08.09.13)

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

RECIPIENT: Natel Energy **STATE:** CA

PROJECT TITLE: Efficient, Modular Low-Head Linear Pelton Turbine with Simple, Low-Cost Civil Works

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001455	DE-EE0008011	GFO-0008011-002	GO8011

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, 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 Natel Energy to design, fabricate, and test a pilot-scale hydraulic turbine that would incorporate a novel linear drivetrain into the design. The turbine would be powered by the momentum of high velocity water carried through flat nozzle jets and captured by Pelton-style buckets. The proposed project would also determine specifications for potential civil works and powerhouse configurations.

The proposed project is divided into two Budget Periods. Previously, DOE completed a NEPA review for Budget Period 1 tasks and sub-tasks (Tasks 1–5), which included analysis work, component design and requirements evaluation, were reviewed as part of NEPA determination GFO-0008011-001 (CX A9 3/6/2017). This NEPA review is for BP 2.

After the completion of BP1, and prior to DOE's NEPA review of BP2, Natel completed Task 6, which included the fabrication and testing of a small-scale prototype. Testing and fabrication activities under this task were completed using a specially-built hydraulic test model assembled at Natel Energy's test facility in Alameda, CA. This NEPA review does not evaluate potential environmental impacts associated with Task 6.

Tasks 7–8 would be primarily limited to data analysis, computer modelling, and design work, though some limited-scale bench-level testing of individual components (e.g. high cyclic fatigue testing on belt and blade attachment components) may also be conducted. Design work would be focused on improving powertrain performance and components (e.g. blade assemblies, nozzles, belt systems, chassis, etc.), as well as civil works assessments (e.g. draft chamber specifications, design, and fluctuation modeling).

Task 9 would consist of the fabrication and testing of an intermediate-scale prototype, which would include a turbine, generator, control system and some civil works elements. Fabrication and design of the prototype would be completed at Natel Energy's headquarter in Alameda, CA. The test device would use the following materials and estimated quantities: mild steel (30 tons), carbon fiber reinforced epoxy composites (2 tons), carbon fiber reinforced urethane composites (50 kg), cast iron (6.5 tons), stainless steel (3 tons), aluminum (200 kg), biodegradable grease SKF LGGB 2 (25 kg), and controls wiring and sensors (100 kg).

All testing activities would utilize Natel's existing hydraulic test model. Testing of the intermediate-scale prototype would use approximately 30,000 gallons of water obtained from the regular building fresh water supply. Testing would

be conducted using a closed-loop test rig, which would include a sump tank with the following dimensions (35 ft. long x 8 ft. wide x 12.6 ft. high). The use of water would be non-consumptive and the water would be used repeatedly. Fish passage testing would also be conducted in partnership with Pacific Northwest National Laboratory (PNNL). This testing would not use live fish, but rather, customized electronic devices, provided by PNNL, containing accelerometers and pressure sensors (i.e. “sensor fish”).

All facilities in which laboratory work would be conducted are pre-existing, purpose built facilities that have conducted work similar to that included as part of this award. No change in the use, mission, or operation of existing facilities would result from any of the proposed project activities. Neither Natel Energy nor any of its project partners would need to obtain any additional permits in order to realize the work activities proposed as part of this award.

Tasks 10-11 would include work activities focused on analysis and final reporting. Oak Ridge National Laboratory would assist Natel in analyzing cost information, building cost estimation models, and drafting final report materials.

The proposed project activities would involve the use of various equipment (e.g. forklifts and metalworking equipment) and materials (e.g. metals and industrial solvents). Risks associated with these activities would be mitigated through adherence to existing corporate health and safety policies procedures, including employee training, the use of proper protective equipment, engineering controls, monitoring, and internal assessments. Hazardous materials would be managed in accordance with Federal, state, and local environmental regulations.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory’s health and safety requirements.

Based on the review of the proposal, DOE has determined that Tasks 7-11 of the proposal fit within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. Tasks 7 – 11 of this proposal are 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:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory’s health and safety requirements.

Note to Specialist :

Water Power Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 07/17/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 7/18/2018

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