PMC-ND

(1.08.09.13)

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

RECIPIENT: Florida Atlantic University **STATE:** FL

PROJECT TITLE : Low-Flow Marine Hydrokinetic Turbine for Small Autonomous Unmanned Mobile Recharge Stations

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001837	DE-EE0008636	GFO-0008636-003	GO8636

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.)
B3.16 Research activities in aquatic environments	Small-scale, temporary surveying, site characterization, and research activities in aquatic environments, limited to: (a) Acquisition of rights-of-way, easements, and temporary use permits; (b) Installation, operation, and removal of passive scientific measurement devices, including, but not limited to, antennae, tide gauges, flow testing equipment for existing wells, weighted hydrophones, salinity measurement devices, and water quality measurement devices; (c) Natural resource inventories, data and sample collection, environmental monitoring, and basic and applied research, excluding (1) large-scale vibratory coring techniques and (2) seismic activities other than passive techniques; and (d) Surveying and mapping. These activities would be conducted in accordance with, where applicable, an approved spill prevention, control, and response plan and would incorporate appropriate control technologies and best management practices. None of the activities listed above would occur within the boundary of an established marine sanctuary or wildlife refuge, a governmentally proposed marine sanctuary or wildlife refuge, or a governmentally recognized area of high biological sensitivity, unless authorized by the agency responsible for such refuge, sanctuary, or area (or after consultation with the responsible agency, if no authorization is required). If the proposed activities would occur outside such refuge, sanctuary, or area and if the activities would have the potential to cause impacts within such refuge, sanctuary, or area, then the responsible agency shall be consulted in order to determine whether authorization is required and whether such activities would have the potential to cause significant impacts on such refuge, sanctuary, or area. Areas of high biological sensitivity include, but are not limited to, areas of known ecological importance, whale and marine mammal mating and calving/pupping areas, and fish and invertebrate spawning and nursery areas recognized as being limited or unique and vulnerable to perturbation; these areas can occur in bays, estuaries, near shore, and far offshore, and may vary seasonally. No permanent facilities or devices would be constructed or installed. Covered actions do not include drilling of resource exploration or extraction wells.
B3.2 Aviation activities	Aviation activities for survey, monitoring, or security purposes that comply with Federal Aviation Administration regulations.
B5.25 Small-scale renewable energy research and development and pilot projects in aquatic environments	Small-scale renewable energy research and development projects and small-scale pilot projects located in aquatic environments. Activities would be in accordance with, where applicable, an approved spill prevention, control, and response plan, and would incorporate appropriate control technologies and best management practices. Covered actions would not occur (1) within areas of hazardous natural bottom conditions or (2) within the boundary of an established marine sanctuary or wildlife refuge, a governmentally proposed marine sanctuary or wildlife refuge, or a governmentally recognized area of high biological sensitivity, unless authorized by the agency responsible for such refuge, sanctuary, or area (or after consultation with the responsible agency, if no authorization is required). If the proposed activities would occur outside such refuge, sanctuary, or area and if the activities would have the potential to cause impacts within such refuge, sanctuary, or area, then the responsible agency shall be consulted in order to determine whether authorization is required and whether such activities would have the potential to cause significant impacts on

such refuge, sanctuary, or area. Areas of high biological sensitivity include, but are not limited to, areas of known ecological importance, whale and marine mammal mating and calving/pupping areas, and fish and invertebrate spawning and nursery areas recognized as being limited or unique and vulnerable to perturbation; these areas can occur in bays, estuaries, near shore, and far offshore, and may vary seasonally. No permanent facilities or devices would be constructed or installed. Covered actions do not include drilling of resource exploration or extraction wells, use of large-scale vibratory coring techniques, or seismic activities other than passive techniques.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Florida Atlantic University (FAU) to design, develop, and test a prototype low-flow marine hydrokinetic (MHK) turbine, which would provide partial power to recharge battery banks onboard a mobile unmanned autonomous floating recharge station for a 0.5 kg to 2.5 kg unmanned aerial vehicle (UAV). A small catamaran, with two electric outboard engines and with capabilities for autonomous navigation, would serve as the floating platform. This would be a small wave-adaptive-modular autonomous unmanned surface vehicle (WAM-USV), approximately 4.88 meters by 2.44 meters and 181 kilograms. Two 16-foot inflatable pontoons, each with an electric outboard engine and connected to an elevated deck would serve as the floating support platform for the marine hydrokinetic platform and turbine. The 1.5 meter long by 1 meter in diameter low-flow turbine would provide partial power to recharge battery banks on the platform for aerial drones. At designated field sites, the MHK platform would anchor, the undershot waterwheel would be deployed from the platform and placed in prevailing currents at one foot below sea level, and energy would be harnessed for conversion to electricity.

DOE previously completed NEPA review of Tasks 1 - 5 (5/24/2019, GFO-0008636-001, CXs A9 and B3.6) and Tasks 6 and 7 and subtask 8.1 (4/1/2021, GFO-0008636-002, CXs A9 and B3.6). Subtask 8.2 and Task 9 include field testing of the complete prototype system and its subcomponents at selected locations and reporting. These were restricted until field testing sites were selected and all relevant information, including a Biological Evaluation, was submitted to DOE for NEPA review. Since that time, FAU has completed informal consultations with National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). Accordingly, field testing activities (Subtask 8.2 and Task 9) will now be reviewed.

Subtask 8.2 involves testing in tidal and coastal waters in three different sites with demonstration of a UAV re-charging onboard the USV platform. The project sites consist of 3 testing locations along the east coast of southern Florida, including the Dania Beach marina, a portion of the Intracoastal Waterway between Dania Beach and Port Everglades, and the coastal area off Fort Lauderdale between Barracuda Reef and Pompano Beach. Field testing of the complete prototype system and its subcomponents would take place at the first and second site (specific sites to be selected, options have been reviewed and approved). Testing and demonstration of the automated drone re-charging process would take place at the third site. Task 9 would include the development of final project deliverables such as detailed documentation of the system and its components and subsystems, updated plans for fabrication, and reports.

Site locations and activities are described in detail below:

Field testing at Sites 1 and 2 would involve automated anchoring in the sandy bottom and operating a turbine close to the water surface. FAU would monitor vessel traffic at each potential location and use the currents and bottom conditions to choose the specific location at sites 1 and 2.

Test site 1 would be selected from three options located in the Intracoastal Waterway between Dania Beach, FL and Port Everglades, FL. Test site options 1.1 and 1.2 are located adjacent to the FAU SeaTech Campus. There is an existing dock at the FAU Campus and these sites have existing buoys in place. Test site option 1.3 is located on the eastern edge of the Intracoastal Waterway south of the New River Cut-off Canal. The complete prototype system and its subcomponents would be field-tested at the selected location at Site 1.

Test Site 2 would also be selected from three options. These are located offshore in the Atlantic Ocean. Test Site option 2.1 is located north of Port Everglades Inlet. Test Site option 2.2 is located within the Barracuda Reef Moorings. Test Site option 2.3 is located at The Caves, moorings east of Ft. Lauderdale Beach. Test Site options 2.1-2.3 have existing buoys in place. The complete prototype system and its subcomponents would also be field-tested at the selected location at Site 2.

Test Site 3 is located off Pompano Beach, FL. No inspections for bottom-type or current resource are needed for this site since no anchoring or current harnessing activities are planned here. This site would be used for testing and

demonstration of recharging the UAV from the unmanned turbine platform. This would involve the drone flying from a support vessel to the turbine platform, recharging, and returning to the support vessel. It would be deployed at a height less than 200 feet above the water level at a coastal location outside of FAA no-fly zones.

Testing would be conducted under low wind and low sea-state conditions and would take place sometime in November through February to avoid the South Florida turtle nesting season. Field testing would involve navigation and anchoring of the unmanned turbine platform at the selected locations at Site 1 or 2, deployment of the turbine from the platform, gathering of energy and data, recovery of the turbine onto the platform, recovery of the platform anchor, and navigation of the platform back to a location where it would be recovered. Several tests would be conducted, each involving total deployment of up to five hours carried out over a four-week period.

Component testing and system assembly would not require any physical modifications to existing facilities or changes to the use, mission, or operations of existing facilities. Ground disturbance in the anchorage areas would be in line with conventional anchoring practices of small watercraft.

The proposed action area could include Endangered Species Act threatened or endangered species (listed species). This includes six reptile, three mammal, three bird, two plant, four fish, and seven invertebrate species. DOE completed a Biological Evaluation (BE) to evaluate impacts of the proposed project to those listed species and their habitats. Based on the analysis in the BE, DOE determined that the proposed action was not likely to adversely affect listed species or designated critical habitats.

On October 28, 2021, DOE initiated informal consultation with NMFS and USFWS and sought concurrence regarding the DOE determination. On January 12, 2022, NMFS concurred with DOE's determinations and on February 23, 2022, USFWS concurred with DOE's determinations. NMFS and USFWS identified avoidance and minimization measures which are required to be implemented to minimize impacts to the marine environment and listed species.

The following precautions, along with any other precautionary measures listed in informal consultation response letters (USFWS letter, dated 2/23/22; NMFS letter, dated 1/12/22), would be taken during field testing to mitigate environmental impacts:

• Where anchorage is required (Test Site 1 and Test Site Option 2.1), the selection of each site location would be away from sensitive areas (e.g., away from seagrass, reefs, shellfish beds, etc.).
• The anchor would be deployed in a way to avoid dragging, using appropriate length of chain and warp, in support of minimizing scouring of the seabed.
• The anchor would be checked periodically to make sure it holds and does not drag.
• In retrieving the anchor, the Platform's uprightness and orientation would be checked first for correctness. Then the Platform would be moved so it is over the anchor point before the anchor is retrieved.
• If anchoring anywhere in the coastal zone is not permitted, permissible mooring to existing mooring structures would be considered.
• A lookout would be present during testing to monitor for local presence of marine mammals and protected species. If a marine mammal or protected species is spotted, the in-water operations would be stopped and the MHK turbine would be retrieved.
• A second lookout would monitor boat traffic to ensure in-water operations are stopped during passage of a large boat in the area.
• The applicant will adhere to USFWS Standard Manatee Conditions for In-Water Work, NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006), NMFS's Vessel Strike Avoidance Measures (NMFS 2008), and testing will be conducted outside of peak sea turtle nesting season.
• Operation of watercraft will be conducted at slow speeds to reduce the likelihood of collisions with ESA-listed species.
• An onsite observer trained in recognizing crocodiles, manatees, signs of their presence, as well as ESA-listed birds will be present for the duration of the proposed activity.
• Observers have the authority to halt project activities if an ESA-listed species is seen in or near the action area and until the ESA-listed species departs the area under its own volition.
• Perform a pre-flight check for shorebirds and seabirds immediately before drone takeoff to determine the location of any nearby birds.
• Avoid launching the drone directly at birds. Launch and land the drone away from birds and preferably out of their sight.
• Avoid changing drone direction, speed, or altitude in the vicinity of birds.
• Cease drone activity immediately if birds are observed flushing or becoming agitated.

Testing locations would have no lasting impacts at any project locations, therefore no breeding habitat or constricted migratory habitat primary constituent elements would be impacted by the hydrokinetic testing. There are no potential routes of effect to any designated critical habitat. Disturbance to ESA-listed birds from noise and the proposed activities would be temporary, therefore discountable.

Project activities would involve the use and handling of various hazardous materials including metals and industrial solvents and the use of overhead lifting equipment and tackle. In addition, USV and UAV systems could pose hazards to navigation. USV and UAV would be operated by trained and certified personnel and would be kept under observation from support craft capable of aborting operations, detecting imminent interactions, and taking the steps appropriate to protect the equipment, the public, and wildlife. Any risks associated with the project activities would be mitigated through adherence to established health and safety policies and procedures. All waste products would be disposed of by licensed waste management service providers. Florida Atlantic University and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

This project includes the use of small unmanned aerial systems (sUAS). The Recipient is responsible for ensuring that all activities involving sUAS are compliant with 14 CFR Part 107 or an applicable Certificate of Waiver or Authorization (COA). This includes, but is not limited to, aircraft requirements such as remote pilot-in-command certification, authorities and responsibilities; ensuring the sUAS is in a condition for safe operation; registration; understanding airspace classifications and requirements; and accident reporting (if applicable).

Consultation with USFWS and/or NMFS must be reinitiated if a take occurs, new information reveals effects of the action not previously considered, if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. In the event that a take occurs, the Recipient is required to notify DOE.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assisstance agreement:

This project includes the use of small unmanned aerial systems (sUAS). The Recipient is responsible for ensuring that all activities involving sUAS are compliant with 14 CFR Part 107 or an applicable Certificate of Waiver or Authorization (COA). This includes, but is not limited to, aircraft requirements such as remote pilot-in-command certification, authorities and responsibilities; ensuring the sUAS is in a condition for safe operation; registration; understanding airspace classifications and requirements; and accident reporting (if applicable).

Consultation with USFWS and/or NMFS must be reinitiated if a take occurs, new information reveals effects of the action not previously considered, if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. In the event that a take occurs, the Recipient is required to notify DOE.

The following precautions, along with any other precautionary measures listed in informal consultation response letters (USFWS letter, dated 2/23/22; NMFS letter, dated 1/12/22), would be taken during field testing to mitigate environmental impacts:

• Where anchorage is required (Test Site 1 and Test Site Option 2.1), the selection of each site location would be away from sensitive areas (e.g., away from seagrass, reefs, shellfish beds, etc.).
• The anchor would be deployed in a way to avoid dragging, using appropriate length of chain and warp, in support of minimizing scouring of the seabed.
• The anchor would be checked periodically to make sure it holds and does not drag.
• In retrieving the anchor, the Platform's uprightness and orientation would be checked first for correctness. Then the Platform would be moved so it is over the anchor point before the anchor is retrieved.
• If anchoring anywhere in the coastal zone is not permitted, permissible mooring to existing mooring structures would be considered.

• A lookout would be present during testing to monitor for local presence of marine mammals and protected species. If a marine mammal or protected species is spotted, the in-water operations would be stopped and the MHK turbine would be retrieved.
• A second lookout would monitor boat traffic to ensure in-water operations are stopped during passage of a large boat in the area.
• The applicant will adhere to USFWS Standard Manatee Conditions for In-Water Work, NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006), NMFS's Vessel Strike Avoidance Measures (NMFS 2008), and testing will be conducted outside of peak sea turtle nesting season.
• Operation of watercraft will be conducted at slow speeds to reduce the likelihood of collisions with ESA-listed species.
• An onsite observer trained in recognizing crocodiles, manatees, signs of their presence, as well as ESA-listed birds will be present for the duration of the proposed activity.
• Observers have the authority to halt project activities if an ESA-listed species is seen in or near the action area and until the ESA-listed species departs the area under its own volition.
• Perform a pre-flight check for shorebirds and seabirds immediately before drone takeoff to determine the location of any nearby birds.
• Avoid launching the drone directly at birds. Launch and land the drone away from birds and preferably out of their sight.
• Avoid changing drone direction, speed, or altitude in the vicinity of birds.
• Cease drone activity immediately if birds are observed flushing or becoming agitated.

Notes:

Water Power Technologies Office
This NEPA determination requires legal review of the tailored NEPA provision.
Review completed by Shaina Aguilar on 4/4/22.

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: 4/8/2022

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: _____ Date: _____

Field Office Manager