

PMC-ND

(1.08.09.13)

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



RECIPIENT: AMP Robotics

STATE: CO

PROJECT TITLE: Artificial Neural Network for MSW Characterization

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002203	DE-EE0009264	GFO-0009264-001	

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 federal funding to AMP Robotics to develop sensor technology for the characterization of municipal solid waste (MSW). AMP Robotics would develop artificial neural network (ANN) software for use in physical sensors. Sensors, integrated with the software, would then be used to characterize MSW samples in a laboratory setting. Iterative characterization experiments would be performed to further develop the software.

Proposed project activities would consist of the following tasks:

Task 1 – Initial Verification: AMP Robotics would perform an initial verification of sensors integrated with currently available ANN software. Laboratory test conveyors would be used to run MSW materials under sensors for characterization.

Several pallets of non-hazardous MSW materials would be used throughout the scope of the project. The MSW would consist of paper waste, yard waste (e.g., leaves, grass, branches, etc.), food waste, plastics, and polymers. Each pallet would measure approximately 48" x 40" x 48" (L x W x H) and would hold approximately 200 unsorted objects.

Task 2 - System Design and Construction: This task would consist of the assembly and installation of two commercial 3D imaging systems. One system would be installed at a research facilities operated by AMP Robotics in Louisville, CO and the other at a research facility operated project partner Idaho National Laboratory (INL), in Idaho Falls, ID. Each system would consist of a 3D camera and associated equipment (e.g., mounting hardware), which would be installed onto existing conveyor belts. Once installed, the camera would be calibrated for purposes of the project.

Task 3 – Characterization of MSW Fractions: ANN software would be developed, and algorithm training would be performed via trial characterization runs using MSW and existing conveyor belt systems at AMP and INL. MSW samples would also be milled to 2 mm particle size and physically characterized in-lab (i.e., compositional analysis).

Task 4 – Identify Reduced Sensor Spectrum: This task would consist of the analysis of performance data and optimization of ANN software.

Task 5 – Final Verification: As part of this task, AMP Robotics and INL would continue to perform runs of unsorted

MSW, collect performance data, and optimize ANN software.

Task 6 – Techno-economic Analysis (TEA) and Life-cycle Analysis (LCA): This task would consist of the development of TEA and LCA models.

Task 7 – Project Management: This would be an ongoing task throughout the life of the project, consisting of all activities relating to project administration, planning, and reporting.

All project work would be coordinated by AMP Robotics. Software development and initial camera characterization of MSW would be performed at AMP Robotics' research and development facility in Louisville, CO. Additional MSW characterization would be performed at a biomass research facility operated by INL in Idaho Falls, ID. No physical modifications to existing facilities, ground disturbance, or changes to the use, mission, or operation of existing facilities would be required. No additional permits or authorizations would be required.

Project work would involve the use and handling of non-hazardous MSW. All such handling would occur in controlled laboratory environments. To mitigate potential risks, established institutional policies and procedures would be adhered to. Protocols would include employee training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. AMP Robotics and INL would observe all applicable Federal, state, and local health, safety, and environmental regulations.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Bioenergy Technologies Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Jonathan Hartman, 02/05/2021

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: Roak Parker

NEPA Compliance Officer

Date: 2/10/2021

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: _____