

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



RECIPIENT: University of Tennessee

STATE: TN

PROJECT TITLE: Biochar Enhanced Ecosystem Services for Energy Crop Systems in the Southeast

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|--|--------------------------------------|----------------------------|-------------------|
| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
| DE-FOA-0002910 | DE-EE0011054 | GFO-0011054-001 | GO11054 |

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:

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| 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.) |
| B3.1 Site characterization and environmental monitoring | Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: (a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; (b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); (c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; (d) Aquifer and underground reservoir response testing; (e) Installation and operation of ambient air monitoring equipment; (f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes); (g) Sampling and characterization of water effluents, air emissions, or solid waste streams; (h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); (i) Sampling of flora or fauna; and (j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7. |
| 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 the University of Tennessee (UT; Knoxville, TN) to engineer and validate a biochar and poultry litter co-application process for carbon sequestration and carbon intensity reduction in bioenergy crop systems within the southeastern U.S. The award would involve field trials at five existing agricultural field sites in Tennessee (TN) and four in Mississippi (MS).

This NEPA Determination (ND) does not apply to Budget Period (BP) 2 Tasks 2.5, 2.6, 2.8, and 2.9 nor BP3 and BP4 activities. BP2 Task 2.7 proposes soil sampling (including the collection of soil cores) and laboratory soil analysis activities. The initial baseline soil sampling at each demonstration and research plot in both TN and MS have been reviewed as part of this ND. Subsequent sampling activities would require further NEPA review before these activities

can occur. DOE will complete the NEPA review for BP2 Tasks 2.5, 2.6, 2.7 (post-baseline soil sampling and analysis activities), 2.8, and 2.9 and BP3 and 4 when consultation with the U.S. Fish and Wildlife Service (USFWS) is complete. No treatment applications (i.e., biochar, poultry litter, synthetic fertilizer, pesticides, herbicides, or insecticides) are allowed to occur without USFWS concurrence and an additional NEPA review. This ND applies to BP1 and BP2 Tasks 2.1, 2.2, 2.3, 2.4, and 2.7 (baseline soil sampling and analysis activities) only.

UT would utilize dedicated university offices and laboratories to complete project management activities, data analysis, biochar and biomass processing and characterization, soil sample processing, soil analysis, soil respiration experiments, pre-fieldwork preparation, and Artificial Intelligence development. Mississippi State University (Mississippi State, MS) would perform project planning activities, data analysis, soil sample processing, and soil analysis within dedicated on-campus offices and laboratories. Management of field trials would be led by Tennessee State University (Nashville, TN). Oak Ridge National Laboratory (Oak Ridge, TN) would be responsible for life cycle assessment and techno-economic analysis activities, biochar characterization, and diversity, equity, and inclusion activities. All facilities are preexisting purpose-built facilities for the type of work to be conducted for this award. Facility modifications would not be required.

Between five and fifteen baseline soil samples per field trial plot would be collected at two depths (0-15 and 15-30 centimeters(cm)) via a hand probe. A hydraulic-powered probe would be used to collect three, 61 cm deep, baseline soil cores per field trial plot. Baseline sampling activities would occur at Sullivan Farm (Spencer, TN), Grant Farm (Decatur, TN), Sutton Farm (Madisonville, TN), Highland Rim Research and Education Center (Springfield, TN), Northeast Tennessee AgResearch and Education Center (Greenville, TN), Mississippi Agricultural and Forestry Experiment Station (MAFES) Bearden Dairy Research Center (Starkville, MS), and MAFES Black Belt Branch Experiment Station (Brooksville, MS). Prior to sampling activities, appropriate best management practices must be implemented to prevent sediment runoff into nearby waterbodies.

Award activities would involve typical hazards associated with laboratory operations, including handling and use of hazardous materials such as cleaning solvents, acids, and highly combustible materials as well as the use of compressed gas cylinders. Soil sampling would require the operation of potentially hazardous equipment and vehicles and involve site-specific environmental hazards. Existing health, safety, and environmental policies and procedures would be followed to mitigate hazards to acceptable levels. Mitigated hazards would pose negligible risks to the public and environment. All activities would comply with existing federal, state, and local laws and regulations.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

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 conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

Budget Period (BP) 1

BP2 Tasks 2.1, 2.2, 2.3, 2.4, and 2.7 (baseline soil sampling and analysis activities)

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

**BP2 Tasks 2.5, 2.6, 2.7 (post-baseline soil sampling and analysis activities), 2.8, and 2.9
BP3 and BP4**

Include the following condition in the financial assistance agreement:

No treatment applications (i.e., biochar, poultry litter, synthetic fertilizer, pesticides, herbicides, or insecticides) or ground disturbance other than baseline soil sampling are allowed to occur without U.S. Fish and Wildlife Service concurrence and an additional NEPA review.

Prior to baseline sampling activities, appropriate best management practices must be implemented to prevent sediment runoff into nearby waterbodies.

Notes:

Bioenergy Technologies Office (BETO)

This NEPA determination requires legal review of the tailored NEPA provision.

NEPA review completed by Corrin MacLuckie, 3/19/2024.

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.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:

 Electronically Signed By: Andrew Montano
NEPA Compliance Officer

Date: 3/19/2024

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: