

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** University of Massachusetts Amherst**STATE:** MA

PROJECT TITLE: Impacts of Dual-Use Solar on Crop Productivity and the Agricultural Economy in Massachusetts and Beyond

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002243	DE-EE0009374	GFO-0009374-001	

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.)
- B3.1 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.
- B5.15 Small-scale renewable energy research and development and pilot projects** Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Massachusetts Amherst (UMass) to design and conduct agricultural site trials on private farm land at which commercial scale solar photovoltaic (PV) arrays have been constructed. "Dual use" solar (solar power co-located with agriculture) site trial research would involve field-based and laboratory measurements including site meteorology, soil moisture, and

biomass quantity and quality in order to better understand the impact of PV installations on agriculture productivity. The research team would also conduct economic analysis of the impacts of dual use solar on farm financial viability and the agricultural sector.

Office tasks associated with research, data analysis, publications, and project management would take place at UMass (Amherst, MA) and American Farmland Trust (Northampton, MA). Other subrecipients supporting the project would include BlueWave Solar, NextSun Energy LLC, Pine Gate Renewables, Hyperion Systems LLC, MA Department of Agricultural Resources and MA Department of Energy Resources. Laboratory analyses of soil and crop samples would take place at dedicated UMass research facilities.

Site trial research would be conducted on areas within commercial dual-use arrays that have been set aside as research plots. During Budget Period 1, the scope of work would include the establishment of protocols and methodologies to collect meteorological, agronomic, and environmental data both before and after solar array construction. These data would be used to develop baseline datasets needed for the subsequent site trials throughout the rest of the award. During Budget Periods 2 and 3, the agricultural research scope would expand to include the establishment of plantings at each site trial location and the deployment of environmental and meteorological monitoring sensors above ground and in the soil, followed by monitoring and data collection over two growing seasons.

The proposed project would modify existing agricultural areas that have been set aside for this type of research. Project work would occur below and around a dual-use solar installation that has been installed separately from the research activities; new solar installations are outside the scope of this award. Each research site would be approximately 2-3 acres. Activities on the broader farm area encompassing the site trials would include standard agricultural procedures to plant, maintain, and harvest crops or graze animals, including soil preparation, irrigation, pest management, and operation of farm machinery. Each site would be subject to standard farming activities but with more direct attention to follow the established research protocols.

The recipient has identified multiple potential locations for the proposed agricultural site trials. Site selection would be determined during final experimental design. All potential locations are privately owned farms located in Massachusetts and used for active agriculture with planned or existing dual-use solar array development:

- Knowlton Family Trust Farm (Grafton, MA)
- Cabral Farms, Inc. (North Dighton, MA)
- S.K. Wainio Bogs, Inc. (Carver, MA)
- Shores Family Farm (Carver, MA)
- Ring Road Bog (Kingston, MA)
- Hall Tavern Farm (Charlemont, MA)
- Czajkowski Farm (Hadley, MA)
- Reddy Fox Farm (Monson, MA)

At the selected locations, ground disturbing activities would be limited to: seasonal installation of subsurface soil moisture sensors no more than 12" below ground; seasonal installation of posts no more than 24" below ground and 60" above ground to support additional monitoring equipment (PAR sensor, meteorological data); installation of plot markers for treatment and control areas; establishing and harvesting of biomass and agricultural products for yield measurement. All ground disturbing activities would be conducted in accordance with routine and standard agricultural practices and procedures that guide such work. Ground disturbance would occur in areas that have been previously disturbed. After the research site trials are completed, any remaining monitoring equipment would be removed and the site would continue to be farmed consistent with the current use of each location.

No existing or new permits, licenses, or authorizations would be required to conduct this research. Air emissions resulting from ground disturbing activities and equipment operation would be de minimis. The proposed research would generate limited amounts of organic wastes in the form of harvested biomass that would be disposed of through on-site composting, sale by the host farmer, or standard environmental health and safety (EH&S) disposal methods in place at UMass for materials analyzed in the lab. Pesticide use is not expected to differ from standard applications that are part of the background farming activity. No additional applications would be prescribed as part of experimental treatments. Typical integrated pest management guidelines, monitoring, and thresholds would be observed and action would be taken, if needed, using standard application methods and following applicable workplace EH&S protocols.

Based on a review of the proposal, DOE has determined that project activities at any of the aforementioned

locations would not have the potential to affect cultural resources, threatened or endangered species, wetlands, floodplains, or prime farmlands. A migratory bird nesting survey shall be completed if project activities involving ground disturbance occur between March 15 and September 15. If nests or eggs are found, the area would be cordoned off with a proper buffer until nestlings fledge.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

A migratory bird nesting survey shall be completed if project activities involving ground disturbance occur between March 15 and September 15. If nests or eggs are found, the area would be cordoned off with a proper buffer until nestlings fledge.

Notes:

Solar Energy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss Donoghue, 6/23/2021

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: _____

 **Kristin Kerwin**
NEPA Compliance Officer

Date: 6/25/2021

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: _____