

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



RECIPIENT: Sublime Systems, Inc.

STATE: MA

PROJECT TITLE : Advanced Electrolytic Cement Production Process for Lower-Energy Use with Alternative Calcium Sources

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002997	DE-EE0011221	GFO-0011221-001	GO11221

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 funding to Sublime Systems, Inc. (Sublime) to research advancements in electrolytic cement production processes for lower energy use with alternative calcium sources.

The proposed work would include research, design, fabrication, grinding operations, and operation of the proposed pilot plant. The project activities would include the scale-up and integration of a novel electrolyzer into an existing chemical process for processing industrial wastes and byproducts and producing cement products for the construction industry. The work would be done in-house within Sublime Systems' current research and development facility and pilot plant, both of which are in Somerville, Massachusetts. The cement production capacity of the pilot plant expansion for this project would approximate 100-tons per year. The project would occur over the course of 3 Budget Periods (BPs), spanning 3-5 years.

During the third and final budget period, and under Task 3 of the project award, a 4,000 lb. field pour would be planned with concrete made and cement produced from the proposed work for the purposes of testing performance in real-world settings with actual customers. The 4,000 lb. concrete field pour location is unknown at this time but would likely happen with a partner/customer/contractor at either their operational site or another construction site of their preference. The concrete pour would be the only ground disturbing activity associated with this award and would occur at an established construction or operational site where concrete pours are routine and existing environmental compliance protocols would be in place. Since the location of the concrete field pour is unknown, BP3 Task 3 would require further NEPA review once the location becomes identified, and thus, BP3 Task 3 is not included in this NEPA Determination (GFO-0011221-001).

The project would involve the use and handling of various hazardous materials including fine powders, corrosive chemicals, and electricity of standard voltages (230-Volt or less). There is also grinding equipment with hazards associated with moving machinery and heavy weights. All such handling would occur in the lab or pilot manufacturing facility that have been operated for those purposes at Sublime historically and be conducted by trained staff. Licensed electricians would be contacted to install and/or upgrade any electrical power systems. All hazardous materials would be managed in accordance with federal, state, and local environmental regulations. Existing corporate health and safety policies and procedures would be followed, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. Additional policies and procedures would be implemented as necessary as new health and safety risks are identified. A modification would need to be made to the Category 3

Permit to Process Hazardous Materials to include the addition of the vessels and new reactors in the Pilot Plant, as well as to the Low-Flow Low-Pollutant Sewer Discharge Permit to increase the allowed discharge volume. Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient.

There would be no combustion or chemical processes associated with this award that would release gases or particulates into the atmosphere. To ensure containment and prevent accidental release of volatile chemicals from the reactors, scrubbers and carbon, absorbent beds would be used at vent locations containing volatile chemicals. Grinding, blending, and bagging operations can create particulate matter including dusts of slags, ashes, or concrete debris. There are multiple engineering controls (local dust collection systems with HEPA filters) in place to capture these particulates at source and prevent release. Both Sublime sites are within a USEPA Attainment Area.

Award work that would occur at the current Sublime pilot plant would require the physical modification of the existing facility, which would include treating the facility floor with an epoxy surface. The electrical infrastructure would also be expanded by licensed electricians. Based on the nature of the modifications associated with the award, the DOE does not anticipate any impacts to resources of concern due to the proposed award activities under this conditional NEPA determination.

NEPA PROVISION

DOE has made a conditional NEPA determination.

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

[Task 1](#)
[Task 2](#)

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

[Task 3](#)

Notes:

[Industrial Efficiency & Decarbonization Office](#)
[NEPA review completed by Chris Akios, 05/24/2024](#)

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: _____



Signed By: [Andrew Montano](#)

NEPA Compliance Officer

Date: 5/24/2024

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: _____