



U.S. Department of Energy

Categorical Exclusion Determination Form

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Proposed Action Title: Optimizing Nuclear Waste and Advanced Reactor Disposal Systems (ONWARDS) Program (FOA No. DE-FOA-0002530 and FOA No. DE-FOA-0002531 (SBIR/STTR))

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): UT, ID; CA; TX; WA; NY; TN; MA; NJ; MO; SC; NC; IL; GA

Proposed Action Description:

AMENDED NEPA DETERMINATION (See the attached original Programmatic Determination, dated March 9, 2022)

This Amended Determination follows ARPA-E's receipt of required information and certifications from four (4) Prime Recipients (See Attachment A, in bold) that were not covered under the original Determination. These projects fit within the class of actions identified under the DOE Categorical Exclusion(s) identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the project. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the projects. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and local regulatory requirements.

The ONWARDS Program is composed of 11 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. This Amended Determination and the original Programmatic Determination cover all 11 projects (listed in Attachment A). Three Prime Recipients (Deep Isolation, GE Research and TerraPower, LLC) have not yet obtained all necessary permits or approvals (or confirmed there are none), or have not yet identified all locations necessary to perform the contemplated work. Each such recipient is prohibited from commencing applicable project work before (1) obtaining the necessary permits and approvals (or confirming none are necessary) and (2) providing written assurances to ARPA-E of the same.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE
Date: 2022.05.24 23:16:09 -04'00'

Date Determined:

**Attachment A: Projects in the ONWARDS (FOA No. DE-FOA-0002530 and DE-FOA-0002531)
Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
GE Research (2530-1501)	Resonance Absorption Densitometry for Materials Assay Security Safeguards (RADMASS)	A9; B3.6
TerraPower, LLC (2530-1515)	Chloride-Based Volatility for Waste Reduction and/or Reuse of Metallic-, Oxide- and Salt-Based Reactor Fuels	A9; B3.6
Citrine Informatics (2530-1528)	Novel Phosphate Waste Forms to Enable Efficient Dehalogenation and Immobilization of Salt Waste	A9; B3.6
Rutgers, the State University of New Jersey (2530-1532)	Pioneering a Cermet Waste Form for Disposal of Waste Streams from Advanced Reactors (PACE-FORWARD)	A9; B3.6
Rensselaer Polytechnic Institute (2530-1533)	Metal-Halide Perovskites as Innovative and Cost-Effective Fluoride Salt Waste Forms	A9; B3.6
Orano Federal Services LLC (2530-1539)	Off-Gas Treatment Process for Conditioning and Recycling Facilities	A9; B3.6
Brigham Young University (2530-1540)	Two-Step Chloride Volatility Process for Reprocessing Used Nuclear Fuel from Advanced Reactors	A9; B3.6
Idaho National Laboratory (2530-1554)	Traveling Molten Zone Refining Process Development for Innovative Fuel Cycle Solutions	A9; B3.6
Oklo Inc. (2530-1563)	Enabling the Near Term Commercialization of an Electrorefining Facility to Close the Metal Fuel Cycle	A9; B3.6
Stony Brook University (2530-1567)	MATRICY: Matrix Engineered TRISO Compacts Enabling Advanced Reactor Fuel cycles	A9; B3.6
Deep Isolation US LLC (2531-1505)	UPWARDS: Universal Performance Criteria and Canister for Advanced Reactor Waste Form Acceptance in Borehole and Mined Repositories Considering Design Safety	A9; B3.6



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Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): UT, ID; CA; TX; WA; NY; TN; MA; NJ; MO; SC; NC

Proposed Action Description:

The ONWARDS Program supports the development of technologies that address significant challenges to closing the back-end of advanced reactor (AR) nuclear fuel cycles. In particular, technologies that significantly improve the disposal impact of used nuclear fuel (UNF) and other waste streams stemming from the implementation of AR fuel cycles with innovative and cost-effective approaches in reprocessing, material accountancy, and waste forms. If successful, ONWARDS projects would dramatically reduce AR waste volume, feature better than 1% fissile-mass accountancy, develop high-performance AR waste forms, and have costs in the range of \$1/MWh.

The ONWARDS Program is composed of 11 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. This Determination covers 7 of the 11 projects (listed in Attachment A). All 7 projects fit within the class of actions identified under the DOE Categorical Exclusion identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE
Date: 2022.03.09 14:10:16 -05'00'

Date Determined:

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Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
GE Research (2530-1501)	Resonance Absorption Densitometry for Materials Assay Security Safeguards (RADMASS)	TBD (pending final review)
TerraPower, LLC (2530-1515)	Chloride-Based Volatility for Waste Reduction and/or Reuse of Metallic-, Oxide- and Salt-Based Reactor Fuels	TBD (pending final review)
Citrine Informatics (2530-1528)	Novel Phosphate Waste Forms to Enable Efficient Dehalogenation and Immobilization of Salt Waste	A9; B3.6
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