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Categorical Exclusion Determination**

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Categorical Exclusion Posting No.: DOE-ID-INL-23-052 R1

**Project Title:** Transient Reactor Test (TREAT) Reactor Experiment Cell (T-REXC) R1

**Project Description and Purpose:**

**Revision 1**

The T-REXC facility is being developed as a versatile platform to support advanced nuclear research. Its primary purpose is to provide a controlled environment for demonstrating low-power micro-reactor technologies and conducting criticality experiments that advance reactor safety, efficiency, and innovation. To prepare for these future experimental campaigns, a series of foundational activities will be undertaken to ensure the facility meets all technical, operational, and regulatory requirements.

- Partial demolition of existing concrete and asphalt inside of and external to TREAT building MFC-720.
- Provide dust and debris control(s) inside of TREAT during demolition work.
- Coordination with BEA radiological technicians for monitoring, sampling, and waste determinations during demolition activities.
- Remove from the site any unusable soil fill material or process, as required, to meet fill and structural fill requirements and utilized in the work.
- Install concrete slabs on grade.
- Preparation and submission of steel reinforcing (rebar) shop drawings that detail fabrication, bending, and placement.
- Install miscellaneous metal fabrications.
- Procurement, fabrication, shop surface preparation and priming of all structural steel.
- Preparation and submission of detailed structural steel shop fabrication drawings, which will include fabrication details of all structural steel components, including connections, splices, bolt holes, steel types with identification marks, weld details, and bolt details.
- Installation of all structural steel, which includes all field bolting and welding, steel shimming and alignment, and grouting of column base plates.
- Installation and testing of compressed gas cylinder storage, manifold, and tubing runs into the facility.
- Installation and testing of the mechanical ventilation systems. Includes mechanical equipment, fans, ductwork, and stacks.
- Route the Government-furnished instrumentation cables between the instrumentation cabinets and the shielded pass through. Terminations to be performed by others.
- Continuity testing for all wiring that is installed but not terminated.
- Install, route, and test electrical power.
- Install normal (commercial) power distribution panelboards, low voltage transformers, disconnect switches, specialty outlets, convenience outlets, and all interconnecting conduit and wiring to support new electrical installations, instrumentation and control equipment, fire detection, and radiological monitoring.
- Relocation of existing electrical infrastructure as noted on the drawings to allow for new installations.
- Design and installation of lightning protection system.
- BIM modeling for coordination, clash detection, and as-built modeling
- Potential installation of modular structures to support construction activities

In addition to the scope outlined above, routine facility modifications may be required to support the T-REXC. These modifications may include, but are not limited to, installation or upgrades to communications systems, HVAC systems, electrical infrastructure, structural supports, and utility connections. Work may also involve running new utilities from existing sources within the area, installation of equipment foundations, and minor structural enhancements to meet operational or safety requirements.

An initial best guess at waste volumes associated with the activities at TREAT.

- ~10yd<sup>3</sup> of concrete from inside of the TREAT high bay – Anticipated to be disposed of as LLW
- ~11yd<sup>3</sup> of soil/sand from inside of the TREAT high bay – Anticipated to be disposed of as LLW
- ~9yd<sup>3</sup> of asphalt/concrete mix from outside of the TREAT facility – Anticipated to be disposed of as standard industrial waste

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- ~11yd<sup>3</sup> of soil mix from outside of the TREAT facility – Anticipated to be disposed of as standard industrial waste
- <1yd<sup>3</sup> of other demo waste. This will consist of material removed for penetrations in the building, so I would anticipate it to be industrial but worst case LLW.

**Original Determination**

The mission of the National Reactor Innovation Center (NRIC) is to accelerate the demonstration and deployment of advanced nuclear energy. NRIC is a national program led by Idaho National Laboratory (INL) that enables collaborators to harness the world-class capabilities of the U.S. National Laboratory System. NRIC is designed to bridge the gap between research, development, and the marketplace to help convert advanced nuclear reactors into commercial applications.

In addition, the Materials and Fuels Complex (MFC) at INL is a world leader in innovative nuclear energy technology and is the hub of INL nuclear energy research. Activities at MFC support core research in nuclear fuels and cladding, radiation damage in core structural materials, chemical separations and fuel recycling, nuclear nonproliferation and nuclear forensics, space nuclear power and isotope technologies, and transient testing of reactor fuels.

In support of the MFC and NRIC missions, INL needs to maintain effective nuclear Research, Development, Demonstration & Deployment (RDD&D) capabilities at MFC by providing a facility to demonstrate new microreactors of low power and perform criticality experiments. To meet these needs the proposed Transient Reactor Test (TREAT) Reactor Experiment Cell (TREXC) is being designed and constructed in the TREAT facility. The purpose of TREXC is to provide certain facilities, systems, and services that demonstrators will be able to use. A key constraint for TREXC is to protect the broader TREAT facility and its ability to support the transient testing mission. As part of TREXC, key components of TREAT infrastructure is made available to support RDD&D.

The proposed TREXC will consist of several modifications to TREAT to prepare the facility for future demonstration projects. These include:

1. North storage pit shield structures to prevent neutron activation of the concrete.
2. Pit Lid.
3. I&C infrastructure to capture and display TREXC facility data and demonstrator data.
4. Electrical power infrastructure in the form of electrical supply panel near the pit and a standby power generator.
5. Control room infrastructure including signal and data transfer between MFC720 and MFC724.
6. Ventilation in the form of a HEPA filtered and monitored exhaust.
7. Fire detection including sodium and NaK fires.
8. Neutron source for startup.
9. Radiation Monitoring.
10. Radial neutron reflectors for the demonstrator to integrate into the demonstration system.
11. Reactivity control components in the form of BeO control drums for neutron population control.
12. A system to preclude water intrusion into the pit.
13. Fire mitigation systems in accordance with the TREAT fire hazards analysis.

The first such reactor to be installed in the T-REXC will be the Microreactor Applications Research Validation and Evaluation (MARVEL). The scope of the MARVEL reactor is covered by the Environmental Assessment (EA) for MARVEL (DOE/EA-2146).

**Environmental Aspects or Potential Sources of Impact:**

**Air Emissions**

This ECP does not cover emissions from potential future projects, each individual project will require its own APAD.

Project activities have the potential to generate fugitive dust. The project will take reasonable precautions to control fugitive dust. If dust control methods are required, the project will record in the project records the date, time, location, and amount/type of suppressant used. Personnel are responsible for working with the Program Environmental Lead (PEL) to determine if any permitting requirements apply to generators and other equipment and, if necessary, obtaining the permit and maintaining a file of the documentation.

Mobile sources such as generators, welders, and compressors may be used temporarily (less than six months) during construction activities. These sources would be required to meet IDAPA 58.01.01.625 visible emission opacity requirements.

**Discharging to Surface-, Storm-, or Ground Water**

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No anticipated discharges to surface, storm or ground water. If project activities involve discharging waters at the INL site, project personnel must contact the PEL to determine required permits.

**Disturbing Cultural or Biological Resources**

There is the potential for this work to impact vegetation and for project personnel to interact with various wildlife species. A Biological Resource Review will be arranged within two weeks prior to the initiation of any activities that might disturb soil or vegetation and again following completion of project activities. A nesting bird survey is included with the Biological Resource Review for actions occurring between April 1 - October 1 per compliance with the Migratory Bird Treaty Act. Bat surveys are also included with the Biological Resource Review in accordance with the INL Bat Protection Plan.

CULTURAL: A Section 106 review has completed under CRMO project number (BEA-26-026) and resulted in No Adverse Effect. Project-specific consultation is not required for this project. Please refer to Holds Points and Project Specific Instructions of the ECP.

**Generating and Managing Waste**

When wastes are generated, how they are disposed can adversely affect the environment. Managing wastes appropriately and responsibly and implementing recycling or reuse practices, where feasible, during project activities can reduce the potential impact on the environment.

Polychlorinated Biphenyl (PCB) waste could be generated when performing maintenance on, replacing, or performing D&D on equipment manufactured before 1982. Such equipment and associated materials include but are not limited to capacitors, lubricants/dielectric fluids, transformers and bushings, light fixtures, electric motors, pumps, voltage regulators, other equipment/components that contain oil, and oil associated with electrical conduit/cable.

Polychlorinated Biphenyl (PCB) waste could be generated when work activities involve structures or buildings built before 1982 (e.g., painted surfaces, caulking, adhesives, rubber gaskets, joint sealer, cable/wire insulation, ventilation duct gaskets or insulation).

**Releasing Contaminants**

When chemicals are used during the project there is the potential for spills that could impact the environment (air, water, soil).

**Using, Reusing, and Conserving Natural Resources**

NA

<b>Determination</b>
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**References:**

B3.6 Small-scale research and development, laboratory operations, and pilot projects. Siting, construction, modification, operation, and decommissioning of facilities for small-scale 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.

The proposal fits within the classes of actions listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures and satisfies the conditions that are integral elements of the classes of actions therein. The proposal does 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, 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, Appendix B.

There is no extraordinary circumstance related to the proposal that is likely to cause a reasonably foreseeable significant adverse effect or for which DOE does not know the environmental effect. Extraordinary circumstances are unique situations presented by specific proposals, including, but not limited to, scientific controversy about the environmental effects of the proposal; uncertain effects or effects involving unique or unknown risks; and unresolved conflicts concerning alternative uses of available resources.

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The proposal has not been segmented to meet the definition of a categorical exclusion. Segmentation can occur when a proposal is broken down into small parts in order to avoid the appearance of significance of the total action. However, segmentation does not include proposals that are developed and potentially implemented over multiple phases where each phase results in a decision whether to proceed to the subsequent phase.

Based on my review of the proposed action, 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.

Approved by Robert Douglas Herzog, DOE-ID NEPA Compliance Officer on: 2/26/2026