Project Title: Standard Nuclear: SNI Construction and Operations

Project Description and Purpose:

PROJECT OVERVIEW

This project involves the construction and operation of a small-scale pilot facility (SN-I) by Standard Nuclear (SN) at the Idaho National Laboratory (INL) site. The SN-I facility supports the U.S. Department of Energy's (DOE) Fuel Line Pilot Program and Executive Order 14301, which aims to accelerate the deployment of advanced nuclear power through private-sector leadership. The facility will manufacture tri-structural isotropic (TRISO) fuel to meet the needs of advanced reactor demonstrations. SN has signed an Other Transaction Agreement (OTA) with DOE, outlining the project's scope, schedule, and responsibilities.

The SN-I facility is considered a small-scale project when compared to commercial nuclear fuel facilities, such as Westinghouse Electric Company's Columbia Fuel Fabrication Facility. The proposed facility consists of a ~12,000 square-foot pre-engineered metal building (PEMB) on a site of approximately 0.5 acres within the Central Facilities Area (CFA) at INL. The secondary building will be a duplicate of the primary building in terms of construction. The purpose of the SN-I Support Building is to provide non-radiological space for supporting work related to SN-I (receiving non-radiological shipments, staging PPE, housing support vehicles such as snowplows, etc.). The SN-I Support Building will be structurally the same as SN-I (details below). Utilities will be commensurate with a support building (details below). The SN-I support building will be constructed after construction of SN-I completes.

In addition to the SN-I facility and support building, the existing infrastructure will be upgraded to include a chemical delivery driveway on the east of the property with access to Oregon Street. A main parking lot will be added to the northwest corner of the site with access to Nashua Ave. A fence will be added around the perimeter of the property with access gates to Nashua Ave. and Oregon Street. Improvements will also be made to the existing asphalt. A temporary construction trailer will be staged on-site during the duration of construction activities. A tank farm with tanks of various capacity to hold process gases used in manufacturing will be located adjacent to the chemical delivery driveway.

The project will also involve site preparation, grading, foundation work, utility connections, and equipment installation.

Utility interconnection will be coordinated with BEA personnel and power management. The following utilities are planned for installation:

- Potable water
- Fire water
- Industrial wastewater
- Sanitary sewer
- Power
- Fiber

Power will be tied-in to existing power poles on-site, while water connection will tie-in to existing infrastructure along Nevada Street, to the west of the site.

PROJECT LOCATION

The SN-I facility will be located near the existing Central Facilities Area (CFA) at the INL site, roughly aligning with the coordinates 43.52842, -112.94145. The area is already developed with asphalt and gravel surfaces, minimizing the need for topsoil handling. Exact locations for spoils, gravel storage, and other materials will be determined during site characterization.

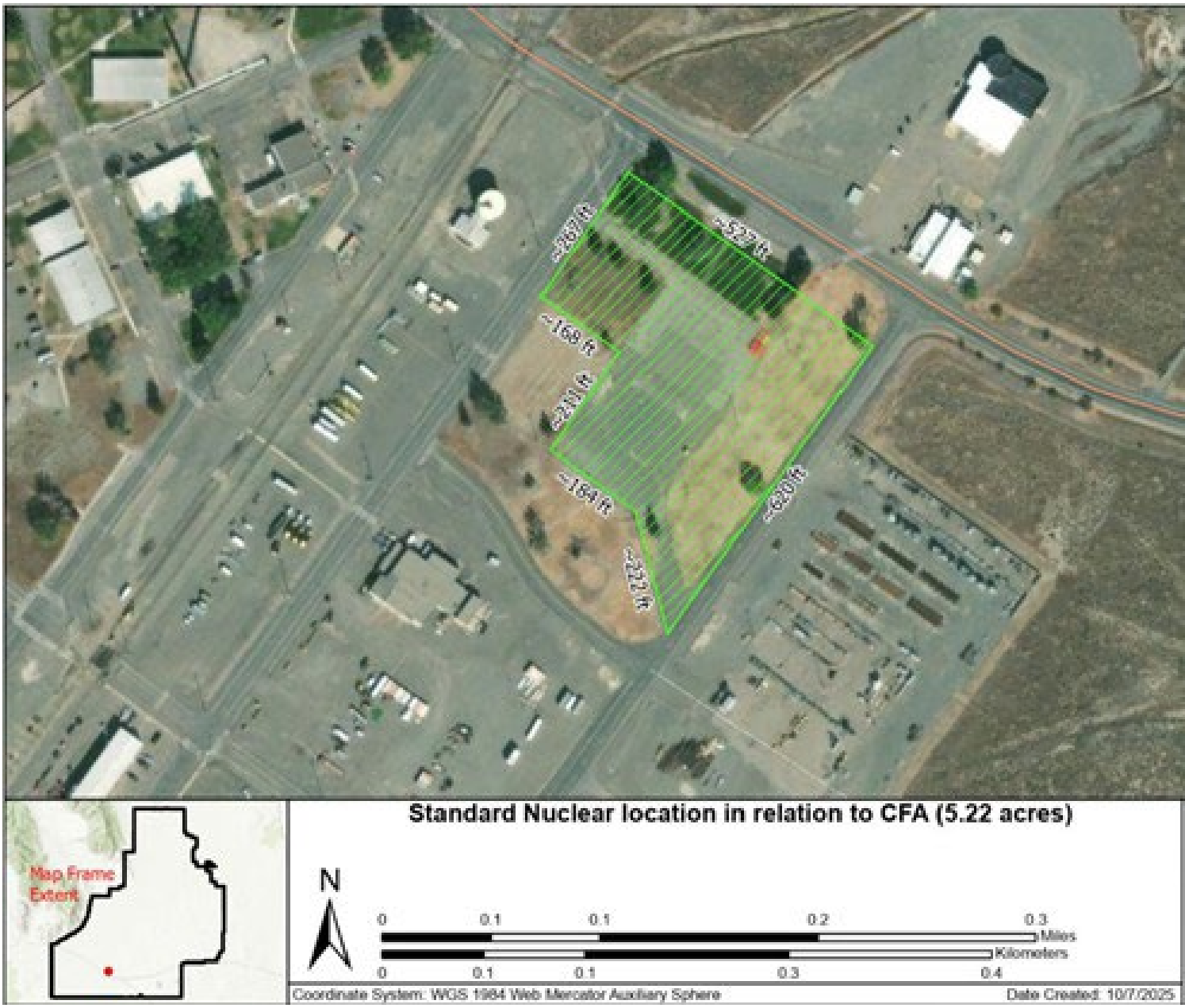

Figure 1. Approximate outline of the plot identified for Standard Nuclear at CFA at the INL Site.

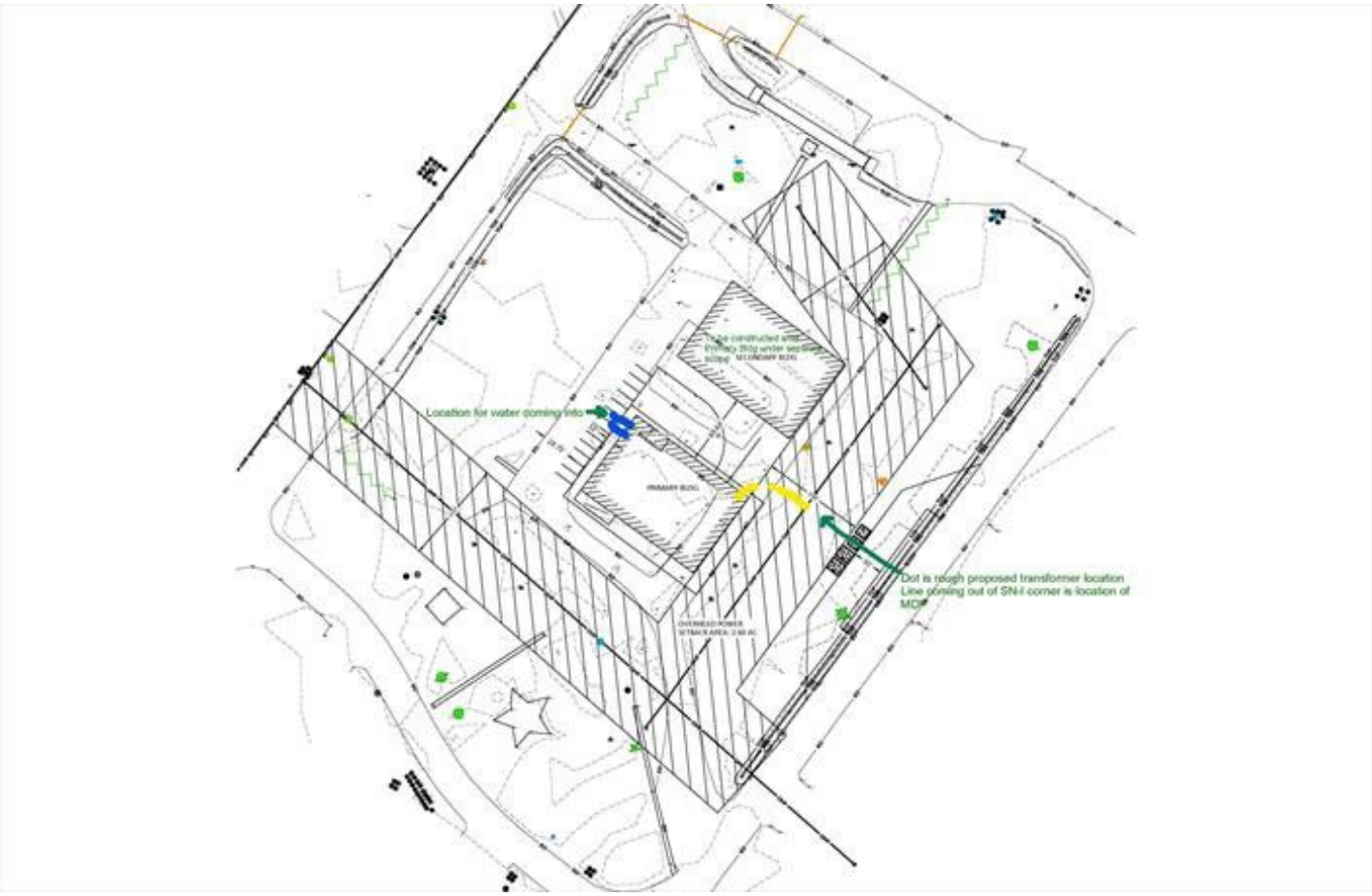

Figure 2. Site plan showing layout building locations and utility tie-in locations. Yellow represents the power connection. Blue indicates the location of the water connection.

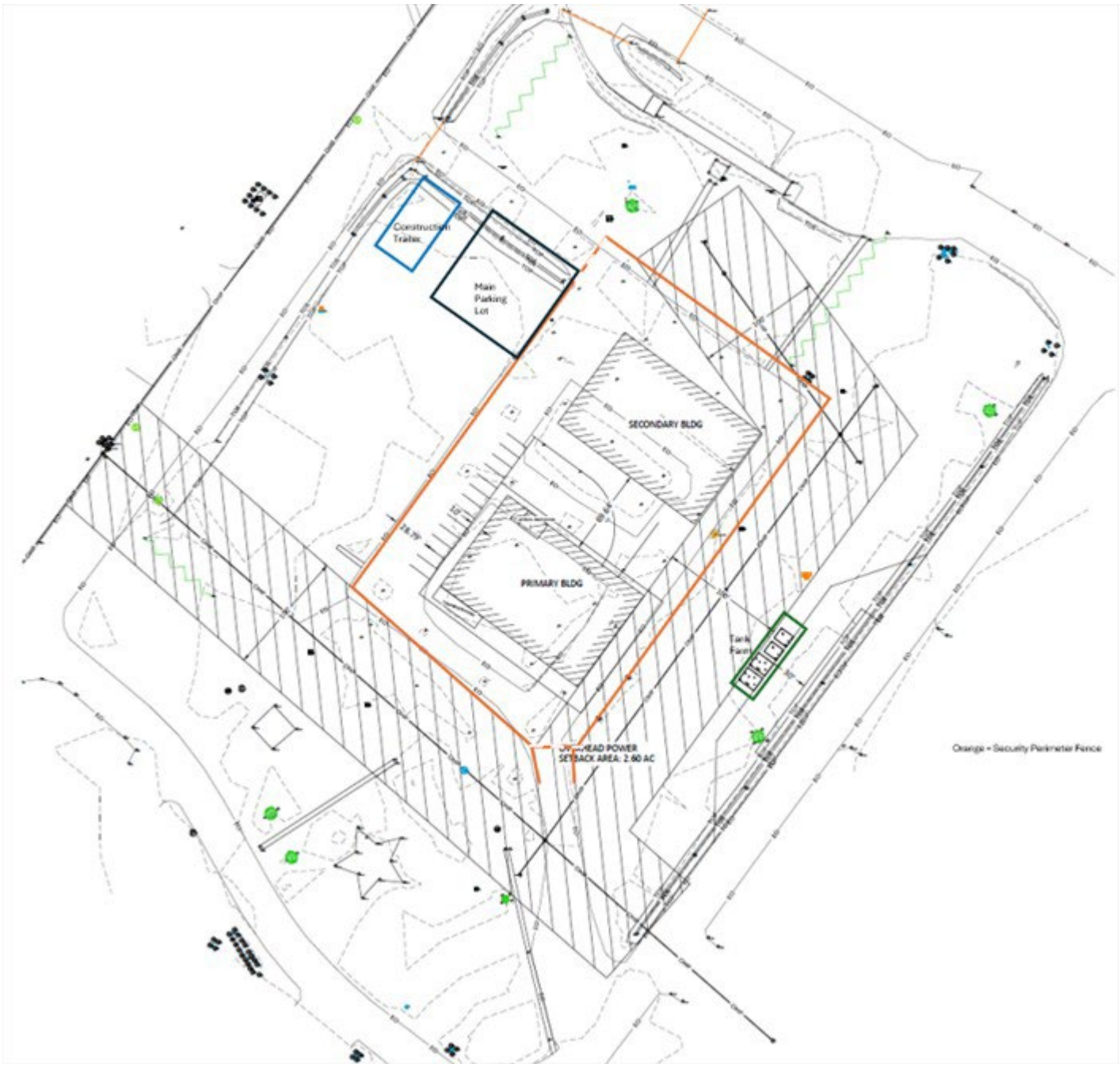

Figure 3. Site layout showing fence, tank farm, driveway, and parking lot locations.

PROPOSED ACTIVITIES

The project encompasses several phases, including:

- Site Preparation: Grading, earthwork, utility installations as needed to support the PEMB construction, and paving/infrastructure improvements.
- Construction: Erecting two ~12,000 sq ft PEMBs, including foundation work, mechanical, electrical, and plumbing installations, and equipment setup.
- Operations: Manufacturing TRISO fuel, handling chemicals, and managing waste under controlled conditions.
- Decommissioning (if applicable): Demolishing equipment and cleaning the site as required by DOE at the end of the OTA term.

Key operational activities during facility operations include:

- Handling and processing fuel feedstocks, including uranium dioxide, uranium trioxide, and other chemicals.

- Producing reactor-specific TRISO fuel for demonstration programs.
- Managing waste streams, including low-level radioactive waste and non-radioactive process waste.
- Performing maintenance and monitoring activities to ensure regulatory compliance.

MATERIALS & EQUIPMENT

Materials Used in Construction:

- Concrete for foundation work
- Structural steel for PEMB framework
- Gravel for bedding and grading
- Excavated soil (repurposed where feasible)

Materials Used in Operations:

- Uranyl nitrate, urea, hexamethylenetetramine (HMTA), nitric acid, and other chemicals for fuel production
- Process gases (hydrogen, acetylene, carbon monoxide)
- Graphite powder and other materials for fuel manufacturing

Equipment Used for Construction:

- Excavator, bulldozer, skid steer, dump truck, and roller for earthwork and compaction
- Concrete trucks for foundation work
- Mobile crane and scissor lift for PEMB erection
- Mobile work trailer for temporary operations

WASTE MANAGEMENT

Standard Nuclear is creating contracts with Waste companies to coordinate the disposal of their own waste during construction and operations. Specific types of waste generated during construction include the following:

Recyclable:

- Metal pieces/fines, including rebar, piping, structural pieces, screws. Painted and unpainted
- Boxes/packaging

Industrial:

- Insulation
- Drywall/plasterboard
- Wood (pallets, forms, offcuts, etc)
- Soil with vegitation
- Asphalt & concrete
- Wire/wire insulation
- Plastics - piping, packaging, conduit
- Paint/paint cans
- Glass
- Graphite dust and Scraps: generated during the machining of graphite compacts
- Pyrolytic carbon and silicon carbon residues: from coating processes that apply these layers to fuel kernels
- Concrete wash-out

Office:

- Standard office supplies
- Food wastes (packaging, etc.)
- Cardboard

Chemical (potentially hazardous):

- Paints, solvents, adhesives
- Treated wood/chemicals
- Chlorinated compounds: used in chemical vapor deposition (CVD) processes, particularly for SiC layer formation
- Acids and solvents: used in cleaning and etching steps during fabrication

Low-level Radiological:

- Tyvek suits
- Gloves
- Booties
- Liquid discharge from scrubber – sampled prior to discharge. Current process for SN-0 is sampled at below drinking water standards for Tennessee prior to discharge.
- Wipes
- Other consumables used in fabrication environment

Radiological:

- Defective particles: TRISO particles that fail quality control due to coating defects or kernel irregularities
- Contaminated equipment and filters: from handling uranium-baring materials

Waste during operations: Limited chemical or radiological waste streams will be disposed of by qualified vendors. These are external licensed vendors that will receive and process these waste streams. No waste processing will be carried out at the SN-I pilot facility.

SCHEDULE OF PROPOSED ACTIVITIES

The overall project timeline spans approximately eight months from initial site work to full operational readiness. Construction activities will primarily occur during daytime hours, with a peak workforce of ~20 workers. The facility will operate on a 10-hour, 5-day workweek schedule during operations. Potentially oversized or overweight equipment transport may be required during construction.

This project description supports a categorical exclusion determination under DOE's NEPA procedures, given the small scale, limited disturbance, and adherence to regulatory standards.

Environmental Aspects or Potential Sources of Impact:

Air Emissions

Project activities are likely to generate dust as well as emissions from vehicles and portable emissions sources such as generators. These emissions are considered temporary as they are generated from the construction activities, as a result they will not be rolled into INL's site-wide emissions, and not part for the PTC-FEC. The combustion sources of mobile equipment and temporary generators (in one location for less than 12 months) are exempt from permitting requirements.

The INL Site is in attainment for all U.S. National Ambient Air Quality Standards (NAAQS).

Manufacturing of TRISO fuel, handling and processing fuel feedstocks have the potential to emit radionuclides

Handling and managing chemicals have the potential to emit toxic air pollutants.

Discharging to Surface-, Storm-, or Ground Water

NA

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 was completed under CRMO project number (BEA-26-021) and resulted in No Historic Properties Affected. Please refer to Hold 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.

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

Project description indicates materials will need to be purchased or used that require sourcing materials from the environment. Being conscientious about the types of materials used could reduce the impact to our natural resources.

Determination:

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.

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 Jason L Anderson, DOE-ID NEPA Compliance Officer on: 2/24/2026