Idaho National Laboratory
Environmental Checklist

EC Document No.: INL-14-044 R1

DIRECTIONS: Responsible Managers, Principle Investigator/Researcher, Program Environmental Lead (PEL), and Environmental Support personnel complete this form by following the instructions found at the beginning of each section (A-G and the 'Approval' and 'Signature' blocks) and submit to Environmental Support & Services (see Environmental Points of Contact, NEPA/Environmental Checklist Support at http://webfiles/es&h/es&s/contacts.pdf).

Enter a Valid Charge Number: 102265F66

SECTION A. Descriptive Information: Enter project title, performing organization, project number, submittal date, and contact information as requested below.

Project Title: Joint Fuel Cycle Studies - Integrated Recycling Test

Performing Organization: Joint Fuel Cycle Studies Project No.: CRADA No. 11-CR-13 Date: 1/29/2015

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Go to Section B, "Project Description"

SECTION B. Project Description: Enter a brief but thorough description of the project or action, including the type of action (for example, new activity or facility, construction, process or facility modification, maintenance, research and development, work for others), description of activities, work phases, location of work activity (include facility area, building number, and if in the field, include a map or diagram and longitude and latitude coordinates), purpose and need (what is the activity and why is it being performed), projected start and end dates, and the approximate project costs.

Enter Keywords: JFCS | KAERI | PWR Fuel

Enter Project Description:

The proposed action is a Cooperative Research and Development Agreement (CRADA) 11-CR-13 between the US Department of Energy (DOE) and Korea Atomic Energy Research Institute (KAERI). The overall CRADA covers a 10-year period, concluding in 2020. The CRADA funding commitments are updated periodically through modifications to 11-CR-13.

As part of the Joint Fuel Cycle Studies (JFCS) an integrated, kilogram-scale test of electrochemical recycling of used nuclear fuel is planned. This activity is described as the Integrated Recycling Test (IRT), and would be performed at the Department of Energy's (DOE's) Idaho National Laboratory (INL), Materials and Fuel Complex (MFC) to study flowsheet options and provide data regarding the technical and economic feasibility and nonproliferation acceptability of electrochemical recycling of commercial light water reactor fuel. Laboratory-scale demonstration for recycled fuel fabrication was analyzed in environmental checklist (EC) INL-11-050 (OA 12). The scope of work analyzed in this Environmental Checklist (EC) was dependent on the results of research activities conducted under EC INL-11-050 (OA 12), and the activities to be performed were unknown when INL-11-050 (OA 12) was developed. The work covered by this EC includes Phases II-A, II-B and Phase III. Each Phase is described below.

Supporting research critical to the successful completion of the IRT and the overall assessment of electrochemical recycling would be performed during each project phase. This supporting research is described as Critical Gap Research and Development. Each major portion of the IRT would be accompanied by associated Critical Gap activities. Per the CRADA, these activities are often general topics without clearly defined R&D approaches to achieve the necessary information. Typical examples of Critical Gap research include experiments performed with existing equipment in the Hot Fuels Examination Facility (HFEF), Engineering Development Laboratory (EDL), and other facilities where IRT process and equipment development work is ongoing.

Phase II-A Equipment Design, Fabrication and Fuel Procurement

Phase II-A focused on the design, construction, and mockup testing of kilogram-scale process equipment and would occur in MFC-765, MFC-768B, MFC-785, MFC-787 and MFC-789. Equipment would be installed in HFEF following completion of Phase II-A. In addition, during Phase II-A, approximately 45 kilograms of used light water reactor (LWR) fuel would be procured for use as feedstock. This feedstock does not currently exist at MFC, and is not readily accessible at INL or in the DOE complex. Current plans call for the procurement of used pressurized water reactor (PWR) fuel from a commercial reactor with a burnup of approximately 55,000 MWD/MT and 10 year cooling time. However, some flexibility exists if used fuel from this reactor type or burnup/cooling parameters proves impossible to acquire in the necessary time frame. The used fuel would be procured from a commercial source and would be approximately 25 individual PWR rods in a Nuclear Assurance Corporation legal-weight truck (NAC-LWT) cask. Upon arrival at INL, spent fuel rods would be stored in fuel storage pits in the HFEF hot cell until needed for project activities described in this document.

Phase II-B Integrated Recycling Test

Modular Workstations
A modular workstation approach will be used to support the kilogram-scale equipment for the IRT in the HFEF Argon Cell. Two large workstations and a smaller intermediate table would provide the operating space and power/instrumentation connections for replaceable equipment modules within the hot cell. The workstations and associated power/instrumentation feedthroughs would have the capability to support the expected kilogram-scale process equipment, and allow equipment to be placed in storage bins below the operating surface when not in active use. The workstations would include one or more integrated balances used for mass tracking purposes. The work scope also includes preparation of the in-cell area and the shifting of some existing functions to other hot cell locations.

Fuel Decladding Equipment
Used nuclear fuel rods from light water reactors would be processed as feedstock for the IRT. These used nuclear fuel rods must be stored, handled, sectioned, and de-clad. The de-clad fuel would likely be sieved to remove fines. Some fines may be further manipulated to demonstrate or test processing methods. Some higher burnup cladding sections may also be processed to demonstrate approaches to reduce fuel holdup. Equipment, storage containers, and handling fixtures are required to perform these tasks.

Oxide Reduction System
De-clad used fuel would be electrochemically reduced to metallic form in the oxide reduction system. The reduction process would have the capability to test the 'universal' basket concept, where a loaded basket can be processed through the oxide reduction, distillation, and electrorefining systems without unloading. The reduction system vessel is anticipated to be rectangular in design, in order to allow the testing of features important to scalability, such as multiple electrodes and variations in basket thickness or electrode spacing. The anode systems would include the flexibility to test a variety of materials, geometries, immersion depths, and off-gas capture settings. An oxide reduction system will be designed, constructed, tested, installed, and operated as a part of the Integrated Recycling Test.

Electrorefining System
Processed fuel from the oxide reduction system will be electrorefined in order to recover a purified low-enriched uranium product. Transuranic elements are accumulated in the electrorefining salt and extracted as a uranium/transuranic/rare earth product using a liquid cadmium cathode (LCC) in order to acquire feedstock to produce fuel rodlets. The electrorefining vessel is planned to be rectangular in design, in order to allow the testing of features important to scalability.

Distillation Systems
Vacuum distillation would be employed to separate salts from metallic products between and following the oxide reduction and electrorefining processes, and also to separate cadmium and salt from the uranium/transuranic/rare earth products. Two remote distillation systems are planned in order to maintain the IRT processing schedule. Two distillation systems will be designed, constructed, tested, installed, and operated to remove salt from metallic products.

Sampling/Casting Furnace
It is expected that a variety of metallic products will require sampling, and the casting of transuranic fuel slugs is an important objective of the IRT. Material losses, remote reliability, and scalability are important issues for long-term success of electrochemical recycling processes. A remote sampling/casting furnace will be designed, constructed, tested, installed, and operated in order to produce homogeneous metallic samples and cast transuranium-bearing fuel slugs. Fuel sampling/casting will be performed in HFEF with fuel fabrication performed in a shielded glovebox.

Used Fuel Feedstock
A significant mass of used LWR fuel is necessary for feedstock. It is desirable to acquire this feedstock through the development of a collaborative arrangement with a fuel vendor and commercial PWR owner. INL will assist DOE and a commercial U.S. power plant fuel vendor/utility in negotiation of an Agreement for Title Transfer and Ownership of the used LWR fuel. Preparations for handling of a loaded cask in HFEF will be accomplished with a dry run. Following this, the spent fuel will be loaded at the reactor site, transported, and unloaded at HFEF.

Nuclear Safety
The location of accountable nuclear material must be tracked through process operations inside HFEF to meet DOE requirements for nuclear safety. Simultaneous tracking of multiple batches for the IRT would exceed the capabilities currently employed in HFEF. A new system to track material in the IRT, possibly integrated with the workstation balances, would be required. Design, coding, and testing of a mass track system would be performed.

Phase II-B Critical Gap Research and Development

Head End Processes

The method by which used fuel would be prepared for processing is important to the subsequent process operations. This task would perform studies to evaluate and select the fuel preparation methods used in the IRT. Mechanical design development, including testing, cutting methods, and handling of fuel pieces and fines, would be performed. Exploration of potential measurement methods to determine input accountancy is also important for the determination of nonproliferation acceptability. Additional studies of processing methods for fuel fines which could be employed for the IRT, such as agglomeration or sintering, or the examination of the off-gasses that may result from processing of fines, would be identified. Prior research has indicated that high burnup fuels may display increasing fuel hold up in the cladding. Studies may also be performed of processing methods that would be used in the IRT to reduce this fuel hold up.

Further decladding methods will also be investigated, including vibratory methods. A hydraulic, triaxial cladding slitter may be adapted, installed, tested, and operated in HFEF to support this research.

Current technology for electrolytic reduction utilizes platinum anodes, however, other materials, such as iridium or conductive ceramics may provide cost and durability advantages. Testing of anode materials would be performed, with focus on testing the performance of iridium electrodes versus surrogate salt systems.

Experiments will be performed to support system design and troubleshoot oxide reduction system operations in the IRT. These research items will include activities such as construction materials and system behavior and characteristics during different operational scenarios. This testing will be performed with non-radioactive surrogates and/or depleted uranium.

Project personnel will verify with the program environmental lead (PEL) that the scope, environmental aspects, and work activities are bounded by the environmental impacts analysis of this environmental checklist (EC), and revise this EC as necessary.

Electrorefining & Liquid Cadmium Cathode Operations

This activity seeks to test a prototype electrorefining system with molten salt and uranium dendrites at appropriate scale. This would allow challenges or performance limitations to be identified prior to remote equipment fabrication and installation and allow trouble-shooting of remote process operations. This testing may include such issues as the impact of process parameters, system design, and materials of construction. These tests will be performed with cold surrogates and/or depleted uranium.

A combined product of uranium, transuranium, and residual rare earths will be recovered during the IRT using the liquid cadmium cathode (LCC) approach. Studies will be performed to explore the impact of process parameters, system design and materials of construction. These studies will be performed with cold surrogates, depleted uranium, and potentially transuranium elements utilizing equipment and materials currently on site at the Materials and Fuel Complex. Anode residue will also be analyzed. Resulting wastes are included in the estimates provided within this document.

Project personnel will verify with the program environmental lead (PEL) that the scope, environmental aspects, and work activities are bounded by the environmental impacts analysis of this environmental checklist (EC), and revise this EC as necessary.

Product Conditioning

In the recovery of the uranium/transuranium/rare earth product via LCC technology, the rare earth contamination may be higher than the desired concentration in the metal fuel. Jointly-planned experiments will be performed to explore the feasibility of various approaches to reduce the concentration of rare earths in uranium/transuranium/rare earth products. These studies will be performed with cold surrogates, depleted uranium, and potentially transuranium elements utilizing equipment and materials currently on site at the Materials and Fuel Complex. Resulting wastes are included in the estimates provided within this document.

Four distillation operations are potentially required for the IRT. Distillation system design issues require confirmation, including the performance of stainless steel for the pressure boundary for distillation up to 1200°C. Investigations will be performed to confirm the design and materials for the distillation system and test the performance of advanced crucible materials for distillation operations. Initial screening would be performed with uranium, and final testing would be performed with uranium/transuranium/rare earth products.

A high-temperature distillation furnace is currently used to separate salt and consolidate the dendritic uranium product into a dense ingot. Initial scoping experiments have been successful for an approach in which salt and metals are continuously separated at atmospheric pressure by a porous bed, with a short residence time. These characteristics and system compactness potentially provide improved product purity, process monitoring, and safeguards opportunities. These tests will be performed with cold surrogates and/or depleted uranium.

Project personnel will verify with the program environmental lead (PEL) that the scope, environmental aspects, and work activities are bounded by the environmental impacts analysis of this environmental checklist (EC), and revise this EC as necessary.

Fuel Fabrication

Engineering-scale fuel fabrication is a critical element to commercialization of electrochemical recycling. Weld inspection is a challenging technology that must be perfected for remote application. Testing of ultrasonic and laser weld inspection systems will be performed. An alternative approach to qualify the welding process based on statistical analysis of welding process parameters will also be evaluated. These tests utilize only non-radioactive materials.

The properties of some metal fuel alloys have not been thoroughly characterized. Fabrication and analysis of fuel alloys may be performed in the Casting Laboratory of the Materials and Fuels Complex. Casting studies will be performed with several fuel variationss in order to swimulate the range of potential products expected in the IRT. These studies will be performed with cold surrogates, depleted uranium, and potentially transuranium elements utilizing equipment and materials currently on site at the Materials and Fuel Complex. Characterization of the cast fuel samples will also be performed, including dilatometry, differential scanning calorimetry, and laser flash thermal diffusivity.

Another area of effort is in-reactor cladding performance. One issue that may limit the integrity of metal fuel is the interaction of fuel constituents and fission products with the cladding, commonly described as fuel cladding chemical interaction (FCCI). Studies of barrier materials to mitigate FCCI are needed to verify performance, especially in the case of TRU and rare-earth-bearing metal fuel. Jointly-agreed barrier cladding samples will be produced by KAERI and INL. Promising candidates may be tested for irradiation in Phase III of this effort.

Project personnel will verify with the program environmental lead (PEL) that the scope, environmental aspects, and work activities are bounded by the environmental impacts analysis of this environmental checklist (EC), and revise this EC as necessary.

Fundamental Properties and Waste Forms

Activities will be performed to increase the state of fundamental knowledge regarding relevant molten salt systems. These efforts may include studies such as the electrochemical or Thermophysical characteristics of molten solutions, and technology relevant to monitor process conditions inside molten salt electrochemical systems. These studies will be performed with cold surrogates, depleted uranium, and potentially transuranium elements utilizing equipment and materials currently on site at the Materials and Fuel Complex. Resulting wastes are included in the estimates provided within this document.

The identification and demonstration of appropriate waste forms is critical to the overall demonstration of the feasibility of electrochemical recycling. The most technologically feasible and cost effective options for fission product concentration and immobilization from the electrochemical recycling of used LWR in the IRT would be determined. These evaluations would involve waste experts from INL, KAERI, Pacific Northwest National Laboratory, and Argonne National Laboratory. The selected waste process approaches are those that would eventually be remotely demonstrated in the IRT in Phase III. Once processes have been defined, laboratory-scale waste forms may be fabricated, if necessary, from fission product streams for characterization and testing. Fission product concentration and waste form processes would be optimized for application to the IRT.

In the IRT, some iodine will enter the oxide reduction vessel with used fuel. Experiments have shown that I2 will likely be released with O2 during the reduction process. Improved understanding of how to capture this iodine, either as a gas or by capture within the molten salt is critical to understand the mass balance of this important fission product in a real process. Methods to better understand I2 release during the reduction process and quantitatively capture the iodine from the off-gas stream would be evaluated in a surrogate salt system. Methods to extract iodine and tellurium from the molten salt would also be examined. The feasibility of getter materials that selectively absorb reactive fission products would be tested in a surrogate salt system.

These studies will be performed with cold surrogates, depleted uranium, and potentially transuranium elements utilizing equipment and materials currently on site at the Materials and Fuel Complex. Resulting wastes are included in the estimates provided within this document. Project personnel will verify with the program environmental lead (PEL) that the scope, environmental aspects, and work activities are bounded by the environmental impacts analysis of this environmental checklist (EC), and revise this EC as necessary.

ANL Activities

Supporting or linked activities will also be performed at Argonne National Laboratory in Illinois. These activities will include supporting research toward fundamental properties and waste forms, and head-end processes, with similar workscope to that described above. These activities will only be performed with cold surrogates, depleted uranium, or very limited amounts of transuranium materials allowed in radiological facilities at ANL. These activities will be conducted with materials already located at ANL and will not involve shipment of any materials between ANL and INL.

Phase III Fuel Rodlet Fabrication and Irradiation

Phase III activities would focus on the production of one or more transuranium-bearing fuel rodlets, their irradiation in the Advanced Test Reactor (ATR), and then post-irradiation examination (PIE) at MFC. Phase III activities would also include continued flow sheet testing in HFEF and studies of waste processes. Waste process activities may include fission product concentration/separation demonstration for both oxide reduction and electrorefining salts, demonstration of glass and ceramic waste form fabrication from both waste salts, and demonstration of cladding recycle and alloy waste form fabrication for the immobilization of undissolved solids. Prior to beginning this phase of the proposed action, this EC will be reviewed to ensure that scope, environmental aspects and work activities proposed for phase III are consistent with the EC. Revision of the EC may be required.

After PIE at INL, the irradiated sample segments and PIE remnants would be stored with other similar DOE-owned irradiated materials and experiments at MFC, most likely in HFEF or the Radioactive Scrap and Waste Facility (RSWF) in accordance with DOE's Programmatic Spent Nuclear Fuel (SNF) Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (FEIS) and ROD (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (February 1996). Ultimate disposal of the irradiated sample segments and PIE remnants would be along with similar DOE-owned irradiated materials and experiments currently at MFC.

Packaging, repackaging, transportation, receiving, and storing used nuclear fuel and research and development for used nuclear fuel management is within the scope of DOE's Programmatic Spent Nuclear Fuel (SNF) Management and Idaho National Engineering Laboratory Environmental Restoration and

Waste Management Programs Final Environmental Impact Statement and Record of Decision (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (February 1996). The analysis includes those impacts related to transportation to, storage of, and research and development related to used nuclear fuel at the INL (see Tables 3.1 of the SNF Record of Decision (May 30, 1995) and Table 1.1 of the Amended Record of Decision [February 1996].

In addition, to complete proposed work activities, it is necessary for the project to use the HFEF hot cell which contains both defense and nondefense related materials and contamination. Project materials will come into contact with defense related materials. It is impractical to clean out defense related contamination, and therefore, waste associated with project activities is eligible for disposal at the Waste Isolation Pilot Plant (WIPP). National Environmental Policy Act (NEPA) coverage for the transportation and disposal of waste to WIPP are found in Final Waste Management Programmatic Environmental Impact Statement [WM PEIS] (DOE/EIS-0200-F, May 1997) and Waste Isolation Plant Disposal Phase Supplemental EIS (SEIS-II) (DOE/EIS-0026-S-2, Sept. 1997), respectively. The 1990 ROD also stated that a more detailed analysis of the impacts of processing and handling transuranic (TRU) waste at the generator-storage facilities would be conducted. The Department has analyzed TRU waste management activities in the Final Waste Management Programmatic Environmental Impact Statement (WM PEIS) (DOE/EIS-200-F, May 1997). The WM PEIS analyzes environmental impacts at the potential locations of treatment and storage sites for TRU waste; SEIS-II addresses impacts associated with alternative treatment methods, the disposal of TRU waste at WIPP and alternatives to that disposal, and the transportation to WIPP.

There is the potential to generate low level waste (LLW). The environmental impacts of transferring low level waste from the INL to the Nevada National Security Site were analyzed in the 1996 Nevada Test Site (NTS) EIS (DOE/EIS-0243) and supplemental analysis (SA) (DOE/EIS-0243-SA-01) and DOE's Waste Management Programmatic EIS (DOE/EIS-200). The fourth Record of Decision (ROD) (65 FR 10061, February 25, 2000) for DOE's Waste Management Programmatic EIS established the Nevada National Security Site as one of two regional LLW and mixed low-level waste (MLLW) disposal sites. The SA considers additional waste streams, beyond those considered in the 1996 NTS EIS, that may be generated at or sent to the Nevada National Security Site for management.

The JFCS project involves research and development work to test and refine various aspects of separations process activities. Research from the project would be used to support the development of processes to separate and recover materials such as plutonium and uranium. The project does not call for the separation of plutonium or uranium isotopes for production purposes. Because the project is for research and development of separations processes rather than for production purposes, the project does not constitute reprocessing.

⇩ Go to Section C, "Environmental Aspects or Potential Sources of Impact"

SECTION C. Environmental Aspects or Potential Sources of Impact: Check the applicable box for the following environmental aspects by reviewing the applicability statements; provide an explanation for any aspect checked Yes. Ask yourself, "How can this activity affect the environment?"

Environmental Aspects Table			
Environmental Aspect	Applicability Statement	Yes	No
Air Emissions	Air emissions applies to operations or activities that have the potential to generate air pollutants, including but not limited to radionuclides, chemical and combustion emissions, fugitive dust, and ozone-depleting substances. Includes activities that may break up, dislodge, disturb or block access to regulated asbestos-containing material (RACM), handle asbestos-containing material, manage asbestos waste, or conduct demolition of load bearing structural members, (including trailers).	☒	☐
Discharging to Surface-, Storm-, or Ground Water	Surface water or storm water contamination applies to activities that have the potential to contaminate Waters of the U.S., wetlands, ground water, or storm water that could reach Waters of the U.S.	☐	☒
Disturbing Cultural or Biological Resources	Cultural resource disturbance applies to activities that have the potential to impact cultural resources, such as disturbing soils by grading, excavating, sampling, off-road vehicle use, or removing vegetation, as well as to personnel working in areas where sensitive cultural or biological resources are located. It also applies to modification or demolition of historical buildings or structures, or activities that could result in loss or damage to these resources. Examples of cultural resources include buildings, structures or objects over 50 years old or those identified as historic due to special significance, archaeological resources, historic home sites, trails, and canals, and places or items of significance to Native Americans and/or others. Biological resources applies to activities that have potential to interact, disturb or affect wildlife or their habitat (e.g., soil disturbance, vegetation removal, physical disturbance of wildlife) or activities involving revegetation or weed control.	☐	☒
Generating and Managing Waste	Regulated, hazardous, or radioactive material and waste packaging and transportation applies to activities that generate, store, treat, or dispose hazardous, radioactive, mixed, industrial waste, or nanoparticle waste.	☒	☐
Releasing Contaminants	Releasing contaminants applies to activities that may release potentially hazardous contaminants into water, soil, or other non-contaminated or previously contaminated locations (NOTE: Air contaminants are covered in "Air Emissions" aspect). These activities may include, but are not limited to, the use of industrial and laboratory chemicals; the use of radionuclides; hazardous, radioactive, and mixed waste treatment and decontamination operations; and contaminated soils disturbance. This aspect also applies to asbestos containing material (ACM) remediation; repair, replacement, and/or disposal of contaminated tanks and associated piping; and the handling and disposal of PCB-contaminated equipment and waste.	☒	☐
Using, Reusing, and Conserving Natural Resources	Use, reuse, and recycling of resources applies to activities that use resources such as water, energy, fuels, minerals, borrow material, wood or paper products, and other materials derived from natural resources. It applies to activities that currently require use, reuse, and recycle as integral to the project such as the construction and operation of a LEED certified building. This applies to waste disposition activities including building demolition. This also applies to activities implementing sustainable practices and conserving of natural resources.	☒	☐
For each environmental aspect checked Yes, provide specific information such as types and amounts of chemicals, waste, effluent, or emissions; size of modification, soil disturbance; or type of tank, equipment, or process and pollution prevention measures for each item checked. Briefly discuss the potential environmental impacts that could occur from project activities.			

Describe Environmental Aspects:

Air emissions - Minor amounts of air emissions would be generated during Phase II-A operations in MFC-787 and MFC-789, these emissions are within the existing Air Permitting Applicability Determinations (APADs). Operation of the Integrated Fuel Testing (IFT) would result in a source of volatilized fission products and fission gas emissions to the HFEF Main Cell environment. It is anticipated that the potential radiological releases to the Main Cell would be consistent with other in cell processes utilizing elevated temperature, such as the Mechanistic Fuel Failure Examination System (MFFES), Fuel Accident Condition Simulator (FACS) furnace, voloxidation, V-mixing, Hot Fuels Dissolution Apparatus and the Metal Waste Form furnace. The facility would control particulate emissions by HEPA filtration and monitor emissions using a continuous emission monitoring system. Based upon a preliminary review of the limited PWR fuel source term information, it is expected that particulate and gaseous emissions from operations would not result in emissions that increase the potential to emit (PTE) from HFEF.

Prior to the project "going hot" in the HFEF Main Cell, the IFT Project would provide MFC ES&S personnel the latest anticipated source term for materials processed. This source would be evaluated against existing emissions, the expected radioisotopes would be compared to the parameters (gross alpha, gross beta and gamma emitters) currently monitored at the HFEF Stack.

Generating and Managing Waste - Total project waste volume from the research and development performed on the used fuel feedstock is projected to be less than 1 m^3. The BEA Waste Management Program and MFC Waste Generator Services (WGS) staff would be consulted for characterization and disposition pathways determination for the generated wastes.

The following are the expected waste streams that may be generated during JFCS activities:

• Irradiated Hardware – Fuel rod plenums would be removed and isolated during head-end activities. These materials would be maintained for research activities in the hot cell until they are determined as no longer needed at which time they would undergo waste characterization. Expected waste form is RH-LLW.
• Integrated Recycling Test (IRT) Off-Gases – Fission product gases would be captured in selective filters, and noble gases would be released to the hot cell atmosphere. Expected waste form is RH-LLW.
• Metal Waste – Distilled metals from the electrorefiner separations process and zircaloy fuel cladding hulls may be combined and retained for metal waste form research that may be defined later in the project. Expected waste form is RH-TRU.
• LiCl-KCl and LiCl Salt Waste Forms – Fission products are removed from the LiCl-KCl and LiCl salts and stabilized in respective waste forms. Research is ongoing to develop an appropriate waste form. The salts would be maintained at HFEF as in-process material used for ongoing research work on waste form development. Expected waste form is RH-TRU.
• Sampling Waste – Samples that are delivered to the Analytical Laboratory (AL) for radiochemical analysis would become waste when the material has been accumulated to the point where it can be removed from HFEF in a waste can, has been terminated from safeguards and transitioned to waste management. This waste would be managed as typical AL remote-handled waste. Expected waste form is RH-TRU.
• Legacy Equipment – The pieces of equipment that do not have a future mission at completion of the project would become legacy equipment subject to disposal. Expected waste forms are RH-TRU and RH-LLW.
• Miscellaneous Radioactive Wastes – Waste generated on a routine basis within radiation areas and hot cells. Expected waste form is CH-LLW.
• Miscellaneous Hazardous Waste – Waste generated during chemistry activities and typical excess chemical waste generated at the AL. Expected waste form is hazardous waste.

Project personnel would work with WGS to characterize and properly dispose of all waste. Irradiated sample debris and PIE waste could generate TRU waste and mixed TRU waste. To complete proposed work activities, it is necessary for the project to use the HFEF hot cell which contains both defense and nondefense related materials and contamination. Project materials would come into contact with defense related materials. It is impractical to clean out defense related contamination, and therefore, waste associated with project activities could be eligible for disposal at the Waste Isolation Pilot Plant (WIPP).

Low level waste (LLW) generated by the project would likely be transferred to the Nevada National Security Site.

It is expected that all generated wastes would be managed under existing BEA waste management plans and procedures.

Releasing Contaminants - All chemicals utilized by the project would be managed in accordance with laboratory procedures.

Using, Reusing, and Conserving Natural Resources - All materials would be reused and recycled where economically practicable. All applicable waste would be diverted from disposal in the landfill where conditions allow. Project personnel will use every opportunity to recycle, reuse, and recover materials and divert waste from the landfill when possible. The project will practice sustainable acquisition, as appropriate and practicable, by procuring construction materials that are energy efficient, water efficient, are bio-based in content, environmentally preferable, non-ozone depleting, have recycled content, or are non-toxic or less-toxic alternatives. New equipment will meet either the Energy Star or Significant New Alternatives Policy (SNAP) requirements as appropriate (see http://www.sftool.gov/GreenProcurement/ProductCategory/14).

Go to Section D, "Work Activities and Environmental Checklist Submittal Determination"

Idaho National Laboratory
Environmental Checklist

EC Document No.: INL-14-044 R1

SECTION D. Work Activities and Environmental Checklist Submittal Determination: Select all of the applicable work activities below. Section numbers refer to section in LWP-8000 Environmental Instructions for Facilities, Processes, Materials, and Equipment. The numbers (e.g., 4.35) refer to LWP-8000 Section numbers and when highlighted or shaded require submittal of the EC to Environmental Support and Services (ES&S) using the instructions in the direction at the beginning of this form.

☒ Required to submit the EC to the appropriate Program Environmental Lead or the NEPA Technical Lead (see Points of Contact, Environmental Management System at http://webfiles/es&h/es&s/contacts.pdf)

☐ Not required to submit EC (see instructions in LWP-8000, Section 4.1).

Work Activity Table	
Will the work activity involve (check all appropriate boxes):	LWP-8000 Section No.
1. Boilers, diesel generators, painting booths, vehicle fleet, gasoline pumps, non road power take offs, laboratory hoods, containments, glove boxes, treatment of spent nuclear fuel (SNF), nuclear reactor, fuel fabrication, open burning, generate fugitive dust, and other activities that could emit air pollutants?	
☒ Causing, or having the potential to cause, process or equipment to approach or exceed permitted or regulatory limits for air emissions	4.33
☐ Conducting open burning	4.35
☐ Constructing, operating, or repairing motor vehicle gasoline station pumps	4.37
☐ Constructing, reconstructing, or modifying stationary air emission sources, including internal combustion engines	4.29
☐ Distributing, excessing, or disposing of appliances containing refrigerants	4.45
☐ Maintaining, servicing, or repairing motor vehicle air conditioners (MVAC)	4.44
☒ Maintaining, servicing, or repairing stationary heating, ventilation, air conditioning and refrigeration equipment	4.43
☐ Maintaining, testing, or disposing of halon-containing equipment and halon	4.38
☐ Manufacturing wood furniture and wood furniture components	4.21
☒ Operating and maintaining stationary air emission sources, including internal combustion engines	4.31
☒ Operating stationary air emission sources that emit radionuclides	4.32
☐ Performing activities with the potential for fugitive dust or fugitive emissions	4.34
☐ Purchasing diesel fuel	4.36
☐ Purchasing equipment containing ozone-depleting substances (ODS), such as refrigerants or halon, or recovery or recycling equipment with ODS	4.42
☐ Purchasing, relocating operating, modifying, or maintaining portable air emission sources, including nonroad internal combustion engines, for use at the Site or Idaho Falls facilities	4.28
☐ Receiving off-site waste containing one or more of the hazardous air pollutants	4.107
☐ Starting up, shutting down, or performing scheduled maintenance on stationary air emissions sources	4.30
2. Pesticides, fertilizers, spills or releases, disposing excess materials, perform site remediation, chemical use or storage, shipping, managing, or removing lead, or other activities that could release contaminants?	
☐ Acquiring, using, storing, and dispositioning chemical	4.5
☐ Applying and storing pesticides	4.46
☐ Applying fertilizers	4.47
☐ Managing and dispositioning excess property and materials	4.80
☐ Procuring pesticides	4.111
Causing, or having the potential to cause, process or equipment to approach or exceed permitted or regulatory limits for:	
☐ Air emissions	4.33
☐ Drinking water	4.13
☐ Wastewater discharges to the City of Idaho Falls sewer system	4.85
Spills and releases	
☐ Cleaning Up spills and releases of polychlorinated biphenyls (PCBs)	4.59
☐ Releases, leaks, spills, or unusual operating condition from an underground storage tank regulated under IDAPA 58.01.07 (40 CFR 280)	4.68
☐ Reporting and cleaning up spills and releases	4.58
Managing, removing, or shipping lead	
☐ Managing elemental lead	4.40
☐ Removing lead from service, from a structure, or classifying newly discovered lead	4.39
☐ Shipping product lead off-site for direct reuse (that is, no reclamation) at another facility	4.41

3. Siting studies, transacting real property and excess real property, site remediation, reactivating buildings or placing buildings in standby, vehicles fleet, paved and unpaved road (or two-track roads), diversion dams, stream channels, disturbing soils, gravel or borrow pits, wildland fires, field work, or constructing, modifying, maintaining, operating, or DD&D facilities, structures, equipment, or processes?		
	☒ Constructing or modifying facilities, structures, equipment, or processes (including changes to operating conditions) – General (see LWP-8000 for definition of modifying versus maintaining)	4.15
	☐ Deactivating, Decontaminating, Dismantling (DD&D) or closing facilities (including trailers), structures, equipment, or processes – General	4.27
	☐ Maintaining or repairing facilities, structures, equipment, or processes – General	4.19
	☐ Modifying buildings or structures constructed on the INL before 1970	4.116
	☒ Operating facilities, equipment, or processes – General	4.17
	☐ Performing site remediation activities	4.114
	☐ Performing siting studies for new buildings or structures	4.14
	☐ Preparing buildings or facilities being transferred to surplus or placed into standby (inactive) status	4.25
	☐ Reactivating buildings or facilities from standby (inactive) status	4.26
	☐ Removing vegetation, disturbing soil, sampling, using vehicles off-road, or excavating in field areas outside Site area boundaries or more than 50 ft from a building or improved grounds at unfenced facilities, or any soil disturbance within the Sagebrush Steppe Reserve (LWP-8000, Appendix E), inside the CITRC boundary or between TAN and SMC; removing gravel or soil from INL borrow sources or expanding borrow source boundaries within approved footprints; field work (outside Site area boundaries); applying pesticide; working inside caves or within 150 ft of caves; or disturbing bird nests containing eggs or young.	4.117
	☐ Transacting Real Property – including transfer, lease, disposition, or acquisition of interests in personal property (including, but not limited to, equipment and materials) or real property (including, but not limited to, permanent structures and land)	4.49
4. Potable (or drinking) water including controlling cross connections and altering drinking water systems or potable water, production, monitoring, observation, or injection wells?		
	Constructing, operating, or decommissioning or abandoning wells	
	☐ Constructing or modifying injection wells	4.94
	☐ Constructing or modifying potable water, production, monitoring, and observation wells	4.91
	☐ Decommission (or abandonment) of potable water, production, monitoring, and observation wells	4.93
	☐ Operating potable water, production, monitoring, and observation wells	4.92
	☐ Operating and sampling drinking water systems and controlling cross connections at the Site	4.10
	☐ Operating, discharging to, or monitoring permitted injection wells	4.95
	☐ Permanent decommission of injection wells	4.97
	Constructing or modifying, maintaining or repairing, operating, or using drinking water systems	
	Constructing or modifying drinking water systems, monitoring wells, production wells, observation wells, and injection wells, and controlling cross connections:	
	☐ At the Site	4.9
	☐ At INL Owned or Leased Facilities	4.108
	Maintaining, repairing, or altering drinking water systems, potable, production, observation, and injection wells, and controlling cross connections:	
	☐ At the Site	4.12
	☐ At INL Owned or Leased Facilities	4.109
	Using drinking water systems and controlling cross- connections:	
	☐ At the Site	4.11
	☐ At INL Owned or Leased Facilities	4.110
	☐ Causing, or having the potential to cause, process or equipment to approach or exceed permitted or regulatory limits for drinking water	4.13
5. Research and development (R&D) or training activities or work for other activities that involve working in a laboratory or in the field, including small-scale pilot and demonstration projects and explosive testing?		
	☒ Conducting new or modifying R&D activities, including indoor bench-scale and small-scale R&D activities, and small-scale pilot projects, or routine administrative activities or work for other activities.	4.50
	☐ Conducting training exercises and simulations related to protective force and emergency response training, fire fighter and rescue training, and spill cleanup training on the INL Site and in town (includes, but not limited to indoor and outdoor training at firing ranges and elsewhere onsite)	4.115
	☐ Importing biomass to the State of Idaho	4.123
	☐ Managing and disposing of unbound engineered nanoparticle waste	4.119
6. Preparing, collecting, packaging, storing, transferring, or disposing samples or obtaining laboratory services?		
	☒ Disposing of samples	4.105
	☐ Monitoring wastewater discharges to the city of Idaho Falls	4.84
	☐ Packaging and temporarily storing samples	4.102
	☐ Preparing to collect and collecting CERCLA or DD&D samples	4.98
	☒ Preparing to collect and collecting Non-CERCLA or Non-DD&D samples	4.100

☒	Storing and maintaining samples	4.104
☒	Transferring samples to a laboratory	4.103
7. Aboveground storage tanks (ASTs) or underground storage tanks (USTs) or containers?		
☐	Changing use, discontinuing use of, closing, relocating, or removing ASTs or USTs (also check 4.71 if activity involves an UST)	4.64
☐	Constructing or modifying ASTs and USTs (also check 4.65 if activity involves an UST)	4.60
☐	Constructing or modifying facilities that store oil in containers or tanks	4.7
☐	Constructing or modifying UST systems regulated under IDAPA 58.01.07 (40 CFR 280) (also check 4.60)	4.65
☐	Operating ASTs or USTs (also check 4.66 if activity involves an UST)	4.61
☐	Operating USTs regulated under IDAPA 58.01.07 (40 CFR 280) (Also check 4.61)	4.66
☐	Operating stationary, portable, or mobile oil tanks and oil container storage facilities	4.8
☐	Repairing ASTs or USTs not regulated under 40 CFR 280 (also check 4.19 If the activity involves an AST or UST; and 4.67 if activity involves only an UST)	4.62
☐	Permanently discontinuing use of, change-in-service of, closing, relocating, or removing USTs regulated under IDAPA 58.01.07 (40 CFR 280) (Also check 4.64)	4.71
☐	Releases, leaks, spills, or unusual operating condition from USTs regulated under IDAPA 58.01.07 (40 CFR 280)	4.68
☐	Repairing USTs regulated under IDAPA 58.01.07 (40 CFR 280) (Also check 4.19; and 4.62)	4.67
8. Preparing to generate or generating a waste (hazardous, industrial, mixed, and radioactive)?		
☒	Generating waste	4.79
☐	Generator treatment of hazardous waste	4.118
☒	Constructing or modifying facilities, equipment, or processes at permitted or interim status Resource Conservation Recovery Act (RCRA) facilities	4.73
☐	Decontaminating equipment containing or contaminated with polychlorinated biphenyls (PCBs)	4.24
☐	Discontinuing use of, or closing facilities, equipment, or processes at Resource Conservation and Recovery Act (RCRA) interim status or permitted facilities	4.75
☐	Disposing of asbestos-containing material	4.112
☐	Disturbing asbestos, removing asbestos-containing material, or conducting a demolition activity	4.3
☐	Maintaining equipment containing or contaminated with polychlorinated biphenyls (PCBs)	4.23
☐	Procuring off-site waste management and RCRA-regulated material recycling services	4.77
9. Septic or sewage systems, wastewater, effluents, or storm water?		
☐	Abandoning or closing septic tanks or systems	4.56
☐	Causing, or having the potential to cause, process or equipment to approach or exceed permitted or regulatory limits for Wastewater Discharges to the City of Idaho Falls Sewer System	4.85
☐	Constructing or modifying septic tanks or systems	4.52
☐	Constructing or modifying sewage and other wastewater systems	4.81
☐	Discharging storm water to the City of Idaho Falls Municipal Separate Storm Sewer System (MS4) or to Waters of the U.S.	4.120
☐	Discharging to septic tanks or other wastewater systems	4.53
☐	Operating wastewater systems, including reclamation or reuse facilities	4.89
☐	Maintaining or repairing septic tanks or septic systems	4.54
☐	Pumping septic tanks or septic systems	4.55
	Discharging New Wastewaters or Changing Discharges:	
☐	At the INL Site	4.86
☐	To the City of Idaho Falls Sewer System	4.82
	Discharging Wastewaters:	
☐	At the INL Site	4.87
☐	To the City of Idaho Falls Municipal Separate Sewer System (MS4)	4.83
10. Incorporating Sustainability and National Environmental Policy Act Compliance?		
☐	Office work and routine administrative activities and work-for-other activities that do not involve working in a laboratory or in the field	4.51
☒	Supporting Site Sustainability Plan goals at INL; does your work involve: ☐ Greenhouse Gases - (burning fossil fuels, operating vehicle fleet, purchasing electricity, business travel, etc.) ☐ Building Energy Use ☐ Renewable Energy Generation or Consumption ☐ Fleet Petroleum or Alternative Fuels Use ☐ Potable, Industrial, or Irrigation Water Consumption ☐ Stormwater Management ☐ Landfill Waste or Construction and Demolition Wastes ☒ Any Recyclable Materials ☐ New Building Construction over 5,000 gross ft² ☐ Any Building Entering the Planning Process after FY 2020 ☒ Engaging in sustainable Acquisition Practices at INL	4.121

	☐ Work involves the following facilities, actions, or processes (compliance with the National Environmental Policy Act): ☐ Remote-Handled Low-Level Waste Facility ☐ Multipurpose Haul Road ☐ Stand-Off Experiment (SOX) Range ☐ Radiological Response Training Range ☐ Research and Education Campus ☐ National Security Test Range ☐ Sagebrush Steppe Ecosystem Reserve ☐ Wildland Fires Pre-Fire, Suppression, and Post-Fire Activities ☐ Silt or Clay Borrow Sources ☐ Resumption of Transient Testing of Nuclear Fuels and Materials	4.122

⇩ Go to Section E, "Describe Conditions"

NOTE: Environmental organization personnel generally complete Sections E, F, and G unless the EC process does not require submittal of the EC to the environmental organization, then project personnel can complete Sections E, F, and G and sign the form; if there are no 'conditions' or project-specific instructions, put "None." Section G should always be complete along with the signature block. Contact your PEL if you have questions about these sections.

SECTION E.	Describe Conditions: (If Yes, then list and describe below.)	Yes	No
	Are there conditions or actions that must be complete before project activities can begin (such as cultural resource or biological resource clearances, air permitting applicability determinations, permits to construct, waste permits, sustainability opportunities and so forth); be specific about the condition and action and who has the action and describe below?.	☒	☐
	Is a Pre-Permit Construction Approval required for this activity, if so, discuss below?	☐	☒

Enter Conditions:

Project personnel must coordinate with the appropriate PEL to evaluate each project with a potential to emit air pollutants, to ensure air emissions would not constitute a new source or modification to an existing source and comply with applicable emission standards.

Project personnel must work with PELs and WGS to develop and approve waste management plans.

⇩ Go to Section F, "Describe Project-Specific Instructions"

SECTION F.	Describe Project-Specific Instructions: (If Yes, then list and describe below.)	Yes	No
	Are there 'project-specific instructions' that must be completed during or at the end of the project (such as notifications, reports, records, and so forth)? If so, list below. NOTE: Generally, project-specific instructions are those items that environmental personnel or project personnel would like to highlight or that do not appear in LWP-8000.	☒	☐

Enter Project-Specific Instructions:

Changes to equipment and chemical and radioactive materials must receive prior approval from the environmental PEL before new work may proceed.

Project personnel would contact WGS to identify waste streams, handling, storage, and disposal requirements. All applicable waste will be diverted from disposal in the landfill when possible. Project personnel will use every opportunity to recycle, reuse, and recover materials and divert waste from the landfill when possible. All waste generated will be transferred to the WGS organization for appropriate disposition.

New equipment will meet either the Energy Star or SNAP requirements as appropriate (see http://www.sftool.gov/GreenProcurement/ProductCategory/14). In addition, the project will practice sustainable acquisition, as appropriate and practicable, by procuring construction materials that are energy efficient, water efficient, are bio-based in content, environmentally preferable, non-ozone depleting, have recycled content, or are non-toxic or less-toxic alternatives.

⇩ Go to Section G, "Determine the Recommended Level of Environmental Review"

SECTION G.	Determine the Recommended Level of Environmental Review (or Documentation) and Reference(s): Identify the level of environmental review (or documentation) by checking the appropriate box or boxes. That is, check Categorical Exclusion number (CX), Environmental Assessment (EA), Environmental Impact Statement (EIS), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Previously Approved NEPA Document, or Routine Maintenance or Operational activity. Provide the appropriate reference for the box or boxes checked. For instance, the specific categorical exclusion from 10 CFR 1021, or the document numbers for referenced environmental assessments, environmental impact statements, CERCLA record of decisions, or a previously approved EC number.

Choose appropriate level of environmental review (may be more than one):

- ☐ CX
- ☐ EA
- ☐ EIS
- ☐ CERCLA
- ☐ Overarching EC
- ☒ Previously Approved EC, EA, or EIS

For projects checked above as "CX," the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, 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 or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

NOTE: *The above paragraph does not apply to EA, EIS, or CERCLA related activities.*

References: Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement and Record of Decision (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (1996).

Final Environmental Impact Statement for the Waste Isolation Pilot Plant (DOE/EIS-0026, October 1980) and Final Supplement Environmental Impact Statement for the Waste Isolation Pilot Plant (SEIS-I) (DOE/EIS-0026-FS, January 1990).

Final Waste Management Programmatic Environmental Impact Statement [WM PEIS] (DOE/EIS-0200-F, May 1997) and Waste Isolation Plant Disposal Phase Supplemental EIS (SEIS-II) (DOE/EIS-0026-S-2, Sept. 1997).

Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada (DOE/EIS-0243) and supplemental analysis (SA) (DOE/EIS-0243-SA-01).

Justification: Transportation, receiving, and storing used nuclear fuel, as well as, research and development for used nuclear fuel management is covered by DOE's Programmatic Spent Nuclear Fuel (SNF) Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement and Record of Decision (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (February 1996). The analysis includes those impacts related to transportation to, storage of, and research and development related to used nuclear fuel at the INL (see Tables 3.1 of the SNF Record of Decision (May 30, 1995) and Table 1.1 of the Amended Record of Decision [February 1996]. The EIS limits the number of shipments to the INL, and the proposed activities would fall within the limits of the EIS.

The potential for transportation accidents has already been analyzed in the SNF EIS (Section 5.1.5 and Appendix I-5 through I-10). NEPA coverage for the transportation and disposal of waste to WIPP are found in Final Waste Management Programmatic Environmental Impact Statement [WM PEIS] (DOE/EIS-0200-F, May 1997) and Waste Isolation Plant Disposal Phase Supplemental EIS (SEIS-II) (DOE/EIS-0026-S-2, Sept. 1997), respectively. The 1990 ROD also stated that a more detailed analysis of the impacts of processing and handling TRU waste at the generator-storage facilities would be conducted. The Department has analyzed TRU waste management activities in the Final Waste Management Programmatic Environmental Impact Statement (WM PEIS) (DOE /EIS-200-F, May 1997). The WM PEIS analyzes environmental impacts at the potential locations of treatment and storage sites for TRU waste; SEIS-II addresses impacts associated with alternative treatment methods, the disposal of TRU waste at WIPP and alternatives to that disposal, and the transportation to WIPP.

The environmental impacts of transferring low level waste from the INL to the Nevada National Security Site were analyzed in the 1996 Nevada Test Site EIS (DOE/EIS-0243) and supplemental analysis (SA) (DOE/EIS-0243-SA-01) and DOE's Waste Management Programmatic EIS (DOE/EIS-200). The fourth Record of Decision (ROD) (65 FR 10061, February 25, 2000) for DOE's Waste Management Programmatic EIS established the Nevada National Security Site as one of two regional LLW and MLLW disposal sites. The SA considers additional waste streams, beyond those considered in the 1996 NTS EIS, that may be generated at or sent to the Nevada National Security Site for management.

⇩ Go to "Approval Block and Signature Block"

EC Document No.: INL-14-044 R1

VERIFY/ACKNOWELDGE/APPROAL BLOCK: Instructions for the individuals listed below to verify/acknowledge/approve.

Review the EC in the context given below for your title and send an e-mail to the ES&S Representative verifying, acknowledging, or approving the information described in the EC. Second tier ECs do not require approval by the DOE NEPA Compliance Officer or the BEA EMS Representative; mark those spaces as N/A for Not Applicable.

Program Environmental Lead: Verifies that they understand the potential environmental impacts (i.e., environmental aspects) are complete, and that the conditions and project-specific instructions are appropriate and applicable to the project scope.

Program/Project Manager or Principle Investigator/Researcher: Verifies that the project description is true, accurate, and complete and that they understand the potential environmental impacts of their work and agree with and commit to implement any conditions or project-specific instruction described in the EC (Sections E and F).

Facility/Tenant Manager: Acknowledge awareness of this project's intent to use facility as described in the EC.

DOE NEPA Compliance Officer: Approves the level of environmental review for DOE; that is, makes a NEPA determination (e.g., CX, EA, EIS, CERCLA or a previously approved EA, EIS, or CERCLA action).

BEA EMS Representative: Verifies that the EC meets the requirements of INL's Environmental Management System (EMS) and approves the EC for BEA.

NOTE: The ES&S Representative will complete the table below and sign the ES&S Signature Block.

Title	Who	Verify Approval Acknowledge	Date
Program Environmental Lead:	Robert Montgomery	☒	2/2/2015
	Tim Solle	☒	2/2/2015
Program/Project Manager or Principle Investigator/Researcher:	Mike Goff	☒	2/2/2015
Facility Manager:	Thomas Couch	☒	2/3/2015
DOE NEPA Compliance Officer:	Jack Depperschmidt	☐	
BEA EMS Representative:	Bruce Angle	☐	
		☐	

ES&S REPRESENTATIVE SIGNATURE BLOCK. Verifies that each EC section is complete and that all pertinent information is received and submitted to the NEPA Database Manager to enter into INL's EDMS and to create DOE's external website document, as applicable. Pertinent information includes the final EC, but may also contain supporting documents as appropriate).

Jenifer Nordstrom		
Print or Type Name	Signature	Date