

Chapter 2: Environmental Compliance Summary

CHAPTER 2

Operations at the Idaho National Laboratory (INL) Site are subject to numerous federal and state environmental statutes, executive orders, and U.S. Department of Energy (DOE) orders. As a requirement of many of these regulations, the status of compliance with the regulations and releases of non-permitted hazardous materials to the environment must be documented. Environmental permits have been issued to the INL Site, primarily by the state of Idaho (Appendix A, Table A-7). There were no reportable environmental releases at the INL Site during calendar year 2021. In 2021, the DOE Idaho Operations Office (DOE-ID) operated in compliance with most of the requirements defined in governing documents. Instances of noncompliance were reported to regulatory agencies and resolved. Significant environmental compliance issues/actions in 2021 include:

- Environmental restoration continued in 2021 at four active Waste Area Groups. Six Waste Area Groups were previously remediated per the Federal Facility Agreement and Consent Order (FFA/CO) signed by DOE-ID, the U.S. Environmental Protection Agency (EPA), and the State of Idaho in 1991. The FFA/CO outlines how the INL Site will comply with the Comprehensive Environmental Response, Compensation, and Liability Act.
- The state of Idaho Department of Environmental Quality (DEQ) performed a Resource Conservation and Recovery Act inspection in April 2021. Due to the challenges associated with the COVID-19 pandemic and the declared state of emergency, Idaho DEQ provided advanced notice of the inspection to DOE-ID and requested documents for review prior to arrival on-site. Idaho DEQ issued a final report, noting that at the time of the inspection, no alleged violations of the Rules and Standards for Hazardous Waste and INL Partial Permits were observed.
- DOE-ID finalized an environmental assessment and issued a Finding of No Significant Impact for the Microreactor Applications Research, Validation and Evaluation project. The Microreactor Applications Research, Validation and Evaluation environmental assessment analyzed the potential impacts of a proposal to construct a microreactor inside INL's Transient Reactor Test (TREAT) Facility.
- The FFA/co requires the preparation of site treatment plans for the treatment of mixed waste stored or generated at DOE facilities. During 2021, four transuranic (TRU) INL Site Treatment Plan milestones including treatment of remote-handled waste, two certification milestones of original volume TRU-contaminated contact-handled waste, and the treatment of sodium contaminated debris were completed. The Idaho DEQ granted milestone extensions associated with the start-up of the Integrated Waste Treatment Unit (IWTU) following the completion of a 30-day public comment period. The original estimated volume of TRU waste at the INL Site was 65,000 m³ (85,016 yd³), while the total cumulative volume of TRU waste shipped out of Idaho, as of December 2021 was 60,829 m³ (79,561 yd³).
- In 2021, approximately 514 m³ (672 yd³) of mixed low-level waste and 226 m³ (295 yd³) of low-level waste was shipped off the INL Site for treatment, disposal, or both. Approximately 18.63 m³ (24.37 yd³) of low-level waste was disposed of at the Subsurface Disposal Area (SDA) in 2021.
- The Idaho DEQ has promulgated Safe Drinking Water Act regulations. Ten active drinking water systems at INL Site facilities were sampled according to these regulations and were well below regulatory limits for drinking water.
- The Idaho DEQ issues reuse permits for municipal and industrial effluent discharges in accordance with Idaho DEQ rules. No DEQ inspections of INL or ICP Core contractors reuse systems occurred in 2021. All systems at the INL Site were operated in substantial compliance with permit requirements during 2021.



- One reportable release occurred during 2021. About 70 gallons of hydraulic fluid leaked from a sonic drilling rig. The affected hose, which appeared to have been damaged by rodents, was wrapped in absorbent and taped to mitigate further leaks. DEQ was notified, and the contaminated soil was shoveled, containerized and disposed of through the ICP Core waste management organization.
- INL Site cultural resources are numerous and represent at least 13,000 years of human land use in the region. As a federal agency, the DOE has been directed by Congress, the U.S. president, and the American public to provide leadership in the preservation of precontact, historic, and other cultural resources on the lands it administers. DOE-ID prepared an assessment, in compliance with Executive Order 13287, “Preserve America,” of the current status of the inventory of historic properties on the INL Site, the general condition and management needs of the properties, and the steps underway or planned to meet management needs. The report was submitted to the DOE Federal Preservation Officer.

2. ENVIRONMENTAL COMPLIANCE SUMMARY

This chapter reports the compliance status of the U.S. Department of Energy (DOE) Idaho National Laboratory (INL) Site with environmental protection requirements. Operations at the INL Site are subject to numerous federal and state environmental protection requirements, such as statutes, acts, agreements, executive orders, and DOE orders. These are listed in Appendix A.

2.1 Environmental Restoration and Waste Management

2.1.1 Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) provides the process to assess and remediate areas contaminated by the release of chemically hazardous, radioactive substances, or both. Nuclear research and other operations at the INL Site left behind contaminants that pose a potential risk to human health and the environment. The INL Site was placed on the National Priorities List under CERCLA on November 29, 1989. The U.S. Department of Energy’s Idaho Operations Office (DOE-ID), the state of Idaho Department of Environmental Quality (DEQ), and the U.S. Environmental Protection Agency (EPA) Region 10 signed the Federal Facility Agreement and Consent Order (FFA/CO) in December 1991 (DOE 1991).

Environmental restoration is conducted under the FFA/CO, which outlines how the INL Site will comply with CERCLA. It identifies a process for DOE-ID to work with its regulatory agencies to safely execute the cleanup of past release sites.

The INL Site is divided into 10 Waste Area Groups (WAGs) as identified in Figure 2-1 as a result of the FFA/CO, and each WAG is further divided into smaller cleanup areas called operable units. Field investigations are used to evaluate potential release sites within each WAG and operable unit when existing data are insufficient to determine the extent and nature of contamination. After each investigation is completed, a determination is made regarding whether a “No Action” or “No Further Action” listing is possible, or if it is appropriate to proceed with an interim cleanup action, the Operable Unit 10-08 Plug-In Remedy action, or further investigation using a remedial investigation/feasibility study (RI/FS). Results from the RI/FS form the basis for risk assessments and alternative cleanup actions. This information, along with the regulatory agencies’ proposed cleanup plan is presented to the public in a document called a proposed plan. After consideration of public comments, DOE, EPA, and the Idaho DEQ develop a record of decision (ROD) that selects a cleanup approach from the alternatives evaluated. Cleanup activities can then be designed, implemented, and completed.

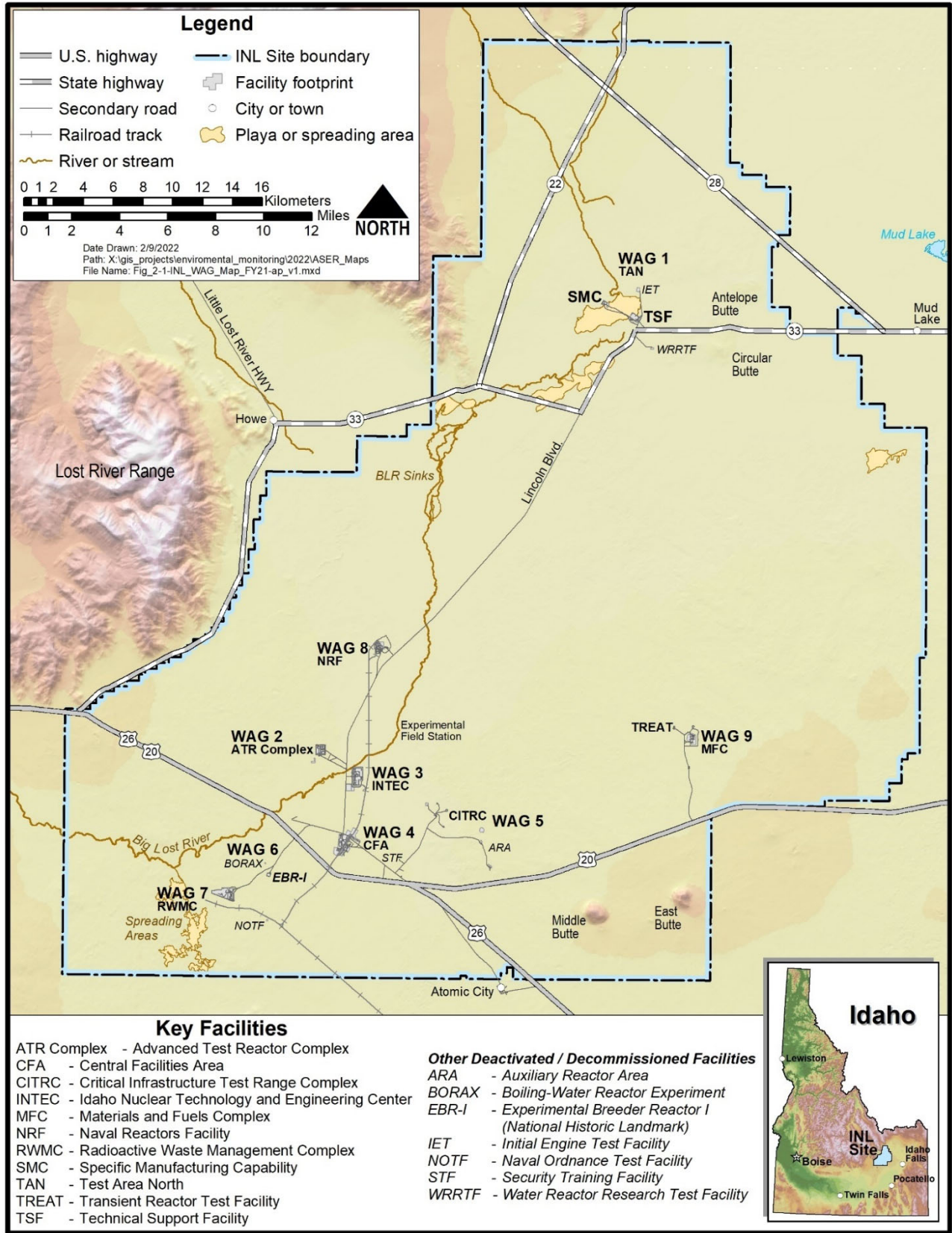


Figure 2-1. INL Site showing facilities and corresponding WAGs.



Since the FFA/CO was signed in December 1991, the INL Site has cleaned up release sites containing asbestos, petroleum products, acids and bases, radionuclides, unexploded ordnance and explosive residues, polychlorinated biphenyls, heavy metals, and other hazardous materials. All 24 RODs that were scheduled have been signed and are being implemented. Comprehensive RI/FSs have been completed for WAGs 1–5, 7–9, and 6/10 (6 is combined with 10). Active remediation is completed at WAGs 1 (excluding Operable Unit 1-07B), 2, 4, 5, 6, 8, and 9. Institutional controls and operations and maintenance activities at these sites are ongoing and will continue to be monitored under the *Site-wide Institutional Controls and Operations and Maintenance Plan* (DOE-ID 2022). The status of on-going active remediation activities at WAGs 1, 3, 7, and 10 is described in Table 2-1.

Table 2-1. 2021 status of active WAGs cleanup.

WASTE AREA GROUP	FACILITY	STATUS
1	Test Area North	<p>Groundwater cleanup of trichloroethene for Operable Unit 1-07B continued through 2021. The New Pump and Treat Facility generally operated four days per week, except for downtime due to maintenance, to maintain trichloroethene concentrations in the medial zone below specified targets. The in-situ bioremediation transitioned into a rebound test in 2012 to determine the effectiveness of the remedy to date. The revised test plan was finalized in early 2017 to establish how the groundwater cleanup at Test Area North will continue. Two in-situ bioremediation injection wells were constructed in 2015 to further in-situ bioremediation efforts and one monitoring well was constructed in 2017 to better monitor the plume at its distal edge. During 2021, one in-situ bioremediation injection well was constructed, and further in-situ bioremediation continues in a specific area where previous efforts had not achieved the desired reduction in contaminant levels. All institutional controls (IC) and operations and maintenance (O&M) requirements were maintained during 2021.</p>
3	Idaho Nuclear Technology and Engineering Center	<p>The Idaho CERCLA Disposal Facility (ICDF) disposes of contaminated soils and debris from CERCLA remediation operations for the protection of human health and the environment and is located southwest of INTEC. Consolidation of waste at the ICDF reduces the risk of exposure of contaminants to human and ecological receptors, and the use of an engineered facility with leachate collection is protective of the underlying Snake River Plain Aquifer (SRPA). The ICDF functions as an INL-Sitewide disposal facility for CERCLA soils and debris from other WAGs in compliance with strict waste acceptance criteria. The facility continues to receive small amounts of liquid and solid waste periodically for disposal in the ICDF evaporation ponds and disposal cells, respectively. The ICDF evaporation ponds are sampled annually in accordance with the ICDF Complex O&M Sampling and Analysis Plan, and results are sent to the EPA and the state of Idaho DEQ.</p> <p>Remedial actions required by the WAG 3, Operable Unit 3-14 ROD, implemented in 2013, included the reduction of approximately nine million gallons of anthropogenic recharge to the northern perched water zones. Remedial actions were taken at the Tank Farm Facility to reduce water infiltration that potentially could transport contaminants from the perched water to the underlying aquifer. Perched and groundwater monitoring under and near the facility will continue until the risk posed by contamination left in place is below target levels. All ICs and O&M requirements were maintained in 2021. An interim low-permeability asphalt barrier was placed over the western two-thirds of the Tank Farm during 2017 to further reduce infiltration of precipitation water until a final cover is constructed after Idaho Nuclear Technology and Engineering Center (INTEC) closure.</p>
7	Radioactive Waste Management Complex	<p>WAG 7 includes the Subsurface Disposal Area (SDA), a 39-hectare (96-acre) radioactive waste landfill that is the major focus of remedial response actions at the Radioactive Waste Management Complex (RWMC) (Figure 2-2). Waste is buried in approximately 14 of the 39 hectares (35 of the 96 acres) within 21 unlined pits, 58 trenches, 21 soil vault rows, and, on Pad A, an above grade disposal area. Disposal requirements have changed in accordance with laws and practices current at the time of disposal. Initial operations were limited to shallow, landfill disposal of waste generated at the INL Site. Beginning in 1954, the DOE</p>



Table 2-1. continued.

WASTE AREA GROUP	FACILITY	STATUS
		<p>Rocky Flats Plant near Boulder, Colorado, was authorized to send waste to the RWMC for disposal. The Rocky Flats Plant was a nuclear weapons production facility with peak operations during the Cold War era. Various types of radioactive waste streams were disposed of, including process waste (e.g., sludge, graphite molds and fines, roaster oxides, and evaporator salts), equipment, and other waste incidental to production (e.g., contaminated gloves, paper, clothing, and other industrial trash). Much of the Rocky Flats Plant waste was contaminated with transuranic (TRU) isotopes and solvents (e.g., carbon tetrachloride). In 1970, burial of TRU waste was prohibited. In 1984, disposal practices were modified to eliminate disposal of mixed waste. Since 1984, only low-level waste was disposed of in the SDA. Disposal of waste from offsite generators was discontinued in the early 1990s, and disposal of contact-handled waste was discontinued at the end of fiscal year (FY) 2008. Currently, only remote-handled, low-level waste is being disposed of in the SDA.</p> <p>The Operable Unit 7-13/14 ROD (DOE/ID-11359, [DOE-ID 2008]) was signed in 2008. The ROD is consistent with DOE's obligations for removal of TRU waste under the <i>Agreement to Implement U.S. District Court Order Dated May 25, 2006</i>, between the Idaho DEQ and DOE-ID, effective July 3, 2008 (U.S. District Court 2008). The ROD calls for exhuming and packaging a minimum of 6,238 m³ (8,159 yd³)—measured as 7,485 m³ (9,790 yd³) packaged—of targeted waste from a minimum combined area of 2.3 hectares (5.69 acres). Targeted waste for retrieval contains TRU elements (e.g., plutonium), uranium, and collocated organic solvents (e.g., carbon tetrachloride). Targeted waste retrievals in specific areas of the SDA commenced in 2005. The retrieved targeted waste is packaged, certified, and shipped out of Idaho. As of December 2021, 10,309 m³ (13,483 yd³) of targeted waste has been retrieved and packaged from a combined area of 3 hectares (7.41 acres).</p> <p>In addition to targeted waste retrieval, the ROD addresses remaining contamination in the SDA through a combination of continued vapor-vacuum extraction and treatment of solvent vapors from the subsurface, in-situ grouting of specified waste forms containing mobile contaminants (completed 2010), constructing an evapotranspiration surface barrier over the entire landfill, and long-term management and control following construction. Construction will be complete by 2028.</p>
10	<p>10-04 INL Site-wide Miscellaneous Sites and Comprehensive RI/FS</p> <p>10-08 INL Sitewide Groundwater, Miscellaneous Sites, and Future Sites</p>	<p>Operable Unit 10-04 addresses long-term stewardship functions—ICs and O&M for sites that do not qualify for Unlimited Use/Unrestricted Exposure—and explosive hazards associated with historical military operations on the INL Site. All ICs and O&M requirements were maintained in 2021, under the Site-wide IC/O&M Plan. The fourth Site-wide CERCLA five-year review covering the period from 2015 through 2019 was finalized in January 2021. The purpose of the CERCLA five-year review is to verify that implemented cleanup actions continue to meet cleanup objectives documented in RODs.</p> <p>Operable Unit 10-08 addresses Site-wide groundwater, miscellaneous sites, and future sites. Response actions for Operable Unit 10-08 are mostly complete, and ongoing activities are groundwater monitoring and the evaluation and remediation of any potential new sites that are discovered. Groundwater monitoring continued in 2021 to verify that there is no unacceptable threat to human health or the environment from commingled plumes or along the southern INL Site boundary.</p>

Documentation associated with the FFA/CO is publicly available in the CERCLA Administrative Record and can be accessed at <https://ar.icp.doe.gov>.



2.1.2 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) established regulatory standards for generation, transportation, storage, treatment, and disposal of hazardous waste. The Idaho DEQ is authorized by the EPA to regulate hazardous waste and the hazardous components of mixed waste at the INL Site. Mixed waste contains both radioactive and hazardous materials. The Atomic Energy Act, as administered through DOE orders, regulates radioactive wastes and the radioactive part of mixed wastes. A RCRA hazardous waste permit application contains two parts: Part A and Part B. Part A of the RCRA hazardous waste permit application consists of EPA Form 8700-23, along with maps, drawings, and photographs, as required by 40 Code of Federal Regulations (CFR) 270.13. Part B of the RCRA hazardous waste permit application contains detailed, site-specific information as described in applicable sections of 40 CFR 262 through 270.27. The INL Site currently has two RCRA Part A permit volumes and seven Part B permit volumes. Parts A and B are considered a single RCRA permit that comprises several volumes.

RCRA Reports. As required by the Idaho DEQ, the INL Site submitted the 2021 annual Idaho Hazardous Waste Generator Annual Report (DOE/ID-11441) on the types and quantities of hazardous wastes generated, shipped for treatment and disposal, and remaining in storage. Federal regulations require large quantity generators to submit a report every two years regarding the nature, quantities, and disposition of hazardous waste generated at their facility. The EPA refers to this as the National Biennial RCRA Hazardous Waste Report or Biennial Report. The Biennial Report form (EPA form 8700-13A/B) is submitted to the Idaho DEQ by March 1 of every even-numbered year for the previous calendar year. The biennial report was not required in 2021.

RCRA Closure Plan. There were no closure activities completed in 2021.

RCRA Inspection. For FY 2021, Idaho DEQ performed a RCRA inspection from April 26-27, 2021. Due to the challenges associated with the COVID-19 pandemic and the declared state of emergency, Idaho DEQ provided advanced notice of the inspection to DOE-ID and requested documents for review prior to arrival on-site. On June 22, 2021, Idaho DEQ issued the final report, noting that at the time of the inspection, no alleged violations of the Rules and Standards for Hazardous Waste and the INL Partial Permits were observed.

RCRA Consent Order. Due to DOE-ID's inability to meet commitments to initiate waste treatment in the Integrated Waste Treatment Unit (IWTU) and cease use of the Idaho Nuclear Technology and Engineering Center (INTEC) tanks, Idaho DEQ assessed a penalty to DOE-ID pursuant to the provisions under Section VII of the Fifth Modification to the Notice of Noncompliance-Consent Order, in the amount of \$552,000 for the period of noncompliance from March 30, 2020, to March 31, 2021. Supplemental Environmental Projects were utilized in lieu of the payment, which was reduced due to adverse impacts to IWTU's outage schedule resulting from the COVID-19 global pandemic.

2.1.3 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires federal agencies to consider potential environmental impacts of proposed actions in the decision-making process. Federal agencies are required to provide a detailed statement on proposals for major federal actions significantly affecting the quality of the human environment. The purpose and function of NEPA is satisfied if federal agencies have considered relevant environmental information, and the public has been informed regarding the decision-making process. DOE-ID implements NEPA according to procedures in the CFR (40 CFR 1500 - 1508; 10 CFR 1021) and assigns authorities and responsibilities according to DOE Policy 451.1, "National Environmental Policy Act Compliance Program." Processes specific to DOE-ID are set forth in its Idaho Operations Office Management System. In 2021, DOE-ID finalized an environmental assessment and issued a Finding of No Significant Impact for the Microreactor Applications Research, Validation, and Evaluation project. The Microreactor Applications Research, Validation and Evaluation environmental assessment analyzed the potential impacts of a proposal to construct a microreactor inside INL's Transient Reactor Test (TREAT) Facility.

2.1.4 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA), which is administered by the EPA, requires the regulation of production, use, or disposal of chemicals. TSCA supplements sections of the Clean Air Act (CAA), the Clean Water Act (CWA), and the Occupational Safety and Health Act. Because the INL Site does not produce chemicals, compliance with the TSCA is



primarily directed towards the use and management of certain chemicals—particularly polychlorinated biphenyls (PCBs). The INL Site manages radioactive mixed waste containing PCBs received from other DOE Sites many years ago for disposal. Environmental remediation activities include the re-processing of these waste materials for disposition off-site. In addition, PCBs were used in the manufacture of many different items and materials including liquid filled electrical equipment such as transformers and capacitors, paint, and caulking. Whenever any of these items or materials are discovered, they are disposed of off the INL Site at a TSCA-approved disposal facility. Requirements for the reporting of PCB-related activities are found in 40 CFR 761 Subpart J, "General Records and Reports." These regulations require a facility to maintain a written record documenting all PCB management activities until the PCBs are disposed of and this written record must be available for inspection or submission if requested by the EPA. It must be prepared each year by July 1 and maintained at the facility for at least three years after the facility ceases using or storing PCBs and PCB items. The INL prepares the required annual documentation each year. It includes an inventory of PCB/radioactive waste in storage at the INL for the previous year and documents progress made toward disposal in accordance with applicable regulations. The INL Site maintains rigorous compliance with all applicable PCB regulations.

2.1.5 Federal Insecticide, Fungicide and Rodenticide Act

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) regulations found in 40 CFR parts 150-189 are promulgated and administered by the EPA. The term "pesticide" means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, (2) any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant, and (3) any nitrogen stabilizer. The FIFRA provides for federal regulation of pesticide distribution, sale, and use. All pesticides distributed or sold in the U.S. must be registered (licensed) by the EPA. The process of registering a pesticide is a rigorous scientific, legal, and administrative procedure. The EPA evaluates a pesticide registration application to assess a wide variety of potential human health and environmental effects associated with use of the product.

The EPA also evaluates and approves the language that appears on each pesticide label to ensure the directions for use and safety measures are appropriate to any potential risk. The label on a pesticide package or container and the accompanying instructions are a very important part of pesticide regulation for the applicator. The label provides critical information about how to handle and safely use the pesticide product and avoid harm to human health and the environment. Using a pesticide product inconsistent with the label requirements is a violation of federal law.

All pesticides applied on the INL Site are EPA approved products. All pesticide applications are made by trained and licensed pesticide applicators. The pesticide label requirements are rigorously followed to ensure the safety of the applicators, site personnel, and the environment, including non-target organisms like wildlife and desirable native vegetation. Most applications target state listed noxious weeds and invasive vegetative species for which control is required by federal orders and to mitigate the amount of potential fuel for wildland fire. Other uses include maintaining clear buffer areas for INL facilities and roadways, as well as controlling insects in building interiors and landscape maintenance. Refer to Section 9.2.4 for additional information about INL contractor's efforts to control noxious and invasive vegetative species.

2.1.6 DOE O 435.1, Radioactive Waste Management Compliance

The Atomic Energy Act of 1954 (42 U.S.C § 2011 1954) Section 161(i) authorizes DOE to regulate activity involving certain radioactive materials, including radioactive waste, to "protect human health and minimize danger to life or property." This authority is implemented through DOE O 435.1, "Radioactive Waste Management," and the accompanying DOE Manual 435.1-1, "Radioactive Waste Management Manual," which set forth the requirements for assuring the safety of the generation, treatment, storage, and disposal of DOE-owned radioactive waste. These DOE Directives ensure that radioactive waste management activities are systematically planned, documented, executed, and evaluated. Specifically, the order and the manual:

- Establish requirements to implement DOE regulating authority and responsibilities for radioactive waste management
- Define DOE radioactive waste types: (1) high-level waste, (2) TRU waste, and (3) low-level waste
- Emphasize management for disposal and establish requirements for waste characterization, waste certification, and waste acceptance criteria



- Identify performance-based requirements
- Require life-cycle management (i.e., from generation planning to disposal)
- Rely on existing nuclear safety philosophies (e.g., Integrated Safety Management System, Graded Approach, Defense-in-Depth)
- Require a DOE-approved Radioactive Waste Management Basis (RWMB) to ensure hazards have been identified, analyzed, and mitigated.

The INL contractor manages all hazardous high-level waste (HLW), mixed low-level waste (MLLW), low-level waste (LLW), contact-handled TRU waste, and remote-handled-TRU waste generated at INL facilities. The Waste Management Program is the lead organization for ensuring compliant cradle-to-grave waste management of containerized waste as described in PDD-17000, "Waste Management Program."

The Idaho Cleanup Project (ICP) Core manages all hazardous, MLLW, LLW, contact-handled TRU waste, and remote-handled-TRU waste that is generated and stored at the Site and approved off-INL Site waste streams. Management activities include, but are not limited to, storing waste, treating waste, and transporting and disposing of waste. The overall responsibility for managing waste resides within the Fluor Idaho Waste Management Programs organization according to PDD-234, "Waste Management Program." All waste management activities described herein are conducted in compliance to all applicable provisions of DOE O 435.1.

See Table 2-2 for information on wastes managed at the INL Site by the INL and ICP Core contractors.

Table 2-2. Wastes managed at the INL Site.

FACILITY	GENERATION	TREATMENT	STORAGE	DISPOSAL
INL CONTRACTOR				
Advanced Test Reactor	LLW	—	LLW	—
Central Facilities Area	LLW	—	LLW	—
Materials and Fuels Complex/INTEC	TRU/LLW	LLW	TRU/LLW	—
Remote Handled Low-level Waste Disposal Facility	LLW	—	LLW	LLW
Research and Education Campus	LLW	—	LLW	—
Specific Manufacturing Capability	LLW	LLW	LLW	—
ICP CORE CONTRACTOR				
Advanced Mixed Waste Treatment Project	TRU/LLW	TRU/LLW	TRU/LLW	—
Idaho CERCLA Disposal Facility	—	—	—	LLW
INTEC Calcined Solids Storage Facility	—	—	HLW	—
INTEC Tank Farm Facility	—	—	HLW	—
Integrated Waste Treatment Unit	—	HLW	HLW	—
Radioactive Waste Management Complex Accelerated Retrieval Project	TRU/LLW	TRU/LLW	TRU/LLW	—
Radioactive Waste Management Complex Active Low-level Waste Disposal Facility	—	—	—	LLW

See Table 2-3 for the status of each phase of the LLW management process for facilities managed at the INL Site by the INL and ICP Core contractors.



Table 2-3. Listing of the status of each phase of the LLW management process for sites authorized to manage a LLW facility.

PHASE	REMOTE-HANDLED LLW DISPOSAL FACILITY	RWMC ACTIVE LLW DISPOSAL FACILITY	ICDF
Performance Assessment (PA)	DOE/ID-11421, "Performance Assessment for the Idaho National Laboratory Remote-Handled Low-Level Waste Disposal Facility"	DOE/NE-ID-11243, "Performance Assessment for the RWMC Active Low-Level Waste Disposal Facility at the Idaho National Laboratory Site"	DOE/ID-10978, "Performance Assessment for the Idaho CERCLA Disposal Facility Landfill"
Composite Analysis (CA)	DOE/ID-11422, "Composite Analysis for the Idaho National Laboratory Remote-Handled Low-Level Waste Disposal Facility"	DOE/NE-ID-11244, "Composite Analysis for the RWMC Active Low-Level Waste Disposal Facility at the Idaho National Laboratory Site"	DOE/ID-10979, "Composite Analysis for the INEEL CERCLA Disposal Facility Landfill"
Closure Plan	PLN-3370, "Preliminary Closure Plan for the Idaho National Laboratory Remote-Handled Low-Level Waste Disposal Facility"	RPT-576, "Interim Closure Plan for the RWMC Active Low-Level Waste Disposal Facility at the Idaho National Laboratory Site"	A preliminary closure plan has been developed for the closure of the entire ICDF Complex. This preliminary closure plan was included in the "ICDF Complex Remedial Action Work Plan" (DOE/ID-10984)
PA/CA Maintenance Program	PLN-3368, "Maintenance Plan for the Remote-Handled Low-Level Waste Disposal Facility Performance Assessment and Composite Analysis"	RPT-431, "Performance Assessment and Composite Analysis Maintenance Plan for the RWMC Active Low-Level Waste Disposal Facility"	RPT-791, "Performance Assessment and Composite Analysis Maintenance Plan for the Idaho CERCLA Disposal Facility"
Latest Annual PA/CA Summary Report	INL/RPT-22-65681, "Annual Summary Report for the Remote-Handled Low-Level Waste Disposal Facility—FY 2021"	RPT-1895, "Annual Summary Report: Review for Continued Adequacy of the Performance Assessment, Composite Analysis, and Supporting Documents for the Active Low-Level Waste Disposal Facility at the RWMC – FY 2020"	RPT-1894, "Annual Summary Report: Review for Continued Adequacy of the Performance Assessment, Composite Analysis, and Supporting Documents for the ICDF Landfill – FY 2020"
Disposal Authorization Statement (DAS)	Bishop, T., memorandum to R. Provencher, May 22, 2018, "Operating Disposal Authorization Statement for the Remote-Handled Low-Level Waste Disposal Facility Idaho National Environmental Laboratory, Idaho," U.S. DOE-NE, May 22, 2018	Marcinowski, F., memorandum to E. Sellers, January 30, 2008, "Revision of the Disposal Authorization Statement for the Idaho National Laboratory Active Low-Level Waste Disposal Facility within the Radioactive Waste Management Complex," CCN 323845	Marcinowski, F., memorandum to R. Provencher, April 7, 2011, "Revision of the Disposal Authorization Statement for the Idaho Comprehensive Environmental Response, Compensation, and Liability Act Disposal Facility," CCN 311791

2.1.7 DOE O 458.1, Radiation Protection of the Public and the Environment

DOE O 458.1, "Radiation Protection of the Public and the Environment," establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE pursuant to the Atomic Energy Act of 1954, as amended. The objectives of this order are to:

- Conduct DOE radiological activities so that exposure to a member of the public is maintained within the dose limits established in this order
- Control the radiological clearance of DOE real and personal property
- Ensure that potential radiation exposures to members of the public are as low as reasonably achievable



- Ensure that DOE sites have the capabilities, consistent with the types of radiological activities conducted, to monitor routine and non-routine radiological releases and to assess the radiation dose to members of the public
- Provide protection of the environment from the effects of radiation and radioactive material.

The Order sets the public dose limit at a total effective dose not to exceed 100 mrem/yr (1 mSv/yr) above background radiation levels. Chapter 8 presents dose calculations for INL Site releases for 2021.

DOE standard DOE-STD-1196-2011, Derived Concentration Technical Standard, supports implementation of DOE O 458.1. The standard defines the quantities used in the design and conduct of radiological environmental protection programs at DOE facilities and sites. These quantities, known as Derived Concentration Standards (DCSs), represent the concentration of a given radionuclide in either water or air that results in a member of the public receiving 100 mrem (1 mSv) effective dose following continuous exposure for one year via each of the following pathways: (1) ingestion of water, (2) submersion in air, and (3) inhalation. Measurements of radionuclides in environmental media sampled on and around the INL Site were all below appropriate DCSs.

DOE O 458.1 specifies the limits for unrestricted release of property to the public. All INL and ICP Core contractors use a graded approach for release of material and equipment for unrestricted public use. Material has been categorized so that in some cases an administrative release can be accomplished without a radiological survey. Such material originates from non-radiological areas and includes the following:

- Personal items or materials
- Documents, mail, diskettes, compact disks, and other office media
- Paper, cardboard, plastic products, aluminum beverage cans, toner cartridges, and other items for recycling
- Office trash
- Non-radiological area housekeeping materials and associated waste
- Breakroom, cafeteria, and medical wastes
- Medical and bioassay samples
- Other items with an approved release plan.

Items originating from non-radiological areas within the INL Site's controlled areas not in the listed categories are surveyed prior to release to the public, or a process knowledge evaluation is conducted to verify that material has not been exposed to radioactive material or beams of radiation capable of creating radioactive material. In some cases, both a radiological survey and a process knowledge evaluation are performed (e.g., a radiological survey is conducted on the outside of the item, and a process knowledge form is signed by the custodian for inaccessible surfaces).

When the process knowledge approach is employed, the history of the material confirms that no radioactive material has passed through or contacted the item. Items advertised for public sale via an auction are also surveyed by the contractor prior to shipment to the INL Site property/excess warehouse where the materials are again resurveyed on a random basis by personnel prior to release, giving further assurance that material and equipment are not being released with inadvertent contamination.

All contractors complete material surveys prior to release and transport to the state-permitted landfill at the Central Facilities Area. The only exception is for items that could be internally contaminated; these items are submitted to Waste Generator Services for disposal using one of the offsite treatment, storage, and disposal facilities that can accept low-level contamination. INL and ICP Core contractors continue to follow the requirements of the scrap metal suspension. No scrap metal directly released from radiological areas is recycled.

2.1.8 INL Site Agreements

The INL has three major site agreements that contain regulatory commitments and milestones. These major Site Agreements are known as the Site Treatment Plan (STP), the Idaho Settlement Agreement (ISA), and the Notice of Noncompliance/Consent Order (NON/CO).



The FFA/CO requires the preparation of site treatment plans for the treatment of mixed waste stored or generated at DOE facilities. Mixed waste contains both hazardous and radioactive components. The INL STP was signed by the Idaho DEQ on November 1, 1995, and is updated annually (DEQ 1995). This plan outlines DOE-ID's proposed treatment strategy for the mixed-waste streams, called the backlog, and identifies onsite and offsite MLLW treatment capabilities.

During 2021, DOE-ID completed four STP milestones including the treatment of remote-handled waste, two certification milestones of original volume TRU-contaminated contact-handled waste, and the treatment of sodium contaminated debris. DOE-ID made a request to the Idaho DEQ to extend milestones associated with the start-up of the IWTU and treatment of sodium bearing waste, which the state approved in September 2021. Idaho DEQ granted the IWTU milestone extensions for good cause after a 30-day public comment period had been completed.

On October 16, 1995, DOE-ID, the U.S. Navy, and the Idaho DEQ entered into an agreement (aka ISA) that guides management of Spent Nuclear Fuel (SNF), high level waste, and TRU waste at the INL Site. The Agreement (DOE 1995) limits shipments of DOE-ID and Naval SNF into the state and sets milestones for shipments of SNF and radioactive waste out of the state.

The STP and the ISA required DOE-ID to process and ship all waste out of Idaho by December 31, 2018, respectively, stored as TRU waste on the INL Site in 1995, when the agreements were signed. The estimated volume of that waste was 65,000 m³ (85,016 yd³). This milestone was not achieved; however, revised STP milestones were agreed upon with the Idaho DEQ and an Addendum to the ISA was signed on November 6, 2019, to address the milestone.

As of December 31, 2021, a total of 60,829 m³ (79,561 yd³) of original volume TRU-contaminated waste had been processed (i.e., shipped or certified for disposal to Waste Isolation Pilot Plant [WIPP]). DOE-ID completed certification of 25% of the Original Volume Transuranic Contaminated waste remaining inventory to be certified for shipment and disposal at WIPP. DOE-ID made 122 shipments of ISA TRU waste to WIPP in 2021, comprised of 102 shipments of legacy TRU waste and 20 shipments of buried TRU.

The ICP Core contractor manages and operates several projects to facilitate the disposition of radioactive waste as required by the ISA and STP. The Advanced Mixed Waste Treatment Project performs retrieval, characterization, treatment, packaging, and shipment of TRU waste currently stored at the INL Site. Most of the waste processed at the Advanced Mixed Waste Treatment Project resulted from the manufacture of nuclear components at DOE's Rocky Flats Plant in Colorado. This waste is contaminated with TRU radioactive elements (primarily plutonium).

The final agreement, the NON/CO and recent modification, in conjunction with the STP, requires the treatment of sodium bearing waste stored at the INTEC Tank Farm at the IWTU. To meet the milestones in the NON/CO and STP, DOE-ID and its ICP Core contractor, Fluor, continued their methodical approach to startup the IWTU, which is designed to process the remaining 3,407,000 L (900,000 gal) of liquid waste stored at INTEC. This waste is stored in three stainless steel underground tanks, and a fourth is always kept empty as a spare. All four will be closed in compliance with hazardous waste regulations. A total of 11 other liquid storage tanks have been emptied, cleaned, and closed. The waste was originally scheduled to begin processing in 2012, but several technical problems have delayed IWTU.

The previous ICP Core contractor assembled a team of nationwide experts on fluidized bed technology to resolve issues with the IWTU identified during previous testing, which occurred incrementally from 2016 and into 2019 during numerous simulant test runs and interim plant outages which was largely retained by the current contractor. The methodical approach includes: (1) implementing design and mechanical modifications; (2) testing and verifying the changes; (3) initiating radiological operations at the facility; and (4) completing processing of the remaining liquid waste. The completion of the previous major outage was delayed in early 2020 due to the onset of COVID-19. The project implemented the final anticipated major facility modifications during its last outage which began in June 2019 and concluded in July 2021, despite adverse schedule impacts resulting from the COVID-19 global pandemic. The major modifications that were installed included wet and dry decontamination systems, canister decontamination robotic systems, re-designed process off gas filter bundles, and other contamination control modifications. The facility commenced a planned confirmatory run in late 2021, but technical challenges interrupted the run prior to completing all test objectives. Minor corrective actions will be implemented in early 2022 followed by another confirmatory run prior to commencing radiological operations anticipated to begin in late 2022.



2.1.9 Low-level and Mixed Radioactive Waste

In 2021, approximately 514 m³ (672 yd³) of MLLW and 226 m³ (295 yd³) of low-level waste was shipped off the INL Site for treatment, disposal, or both. Approximately 18.63 m³ (24.37 yd³) of low-level waste was disposed at the SDA in 2021 as shown in Figure 2-2.

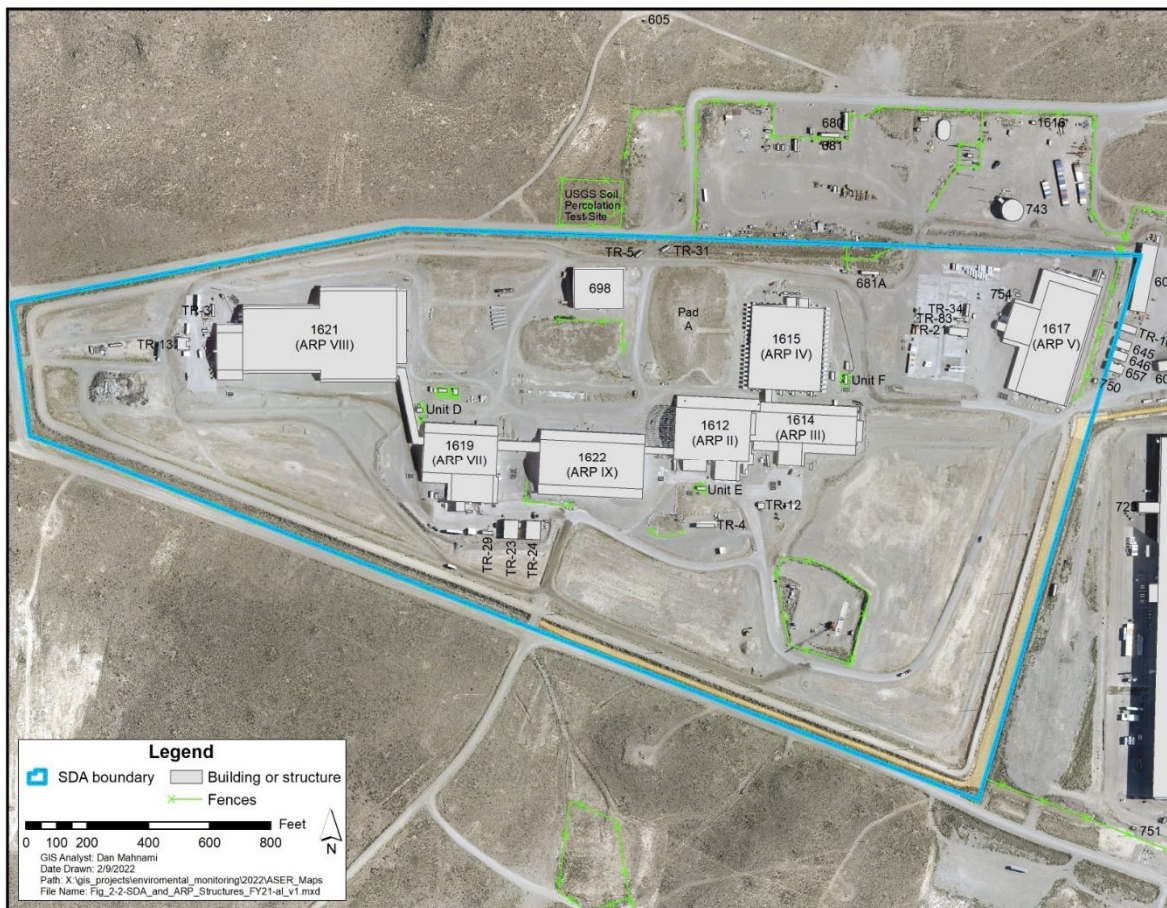


Figure 2-2. Radioactive Waste Management Complex Subsurface Disposal Area (2021).

2.1.10 Spent Nuclear Fuel

SNF is nuclear fuel that has been withdrawn from a nuclear reactor following irradiation and the constituent elements have not been separated. SNF contains unreacted uranium and radioactive fission products. Because of its radioactivity (primarily from gamma rays), it must be properly shielded. DOE-ID's SNF is from the development of nuclear energy technology (including foreign and domestic research reactors), national defense, and other programmatic missions. At the INL Site, SNF is managed by Fluor Idaho, the ICP Core contractor at INTEC, the Naval Nuclear Propulsion Program at the Naval Reactors Facility, and the INL contractor at the Advanced Test Reactor Complex and Materials and Fuels Complex.

The ISA put milestones into place for the management of SNF at the INL Site:

- DOE-ID shall complete the transfer of spent fuel from wet storage facilities by December 31, 2023 (Paragraph E.8)
- DOE-ID shall remove all spent fuel, including naval spent fuel and Three Mile Island spent fuel, from Idaho by January 1, 2035 (Paragraph C.1).

Meeting these remaining milestones comprise the major objectives of the SNF program.



2.2 Air Quality and Protection

2.2.1 Clean Air Act

The Clean Air Act (CAA) is the basis for national air pollution control. Congress passed the original CAA in 1963, and several amendments containing key pieces of legislation have been passed with the latest in 1990, which resulted in the current CAA law. The CAA provides the EPA with broad authority to implement and enforce regulations to reduce air pollutant emissions with an emphasis on cost-effective methods. In addition to EPA, states, tribes, and local governments play a key role in the implementation of the CAA. The Idaho DEQ has been delegated authority to implement the CAA through the development of an EPA-approved state implementation plan. DOE-ID holds a synthetic minor, Sitewide, air quality permit to construct with a facility emission cap component from the Idaho DEQ for INL to limit its potential to emit to less than major facility limits for criteria air pollutants (CAPs) regulated under Section 109 of the CAA. INL is currently a major source of CAP emissions and an area source of hazardous air pollutant emissions regulated under Section 112 of the CAA. The facility emission cap includes enforceable CAP and hazardous air pollutant limits to ensure that current and future operations will not trigger the requirement to obtain a Title V/Tier I operating permit or implementation of current or future major source maximum achievable control technology standards.

No air quality inspections were performed by the Idaho DEQ during calendar year 2021.

2.2.2 Hydrofluorocarbon Phasedown

In October 2021, EPA issued regulations to decrease the production of hydrofluorocarbons (HFCs) over the next fifteen years thereby decreasing the supply (40 CFR 84). HFCs were developed and manufactured to replace chlorofluorocarbons, which damage the stratospheric ozone layer. HFC uses include refrigerants, solvents, fire suppressants, and aerosols. Through these regulations, EPA seeks to reduce HFC consumption and production to 15% of a 2011-2013 baseline by 2036. These regulations do not prevent entities from using equipment containing HFCs that have already been purchased and are currently in use. However, as the phasedown progresses, these HFCs will become less available and more expensive. The DOE Office of Environment, Health, Safety, and Security published OE-3: 2021-06, "Hydrofluorocarbon Phasedown," to provide information and suggestions to DOE programs and sites about these new regulations. A summary of the INL and ICP Core contractors HFC uses, replacements, procurement, and proactive measures taken as a result of the HFC phasedown can be found in Section 4.2.1.

2.3 Water Quality and Protection

2.3.1 Clean Water Act

The Clean Water Act (CWA), which was passed in 1972, established goals to control pollutants discharged to U.S. surface waters. Among the main elements of the CWA are effluent limitations for specific industry categories set by EPA, as well as regulating water quality standards for surface water. The CWA also provided for the National Pollutant Discharge Elimination System (NPDES) permit program, requiring permits for discharges into regulated surface waters. The Idaho DEQ has been authorized by the EPA to assume permitting authority over the NPDES program. The Idaho DEQ program is called the Idaho Pollutant Discharge Elimination System (IPDES). The INL and ICP Core contractors do not currently hold any IPDES permits but in town facilities discharge to the city of Idaho Falls wastewater treatment plant which is required by the IPDES permit program to set pretreatment standards for nondomestic discharges to publicly owned treatment works. The INL Research Center complies with an Industrial Wastewater Acceptance permit for discharges to the city of Idaho Falls. This program is set out in Title 8, Chapter 1 of the Municipal Code of the city of Idaho Falls. All discharges in 2021 were within levels established in the INL Research Center Industrial Wastewater Acceptance permit. An inspection was performed April 14, 2021, by the city of Idaho Falls and was found to be in substantial compliance.

2.3.2 Safe Drinking Water Act

The Safe Drinking Water Act establishes rules governing the quality and safety of drinking water. The Idaho DEQ promulgated Safe Drinking Water Act regulations according to IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems."



The eastern Snake River Plain aquifer is the source for the 11 active public water systems at all the facilities on the INL Site. Ten are monitored by the INL and ICP Core contractors. The remaining system is monitored by the Naval Reactors Facility contractor. All INL Site public water systems sample their drinking water as required by the Idaho DEQ. There were no drinking water requirements exceedances for any of the INL public water systems during 2021. Chapter 6 contains details on drinking water monitoring.

The EPA is establishing regulations for a class of widely used and dispersed man-made chemicals called per- and polyfluoroalkyl substances. The INL site participated in a voluntary Idaho state initiative involving a select group of drinking water systems to identify drinking water sources that may contain per- and polyfluoroalkyl substances. In 2021 10 out of 13 wells were sampled that supply water to their eight water systems. Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS), for example, are two of the most widely used and studied chemicals in the perfluoroalkyl substances group. The EPA proposed an initial health advisory limit for PFOA and PFOS combined at 70 parts per trillion in drinking water. This limit is expected to be refined as more definitive health risk information is derived. INL will be reporting on sampling efforts and results for all water systems in the future.

2.3.3 Idaho DEQ Reuse Permits

Wastewater is the spent water or effluent from activities and processes occurring in dwellings, commercial buildings, industrial plants, institutions and other establishments. If the wastewater contains sewage, it is considered municipal wastewater. If it does not contain sewage, it is considered industrial wastewater. Recycled water is wastewater effluent that is treated, if necessary, and then reused for other purposes. The Idaho DEQ encourages reuse, which is the practice of using recycled water for irrigation, ground water recharge, landscape impoundments, toilet flushing in commercial buildings, dust control, and other beneficial uses.

The Idaho DEQ requires anyone choosing to use recycled water to obtain a reuse permit. Reuse permits consider the site-specific conditions of each facility and include site-specific limits and conditions as applicable to protect public health and the environment, including groundwater. The Idaho DEQ issues these permits in accordance with IDAPA 58.01.17, "Recycled Water Rules;" IDAPA 58.01.16, "Wastewater Rules;" and IDAPA 58.01.11, "Ground Water Quality Rule." The following facilities have reuse permits at the INL Site:

- Advanced Test Reactor Complex Cold Waste Ponds (I-161-03)
- INTEC New Percolation Ponds (M-130-06)
- Materials and Fuels Complex Industrial Waste Pond (I-160-02).

These reuse facilities were operated in substantial compliance with permit requirements during 2021. Chapter 5 contains details on recycled water monitoring.

2.4 Other Environmental Statutes

2.4.1 Endangered Species Act

The Endangered Species Act (ESA):

- Provides a means whereby the ecosystems endangered, and threatened species depend on may be conserved
- Provides a program to support the conservation of such endangered and threatened species and their habitats
- Takes steps, as appropriate, to achieve the purposes of the international treaties and conventions on threatened and endangered species.

The act requires that all federal departments and agencies seek to conserve endangered and threatened species and use their authorities to further the purposes of this act.

Personnel in the Environmental Surveillance, Education and Research (ESER) program conduct ecological research, field surveys, and NEPA evaluations regarding ecological resources on the INL Site (see Chapter 9). Emphasis is given to threatened and endangered species, species of conservation concern, and species of greatest conservation need identified by the U.S. Fish and Wildlife Service (FWS) and Idaho Department of Fish and Game.



Three species are currently identified as potentially occurring on the INL Site under the ESA by the FWS: (1) Canada Lynx (*Lynx canadensis* - threatened [<https://www.fws.gov/species/canadian-lynx-lynx-canadensis>]); (2) whitebark pine (*Pinus albicaulis* - proposed threatened [<https://www.fws.gov/species/scrub-pine-pinus-albicaulis>]); and (3) monarch butterfly (*Danaus plexippus* - candidate [<https://www.fws.gov/species/monarch-butterfly-danaus-plexippus>]).

The Canada lynx is typically found inhabiting boreal and subalpine forests where snow is deep and high densities of snowshoe hare populations, their principal prey, are present. There is no critical habitat or other resources available on the INL Site to support the Canada lynx, and if they are observed on the INL Site, it would be transitory in nature.

Whitebark pine is also associated with high subalpine elevations and can be found in the upper elevations of mountain ranges that surround the INL Site. It relies on species such as the Clark's nutcracker (*Nucifraga columbiana*) for seed dispersal. Although, the Clark's nutcracker is an uncommon visitor to juniper dominated portions of the INL Site, the proper elevations are not present for whitebark pine to survive, and it is highly unlikely that this species would ever be present.

Monarch butterfly larvae are dependent upon milkweed (*Asclepias* sp.) species as their sole food source. Milkweed species are typically found in fence rows and along the banks of rivers, lakes, ponds or other waterways; however, on the INL Site, the inconsistent water flows in the Big Lost River reduce the likelihood of milkweed species. Therefore, it is highly unlikely that Monarch butterflies would occur on the Site, and if they are observed, it would likely be transitory in nature.

One species categorized as threatened under the ESA, that may rarely traverse the INL Site is the Yellow-billed Cuckoo (*Coccyzus americanus*). On October 3, 2014, the FWS determined threatened status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*) (<https://www.fws.gov/species/yellow-billed-cuckoo-coccyzus-americanus>). The rare species is known to breed in river valleys in southern Idaho but a single sighting has been documented near the INL Site at Atomic City.

FWS conducted a status review and, in September 2015, announced that the greater sage-grouse does not warrant protection under the ESA. FWS made this determination based upon reduction in threats, which caused the FWS to initially designate the bird "warranted but precluded" in 2010. Federal, state, and private land-use conservation efforts were major factors in accomplishing threat reduction, such as the *Candidate Conservation Agreement for Greater Sage-grouse on the INL Site* (DOE-ID and USFWS 2014) that DOE-ID and FWS signed in October 2014. The voluntary agreement includes conservation measures that protect sage-grouse and its habitat while allowing DOE-ID flexibility in accomplishing its missions. For additional information regarding the CCA, refer to Chapter 9.

White-nose syndrome (WNS) has been identified as a major threat to many bats that hibernate in caves. This disease is caused by a cold-adapted fungus (*Pseudogymnoascus destructans*) that has killed at least 5.5 to 6.7 million bats across seven species. Many species of bats could be at risk for significant decline or extinction due to this disease. At least two species of bats that occupy the INL Site could be affected by WNS if this disease arrives in Idaho: the little brown myotis (*Myotis lucifugus*) and the big brown bat (*Eptesicus fuscus*). In 2010, the little brown myotis was petitioned for emergency listing under the ESA, and the FWS is collecting information on both species to determine if, in addition to existing threats, this disease may be increasing the extinction risk of these bats. Biologists from the ESER program operate a monitoring program using acoustical detectors set at hibernacula and important habitat features (e.g., caves and facility ponds) used by these mammals on the INL Site. Naval Reactors and DOE-ID have developed a Bat Protection Plan for the INL Site (DOE-ID 2018). The plan was updated in 2020. The Bat Protection Plan allows the INL Site to proactively position itself to continue its missions if there is an emergency listing of a bat species due to WNS. The plan is based upon monitoring data and other current knowledge of bat populations on the INL Site. Bat monitoring is discussed further in Chapter 9.

2.4.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act prohibits taking any migratory bird, or any part, nest, or egg of any such bird, without authorization from the U.S. Department of the Interior (DOI). Permits may be issued for scientific collecting, banding and marking, falconry, raptor propagation, depredation, import, export, taxidermy, waterfowl sale and disposal, and special purposes. DOE-ID has a USFWS Special Purpose Permit for limited nest relocation and destruction and the associated take of migratory birds, if necessary, for mission-critical activities. The permit would be applied in very limited and



extreme situations where no other recourse is practicable. The permit also authorizes possession, salvage, and disposition of migratory birds killed through incidental take (e.g., mainly collisions with vehicles, windows, and other structures). The permit authorizes DOE-ID and contractors to relocate a limited number of active migratory bird nests for the protection of birds and human health and safety. If relocating the nest is not practicable, and all other mitigation and avoidance measures have been exhausted, the permit authorizes destruction of the nest. Nonnative species such as European starling, rock pigeon, house sparrow, and Eurasian collared dove are not protected under the Migratory Bird Treaty Act and upland gamebirds such as grouse, turkey and quail are regulated by the Idaho DEQ. Bald and golden eagles are included in the permit only to ensure reporting of potential criminal activity associated with injury or death, and to salvage and transfer carcasses to FWS for necropsy. As required by the permit, DOE-ID submitted an annual report to FWS by January 31, detailing reportable activities related to migratory birds. There were numerous salvage actions tracked, documented, and reported in compliance with permit requirements during 2021. A total of 201 birds, four nests, and six eggs were salvaged in 2021. Thirty-nine of the salvaged birds were among the August 2021 mass avian mortality discussed below. A Say's Phoebe nest with three eggs was found abandoned, a common Raven nest and a Barn Swallow nest without eggs or young were salvaged, and the fourth nest was that of the Say's Phoebe discussed below. No takes occurred in 2021.

Three migratory bird-related activities that occurred on the INL Site during 2021 are highlighted herein. No takes occurred in 2021.

- On July 6, 2021, a Barn Swallow nest with three young was found on equipment staged outdoors at the INL Site. The nest was relocated to a licensed rehabilitator in Pocatello, Idaho, but perished a short time after relocation. DOE-ID timely notified the FWS of this activity.
- On July 12, 2021, a Say's Phoebe nest with three eggs was found on equipment staged outdoors at the INL Site. Daily monitoring of the nest revealed that there was no bird activity at the nest implying that the nest was abandoned. The eggs were examined by ESER program biologists and were found to be non-viable, therefore, the nest was inactive. The nest was salvaged and will be used for training and education purposes as allowed by the permit.
- On August 30, 2021, DOE-ID reported mass avian mortalities to FWS that occurred on the INL Site from August 18-19, 2021. On recommendation from the FWS, DOE-ID shipped the carcasses to the U.S. Geological Survey National Wildlife Health Center for evaluation. In the final report dated November 9, 2021, the National Wildlife Health Center determined the birds died from blunt-force trauma, most likely through collisions with man-made structures. DOE-ID is evaluating measures to reduce the potential recurrence of a similar incident, including changes to facility lighting that may have affected the birds' flight path.

In support of meeting the requirements set forth in the Migratory Bird Treaty Act and Executive Order 13186 "Responsibilities of Federal agencies to protect Migratory Birds" DOE-ID has developed a Migratory Bird Conservation Plan that provides conservation measures designed to protect nesting birds on the INL Site. To properly implement this plan and promote the conservation of migratory birds, a Migratory Bird/Wildlife Conservation Working group was established in 2019. This group routinely meets throughout the nesting season to discuss/resolve a variety of bird and wildlife-related issues experienced at INL facilities and ensure compliance with the requirements of the DOE-ID Migratory Bird Treaty Act permits issued by the FWS and the Idaho Department of Fish and Game. Chapter 9 provides additional information about the Conservation Plan and Working group.

DOE-ID and INL and ICP Core contractors also have permits from the Idaho Department of Fish and Game to manage migratory birds and collect other wildlife specimens for scientific research. The permits allow for the collection of bat carcasses, sampling of big game animal carcasses found on the INL Site, and for active harvest of waterfowl from INL Site wastewater ponds (e.g., the INL contractor also has a, FWS Special Purpose Permit that allows waterfowl collection). The animal samples are analyzed for radionuclides. Wildlife sampling and analysis is further discussed in Chapter 7.

2.4.3 Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 was created to help communities plan for emergencies involving hazardous substances. The Act establishes requirements for federal, state, and local governments; Indian tribes; and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and



communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. The INL Site's compliance with key EPCRA provisions is summarized in the following subsections and in Table 2-4.

Table 2-4. INL Site EPCRA reporting status (2021).

EPCRA SECTION	DESCRIPTION OF REPORTING	2021 STATUS
Section 304	Extremely Hazardous Substance Release Notification	Not Required
Section 311-312	Safety Data Sheet/Chemical Inventory	Required
Section 313	Toxic Chemical Release Inventory Reporting	Required

Section 304 – Section 304 requires owners and operators of facilities where hazardous chemicals are produced, used, or stored to report releases of CERCLA hazardous substances or extremely hazardous substances that exceed reportable quantity limits to state and local authorities (i.e., state emergency response commissions and local emergency planning committees). There were no CERCLA-reportable chemicals released at the INL Site during 2021.

Sections 311 and 312 – Sections 311 and 312 require facilities manufacturing, processing, or storing designated hazardous chemicals to make safety data sheets describing the properties and health effects of these chemicals available to state and local officials and local fire departments. Facilities are also required to report inventories of all chemicals that have safety data sheets to state and local officials and local fire departments. The INL Site satisfies the requirements of Section 311 by submitting a quarterly report to state and local officials and fire departments, identifying chemicals that exceed regulatory thresholds. In compliance with Section 312, the annual Emergency and Hazardous Chemical Inventory (Tier II) Report is provided to local emergency planning committees, the state emergency response commission, and local fire departments by the regulatory due date of March 1. This report includes the types, quantities, and locations of hazardous chemicals and extremely hazardous substances stored at the INL Site and Idaho Falls facilities that exceed regulatory thresholds. In 2021, the chemical inventory report included 71 individual chemicals at INL Site facilities and eight at Idaho Falls facilities. The INL Site also stores extremely hazardous substances, a category of chemicals that could cause serious irreversible health effects from accidental releases. Extremely hazardous substances chlorine, cyclohexylamine, nitric acid, nitrogen dioxide, and sulfuric acid were among the chemicals reported in 2021.

Section 313 – Section 313 requires facilities to submit a Toxics Release Inventory Form annually for regulated chemicals that are manufactured, processed, or otherwise used above applicable threshold quantities. Releases under EPCRA 313 reporting include transfers to waste treatment and disposal facilities off the INL Site, air emissions, recycling, and other activities. The INL Site submitted Toxics Release Inventory Forms for chromium, diisocyanates, lead, naphthalene, nickel, nitrates and nitric acid, to EPA and the Idaho DEQ by the regulatory due date of July 1.

Reportable Environmental Releases – There was one reportable environmental release from the INL Site in 2021:

A release of hydraulic fluid was discovered and cleaned up at the RWMC on July 8, 2021. The release occurred to the gravel/soil in the Construction Laydown Area just north of the RWMC SDA north berm. The spill was determined to have occurred from a leaking hydraulic fluid system main supply hose on a 1986 sonic drilling rig. It was also determined that the hose had been destroyed by chewing rodents. The spill was estimated to be 70 gallons. The surface stain to the soil was approximately 14 feet in length and approximately 9 feet in width. All stained soil resulting from the spill was excavated and removed. The petroleum contaminated soils were containerized for disposal in eight BR-90 (90 cubic feet) steel boxes and the excavation was backfilled with clean soil. The damaged hose was wrapped in absorbent and taped to mitigate any further leaking. Because the release quantity was greater than the 25-gallon reporting threshold (IDAPA 58.01.02.851), DOE-ID notified the Idaho DEQ.

2.4.4 Executive Order 11988, Floodplain Management

Executive Order 11988 requires each federal agency to issue or amend existing regulations and procedures to ensure that the potential effects of any action it may take in a floodplain are evaluated and that its planning programs and budget requests consider flood hazards and floodplain management. It is the intent of Executive Order 11988 that federal agencies implement floodplain requirements through existing procedures, such as those established to implement NEPA.



10 CFR 1022 contains DOE policy and floodplain environmental review and assessment requirements through the applicable NEPA procedures. In those instances where impacts of actions in floodplains are not significant enough to require the preparation of an Environmental Impact Statement (EIS) under NEPA, alternative floodplain evaluation requirements are established through the INL Site Environmental Checklist process.

For the Big Lost River, DOE-ID has accepted the *Big Lost River Flood Hazard Study* (Bureau of Reclamation 2005). This flood hazard report is based on geomorphological models and has undergone peer review. All activities on the INL Site requiring characterization of flows and hazards are expected to use this report. For facilities at Test Area North, the 100-year floodplain has been delineated in a U.S. Geological Survey report (USGS 1997).

2.4.5 Executive Order 11990, Protection of Wetlands

Executive Order 11990 requires each federal agency to issue or amend existing regulations and procedures to ensure wetlands are protected in decision making. It is the intent of this Executive Order that federal agencies implement wetland requirements through existing procedures, such as those established to implement NEPA. The 10 CFR 1022 regulations contain DOE policy and wetland environmental review and assessment requirements through the applicable NEPA procedures. In instances where impacts of actions in wetlands are not significant enough to require the preparation of an EIS under NEPA, alternative wetland evaluation requirements are established through the INL Site Environmental Checklist process. Activities in wetlands considered waters of the U.S. or adjacent to waters of the United States may also be subject to the jurisdiction of Sections 404 and 402 of the CWA.

The only areas of the INL Site currently identified as potentially jurisdictional wetland are the Big Lost River corridor and Big Lost River Sinks. The FWS National Wetlands Inventory map is used to identify potential jurisdictional wetlands and non-regulated sites with ecological, environmental, and future development significance. In 2021, no actions took place within potential wetland areas on the INL Site that would require a Jurisdictional Review or Determination to be made by the U.S. Army Corps of Engineers.

2.4.6 Executive Order 14008, Ecological Resource Conservation, Land Use, and Resilience Activities

The purpose of Executive Order 14008, “Tackling the Climate Crisis at Home and Abroad” is to make climate considerations an essential element of U.S. foreign policy and national security planning, and to understand how domestic policy can address the implications of climate change. Overarching goals for domestic policy include strengthening clean air and water protections, holding polluters accountable, delivering environmental justice, and driving the mitigation of climate-related risks in our economy. At INL, several initiatives have been undertaken to address Executive Order 14008. These initiatives include activities as diverse as evaluating infrastructure to identify opportunities to increase efficiency in electricity and water use, assessing the materials supply chain to reduce INL’s carbon footprint, implementing the INL NetZero Plan, and aligning land use/land stewardship objectives with ecosystems resilience and ecosystem services priorities.

With respect to ecological resource conservation, INL implements a number of conservation plans. Land stewardship activities prioritize conserving and restoring native communities to maximize ecosystem services like carbon sequestration. Wildland fire management is an important focus for INL land stewardship, particularly minimizing losses of native plant communities to wildland fire and restoring communities affected by wildland fire to historical ecological function. Another aspect of maintaining healthy, native ecosystems at INL is consistent implementation of the site-wide noxious weed plan. Ecological monitoring activities are conducted to continuously evaluate the condition of natural resources and ensure the local sagebrush steppe ecosystem remains healthy and resilient in its ability to respond to the stresses associated with climate change. See Chapter 9 for a more thorough discussion of the ecological aspects of implementing Executive Order 14008 on the INL Site.

Concerning Site Resiliency, INL is taking actions to bolster adaptation and increase the resilience of DOE-ID facilities and operations. INL is currently working on a number of sustainable actions. For example, in 2021, INL included sustainable acquisition clauses in electronic purchases. These new acquisitions use the Electronic Product Environmental Assessment Tool products to reduce energy use. The most prominent initiative is the INL NetZero Plan, an initiative announced in 2021 to offset any greenhouse gas emissions that are produced from its 357 buildings, 605 vehicles, and



approximately 5,400 employees spread over its roughly 900-square-mile campus. Additionally, INL and ICP Core contractors are updating the Climate Vulnerability Assessment and incorporating all the requirements of the Vulnerability Assessment and Resiliency Plan. These plans intend to assess vulnerabilities, implement solutions, institutionalize climate adaptation across policies, provide climate adaptation tools, and deploy merging climate technologies. The performance status of current sustainable activities and further details of new initiatives are further discussed in Chapter 3.

2.5 Cultural Resources Protection

INL Site cultural resources are numerous and represent at least 13,000 years of human land use in the region. DOE provides leadership in the preservation of precontact, historic, and other cultural resources on the lands it administers in a spirit of stewardship for the future as outlined in various federal preservation laws, regulations, and guidelines, such as the National Historic Preservation Act and the Archaeological Resources Protection Act, and the National Environmental Policy Act. These resources are nonrenewable, bear valuable physical and intangible legacies, and yield important information about the past, present, and perhaps the future. There are special challenges associated with balancing the preservation of these sites with the management and ongoing operation of an active scientific laboratory. DOE-ID is committed to a cultural resource management program that accepts these challenges in a manner reflecting both the spirit and intent of the legislative mandates. In 2004, DOE-ID entered into a Programmatic Agreement with the Idaho State Historic Preservation Office and Advisory Council on Historic Preservation (DOE-ID 2004). The Programmatic Agreement required development of the INL Cultural Resource Management Plan to govern a tailored approach for compliance with Section 106 of the National Historic Preservation Act (NHPA) for all INL Site undertakings. DOE-ID works with INL's Cultural Resource Management Office (CRMO) on the implementation of a cultural resource management program for the INL Site. Cultural resource professionals within the INL Cultural Resource Management Office coordinate cultural resource-related activities at the INL Site and implement the INL Cultural Resource Management Plan (DOE-ID 2016) with oversight by DOE-ID's Cultural Resource Coordinator. DOE-ID continues to work with the Shoshone-Bannock Tribes under the 2017 Agreement in Principle for government-to-government consultation and participation on cultural resources field surveys. The Tribes play a critical role in identifying, evaluating, and protecting cultural resources on the INL Site. Through the Shoshone-Bannock Heritage Tribal Office, Tribal cultural resource staff perform archaeological inventories with the INL CRMO for NHPA Section 106 and 110, serve as reviewers and co-authors in research proposals and publications, monitor work performed in sensitive archaeological areas, perform annual monitoring of cultural resource sites, lead tours of Tribal members of INL Site resources, provide cultural resource awareness training to INL Site personnel, and participate in meetings of the INL Site Cultural Resource Working Group.

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