# CHAPTER 2

Operations at the Idaho National Laboratory (INL) Site are subject to numerous federal and state environmental statutes, regulations, executive orders, and United States (U.S.) Department of Energy (DOE) directives. 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 were issued to the INL Site, primarily by the state of Idaho (see Table 2-5).

There was one reportable environmental spill at the INL Site during 2024, as discussed in Subsection 2.5.1.

In 2024, the U.S. Department of Energy, 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. The environmental compliance status for 2024 at the INL Site is provided in Table 2-1.

## 2. ENVIRONMENTAL COMPLIANCE SUMMARY

This chapter presents the compliance status for operations at the INL Site and DOE-ID programs that are subject to federal and state environmental protection requirements, such as statutes, regulations, acts, agreements, executive orders, and DOE directives.

### 2.1 Enforcement and Compliance History Online Database

The U.S. Environmental Protection Agency (EPA) developed the Enforcement and Compliance History Online website that provides integrated compliance and enforcement that can be used to search and view information on permit data, inspection dates and findings, violations, enforcement actions, and penalties assessed for INL Site operations. The Enforcement and Compliance History Online website also allows users to sort and analyze data in many ways, according to their individual needs.

### 2.2 Compliance with Requirements

INL Site activities must adhere to environmental standards established by federal, state, and local regulations; DOE directives, permits, and compliance; and settlement agreements where applicable. The EPA and Idaho Department of Environmental Quality (DEQ) are the principal regulating agencies that issue permits, review compliance reports, and participate in joint monitoring programs, inspect facilities and operations, and enforce compliance with applicable requirements as identified in Table 2-1. The 2024 status of active Waste Area Groups (WAGs) are shown in Table 2-2.

*Table 2-1. Federal, state, and local laws and regulations established for protection of human health and the environment.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| **AIR QUALITY AND PROTECTION** | | |
| ***40 Code of Federal Regulations (CFR) 61, "National Emission Standards for Hazardous Air Pollutants," 42 USC 7401 et seq.***<br>These standards are the basis for national air pollution control. Emissions of radioactive hazardous air pollutants are regulated by the EPA. | The EPA has not delegated the 40 CFR Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities," regulations, and is the primary agency to which DOE-ID reports compliance. The Idaho DEQ incorporates the requirements of the subpart into the Sitewide Permit To Construct (PTC)-Facility Emissions Cap (FEC) and is therefore included in all reporting and noncompliance occurrences. The INL Site is in compliance, as reported in the compliance report, "National Emission Standards for Hazardous Air Pollutants – Calendar Year 2024" (INL 2025a). | 4.2<br>4.3<br>8.2.1 |
| ***40 CFR 84, "Phasedown of Hydrofluorocarbons"***<br>In October 2021, the EPA issued regulations to decrease hydrofluorocarbon (HFC) production over the next 15 years, thereby decreasing the supply. HFCs were developed and manufactured to replace chlorofluorocarbons (CFCs), which damage the stratospheric ozone layer. The use of HFCs include refrigerants, solvents, fire suppressants, and aerosols. Through these regulations, the 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. In October 2023, the EPA issued regulations to restrict the use of some HFCs in specific applications; compliance dates vary depending on the application. In October 2024, the EPA issued HFC management regulations; the compliance date is January 1, 2026. | A summary of the INL Site contractors' HFC uses, replacements, procurement, and proactive measures taken as a result of the HFC phasedown can be found in Subsection 4.5. The INL contractor issued a program description document to implement the HFC use restrictions and is working on implementing the HFC management regulations as discussed in Subsection 4.5. | 4.5 |
| ***Clean Air Act (1970), 42 USC 7401 et seq.***<br>The Clean Air Act (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 | Idaho DEQ has been delegated authority to implement the CAA through the development of an EPA-approved state implementation plan and is codified in Idaho Administrative Code, "Rules for the Control of Air Pollution in Idaho" (IDAPA 58.01.01). DOE-ID holds a synthetic minor, Sitewide, air quality permit from Idaho | 4.3<br>8.2 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| addition to the EPA, states, tribes, and local governments play a key role in implementation of the CAA.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• 40 CFR 50, "National Primary and Secondary Ambient Air Quality Standards." | DEQ. This PTC contains an FEC component that enforces a limit on the emissions of criteria air pollutants (CAP) and hazardous air pollutants to less than major source thresholds. Without the synthetic limits on Sitewide CAP emissions, the INL Site would be considered a major source for CAP emissions and would require a Tier I/Title V permit. This permit covers all non-exempt air emission sources located on the INL Site but does not cover air-emitting sources located at the Research and Education Campus (REC) in Idaho Falls, Idaho. All air emission sources located at the REC were determined to be minor and were exempted from the permitting requirements in IDAPA 58.01.01. As reported in the annual compliance report required by the PTC-FEC, the INL Site emitted CAP and hazardous air pollutants were below the permitted limits in 2024.<br>Idaho DEQ performed an air quality inspection of the Material and Fuels Complex (MFC) on April 15, 2024. Sources inspected were found to be in compliance. There were no Idaho DEQ CAA inspections at Idaho Cleanup Project (ICP) facilities in 2024. | |
| **CULTURAL AND ENVIRONMENTAL RESOURCES PROGRAMS** | | |
| ***Endangered Species Act* (1973), 16 USC 1531-1544**<br>The Endangered Species 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.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• 50 CFR 17, "Endangered and Threatened Wildlife and Plants"<br>• 50 CFR 226, "Designated Critical Habitat"<br>• 50 CFR 402, "Interagency Cooperation – Endangered Species Act of 1973, as Amended"<br>• 50 CFR 424, "Listing Endangered and Threatened Species and Designating Critical Habitat" | There are currently no resident INL Site species listed as threatened or endangered under the Endangered Species Act and there is no designated critical habitat on the INL Site. In 2014, DOE-ID entered into a voluntary candidate conservation agreement with the U.S. Fish and Wildlife Service (USFWS) to conserve and protect Greater sage-grouse and their sagebrush habitat on the INL Site prior to the USFWS determining the species was not warranted for listing. In 2024, DOE-ID published an annual report of Greater sage-grouse and sagebrush monitoring activities and held an annual meeting with the USFWS and other stakeholders to discuss the report and progress toward achieving the conservation objectives.<br>In 2018, DOE-ID produced a Bat Protection Plan for the INL Site and has since produced an annual report providing current information on the conservation of bats and their habitat on the INL Site. The INL Natural Resources Group also conducts ecological research, field surveys, and National Environmental Policy Act (NEPA) evaluations regarding resources on the INL Site. | 9.1.2<br>9.1.3 |

***Table 2-1. continued.***

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| • 50 CFR 450–453, "Endangered Species Exemption Process." | These program activities complied with all requirements. Details of related activities can be found in Chapter 9. | |
| ***Executive Order 11988, "Floodplain Management"***<br>This Executive Order requires federal agencies to consider, evaluate, and avoid to the extent possible, adverse impacts associated with the occupancy and modification of floodplains, to reduce the risk of flood loss, to minimize the impacts of flood on human safety, health, and welfare, and to restore and preserve the natural and beneficial values of floodplains.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• 10 CFR 1022, "Compliance with Floodplain and Wetland Environmental Review Requirements." | It is the intent of EO 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 Compliance Permit (ECP) process.<br>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 the characterization of flows and hazards are expected to use this report.<br>A 1996 study entitled, "Estimated 100-Year Peak Flows and Flow Volumes in the Big Lost River and Birch Creek at the Idaho National Engineering Laboratory, Idaho" (Kjelstrom and Berenbrok 1996), was conducted by the U.S. Geological Survey. This study provided an estimated extent of the 100-year floodplain for the Big Lost River (BLR) and Birch Creek on the INL Site. Test Area North (TAN) was the facility included in this study. A few years later, another study was completed by the Bureau of Reclamation on the INL Site entitled, "Big Lost River Flood Hazard Study" (Ostenaa and O'Connell 2005). The objective of this study was to develop probabilistic flood-stage estimates for specific facility locations at the Idaho Nuclear Technology and Engineering Center (INTEC) and Test Reactor Area (TRA). According to the study, the Central Facilities Area (CFA) and MFC are not within the 100-year or 500-year floodplain of the BLR. The probabilistic flood-stage estimates created from this study are to be used for all future BLR flood hazard-characterization efforts for INTEC and TRA. Together, the above-mentioned studies are to be used to characterize and identify the floodplains for their respective facilities on the INL Site. | N/A |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| ***Executive Order 11990, "Protection of Wetlands"***<br>This Executive Order requires federal agencies to identify potential impacts on wetlands resulting from proposed activities and to minimize the destruction, loss, or degradation of wetlands and preserve and enhance the natural and beneficial values of wetlands. | The only areas of the INL Site currently identified as potentially jurisdictional wetland are the BLR corridor and BLR Sinks. The USFWS National Wetlands Inventory Map is used to identify potential jurisdictional wetlands and non-regulated sites with ecological, environmental, and future development significance.<br>In 2024, there were no reviews or evaluations performed by the U.S. Army Corps of Engineers for the INL Site. No new actions have taken place within potential wetland areas on the INL Site that would require additional review by the U.S. Army Corps of Engineers or an update to an existing jurisdictional determination. | |
| ***Executive Order 13751, "Safeguarding the Nation from the Impacts of Invasive Species"***<br>This Executive Order calls on federal agencies to prevent the introduction, establishment, and spread of invasive species, as well as to eradicate and control populations of invasive species that are established.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• Federal Noxious Weed Act (1974), 7 USC 2801<br>• IDAPA 02.06.09, "Rules Governing Invasive Species and Noxious Weeds"<br>• Idaho Statute Title 22, Chapter 19, "The Idaho Invasive Species Act of 2008"<br>• Idaho Statute Title 22, Chapter 24, "Noxious Weeds." | INL Site contractors implement a Sitewide plan for managing invasive species. This Sitewide plan addresses each requirement of federal agencies as outlined in EO 13112, as amended by EO 13751. Additionally, federal agency requirements outlined in the Federal Noxious Weed Act of 1974 and state of Idaho requirements related to invasive species and noxious weeds are met with compliance of EO 13112, as amended by EO 13751. For more details on how this plan is carried out and how the requirements are met, see Subsection 9.4.3. | 9.4.3 |
| ***Migratory Bird Treaty Act (1918), 16 USC 703-712***<br>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. 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 for mission-critical activities if all other means to prevent such take were explored and/or exhausted. DOE-ID and INL Site contractors also have permits from the Idaho Department of Fish and Game (IDFG) to manage migratory birds and collect other wildlife specimens for scientific research. All stipulated reporting requirements were met for 2024. | 7.1.3 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| *Other environmental statutes and regulations apply, in whole or in part:*<br>• EO 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds"<br>• Bald and Golden Eagle Protection Act (1940), 16 USC 668-668d<br>• Idaho Statute Title 36, Chapter 1, Fish and Game Commission, 106 e.5. | | |
| ***National Environmental Policy Act (1969)***<br>The National Environmental Policy Act (NEPA) requires federal agencies to consider the 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.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• 10 CFR 1021, "National Environmental Policy Act Implementing Procedures" | As a federal agency, DOE complies with NEPA requirements as outlined in DOE's "NEPA Implementing Procedures" (10 CFR 1021). DOE fulfills its obligation to comply with NEPA by providing timely and appropriate analysis of proposed activities in accordance with current guidance and implementing regulations. | 9.2.2<br>9.3.1 |
| ***National Historic Preservation Act (NHPA) (1966), as amended, 54 USC 300101 et seq.***<br>The National Historic Preservation Act (NHPA) requires federal agencies to establish programs to identify, record, and protect cultural resources and to assess the impacts of proposed projects on historic or culturally important sites, structures, or objects within the area of potential effect for a proposed project. The NHPA further requires federal agencies to assess archaeological sites, historical buildings, and objects on such | The INL Cultural Resource Management Office (CRMO) works with the DOE-ID Cultural Resource Coordinator to steward archaeological and architectural cultural resources across the INL Site. | 9.5 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| sites to determine their qualification for inclusion in the National Register of Historic Places. In addition, the NHPA requires federal agencies to consult with State Historic Preservation Offices, affected Indian tribes, the Federal Advisory Council on Historic Preservation, and other interested parties, as appropriate, when determining whether the proposed actions would adversely affect properties eligible for listing on the National Register of Historic Places. Compliance is achieved via adherence to Sections 106 and 110 of the NHPA.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• Archaeological Resources Protection Act (1979), 16 USC §470aa-470mm<br>• 36 CFR 79, "Curation of Federally Owned and Administered Archaeological Collections"<br>• 36 CFR 800, "Protection of Historic Properties"<br>• 43 CFR 7, "Protection of Archaeological Resources"<br>• Native American Graves Protection and Repatriation Act (1990), as amended, 25 USC 3001-3013<br>• Protection and Preservation of Traditional Religions of Native American (1996), 42 USC 1996<br>• Religious Freedom Restoration Act (1993), 42 USC §200bb-200bb4<br>• EO 13007, "Indian Sacred Sites"<br>• EO 13175, "Consultation and Coordination with Indian Tribal Governments." | | |
| **HAZARDOUS MATERIALS AND WASTE MANAGEMENT** | | |
| ***Comprehensive Environmental Response, Compensation, and Liability Act (1980), (amended by the Superfund*** | 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. | Table 2-2<br>6.5 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| ***Amendments and Reauthorization Act [SARA]), 40 CFR 300, 42 USC 9601 et seq.***<br>The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) provides the process to assess and remediate areas contaminated by the release or threat of release of chemically hazardous, radioactive substances, or both.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• 40 CFR 300, "National Oil and Hazardous Substances Pollutant Contingency Plan." | DOE-ID, Idaho DEQ, and the EPA Region 10 signed the Federal Facility Agreement and Consent Order (FFA/CO) in December of 1991 (DOE 1991).<br>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 ten WAGs as a result of the FFA/CO, and each WAG is further divided into smaller cleanup areas called operable units (OUs). Field investigations are used to evaluate potential release sites within each WAG and OU 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 with Institutional Controls" listing is possible, or whether it is appropriate to proceed with an "Interim Cleanup Action," the "OU 10-08 Plug-In Remedy Action," or further investigation using a remedial investigation/feasibility study (RI/FS). Results from an 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. Following the consideration of public comments, DOE, EPA, and Idaho DEQ develop a ROD that selects a cleanup approach from the alternatives evaluated. Cleanup activities can then be designed, implemented, and completed.<br>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 scheduled RODs were signed and are being implemented or were completed. Comprehensive RI/FSs were completed for WAGs 1–5, 7–9, and 6/10 (6 is combined with 10). Active remediation is completed at WAGs 2, 4, 5, 6, 8, and 9. Institutional controls (ICs) and operations and maintenance (O&M) activities at these sites (except for WAG 8, which is managed by the Naval Reactors Facility [NRF]) are ongoing and will continue to be monitored under the "Site-wide Institutional Controls and Operations and Maintenance Plan for CERCLA Response Actions" (DOE-ID 2024a). The status of ongoing active remediation activities at WAGs 1, 3, 7, and 10 are described in Table 2-2. | |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| | Documentation associated with the remedial actions and other removal actions are publicly available in the CERCLA Administrative Record.<br><br>Decontamination and decommissioning activities also are performed at the INL Site in accordance with CERCLA (42 USC 9601 et seq.), as amended by the "Superfund Amendments and Reauthorization Act of 1986" (Public Law 99-499), and in accordance with the "National Oil and Hazardous Substances Pollutant Contingency Plan" (40 CFR 300). Decontamination and decommissioning activities are consistent with the joint DOE and EPA "Policy on Decommissioning of Department of Energy Facilities Under the Comprehensive Environmental Response, Compensation, and Liability Act" (DOE and EPA 1995), which establishes the CERCLA non-time-critical removal-action process as an approach for decommissioning pursuant to CERCLA, Section 104(a), and EO 12580, "Superfund Implementation," as recognized by Section 5.3 of the FFA/CO (DOE 1991). In accordance with 40 CFR 300.415(j) and DOE guidance, INL Site removal actions conducted under CERCLA are required to meet applicable or relevant and appropriate requirements to the extent practicable considering the exigencies of the situation. This approach satisfies environmental review requirements and provides for stakeholder involvement, while providing a framework for selecting the decommissioning alternative. | |
| ***DOE Order 435.1***<br>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.<br><br>These DOE directives ensure that radioactive waste management activities are systematically planned, documented, | INL Site contractors manage all radioactive waste generated at INL facilities. The Waste Management Program provides the structure for integrating/dispositioning radioactive waste and is the lead organization for ensuring compliant cradle-to-grave waste management of containerized waste as described in PDD-17000, "Waste Management Program," (INL 2025b). INL Site contractors maintain facility-specific Radioactive Waste Management Basis documents to demonstrate DOE O 435.1 compliance.<br><br>INL Site contractors manage all hazardous waste, mixed low-level waste, LLW, TRU waste, HLW, remote-handled waste, recyclable waste, waste with no identified path to disposal, industrial waste, Toxic Substances Control Act (TSCA) waste, CERCLA waste, and universal waste streams that are generated and stored at the INL Site, and approved offsite-INL waste streams. Management activities include, but are not limited to, controls for waste characterization, waste certification, waste acceptance criteria compliance, storing waste, treating waste, | 2.4<br>4.4<br>5.3<br>6.6 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| executed, and evaluated. Specifically, the Order and the manual:<br>• Establish requirements to implement DOE regulating authority and responsibilities for radioactive waste management<br>• Define DOE radioactive waste types: (1) high-level waste (HLW), (2) transuranic (TRU) waste, and (3) low-level waste (LLW)<br>• Emphasize management for disposal and establish requirements for waste characterization, waste certification, and waste acceptance criteria<br>• Identify performance-based requirements<br>• Require life cycle management (i.e., from generation planning to disposal)<br>• Rely on existing nuclear safety philosophies (e.g., Integrated Safety Management System, graded approach, defense-in-depth)<br>• Require a DOE-approved Radioactive Waste Management Basis to ensure hazards were identified, analyzed, and mitigated. | and transporting and disposing of waste. The overall responsibility for managing waste at INL contractor facilities resides in the INL contractor's Waste Management Programs organization, according to LWP-17000, "Waste Management." The ICP contractor manages waste that is generated and stored at ICP facilities and approved offsite waste streams per PDD-234, "Waste Management Program." All waste management activities described herein are conducted in compliance with all applicable provisions of DOE O 435.1.<br>The ICP uses DOE M 435.1-1, Change 2, to meet contractual requirements. The contract will be updated in the future to reflect Change 3.<br>See Table 2-3 for information on wastes managed at the INL Site by INL Site contractors.<br>See Table 2-3 for the status of each phase of the LLW management process for facilities managed at the INL Site by INL Site contractors. | |
| ***Federal Facility Compliance Act of 1992, as amended.*** Enacted by Congress on October 6, 1992, the Federal Facility Compliance Act amends Section 6001 of the Resource Conservation and Recovery Act of 1976 (RCRA) to specify that the U.S. waives sovereign immunity from civil and administrative fines and penalties for RCRA violations.<br>In addition, the RCRA requires the EPA to conduct annual inspections of all federal facilities. Authorized states are given the authority to conduct inspections of federal facilities to enforce compliance with state hazardous waste programs. | INL Site contractors manage all mixed waste generated at their respective facilities. The Waste Management Program is the lead organization for ensuring compliant cradle-to-grave management of INL containerized mixed waste as described in PDD-17000, "Waste Management Program." Waste Management at ICP facilities is described in PDD-234, "Waste Management Program." INL Site contractors maintain facility-specific Radioactive Waste Management Basis documents to demonstrate DOE O 435.1 compliance. DOE-ID submitted the FY 2025 "Site Treatment Plan Annual Update and FY 2024 Site Treatment Plan Annual Report" to Idaho DEQ in November 2024 in accordance with Subsections 2.3.3 and 2.3.4. DOE-ID and INL Site contractors met quarterly with | 2.3 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| DOE-ID is required to submit and receive approval of the INL Site Treatment Plan from Idaho DEQ. | Idaho DEQ to discuss the status of milestones, treatment projects, and other activities conducted under the Site Treatment Plan. | |
| ***Federal Insecticide, Fungicide, and Rodenticide Act (1996), 7 USC 136 et seq.***<br>The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is the federal statute that governs the registration, distribution, sale, and use of pesticides in the U.S. The FIFRA regulations found in 40 CFR Parts 150–189 are promulgated and administered by the EPA.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• IDAPA 02.03.03, "Rules Governing Pesticide and Chemigation Use and Application"<br>• Idaho Statute Title 22, Chapter 34, "Pesticides and Chemigation." | All pesticide applications on the INL Site are conducted in accordance with the specific pesticide label instructions in accordance with the FIFRA. Additionally, all appropriate records associated with pesticide applications are kept for a minimum of three years by each pesticide applicator in accordance with IDAPA 02.03.03. For details on pesticide application on the INL Site, see Subsection 9.4.3. | 9.4.3 |
| ***Resource Conservation and Recovery Act (1976), 40 CFR 259-282, 42 USC 6901 et seq.***<br>The Resource Conservation and Recovery Act (RCRA) established regulatory standards for the generation, transportation, storage, treatment, and disposal of hazardous waste.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• 40 CFR 270.13, "Contents of Part A of the Permit Application"<br>• 40 CFR 262, "Standard Applicable to Generators of Hazardous Waste"<br>• 40 CFR 263, "Standards Applicable to Transporters of Hazardous Waste" | *RCRA Permits:* Form 8700-23, along with maps, drawings, and photographs, as required by 40 CFR 270.13, is included with the Part A permit application (Volume 1), and in each Part A application included with the partial Part B permits. The INL Site currently has one RCRA permit (Volume 1) for the interim status unit, the INTEC Tank Farm Facility (TFF). An interim status unit is a Part A (interim status) unit that has not been RCRA-closed or has not been permitted under a Part B hazardous waste permit application. The INL Part B permits are considered a single RCRA permit that comprises several volumes, all under a single EPA ID number, ID 4890008952. Therefore, each of the Part B Permit volumes is called a partial permit. Each partial Part B Permit includes the Part A application specific to the permitted units in that Part B and the Part B of the RCRA hazardous waste permit that contains detailed, site-specific information and hazardous waste operations as described in the applicable Sections of 40 CFR 262 through 40 CFR 270.27. INL currently has one RCRA post-closure permit. Post-closure permits ensure that appropriate monitoring and maintenance activities will be | N/A |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| • 40 CFR 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities"<br>• 40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities"<br>• 40 CFR 266, "Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities"<br>• 40 CFR 267, "Standard for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit"<br>• 40 CFR 268, "Land Disposal Restrictions"<br>• 40 CFR 270, "EPA Administered Permit Programs: The Hazardous Waste Permit Program"<br>• 40 CFR 273, "Standards for Universal Waste Management"<br>• 40 CFR 279, "Standards for the Management of Used Oil." | conducted on those units/land disposal units that leave hazardous waste in place closure (i.e., cannot clean close).<br><br>*RCRA Reports.* As required by Idaho DEQ, the INL Site submitted the 2024 Idaho Hazardous Waste Generator Annual Report (Reno [CCN 333874]) on the types and quantities of hazardous wastes generated, shipped for treatment and disposal, and remain 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 Idaho DEQ by March 1 of every even-numbered year for the previous calendar year. The biennial report was submitted to EPA via the electronic RCRA Info Industry Application. The biennial report was not to be submitted in 2024.<br><br>In addition, small and large quantity generators of hazardous waste are required to report to DEQ annually the types and quantities of hazardous waste generated and shipped in the last year, the types and quantity of waste currently stored on the INL Site, and the waste shipped and treated in Idaho or out of state. Operators of hazardous waste disposal facilities must also report annually on the types and quantities of received wastes generated in Idaho or out of state. Reports are due to Idaho DEQ by January 31 each year. The annual report was submitted to Idaho DEQ in 2024 (CCN 333874).<br><br>*RCRA Closure Plan.* No RCRA INL Site facilities were closed in 2024.<br><br>*RCRA Inspection.* For 2024, Idaho DEQ performed a RCRA inspection from May 20–23, 2024. On July 1, 2024, Idaho DEQ issued a warning letter to DOE-ID and the ICP related to two previously self-disclosed events resulting in permit noncompliances noted by Idaho DEQ during the May inspection.<br><br>*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 the use of the INTEC interim status 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 $2,190,000 for the period of | |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
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| | noncompliance from March 31, 2023, to March 30, 2024. Supplemental environmental projects were utilized in lieu of the original payment. | |
| **OTHER ENVIRONMENTAL REQUIREMENTS** | | |
| ***DOE Order 231.1B, "Environmental, Safety, and Health Reporting," Change 1***<br>Environmental, Safety, and Health Reporting requires the timely collection and reporting of information on environmental issues that could adversely affect humans and the safety of the public and the environment at DOE sites.<br>*Other environmental statutes, regulations, and directives apply, in whole or in part:*<br>• DOE O 458.1, Change 4, "Radiation Protection of the Public and the Environment." | This report, "2024 Idaho National Laboratory Annual Site Environmental Report," fulfills DOE O 231.1B, the radiation protection requirements of DOE O 458.1, and documents and communicates the environmental performance to members of the public living near the INL Site and to other interested parties. | All chapters |
| ***DOE Order 232.2A, "Occurrence Reporting and Processing of Operations Information"***<br>In accordance with DOE O 232.2A, the INL Site ensures DOE personnel are notified of events that could adversely affect the health and safety of workers, the public, the environment, DOE's missions, or DOE credibility. Events are provided with report levels (e.g., High, Low, Informational) to reflect the impact associated with a given occurrence in terms of health, safety, and security. INL has a Tailoring Agreement in place that allows reporting most Informational events to DOE-ID through the INL issues management software (LabWay). Other events are also reported to DOE Headquarters through the Occurrence Reporting and Processing System (ORPS). | From January 1, 2024, to December 31, 2024, INL Site contractors did not report any events related to an environmental release under ORPS criteria in Group 5 – Environmental. | N/A |
| ***Emergency Planning and Community Right-to-Know Act (1986), 42 USC 11001, et seq.***<br>The Emergency Planning and Community Right-to-Know Act (EPCRA) was created to help communities plan for emergencies involving hazardous substances. The Act helps | The INL Site's 2024 compliance with key EPCRA provisions is summarized below:<br>• *Section 304: Extremely Hazardous Substance Release Notification*. There were no CERCLA-reportable chemicals released at the INL Site during 2024. | 2.5.1 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| 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.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• IDAPA 58.01.02.851, "Petroleum Release Reporting, Investigation, and Confirmation." | • 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).<br>• *Section 311-312: Safety Data Sheet/Chemical Inventory*. Extremely hazardous substances, such as cyclohexylamine, nitric acid, nitrogen dioxide, and sulfuric acid were among the chemicals reported in 2024.<br>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 also are 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 REC facilities that exceed regulatory thresholds. In 2024, the chemical inventory report included 84 individual chemicals at INL Site facilities and seven at REC facilities. The INL Site also stores extremely hazardous substances, a category of chemicals that could cause serious irreversible health effects from accidental releases.<br>• *Section 313: Toxic Chemical Release Inventory Reporting*. The INL Site submitted Toxics Release Inventory Forms for chromium, lead, mercury, naphthalene, nickel, nitrate compounds, and nitric acid to the EPA by the regulatory due date of July 1.<br>• 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 | |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| | EPCRA 313 reporting include transfers to waste treatment and disposal facilities off the INL Site, air emissions, recycling, and other activities.<br>• *Reportable Environmental Releases*. The INL Site contractor had one reportable spill in 2024. See Subsection 2.5.1. | |
| **RADIATION PROTECTION** | | |
| ***DOE Order 458.1, Change 4, "Radiation Protection of the Public and the Environment"***<br>The Order was established to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE and DOE contractors. | 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 2024. The annual dose to the maximally exposed individual in 2024, as determined using CAA Assessment Package 88-PC, was 0.029 mrem (0.29 µSv).<br>The "Derived Concentration Technical Standard" (DOE 2022) supports the 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, represent the concentration of a given radionuclide in either water, milk 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 or milk, (2) submersion in air, and (3) inhalation.<br>Measurements of radionuclides in environmental media sampled on and around the INL Site were all below applicable Derived Concentration Standards.<br>DOE O 458.1 specifies the limits for unrestricted release of property to the public. INL Site contractors use a graded approach for the 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 controlled areas and includes the following:<br>• Personal items or materials<br>• Documents, mail, electronic storage media, and other office media<br>• Paper, cardboard, plastic products, aluminum beverage cans, toner cartridges, and other items for recycling<br>• Office trash | Chapter 4<br>Chapter 5<br>Chapter 6<br>Chapter 7<br>Chapter 8<br>Appendix A |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| | • Non-radiological area housekeeping materials and associated waste<br>• Breakroom, cafeteria, and medical wastes<br>• Medical and bioassay samples<br>• Other items with an approved release plan.<br><br>Items originating from radiological areas within the INL Site's controlled areas not in listed categories are either surveyed prior to release to the public, or a process knowledge evaluation is conducted to verify the item 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).<br><br>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 also are 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 this material is not released with inadvertent contamination.<br><br>All INL Site contractors complete material surveys prior to release and transport to the state-permitted landfill at CFA. 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. DOE-ID, using a graded approach, provides oversight of the INL clearance processes.<br><br>For 2024, the INL contractor had 1,326 releases of personal property items with over 99% of these releases being for reuse at INL (i.e., instruments for calibration, miscellaneous tools, and equipment). Those that were not released for reuse were released for appropriate disposal.<br><br>The ICP contractor had 1,509 releases of personal property items. Those that were not released for reuse were released for appropriate disposal. The ICP contractor diverted 1,395,272 lbs of mixed-metal scrap from onsite landfills in 2024 by sending it to an offsite recycling facility. The scrap metal was accumulated during the deactivation and decommissioning of the Submarine First Generation | |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| | Westinghouse (S1W) and Aircraft Carrier First Generation Westinghouse (A1W) prototypes at the NRF. Before their release, these materials were characterized to ensure they were not hazardous waste and that they were deemed free of radioactive contamination based on surveys performed by Radiological Protection personnel.<br><br>On January 12, 2000, the Secretary of Energy established a DOE moratorium on the unrestricted release of all volumetrically contaminated metals.<br><br>On July 13, 2000, DOE suspended "the unrestricted release for recycling of scrap metal from radiological areas within DOE facilities" (DOE Secretarial Memorandum: Release of Surplus and Scrap Materials; Memorandum from Bill Richardson to Heads of Departmental Elements).<br><br>The moratorium and suspension on the release of metals from DOE sites remained in effect through the end of 2024. INL Site contractors continued to follow the requirements outlined in the applicable Secretarial Memorandums during that time. No scrap metal directly released from radiological areas is recycled. However, the moratorium was officially rescinded in 2025, as documented in the Federal Register.<br><br>On December 14, 2023, DOE-ID approved the use of American National Standards Institute (ANSI)/Health Physics Society (HPS) N13.12, ""Surface and Volume Radioactivity Standards for Clearance" and Comparison with Existing Standards" (PNNL-13484), at INL as volumetric radioactivity screening levels for clearance of personal property and as pre-approved authorized limits. INL did not release any items under this new program in 2024. | |
| ***Toxic Substance Control Act* (1976), 15 USC 2601 et seq.**<br>The Toxic Substance Control Act (TSCA), which is administered by the EPA, requires the regulation of production, use, or disposal of chemicals. The TSCA supplements sections of the CAA, Clean Water Act (CWA), and Occupational Safety and Health Act.<br><br>*Other environmental statutes and regulations apply, in whole or in part:* | Because the INL Site does not produce chemicals, compliance with TSCA is primarily directed toward the use and management of certain chemicals—particularly polychlorinated biphenyls (PCBs)—and toward recently published EPA-use restrictions on certain chemicals under TSCA Section 6. These chemicals include methylene chloride, carbon tetrachloride, perchloroethylene, and trichloroethylene. The EPA is in the process of performing a risk analysis and writing proposed regulations for other chemicals. The INL Site manages radioactive mixed waste containing PCBs received from other DOE sites many years ago for disposal. Environmental remediation activities include the | N/A |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| • 40 CFR 761, Subpart J, "General Records and Reports." | reprocessing of these waste materials for disposition offsite. 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.<br><br>The INL contractor manages TSCA Risk-Based Disposal Approvals (RBDAs) at the Advanced Test Reactor (ATR) Complex, which establishes an agreement with the EPA to properly dispose of and/or decontaminate PCB waste in accordance with 40 CFR 761. TSCA RBDAs are situational based off discovery with the intention of minimizing risk to human health and the environment. TRA-641 was developed to address painted surfaces in the empty canal under 40 CFR 761.62(c) for paint, and under 40 CFR 761.61(c) for PCBs, that may have penetrated the concrete. TRA-619 was developed to address short-term cleanup and disposal of applied PCB paint and interim cleanup of PCBs that have penetrated the concrete flooring from the application of PCB paint under 40 CFR 761.61(c).<br><br>The ICP contractor holds one RBDA, granted by EPA Region 10, which allows for the processing of PCB-contaminated legacy sludge wastes from the Rocky Flats Plant at RWMC. Per 40 CFR 761.20(c)(2)(ii), processing activities that are primarily associated with and facilitate treatment or disposal require TSCA PCB approval. Work performed under this RBDA ensures the waste can be accepted for disposal at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. | |
| **WATER QUALITY AND PROTECTION** | | |
| ***Clean Water Act* (1972), 40 CFR 109-140, 33 USC 1251, et seq.**<br>The Clean Water Act (CWA) 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 the EPA, as well as regulating water quality standards for surface water. The CWA also provided for the National Pollutant Discharge Elimination System permit | Idaho DEQ is authorized by EPA as the permitting authority over the National Pollutant Discharge Elimination System program. The Idaho DEQ program is called the Idaho Pollutant Discharge Elimination System (IPDES). INL Site 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. On March 15, 2023, the city of Idaho Falls notified INL that, based on a review of INL's flow data, sampling data, | 5.1 |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| program, requiring permits for discharges into regulated surface waters.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• IDAPA 58.01.16, "Wastewater Rules"<br>• IDAPA 58.01.25, "Rules Regulating the Idaho Pollutant Discharge Elimination System Program." | water savings, and low pollutant levels, the city no longer considers the INL Research Center to be a significant industrial user and a permit is no longer required for discharge into the city of Idaho Falls' publicly owned treatment works (Henricksen 2023). | |
| ***Idaho Reuse Permits***<br>Idaho defines recycled water as water that has been treated by a wastewater treatment system and is used in accordance with the Recycled Water Rules.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• IDAPA 58.01.11, "Ground Water Quality Rule"<br>• IDAPA 58.01.16, "Wastewater Rules"<br>• IDAPA 58.01.17, "Recycled Water Rules." | 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.<br>Recycled water is wastewater effluent that is treated, if necessary, and then reused for other purposes. Idaho DEQ encourages reuse, which is the practice of using recycled water for irrigation, groundwater recharge, landscape impoundments, toilet flushing in commercial buildings, dust control, and other beneficial uses.<br>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. Idaho DEQ issues these permits in accordance with IDAPA 58.01.11, IDAPA 58.01.16, and IDAPA 58.01.17. The following facilities have reuse permits at the INL Site:<br>• ATR Complex Cold Waste Ponds (I-161-03)<br>• INTEC Percolation Ponds (M-130-07)<br>• MFC Industrial Waste Pond (I-160-02).<br>Idaho DEQ inspected the INL Site contractors reuse systems in April 2024. All reuse systems at the INL Site were operated in substantial compliance with permit requirements during 2024. | Chapter 5<br>Chapter 6<br>Appendix A |

*Table 2-1. continued.*

| REGULATORY PROGRAM DESCRIPTION | 2024 COMPLIANCE STATUS | REPORT SECTIONS |
|---|---|---|
| ***Safe Drinking Water Act* (1974), 40 CFR 141, 40 CFR 143, 42 USC 300f, et seq.**<br>The Safe Drinking Water Act establishes primary standards for public water supplies to ensure it is safe for consumption.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• 40 CFR 141, "National Primary Drinking Water Regulations"<br>• 40 CFR 143, "Other Safe Drinking Water Act Regulations"<br>• IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems." | INL Site drinking water complied with all applicable federal and state water quality standards in 2024. Eleven potable water systems are permitted by Idaho DEQ. Each potable water system is sampled according to a monitoring cycle that identifies specific contaminants and sampling frequency, ranging from monthly, quarterly, or once every 1, 3, 6, or 9 years.<br>In addition to regulatorily required sampling, INL Site contractors performed additional surveillance monitoring for bacteriological contaminants, radiological contaminants, and per- and poly-fluoroalkyl substances in 2024.<br>Idaho DEQ conducted sanitary surveys of the Critical Infrastructure Test Range Complex, the Experimental Breeder Reactor I (EBR-I), the Gun Range, and the Main Gate public water systems in 2024. No significant deficiencies were found at any of these locations. | Chapter 6 |
| **QUALITY ASSURANCE** | | |
| ***10 CFR 830, Subpart A, "Quality Assurance Requirements"***<br>10 CFR 830 establishes quality assurance requirements for contractors conducting activities, including providing items or services that affect, or may affect, the nuclear safety of DOE nuclear facilities.<br>*Other environmental statutes and regulations apply, in whole or in part:*<br>• DOE O 414.1D, Change 2, "Quality Assurance." | Quality assurance and quality control programs for environmental surveillance monitoring were maintained in 2024 by INL Site contractors and laboratories performing environmental analyses. These results are summarized in Chapter 10, Subsection 10.4. Field sampling elements, laboratory measurements, and performance evaluation samples were reviewed and evaluated for each INL contractor laboratory. Together, this information was used to assess the quality of data provided to INL Site contractors, and to follow-up and/or conduct corrective action to improve processes when necessary. This multifaceted approach to quality assurance and quality control added value to each INL Site contractor's monitoring program by providing confidence that all laboratory data reported in this report are reliable and of acceptable quality. | Chapter 10 |

*Table 2-2. Status of active WAGs (2024).*

| WAG | FACILITY | STATUS |
|---|---|---|
| 1 | Test Area North (TAN) | Groundwater cleanup of trichloroethene for OU 1-07B continued through 2024 in accordance with EPA- and Idaho DEQ-approved plans (DOE-ID 2022a, 2022b). 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 (ISB) 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 TAN will continue. Two ISB injection wells were constructed in 2015 to further ISB efforts, while one monitoring well was constructed in 2017 to better monitor the plume at its distal edge. During 2021, one ISB injection well was constructed, and further ISB continues in a specific area where previous efforts had not achieved the desired reduction in contaminant levels. All ICs and O&M requirements were maintained during 2024 (DOE-ID 2025a). |
| 2 | Advanced Test Reactor (ATR) Complex | The ATR Complex, formerly known as the Reactor Technology Complex and, before that, the TRA, was established in the early 1950s to study the effects of radiation on materials, fuels, and equipment. To aid in this research, several facilities were constructed, including three test reactors: the Materials Test Reactor (1952 to 1970), the Engineering Test Reactor (1957 to 1982), and the ATR (1967 to present). Some operations at the ATR Complex released radioactive and nonradioactive contaminants. Consequently, the ATR Complex was designated as WAG 2 under the FFA/CO (DOE 1991), which further divided WAG 2 into 13 OUs that contain a total of 55 release sites. OU 2-13 is the only remaining OU where remedial actions are active. OU 2-13 is the comprehensive investigation of WAG 2, the ATR Complex. Remediation is complete at the ATR Complex, except for groundwater and perched-water monitoring under an OU-specific monitoring plan (DOE-ID 2016b). No analytes exceeded EPA maximum contaminant levels in the aquifer in October 2024 (DOE-ID 2025b). All ICs and O&M requirements were maintained in 2024. |
| 3 | Idaho Nuclear Technology and Engineering Center (INTEC) | The Idaho CERCLA Disposal Facility (ICDF), located southwest of INTEC, disposes of contaminated soils and debris from CERCLA remediation operations for the protection of human health and the environment. Operations and monitoring at the ICDF are carried out in accordance with EPA- and Idaho DEQ-approved plans (DOE-ID 2018a, 2022c, 2023a). The consolidation of waste at ICDF reduces the risk of exposure to contaminants for human and ecological receptors, and the use of an engineered facility with leachate collection protects the underlying Snake River Plain Aquifer. 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 and the Snake River Plain Aquifer are sampled annually; results are sent to the EPA and Idaho DEQ. In 2022, an Explanation of Significant Differences to the OU 3-13 ROD for an Additional Cell at ICDF at the INL Site (DOE-ID 2022c) was approved. The new disposal cell approved through the explanation of significant differences increases the volume of waste that can be disposed of at ICDF through disposal at Cells 1 and 2, as well as through the construction of a third cell, which began in 2023.<br><br>Remedial actions and monitoring required by the WAG 3, OU 3-14 ROD (DOE-ID 2007a) are implemented through EPA and Idaho DEQ-approved plans (DOE-ID 2024b, 2018a). Remedial actions at TFF are designed to reduce water infiltration that could potentially transport contaminants from the vadose zone and perched-water basins to the underlying aquifer. An interim low-permeability asphalt barrier was placed over the western two-thirds of the TFF during 2017 to further reduce infiltration of precipitation water until a final cover is constructed over the TFF after |

*Table 2-2. continued*

| WAG | FACILITY | STATUS |
|---|---|---|
| | | closure of the final four tanks. Perched and groundwater monitoring under and near the TFF will continue until the risk posed by contamination left in place is below target levels. All ICs and O&M requirements were maintained in 2024. |
| 4 | Central Facilities Area (CFA) | CFA was established in the early 1950s to provide centralized support services for INL Site operations, which included the operation of several former landfills. WAG 4 groundwater monitoring consists of two different components: (1) monitoring the CFA landfill, and (2) monitoring of a nitrate plume south of CFA. Wells at the CFA landfills are monitored to determine potential impacts from the landfills, while the nitrate plume south of CFA is monitored to evaluate nitrate trends. In 2024, nitrate was above the EPA maximum contaminant level (10 mg/L-N) in Well CFA-MON-A-002, with a concentration of 13.5 mg/L-N (DOE-ID 2025c). All ICs and O&M requirements were maintained in 2024. |
| 7 | Radioactive Waste Management Complex (RWMC) | The major focus of remedial response actions at RWMC is the Subsurface Disposal Area (SDA), a 97-acre landfill that received radioactive and mixed waste from reactor research operations and Cold War weapons production (see Figure 2-3). Waste was buried in approximately 35 of the 97 acres within 21 unlined pits, 58 trenches, 21 soil vault rows, and on Pad A, which was constructed as an above-grade disposal area that has since been covered with soil.<br><br>The OU 7-13/14 ROD (DOE-ID 2008a) called for exhuming and packaging a minimum of 6,238 $m^3$ (8,159 $yd^3$) of targeted waste from a minimum combined area of 5.69 acres. Targeted waste for retrieval contained TRU elements (e.g., plutonium), uranium, and collocated organic solvents (e.g., carbon tetrachloride). Targeted waste retrieval operations began in 2004 and were completed in 2021. The retrieved targeted waste is packaged, certified, and shipped out of Idaho. A total of 10,417.5 $m^3$ (13,625.58 $yd^3$) of targeted waste was retrieved and packaged for offsite shipment.<br><br>In addition to targeted waste retrieval, the ROD addressed cleanup of the remaining contamination in the SDA through a combination of vapor-vacuum extraction and the treatment of solvent vapors from the subsurface (completed in August 2022; RPT-1904), in situ grouting of specified waste forms containing mobile contaminants (completed in 2010; DOE-ID 2011a), and environmental monitoring, which is ongoing and includes quarterly sampling of solvent vapors in the vadose zone and annual sampling of the Snake River Plain Aquifer in accordance with the respective plans (DOE-ID 2025d; DOE-ID 2025e). Eventually, an evapotranspiration (ET) surface barrier will be constructed over the entire SDA landfill, followed by long-term management and control. The remedial design is complete and current operations at RWMC are focused on preparing the SDA for the construction of the ET surface barrier. |
| 10 | OU 10-04 INL Sitewide Miscellaneous Sites and Comprehensive RI/FS | OU 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 2024, under the Sitewide IC/O&M Plan (DOE-ID 2022d). The fifth Sitewide CERCLA five-year review covering the period from 2020 through 2024 will be finalized in February 2026. The purpose of the CERCLA five-year review is to verify that implemented cleanup actions continue to meet the cleanup objectives documented in the RODs. |
| | OU 10-08 INL Sitewide Groundwater, Miscellaneous | OU 10-08 addresses Sitewide groundwater, miscellaneous sites, and future sites (DOE-ID 2009). Response actions for OU 10-08 are mostly complete, and ongoing activities include groundwater monitoring and evaluating and remediating potential new sites that are discovered. Sampling for OU 10-08 is biennial, and no sampling was performed in 2024. |

*Table 2-2. continued*

| WAG | FACILITY | STATUS |
|---|---|---|
| | Sites, and Future Sites | unacceptable threat to human health or the environment from commingled plumes or along the southern INL Site boundary. |

## 2.3 INL Site Agreements

DOE-ID has four major agreements that contain regulatory commitments and milestones for the INL Site. These major agreements are known as the Federal Facility Agreement and Consent Order (FFA/CO) (DOE 1991), the Site Treatment Plan (DOE-ID 2023b), the Idaho Settlement Agreement (ISA) (DOE 1995), and the Notice of Noncompliance/Consent Order (NON/CO) (CCN 317575).

***Federal Facility Agreement and Consent Order***

Since its inception in 1949, past INL Site activities have resulted in suspected and confirmed releases of contaminants to the environment. As a result, INL was added to the EPA National Priority List of CERCLA Sites in 1989. The FFA/CO is a CERCLA-based legally binding cleanup agreement that was signed in 1991 by Idaho DEQ, the EPA, and DOE.

As a CERCLA Site, DOE conducts risk-based cleanup, which is subject to Idaho DEQ and EPA approval in accordance with the FFA/CO. This means that if a confirmed contaminant release to the soil and/or the groundwater poses an unacceptable risk to either humans or the environment, it requires cleanup or the establishment of controls to keep people, plants, or animals from coming into contact with the waste. If a CERCLA Site poses little to no risk, either limited action or no action is taken.

Since 1991, the EPA, Idaho DEQ, and DOE have signed 25 RODs on individual contaminant release sites and entire facilities at INL. Cleanup actions continue at TAN, INTEC, and RWMC. The FFA/CO subdivided INL into 10 WAGs to facilitate remediation. These groups contain individual sites that are organized into OUs based on proximity or similar characteristics. WAGs 1–9 comprise the major facilities at INL, while WAG 10 encompasses the remaining portions of the INL Site and all INL Sitewide groundwater issues. Each WAG has a comprehensive ROD that addresses human and ecological risk and has actions to restore groundwater within 100 years or protect it.

***Site Treatment Plan***

The Federal Facility Compliance Act of 1992 requires the preparation of plans for the treatment of mixed waste stored or generated at DOE facilities. Mixed waste contains both hazardous and radioactive components. The Federal Facility Compliance Act Consent Order and Site Treatment Plan was finalized and signed by the state of Idaho on November 1, 1995, and is updated annually (DEQ 1995). This plan outlines DOE-ID's proposed treatment strategy for mixed waste streams, called the backlog, and identifies onsite and offsite mixed LLW treatment capabilities.

During 2024, DOE-ID completed four Site Treatment Plan milestones, including two associated with the Sodium Components Maintenance Shop, one associated with Transuranic Waste Certification, and one granting approval of the project definition for the Calcine Disposition Project.

***Idaho Settlement Agreement***

On October 16, 1995, DOE-ID, the U.S. Navy, and Idaho DEQ entered into this agreement—also known as the ISA—that guides the management of spent nuclear fuel (SNF), HLW, and TRU waste at the INL Site. The ISA (DOE 1995) limits shipments of DOE-ID and U.S. Navy SNF into the state and sets milestones for shipments of SNF and radioactive waste out of the state.

In 2008, the DOE, state of Idaho and U.S. Environmental Protection Agency agreed to exhume targeted radioactive and hazardous waste from the 5.69-acre SDA landfill. In March 2022, the DOE and ICP workforce safely completed retrieval of SDA buried waste more than 18 months ahead of schedule.

The Site Treatment Plan and ISA required DOE-ID to process and ship all covered TRU waste out of the state of Idaho by December 31, 2018, when the agreements were signed. The estimated volume of that waste was 65,000 $m^3$ (85,016 $yd^3$). This milestone was not achieved; however, revised Site Treatment Plan milestones were agreed upon with Idaho DEQ; an addendum to the ISA was signed on November 6, 2019, to address the milestone.

As of December 31, 2024, approximately 5,100 $m^3$ of original volume TRU-contaminated waste and 610 $m^3$ of exhumed waste remains onsite. DOE-ID made 341 shipments of TRU waste to WIPP in 2024, which consisted of 165 shipments of ISA legacy waste and 176 shipments of Accelerated Retrieval Project exhumed waste.

The ICP contractor manages and operates several projects to facilitate the disposition of radioactive waste as required by the ISA and Site Treatment Plan. The Advanced Mixed Waste Treatment Project (AMWTP) performs retrieval, characterization, treatment, packaging, and shipment of TRU waste currently stored at the INL Site. Most of the waste processed at AMWTP 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.

***Notice of Noncompliance/Consent Order***
The final agreement, the NON/CO and recent modification, in conjunction with the Site Treatment Plan, requires the treatment of sodium-bearing waste to be stored at the INTEC TFF at IWTU. To meet the milestones in the NON/CO and Site Treatment Plan, DOE-ID and its ICP contractor implemented a methodical approach to begin operating IWTU in early 2017, which was completed in 2023 when the facility began processing 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, while a fourth is always kept empty as a spare. All four tanks will be closed in compliance with hazardous waste regulations. A total of 11 other liquid storage tanks were emptied, cleaned, and closed. The waste was originally scheduled to begin processing in 2012, but several technical problems delayed IWTU from operating.

IWTU completed a facility outage implementing needed facility modifications in preparation for supporting sustained radiological waste treatment operations in July 2021. Following successful completion of readiness verification activities, IWTU commenced a final confirmatory run-on simulant waste feed in late 2021. Technical challenges delayed completion of the final confirmatory run until mid-2022. These issues were adequately resolved, and the facility restarted its test run in May 2022. The facility successfully completed the final confirmatory run in late July 2022, along with a final round of readiness assessments for radiological operations. The facility processed 137,000 gallons of simulated waste over 65 days of continuous operation, filling 125 product canisters. The facility shut down and entered a planned outage to inspect process vessels/components, conduct maintenance, and make minor modifications, which concluded in November 2022. The facility initiated a plant restart for simulant testing in December 2022; radiological operations began in April 2023. With the completion of system performance testing in August 2023, IWTU transitioned out of interim operation status. From April to September 2023, IWTU safely treated approximately 68,000 gallons of sodium-bearing waste from the INTEC TFF. IWTU suspended operations, shut down, and entered a maintenance period in September 2023 to replace expended media that had become saturated with mercury in the granular-activated carbon vessels in accordance with operating permit requirements. IWTU resumed operations in August 2024. IWTU safely treated approximately 259,000 gallons of sodium-bearing waste from the INTEC TFF in 2024.

## 2.4 Low-Level and Mixed Radioactive Waste

In 2024, approximately 276 $m^3$ (361 $yd^3$) of mixed LLW and 210 $m^3$ (275 $yd^3$) of LLW was shipped off the INL Site for treatment, disposal, or both, by the ICP contractor. In 2024, no LLW was disposed of at the SDA. INL Site Waste types managed by the INL Site contractors can be found here. The status of each phase of the LLW management process for facilities managed at the Site by the INL Site contractors is shown in Table 2-3.

***Table 2-3. Status of each phase of the LLW management process for sites authorized to manage an LLW facility.***

| PHASE | REMOTE-HANDLED LOW-LEVEL WASTE (RHLLW) DISPOSAL FACILITY | RWMC ACTIVE LLW DISPOSAL FACILITY | ICDF |
|---|---|---|---|
| Performance Assessment | DOE/ID-11421 (DOE-ID 2018b), "Performance Assessment for the Idaho National Laboratory Remote-Handled Low-Level Waste Disposal Facility" | DOE/NE-ID-11243 (DOE-ID 2007b), "Performance Assessment for the RWMC Active Low-Level Waste Disposal Facility at the Idaho National Laboratory Site" | DOE/ID-10978 (DOE-ID 2011b), "Performance Assessment for the Idaho CERCLA Disposal Facility Landfill" |

*Table 2-3. Continued.*

| PHASE | REMOTE-HANDLED LOW-LEVEL WASTE (RHLLW) DISPOSAL FACILITY | RWMC ACTIVE LLW DISPOSAL FACILITY | ICDF |
|---|---|---|---|
| Composite Analysis | DOE/ID-11422 (DOE-ID 2012), "Composite Analysis for the Idaho National Laboratory Remote-Handled Low-Level Waste Disposal Facility" | DOE/NE-ID-11244 (DOE-ID 2008b), "Composite Analysis for the RWMC Active Low-Level Waste Disposal Facility at the Idaho National Laboratory Site" | DOE/ID-10979 (DOE-ID 2003), "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 was developed for the entire ICDF Complex closure. This plan was included in the "ICDF Complex Remedial Action Work Plan" (DOE/ID-10984) (DOE-ID 2024a) |
| Performance Assessment/ Composite Analysis 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 Performance Assessment/ Composite Analysis Summary Report | INL/RPT-24-82600 (INL 2025c), "Annual Summary Report for the Remote-Handled Low-Level Waste Disposal Facility – FY 2024" | RPT-2160, "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 2023" | RPT-2161, "Annual Summary Report: Review for Continued Adequacy of the Performance Assessment, Composite Analysis, and Supporting Documents for the ICDF Landfill – FY 2023" |
| Disposal Authorization Statement | 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 | Kristen G. Ellis, memorandum to Connie M. Flohr, September 22, 2023, "Revision of the Disposal Authorization Statement for the Idaho Comprehensive Environmental Response, Compensation, and Liability Act Disposal Facility," 9266728 |

### 2.4.1 Spent Nuclear Fuel

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. It contains unreacted uranium and radioactive fission products and must be properly shielded because of its radioactivity—primarily from gamma rays. SNF from DOE-ID 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 the ICP contractor at INTEC, and the INL contractor at the ATR Complex and MFC.

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

- DOE-ID shall remove all spent fuel, including naval spent fuel and Three Mile Island spent fuel, from the state of Idaho by January 1, 2035 (Paragraph C.1).

Meeting this remaining milestone comprises the major objective of the SNF program.

## 2.5 Environmental Releases, Response, and Reporting at the INL Site

Federal guidelines stipulate that certain environmental discharges and spills must be communicated to regulatory agencies. Releases that are subject to reporting are those discharges of hazardous substances to the environment that are not authorized by state or federal regulations. Per CERCLA Section 103, any release of a hazardous substance that reaches or surpasses predetermined reportable quantities must be reported. This includes ongoing releases that have a consistent quantity and rate yet surpass the established thresholds. These reporting obligations cover releases into the soil, groundwater or surface water, or into the atmosphere, in instances where such releases pose a threat to human health or the environment.

### 2.5.1 Spills

INL Site contractors had one reportable spill in 2024. Approximately 10–15 gallons of diesel fuel were spilled to the soil during an overfill event from an emergency diesel-backup generator at ATR-786 on November 8, 2024. Idaho DEQ was notified that the cleanup could not take place under the landing gear of the trailer until ATR went into outage. Cleanup will occur in 2025.

### 2.5.2 Unplanned Releases

INL Site contractors had no unplanned releases of hazardous substances or any events resulting in emissions exceeding reporting thresholds that would require notification to be made to regulatory agencies in 2024. All radiological emissions were accounted for in the dose received by the maximally exposed individual (see Chapter 8).

## 2.6 Environmental Permits

Table 2-4 presents the complete list of all active federal and state permits during 2024 for INL Site operations. This table includes those pertaining to air emissions, ecological, groundwater, RCRA, and recycled water.

***Table 2-4. Environmental permits for the INL Site (2024).***

| ACTIVE PERMIT NAME | PERMIT NUMBER | REGULATORY AGENCY | EXPIRATION DATE |
|---|---|---|---|
| **AIR EMISSIONS** | | | |
| INL Permit to Construct (PTC) with a Facility Emissions Cap (FEC) | P-2020.0045 | DEQ | 01/29/2026 |
| **ECOLOGICAL** | | | |
| Special Purpose – Miscellaneous | MB04294B | USFWS | 03/31/2025 |
| Scientific Collecting | MB13633C | USFWS | 03/31/2025 |
| Scientific Collecting | 71847 | IDFG | 12/31/2024 |
| Scientific Collecting | 79645 | IDFG | 12/31/2024 |
| **GROUNDWATER** | | | |
| Idaho Department of Water Resources (IDWR) Permit for the Operation of Injection Well | 25W-062-001 | IDWR | 02/14/2028 |
| Water Right Agreement | PER[a]-154 | IDWR | NA |
| **RCRA[b]** | | | |
| AMWTP Hazardous Waste Management Act (HWMA)/RCRA Permit | PER[a]-153 | DEQ | 03/19/2029 |
| HWMA/RCRA Partial Permit for Storage at the Calcined Solids Storage Facility at the INTEC on the INL | PER[a]-114 | DEQ | 06/26/2027 |
| HWMA/RCRA Post-closure Permit for the INTEC on the INL | PER[a]-112 | DEQ | 03/14/2034 |
| HWMA/RCRA Storage and Treatment Permit for the MFC | PER[a]-116 | DEQ | 10/01/2025 |

*Table 2-4. continued.*

| ACTIVE PERMIT NAME | PERMIT NUMBER | REGULATORY AGENCY | EXPIRATION DATE |
|---|---|---|---|
| HWMA Storage and Treatment Permit for the INTEC Waste Management Operations on the INL | PER[a]-109 | DEQ | 06/27/2034 |
| Part A Permit App, Interim Status Facility, TFF at INTEC | PER[a]-101 | DEQ | NA |
| Partial Permit for HWMA Storage and Treatment for the Liquid Waste Management System at the INTEC on the INL | PER[a]-111 | DEQ | 11/20/2024 |
| **RECYCLED WATER** | | | |
| ATR Complex Cold Waste Ponds Reuse Permit | I-161-03 | DEQ | 10/10/2029 |
| MFC Industrial Waste Pond Reuse Permit | I-160-02 | DEQ | 01/25/2027 |
| Reuse Permit for the INTEC Percolation Pond | M-130-07 | DEQ | 06/25/2034 |

a. PER is the INL document type used for regulatory permits.

b. Part A interim status units are those units with Part A permit applications (interim status) that have not been RCRA-closed. Partial Part B permits include the Part A application and Part B application. Part A addresses each of the permitted units in Part B, while Part B includes specific details and permit operating requirements. A partial permit that includes the unit-specific Part A and Part B is considered a RCRA partial Part B permit. There are six RCRA partial Part B permits for the INL Site.

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