Chapter 1: Introduction

1. INTRODUCTION

This annual report is prepared in compliance with the following U.S. Department of Energy (DOE) orders:

- DOE O 231.1B, "Environment, Safety and Health Reporting"
- DOE O 436.1, "Departmental Sustainability"
- DOE O 458.1, "Radiation Protection of the Public and the Environment."

The purpose of the report, as outlined in DOE O 231.1B, is to present summary environmental data to:

- Characterize site environmental performance
- Summarize environmental occurrences and responses during the calendar year
- Confirm compliance with environmental standards and requirements
- Highlight significant facility programs and efforts.

This report is the principal document that demonstrates compliance with DOE O 458.1 requirements and, therefore, describes the DOE Idaho National Laboratory (INL) Site impact on the public and the environment with an emphasis on radioactive contaminants.

1.1 Site Location

The INL Site encompasses about 2,305 square kilometers (km^2) (890 square miles [mi^2]) of the upper Snake River Plain in southeastern Idaho (Figure 1-1). Over 50% of the INL Site is located in Butte County and the rest is distributed across Bingham, Bonneville, Clark, and Jefferson counties. The INL Site extends 63 km (39 mi) from north to south and is approximately 61 km (38 mi) at its broadest east-west portion. By highway, the southeast entrance is approximately 40 km (25 mi) west of Idaho Falls. Other towns surrounding the INL Site include Arco, Atomic City, Blackfoot, Rigby, Rexburg, Terreton, and Howe. Pocatello is 85 km (53 mi) to the southeast.

Federal lands surround much of the INL Site, including U.S. Bureau of Land Management lands and Craters of the Moon National Monument and Preserve to the southwest, Salmon-Challis National Forest to the west, and Targhee National Forest to the north. Mud Lake Wildlife Management Area, Camas National Wildlife Refuge, and Market Lake Wildlife Management Area are within 80 km (50 mi) of the INL Site. The Fort Hall Indian Reservation is located approximately 60 km (37 mi) to the southeast.

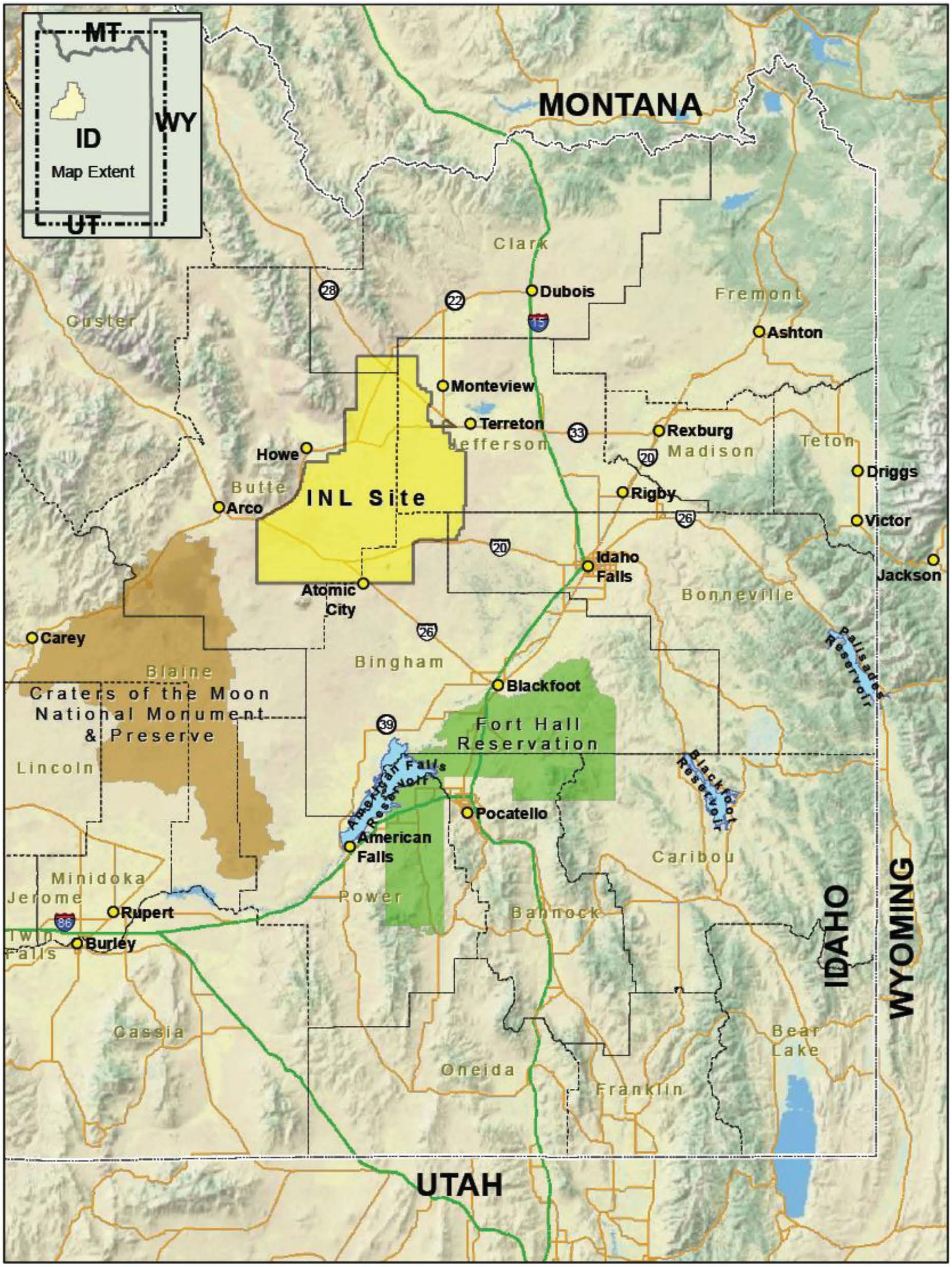

Figure 1-1. Location of the INL Site.

1.2 Environmental Setting

The INL Site is located in a large, relatively undisturbed expanse of sagebrush steppe. Approximately 94% of the land on the INL Site is open and undeveloped. The INL Site has an average elevation of 1,500 m (4,900 ft) above sea level and is bordered on the north and west by mountain ranges and on the south by volcanic buttes and open plain. Lands immediately adjacent to the INL Site are open sagebrush steppe, foothills, or agricultural fields. Agriculture is concentrated in areas northeast of the INL Site.

About 60% of the INL Site is open to livestock grazing. Controlled hunting is permitted, but is restricted to a very small portion of the northern half of the INL Site.

The climate of the high desert environment of the INL Site is characterized by sparse precipitation (about 21.4 cm/yr [8.43 in./yr]), warm summers (average daily temperature of 18.8°C [65.8°F]), and cold winters (average daily temperature of -7.3°C [18.9°F]), based on observations at Central Facilities Area from 1991 through 2020 (NOAA 2022). The altitude, intermountain setting, and latitude of the INL Site combine to produce a semi-arid climate. Prevailing weather patterns are from the southwest, moving up the Snake River Plain. Air masses, which gather moisture over the Pacific Ocean, traverse several hundred miles of mountainous terrain before reaching southeastern Idaho. Frequently, the result is dry air and little cloud cover. Solar heating can be intense, with extreme day-to-night temperature fluctuations.

Basalt flows cover most of the Snake River Plain, producing rolling topography. Over 400 different kinds (taxa) of plants have been recorded on the INL Site (Anderson et al. 1996). Vegetation is dominated by big sagebrush (*Artemisia tridentata*) with grasses and wildflowers beneath that have been adapted to the harsh climate.

The INL Site is also home to many kinds of animals. Vertebrate animals found on the INL Site include small burrowing mammals, snakes, birds, and several large mammals. Published species records include six fishes, one amphibian, nine reptiles, 164 birds, and 39 mammals (Reynolds et al. 1986).

The Big Lost River on the INL Site flows northeast, ending in a playa area on the northwestern portion of the INL Site, called the Big Lost River Sinks. Here, the river evaporates or infiltrates to the subsurface, with no surface water moving off the INL Site. Normally, the riverbed is dry because of upstream irrigation and rapid infiltration into desert soil and underlying basalt (Figure 1-2). The river rarely flows onto the INL Site. Water demands upstream at the Mackay Reservoir inhibited river flow onto the INL from March to May 2021 and flow never went as far as the Lincoln Blvd bridge. No river samples were collected during 2021 at the INL because of the lack of surface water flow in the Big Lost River.

Fractured volcanic rocks under the INL Site form a portion of the eastern Snake River Plain aquifer (Figure 1-3), which stretches 320 km (199 mi) from Island Park to King Hill, which is 9.7 km (6 mi) northeast of Glenns Ferry and stores one of the most bountiful supplies of groundwater in the nation. An estimated 247 to 370 billion m^3 (200 to 300 million acre-ft) of water is stored in the aquifer's upper portions. The aquifer is primarily recharged from the Henrys Fork and the South Fork of the Snake River, and to a lesser extent from the Big Lost River, Little Lost River, Birch Creek, and irrigation. Beneath the INL Site, the aquifer moves laterally southwest at a rate of 1.5 to 6 m/day (5 to 20 ft/day) (Lindholm 1996). The eastern Snake River Plain aquifer emerges in springs along the Snake River between Milner and Bliss, Idaho. Crop irrigation is the primary use of both surface water and groundwater on the Snake River Plain.

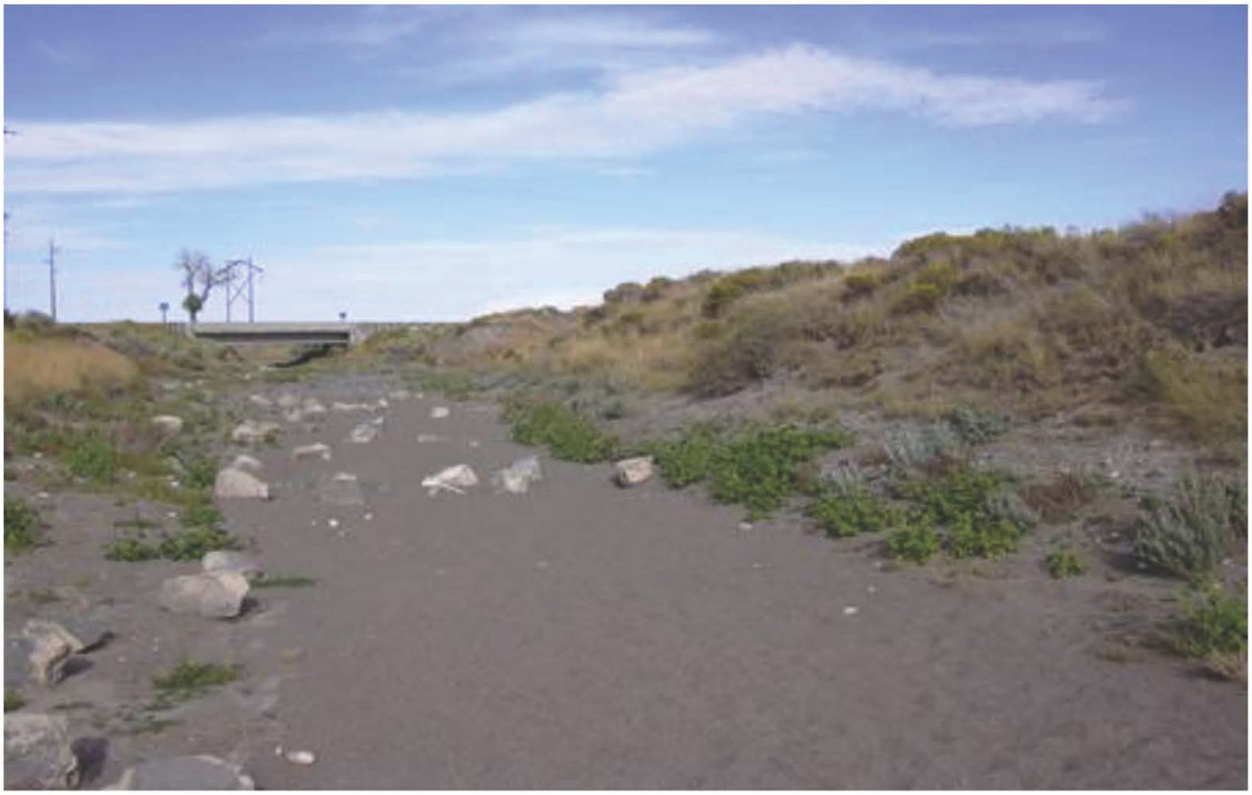

Figure 1-2. Big Lost River. *Dry riverbed in 2016 (upper). Flowing river in May 2017 (lower).*

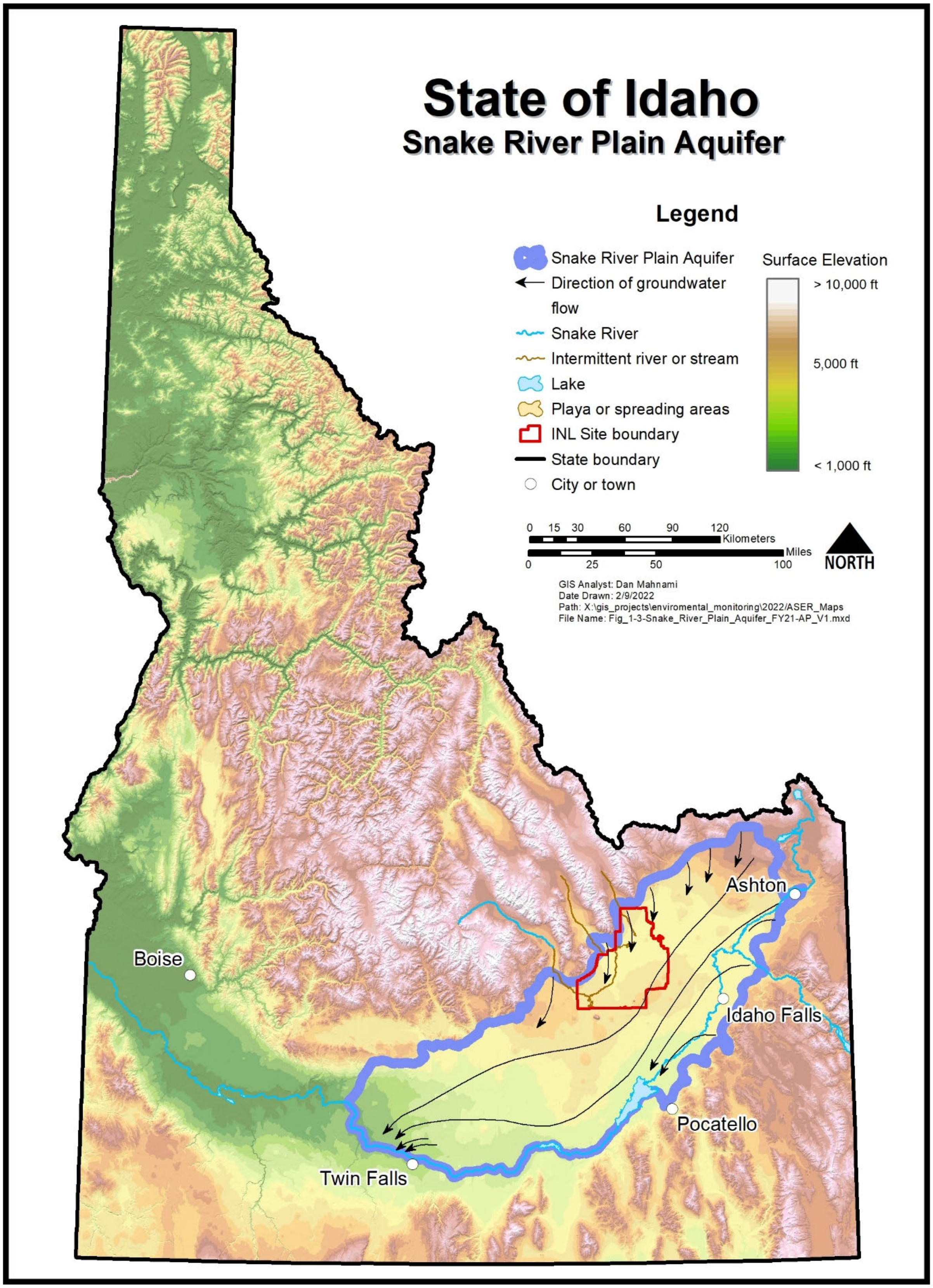

Figure 1-3. INL Site relation to the eastern Snake River Plain Aquifer.

1.3 History of the INL Site

The geologic events that have shaped the modern Snake River Plain took place during the last two million years (Ma) (Lindholm 1996; ESRF 1996). This plain, which arcs across southern Idaho to Yellowstone National Park, marks the passage of the earth's crust over a plume of melted mantle material.

The volcanic history of the Yellowstone-Snake River Plain volcanic field is based on the time-progressive volcanic origin of the region, characterized by several large calderas in the eastern Snake River Plain, with dimensions similar to those of Yellowstone's three giant Pleistocene calderas. These volcanic centers are located within the topographic depression that encompasses the Snake River drainage. Over the last 16 Ma, a series of giant, caldera-forming eruptions occurred, with the most recent at Yellowstone National Park 630,000 years ago. The youngest silicic volcanic centers correspond to the Yellowstone volcanic field that are less than 2 Ma old and are followed by a sequence of silicic centers at about 6 Ma ago, southwest of Yellowstone. A third group of centers, approximately 10 Ma old, is centered near Pocatello, Idaho. The oldest mapped silicic rocks of the Snake River Plain are approximately 16 Ma old and are distributed across a 150-km-wide (93-mi-wide) zone in southwestern Idaho and northern Nevada; they are the suspected origin of the Yellowstone-Snake River Plain (Smith and Siegel 2000).

The earliest human occupants of the eastern Snake River Plain were the Shoshone and Bannock people, the ancestors of the present-day Shoshone-Bannock Tribes. Their presence dates back 13,500 years. Tools recovered from this period indicate they were hunters of large game. The ancestors of the present-day Shoshone and Bannock people came north from the Great Basin around 4,500 years ago (DOE-ID 2016).

People of European descent began exploring the Snake River Plain between 1810 and 1840; these explorers were trappers and fur traders seeking new supplies of beaver pelts.

Between 1840 and 1857, an estimated 240,000 immigrants passed through southern Idaho on the Oregon Trail. The Shoshone and Bannocks entered into peace treaties in 1863 and 1868 known today as the Fort Bridger Treaty. The Fort Hall Reservation was reserved for the various tribes under the treaty agreement. During the 1870s, miners entered the surrounding mountain ranges, followed by ranchers grazing cattle and sheep in the valleys.

In 1901, a railroad was opened between Blackfoot and Arco, Idaho. By this time, a series of acts (e.g., the Homestead Act of 1862, the Desert Claim Act of 1877, the Carey Act of 1894, the Reclamation Act of 1902) provided sufficient incentive for homesteaders to build diversionary canals to claim the desert. Most of these canal efforts failed because of the extreme porosity of the gravelly soils and underlying basalts.

During World War II, large guns from U.S. Navy warships were retooled at the U.S. Naval Ordnance Plant in Pocatello, Idaho. These guns needed to be tested, and the nearby uninhabited plain was used as a gunnery range, known then as the Arco Naval Proving Ground.

The U.S. Army Air Corps also trained bomber crews out of the Pocatello Airbase and used the area as a bombing range.

After the war ended, the nation turned to peaceful uses of atomic power. DOE's predecessor, the U.S. Atomic Energy Commission, needed an isolated location with an ample groundwater supply on which to build and test nuclear power reactors. In 1949, the Arco Naval Proving Ground became the National Reactor Testing Station.

In 1951, the Experimental Breeder Reactor-I became the first reactor to produce useful electricity. In 1955, the Boiling-Water Reactor Experiments-III reactor provided electricity to Arco, Idaho, which was the first time a nuclear reactor powered an entire community in the United States. The laboratory also developed prototype nuclear propulsion plants for Navy submarines and aircraft carriers. Over time, the Site evolved into an assembly of 52 reactors, associated research centers, and waste handling areas.

The National Reactor Testing Station was renamed the Idaho National Engineering Laboratory in 1974 and Idaho National Engineering and Environmental Laboratory in 1997 to reflect the Site's leadership role in environmental management. The U.S. Atomic Energy Commission was renamed the U.S. Energy Research and Development Administration in 1975 and reorganized to the present-day DOE in 1977.

With renewed interest in nuclear power, DOE announced in 2003 that Argonne National Laboratory-West and the Idaho National Engineering and Environmental Laboratory would be the lead laboratories for development of the next generation of power reactors. On February 1, 2005, Battelle Energy Alliance, LLC, took over operation of the laboratory, merged with Argonne National Laboratory-West, and the facility name was changed to Idaho National Laboratory. At this time, the site's cleanup activities were moved to a separate contract, the Idaho Cleanup Project, which is currently managed by Fluor Idaho, LLC. Research activities, which include projects other than nuclear research such as National and Homeland Security projects, were consolidated in the newly named Idaho National Laboratory.

1.4 Human Populations Near the INL Site

The population of the region within 80 km (50 mi) of the INL Site is estimated, based on the 2010 census and projected growth, to be 348,024. Over half of this estimated population (184,761) resides in the census divisions of Idaho Falls (116,693) and northern Pocatello (68,068). Another 32,652 are projected to live in the Rexburg census division. Approximately 23,308 are estimated to reside in the Rigby census division and 16,311 in the Blackfoot census division. The remaining population resides in small towns and rural communities. Note: The 2020 census was not available at the time of report preparation.

1.5 Idaho National Laboratory Site Primary Program Missions and Facilities

The INL Site mission is to operate a multi-program national research and development laboratory and to complete environmental cleanup activities stemming from past operations. The U.S. Department of Energy, Idaho Operations Office (DOE-ID) receives implementing direction and guidance primarily from two DOE Headquarters offices—the Office of Nuclear Energy and the Office of Environmental Management. The Office of Nuclear Energy is the Lead Program Secretarial Office for all DOE-ID-managed operations on the INL Site.

The Office of Environmental Management provides direction and guidance to DOE-ID for environmental cleanup on the INL Site and functions in the capacity of Cognizant Secretarial Office. Naval Reactors operations on the INL Site report to the Pittsburgh Naval Reactors Office, which fall outside the purview of DOE-ID and therefore are not included in this report.

1.5.1 Idaho National Laboratory

The INL mission is to discover, demonstrate, and secure innovative nuclear energy solutions, other clean energy options, and critical infrastructure. Its vision is to change the world's energy future and secure our nation's critical infrastructure. To fulfill its assigned duties during the next decade, INL will work to transform itself into a laboratory leader in nuclear energy and homeland security research, development, and demonstration. This transformation will be the development of nuclear energy and national and homeland security leadership highlighted by achievements such as demonstration of Generation IV reactor technologies; the creation of national user facilities, including the Advanced Test Reactor National Scientific User Facility, Wireless National User Facility, and Biomass Feedstock National User Facility; the Critical Infrastructure Test Range Complex; piloting of advanced fuel cycle technology; the rise to prominence of the Center for Advanced Energy Studies; and recognition as a regional clean energy resource and world leader in safe operations.

On February 22, 2021, an addendum to the 2019 memorandum of understanding between the DOE and the Nuclear Regulatory Commission (NRC) formalized the coordination between these two federal agencies in regard to National Reactor Innovation Center projects. This addendum specifically focuses on research, development, and demonstration projects, and it solidifies a partnership in order to deliver successful nuclear reactor demonstrations. The National Reactor Innovation Center is a national DOE program led by INL, allowing collaborators to harness the world-class capabilities of the U.S. National Laboratory System. The Center is charged with and committed to demonstrating advanced reactors by the end of 2025.

Battelle Energy Alliance, LLC, is responsible for management and operation of the INL.

1.5.2 Idaho Cleanup Project

The Idaho Cleanup Project (ICP) Core involves the safe environmental cleanup of the INL Site, which was contaminated with waste generated during World War II-era conventional weapons testing, government-owned research and defense reactor operations, laboratory research, fuel reprocessing, and defense missions at other DOE sites. The project focuses on meeting Idaho Settlement Agreement (DOE 1995) and environmental cleanup milestones while reducing risks to workers. Protection of the Snake River Plain aquifer, the sole drinking water source for more than 300,000 residents of eastern Idaho, was the principal concern addressed in the Settlement Agreement. Fluor Idaho, LLC, is responsible for the ICP Core.

Most of the cleanup work under the contract is driven by regulatory compliance agreements. The two foundational agreements are: (1) the 1991 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-based Federal Facility Agreement and Consent Order (DOE 1991), which governs the cleanup of contaminant releases to the environment; and (2) the 1995 Idaho Settlement Agreement (DOE 1995), which governs the removal of transuranic waste, spent nuclear fuel, and high-level radioactive waste from the state of Idaho. Other regulatory drivers include the Federal Facility Compliance Act-based Site Treatment Plan (treatment of hazardous wastes), and other environmental permits, closure plans, federal and state regulations, Records of Decision and other implementing documents.

The ICP Core involves treating a million gallons of sodium-bearing liquid waste; removing targeted transuranic waste from the Subsurface Disposal Area; placing spent nuclear fuel in dry storage; treating high-level waste calcine; treating both remote- and contact-handled transuranic waste for disposal at the Waste Isolation Pilot Plant in New Mexico; and demolishing and disposing of more than 200 contaminated structures, including reactors, spent nuclear fuel storage basins, and laboratories used for radioactive experiments.

1.5.3 Primary Idaho National Laboratory Site Facilities

Most INL Site buildings and structures are located within developed areas that are typically less than a few square miles and separated from each other by miles of undeveloped land. DOE controls all land within the INL Site (Figure 1-4). In addition to the INL Site, DOE owns or leases laboratories and administrative offices in the city of Idaho Falls, about 40 km (25 mi) east of the INL Site.

Advanced Test Reactor Complex – The Advanced Test Reactor (ATR) Complex was established in the early 1950s and has been the primary operations site for three major test reactors: (1) the Materials Test Reactor (1952–1970), (2) the Engineering Test Reactor (1957–1982), and (3) the Advanced Test Reactor (1967–present). The current primary mission at the ATR Complex is operation of the Advanced Test Reactor, the world's premier test reactor used to study the effects of radiation on materials. This reactor also produces rare and valuable medical and industrial isotopes. The ATR is a National Scientific User Facility. The ATR Complex also features the ATR Critical Facility, Test Train Assembly Facility, Radiation Measurements Laboratory, Radiochemistry Laboratory, and Safety and Tritium Applied Research Facility, which is a national fusion safety user facility. The ATR Complex is operated by the INL contractor.

Central Facilities Area – The Central Facilities Area is the main service and support center for the INL Site's desert facilities. Activities at the Central Facilities Area support transportation, maintenance, medical, construction, radiological monitoring, security, fire protection, warehouses, and instrument calibration activities. It is operated by the INL contractor.

Critical Infrastructure Test Range Complex – The Critical Infrastructure Test Range Complex encompasses a collection of specialized test beds and training complexes that create a centralized location where government agencies, utility companies, and military customers can work together to find solutions for many of the nation's most pressing security issues. The Critical Infrastructure Test Range Complex provides open landscape, technical employees, and specialized facilities for performing work in three main areas: (1) physical security, (2) contraband detection and (3) infrastructure testing. It is operated by the INL contractor.

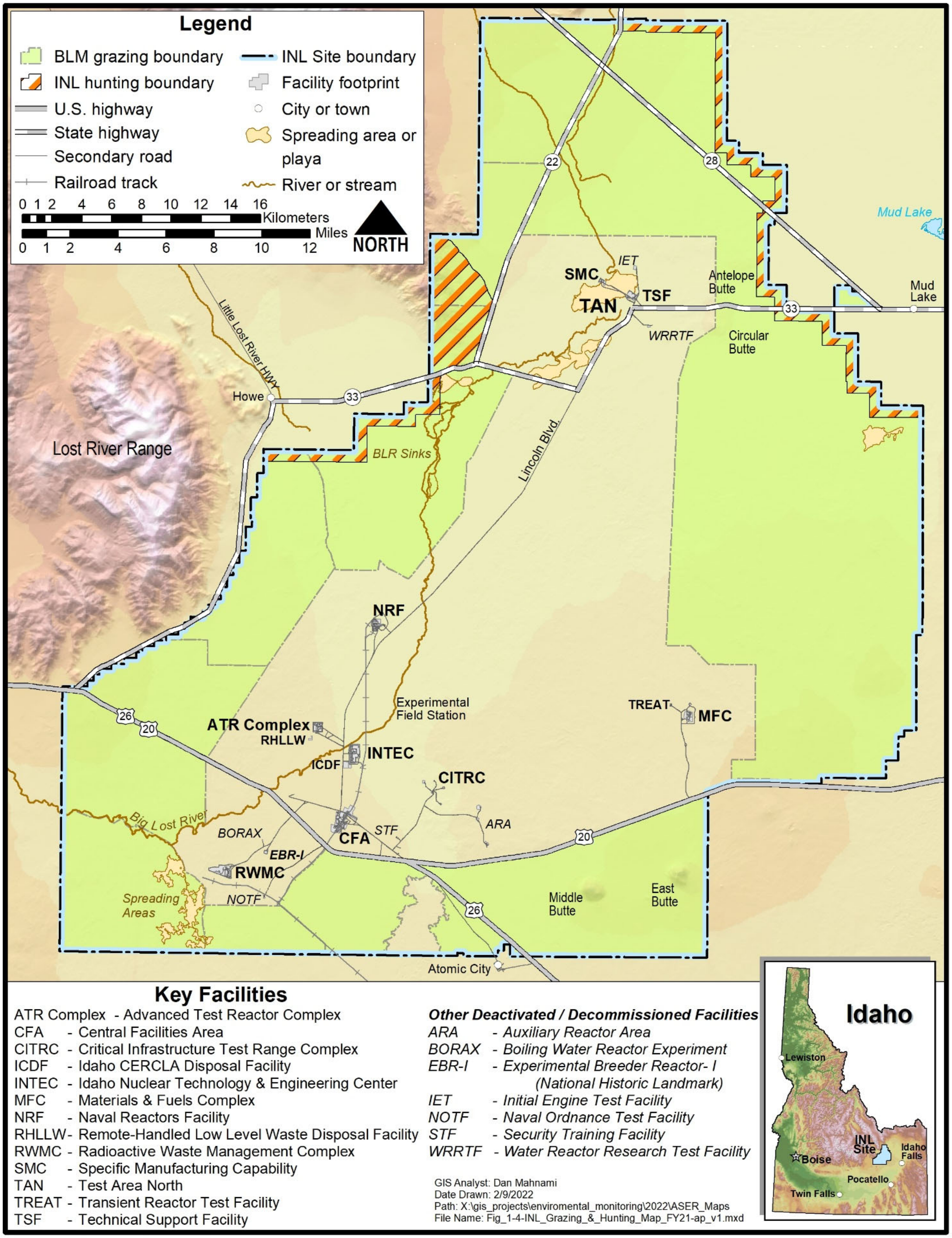

Figure 1-4. Location of the INL Site, showing key facilities.

Idaho Nuclear Technology and Engineering Center – The Idaho Chemical Processing Plant was established in the 1950s to recover usable uranium from spent nuclear fuel used in DOE and U.S. Department of Defense (DoD) reactors. Over the years, the facility recovered more than $1 billion worth of highly enriched uranium that was returned to the government fuel cycle. In addition, an innovative high-level liquid waste treatment process known as calcining was developed at the plant. Calcining reduced the volume of liquid radioactive waste generated during reprocessing and placed it in a more stable granular solid form. In the 1980s, the facility underwent a modernization, and safer, cleaner, and more efficient structures replaced most major facilities. Reprocessing of spent nuclear fuel was discontinued in 1992. In 1998, the plant was renamed the Idaho Nuclear Technology and Engineering Center. Current operations include startup and operation of the Integrated Waste Treatment Unit, designed to treat approximately 3,406,871 liters (900,000 gallons) of sodium-bearing liquid waste and closure of the remaining liquid waste storage tank, spent nuclear fuel storage, environmental remediation, disposing of excess facilities, and management of the Idaho CERCLA Disposal Facility. The Idaho CERCLA Disposal Facility is the consolidation point for CERCLA-generated wastes within the INL Site boundaries. The Idaho Nuclear Technology and Engineering Center is operated by Fluor Idaho, the ICP Core contractor.

Materials and Fuels Complex – The Materials and Fuels (MFC) Complex is a prime testing center for advanced technologies associated with nuclear power systems. This complex is the nexus of research and development for new reactor fuels and related materials. As such, it will contribute to increasingly efficient reactor fuels and the important work of nonproliferation—harnessing more energy with less risk. Facilities at the Materials and Fuels Complex also support manufacturing and assembling components for use in space applications. It is operated by the INL contractor.

Naval Reactors Facility – The Naval Reactors Facility (NRF) is operated by Fluor Marine Propulsion, LLC. As established in Executive Order 12344 (1982), the Naval Nuclear Propulsion Program is exempt from the requirements of DOE O 436.1, DOE O 458.1, and DOE O 414.1D. Therefore, NRF is excluded from this report. The director of the Naval Nuclear Propulsion Program establishes reporting requirements and methods implemented within the program, including those necessary to comply with appropriate environmental laws. The NRF's program is documented in the NRF Environmental Monitoring Report (FMP 2021).

Radioactive Waste Management Complex – Since the 1950s, DOE has used the Radioactive Waste Management Complex (RWMC) to manage, store, and dispose of waste contaminated with radioactive elements generated in national defense and research programs. RWMC provides treatment, temporary storage, and transportation of transuranic waste destined for the Waste Isolation Pilot Plant.

The Subsurface Disposal Area is a 39-hectare (96-acre) radioactive waste landfill that was used for more than 50 years. Approximately 14 of the 39 hectares (35 of 96 acres) contain waste, including radioactive elements, organic solvents, acids, nitrates, and metals from historical operations such as reactor research at the INL Site and weapons production at other DOE facilities. A CERCLA Record of Decision (OU-7-13/14) was signed in 2008 (DOE-ID 2008) and includes exhumation and off-site disposition of targeted waste. Cleanup of RWMC is managed by the ICP Core contractor.

Remote-Handled Low-Level Waste Disposal Facility – The Remote-Handled Low-Level Waste (RHLLW) Disposal Facility is a Hazard Category 2 nuclear facility providing below-grade, permanent radioactive waste disposal capability critical for INL nuclear research and Naval Reactors missions at the INL Site. RHLLW is generated from nuclear programs conducted at INL Site facilities, including the NRF, the ATR Complex, and the MFC. The facility began operations in 2018 and will support an anticipated 20 years of waste disposal operations with an expansion capability for up to 50 years. The facility comprises an administration building, a maintenance building, and a 175,000-square-foot vault yard that includes monitoring wells, a robust drainage system, and 446 below-grade concrete waste disposal vaults sized to accommodate 939 stainless steel waste canisters of various configurations dependent on the waste type and waste generator facility.

Research and Education Campus – The Research and Education Campus (REC), operated by the INL contractor, is the collective name for INL's administrative, technical support, and computer facilities in Idaho Falls, as well as the in-town laboratories where researchers work on a wide variety of advanced scientific research and development projects. As the name implies, the REC uses both basic science research and engineering to apply new knowledge to products and processes that improve quality of life. This reflects the emphasis INL is placing on strengthening its science base and increasing the commercial success of its products and processes. Two new laboratory facilities—the Energy Systems Laboratory (ESL) and Energy Innovation Laboratory (EIL) —were constructed in 2013 and 2014. In 2019, the Idaho

Board of Education and INL completed the construction of two new research facilities: the (1) Cybercore Integration Center; and the (2) Collaborative Computing Center. The Cybercore Integration Center leads national efforts to secure critical infrastructure control systems from cyber threats while the Collaborative Computing Center will advance the computational science needs of INL while providing academia and industry with unprecedented access to high-performance computing. These and other facilities are integral for transforming INL into a renowned research laboratory.

The DOE Radiological and Environmental Sciences Laboratory (RESL) is located within the REC and provides a technical component to DOE oversight of contractor operations at DOE facilities and sites. As a reference laboratory, RESL conducts cost-effective measurement quality assurance programs that help ensure key DOE missions are completed in a safe and environmentally responsible manner. By ensuring the quality and stability of key laboratory measurement systems throughout DOE, and by providing expert technical assistance to improve those systems and programs, RESL ensures the reliability of data on which decisions are based. RESL's core scientific capabilities are in analytical chemistry and radiation calibrations and measurements. In 2015, RESL expanded its presence in the REC with the addition of a new building for the DOE Laboratory Accreditation Program. The new DOE Laboratory Accreditation Program facility adjoins the RESL facility and provides irradiation instruments for the testing and accreditation of dosimetry programs across the DOE Complex.

Test Area North – Test Area North (TAN) was established in the 1950s to support the government's Aircraft Nuclear Propulsion program with the goal to build and fly a nuclear-powered airplane. When President John F. Kennedy cancelled the nuclear propulsion program in 1961, TAN began to host a variety of other activities. The Loss-of-Fluid Test (LOFT) reactor became part of the new mission. The LOFT reactor, constructed between 1965 and 1975, was a scaled-down version of a commercial pressurized water reactor. Its design allowed engineers, scientists, and operators to create or recreate loss-of-fluid accidents (e.g., reactor fuel meltdowns) under very controlled conditions. The LOFT dome provided containment for a relatively small, mobile test reactor that was moved in and out of the facility on a railroad car. The NRC incorporated data received from these accident tests into commercial reactor operating codes. Before closure, the LOFT facility conducted 38 experiments, including several small loss-of-coolant experiments designed to simulate the type of accident that occurred at Three Mile Island (TMI) in the state of Pennsylvania. In October 2006, the LOFT reactor and facilities were decontaminated, decommissioned, and demolished.

Additionally, TAN housed the TMI-2 Core Offsite Examination Program that obtained and studied technical data necessary for understanding the events leading to the TMI-2 reactor accident. Shipment of TMI-2 core samples to the INL Site began in 1985, and the program ended in 1990. INL Site scientists used the core samples to develop a database that predicts how nuclear fuel will behave when a reactor core degrades.

In July 2008, the TAN Cleanup Project was completed. The TAN Cleanup Project demolished 44 excess facilities, the TAN Hot Shop, and the LOFT reactor. Environmental monitoring continues at TAN. See Waste Area Group 1 status in Table 2-1.

The Specific Manufacturing Capability (SMC) Project is located at TAN. This project is operated for the DoD by the INL contractor and manufactures protective armor for the Army M1-A1 and M1-A2 Abrams tanks.

1.5.4 Independent Oversight and Public Involvement and Outreach

DOE encourages information exchange and public involvement in discussions and decision-making regarding INL Site activities. Active participants include the public; Native American tribes; local, state, and federal government agencies; advisory boards; and other entities in the public and private sectors.

The roles and involvement of selected organizations are described in the following sections.

1.5.5 Citizens Advisory Board

The ICP Citizens Advisory Board is a federally appointed citizen panel formed in 1994 that provides advice and recommendations on the ICP activities to DOE-ID. The Citizens Advisory Board consists of 12 to 15 members who represent a wide variety of key perspectives on issues of relevance to Idaho citizens. Board members comprise a variety of backgrounds and viewpoints, including environmentalists; natural resource users; previous INL Site workers; and representatives of local government, health care, higher education, business, and the general public. Their diverse backgrounds assist ICP Environmental Management program in making decisions and having a greater sense of how the cleanup efforts are perceived by the public. Additionally, one board member represents the Shoshone-Bannock Tribes. Members are appointed by the DOE Environmental Management Assistant Secretary and serve voluntarily without compensation. Three additional nonvoting liaisons include representatives from DOE-ID, Environmental Protection Agency Region 10, and the Idaho Department of Environmental Quality (DEQ). These liaisons provide information to the Citizens Advisory Board on their respective agencies' policies and views.

The Citizens Advisory Board is chartered by DOE through the Federal Advisory Committee Act. The Citizens Advisory Board's charter is to provide input and recommendations to DOE on topics such as cleanup standards and environmental restoration, waste management and disposition, stabilization and disposition of nonstock pile nuclear materials, excess facilities, future land use and long-term stewardship, risk assessment and management, and cleanup science and technology activities. More information about the Citizens Advisory Board's recommendations, membership, and meeting dates and topics can be found at https://www.energy.gov/em/icpcab.

1.5.6 Site-wide Monitoring Committees

Site-wide monitoring committees include the INL Site Monitoring and Surveillance Committee and the INL Site Water Committee. The INL Site Monitoring and Surveillance Committee was formed in March 1997 and meets quarterly, or as needed, to coordinate activities among groups involved in environmental monitoring on and off the INL Site. This standing committee includes representatives of DOE-ID; INL Site contractors; the Environmental Surveillance, Education, and Research (ESER) contractor; Shoshone-Bannock Tribes; the state of Idaho DEQ-INL Oversight Program; the National Oceanic and Atmospheric Administration (NOAA); NRF; and the U.S. Geological Survey (USGS). The INL Site Monitoring and Surveillance Committee has served as a valuable forum to review monitoring, analytical, and quality assurance methodologies; to coordinate efforts; and to avoid unnecessary duplication.

The INL Site Water Committee was established in 1994 to coordinate drinking-water-related activities across the INL Site and to provide a forum for exchanging information related to drinking water systems. In 2007, the INL Site Water Committee expanded to include all Site-wide water programs—drinking water, wastewater, storm water, and groundwater. The committee includes monitoring personnel, operators, scientists, engineers, management, data entry, and validation representatives of the DOE-ID, INL Site contractors, USGS, and NRF. The committee serves as a forum for coordinating water-related activities across the INL Site and exchanging technical information, expertise, regulatory issues, data, and training.

The INL Site Water Committee interacts on occasion with other committees that focus on water-related topics or programs, such as the INL Site Monitoring and Surveillance Committee.

1.5.7 Environmental Oversight and Monitoring Agreement

A new five-year Environmental Oversight and Monitoring Agreement (DOE-ID 2021) between DOE-ID, Naval Reactors Laboratory Field Office/Idaho Branch Office, and the Idaho DEQ was signed March 2021. The 2021 version is the latest in a succession of agreements that was first implemented in 1990. The new Environmental Oversight and Monitoring Agreement governs the activities of the DEQ-INL Oversight Program and DOE-ID's cooperation in providing access to facilities and information for non-regulatory, independent oversight of INL Site impacts to public health and the environment. The first agreement established in 1990 created the state of Idaho INL Oversight Program.

The DEQ-INL Oversight Program's main activities include environmental surveillance, emergency response, and public information. More information can be found on the DEQ-INL Oversight Program website at www.deq.idaho.gov.

1.5.8 Environmental Education Outreach

The ESER program provides the DOE-ID with technical support on National Environmental Policy Act environmental analyses, such as wildlife surveys; ecological compliance, including threatened and endangered species assessment; and offsite environmental sampling of air, surface water, soil, plants, and animals. The ESER Educational Program's mission is to:

- Increase public awareness of the INL Offsite Environmental Surveillance Program and ESER ecological and radioecological research
- Increase public understanding of surveillance and research results
- Provide an education resource for local schools.

The program accomplishes this mission by providing communication and educational outreach relating to data gathered and evaluated in the performance of all ESER tasks. Priority is placed on those communities surrounding the INL Site, touching other parts of southeast Idaho as resources allow. Emphasis is placed on providing the public and stakeholders with valid, unbiased information on qualities and characteristics of the INL Site environment and impacts of INL Site operations on the environment and public.

Involvement of students, especially K–12, is emphasized. Because of the unique challenges posed by the COVID-19 pandemic, nearly all programs had to be modified to some extent. In some cases, schools were closed or visiting speakers were not allowed. Despite these challenges during 2021, ESER was still able to create and present educational programs to over 3,000 students online and in their classrooms. Presentations covering physical science, biological science, and ecological science subjects, are adapted for grade level, and are aligned with Idaho State Science Standards. Because of the online learning burnout created by the long duration of the COVID-19 pandemic, classroom visits were pursued wherever possible in accordance with local and corporate safe exposure policies.

The ESER Education Program worked together with DOE, INL contractor, ICP Core contractor, and other businesses and agencies to present community outreach programs when possible. The prohibition against large gatherings resulted in outright cancellation of certain traditional events like the Water Awareness Festival and modification to others. In spite of these challenges, ESER staff were instrumental in the organization and creation of websites to communicate information.

The ESER Education Program, the Museum of Idaho, and Boise State University collaborated on teacher outreach program development, which is designed to educate teachers about native Idaho habitats, to provide tools and hands-on activities that can be adapted to their classrooms, and to introduce them to experts who may serve as classroom resources. A grant from the Idaho Department of Education allowed the expansion of an online course called “Bring Idaho Alive in Your Classroom.” By expanding the online format, 45 teachers were able to attend a two-credit six-month course. Tool kits were also provided to the teachers to supplement learning.

The ESER Education Program, Idaho Falls Zoo, and Idaho State Department of Education collaborated on teacher outreach program development called the “i-STEM Strand Program.” The two-credit online workshop was coordinated through the Idaho Science, Technology, Engineering, and Mathematics (STEM) Action Center and allow 20 teachers to learn about wildlife conservation and the important role played by zoos.

The ESER Education Program worked with the education staff at the Museum of Idaho to provide summer camps for both students and educators through the Rocky Mountain Adventure Program. Three sets of 12 student camps were offered for younger children and three sets for middle-school students. These workshops focused on a combination of scientific, habitat, and historical aspects (Figure 1-5). Three teacher workshops were also offered. These workshops were offered in conjunction with Northwest Nazarene College for two credits. Staff from ESER assisted with the field portion of the teacher classes and various locations were utilized to expose teachers to different habitats (Figure 1-6).

Figure 1-5. Students in the Gross Science Summer Camp dissecting owl pellets.

Figure 1-6. ESER environmental educator, Gregg Losinski, explaining the native fauna to teachers in the Rocky Mountain Adventure program.

COVID-19 restriction eased just in time for ESER to join with the Idaho Falls Zoo in offering a bat night. This unique learning opportunity allowed 100 guests to learn about, view, and hear bats at the only chiropterarium at a zoo in the country (Figure 1-7).

Figure 1-7. Visitors experience the only zoo chiropterarium in the nation at bat night at the Idaho Falls Zoo (left). ESER bat biologist, Bill Doering, explains the unique relationship between humans and bats to participants of bat night (right).

In partnership with the Idaho Falls Post Register newspaper, the ESER Program creates a weekly column called “Ask a Scientist” Which began in 2007. In 2021, the column was sponsored by the ESER Program, the Post Register, and INL. The column calls on the experience and knowledge of a panel of about 30 scientists—including many from ESER—representing businesses, organizations, and agencies in southeastern Idaho to answer questions from local students and adults. An archive of questions and answers may be found at www.idahoaskascientist.com.

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