6 EFFLUENT AND ENVIRONMENTAL MEASUREMENTS AND MONITORING PROGRAMS

The proposed Idaho Spent Fuel Facility would be one of many active, proposed, and formerly operational facilities at the Idaho National Engineering and Environmental Laboratory (INEEL). The U.S. Department of Energy (DOE) Idaho Operations Office is the principal INEEL manager and has a comprehensive environmental monitoring program conducted on and around INEEL. The INEEL Monitoring and Surveillance Committee was formed to prevent multiple organizations from collecting duplicate data using varied methodologies. The environmental monitoring programs at INEEL include Effluent Monitoring Program, Drinking Water Program, Storm Water Monitoring Program, Site Environmental Surveillance Program, Off-Site Environmental Surveillance Program, U.S. Geological Survey Groundwater Monitoring Program, Meteorological Monitoring Program, and INEEL Oversight Program. Further information concerning these programs is discussed in Section 5 and presented in the Foster Wheeler Environmental Corporation (FWENC) environmental report (2001a). It is expected that FWENC would participate in this committee and the associated monitoring programs. FWENC is responsible for operational monitoring programs within the proposed Idaho Spent Fuel Facility site and relies on these Idaho Operations Office programs outside the proposed Idaho Spent Fuel Facility site (FWENC, 2001a, Section 6.3).

6.1 Radiological Monitoring

FWENC would be responsible for monitoring within the proposed Idaho Spent Fuel Facility site and would rely on existing monitoring programs outside the proposed Idaho Spent Fuel Facility site. Existing environmental programs on INEEL include the monitoring of effluents, drinking water, snow melt and rain runoff, direct radiation, air, soil, off-site produce and animal products, groundwater, surface water, and meteorology. The remainder of this section describes the monitoring performed on the proposed Idaho Spent Fuel Facility site. Based on FWENC (2001b, Section 7.6.1.4), there would be no radioactive liquid discharges from the proposed facility. Radiological monitoring for the preoperational and operational periods are presented in the next two subsections.

6.1.1 Preoperational Radiological Monitoring

The preoperational radiological monitoring program would establish background information for the site. Monitoring and sampling locations for the preoperational program are shown in Figure 6-1. The background information would be compared to operational data and ultimately with decommissioning survey results. The preoperational program would measure direct radiation, airborne radionuclide concentrations within the proposed Idaho Spent Fuel Facility site boundaries, and radionuclide concentrations in the soil on the proposed site. Direct radiation would be measured at the facility fence using 10 environmental thermoluminescent dosimeters that would be exchanged quarterly. After dust-generating activities are complete and electric power is available, particulate air samplers would begin collecting data at four locations (oriented at 90-degree intervals from the predominant wind direction, west-southwest). The filter paper in the particulate air samplers would be collected weekly for analysis and replaced. At the start of construction, five soil samples would be collected from random locations and analyzed quarterly.

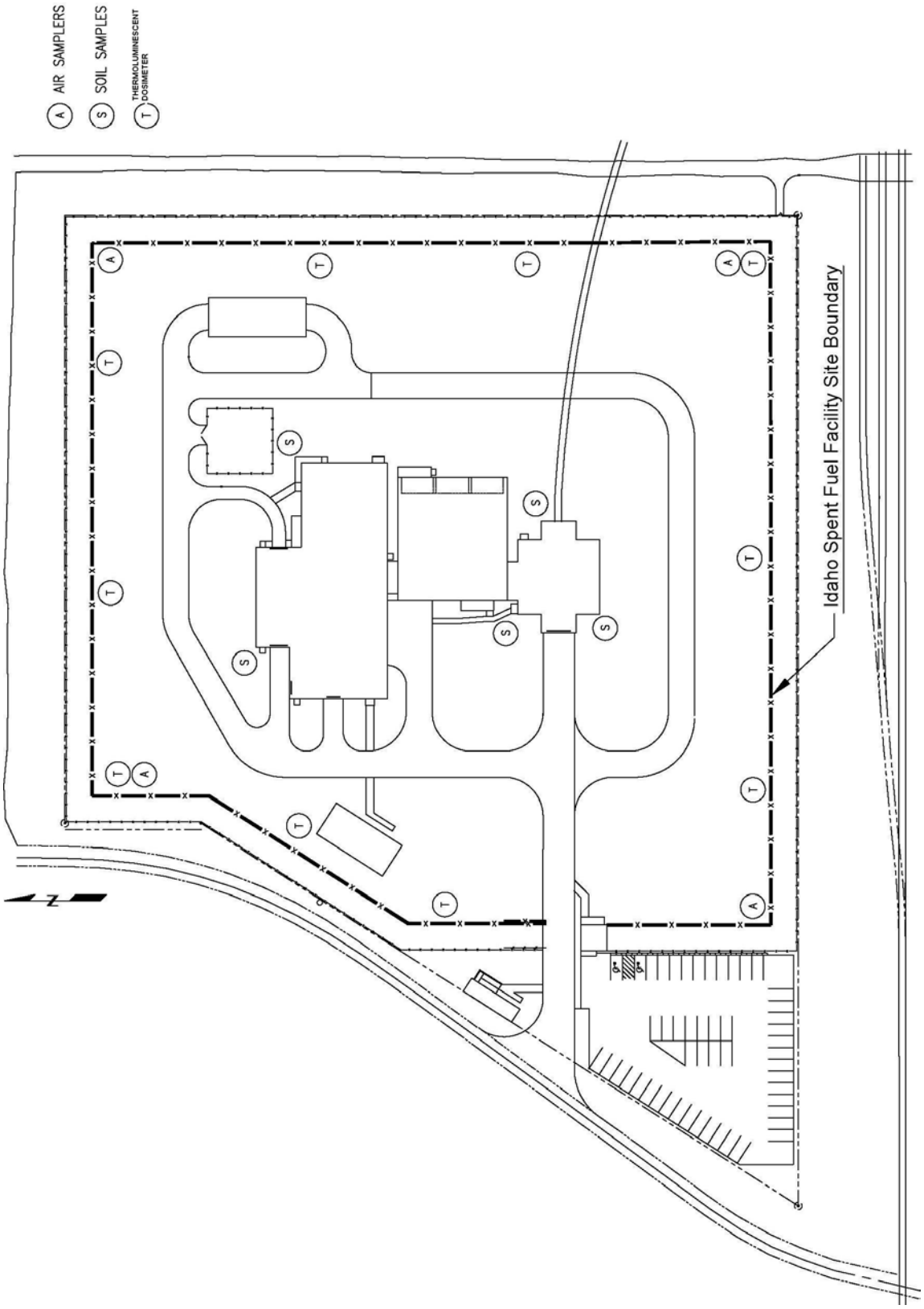

Figure 6-1. Preoperational Environmental Radiation Monitoring Locations at the Proposed Idaho Spent Fuel Facility (Modified from FWENC, 2001b)

Information gained during the preoperational phase of the radiological monitoring program may be used to modify the plans for operational monitoring (e.g., result in additional sampling locations).

6.1.2 Operational Radiological Monitoring

The operational monitoring program would demonstrate compliance with the exposure limits to the public in 10 CFR Part 72.104 and 40 CFR Part 61, Subpart H. Similar to the preoperations monitoring program, the operational program would measure direct radiation, airborne radionuclide concentrations within the proposed Idaho Spent Fuel Facility site boundaries, and radionuclide concentrations in the soil on the proposed site (Figure 6-2). The environmental thermoluminescent dosimeters at the fence would be exchanged monthly during operations. Particulate air samplers would continue to collect data at the four preoperational locations plus an additional location at the interior of the proposed Idaho Spent Fuel Facility site. The filter paper in the particulate air samplers would be collected weekly for analysis and replaced. During operations, five soil samples would be collected from random locations and analyzed quarterly. Additional sampling and analysis would be performed if routine outdoor surveys show unexpected anomalies or after any incident involving a radioactive spill.

Particulates and gaseous radionuclides are expected to constitute the proposed Idaho Spent Fuel Facility releases during operations. Specifically, the primary particulate radionuclides are cesium-137/barium-137m and strontium-90/yttrium-90. The primary gaseous radionuclides of concern are iodine-129, krypton-85, and tritium (hydrogen-3), which could be released as a result of the fuel-packaging operations conducted in the Fuel Packaging Area. Facility effluent monitoring at the proposed Idaho Spent Fuel Facility would consist of stack sampling for particulate radionuclides and stack sampling for iodine-129 and tritium. An isokinetic sampler in the stack would determine effluent concentrations.

6.2 Nonradiological Monitoring

6.2.1 Preoperational monitoring

Preoperational monitoring was used to collect baseline data on the proposed site. Much of this baseline information is presented in Section 3 of this environmental impact statement (EIS).

Air sampling within the proposed Idaho Spent Fuel Facility during the preoperational phase would begin after dust-generating activities are complete and would not include analysis for nonradioactive constituents (FWENC, 2001a, Section 6.1).

Soil sampling of the proposed Idaho Spent Fuel Facility site was conducted in July 2000 as part of a geotechnical investigation to determine site geotechnical characteristics (FWENC, 2001a, Section 6.1). Soil samples also would be collected periodically from within the proposed Idaho Spent Fuel Facility site boundaries during the preoperational phase; however, these samples would not be analyzed for nonradioactive constituents (FWENC, 2001a, Section 6.1).

No surface or groundwater bodies are affected by the proposed Idaho Spent Fuel Facility. Therefore, the environmental monitoring programs do not need to include these areas (FWENC, 2001a, Section 6.1). Rainwater and snow melt from the proposed Idaho Spent Fuel Facility would be classified as storm water discharge and must be considered by the National Pollutant

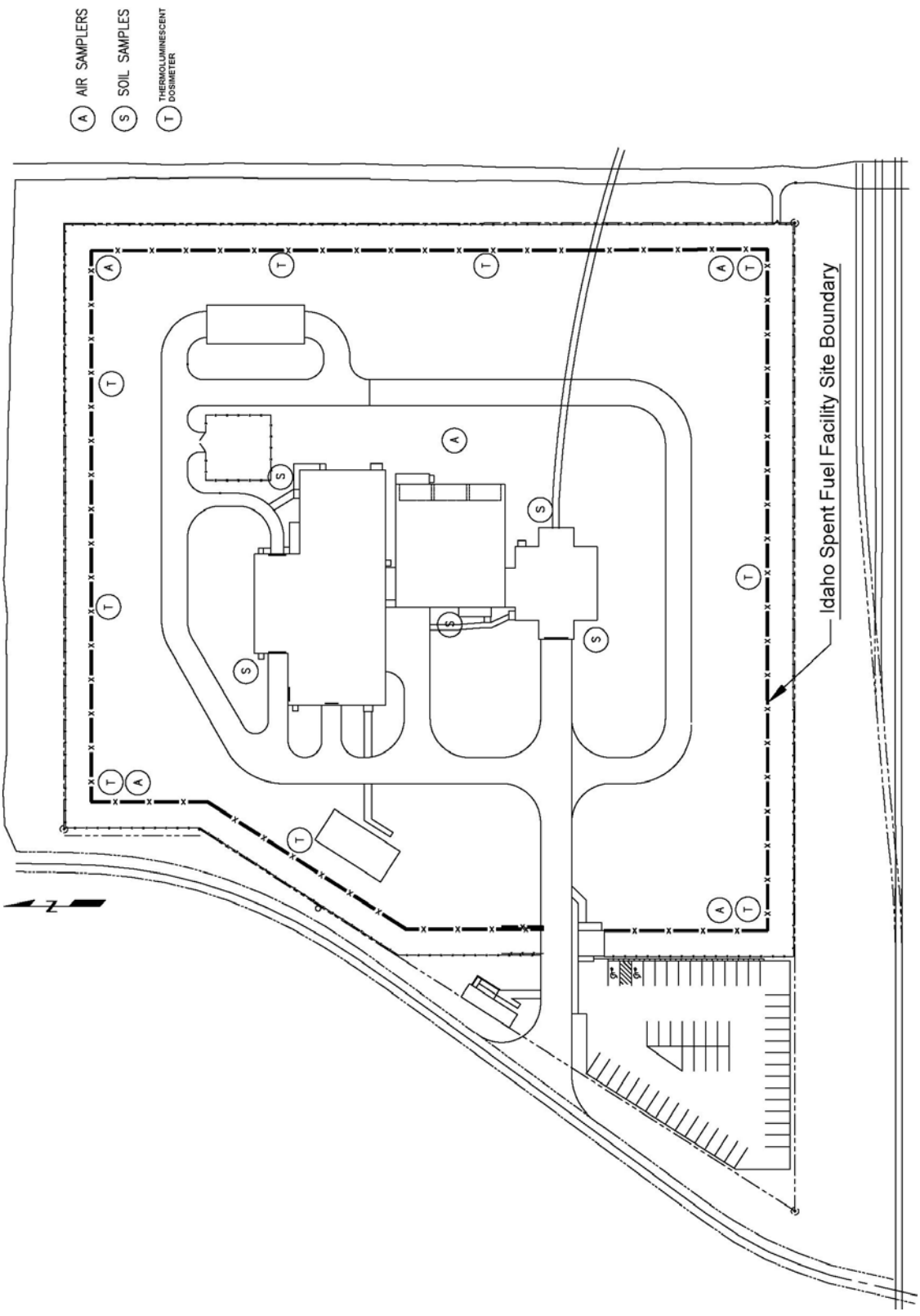

Figure 6-2. Operational Environmental Radiation-Monitoring Locations at the Proposed Idaho Spent Fuel Facility (Modified from FWENC, 2001b)

Discharge Elimination System (NPDES) permitting process. Storm water permits fall into two classifications—construction and industrial activities. For the construction storm water permit process, the DOE Idaho Operations Office filed for a construction general permit as required by federal law (DOE, 1998). A site-specific Construction Storm Water Pollution Prevention Plan would be developed, but does not need to be submitted to the U.S. Environmental Protection Agency (EPA) (FWENC, 2001a, Section 12.1).

INEEL has undergone a variety of ecological assessments in the last 10 years. Two of the most recent were the Spent Nuclear Fuel Programmatic EIS (DOE, 1995) and the Idaho High-Level Waste and Facilities Disposition EIS (DOE, 2002). Because these assessments did not include the proposed Idaho Spent Fuel Facility site, FWENC sponsored a separate assessment by the S.M. Stoller Corporation. The parameters and results of this assessment are summarized in the applicant's environmental report (FWENC, 2001a, Section 4.3).

6.2.2 Operational Monitoring

The proposed Idaho Spent Fuel Facility would have no chemical air discharges to the environment. Nonradiological airborne effluents are monitored at the sources, the New Calcining Facility, and the Argonne National Laboratory–West (FWENC, 2001a, Section 6.3). At the proposed Idaho Spent Fuel Facility, process ventilation would be filtered and discharged through the monitored exhaust stack. Air sampling within the proposed Idaho Spent Fuel Facility would be limited to radiological constituents (FWENC, 2001a, Section 6.2).

No nonradiological soil sampling within the proposed Idaho Spent Fuel Facility site would be conducted during the operation phase (FWENC, 2001a, Section 6.1).

The proposed Idaho Spent Fuel Facility, as part of INEEL, would become part of the site environmental surveillance program. This program has the overall responsibility for sampling air and soil at various onsite locations. Some sampling is also conducted offsite for comparison. Nonradiological constituents monitored in this program include nitrogen dioxide and sulfur dioxide (FWENC, 2001a, Section 6.3).

The proposed Idaho Spent Fuel Facility, as part of the INEEL, would also become a part of the off-site environmental surveillance program. The Environmental Science and Research Foundation conducts environmental monitoring independent of the INEEL management and operating contractor. The Foundation analyzes samples from stations in Rexburg and Blackfoot to determine concentration of fine particulates. The National Park Service manages a program called Interagency Monitoring of Protected Visual Environments (IMPROVE) to measure fine particles that are the primary cause of visibility degradation. This program uses two samplers—one at Craters of the Moon National Monument and Preserve and one inside INEEL (FWENC, 2001a, Section 6.3).

The proposed Idaho Spent Fuel Facility would have no chemical liquid discharges to the environment (FWENC, 2001a, Section 5.3). Nonradiological liquid effluents are monitored from discharge points within INEEL and in Idaho Falls. Because no liquid effluents would be discharged, no nonradiological monitoring of any liquid discharge at the proposed Idaho Spent Fuel Facility is required.

The proposed Idaho Spent Fuel Facility does not require addition of any new water supply wells. The proposed facility would use water from the existing INEEL wells and would have minimal impact on groundwater resources (FWENC, 2001a, Section 5.6).

The INEEL management and operating contractor monitors the INEEL production and drinking water wells for chemical and bacteriological contamination. Facilities that the INEEL management and operating contractor do not operate and that contain a production well must provide samples to the INEEL management and operating contractor for analysis. No production wells are within the proposed Idaho Spent Fuel Facility site boundaries. Therefore, FWENC would not need to provide samples to the INEEL management and operating contractor (FWENC, 2001a, Section 6.3). Production and drinking water wells adjacent to the proposed Idaho Spent Fuel Facility site would be monitored for nonradiological constituents as part of the existing INEEL Environmental Monitoring Program.

The proposed Idaho Spent Fuel Facility, as part of INEEL, would become a part of the U.S. Geological Survey Groundwater Monitoring Program. The U.S. Geological Survey maintains aquifer observation wells on or near INEEL, which are monitored for nonradiological substances. The U.S. Geological Survey also collects water samples from selected onsite production wells and groundwater monitoring wells and analyzes the samples for purgeable organic compounds (FWENC, 2001a, Section 6.3).

As a requirement of the NPDES General Permit, INEEL developed a program for monitoring snow melt and rain runoff. The proposed Idaho Spent Fuel Facility would be exempt from the industrial activities storm water permit, because it is not included in EPA-identified sectors or subsectors requiring this permitting process (FWENC, 2001a, Section 12.1).

Because the proposed Idaho Spent Fuel Facility would be within the INEEL boundary, annual environmental assessments prepared for DOE would provide information updates related to the INEEL ecological monitoring program (FWENC, 2001a, Section 6.1).

6.3 References

DOE. DOE/EIS–0287–F, "Idaho High-Level Waste and Facilities Disposition Final Environmental Impact Statement." Idaho Falls, Idaho: DOE, Idaho Operations Office. 2002.

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FWENC. "Environmental Report, Idaho Spent Fuel Facility." NRC Docket No. 72-25. ISF–FW–RPT–0032. Morris Plains, New Jersey: FWENC. 2001a.

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