

1                   **6 EFFLUENT AND ENVIRONMENTAL MEASUREMENTS AND**  
2                   **MONITORING PROGRAMS**

3  
4 The proposed Idaho Spent Fuel Facility would be one of many active, proposed, and formerly  
5 operational facilities at the Idaho National Engineering and Environmental Laboratory (INEEL).  
6 The U.S. Department of Energy (DOE) Idaho Operations Office is the principal INEEL manager  
7 and has a comprehensive environmental monitoring program conducted on and around INEEL.  
8 The INEEL Monitoring and Surveillance Committee was formed to prevent multiple  
9 organizations from collecting duplicate data using varied methodologies. The environmental  
10 monitoring programs at INEEL include Effluent Monitoring Program, Drinking Water Program,  
11 Storm Water Monitoring Program, Site Environmental Surveillance Program, Off-Site  
12 Environmental Surveillance Program, U.S. Geological Survey Groundwater Monitoring Program,  
13 Meteorological Monitoring Program, and INEEL Oversight Program. Further information  
14 concerning these programs is discussed in Section 5 and presented in the Foster Wheeler  
15 Environmental Corporation (FWENC) environmental report (2001a). It is expected that  
16 FWENC would participate in this committee and the associated monitoring programs. FWENC  
17 is responsible for operational monitoring programs within the proposed Idaho Spent Fuel Facility  
18 site and relies on these Idaho Operations Office programs outside the proposed Idaho Spent  
19 Fuel Facility site (FWENC, 2001a, Section 6.3).

20  
21           **6.1           Radiological Monitoring**

22  
23 FWENC would be responsible for monitoring within the proposed Idaho Spent Fuel Facility site  
24 and would rely on existing monitoring programs outside the proposed Idaho Spent Fuel Facility  
25 site. Existing environmental programs on INEEL include the monitoring of effluents, drinking  
26 water, snow melt and rain runoff, direct radiation, air, soil, off-site produce and animal products,  
27 groundwater, surface water, and meteorology. The remainder of this section describes the  
28 monitoring performed on the proposed Idaho Spent Fuel Facility site. Based on FWENC  
29 (2001b, Section 7.6.1.4), there would be no radioactive liquid discharges from the proposed  
30 facility. Radiological monitoring for the preoperational and operational periods are presented in  
31 the next two subsections.

32  
33           **6.1.1       Preoperational Radiological Monitoring**

34  
35 The preoperational radiological monitoring program would establish background information for  
36 the site. Monitoring and sampling locations for the preoperational program are shown in  
37 Figure 6-1. The background information would be compared to operational data and ultimately  
38 with decommissioning survey results. The preoperational program would measure direct  
39 radiation, airborne radionuclide concentrations within the proposed Idaho Spent Fuel Facility  
40 site boundaries, and radionuclide concentrations in the soil on the proposed site. Direct  
41 radiation would be measured at the facility fence using 10 environmental thermoluminescent  
42 dosimeters that would be exchanged quarterly. After dust-generating activities are complete  
43 and electric power is available, particulate air samplers would begin collecting data at four  
44 locations (oriented at 90-degree intervals from the predominant wind direction, west-southwest).  
45 The filter paper in the particulate air samplers would be collected weekly for analysis and  
46 replaced. At the start of construction, five soil samples would be collected from random  
47 locations and analyzed quarterly.

Effluent and Environmental Measurements  
and Monitoring Programs

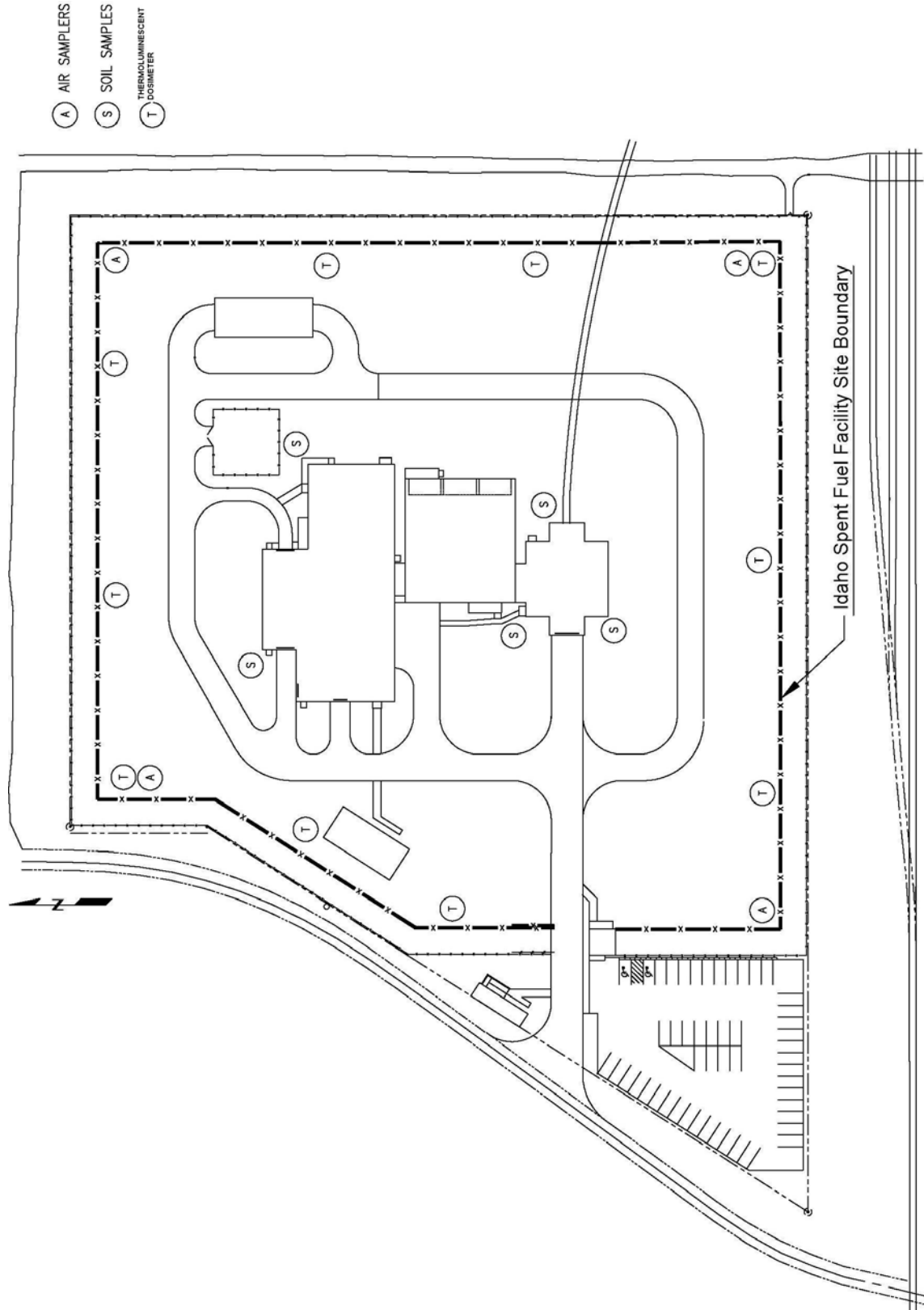


Figure 6-1. Preoperational Environmental Radiation Monitoring Locations at the Proposed Idaho Spent Fuel Facility  
(Modified from FWENC, 2001b)

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

## 4 5 **6.1.2 Operational Radiological Monitoring**

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

19  
20 Particulates and gaseous radionuclides are expected to constitute the proposed Idaho Spent  
21 Fuel Facility releases during operations. Specifically, the primary particulate radionuclides are  
22 cesium-137/barium-137m and strontium-90/yttrium-90. The primary gaseous radionuclides of  
23 concern are iodine-129, krypton-85, and tritium (hydrogen-3), which could be released as a  
24 result of the fuel-packaging operations conducted in the Fuel Packaging Area. Facility effluent  
25 monitoring at the proposed Idaho Spent Fuel Facility would consist of stack sampling for  
26 particulate radionuclides and stack sampling for iodine-129 and tritium. An isokinetic sampler in  
27 the stack would determine effluent concentrations.

## 28 29 **6.2 Nonradiological Monitoring**

### 30 31 **6.2.1 Preoperational monitoring**

32  
33 Preoperational monitoring was used to collect baseline data on the proposed site. Much of this  
34 baseline information is presented in Section 3 of this environmental impact statement (EIS).

35  
36 Air sampling within the proposed Idaho Spent Fuel Facility during the preoperational phase  
37 would begin after dust-generating activities are complete and would not include analysis for  
38 nonradioactive constituents (FWENC, 2001a, Section 6.1).

39  
40 Soil sampling of the proposed Idaho Spent Fuel Facility site was conducted in July 2000 as part  
41 of a geotechnical investigation to determine site geotechnical characteristics (FWENC, 2001a,  
42 Section 6.1). Soil samples also would be collected periodically from within the proposed Idaho  
43 Spent Fuel Facility site boundaries during the preoperational phase; however, these samples  
44 would not be analyzed for nonradioactive constituents (FWENC, 2001a, Section 6.1).

45  
46 No surface or groundwater bodies are affected by the proposed Idaho Spent Fuel Facility.  
47 Therefore, the environmental monitoring programs do not need to include these areas (FWENC,  
48 2001a, Section 6.1). Rainwater and snow melt from the proposed Idaho Spent Fuel Facility  
49 would be classified as storm water discharge and must be considered by the National Pollutant

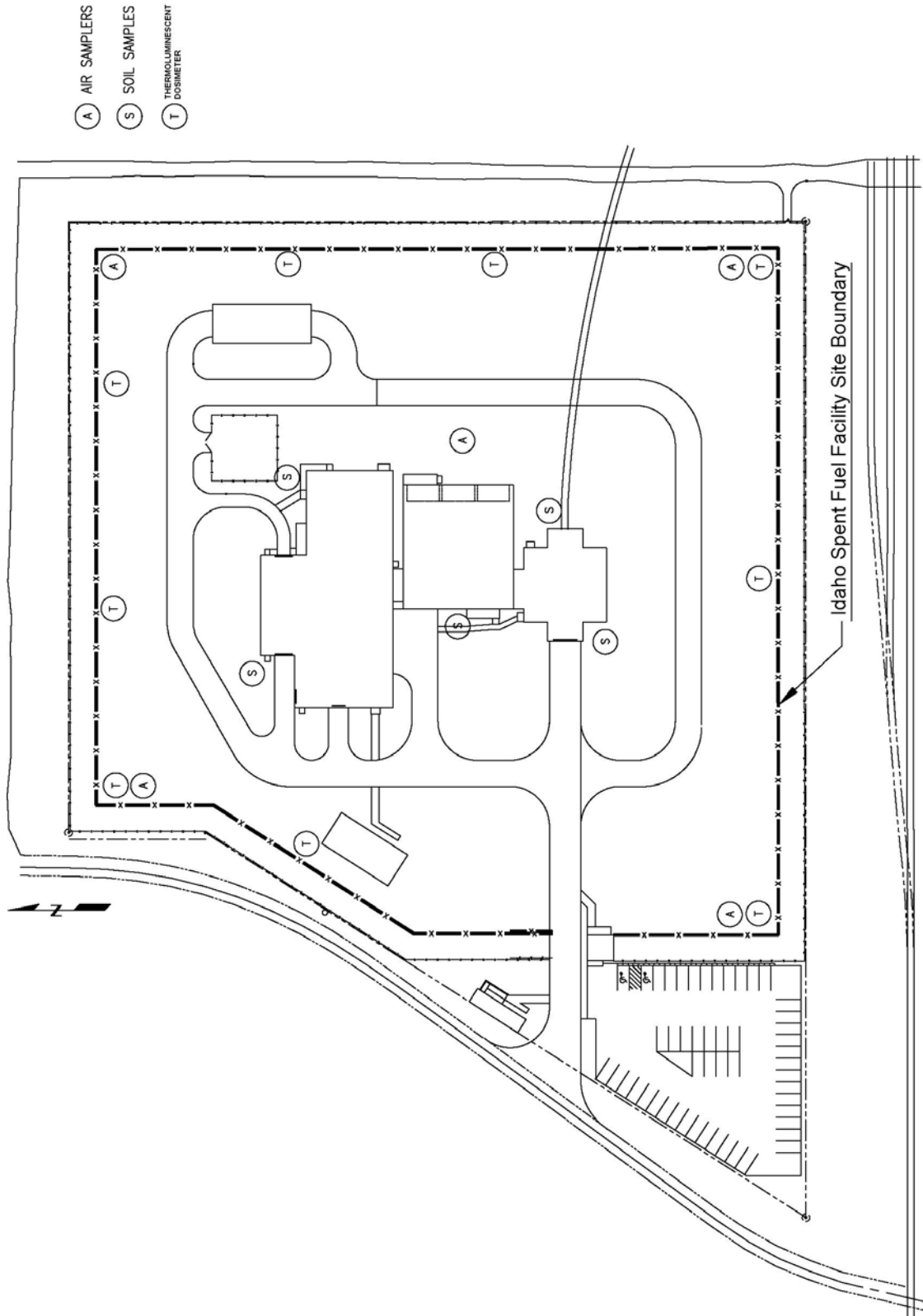


Figure 6-2. Operational Environmental Radiation-Monitoring Locations at the Proposed Idaho Spent Fuel Facility  
(Modified from FWENC, 2001b)

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

7  
8 INEEL has undergone a variety of ecological assessments in the last 10 years. Two of the most  
9 recent were the Spent Nuclear Fuel Programmatic EIS (DOE, 1995) and the Idaho High-Level  
10 Waste and Facilities Disposition EIS (DOE, 2002). Because these assessments did not include  
11 the proposed Idaho Spent Fuel Facility site, FWENC sponsored a separate assessment by the  
12 S.M. Stoller Corporation. The parameters and results of this assessment are summarized in the  
13 applicant's environmental report (FWENC, 2001a, Section 4.3).

## 14 15 **6.2.2 Operational Monitoring**

16  
17 The proposed Idaho Spent Fuel Facility would have no chemical air discharges to the  
18 environment. Nonradiological airborne effluents are monitored at the sources, the New  
19 Calcining Facility, and the Argonne National Laboratory–West (FWENC, 2001a, Section 6.3).  
20 At the proposed Idaho Spent Fuel Facility, process ventilation would be filtered and discharged  
21 through the monitored exhaust stack. Air sampling within the proposed Idaho Spent Fuel  
22 Facility would be limited to radiological constituents (FWENC, 2001a, Section 6.2).

23  
24 No nonradiological soil sampling within the proposed Idaho Spent Fuel Facility site would be  
25 conducted during the operation phase (FWENC, 2001a, Section 6.1).

26  
27 The proposed Idaho Spent Fuel Facility, as part of INEEL, would become part of the site  
28 environmental surveillance program. This program has the overall responsibility for sampling air  
29 and soil at various onsite locations. Some sampling is also conducted offsite for comparison.  
30 Nonradiological constituents monitored in this program include nitrogen dioxide and sulfur  
31 dioxide (FWENC, 2001a, Section 6.3).

32  
33 The proposed Idaho Spent Fuel Facility, as part of the INEEL, would also become a part of the  
34 off-site environmental surveillance program. The Environmental Science and Research  
35 Foundation conducts environmental monitoring independent of the INEEL management and  
36 operating contractor. The Foundation analyzes samples from stations in Rexburg and Blackfoot  
37 to determine concentration of fine particulates. The National Park Service manages a program  
38 called Interagency Monitoring of Protected Visual Environments (IMPROVE) to measure fine  
39 particles that are the primary cause of visibility degradation. This program uses two  
40 samplers—one at Craters of the Moon National Monument and Preserve and one inside INEEL  
41 (FWENC, 2001a, Section 6.3).

42  
43 The proposed Idaho Spent Fuel Facility would have no chemical liquid discharges to the  
44 environment (FWENC, 2001a, Section 5.3). Nonradiological liquid effluents are monitored from  
45 discharge points within INEEL and in Idaho Falls. Because no liquid effluents would be  
46 discharged, no nonradiological monitoring of any liquid discharge at the proposed Idaho Spent  
47 Fuel Facility is required.

## Effluent and Environmental Measurements and Monitoring Programs

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

4

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

14

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

21

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

26

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

30

### 31 **6.3 References**

32

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

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36 ———. DOE/ID-10425(98), "INEEL Storm Water Pollution Prevention Plan for Construction  
37 Activities—Generic Plan." Idaho Falls, Idaho: DOE, Idaho Operations Office. 1998.

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39 ———. DOE/EIS-0203-F, "Department of Energy Programmatic Spent Nuclear Fuel  
40 Management and Idaho National Engineering Laboratory Environmental Restoration and Waste  
41 Management Programs Final Environmental Impact Statement." Idaho Falls, Idaho: DOE,  
42 Idaho Operations Office. 1995.

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

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47 ———. "Safety Analysis Report, Idaho Spent Fuel Facility." NRC Docket No. 72-25.  
48 ISF-FW-RPT-0033. Morris Plains, New Jersey: FWENC. 2001b.