

8 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

8.1 Unavoidable Adverse Impacts

Information on the adverse impacts to the affected environment at the Idaho National Engineering and Environmental Laboratory (INEEL) that cannot be avoided for this proposed action is given in Section 4 of this environmental impact statement (EIS). The environmental impacts from the proposed action are small and will be mitigated by methods described in Section 5. Monitoring methods are described in Section 6. Comparison with the potential impacts from the proposed action to those of the no-action alternative is provided in Table 2-1. Detailed analysis of the potential impacts on public health and safety is provided in the safety evaluation report to be prepared by the U.S. Nuclear Regulatory Commission (NRC). Following is a brief summary of the impacts presented in Section 4 with topical areas classified as resources, ecosystems, or human communities.

- Land Use (Section 4.1)—Ecosystem: Construction activities to occur on an 3.2-ha [8-acre] facility site and an adjoining 4.1-ha [10-acre] laydown area. The 7.3 ha [18 acres] are adjacent to Idaho Nuclear Technology and Engineering Center (INTEC) and have been previously disturbed by other construction activities and land uses. Potential operation impacts include restricted access to the 3.2-ha [8-acre] facility site; and the use of the site for spent nuclear fuel (SNF) receiving, packaging, and storage.
- Transportation (Section 4.2)—Human Community: Operation impacts are related to transfer of the currently stored SNF at INTEC, a distance of approximately 700 m [2,300 ft], to the proposed Idaho Spent Fuel Facility. Shipments would be made in U.S. Department of Energy (DOE)-supplied casks loaded on trailers. Movement of the SNF within the proposed Idaho Spent Fuel Facility would be conducted in accordance with the DOE procedures and orders for SNF transfers within the INEEL complex.
- Geology and Soils (Section 4.3)—Resource: Construction-related impacts to soil would occur on the 3.2-ha [8-acre] site and, to some extent, on the 4.1-ha [10-acre] laydown area. Excavation, earthmoving, and grading would occur on the 3.2-ha [8-acre] site. There is no contamination at the site above regulatory limits. No construction or operation impacts would occur on mineral deposits or unique geological resources.
- Water Resources—Water Quality (Section 4.4.1)—Resource: Construction phase impacts would be minimal to both surface water quality and groundwater quality. A storm water pollution prevention plan will be implemented. The proposed site is 140–146 m [460 to 480 ft] above the Snake River Plain Aquifer. Water used for construction phase dust control would evaporate or seep into surface soils. No new groundwater wells or percolation ponds would be required.
- Water Resources—Water Use (Section 4.4.2)—Resource: During the first year of construction, approximately 1.5 million L [396,000 gal] of water would be used for dust suppression, with an estimated additional 1.91 million L [505,000 gal] for concrete production at the site. During the second year of construction, it is estimated that water needs would be reduced by half. Drinking water use during operation would be nearly 141,950 L/mo [37,500 gal/mo]. These two amounts are a small fraction of the

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7.4 billion L [2.0 billion gal] used annually at the INEEL and the annual withdrawal of 43 billion L [11.4 billion gal] permitted by the DOE/State of Idaho Water Rights Agreement. Wastewater treatment requirements would be met via existing INTEC facilities.

- Ecological (Section 4.5)—Ecosystem: Minimal impacts from the construction and operation of the facility would be anticipated. There are no wetlands or habitats for threatened or endangered plant or animal species at the 3.2-ha [8-acre] site or 4.1-ha [10-acre] laydown area. Secondary impacts on wildlife from noise and various human activities would also be minimal.
- Air Quality (Section 4.6)—Resource: Construction-related fugitive dusts and exhaust emissions would be temporary and highly localized. With construction phase watering, the fugitive dusts and particulates would be about 8.2 metric tons [9 tons]; this is a small amount in relation to the INEEL emission inventory for particulates. No impacts to radiological air quality are anticipated from construction activities. During operation, there would be no chemical air discharges, and the vehicular exhausts would be small and within limitations. Therefore, no significant impacts to nonradiological air quality are anticipated. Facility operations would not be expected to result in the atmospheric discharge of significant amounts of gaseous radioactive effluents. The facility would be fully enclosed and includes a special ventilation system along with high efficiency particulate air (HEPA) filters. Monitoring of stack emissions for particulate radionuclides, iodine-129, and tritium would be used to identify any releases.
- Noise (Section 4.7)—Resource: Construction phase noise levels would be typical of industrial areas; further, the noise would be temporary and highly localized. Noise from construction and operation traffic would be minimal in relation to existing traffic noise levels in the INTEC area. Potential noise levels from operations would be less than those from construction. Hearing protection will be required for workers per 29 CFR 1910.95. No unique noise receptors are in the vicinity of the proposed Idaho Spent Fuel Facility. Therefore, noise impacts are not expected to be significant.
- Historical, Cultural, and Paleontological (Section 4.8)—Human Community: There are no known historical and cultural resources, or paleontological resources, within the 3.2-ha [8-acre] site and the 4.1-ha [10-acre] laydown area. Thirty-eight buildings and structures within INTEC are potentially eligible for the National Register of Historic Places, but only one of these (CPP-603) is near the area that would be affected by the construction of the proposed facility and the transfer of SNF. The proposed facility would not introduce a built environment in a pristine natural setting. There are potential cumulative effects from withdrawal of access to the proposed 7.3-ha [18-acre] site by the Shoshone-Bannock Tribes, however, these lands are already contained within the limited access buffer area around INTEC.
- Visual/Scenic (Section 4.9)—Human Community: Because of its smaller scale in relation to the adjacent INTEC facilities, construction and operation of the proposed Idaho Spent Fuel Facility would not cause visual impacts to the Bureau of Land Management (BLM) Class IV rating for the INTEC area. Fugitive dusts and exhaust emissions from construction would not impair the BLM Class III rating of lands adjacent

to INEEL nor would the minimal-to-nil releases of radioactive particulates and gases during operations. No significant visual or scenic impacts are anticipated.

- Socioeconomic (Section 4.10)—Human Community: Construction of the proposed Idaho Spent Fuel Facility is scheduled to last approximately 2 years. This phase would employ a maximum of 250 workers, approximately 3 percent of the current INEEL workforce of 8,100. Because most of the workers would likely come from the existing INEEL workforce, the construction phase would not have significant socioeconomic effects on population growth, employment levels, housing, and infrastructure. For the first 4 years of facility operations, when fuel receipt and packaging occurs, about 60 employees would be required. Storage operations beyond the first 4 years will likely require fewer staff. Most operations personnel would be from the local INEEL workforce. Again, no significant impacts are expected on the various features of the socioeconomic environment.
- Environmental Justice (Section 4.11)—Human Community: The minority population near INEEL is predominately Hispanic, American Indian, and Asian, with these groups composing approximately 7 percent of the population within a 80-km [50-mi] radius. The low-income population in this same area comprises approximately 14 percent of the population. Special concerns related to the Shoshone–Bannock Tribes have been identified numerous consultations between tribal officials and INEEL officials. Two recent programmatic impact studies for INEEL concluded that environmental justice impacts are not significant (DOE, 1995, 2002), as did the recent EIS on the independent SNF storage installation for the Three-Mile Island Unit 2 Spent Fuel (NRC, 1998). Accordingly, because of the small socioeconomic impacts of the proposed Idaho Spent Fuel Facility, in general, and the lack of identified disproportionate impacts in the three recent impact studies, it is likely that no disproportionately high and adverse human health or environmental effects will occur on minority and low-income populations.
- Public and Occupational Health and Safety (Section 4.12)—Human Community: Potential impacts were examined for normal, off-normal, and accident conditions. For normal operating conditions, no chemical discharges are planned from the proposed facility, and a health and safety program would be in place for the workers. The primary pathway for off-site radiation exposure to the public would be from atmospheric emissions of radioactive particulates, iodine-129, tritium, and a few other radionuclides. Iodine-129 and tritium contribute approximately 80 percent of the total dose. The estimated annual dose for the maximally exposed individual at the southern boundary of INEEL is 3×10^{-7} mSv [3×10^{-5} mrem] from the proposed Idaho Spent Fuel Facility; from all nearby facility operations, the dose is less than 0.0032 mSv [0.32 mrem]. The regulatory annual dose limit is 0.1 mSv [10 mrem], and the natural background annual radiation is 3.6 mSv [360 mrem] in this general area. Therefore, public radiation impacts during normal operation of the proposed Idaho Spent Fuel Facility would be minimal and insignificant. Occupational radiological doses from the construction of the proposed Idaho Spent Fuel Facility would be less than 0.0032 mSv [0.32 mrem] annually to construction workers. The NRC annual occupational limit is 50 mSv [5,000 mrem], and the annual natural background radiation dose is 3.6 mSv [360 mrem]. The occupational dose to SNF-handling workers would be 9.1 mSv [910 mrem] annually, with the NRC annual occupational limit being 50 mSv [5,000 mrem]. The annual radiation dose to all workers within an 8-km [4.8-mi] radius is 6.68×10^{-5} mSv [6.68×10^{-3} mrem]. Detailed

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analyses of the radiation doses from off-normal events and accidents at the proposed Idaho Spent Fuel Facility are in Foster Wheeler Environmental Corporation (FWENC) (2001a). Further, analyses were also made of the public and occupational health and safety impacts of external events such as flooding, aircraft impact, volcanic hazards, seismic hazards, and extreme wind and wind-generated missiles. Design features and operational practices are expected to minimize the public and occupational health and safety impacts of these events and accidents.

- Waste Management (Section 4.13)—Resource: Small quantities of gaseous, liquid, and solid low-level radioactive waste would be generated during the SNF receipt and repackaging operations planned for the first 3 years at the proposed Idaho Spent Fuel Facility. After repackaging and storing, no gaseous releases, or liquid or solid radioactive wastes are anticipated to be generated on a regular basis at the proposed facility. Less than 17,790 L [4,700 gal] of low-level liquid wastes would be annually generated from decontamination activities. The INEEL Radioactive Waste Management Complex has the capacity to handle the small quantities of the generated wastes during the storage period for the repackaged SNF.

8.2 Relationship Between Short-Term Uses and Long-Term Productivity

As discussed in Section 4.1 of this EIS, the proposed Idaho Spent Fuel Facility includes the short-term use of up to 7.3 ha [18 acres] of previously disturbed, undeveloped land. This includes the 3.2-ha [8-acre] tract where the proposed facility will be constructed and a contiguous 4.1-ha [10-acre] construction laydown tract. The proposed action would result in physical changes to the site, including construction of a new facility and grading and leveling to prepare the site. Because these two areas are small compared with the 2,305 km² [890 mi²] INEEL and the 101-ha [250-acre] INTEC facility adjacent to the proposed facility, the physical changes are expected to be minor. These changes would restrict access to the land during construction and operation of the proposed Idaho Spent Fuel Facility. The restriction would not affect the value of the land, because the property is classified as least productive, and access is already limited. The site would be decontaminated and decommissioned to meet applicable NRC standards at the end of facility use (see Sections 4.16 and 7.1.3). Therefore, it is anticipated that impacts from the proposed action would not lead to any impacts on the long-term productivity of the land.

8.3 Irreversible and Irretrievable Commitment

The construction and operation of the proposed Idaho Spent Fuel Facility would consume irretrievable amounts of electrical energy, fuel (see Table 7-2), and miscellaneous chemicals. Also, there would be an indefinite commitment of concrete, metals, plastic, lumber, sand, gravel, and a fraction of the water used in construction. Transfer of SNF into new storage containers and placement in the vault will require consumable materials such as filters, welding supplies, and other housekeeping materials. Storage operations would require materials such as HEPA filter media and other housekeeping materials. Scarce or strategic material would not be used for the construction of the facility. When the proposed Idaho Spent Fuel Facility ceases operation, DOE would be required to submit an updated decontamination and decommissioning plan for NRC review and approval. NRC will require the site be cleaned to applicable standards at that time. The current conceptual decontamination and decommissioning plan for the facility

is described in the FWENC license application for the proposed action (FWENC, 2001b) and discussed in Sections 4.16 and 7.1.3 of this EIS.

8.4 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.
- . DOE/EIS-0203-F, "Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement." Idaho Falls, Idaho: DOE, Idaho Operations Office. 1995.
- FWENC. "Safety Analysis Report, Idaho Spent Fuel Facility." NRC Docket No. 72-25. ISF-FW-RPT-0033. Morris Plains, New Jersey: FWENC. 2001a.
- . "License Application, Idaho Spent Fuel Facility." NRC Docket No. 72-25. ISF-FW-RPT-0127." Morris Plains, New Jersey: FWENC. 2001b.
- NRC. NUREG-1626, "Final Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation to Store the Three-Mile Island Unit 2 Spent Fuel at the Idaho National Engineering and Environmental Laboratory." Washington, DC: NRC. March 1998.