UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

August 17, 2001

Reply To
Attn Of: ECL-113

Kathleen Hain, Director
Environmental Restoration Program
Department of Energy
Idaho Operations Office
850 Energy Drive
Idaho Falls, Idaho 83401-1563

Re: Idaho National Engineering Laboratory SL-1/BORAX-1 Burial Grounds Remedial Action Review

Dear Ms. Hain:

Enclosed is the EPA review of the remedial action at the SL-1/BORAX-1 Burial Grounds. This review was performed in accordance with the review requirements identified in the 1996 Record of Decision for the SL-1/BORAX-1 Burial Grounds. If you have any questions, please contact me at 206-553-8633.

Sincerely,

Richard Poeton, WAG 5 Manager

encl

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U.S. Environmental Protection Agency
Region 10
Office of Environmental Cleanup
Remedial Action Review
Idaho National Engineering and Environmental Laboratory
Stationary Low-Power Reactor-1 and Boiling Water Reactor-1
Burial Grounds

1. Introduction

EPA Region 10 has conducted a Remedial Action Review of the Idaho National Engineering Laboratory (INEEL) Stationary Low-Power Reactor-1 (SL-1) and Boiling Water Reactor-1(BORAX-1) Burial Grounds consistent with the 1996 Record of Decision for this site. This review is distinct from the statutory INEEL-wide Five-Year Review, performed in 2000, which was based on the requirements of Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.400(f)(4)(ii)of the National Contingency Plan (NCP). The purpose of this review is to comply with the review requirements identified in the 1996 ROD and to ensure that the remedial action remains protective of human health and the environment and is functioning as designed.

2. Site Location and Description

The INEEL is located 32 miles west of Idaho Falls, Idaho and occupies 890 square miles of the northeastern portion of the Eastern Snake River Plain. The SL-1 site is located approximately 1,600 feet northeast of the Auxiliary Reactor Area II and includes a fenced burial ground containing approximately 99,000 cubic feet of radionuclide-contaminated debris, soil, and gravel. The BORAX-1 Burial Ground is located approximately 2,730 feet northwest of the Experimental Breeder Reactor-1, which is a registered National Historic Landmark. The BORAX-1 site includes a fenced burial ground containing approximately 6,336 cubic feet of radionuclide-contaminated soil and debris.

The SL-1 and BORAX-1 Burial Grounds were constructed to dispose of contaminated debris, soil and gravel generated by the destruction of a small nuclear reactor at each location. The BORAX-1 burial ground was established in 1954, the SL-1 burial ground was established in 1961. Both sites were evaluated under the 1991 INEEL Federal Facility Agreement and Consent Order and both were capped with engineered barriers as part of the remedy selected in 1996.

3. Remedial Objectives

Remedial Action Objectives were established for the protection of human health:

> Inhibit exposure to radioactive materials that would result in a total excess cancer risk from all contaminants of greater than 1 in 10,000 to 1 in 1,000,000.
>
> Inhibit ingestion of radioactive materials that would result in a total excess cancer risk from all contaminants of greater than 1 in 10,000 to 1 in 1,000,000.
>
> Inhibit inhalation of suspended radioactive materials that would result in a total excess cancer risk from all contaminants of greater than 1 in 10,000 to 1 in 1,000,000.
>
> Inhibit degradation of the burial grounds that could result in exposure of buried wastes or migration of contaminants to the surface that would result in a total excess cancer risk from all contaminants of greater than 1 in 10,000 to 1 in 1,000,000.

A Remedial Action Objective was established for the protection of the environment:

> Inhibit adverse effects to resident species from exposure to contaminants at the burial grounds.

The remedy selected in the ROD for both the SL-1 and BORAX-1 Burial Grounds consisted primarily of containment by capping with an engineered barrier. For BORAX-1, the remedy also included consolidation of surrounding contaminated surface soils within the containment system. The remedy for both sites included institutional controls consisting of access and land use restrictions to discourage intrusion into the burial grounds. Other aspects of the remedy included fences, warning signs, and permanent markers to discourage unauthorized entry. Requirements for cap integrity monitoring and radiological survey programs were included in the remedy to ensure the continued functioning of the containment systems, and a review of the remedy was required at least every five years.

Groundwater monitoring requirements were not included in the SL-1 and BORAX-1 Burial Grounds remedy, since groundwater monitoring requirements for the SL-1 Burial Ground would be addressed by the WAG 5 Comprehensive ROD, and groundwater monitoring requirements for the BORAX-1 Burial Ground will be addressed by the OU 10-08 WAG 10 RI/FS. The WAG 5 Comprehensive ROD did not find unacceptable risk due to impacts on groundwater, but required groundwater monitoring until the time of this first review to reduce uncertainties and provide trend data.

The Remedial Action Report for the SL-1 and BORAX-1 Burial Grounds was completed in 1997.

4. Inspections and evaluations

The Operations and Maintenance Plan for the SL-1 and BORAX-1 burial grounds requires annual inspections of the SL-1 and BORAX-1 engineered barriers and annual radiological surveys.

The 1998 Annual Inspection Report identified localized areas of potential contamination observed during the radiological surveys of the SL-1 and BORAX-1 areas. In the case of the SL-1 site, similar findings from subsequent sampling were noted in by the State Of Idaho INEEL Oversight Program in its report SL-1 Site Survey. The SL-1 Burial Ground is located in close proximity to remaining areas of surface contamination. Operational experience indicates that windblown transport of radioactive particles has been responsible for observed spread of contamination from these surface contamination areas. It appears likely that the contamination observed in the SL-1 Burial Ground comes from similar sources. Based on these observations, the newly-identified contaminated areas in the SL-1 Burial Ground were included along with the nearby surface contamination areas in the WAG 5 Comprehensive RI/FS (OU 5-12). The OU 5-12 Record of Decision (January 2000), selected removal as the remedy for these and other contaminated soil sites in OU 5-12. The remedy will be implemented under the December 2000 RD/RA Workplan for Phase II of the WAG 5 remedial action.

Potential contamination at the BORAX-1 Burial Ground is being addressed the WAG 10 Comprehensive RI/FS (OU 10-04), which is addressing windblown contamination areas in a number of locations sitewide. Sampling performed in 2000 did not confirm the potential contamination identified in the 1998 Annual Inspection Report.

The most recent Annual Inspection Report was received by EPA on June 1, 2001. Based on this report, the engineered barriers appear intact with no visible evidence of subsidence or erosion. There is no indication of encroachment of weeds or shrubs onto the engineered barriers, and no indication of other biointrusion. The revegetated areas show no indications of soil movement or erosion, and grass appears to be well established. The permanent markers, fences, signs and posted notices were all found in place and intact. The report notes that the BORAX-1 CERCLA sign needs to be updated to correctly state the existing dimensions of the perimeter fence. Results of radiological surveys were consistent with those obtained in previous years following remedial action.

During the week of July 16, 2001 EPA staff performed a visual inspection of the site. No observations inconsistent with the annual inspection report results were noted.

5. Conclusions

The actions completed under the Record of Decision for the SL-1 and BORAX-1 burial grounds have been effective in meeting the Remedial Action Objectives. The engineered covers are performing as designed with no evidence of subsidence, erosion, or intrusion. Fences, signs and

protective barriers have been effective in securing the site against unauthorized human intrusion. Effective isolation of contamination from the environment has prevented adverse effects to resident species. The revegetation has been successful based on the coverage of perennial grasses and the absence of weeds or shrubs.

The observation of contamination at the burial grounds so soon after completion of remedial action is cause for concern, but there is no indication of failure of the engineered barriers. The early appearance of contamination, the proximity of exposed surface contamination areas and the fact that radiological surveys are similar from one year to the next suggests windblown cross contamination as a likely source of the observed contamination.

6. Recommendations

It is recommended that the next review of the remedy for the SL-1 and BORAX-1 Burial Grounds ROD be coordinated with the next statutory INEEL-wide Five Year Review in 2005. Annual inspections and reports of institutional controls should continue consistent with the May 3, 1999 Region 10 Final Policy on the Use of Institutional Controls at Federal Facilities. Radiological surveys should be continued to track potential contamination concerns, and new baseline surveys should be performed as soon as possible following completion of any remedial actions under WAG 5 or WAG 10 Records of Decision.

Aug 14, 2001
Date

Michael Gearheard, Director
Office of Environmental Cleanup

References

1. Record of Decision, Stationary Low-Power Reactor-1 and Boiling Water Reactor Experiment-1 Burial Grounds, INEL-95/0282, January, 1996

2. SL-1 Site Survey, INEEL Oversight Program, Idaho Division of Environmental Quality, OP-99-02.

3. OU 5-05/6-01, BORAX/SL-1 Annual Inspection Reports, 1999-2001, US DOE INEEL

4. Record of Decision, Power Burst Facility and Auxiliary Reactor Area, OU 5-12, DOE/ID-10700. January 2000.

5. Waste Area Group 5 Operable Unit 5-12 Comprehensive Remedial Investigation/Feasibility Study, DOE-10607, January 1999.

6. Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04, July 2001.

7. Engineering Design File ER-WAG5-104, In Situ Gamma Radiation Survey at ARA-23 and ARA-24.