6.4 Waste Management Plan

INEEL/EXT-02-00767
(Formerly DOE/ID-10789)
Revision B

Waste Management Plan for the OU 7-10 Glovebox Excavator Method Project (Draft)

September 2002

Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC

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September 2002

Idaho National Engineering and Environmental Laboratory
Environmental Restoration Program
Idaho Falls, Idaho 83415

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management
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Approved

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ABSTRACT

The purpose of this waste management plan is to describe methods for identifying, characterizing, and managing the waste streams associated with Operable Unit 7-10 Glovebox Excavator Method Project activities at the Subsurface Disposal Area within the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory. In addition, this plan discusses regulatory considerations and waste management assumptions and defines and identifies the waste streams associated with this project.

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ACRONYMS

Anti-C	anticontamination
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
D&D&D	deactivation, decontamination, and decommissioning
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
FFS	Facility Floor Structure
FSP	field sampling and analysis plan
HEPA	high-efficiency particulate air
H&V	heating and ventilation
HW	hazardous waste
HWD	hazardous waste determination
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
INEEL	Idaho National Engineering and Environmental Laboratory
IW	industrial waste
IWTS	Integrated Waste Tracking System
LDR	land disposal restriction
LLW	low-level waste

MCP	management control procedure
MLLW	mixed low-level waste
MTRU	mixed transuranic
OU	operable unit
PCB	polychlorinated biphenyl
PGS	Packaging Glovebox System
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RCS	Retrieval Confinement Structure
RD/RA	remedial design/remedial action
RFP	Rocky Flats Plant
ROD	Record of Decision
RRWAC	reusable property, recyclable materials, and waste acceptance criteria
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
TBD	to be determined
TRU	transuranic
TSA	Transuranic Storage Area
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
UW	universal waste
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant
WES	Weather Enclosure Structure
WGS	Waste Generator Services
WMP	waste management plan

Waste Management Plan for the OU 7-10 Glovebox Excavator Method Project (Draft)

1. INTRODUCTION

The *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory* (DOE-ID 1993) specifies the environmental remediation of transuranic (TRU) waste from Operable Unit (OU) 7-10 (Pit 9) within the Subsurface Disposal Area (SDA) of the Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering and Environmental Laboratory (INEEL). On October 1, 2001, the INEEL published the *Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications* report (INEEL 2001), which identified a feasible approach for retrieving waste from OU 7-10. The OU 7-10 Glovebox Excavator Method Project was established to accomplish the objectives presented in that report. The overall objectives for the project are as follows:

- Demonstrate waste zone material retrieval
- Provide information on any contaminants of concern present in the underburden
- Characterize waste zone material for safe and compliant storage
- Package and store waste onsite, pending a decision on final disposition.

This waste management plan (WMP) describes the management of waste generated during project activities. This is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.) project conducted in agreement with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1991). This project will be performed as part of implementing the 1993 Record of Decision (ROD) (DOE-ID 1993) and the 1995 and 1998 Explanation of Significant Differences documents (DOE-ID 1995, 1998). This project includes demonstration of retrieval, examination, characterization, repackaging, and storage of buried TRU waste from OU 7-10.

1.1 Purpose and Scope

The purpose of this WMP is to describe methods for identifying, characterizing, and managing the waste streams associated with the project. The project involves the following activities:

1. Construction of retrieval system structures
2. Removal and staging of overburden soil
3. Retrieval, repackaging, characterization, and storage of limited quantities of waste from OU 7-10, including underburden sampling
4. Shutdown of the facility, which includes pit backfilling and immobilizing residual contamination
5. Layup of the facility, which entails monitoring, periodic maintenance, and inspection of equipment
6. Deactivation, decontamination, and decommissioning (D&D&D) of the project structures.

This plan addresses waste management considerations associated with waste from retrieval operations, as well as associated secondary waste streams, and addresses management of waste generated during the construction and dismantlement phases. Sampling, characterization, and D&D&D-related waste are addressed in this plan; however, waste projection details will be provided in the project field sampling and analysis plan and the final D&D&D plan, respectively. This plan supports waste management planning requirements found in U.S. Department of Energy (DOE) orders and fulfills the scope requirements of the *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: Operable Unit OU 7-10 (Pit 9 Project Interim Action)* (LMITCO 1997).

2. SITE DESCRIPTION AND BACKGROUND

The INEEL is a DOE facility located 52 km (32 mi) west of Idaho Falls, Idaho, that occupies 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Idaho Snake River Plain. The eastern boundary of the INEEL is located 52 km (32 mi) west of Idaho Falls, Idaho. The U.S. Department of Energy Idaho Operations Office (DOE-ID) is responsible for the INEEL and the current management and operating contractor is Bechtel BWXT Idaho, LLC.

2.1 Site Description

The RWMC is a restricted-access area located 11.3 km (7 mi) southwest of the Central Facilities Area (CFA) in the southwestern portion of the INEEL (see Figure 1). The RWMC encompasses 580 ha (144 acres) and consists of two main disposal and storage areas: (1) the Transuranic Storage Area (TSA), and (2) the SDA. Within these areas are smaller specialized disposal and storage areas.

The SDA is a 97-acre (39-ha) area located within the RWMC that is dedicated to permanent shallow-land disposal of solid low-level waste (LLW). Operable Unit 7-10 (Pit 9) is located in the northeast corner of the SDA and covers approximately 116 × 39 m (379 × 127 ft), as shown in Figure 2. Figure 3 provides the plot plan for the existing OU 7-10 area showing the infrastructure.

The TSA, a 23-ha (56-acre) area located in the southern section of the facility, is dedicated to the temporary storage of contact- and remote-handled solid TRU waste. In addition, the TSA contains the facility for the Advanced Mixed Waste Treatment Project Facility.

2.2 Site History

The RWMC was established in the early 1950s as a disposal site for solid LLW generated by INEEL operations. In addition, TRU waste generated by national defense programs was disposed of in the SDA from 1954 to 1970 and placed in storage from 1970 to the present. Radioactive waste materials have been buried at the SDA in underground pits, trenches, soil vault rows, and one aboveground pad (i.e., Pad A). The TSA provides interim storage of TRU waste in containers on asphalt pads. The TRU waste was received from the Rocky Flats Plant (RFP)[a] for disposal in the SDA from 1954 through 1970.

As described in the OU 7-10 ROD (DOE-ID 1993), waste was placed in OU 7-10 at the SDA from November 1967 to June 1969. The thickness of the SDA overburden averages approximately 1.8 m (6 ft). Approximately 7,079.2 m^3 (250,000 ft^3) of overburden, 4,250 m^3 (150,000 ft^3) of packaged waste, and 9,911 m^3 (350,000 ft^3) of soil between and below the buried waste were present at the time of the OU 7-10 closure. The depth of OU 7-10 from ground surface to the bedrock is approximately 5.3 m (17.5 ft). No waste disposal has occurred in OU 7-10 at the SDA since its closure in 1969.

In August 1987, the *Consent Order and Compliance Agreement* (DOE-ID 1987) was entered into between DOE and the U.S. Environmental Protection Agency (EPA) pursuant to the Resource Conservation and Recovery Act (RCRA) Section 3008(h) (42 USC § 6901 et seq.). The *Consent Order and Compliance Agreement* required DOE to conduct an initial assessment and screening of all solid and

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a. The Rocky Flats Plant is located 26 km (16 mi) northwest of Denver. In the mid-1990s, it was renamed the Rocky Flats Environmental Technology Site. In the late 1990s, it was again renamed, to its present name, the Rocky Flats Plant Closure Project.

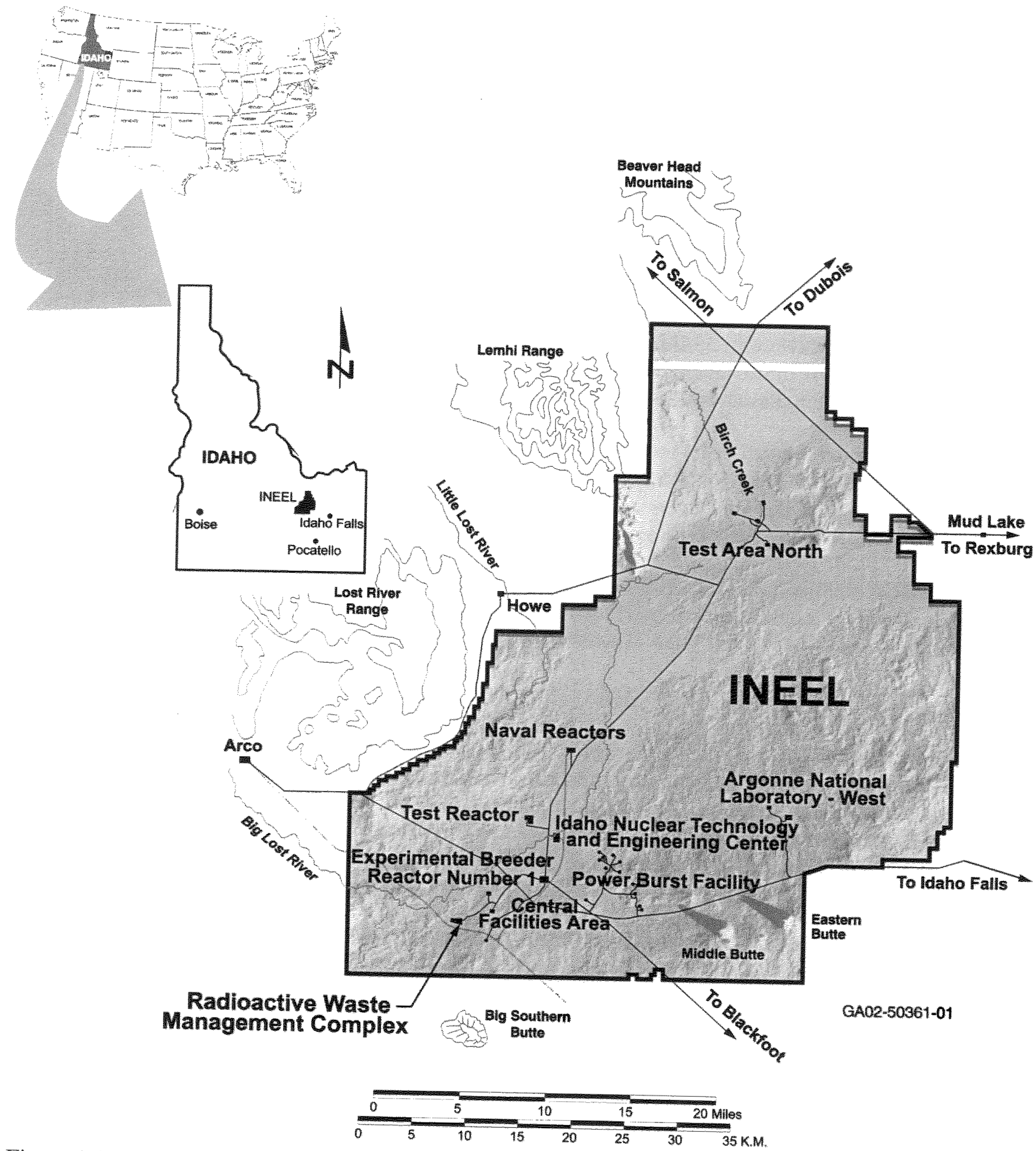

Figure 1. Map of the Idaho National Engineering and Environmental Laboratory showing the location of the Radioactive Waste Management Complex.

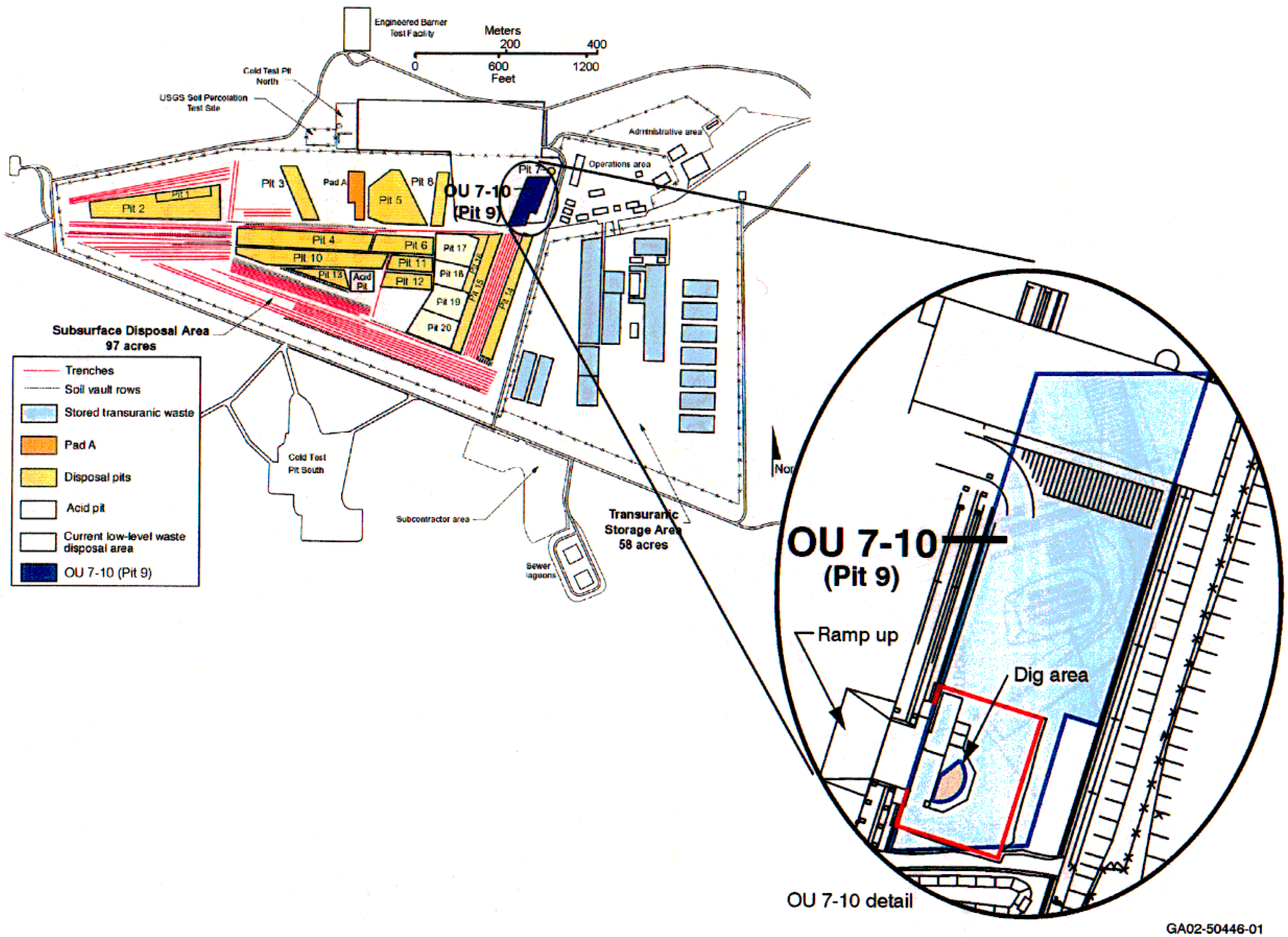

Figure 2. Map of the Subsurface Disposal Area at the Radioactive Waste Management Complex with an expanded view of the Operable Unit 7-10 Glovebox Excavator Method Project area.

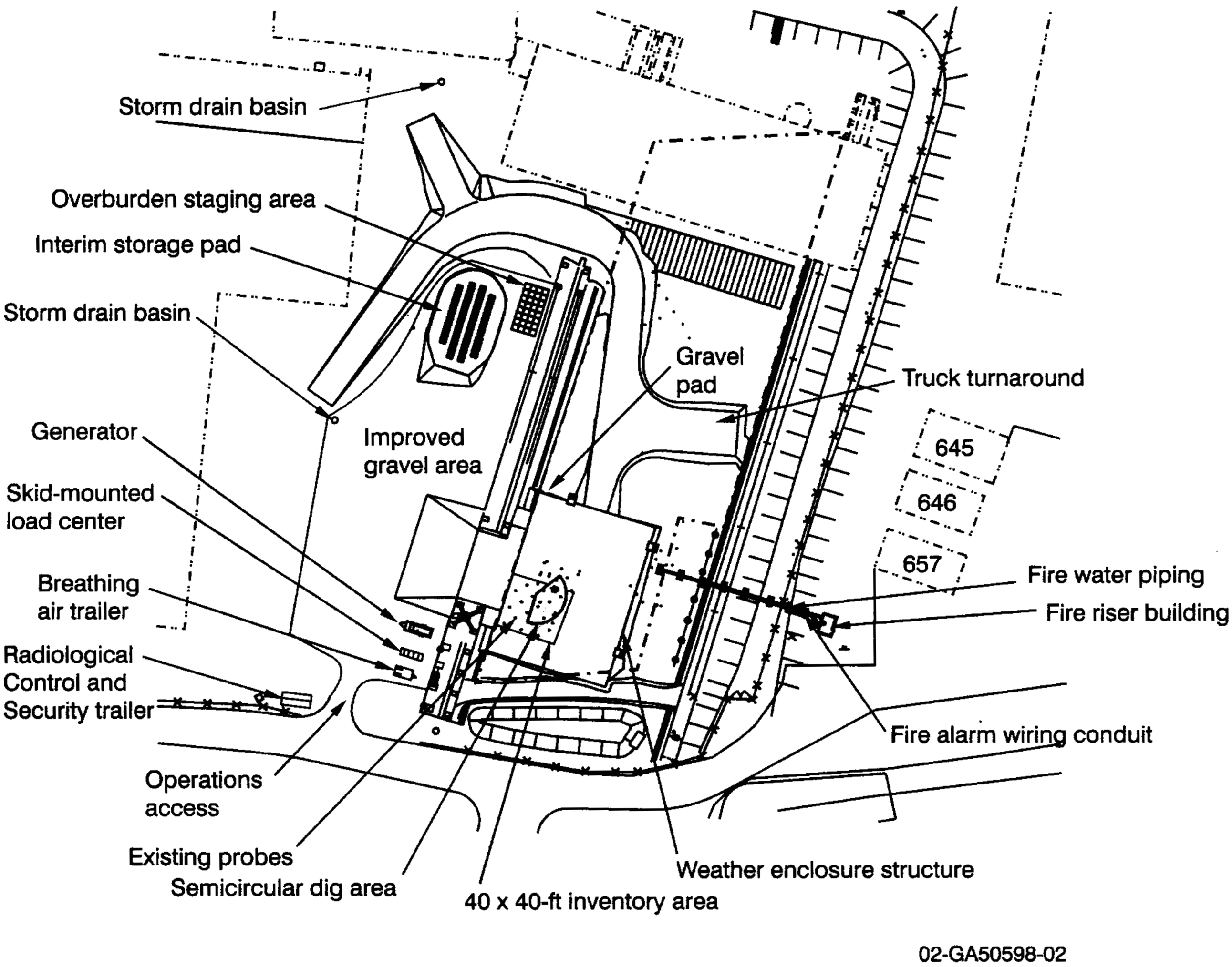

Figure 3. Plot plan of the existing Operable Unit 7-10 area.

hazardous waste disposal units at the INEEL and set up a process for conducting any necessary corrective actions. On July 14, 1989, the INEEL was proposed for listing on the National Priorities List for Uncontrolled Hazardous Waste Sites (54 FR 29820). The listing was proposed by the EPA under the authorities granted EPA by the CERCLA of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499). The final rule that listed the INEEL on the National Priorities List was published in the "National Priorities List of Uncontrolled Hazardous Waste Sites; Final Rule" (54 FR 48184) on November 21, 1989. As a result of the INEEL being listed on the National Priorities List, the DOE, EPA, and Idaho Department of Health and Welfare entered into the Federal Facility Agreement and Consent Order on December 9, 1991. Operable Unit 7-10 was identified for an interim action under the Federal Facility Agreement and Consent Order, as described in the OU 7-10 ROD.

2.3 Existing Information and Contaminants of Concern

Operable Unit 7-10 was used for disposal of radioactive and hazardous chemical waste from November 8, 1967, to June 9, 1969. Inventories of waste in OU 7-10 and the SDA pits and trenches have been generated using existing and available historical records. However, these records contain uncertainties about various items, including exact locations of drums inside the pit, extent of contaminant migration, specific isotopic information and chemical form, and valence state of the contaminants.

The TRU waste disposed of in OU 7-10 was primarily produced at the RFP. Approximately 3,115 m^3 (110,000 ft^3) of the estimated 4,250 m^3 (150,000 ft^3) of waste in OU 7-10 was generated from weapons production operations at the RFP. Other materials in OU 7-10 include LLW from waste generators located at the INEEL and INEEL nuclear reactor testing activities. The waste includes a variety of radionuclides and organic and inorganic compounds. An inventory of these materials is detailed in the OU 7-10 ROD. In addition to waste, the pit contains an estimated 7,079 m^3 (250,000 ft^3) of overburden soil and approximately 9,911 m^3 (350,000 ft^3) of interstitial and underburden soil between and below the buried waste.

The OU 7-10 ROD inventory was compiled from two documents: (1) *Nonradionuclide Inventory in Pit 9 at the RWMC* (Liekhus 1992), which was converted from an earlier report, *Nonradionuclide Inventory in Pit 9 at the RWMC* (Liekhus 1991); and (2) *Methodology for Determination of a Radiological Inventory for Pit 9 and Corresponding Results* (King 1991). Since the OU 7-10 ROD was written, a number of refinements to the inventory estimates have been made based on various new information sources. The current OU 7-10 inventory document is *Pit 9 Estimated Inventory of Radiological and Nonradiological Constituents* (Einerson and Thomas 1999), which documents the estimated inventory for the entire disposal pit from all generators. However, this inventory does not focus on the Stage I area in the southern portion of OU 7-10.

Inventory information pertinent to the Stage I and retrieval target areas is summarized in Table 1. As previously stated, this inventory is the best available based on incomplete historical records. The waste from the RFP was shipped in 55-gal drums (Clements 1982) and the OU 7-10 Stage I and retrieval target areas contain these waste streams from the RFP. In addition, it has been determined that waste from various INEEL facilities was disposed of elsewhere in OU 7-10. The drum quantity estimates shown on Table 1 are for the entire 12 × 12-m (40 × 40-ft) Stage I focus area[b] and for the project retrieval target area (INEEL 2002). The project retrieval area includes only a portion of the overall 12 × 12-m (40 × 40-ft) Stage I focus area. Figure 3 depicts the proposed excavation and retrieval area.

As the summary in Table 1 shows, the RFP waste forms contain various radiological and nonradiological contaminants. The material shipped to OU 7-10 from RFP included weapons-grade plutonium and uranium isotopes. Weapons-grade plutonium, called Pu-52, contains Pu-238, Pu-239, Pu-240, Pu-241, and Pu-242. Uranium isotopes shipped to the RWMC included U-235 and U-238. Also included in the waste shipments were Am-241 and Np-237. Am-241 and Np-237 are daughter products resulting from the radioactive decay of Pu-241. In addition to the Am-241 produced by the decay of the inventory, Am-241 removed from Pu-52 during processing at the RFP also was disposed of in OU 7-10. This extra Am-241 is a significant contributor to the total radioactivity located in OU 7-10. A number of radionuclides primarily from INEEL waste generators (Co-60, Cs-137, Sr-90, Y-90, and Ba-137) are not expected to be encountered in the project area.

The primary organic chemicals known to be in OU 7-10 include carbon tetrachloride, trichloroethene, 1,1,1-trichloroethane, tetrachloroethene, lubricating oils, Freon 113, alcohols, organic acids, and Versenes (ethylenediaminetetraacetic acid). Examples of inorganic chemicals known to be in the waste include hydrated iron, zirconium, beryllium, lead, sodium nitrate, potassium nitrate, cadmium, dichromates, potassium phosphate, potassium sulfate, silver, asbestos, and calcium silicate.

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b. R. W. Thomas Interdepartmental Memorandum to David E. Wilkins, April 16, 1999, "Waste Contents Associated with OU 7-10 Stages I/II Activities in Pit 9," RWT-01-99, Idaho National Engineering and Environmental Laboratory, Lockheed Martin Idaho Technologies Company, Idaho Falls, Idaho.

Table 1. Waste content in the Operable Unit 7-10 Stage I and Operable Unit 7-10 Glovebox Excavator Method Project retrieval areas.

Waste Stream	Summary Characteristics	Packaging	Stage I 40 × 40-ft Area[a]	Glovebox Excavator Retrieval Area[a]
Series 741 first stage sludge	Salt precipitate containing plutonium and americium oxides, depleted uranium, metal oxides, and organic constituents.	18.1 to 22.7 kg (40 to 50 lb) of Portland cement added to top and bottom of drum to absorb any free liquids. Two plastic bags.	3 drums	1 drum
Series 742 second stage sludge	Salt precipitate containing plutonium and americium oxides, metal oxides, and organic constituents.	18.1 to 22.7 kg (40 to 50 lb) of Portland cement added in layers to absorb any free liquids. Two plastic bags.	27 drums	5 drum
Series 743 sludge organic setups	Organic liquid waste solidified using calcium silicate (paste- or grease-like).	113.6 L (30 gal) of organic waste mixed with 45.4 kg (100 lb) calcium silicate. Small quantities (4.5 to 9.1 kg [10 to 20 lb]) of Oil-Dri added to top and bottom, if necessary. Two plastic bags.	379 drums	50 to 80 drums
Series 744 sludge special setups	Complexing chemicals (liquids) including Versenes, organic acids, and alcohols solidified with cement.	86.2 kg (190 lb) of Portland cement and 22.7 kg (50 lb) of magnesia cement in drum followed by the addition of 99.9 L (26.4 gal) of liquid waste. Additional cement top and bottom. Two plastic bags.	2 drums	1 drum
Series 745 sludge evaporator salts	Salt residue from evaporated liquids from solar ponds containing 60% sodium nitrate, 30% potassium nitrate, and 10% miscellaneous.	Salt residue packaged in plastic bag and drum. Cement added to damp or wet salt, when necessary.	42 drums	8 drums
Noncombustible waste	Various miscellaneous waste such as gloveboxes, lathes, ducting, piping, angle iron, electronic instrumentation, pumps, motors, power tools, hand tools, chairs, and desks.	Varies by process line generating the waste. Waste may have been wrapped in plastic or placed directly into the waste container.	28 drums	5 drums
Combustible waste	Dry combustible materials such as paper, rags, plastics, surgeon's gloves, cloth coveralls and booties, cardboard, wood, wood filter frames, and polyethylene bottles.	Varies by process line generating the waste. Plastic bags used in some instances, but in other instances waste placed directly into waste container.	260 drums	40 to 60 drums
Graphite	Graphite mold pieces after excess plutonium removal. Molds are broken into large pieces before packaging.	Drums lined with polyethylene bags and, most likely, a cardboard liner.	22 drums	4 drums
Empty 55-gal drums	Empty drums that originally held lathe coolant at Rocky Flats Plant. Some drums may contain residues.	Single drum placed in cardboard carton.	544 drums	80 to 120 drums

a. Estimated quantity.

A few nonradiological constituents have been reported as being disposed of somewhere in the SDA and may have been buried in OU 7-10. However, it is not known for sure whether these radiological constituents were disposed of in OU 7-10 and verification is not possible. These constituents include sodium and potassium cyanide, lithium oxide, mercury, nitrobenzene, picric acid, and polychlorinated biphenyls (PCBs).

The preliminary hazardous waste determinations and associated waste codes for each of the RFP waste streams are described in Section 4.1.2. Waste management activities will be based on information from the various inventory documents identified in the preceding paragraphs. In addition, analytical data collected during project activities will be used to determine appropriate waste management.

The TRU radionuclides in OU 7-10 are believed to be primarily contained in the drummed sludge and other RFP waste (e.g., graphite). The buried waste contains TRU radionuclides and LLW. Waste definitions are provided below for purposes of clarification:

- **Transuranic radionuclides**—Alpha-emitting radionuclides with an atomic number greater than 92 (DOE Order 435.1, "Radioactive Waste Management").

- **Transuranic waste**—Without regard to source or form, waste that is contaminated with alpha-emitting TRU radionuclides (atomic number greater than 92) with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay. Heads of DOE operations offices (e.g., DOE-ID) may determine whether other alpha-contaminated waste, peculiar to a specific site, must be managed as TRU waste (DOE Order 435.1). At the INEEL, waste containing Ra-226 and U-233 are included as TRU waste (DOE-ID 2002).

- **Low-level waste**—Waste that is not high-level radioactive waste, spent nuclear fuel, TRU waste, by-product material (as defined in Section 11e[2] of the Atomic Energy Act of 1954, as amended [U.S. Congress 1954]), or naturally occurring radioactive material (DOE Order 435.1).

3. PROJECT FACILITIES AND PROCESSES

The primary facilities and operations of the OU 7-10 Glovebox Excavator Method Project are described in the following subsections. Summary-level detail is provided to support general information discussed in subsequent sections of this plan. Full description and design detail should be referenced in the title design submittal. Not all of the facilities and operational information presented in the following subsections relates directly to waste management activities or assumptions, but is included for completeness.

3.1 Facilities

The project retrieval system consists of the Weather Enclosure Structure (WES), the Retrieval Confinement Structure (RCS), the Packaging Glovebox System (PGS), a standard excavator, ventilation system, and other supporting equipment. The major facility is the WES. It contains the RCS and the PGS. Retrieval, packaging, and sampling of OU 7-10 materials will occur within the RCS and PGS facilities. Overburden will be removed to a specified depth and then the excavator arm (contained within the RCS) will excavate a semicircular swath of waste zone material. The retrieved waste zone material will be placed in transfer carts by the excavator bucket. The carts will transport waste zone materials inside PGS gloveboxes where the material will be inspected, categorized, and sampled. Each of the three gloveboxes will be equipped with drum bag-out stations for packaging the material into 55- and 85-gal drums.

The project facility layout within OU 7-10 is depicted in Figure 3. The primary structures comprising the WES, the RCS, and the PGS are shown in Figure 4. Figure 5 provides a plan view of the major components and design layout of the WES. A listing of major buildings and building areas is presented in Table 2. The planned locations of the interim CERCLA storage area and Toxic Substances Control Act (TSCA) portable storage units (if required) are shown on Figure 3. Other facilities will be installed to provide utility and other support functions.

3.2 Process and Operations Summary

The project consists of an excavation and retrieval facility to be used to retrieve and package a limited amount of materials from OU 7-10. Activities include the following:

1. Construction of retrieval system temporary structures

2. Removal and staging of overburden soil

3. Retrieval, repackaging, characterization, storage, and dispositioning of limited quantities of waste from OU 7-10, including underburden sampling

4. Shutdown of facility (i.e., pit backfill; stabilization and decontamination of RCS, PGS, and equipment; immobilizing residual contamination; and securing equipment)

5. Layup of facility (i.e., monitoring the facility to ensure radiological confinement is maintained and periodic maintenance and inspection of equipment)

6. Deactivation, decontamination, and decommissioning of project structures at the conclusion of project activities.

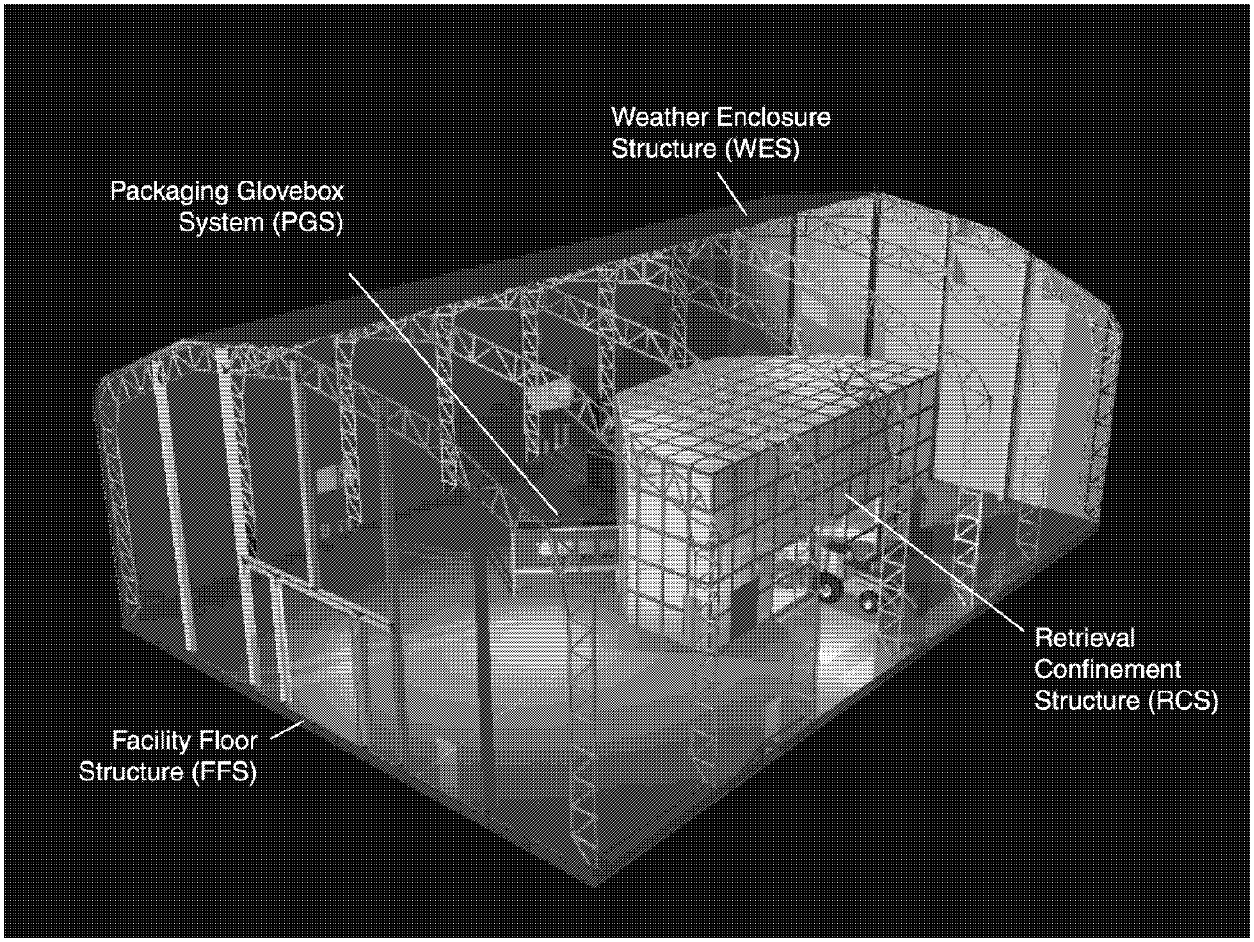

Figure 4. Weather Enclosure Structure housing the Retrieval Confinement Structure and the Packaging Glovebox System.

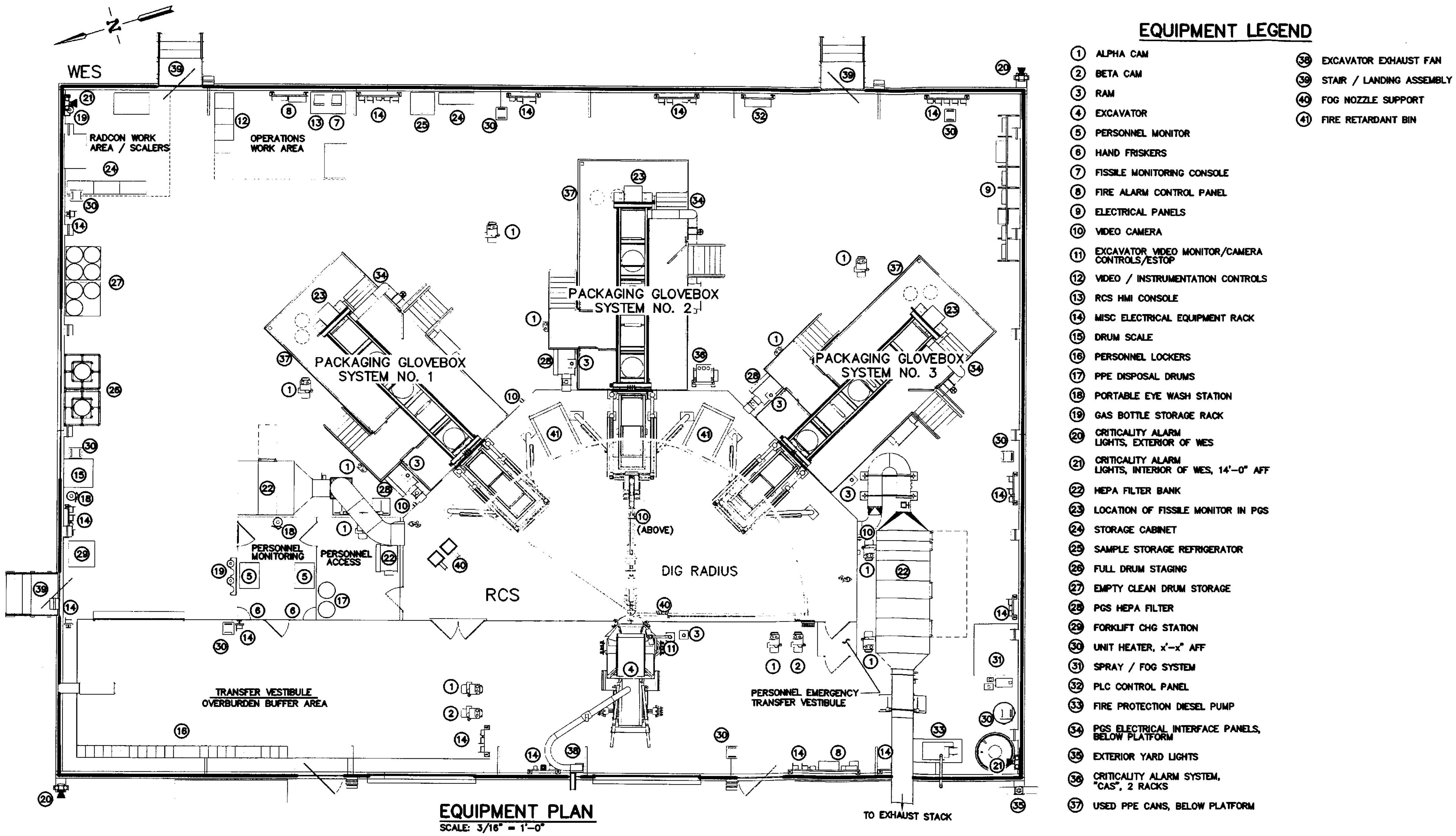

Figure 5. Weather Enclosure Structure and operational layout of the Operable Unit 7-10 Glovebox Excavator Method Project.

Table 2. Building and module names in the Operable Unit 7-10 Glovebox Excavator Method Project.

Building or Module	Summary Description
WES	Commercial-grade structure, approximately 24 × 33.5 × 11 m (80 × 110 × 35 ft). Prefabricated steel frame covered with insulated fabric. The WES houses the RCS, PGS, and other operational equipment.
RCS	Prefabricated modular structure, approximately 16 × 9 × 7 m (52 × 28 × 24 ft), which encloses the excavation area. The RCS interfaces with the excavator and PGS and is sealed to confine the waste retrieval area.
PGS	Consists of three separate gloveboxes. Each glovebox is a rectangular steel box approximately 6 × 1 × 2 m (21 × 3.5 × 7 ft) with windows. Waste zone material is opened, inspected, sorted, sampled, sized, monitored, and packaged in the PGS.
Drum loading enclosure	Process area that will be used to remove the repackaged TRU and mixed TRU waste from the PGS.
Interim storage pad	Storage area used for interim storage of waste coming from the PGS and associated secondary and D&D&D waste streams.
TSCA and RCRA portable storage units	Additional storage facilities used for interim storage of TSCA and RCRA waste resulting from project activities.
Overburden staging area	An area located outside of the OU 7-10 boundary used to stage the bagged overburden soil until pit closure activities or optional transfer to ICDF.
Excavator	An off-the-shelf hydraulic unit with the hydraulic arm inside the RCS and the cab outside the RCS. The excavator interfaces with the RCS and PGS.
FFS	The FFS covers the same area as the WES and is designed to support the WES, RCS, PGS, and other structures and equipment within the WES. The FFS contains the shoring box for the excavation.
Assay trailer	Leased trailer containing drum assay capability.

Table 2. (continued).

WES = Weather Enclosure Structure
RCS = Retrieval Confinement Structure
PGS = Packaging Glovebox System
TSCA = Toxic Substances Control Act
RCRA = Resource Conservation and Recovery Act
FFS = Facility Floor Structure
TRU = transuranic
D&D&D = deactivation, decontamination, and decommissioning
OU = operable unit
ICDF = INEEL CERCLA Disposal Facility

Once the construction phase is complete and operational readiness is achieved, the overburden soil within the RCS will be removed using a manned excavator. Overburden soil will be retrieved to an approximate depth of 1.1 m (3.5 ft). The overburden soil is assumed free of hazardous contamination, but may contain spots of low-level radioactive contamination. The excavated soil will then be packaged into $1.2 \times 1.2 \times 1.2$-m ($4 \times 4 \times 4$-ft) pliable fabric sacks and staged outside of the WES near OU 7-10. Once overburden soil has been removed, retrieval of waste zone material will begin. Approximately 57 to 96 m^3 (75 to 125 yd^3) of waste zone material and interstitial soil will be removed from the pit within the RCS. This waste zone material will be processed through the PGS for sampling and repackaging. The waste zone material will be repackaged into 55-gal drums, overpack drums, and special case bags[c] as needed (INEEL 2002). Table 3 provides a summary of excavation material quantity estimations. The estimated number of existing waste containers to be retrieved was calculated by ratioing the volume of the excavation pit waste layer (52-degree reposed-wall, 145-degree fan-shaped) to the volume of the $12 \times 12 \times 2.3$-m ($40 \times 40 \times 7.5$-ft) inventoried waste layer. This scaling ratio (i.e., 0.18) was then multiplied by each of the drum quantities and the results were rounded up to the nearest integer.

After excavation of the waste zone material, core samples of the underburden soil will be collected to obtain migration information about contaminants of concern. After retrieval operations are complete, the excavation area, facilities, and equipment will be placed in a safe configuration and shut down. Pit closure entails applying water sprayed from the dust-suppression system over the excavation area to prevent contamination spread within the RCS and then adding weak grout from the bottom of the pit to a level slightly above the bottom of the shoring box, approximately 1 m (3 ft) below grade. At the completion of D&D&D, the remaining 1 m (3 ft) will be covered with approved fill material (e.g., either return of the original overburden material or soil from a location such as the spreading areas).

Plans for D&D&D have not been finalized, but it is assumed that all structures will be removed from the project site. Final backfill of the pit area with approved fill material will be completed during D&D&D after removal of the shoring box. The RCS will still be in place while final backfilling is occurring. Final contouring of the surface will occur after the facility has been removed during D&D&D. The construction details and process flow are presented in the *OU 7-10 Glovebox Excavator Method Project Conceptual Design Report for Critical Decision 1* (INEEL 2002).

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c. Special case bags are polyurethane sealable bags that may be used to contain outlier items such as a bottle of liquid or other unexpected items that may be encountered during excavation.

3.2.1 Operations and Maintenance Assumptions

Operations consist of all tasks performed to excavate, retrieve, sample, package, handle, assay, and store all of the soil and waste zone material to be removed from the designated portion of OU 7-10. Once begun, operations will continue nonstop, 24 hours a day until completed. This strategy minimizes risk by minimizing exposure. Therefore, current operations are planned to run 24 hours per day using four crews working 12-hour shifts with 4 days on and 4 days off. Fire-watch support will be provided through the RWMC. The waste zone retrieval processes are estimated to take approximately 1 to 3 months for completion.

Given the relatively short retrieval duration, maintenance activities are assumed to be minimal. Maintenance activities include both planned preventive maintenance and unscheduled corrective maintenance. Preventive maintenance is scheduled to prevent system or component failure. Corrective maintenance is conducted in response to an unexpected failure or breakdown. In some cases, preventive and corrective maintenance may be accomplished through the use of the glovebox port accesses; however, personnel likely may be required to enter confinement areas in appropriate anticontamination (Anti-C) clothing and respiratory protection to conduct maintenance.

Table 3. Overburden and waste zone material retrieval estimates for the Operable Unit 7-10 Glovebox Excavator Method Project.

	Retrieved Material[a]	Packaged Material[b]
Overburden	70 to 75 yd^3	45 to 55 soil sacks
Waste zone material	75 to 125 yd^3	500 to 700 drums of waste zone material
• Series 741 sludge (1 drum)		40 to 60 overpacks of drum remnants
• Series 742 sludge (5 drums)		10 to 15 special case bags
• Series 743 sludge (50 to 80 drums)		
• Series 744 sludge (1 drum)		
• Series 745 sludge (8 drums)		
• Combustible (40 to 60 drums)		
• Noncombustible (4 drums)		
• Graphite (5 drums)		
• Empty (80 to 120 drums)		
Underburden	Not applicable	Not applicable

a. Based on a 45 to 60-degree angle of repose.
b. Estimate ranges for packaged materials are based on process calculations documented in EDF-3125 (Walsh 2002).

4. WASTE STREAM IDENTIFICATION AND MANAGEMENT

Activities of the OU 7-10 Glovebox Excavator Method Project will involve the retrieval and characterization of a variety of waste forms that will ultimately result in approximately 500 to 700 packaged containers of waste zone material requiring interim storage. Current planning is to transfer repackaged waste zone materials to the RCRA-permitted storage module, WMF-628, located within the RWMC TSA for storage. A modification of the RCRA permit for the facility will be pursued to support the transfer of the OU 7-10 project CERCLA waste. The ultimate disposal path for the majority of the waste zone material is the Waste Isolation Pilot Plant (WIPP); however, activities associated with disposal of the waste zone material will occur in a subsequent project phase.

As previously outlined, this project is comprised of distinct phases: construction, overburden removal, waste zone material retrieval, facility shutdown, facility layup, and finally D&D&D of the facility structures. Varying levels of hazardous and radioactive contamination are anticipated for each of these phases. Accompanying the generation of the waste zone material are various secondary waste streams.

For the purposes of this WMP, the waste streams associated with project activities are classified into the following categories:

1. **Construction waste**—Waste generated during the onsite construction of facilities and equipment.

2. **Overburden removal waste**—Waste generated during the initial removal of overburden soil.

3. **Waste zone (OU 7-10-derived) materials**—Materials (waste or soils) that were originally disposed of in OU 7-10 including interstitial soils and waste (e.g., debris and sludges) and materials associated with sampling (waste and underburden sampling).

4. **Facility shutdown**—Waste associated with pit grouting, facility characterization sampling, decontamination, and immobilization of residual contamination.

5. **Facility layup**—Waste associated with routine radiological monitoring of confinement and maintenance and inspection of equipment.

6. **Deactivation, decontamination, and decommissioning waste**—Waste generated during the D&D&D of facility structures and processes.

7. **Secondary waste**—A generic category for waste is generated from support activities (including operations and maintenance activities) related to retrieving, processing, sampling, and packaging the OU 7-10 waste zone materials. Examples of secondary waste include waste associated with routine decontamination activities (excluding facility closure) and personal protective equipment (PPE), administrative area and support service waste, used equipment and filters, and other similar waste generated during operations, maintenance, and sampling activities. Secondary waste is generated during each of the phases.

Interim storage of certain secondary and D&D&D waste streams in the interim CERCLA storage area adjacent to Pit 9 is also planned. Storage in this area will include provisions for storage of certain materials in containers on a graded gravel pad and may include the use of RCRA/TSCA compliant portable storage units, as necessary. Characterization results and hazardous waste determinations for these waste streams will determine the final storage and/or disposal location. As outlined in Appendix A, it is anticipated that secondary and D&D&D waste streams will be generated that require management as LLW, mixed LLW (MLLW), and mixed TRU (MTRU) wastes in addition to industrial waste (IW). Consequently, once characterized, the secondary and D&D&D waste streams may be transferred to WMF-628 for storage (i.e., if MTRU or TRU) or will be eligible for transfer to appropriate INEEL facilities (e.g., INEEL CERCLA Disposal Facility [ICDF] or CFA landfill) for disposal pending determination that the wastes meet the respective facility's waste acceptance criteria (WAC). Transfer of waste streams to off-INEEL site disposal facilities is not expected to be required, but may be implemented as needed.

Waste will be evaluated within each of these categories through analytical data and process knowledge. Depending on the storage location chosen, waste will be defined and characterized in accordance with the appropriate facility's WAC. The reusable property, recyclable materials, and waste acceptance criteria (RRWAC) (DOE-ID 2002) will apply to storage in WMF-628. Project-specific WAC applicable to receipt of waste into CERCLA storage will be developed. As noted, the ICDF WAC[d] will apply to certain secondary and D&D&D waste streams. In addition, applicable INEEL management control procedures (MCPs) and federal and state regulations for identifying waste will be implemented. A more detailed discussion about waste identification is included in succeeding sections.

4.1 Waste Management Assumptions and Regulatory Considerations

Because the project activities are being conducted under the OU 7-10 ROD, prepared pursuant to CERCLA, all of the waste streams identified in this plan (while being managed on-Site) will be managed in accordance with the substantive requirements of applicable or relevant and appropriate requirements (ARARs). Administrative requirements such as timeframes or reporting requirements do not apply to the waste while remaining in CERCLA storage, but may be implemented if required by internal INEEL procedures or may be adopted as best management practices. Waste shipped to a treatment, storage, and disposal facility (TSDF) outside the INEEL will comply with the off-Site rule (40 CFR 300.440, "Procedures for Planning and Implementing Off-Site Response Actions"). In addition, wastes stored within WMF-628 will be required to comply with the requirements of the applicable RCRA/Hazardous Waste Management Act (HWMA) permit.

A potential exists to generate a number of waste streams that have no immediate path to disposal. For example, waste zone materials may be generated that are associated with TRU concentrations between 10 and 100 nCi/g (i.e., not eligible for disposal at the WIPP), mixed waste, and waste regulated by TSCA because of PCB content. Some portion of this orphan waste may be accepted at WIPP if it is part of a WIPP-approved waste stream that is greater than 100 nCi/g on the average and can be packaged with the same waste in a payload container such that the waste in the payload container is greater than 100 nCi/g on the average. However, if these criteria cannot be satisfied, this orphan waste will have to be disposed of at a different facility as MLLW; therefore, the waste will require treatment to achieve RCRA land disposal restrictions (LDRs), TSCA requirements for PCBs, and any other WAC of the disposal facility. Because treatment of MLLW to satisfy RCRA LDR criteria and TSCA PCB restrictions is not planned as part of the Advanced Mixed Waste Treatment Project and no off-Site treatment facility has been identified that can accept this waste, a treatment process may have to be provided as part of Stage III work scope. All waste streams generated will be identified, characterized, and managed in accordance with the requirements and processes defined in the following documents, including but not limited to the following:

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d. DOE-ID, 2002, "Waste Acceptance Criteria (WAC) for INEEL CERCLA Disposal Facility (ICDF) Landfill (Draft Final Title II) - ICDF 90% Design Package – Appendix P to Remedial Design Construction Workplan (RD/CWP) - Included in Volume 3 of 5, Design Analyses (Draft)," DOE/ID-10865, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.

- MCP-3472, "Identification and Characterization of Environmentally Regulated Waste"
- MCP-62, "Waste Generator Services—Low-Level Waste Management"
- MCP-63, "Waste Generator Services—Conditional Industrial Waste Management"
- MCP-69, "Waste Generator Services—Hazardous Waste Management"
- MCP-3475, "Temporary Storage of CERCLA-Generated Waste at the INEEL"
- MCP-3480, "Environmental Instructions for Facilities, Processes, Materials, and Equipment"
- MCP-3470, "RCRA 90-Day Storage Areas"
- MCP-70, "Waste Generator Services—Mixed Low-Level Waste Management"
- PLN-287, "Soil Plan for Radioactive Waste Management Complex"
- Reusable property, recyclable materials, and WAC (DOE-ID 2002)
- OU 7-10 ROD.

4.1.1 Area of Contamination and Land Disposal Restrictions

The Remedial Design/Remedial Action (RD/RA) Scope of Work (LMITCO 1997) defines the area of contamination (AOC) for OU 7-10. The RD/RA Scope of Work states that ". . .the AOC associated with OU 7-10 extends at least 152 m (500 ft) from OU 7-10 physical boundaries in areas exhibiting elevated levels of soil gas and/or subsurface soil contamination."

Based on the facility description identified in Section 3.1, interim storage of the materials derived from OU 7-10 (if deemed necessary) will occur within the OU 7-10 AOC. The interim storage pad and TSCA portable storage units will be near OU 7-10 and will meet substantive RCRA and TSCA storage requirements. The containerized waste may be housed at the interim storage pad or portable storage units until the characterization, profiling, and disposition path is finalized. Further details about applicability or implementation of LDRs will be presented in ARARs documentation associated with the remedial design submittal.

4.1.2 Hazardous Waste Determination

To guide appropriate management of waste generated during project activities, a hazardous waste determination (HWD) conducted in accordance with 40 *Code of Federal Regulations* (CFR) 262.11, "Hazardous Waste Determination," will be performed for each waste stream. This requirement is implemented to support transfer of the waste material to the RCRA Type II and other TSDFs, as needed. It is expected that the primary waste stream generated through the project activities will consist of a combination of originally disposed waste streams. This is because retrieval with the backhoe-type excavator will lead to some commingling of the buried waste. In addition, the original waste containers are assumed to have lost their integrity through long-term corrosion (i.e., intact drums of waste are not expected to be encountered during retrieval).

Guidance contained in *Management of Remediation Waste Under RCRA* (EPA 1998) states that if a facility owner or operator has made a good faith effort to determine whether a material is a listed hazardous waste and cannot make such a determination because of unavailable or inconclusive information about the processes that generated the waste, then the waste does not have to be considered as listed, and provided the waste does not exhibit hazardous characteristics, RCRA requirements do not apply. In this case, it is believed that sufficient information is available to base the assignment of listed codes to identified waste zone materials encountered during retrieval activities and to other materials that are identified to have come into direct contact with the waste zone materials. The waste streams to be retrieved from the project retrieval area are similar to those in the INEEL stored waste inventory (see footnote b). Table 4 provides potential corresponding stored waste inventory links and associated hazardous waste numbers from the stored waste inventory items. These hazardous waste numbers were derived from the *Chemical Constituents in Transuranic Storage Area (TSA) Waste* (Major, Medeiros, and Hailey 2000).

In general, assignment of characteristic codes will occur based on testing of the waste zone materials. In some limited instances, characteristic codes may be assigned to some waste streams without testing, such as for lead scrap (Content Code D008) and potentially for nitrate salts associated with Series 745 sludge. As discussed in the *Evaluation of Chemical Compatibilities of the OU 7-10 Glovebox Excavator Method Project* (Dick and Burton 2002), commingling of nitrate salts and other carbonaceous waste forms (e.g., combustibles and graphite) may result in a mixture that is considered reactive as defined by RCRA (i.e., results in assignment of a D003 hazardous waste number). The "Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project (Draft)"[e] defines the analytical data that will be collected to support the HWD. In addition to the analytical data defined by the Field Sampling Plan, testing of surrogate mixtures of nitrate salts and carbonaceous materials will be performed to define the threshold concentrations at which the relevant mixtures may exhibit the reactivity or ignitability characteristic.

The following paragraphs describe preliminary hazardous waste determinations for various waste types expected to be encountered during retrieval. The preliminary determinations are based on process knowledge about the sources of the expected waste. Subsequent to generation, sampling, and analysis, any or all of the waste may be reclassified. Before ultimate disposal, waste may need to be further characterized to ensure compliance with the receiving facility's WAC.

4.1.2.1 Operable Unit 7-10-Derived Materials. As described earlier, OU 7-10-derived materials are considered to consist of waste (e.g., sludges and debris) and soils (e.g., interstitial and underburden) that were originally disposed of in OU 7-10. The project area of OU 7-10 is known to contain sludges from the RFP. Information available about the processes that generated these sludges and the potential links to the INEEL stored waste inventory indicate that several listed and characteristic hazardous waste codes are potentially applicable. The described sludge series include Series 741, 742, 743, 744, 745, and graphite. The following is a description of these waste streams.

4.1.2.1.1 Series 741 Sludge—The Series 741 sludge was a wet sludge consisting of approximately 50 to 70% water and a precipitate of hydrated oxides of iron, magnesium, aluminum, silicon, plutonium, and americium. Free Am-241 is the dominant radiological hazard, along with small quantities of depleted uranium and weapons-grade plutonium. Each drum was layered with 18.1 to 22.7 kg (40 to 50 lb) of Portland cement to absorb any free liquid. As described in Einerson and Thomas (1999), some drums of Series 741 sludge contained concentrations of beryllium on the order of 1,000 mg/kg. Based on shipping records and process knowledge, an average concentration for the Series 741 sludge drums was estimated to be 500 mg/kg. Einerson and Thomas (1999) confirm that recent

e. Saloman, Hopi, Daryl Haefner, Jeff Einerson, Jila Banee, and Beth McIlwain, 2002, "Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project," Rev. B, Idaho National Engineering and Environmental Laboratory, Bechtel BWXT Idaho, LLC, Idaho Falls, Idaho.

data collected from the sampling and analysis of sludge drums stored aboveground by the Transuranic Waste Program show the mean beryllium content to be 748 mg/kg. Einerson and Thomas (1999) also describe the Series 741 sludge as containing carbon tetrachloride and 1,1,1-trichloroethane from the same sources as the Series 743 sludge.

4.1.2.1.2 Series 742 Sludge—The Series 742 sludge is fairly similar to the Series 741 with the difference being that the Series 742 has lower radionuclide levels and may contain other waste items such as electric motors, containers of liquid chemical waste, and other materials. Originally, the Series 742 sludge was not believed to contain any beryllium; however, recent data collected in support of the Transuranic Waste Program showed the mean beryllium concentration for Series 742 sludge to be 530 mg/kg. Einerson and Thomas (1999) also describe the Series 742 sludge as containing carbon tetrachloride and 1,1,1-trichloroethane from the same sources as the Series 743 sludge.

4.1.2.1.3 Series 743 Sludge—According to Einerson and Thomas (1999), Series 743 sludge consisted of a mixture of 140 L (37 gal) of organic liquid and 45.5 kg (100 lb) of calcium silicate along with 4.5 to 9.1 kg (10 to 20 lb) of oil absorbent. The organic liquid was described as consisting of the following:

- Approximately 47% lathe coolant (i.e., 43.5% Texaco Regal Oil and 56.5% carbon tetrachloride)
- 10% degreasing agents (i.e., 1,1,1-trichloroethane)
- 43% miscellaneous organic compounds consisting of unspecified amounts of carbon tetrachloride; chloroethenes; hydraulic, gearbox, and spindle oils; Freon; Varsol; and trace amounts of laboratory waste (organophosphate, nitrobenzene).

In addition, an unknown amount of PCB-contaminated oil was processed with the other organic waste in the Series 743 sludge. Low concentrations of beryllium are present in some of the Series 743 sludge.

The *Comparison of the Pit 9 Project Inventory of Contaminants against the Corresponding Portion of the Historical Data Task Inventory, and Recommended Revised Quantities* (Smith and Kudera 1996) confirms the Series 743 sludge recipe, although at slightly different ratios. It is assumed that the organic liquid consisted of the following:

- Approximately 47% lathe coolant made up of 43.5% Texaco Regal Oil and 56.5% carbon tetrachloride
- 10% degreasing agents
- 43% miscellaneous organics consisting of 25% carbon tetrachloride, 25% 1,1,1-trichloroethane, 25% tetrachloroethene, and 25% miscellaneous oils.

In addition, the Transuranic Waste Program detected beryllium in aboveground drums with concentrations averaging 2.76 mg/kg. On an individual drum basis, the composition can vary because of batching different organic inputs at the Series 743 sludge process line.

4.1.2.1.4 Series 744 Sludge—In each drum containing Series 744 sludge, approximately 98.4 L (26 gal) of waste was mixed with 86.2 kg (190 lb) of Portland cement and 22.7 kg (50 lb) of magnesia cement. Approximately 4.5 to 6.8 kg (10 to 15 lb) of additional Portland cement was placed on top of the cement mixture before it was sealed in a plastic bag. The Series 744 sludge is believed to contain alcohols, organic acids, and Versenes although Einerson and Thomas (1999) state that methyl alcohol and butyl alcohol were disposed of in uncemented sludges. In addition, Einerson and

Thomas (1999) describe the Series 744 sludge as containing carbon tetrachloride and 1,1,1-trichloroethane from the same sources as the Series 743 sludge.

4.1.2.1.5 Series 745 Sludge—The Series 745 sludge is described as 60% sodium nitrate, 30% potassium nitrate, and 10% miscellaneous. The miscellaneous constituents consisted of sodium and potassium chlorides, dichromates, phosphates, and sulfates.

4.1.2.1.6 Graphite—Graphite is considered a combustible waste. Graphite molds used in casting plutonium were brushed to remove any adhering plutonium and were broken or crushed into pieces. This waste is the next lowest density to combustible waste. It is expected that the graphite will be present in 1 to 10-cm (0.4 to 4-in.) chunks and finely divided black powder, and will be free flowing and pourable.

4.1.2.1.7 Empty Containers—Available information indicates that approximately 544 empty drums have been placed in OU 7-10. It is expected that retrieval activities will encounter approximately 80 to 120 of these drums. It is believed the drums originally held 743 series sludges and that some drums may still contain residues. These containers and any residues will be subject to evaluation under 40 CFR 261.7, "Residues of Hazardous Waste in Empty Containers." The empty containers likely will be considered as debris in accordance with 40 CFR 268.2, "Definitions Applicable in this Part." Assignment of waste codes for any residues (over the allowed amount) or containers would depend on whether contents could be positively identified.

4.1.2.1.8 Soils—Overburden soils in the project area may contain isolated spots of radiological contamination. Based on the Administrative Record for the OU 7-10 ROD, no basis exists for assuming that the overburden soils contain listed hazardous waste or are themselves characteristic waste. No hazardous waste codes will be assigned to overburden soils. The overburden soils, if used as backfill, will not be classified as waste because those soils are to be temporarily removed and then returned to the pit after waste zone material retrieval is complete. If the overburden soils are to be disposed of, then those soils likely will be disposed of as LLW.

Table 4. Waste zone materials and potential stored waste inventory links for the Operable Unit 7-10 Glovebox Excavator Method Project.

Component Waste Stream	Potential Corresponding Stored Waste Inventory Item Description Code[a]	Idaho National Engineering and Environmental Laboratory Potential Hazardous Waste Numbers Associated with Stored Waste Inventory[a]
Series 741 sludge	001 first stage sludge	F001, F002, F003, F005, F006, F007, F009, D002, D004, D005, D006, D007, D008, D009, D010, D011
Series 742 sludge	002 second stage sludge	F001, F002, F003, F005, F006, F007, F009, D002, D004, D005, D006, D007, D008, D009, D010, D011
Series 743 sludge	003 organic setups, oil solids	F001, F002, F003, F005, D005, D011, D022, D029, D036
Series 744 sludge	004 special setups (cement)	F001, F002, F003, F005
Series 745 sludge	005 evaporator salts	D001
Graphite	300 graphite molds	F002

Table 4. (continued).

Combustible waste	330 paper and rags—dry	F001, F002, F003, F005, F006, F007, F009 D006, D007, D008, D011, D022
Noncombustible waste	480 metal, scrap (nonspecial source)	F001, F002, F003, F005, F006, F007, F009 D001, D004, D005, D006, D007, D008, D009, D010, D011
Empty containers	No definitive information to correspond to RWMC-EDF-803.[a]	No definitive information to correspond to RWMC-EDF-803.[a]
Interstitial soils	Hazardous waste numbers derived from surrounding waste streams.	Not applicable.

a. *Chemical Constituents in Transuranic Storage Area (TSA) Waste* (Major, Medeiros, and Hailey 2000).

Interstitial soils will be processed through the PGS with other waste. It is assumed that it will be difficult to distinguish interstitial soils from waste zone materials because of commingling. Hazardous waste codes will be assigned in accordance with the type of waste found to be in contact with the soils, if determinable. If the waste code is not determinable, then the interstitial soils likely will be considered in the same fashion as the primary combination waste stream. Available data from the project data collection effort will be considered before finalization of the HWD for these interstitial soils. Characteristic codes may be assigned by stored waste process knowledge as well. Core samples of the underburden soils will be collected targeting visibly stained soils, as applicable (INEEL 2002). These samples will be collected to provide migration information about the contaminants of concern. Underburden soils, however, will remain in place and are not considered waste materials.

4.1.2.2 Construction; Facility Shutdown and Layup; Deactivation, Decontamination, and Decommissioning; and Secondary Waste. Waste (e.g., construction, facility shutdown, facility layup, D&D&D, and secondary waste streams) that has come in contact with OU 7-10-derived materials will undergo an HWD based on the results of the HWD for OU 7-10-derived materials that are known to have been in contact with these types of waste. Where this relationship is not clear, analytical testing may be conducted to assist in determining the appropriate waste-code assignment or it may be assumed that the listed waste codes identified in the OU 7-10 ROD apply to the secondary waste streams in question. Waste streams that are known not to have contacted listed waste will have an applicable hazardous waste code assigned deemed appropriate through analytical testing or process knowledge.

4.1.3 Toxic Substance Control Act Assumptions

The OU 7-10 is suspected to contain PCBs; however, definitive information about the presence and concentration of PCBs is not available because of a lack of characterization information. Current inventory documentation indicates that PCBs were not a routine contaminant in OU 7-10 waste streams, but may have been placed in OU 7-10 waste occasionally. As a result of these uncertainties, OU 7-10 waste streams will be managed as follows:

- **Waste zone (OU 7-10-derived) materials** will be screened for PCBs. If the screening data identify the presence of PCBs, the materials will be managed based on the concentration of the PCBs in the waste. Liquids and underburden soil samples will have PCB chemical analyses performed as required by the sampling and analysis plan.

- **Construction, pit backfill, D&D&D, and secondary waste streams** will be evaluated for contact with waste zone (OU 7-10-derived) materials. If contact occurs, examination of analytical data (for PCBs) associated with the OU 7-10-derived materials contacted will support determining whether the waste is TSCA regulated or requires analytical testing. If analytical data are collected and identify the presence of PCBs, the waste will be managed based on the concentrations of the PCBs in the waste.

Management of waste based on as-found concentrations is consistent with requirements for PCB remediation waste as defined in 40 CFR 761.3, "Definitions." Consistent with the above criteria, TSCA labeling and marking requirements will only be initiated based on receipt of analytical data verifying the presence of PCBs above the regulatory threshold of 50 ppm. However, to address the possibility of PCB contamination, at least some portion of the project CERCLA storage areas and facilities will be constructed to comply with ARARs of 40 CFR 761.65, "Storage for Disposal." Further discussion of TSCA ARAR considerations will be presented in project ARARs documentation.

In particular, the project ARARs documentation defines steps for characterization and management of waste that contains liquid PCBs to ensure compliance with TSCA ARARs. Based on the ARARs documentation,[f] the project must perform separate characterization of liquid PCBs observed in the PGS before solidifying the liquids. In addition, the TSCA requires that persons disposing of multiphasic nonliquid or liquid mixtures must use the PCB disposal requirements that apply to the individual phase with the highest PCB concentration or to separate the phases and use the PCB disposal requirements that apply to each separated, single-phase material. To comply with the TSCA, the project may perform the planned solidification if the waste is disposed of based on the disposal requirements that would have applied before the waste was solidified. To ensure this happens, the following activities will occur:

1. Sampling of the separate waste phases will occur before solidification in the PGS transfer cart

2. Careful waste tracking will occur to ensure drums that contained liquid PCBs greater than or equal to 50 ppm (i.e., that were subsequently solidified) are tracked, labeled, and dispositioned properly.

4.1.4 Waste Segregation

Construction waste streams generally will not be hazardous waste, but rather will be industrial waste (IW) (i.e., nonhazardous solid waste) or conditional industrial waste and will typically not require RCRA- or TSCA-compliant storage. Some IW generated during construction (e.g., office waste and lunch trash) can be disposed of in cold-waste (i.e., nonradioactive) receptacles located on the construction site before final disposition in accordance with the INEEL RRWAC (DOE-ID 2002).

Container storage areas and containers for collection of waste will be clearly labeled to identify waste type. When operators receive waste zone material from the pit, they will handle and inspect the waste zone material, during which they will also characterize the waste zone material. Characterization efforts for waste zone materials will be dictated by the project Field Sampling Plan (see footnote e). Characterization includes a physical description of the waste zone material. The description is recorded on a paper form. Once the waste zone material drum has been sealed, the drum will then be transferred to the WMF-628 or placed in the CERCLA storage area if interim storage is required. The drum will be weighed and assayed. For interim storage situations, the drum location at the storage area or in the portable storage units will be noted and added to the waste zone material drum data file. When the sample analysis results are obtained (as necessary), they will be included in the data file. All of this information will also be entered into the Integrated Waste Tracking System (IWTS) used by the INEEL for dispositioning and transporting waste. Of course, the RCRA/HWMA permit will define any required segregation for storage within WMF-628.

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f. Burton, Brent N., 2002, "Applicable or Relevant and Appropriate Requirements Implementation Matrix for the OU 7-10 Glovebox Excavator Method Project (Draft)," EDF-3234, Idaho National Engineering and Environmental Laboratory, Bechtel BWXT Idaho, LLC, Idaho Falls, Idaho.

If waste requires storage onsite, it generally will be segregated in accordance with waste category (i.e., hazardous classification) and type (e.g., solids or liquids). Segregation by waste category primarily entails designation (i.e., by posting signs) of separate areas within the interim storage area. This segregation may entail separation of TRU waste, LLW, mixed waste, hazardous waste, solid waste, and liquid waste streams within the storage areas (as necessary). Waste segregation by type may be an iterative process such that initial classifications of waste may change because of receipt of analytical results.

Finally, it is not anticipated that waste streams requiring segregation for chemical compatibility considerations will be encountered during project activities (Dick and Burton 2002). A majority of the waste materials within the planned excavation area already is assumed to be commingled because container integrity within this area is questionable. However, visual observations of conditions during waste retrieval may lead to the need to segregate waste or conduct special characterization of waste.

4.1.5 Waste Minimization

Pollution prevention and waste minimization assessments are a significant component of the RD/RA phase of CERCLA. Each CERCLA remediation project is unique with most having short project durations. The concurrent development of this plan and project design is an example of how the Environmental Restoration (ER) Department evaluates waste minimization closely before operation to evaluate and consider options that will reduce the overall waste generation through the life cycle of the project.

Waste minimization for this project will be accomplished through design and planning to ensure efficient operations that will not generate unnecessary waste. As part of required prejob briefings, emphasis will be placed on waste reduction philosophies and techniques, and personnel will be encouraged to continuously attempt to improve methods for minimizing generated waste. Practices to be instituted to support waste minimization include, but are not limited to, the following:

- Restricting material (especially hazardous material) entering radiological buffer areas to those needed for work performance
- Substituting recyclable or incinerable items for disposable items
- Reusing items when practicable
- Segregating contaminated from uncontaminated waste
- Segregating reusable items such as PPE and tools
- Sizing and arranging the interior corridors to accommodate decontamination and decommissioning of the facility, including equipment required during decontamination
- Using modular, separable confinements for radioactive and other hazardous materials to preclude contamination of fixed portions of the structure
- Locating exhaust filtration components of the ventilation systems at or near individual enclosures to minimize long runs of internally contaminated ductwork
- Implementing designs that ease decontamination, dismantlement, removal, and packaging of contaminated equipment from the facility

- Using lifting lugs on large tanks and equipment

- Using cameras and windows to allow remote operations to reduce personnel entry.

A more complete discussion of waste minimization for the ER projects is contained in *U.S. Department of Energy-Idaho Operations Office, Idaho National Engineering and Environmental Laboratory Interim Pollution Prevention Plan* (Janke 1997).

Table 5 provides a summary of waste minimization opportunities as it applies to the operational process.

4.1.5.1 Source Reduction. Source reduction is most applicable to secondary waste streams resulting from the actual cleanup activity—such as PPE, plastic sheeting, decontamination media, packaging materials, and equipment—used to perform the work. Source reduction is a technique that should be incorporated during the planning phases to prevent additional waste generation as a result of doing the cleanup work. This project supports source reduction by design. Many of the operations are to be conducted remotely. Cameras and windows will be positioned to allow for efficient remote operations. This will reduce the need for personnel entry, thus significantly reducing the amount of PPE and sampling waste generated.

Table 5. Waste minimization summary of the Operable Unit 7-10 Glovebox Excavator Method Project.

Equipment or Activity	Waste Minimization Opportunity	Waste Minimization Application
Planning and monitoring	Procedure decisions.	Reduces the amount of time expended.
	Prior consideration of and compliance with requirements and regulations.	Prevents cross-contamination.
	Procedures have been developed and practiced.	Minimizes unnecessary handling of soil or waste.
	Provide characterization data.	Minimizes mistakes in segregation of soil or waste.
Construction activities	Planning.	Lessens overages in materials.
	Training.	Eliminates waste being trucked in and out or generated.
		Prevents cross-contamination within equipment
		Reduces generation of hazardous waste.
	Maintenance-related activities.	Reduces radiological contamination of materials used in construction activities.
	Radiological screening.	Reuse construction materials (i.e., wood framing or bracing).
	Incentive-based waste minimization program.	Heightens construction workers awareness to implement waste minimization strategies.
Removal and staging of overburden	Remote operation of equipment.	Reduces the need for personnel entry.
		Reduces generation of PPE and waste.
	Efficiently designed equipment.	Lessens complex steps for removal and segregation.

Table 5. (continued).

Equipment or Activity	Waste Minimization Opportunity	Waste Minimization Application
	Performs precision operations of equipment.	Minimizes mistakes in segregation of soil or waste.
		Prevents cross-contamination.
		Increases maneuverability providing more efficient excavation.
	Overburden soil removal.	Minimizes amount of waste material and drum use.
		Reuse overburden soils at project end.
	RCS and PGS design.	Reduces the need for personnel entry.
		Reduces generation of PPE.
		Reduces generation of waste.
		Prevents cross-contamination.
	Dry decontamination (as necessary).	No liquid waste stream from decontamination.
Waste material handling	Efficiently designed gloveports and waste transfer system (RCS and PGS).	Heightens efficiency from personnel.
	Performs precision operations for remote operation.	Reduces the need for personnel entry.
	Drum-compatible waste.	Reduces generation of PPE.
		Reduces generation of waste.
		Prevents cross-contamination.
		Provides Waste Isolation Pilot Plant requirement data.
		Repackaging and resampling are unnecessary.
		Reduces total volume of drums.
	Dry decontamination (as necessary).	No liquid waste stream from decontamination.
Sampling	Statistical sampling approach.	Minimal number of samples taken.
		Reduces waste generated because of laboratory analysis.
	Remote operation.	Reduces the need for personnel entry.
		Reduces generation of PPE.
		Provides TSDF requirement data.
	Dry decontamination (as necessary).	No liquid waste stream from decontamination.
Assay	Nondestructive assay analyses.	Reduces generation of waste because of drum reopening.

Table 5. (continued).

Equipment or Activity	Waste Minimization Opportunity	Waste Minimization Application
Storage	Training in waste movement.	Reduces generation of waste because of possible spillage.
	Waste profiling in advance.	Reduces time waste spends in storage.
	Segregation of waste.	Minimizes cross contamination and generation of mixed waste.
	Storage of compatible waste.	Reduces generation of waste because of chemical reactions leading to emergency response activities.
Data management functions	Waste tracking system.	Provides TSDF requirement data. Repackaging or resampling is unnecessary because of tracking. Uses administrative controls to prevent cross-contamination.
Decontamination and deactivation	Planning.	Lessen overages in materials. Minimizes mistakes in waste segregation.
	Weather enclosure structure, continuous air monitors, radiation air monitors, personnel contamination monitors, water tanks, storage cabinets, battery charging stations, and forklifts.	Reuse.

RCS = Retrieval Confinement Structure
PGS = Packaging Glovebox System
PPE = personal protective equipment
TSDF = treatment, storage, and disposal facility

4.1.5.2 Recycle and Reuse. Recycling and reuse generally provide the most viable pollution prevention benefits from environmental restoration and decommissioning activities. Recycling and reusing materials saves valuable disposal capacity and costs associated with disposal. The DOE has encouraged recycling and reuse of materials and has requested that a thorough life-cycle cost analysis be performed during environmental restoration activities to assess the cost of recycle and reuse versus the cost of disposal. Specifically, any secondary waste generated during the project must meet the RRWAC (DOE-ID 2002), which first evaluates recycle and reuse opportunities before disposal.

The primary issue with the project and recycling is the DOE moratorium on the recycle of scrap metals from radiation areas. This project will extensively evaluate the potential for recycling; however, for materials that come into contact with the waste material, viable recycling options are limited. For the recycling of these materials, a future use within the DOE complex must first be identified. Materials and equipment that do not come into contact with waste materials (e.g., water tanks, storage cabinets, and other items located within the WES) may be reused within the DOE complex without significant planning efforts.

4.1.5.3 Disposal and Treatment. Long-term, interim storage onsite is the last option in the waste management hierarchy. Choices made in the type of disposal or storage facility may determine the most cost-effective disposal location for the waste. Careful consideration will be given to disposal and all costs associated with the packaging, placement, surveillance, and other activities performed when disposing of project waste.

Treatment is defined as any method, technique, or process designed to change the physical or chemical character of waste to reduce its volume, render it less hazardous, or make it safer to transport, store, or dispose of. Treatment methods also determine the degree to which hazardous, radioactive, and nonhazardous materials can be segregated.

Volume reduction is not typically included as a technique for pollution prevention, but it does reduce the volume of waste destined for disposal. Volume reduction is actually a treatment defined as a physical change in the waste that reduces its hazardous nature, mobility, or volume. In environmental restoration activities, particularly decommissioning activities, reducing the volume by compaction, evaporation, shearing, or crushing can result in reduced disposal costs.

4.1.5.4 Best Management Practices. Best management practices are inherently pollution prevention practices. Traditionally, best management practices have focused on housekeeping measures and management techniques intended to avoid contact between water media and pollutants that result from spills, leaks, and improper waste disposal. Based on the regulations, best management practices may include a broad range of pollution prevention techniques (e.g., production modifications, operational changes, material substitution, and materials and water conservation) and other such measures. The intent of pollution prevention practices and best management practices is similar and both practices can be developed concurrently in a technologically sound and cost-effective manner. Business management practices, in conjunction with pollution prevention (for all media), maximize the benefits achieved. Within the ER program, best management practices are used routinely to ensure that a project adheres to cost and schedule constraints.

4.1.5.5 Training. The INEEL project managers assigned to each remediation project have specific responsibilities for implementing waste minimization requirements for their projects. Waste minimization and pollution prevention requirements, as implemented in INEEL MCPs, are required reading for all project managers.

Each removal or remediation project is required to have a sampling and analysis plan and health and safety plans with sections defining project pollution prevention and waste minimization practices and systems in addition to generation and implementation of project-specific waste minimization plans. Project personnel are required to read and understand the pertinent portions of these plans with respect to their functions before performing the tasks. Training is tracked through initial required reading and training performance documentation once the employee has been on the job for 3 days.

4.1.5.6 Waste Tracking. This project will comply with the elements outlined in the ER waste-tracking program. The ER program waste tracking and forecasting systems include the ER Waste Stream Tracking System database and the Baseline Environmental Management Report database. Additionally, the IWTS database is used to monitor waste stream disposal. Project managers from each project generating and storing radioactive, hazardous, and mixed waste in CERCLA waste storage units maintain and submit waste inventory reports to the ER Environment, Safety, Health, and Quality Assurance manager. In addition, a database is maintained for investigation-derived waste generated, stored, treated, and disposed of as part of the CERCLA investigation and treatability study process.

4.1.5.7 Waste Management Costs. Costs for waste generation, storage, and disposal are planned, funded, and tracked on a project-specific basis. Program waste management costs—such as program waste tracking, program waste minimization, and waste certification costs—are funded and accrued at the ER program support level.

4.2 Waste Stream Identification

This section provides descriptions of the waste streams expected to be generated in association with this project. Succeeding sections address waste packaging, labeling, storage, transportation, and potential waste disposal options. Table A-1 in Appendix A provides a summary of the waste streams and estimated volumes (as necessary).

4.2.1 Construction Waste Streams

Construction waste streams will be generated during the construction of site facilities and will primarily include nonhazardous solid waste that is sent to the INEEL solid and industrial waste landfill complex. The waste streams expected to be generated during construction activities include bulky and nonbulky industrial waste (nonhazardous solid waste) and limited RCRA hazardous waste streams. Radioactive or radioactive mixed waste should not be generated during construction activities based on baseline radiological conditions known to be present in the surface soils in the project area. Examples of the types of waste to be generated during construction activities are presented below.

Construction waste streams generated during RD/RA activities under a CERCLA ROD can be appropriately managed, while onsite, in accordance with substantive ARARs. Administrative requirements, such as the 90-day accumulation time limitation, do not apply. As stated in Section 4.1.2.2, construction waste is subject to an HWD.

4.2.1.1 Industrial or Conditional Industrial Waste. Typical bulky waste to be generated will include concrete and large wood and metal items. These waste items are typically discarded into cold-waste (nonradioactive) dumpsters located at the construction site pending transport to the bulky waste section of the INEEL industrial waste landfill. Note that items such as rubber tires and scrap metal or lumber pieces of reusable size are sent to the Property Disposal Facility at CFA and not the INEEL Landfill Complex. Conditional IW is IW that has a higher probability to contain hazardous constituents, PCBs, and radiological contamination based on the history of the generating activities and generator locations.

Examples of nonbulky IW could include waste from welding operations (welding rod), metal scrap from sheet metal work, and small wood scrap from various carpentry and formsetting activities, electrical wiring, and empty aerosol cans. These waste items are typically discarded into cold-waste dumpsters located at the construction site pending transport to the INEEL Landfill Complex. In addition, spills of hydraulic oil and other petroleum products could potentially occur. All soil stained from such spills and leaks is containerized and can be processed, pending a complete HWD, under the RRWAC as conditional IW. The soil may be acceptable for land treatment and farming.

4.2.1.2 Potential Resource Conservation and Recovery Act Hazardous Waste. The potential exists for the generation of limited quantities of RCRA hazardous waste; however, management of construction chemicals and other products will focus on avoidance of hazardous waste (if possible). Unwanted and unused chemicals, paints, and oils that are still acceptable for use can be evaluated for potential use on the INEEL Material Exchange Database to avoid waste generation. Any RCRA hazardous waste meeting the appropriate RRWAC can be disposed of at various off-Site treatment, storage, and disposal facilities under subcontract to the INEEL.

4.2.2 Overburden Removal

The OU 7-10 was constructed by digging to the basalt and backfilling to provide a layer of underburden soil. Waste was then placed or dumped into the pit until it was full and an initial 1-m (3-ft) layer of overburden soil was then placed over the waste, some at the time of emplacement and the remainder at the time of pit closure. During subsequent years, periodic maintenance was performed by filling in areas of subsidence to restore the original grade and contour. The soils used for these activities were clean INEEL soils (i.e., consistent with INEEL background concentrations), usually excavated from the spreading areas (playas) south of the RWMC. As stated in the OU 7-10 ROD (DOE-ID 1993), an estimated 2 m (6 ft) of overburden soil is located on top of the buried waste within the 0.4-ha (1-acre) pit. However, current information indicates that a depth of less than 2 m (6 ft) of overburden may be more likely.

In July 1995, characterization activities were conducted through core sampling of the OU 7-10 overburden soils. The characterization effort indicated that low levels of alpha contamination and some limited chemical contamination might have migrated into the overburden since original emplacement. In particular, the analytical results showed a range of detectable gross alpha contamination from 8.4 to 770 pCi/g and a range of detectable gross beta contamination from 17.4 to 53.3 pCi/g. In addition, the 1995 characterization effort identified detectable concentrations of various chemical contaminants, including tetrachloroethene and trichloroethene (LMAES 1995).

In summary, the available information concerning OU 7-10 overburden soils indicates the soils are associated with very low levels of radionuclide contamination, but at levels well below the 10-nCi/g TRU threshold. Based on the Administrative Record for the OU 7-10 ROD, nothing indicates that the overburden soils contain listed hazardous waste or are characteristic waste. The overburden soil is to be removed to an approximate 1.1-m (3.5-ft) depth. This soil will be staged near OU 7-10 until waste zone material retrieval and underburden sampling are complete. This soil may be returned to the pit and therefore never classified as waste or may potentially be disposed of at the ICDF or the RWMC LLW pit. The project design (INEEL 2002) estimates that 70 to 75 yd^3 of waste, comprising approximately 45 to 55 $1.2 \times 1.2 \times 1.2$-m ($4 \times 4 \times 4$-ft) soil sacks of overburden, will be removed from the excavation area during waste zone material retrieval.

4.2.3 Waste Zone (Operable Unit 7-10-Derived) Materials

As defined in Section 4, OU 7-10-derived materials consist of all materials originally disposed of within OU 7-10 including interstitial and underburden soils and packaged waste from INEEL and non-INEEL generators.

4.2.3.1 Interstitial Soils. Interstitial soils, like overburden soils, originated in the spreading areas and were placed among and atop the waste during burial. An approximate 1- to 1.8-m (3- to 6-ft) layer of soil was placed over the basalt before burial of the waste in the pit. Little information is currently available about the chemical or radiological contamination levels within the interstitial soils and underburden. It is initially assumed that the interstitial soils are commingled with waste zone materials and will be associated with contamination consistent with management as MTRU waste. It is initially assumed that the listed or characteristic waste codes from the original waste zone material will apply to the adjacent associated interstitial soils.

Approximately 57 to 96 m^3 (75 to 125 yd^3) of waste zone material will be removed by this project. This includes both disposed-waste container materials and interstitial soils. Waste zone materials anticipated for retrieval (INEEL 2002) are listed in Table 3.

4.2.3.2 Waste Items. The waste and contaminants located in OU 7-10 are described in Section 2.3. The project area, as presented on Figure 4, is located in the southern portion of OU 7-10. Records show that this area contains RFP waste rather than waste from INEEL generating facilities. Tables 1 and 3 provide a summary of the waste containers and items to be encountered during waste zone material retrieval.

Each of the waste forms expected could potentially have waste items that assay less than or equal to 10 nCi/g TRU (i.e., LLW), as orphan (i.e., more than 10 nCi/g but less than 100 nCi/g TRU), or as TRU waste. However, it is assumed that the majority of the packaged waste from RFP will assay more than 10 nCi/g TRU, will be associated with RCRA hazardous contaminants (pending completion of the HWD described in Section 4.1.2), and will, therefore, require management as MTRU or MLLW. Waste items may also require management as TSCA waste, although current inventory assumptions do not indicate this is likely.

It is recognized that unknown waste may be encountered. Screening techniques at the excavation and in the PGS will hopefully be able to provide preliminary information, and further analytical testing may be necessary. Unknown waste will be managed in accordance with INEEL MCPs for unknown materials (i.e., MCP-3470). The project design estimates approximately 57 to 96 m^3 (75 to 125 yd^3) of waste zone material, resulting in 500 to 700 containers, will be retrieved and placed in interim storage.

4.2.4 Facility Shutdown and Layup Phase

At the conclusion of waste zone material retrieval and underburden sampling, the project will initiate facility shutdown including pit stabilization. Shutdown activities mainly will consist of the following:

- Performing initial facility characterization
- Performing gross decontamination of the PGS gloveboxes and the RCS
- Backfilling the pit with a weak grout to within 1 m (3 ft) of final grade
- Immobilizing residual contamination
- Securing nonessential equipment.

A majority of the waste generated during the facility shutdown is sampling and other secondary-types of waste (see Section 4.2.6 for additional detail on secondary waste streams).

4.2.5 Deactivation, Decontamination, and Decommissioning Waste

The D&D&D activities will be initiated as soon as possible after the facility safe shutdown state is achieved. The duration of the layup period will be determined by time required to perform the following:

- Complete the D&D&D planning
- Prepare the necessary documentation and procedures
- Successfully complete a readiness assessment
- Mobilize the D&D&D resources.

The D&D&D activities and further definition of the D&D&D waste will be detailed in the final D&D&D plan. The specific end-state of the project is still in the planning stages; however, preliminary assumptions have been made for expected waste types to be generated. The waste types are discussed below and presented in Appendix A.

4.2.5.1 Mixed Transuranic Waste. This category was used for items that reasonably could be expected to have come into direct contact with the waste during retrieval and packaging (e.g., excavation equipment and tools, high-efficiency particulate air [HEPA] filters, and the Facility Floor Structure [FFS] within the RCS). For initial planning purposes, a majority of the waste will be considered MTRU based on radiological engineering input. It is likely that decontamination of structures and debris from D&D&D will be conducted in accordance with the requirements set forth in 40 CFR 268.45(c), "Conditioned Exclusion of Treated Debris," to potentially remove associated listed hazardous waste codes. This decontamination may also reduce the radiological contamination levels to meet the definition of LLW.

4.2.5.2 Mixed Low-Level Waste. This category was used for items that may not have had direct contact with the waste, but could be expected to have had contact with airborne contamination or items that have contacted MTRU waste, but will likely not be TRU because of the large bulk density (e.g., exhaust ventilation ductwork up to the filter bank, RCS ceiling, and piping and supports inside the primary confinement boundary). In addition, most metals may end up as MLLW because of the weight driving the TRU concentration below 10 nCi/g. Likely, decontamination of structures and debris from D&D&D will be conducted in accordance with the requirements set forth in 40 CFR 268.45(c) to potentially remove associated listed hazardous waste codes.

4.2.5.3 Low-Level Waste. This category was used for items that would be suspect because they had been used on OU 7-10 or the SDA and would not be easily surveyed.

4.2.5.4 Conditional Industrial Waste. This category was used for generally nonreusable items that could easily be proven as clean but carried residual risk because of (1) use in the storage of TRU waste, (2) siting at OU 7-10, or (3) siting at the SDA (e.g., utility and storage building metal, structural, and sheathing components; concrete foundations; and WES exhaust ductwork downstream from the main filter bank). These waste streams would be evaluated to ensure landfill disposal criteria are met.

4.2.5.5 Universal Waste. Universal waste (UW) is hazardous waste (e.g., lead-acid batteries, fluorescent bulbs, metal halide lamps, and mercury thermostats) that is governed by the UW management standards within 40 CFR 273, "Standards for Universal Waste Management." If no radiological contamination were anticipated, these waste streams would be disposed of through an INEEL UW program contract. If radiological contamination is expected, these waste streams may be managed as MTRU or MLLW.

4.2.5.6 Reusable or Idaho National Engineering and Environmental Laboratory Excess. This category was used for generally reusable items that are not expected to have become contaminated (e.g., water tanks in the WES, forklifts, battery-charging stations, and storage cabinets).

4.2.5.7 Recyclable. This category was used for materials such as metals that could be candidates for recycling if no further use has been determined. A DOE-imposed moratorium on the release of recycled metals from radiological areas prevents most metals from the project from being recycled because of the release restrictions. Most scrap metals will be disposed of in accordance with appropriate WAC. However, if the moratorium is lifted, the recycling option will be revisited.

4.2.6 Secondary Waste Streams

As defined in Section 4, secondary waste is a generic category for waste streams that result from support activities associated with the retrieval and packaging of waste zone, OU 7-10-derived materials. This category includes operations, maintenance, sampling, and administration and support service waste. The following subsections present management information for the secondary waste streams. Each phase of the project will generate secondary waste streams. However, the secondary waste streams will differ in types, quantities, and anticipated contamination levels. A summary of the information is presented on Table A-1 in Appendix A.

4.2.6.1 Operations Waste. The predominant waste streams associated with operation of facilities include (1) PPE and decontamination waste, (2) discarded portions of bags associated with the drum bagging system, (3) radiological control survey waste, and (4) liquid and potential spill waste. Each of these waste streams is discussed below.

4.2.6.1.1 Personal Protective Equipment—The major operational sources of PPE waste will be generated from the processing of materials and maintenance-type activities in the RCS and PGS.

Most tasks to be performed within the RCS and PGS will be done remotely or through the glovebox ports, which will keep waste generation to a minimum. Instances may occur when personnel will have to enter these confinements for work-related activities.

Most waste sampling and handling will be conducted within the PGS and will be conducted remotely. The PPE requirements will be defined in the project health and safety plan and may change as directed by the industrial hygienist and radiological control technician based on work conditions and contamination levels. For initial planning purposes, it is assumed that the individuals working at the PGS will not be required to wear Anti-C clothing but will wear launderable coveralls, which will minimize waste generation. The operators will wear cotton glove liners or latex gloves that are changed and discarded multiple times during the day. Leather gloves also may be used.

4.2.6.1.2 Decontamination Waste—Decontamination may take place within the RCS and PGS following drum processing, sampling, or maintenance activities. Current planning indicates that the decontamination will consist of a wipedown of surfaces (e.g., glovebox tools) using massoline cloths as rags. Current assumptions for decontamination do not include significant use of liquids as part of this decontamination process; therefore, no estimates of liquid waste generation are provided. If liquid waste generation occurs, the resulting liquid waste stream would be absorbed and included in the OU 7-10 waste. Used rags will be placed into 55-gal drums along with waste zone material through the PGS or will be bagged out of the RCS. The drummed waste, expected to be MLLW, will then be transported to the interim storage area for storage.

4.2.6.1.3 Discarded Portions of Bags Associated with Drum Bagging System—The new drums receiving waste in the PGS will be lined with polyethylene bags that are filled through a drum-bagging system that provides containment in the filling process. Bag sealing will be performed in the drum-loading enclosure for protection against a breached bag. Once a drum is full, the drum-port opening will be covered, and the drum lowered away from the port. The bag liner still will be attached to the port, maintaining confinement for the drum contents. The bag liner then will be twisted, sealed in two places, and then cut between the two seals. The bag liner remnant, attached to the port, will go into the next drum.

4.2.6.1.4 Radiological Control Survey Waste—Radiological Control personnel will support operational activities through numerous surveys within all facilities to support personnel occupation of the areas, as well as surveys to support transfer of newly containerized waste. Waste from these activities will be limited and primarily will consist of swipes, bags, tape, or other similar items. Based on the design approach of limiting contamination to primary confinement areas, it is expected that this waste stream will consist mainly of industrial waste, but will be managed as LLW as a minimum. The LLW radiological control survey waste will be managed through the RWMC. If contact with waste zone material is demonstrated, then this waste stream may be MLLW or MTRU and then will be managed along with other project secondary waste streams.

4.2.6.1.5 Liquid and Spill Waste—Spills of various materials could occur during operational activities, although the design does not include significant use of liquids or chemicals. The primary spills that could occur include spills of OU 7-10-derived materials (potentially including liquids such as oils from sludge drums and containerized mercury), hydraulic oil spills or leaks from retrieval equipment, and spills associated with filling of the diesel tanks for the excavator.

Liquid waste could result from emergency actions such as putting out a fire. Water could soak into soils or could pool in places either in the pit, the RCS, or the PGS if used inside the building for fire suppression. Where water has ponded, it may be absorbed or otherwise contained as soon as allowable by emergency planning and may be sampled for evaluation through the HWD process. Where water has soaked into waste zone material soils, the soil will be retrieved, containerized, and evaluated through the normal retrieval and repackaging process. If a fire occurs in a location other than the retrieval building, the same process will apply. Water will be absorbed or contained where possible for sampling and analysis, as necessary. Where water has soaked into soils, the soil will be sampled and analyzed as part of the planned process. For fires occurring in office or administrative buildings, water will drain into the sanitary system for the building or will be soaked up by carpet and furniture. This circumstance will not usually result in any hazardous or radioactive waste generation; however, all waste streams will be evaluated for proper storage and ultimate disposal.

Releases of OU 7-10-derived materials would only be considered spills if they occur after the material has been packaged in a container. Releases of OU 7-10-derived materials internal to the retrieval building (i.e., within the primary confinement) are handled as part of the normal retrieval process with retrieval system equipment and are not classified as spills. Release of materials within the RCS or PGS before containerization will be handled as part of the normal retrieval and repackaging process and will be absorbed before being repackaged.

Spills of OU 7-10-derived materials that occur following containerization in the PGS may result from nonroutine scenarios such as an overturned drum or drum rupture from forklift operations. These spills, although not routinely expected, could occur and will be addressed in specific operational procedures. Standard INEEL company procedures and documents also address spill response actions; most notably, Addendum 3 to PLN-114, "Emergency Preparedness – Addendum 3, Radioactive Waste Management Complex," or a specific OU 7-10 emergency response plan addendum. It is expected that spill materials will be collected by personnel using appropriate PPE and materials will be containerized for storage (pending an HWD) with other OU 7-10-derived waste containers.

Hydraulic oil leaks could occur from line failures on retrieval equipment. If a leak occurs such that liquid accumulates on the retrieval area floor, it is expected that the liquid will be absorbed with rags or absorbent materials through the use of retrieval system equipment. Any spilled material within the digface area would be retrieved along with other waste or soil items in the normal retrieval process. This spilled waste material released in the RCS is expected to be MLLW or MTRU waste based on potential contact with contaminated material from OU 7-10. Resulting rags and accumulated liquid would be containerized and stored within the interim storage pad area. Hydraulic oil leaks from the excavator within the WES but outside of the RCS also will be managed as MTRU or MLLW. This spill material also will be collected using appropriate PPE, containerized, and stored pending an HWD. Hydraulic oil leaks from noncontaminated systems occurring in the WES (i.e., forklifts) can be disposed of at the CFA landfill.

4.2.6.2 Maintenance Waste. The maintenance activities for operations include preventive and corrective maintenance. A brief list of major maintenance activities and associated waste streams is identified below.

The primary maintenance-related waste streams currently identified include the following:

- Used filters from the off-gas treatment system
- Personal protective equipment generated during maintenance
- Decontamination waste generated during maintenance (liquid and solid waste)
- Used or failed parts and equipment
- Other miscellaneous items.

Given the relatively short project operations duration (assumed less than 3 months), required maintenance should be minimal. Each of the waste streams related to maintenance activities is discussed below.

4.2.6.2.1 Filters from the Off-Gas Treatment System—Filters will be used in several locations to control airborne releases from the various facilities, including filtration of both inlet and exhaust air. Roughing filters will be used upstream of HEPA filters in most locations. The inlet air filters in the WES will likely be IW; however, they could require management as LLW. Other filters are expected to require management as MTRU or MLLW.

4.2.6.2.2 Personal Protective Equipment—Various PPE will result from planned and corrective maintenance activities, as well as pit closure and D&D&D activities. Some maintenance within the RCS and PGS may be performed through the gloveports. Most (if necessary) would require personnel entry. Personnel in appropriate PPE will perform any corrective maintenance that cannot be accomplished through gloveport intervention. Maintenance personnel entering the retrieval building for corrective or preventive maintenance will be required to wear Anti-C clothing and supplied-air respiratory protection. It is expected that the contaminated PPE would require management as MTRU or MLLW.

The PPE ensemble expected to be worn by maintenance personnel performing corrective maintenance in the primary confinement areas (and filter change-out) will include a double set of Anti-C clothing (expected to be cloth and Tyvek combination with hood), air-purifying or airline respirator with bubblehood, outer and inner gloves, shoe covers, and radiological modesty garments. The outer pair of Tyvek coveralls, gloves, shoe covers, and bubble hood will be discarded as MTRU, MLLW, or LLW depending on the particular maintenance activity and location. For example, it is expected that PPE from filter change-out operations can be managed as LLW because of the bag-in and bagout operation.

4.2.6.2.3 Decontamination Waste—In some instances, maintenance activities will require decontamination of equipment before performing the maintenance work. The details of this decontamination are not currently defined, but could lead to the generation of various solid (e.g., rags) and liquid waste streams. It is expected that these waste streams will require management as MTRU, with the possibility of generating MLLW waste.

4.2.6.2.4 Parts and Equipment Replacement—Parts and equipment replacement may be required primarily relating to corrective maintenance activities. Metal parts and other components may fail, be replaced, and be discarded as waste. Alternatively, parts potentially could be decontaminated and repaired. Currently, assumptions about projected part- and equipment-failure rates are not available, but it is assumed that parts will be disposed of and not reused. The parts and equipment from inside the RCS and PGS will be managed as MTRU or MLLW. Parts and equipment within the WES will be disposed of (i.e., managed) as IW.

4.2.6.2.5 Miscellaneous Maintenance Waste—Various miscellaneous types of maintenance waste will be generated from planned and corrective maintenance activities. The waste will include items such as used batteries, light bulbs, oil and grease, and janitorial waste. Janitorial waste will most likely be nonhazardous waste. The other waste streams will be managed in accordance with MCP-3628, "Managing Special Waste Types," which covers the characterization and management of such waste as spent lamps and tubes, bulbs, used oil, waste batteries, and aerosol cans. Condensation from compressors will be evaluated through the HWD process before waste generation. If RCRA hazardous waste is generated from these maintenance activities, the waste can be stored in the interim storage pad area pending processing in accordance with the INEEL RRWAC (DOE-ID 2002).

4.2.6.3 Sampling Waste. Sampling of retrieved waste, interstitial, and underburden soils will occur in the project. The project Field Sampling Plan[g] describes all planned sampling events as well as methodologies, techniques, and quality assurance requirements and considerations. Types of waste to be generated include PPE, equipment, decontamination waste, and administrative waste (e.g., labels).

4.2.6.4 Administration- and Support-Service Waste. The administrative facilities will be located within the RWMC area and will house a limited number of personnel. The RWMC will provide many of the support facilities and services. Support services (e.g., sanitation and potable water supply) will be provided by the RWMC. The waste streams expected in this category are general solid municipal waste related to office-type activities (primarily consisting of paper products), limited medical waste, sanitation waste, wastewater from self-contained personnel showers, and storm water discharge. It is noted that storm water discharge is not technically a wastewater stream, but could require management as a wastewater if the site were not managed appropriately to prevent contamination. Storm water pollution prevention plans will be prepared to ensure appropriate management if storm water occurs.

4.2.6.4.1 General Solid Municipal Waste—Solid nonhazardous waste (e.g., paper products and cardboard) will be generated during administrative activities. This waste will be managed as part of the existing RWMC waste streams. The RWMC municipal waste will be placed in cold-waste dumpsters or trashcans and sent to the INEEL Landfill Complex. The INEEL has instituted a recycling program at the Site that contributes to waste minimization efforts. Materials that can be recycled include white paper, light-toned colored paper, envelopes, fax paper, manila file folders, phone books, Post-it notes, and flattened, corrugated cardboard.

4.2.6.4.2 Medical Waste—The RWMC does not operate a medical dispensary. Personnel requiring medical attention will be routed to the dispensary at CFA. Medical waste that may be generated (e.g., used bandages and sharp medical implements) will be disposed of through subcontracted waste disposal to an off-Site facility.

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g. INEEL, 2002, "Field Sampling Plan for the Operable Unit (OU) 7-10 Glovebox Excavator Method Project (Draft)," INEEL/EXT-02-00542, Rev. A, Idaho National Engineering and Environmental Laboratory, Bechtel BWXT, LLC, Idaho Falls, Idaho.

4.2.6.4.3 Sanitary Sewage—Sanitary sewage services for project activities are supported by the RWMC. The RWMC sanitary sewage wastewater flows to sewage lagoons located to the south of the TSA.

4.2.6.4.4 Shower Water—A self-contained clean shower may be located within the OU 7-10 area to support daily personnel showers. The shower water would be sampled for radiological control purposes and discharged into the RWMC sanitary sewage system for disposal.

4.2.6.4.5 Storm Water Discharge—All SDA and OU 7-10 storm drainage ultimately collects into a sedimentation basin located just south of OU 7-10 and then either overflows into or is pumped into the water quality control outlet structure on the south end of the OU 7-10 boundary. The sedimentation basin can detain water for sufficient time to allow sedimentation to occur. In addition, the basin provides a point where water can be sampled and analyzed for various contaminants of concern that could potentially leave the SDA through surface-water migration. The RWMC and storm water environmental sampling personnel will conduct this sampling.

5. CONTAINER MANAGEMENT

The following subsections describe the management of waste in containers during onsite CERCLA storage, transportation, and disposal. This section does not apply to the containers stored in WMF-628 if stored in accordance with the RCRA and HWMA permit.

5.1 Packaging

Packaging of waste zone material from the PGS will be in accordance with operation design details and procedures and the applicable WAC (e.g., RRWAC or project-specific WAC). Packaging will be in compliance with the following:

- Reusable property, recyclable materials, and waste acceptance criteria
- Resource Conservation and Recovery Act regulations found in 40 CFR 264 Subpart I, "Use and Management of Containers"
- Toxic Substances Control Act requirements found in 40 CFR 761.65
- Receiving TSDF WAC
- Applicable U.S. Department of Transportation (DOT) regulations including the following:
  - 49 CFR 171, "General Information, Regulations, and Definitions"
  - 49 CFR 173, "Shippers—General Requirements for Shipments and Packagings"
  - 49 CFR 177, "Carriage by Public Highway"
  - 49 CFR 178, "Specifications for Packagings."

The INEEL Waste Generator Services (WGS) along with the Packaging and Transportation organization should be consulted before waste is generated to identify specific types of containers to be used for the anticipated waste. Typical containers include 55-gal steel UN1A1 and UN1A2 drums, 85-gal overpack containers, wooden or metal boxes measuring 1.2 × 1.2 × 2.4 m (4 × 4 × 8 ft) or 0.6 × 1.2 × 2.4 m (2 × 4 × 8 ft), and soft-sided bags.

5.2 Labeling

All waste containers will be labeled appropriately. Conditional IW will be labeled as such. All CERCLA remediation waste will be labeled with a CERCLA Waste label that includes the following:

- An accumulation start date
- Waste description
- Potential and final waste codes
- Name of waste generator.

Each container will have a bar code label generated from the IWTS database. The IWTS is the database used by the INEEL to track disposition of waste to on- or off-Site facilities. Additional labels will be affixed to containers, as described in the design flow process. Information included will be spatial coordinates and assay results. All container labels will be placed where they are clearly visible during storage and shipment. Drums will be labeled on the top and on one side. Boxes will be labeled on the top and on two opposing sides of the container. These directions are in accordance with INEEL company procedures. Radiation labels (in addition to assay results) will be completed and placed on each container if required by a radiological control technician in accordance with *Radiation Protection – INEEL Radiological Control* (PRD-183). Labels for PCBs will comply with TSCA regulations and will be applied to containers when necessary. In preparation for shipment, other information must be included on containers such as applicable DOT labels, manifest number, gross weight, and the complete name and address of the shipper.

5.3 Storage and Inspection

For temporary CERCLA storage, the waste will be stored within the AOC in the interim storage area or in TSCA and RCRA portable storage units. The design will include aisle space for inspection activities and drum movements. The base elevation of these areas/structures will be above the local 100-year flood water level. The types of materials that will be stored will primarily consist of solid debris items, but may include interstitial and waste zone materials; hazardous, PCB-contaminated waste; LLW; and TRU-contaminated waste associated with operations. The design will accommodate storage of projected volumes and types of secondary and D&D&D waste streams.

Containers that are to be stored at the interim storage pad area and in the portable storage units will be inspected in accordance with requirements stated in internal INEEL waste management procedures, the INEEL Radiological Control Manual, and applicable ARARs. These procedures and regulations contain requirements for waste segregation, weekly inspections, types of emergency response and spill equipment to be stored on the premises, emergency communication, recordkeeping, and reporting. Temporary staging of containers may also occur within the WES.

5.4 Transportation

The CERCLA remediation waste generated as a result of project activities will be transported in accordance with requirements identified in the RRWAC, project-specific WAC, appropriate DOT regulations, RCRA regulations, and company procedures (MCP-2669, "Hazardous Material Shipping," and MCP-2670, "Motor Carrier Operations") as necessary. If shipment of CERCLA remediation waste is necessary during the project, WGS and Packaging and Transportation organization personnel will be responsible for performing those activities. Industrial waste transported to the INEEL Landfill Complex can be transported by the waste generator or WGS personnel.

5.5 Disposal

Disposal of each type of waste stream generated during the project will be accomplished in accordance with all applicable requirements found in state and federal regulations, INEEL company procedures and documents, and the OU 7-10 ROD. Disposal options for each type of expected waste stream are summarized below. In general, waste zone materials will not be disposed as part of the project (i.e., Stage II) work scope, but will be placed in interim storage pending future disposition as part of a subsequent project phase. Disposition of project secondary and D&D&D waste streams will occur, where possible.

5.5.1 Nonconditional and Conditional Industrial Waste

This waste is solid, nonhazardous waste that is accepted for disposal at the INEEL Landfill Complex or the Landfarm. This waste type includes petroleum-contaminated material (e.g., from a hydraulic oil spill), concrete, masonry items, and food and office waste. Secondary, construction, and safe-shutdown waste streams most likely will generate this type of waste stream.

5.5.2 Hazardous Waste

Hazardous waste will be identified in accordance with the evaluation process described in Section 4.1.2. It is likely that hazardous waste will be dispositioned to the ICDF or to off-Site TSDFs in accordance with the INEEL management and operating contract.

5.5.3 Low-Level Waste

Low-level waste will be identified in accordance with the evaluation process described in Section 4.1.2. Low-level waste will go to either the RWMC LLW pit or to the ICDF. Low-level waste could include overburden soil, PPE, and decontamination waste.

5.5.4 Mixed Low-Level Waste

Mixed LLW will be identified in accordance with the evaluation process described in Section 4.1.2. Options for MLLW include being sent to the ICDF for disposal or to other off-INEEL disposal facilities depending on LDRs and radiological contamination levels. Waste acceptance criteria for each of these facilities must be met. As discussed in Section 4.1, MLLW may be generated without an immediate path to disposal.

5.5.5 Transuranic Waste

Transuranic waste will undergo the evaluation process described in Section 4.1.2 as well as being identified in accordance with the RRWAC. Transuranic-contaminated waste (higher than 100 nCi/g) will be packaged in accordance with the RRWAC or project-specific WAC with ultimate disposition anticipated to be at the WIPP as part of a subsequent project phase.

5.5.6 Mixed Transuranic Waste

Mixed TRU waste will undergo the evaluation process described in Section 4.1.2 as well as being identified in accordance with the RRWAC. Transuranic-contaminated waste (more than 100 nCi/g) will be packaged in accordance with the RRWAC or project-specific WAC with ultimate disposition anticipated to be at the WIPP.

5.5.7 Toxic Substances Control Act Waste

Toxic Substances Control Act waste will be identified in accordance with the evaluation process described in Sections 4.1.2 and 4.1.3. Options for TSCA waste depend on radiological contamination levels and TSDF WAC.

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Appendix A

Waste Stream Summary for the OU 7-10 Glovebox Excavator Method Project

Appendix A

Waste Stream Summary for the OU 7-10 Glovebox Excavator Method Project

This appendix provides the following waste stream summary information in Table A-1:

- Description of waste
- Estimated volume of waste
- Container types and quantities (e.g., reusable, drums, or bags)
- Types of waste expected based on existing knowledge and assumptions (e.g., mixed TRU, low-level, or TRU waste)
- Storage or staging location of waste
- Planned disposition of waste (e.g., launder or dispose of in a landfill).

Table A-1. Waste stream summary table for the OU 7-10 Glovebox Excavator Method Project.

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
1. Construction phase					
Construction debris—metals.	Not estimated (NE)[b]	Material or item can be recycled or reused (N/A).	Industrial waste (IW)	Temporarily staged near Operable Unit (OU) 7-10 (Pit 9).	Recycling or Idaho National Engineering and Environmental Laboratory (INEEL) Landfill Complex.
Construction debris—(other) wood, plastics, and paper.	NE[b]	N/A	IW	Construction debris dumpster.	Recycling or INEEL Landfill Complex.
Radiological control survey waste.	<7 ft^3	One 55-gal drum[g]	Low-level waste (LLW)— No contamination expected; however, radiological control survey waste is managed as LLW.	Stored in survey waste cargo container at the Transuranic Storage Area (TSA).	Radioactive Waste Management Complex (RWMC) LLW pit.
Remainder chemicals from construction.	NE[b]	N/A	IW—nonhazardous materials.	Interim Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) storage.	INEEL materials exchange or INEEL Landfill Complex.
			Hazardous waste (HW)—Resource Conservation and Recovery Act (RCRA) or Toxic Substances Control Act (TSCA) only hazardous if present in the original material.		INEEL materials exchange or HW disposal under INEEL contract.
2. Overburden removal phase					
Overburden soil.	70 to 75 yd^3	45 to 55 $4 \times 4 \times 4$-ft soil sacks[g]	LLW	Staged outside of Weather Enclosure Structure (WES) near OU 7-10 in area of concern (AOC).	INEEL CERCLA Disposal Facility (ICDF) or RWMC LLW pit. (If used as backfill material, may be returned to excavated pit once waste retrieval is complete.)
Radiological control survey waste.	<7 ft^3	One 55-gal drum[g]	LLW—No contamination expected; however, radiological control survey waste is managed as LLW.	Stored in survey waste cargo container at TSA.	RWMC LLW pit.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Personal protective equipment (PPE) from overburden removal.	<7 ft^3	One 55-gal drum[g]	LLW—Although the overburden soil was originally clean, there are isolated spots where low-level contamination may be present because of flooding and earthwork.	Stored in survey waste cargo container at TSA. (Some of the PPE will be laundered.)	RWMC LLW pit. Laundry (nonwaste).
3.(a) Waste zone material retrieval phase—Waste derived from inside the retrieval confinement structure or packaging glovebox system					
Waste zone material, including • Series 741 sludge • Series 742 sludge • Series 743 sludge • Series 744 sludge • Series 745 sludge • Combustible • Noncombustible • Graphite • Empty.	75 to 125 yd^3	500 to 700 55-gal drums[g] of waste zone material 40 to 60 85-gal overpacks[g] of drum remnants 10 to 15 special-case bags[g]	Mixed transuranic (TRU) (MTRU) waste (potentially TSCA because of polychlorinated biphenyls [PCBs]).	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at the Waste Isolation Pilot Plant (WIPP).
PPE from waste zone material retrieval (includes glovebox gloves and drum bagout PPE).	800 ft^3[c]	Container type has not been identified[c]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP. Radiological laundry for washing.
			Reuse	Some of the PPE, including respirators, may be sent to radiological laundry for cleaning and reuse.	

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
PPE from maintenance conducted within Retrieval Confinement Structure (RCS) or the Packaging Glovebox System (PGS).	0 to 14 ft^3	0 to 2 55-gal drums[g]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
			Reuse	Some of the PPE, including respirators, may be sent to radiological laundry for cleaning and reuse.	Radiological laundry for washing.
Discarded poly bags.	Minimal	N/A	MTRU	Will be placed in next packaged drum and transferred to CERCLA storage.	Ultimate disposal at WIPP.
Used parts and equipment to be discarded (i.e., handtools).	<7 ft^3	One 55-gal drum[g]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Decontamination waste supporting maintenance (liquid waste generation will be avoided).	180 ft^3	Container type has not been identified; however, would result in 25 55-gal drums.[d]	MTRU	Will be placed in waste stream.	Ultimate disposal at WIPP.
Radiological control survey waste.	<7 ft^3	One 55-gal drum[g]	MTRU	Will be placed in next packaged drum.	Ultimate disposal at WIPP.
Spill waste—OU 7-10-derived.	NE[b]	NE[b]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Spill waste—hydraulic fluids (includes hydraulic fluids that leak from the excavator outside of the RCS).	NE[b]	NE[b]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Batteries.	0 to 7 ft^3	0 to 1 55-gal drum[g]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Used high-efficiency particulate air (HEPA) or roughing filters.	<7 ft^3	One 55-gal drum[g]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
The field sampling and analysis plan (FSP) is currently under development. Sample waste estimates will be identified in the waste management section of the FSP.	NE	NE	MTRU potentially TSCA because of PCBs.	See the FSP.	Ultimate disposal at WIPP.
PPE waste from sampling activities has been accounted for in waste zone material retrieval and will be identified in the waste management section of the FSP.	NE	NE	MTRU potentially TSCA because of PCBs (most sampling will be conducted remotely). Reuse	See the FSP.	Ultimate disposal at WIPP. Radiological laundry for washing.
Underburden sample waste estimates will be identified in the waste management section of the FSP.	NE	NE	MTRU (potentially TSCA because of PCBs).	See the FSP.	Ultimate disposal at WIPP.
PPE waste from underburden sampling activities will be identified in the waste management section of the FSP.	NE	NE	MTRU Reuse	See the FSP. Some of the PPE, including respirators, may be sent to radiological laundry for cleaning and reuse.	Ultimate disposal at WIPP. Radiological laundry for washing.
Decontamination waste for sampling activities (brushes and wipes) will be identified in the FSP.	NE	NE	MTRU (Decontamination likely will be minimal. Most sampling tools and equipment will be disposed of.)	See the FSP.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
3.(b) Waste zone material retrieval phase—Waste derived from the weather enclosure structure outside of the retrieval confinements structure or packaging glovebox system					
PPE waste from maintenance and operations (i.e., cotton gloves).	7 to 14 ft^3	One to 2 55-gal drums[g]	IW	Clean waste receptacles.	INEEL Landfill Complex after survey release.
Used parts from maintenance.	<7 ft^3	One 55-gal drum[g]	IW	Clean waste receptacles.	INEEL Landfill Complex after survey release.
Administrative waste (paper, tape, pens).	7 to 14 ft^3	One to 2 55-gal drum[g]	IW	Clean waste receptacles.	INEEL Landfill Complex after survey release.
Spill waste—hazardous materials	NE[b]	NE[b]	HW	RWMC CERCLA storage.	INEEL contract for HW disposal.
Spill waste—nonhazardous materials (i.e., forklift hydraulic fluids).	NE[b]	NE[b]	IW	RWMC CERCLA storage.	INEEL Landfill Complex after survey release.
Radiological control survey waste.	<7 ft^3	One 55-gal drum[g]	No contamination expected; however, radiological control survey waste is managed as LLW.	Stored in survey waste cargo container at TSA.	RWMC LLW pit.
Light bulbs	NE[b]	NE[b]	IW or universal waste (UW).	Clean waste receptacles or RWMC accumulation area for UW bulbs.	INEEL Landfill Complex or INEEL contract for UW disposal.
Batteries	NE[b]	NE[b]	IW or UW	Clean waste receptacles or RWMC accumulation area for batteries if UW.	INEEL Landfill Complex or INEEL contract for UW disposal.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
4. Facility shutdown (includes decontamination, backfilling pit, immobilizing residual contamination, and securing and deenergizing equipment)					
PPE waste from pit backfill, initial decontamination of RCS, PGS, and equipment, and fixant application.	90 ft^3[e]	Container type has not been identified.[c]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
			Reuse	Some of the PPE, including respirators, may be sent to radiological laundry for cleaning and reuse.	Radiological laundry for washing.
Small tools and items bagged out of RCS and PGS.	7 ft^3	One 55-gal drum[g]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Compressed gas cylinders.	N/A	N/A	N/A	Staged in AOC.	Central Facilities Area (CFA) Property Control (Contract for compressed gas cylinders).
Radiological control survey waste.	<7 ft^3	One 55-gal drum[g]	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
5. Facility layup (includes radiological monitoring and equipment maintenance and inspection)					
Radiological control survey waste.	<7 ft^3	One 55-gal drum[g]	LLW—No contamination expected; however, radiological control survey waste is managed as LLW.	Stored in survey waste cargo container at TSA.	RWMC LLW pit.
PPE waste from maintenance activities.	<7 ft^3	One 55-gal drum[g]	IW or LLW	Stored in survey waste cargo container at TSA. (Some of the PPE will be laundered.)	INEEL Landfill Complex or RWMC LLW pit. Laundry (nonwaste).
Used parts from maintenance.	<7 ft^3	One 55-gal drum[g]	IW	Clean waste receptacles.	INEEL Landfill Complex after survey release.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
6.(a) Deactivation, decontamination, and decommissioning phase—inside and including the retrieval confinement structure					
RCS skin or shell, doors, and windows.	66 ft^{3}[f]	To be determined (TBD) in accordance with treatment, storage, and disposal facility (TSDF) waste acceptance criteria (WAC) and final waste characterization.	LLW—If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it also is not characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
			MTRU if no decontamination.		
RCS support structure.	407 ft^{3}[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW – The support structure is assumed to be external to the RCS. It is assumed to be LLW instead of IW, mainly because of association with RCS.	Transfer to ICDF or RWMC LLW pit (temporary staging in the AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF or RWMC LLW pit.
Probes—cut off portions.	29 ft^{3}[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW or mixed low-level waste (MLLW)—If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste).	Transfer to ICDF (temporary staging in AOC may be necessary.	Transfer to ICDF for disposal.
RCS gloves	<5 ft^{3}[f]	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Excavator bucket(s)	50 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It also is assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Excavator arm	160 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	MLLW	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			MTRU if decontamination efforts cannot reduce to contamination levels.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Excavator hydraulic hoses, connections, and valves. Note: This waste stream is from the excavator body. The hydraulics from the arm would likely not be removed for separate disposal.	<5 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	MTRU (This waste stream is generated only if the excavator body is not released for restricted reuse within the DOE complex.)	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Excavator hydraulic fluids and greases.	<5 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area. Fluids may need to be solidified before transfer.)	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Excavator tools	<5 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Waste transfer conveyance systems and trays.	25 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Cutting torch	<5 ft^{3}[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Flooring structure within RCS.	279 ft^{3}[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Shoring box	248 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Dust suppression piping and spray nozzles inside RCS.	25 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Fire protection system (internal to RCS).	25 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Heating and ventilation (H&V) ducting.	10 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	LLW—If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the RCS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Final HEPA filters and housing (including inlet HEPA filters).	90 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Decontamination waste (solids)	255 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MLLW	Temporarily staged in AOC.	If land disposal restriction (LDR) -compliant and <10 nCi/g TRU, then dispose of at ICDF.
Slings	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MLLW	Temporarily staged in AOC.	If LDR-compliant and <10 nCi/g TRU, then dispose of at ICDF.
Paint and water sprayers	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MLLW	Temporarily staged in AOC.	If LDR-compliant and <10 nCi/g TRU, then dispose of at ICDF.
Grout hose	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage.	Ultimate disposal at WIPP.
Decontamination waste (liquids)	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MLLW or MTRU	Interim storage at WMF-628 or CERCLA storage. Fluids may need to be solidified before transfer.)	If LDR-compliant and < 10 nCi/g TRU, then dispose of at ICDF or store and future WIPP disposal.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
6.(b) Deactivation, decontamination, and decommissioning phase—packaging glovebox system					
Glovebox skin or shell	214 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW—If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Because the PGS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Glovebox support structure	389 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW – the support structure is assumed to be external to the PGS. It is assumed to be LLW instead of IW, mainly because of association with PGS.	Transfer to ICDF or RWMC LLW pit (temporary staging in the AOC may be necessary).	Because the PGS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF or RWMC LLW pit.
Glovebox windows	<5 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary staging in AOC may be necessary).	Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Glovebox port gloves	7 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Glovebox conveyance system	154 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW if decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary CERCLA storage may be necessary).	Because the PGS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
			MTRU if no decontamination.		
Glovebox hoist	14 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Glovebox tools (electric)	<5 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Glovebox tools (nonelectric)	23 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Glovebox fire suppression and detection system	32 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	LLW or MLLW If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste).	Interim CERCLA storage.	If LDR-compliant and <10 nCi/g TRU, then dispose of at ICDF.
Glovebox heating and ventilating (H&V) ducting	32 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	LLW—If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste). It is also assumed that decontamination efforts will reduce contamination to <10 nCi/g.	Transfer to ICDF (temporary CERCLA storage may be necessary).	Because the PGS is a radiation contamination area, the scrap metals moratorium restricts recycling. Dispose of at ICDF.
			TRU if decontamination efforts cannot reduce contamination levels. MTRU if no decontamination.	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
HEPA filters and housing (including inlet HEPA filters)	6 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Glovebox fissile monitor system	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	N/A or IW Most of this system is contained within the WES and not exposed to RCS or PGS contamination.	Temporarily staged in AOC.	Survey and release for reuse.
Glovebox fissile monitor well	<5 ft^3	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
PGS working platforms	320 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release.
PGS drum-loading enclosures	343 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	LLW or MLLW If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste).	Temporarily staged in AOC.	If LDR-compliant and <10 nCi/g TRU, then dispose of at ICDF.
Decontamination waste (solids)	336 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MLLW or MTRU	Temporarily staged in AOC.	If LDR-compliant and <10 nCi/g TRU, then dispose of at ICDF.
Decontamination waste (liquids)	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MLLW or MTRU	Interim storage at WMF-628 or CERCLA storage area. Fluids may need to be solidified before transfer.	If LDR-compliant and <10 nCi/g TRU, then dispose of at ICDF.
6. (c) Deactivation, decontamination, and decommissioning phase—weather enclosure structure outside of the retrieval confinement structure and packaging glovebox system					
WES skin or shell	557 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	IW N/A	Temporarily staged in AOC.	INEEL Landfill Complex after survey release. Survey and release for reuse within the U.S. Department of Energy (DOE) complex.
WES support structure	644 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	IW N/A	Temporarily staged in AOC.	INEEL Landfill Complex after survey release. Survey and release for reuse within the DOE complex.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Flooring structure outside of the RCS	1,889 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release.
Overburden sacks	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	LLW	Temporarily staged in AOC.	Dispose of at ICDF or RWMC LLW pit.
Overburden boxes (used during overburden removal)	2 to 3 empty boxes	N/A	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release or reuse at the INEEL.
Geotextile fabric cover from pit surface	50 ft^3	TBD in accordance with TSDF WAC and final waste characterization.	LLW	Temporarily staged in AOC.	Transfer to ICDF for disposal.
Miscellaneous concrete support pads	6 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release or the RWMC LLW pit for beneficial use (stabilizing fill).
Standby power diesel generator	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Vestibule walls and roof	119 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	LLW	Temporarily staged in AOC.	Transfer to ICDF for disposal.
Electrical wiring, conduit, and outlets	50 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release.
Emergency eye-wash stations	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Gravel fill material (facility floor structure leveling course, access ramps, and roads)	5,697 ft^3	N/A	LLW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release or the RWMC LLW pit for beneficial use (stabilizing fill).
H&V air handling motor and controls	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
H&V ducting, fan, and stack downstream of HEPA system	348 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	LLW or MLLW If decontaminated in place in accordance with 40 CFR 268.45(c), then waste is not hazardous (as long as it is not also characteristic hazardous waste).	Temporarily staged in AOC.	If LDR-compliant and <10 nCi/g TRU, then disposed of at ICDF.
Weigh scales	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Dust-suppression system piping	NE	NE	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release.
Material handling equipment (e.g., forklifts, drum handlers, and pallet jack)	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Pallets	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Radiant heaters	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Fire protection systems outside of the confinement (including piping, nozzles, controls, and skids.)	142 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	IW N/A	Temporarily staged in AOC.	INEEL Landfill Complex after survey release. Some components such as the skids may be surveyed and released for reuse within the DOE complex.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Lighting systems (WES, RCS, and PGS)	200 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release.
			N/A		Survey and release for reuse within the DOE complex.
Compressed gas cylinders	N/A	N/A	N/A	Staged in AOC.	CFA Property Control (i.e., contract for compressed gas cylinders).
Breathing air compressor and plant air compressor (skid and cabinet).	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Radiation air monitors, continuous air monitors, and personnel contamination monitors.	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Criticality monitoring system.	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Video monitors, videocassette recorders, and RCS and PGS cameras.	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Dust-suppression system (skid, with pumps and tanks, and control cabinets).	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Electrical supply and distribution equipment (e.g., skid mounted load center, transformers, breakers, and panels).	90 ft^3[f]	TBD in accordance with TSDF WAC and final waste characterization.	IW (some components of electrical systems may have hazardous constituents)	Temporarily staged in AOC.	INEEL Landfill Complex after survey release.
			N/A		Survey and release for reuse within the DOE complex.
Storage cabinets	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Cargo containers	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Grout hose (WES section)	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	IW	Temporarily staged in AOC.	INEEL Landfill Complex after survey release.
Office trailers	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Battery charging stations	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
Deactivation, decontamination, and decommissioning (D&D&D) vacuum	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for reuse within the DOE complex.
D&D&D vacuum filters and contents.	<5 ft^{3f}	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Interim storage at WMF-628 or CERCLA storage area.	Ultimate disposal at WIPP.
Final D&D&D PPE.	828 ft^3	TBD in accordance with TSDF WAC and final waste characterization.	LLW	Temporarily staged in AOC.	ICDF for disposal.
	1993 ft^3		TRU		Ultimate disposal at WIPP. Radiological laundry for washing.
	1993 ft^3		Reuse		
Tents for D&D&D of heavy equipment.	389 ft^3	TBD in accordance with TSDF WAC and final waste characterization.	MTRU	Temporarily staged in AOC.	Ultimate disposal at WIPP.
Wood structures for D&D&D of heavy equipment.	311 ft^3	TBD in accordance with TSDF WAC and final waste characterization.	LLW	Temporarily staged in AOC.	ICDF for disposal.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Excavator body	N/A	N/A	N/A	Temporarily staged in AOC.	Survey and release for restricted use within the DOE complex.
			MLLW—If hydraulic system can be removed, then excavator body is likely not hazardous or radioactive but will possibly be considered MLLW.		Note: The possibility is high that the costs of decontamination to allow for unrestricted reuse of the excavator will exceed the value of the excavator. This depends on the level of contamination in the facility and the ability of the excavator seals to keep the contamination from entering the hydraulic system. If the excavator is not released for reuse, hazardous components such as the battery, fuel, oil, and hydraulic system will be removed and disposed of appropriately. The excavator body will be disposed of at the ICDF as MLLW. The hydraulic fluids, greases, and hydraulic system components will be MTRU and may ultimately require disposal at WIPP.
			MTRU—No HW or radioactive contamination anticipated external to the excavator; however, the hydraulic system is assumed contaminated with OU 7-10 derived materials.		Ultimate disposal at WIPP.

Table A-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition

a. Waste type expected based on existing knowledge and assumptions. Activities conducted within the RCS and PGS are considered to produce mixed TRU waste unless decontaminated. However, decontamination may only remove the hazardous component of the waste. If decontaminated in accordance with 40 CFR 268.45(c), "Conditioned Exclusion of Treated Debris," the waste could be classified as TRU or low-level waste depending on radiological constituents. Final characterization of waste type is based on complete hazardous waste determination and evaluation of data collected. OU 7-10-derived materials and some secondary waste also may require management as Toxic Substances Control Act-regulated waste (15 USC § 2601 et seq.).

b. NE = Not estimated because a reasonable basis for an estimate is lacking (e.g., unknown maintenance assumptions), or disposal at the Idaho National Engineering and Environmental Laboratory landfill as industrial waste.

c. Assume two people for each drum requiring bagout (two sets of personal protective equipment [PPE] per drum × 400 drums = 800 sets). Assume each set to be approximately 1 ft^3, which results in 800 ft^3 of PPE for disposal. There will also be approximately 800 ft^3 of launderable PPE resulting from bagout operations.

d. Assumed 3 ft^3 per PGS system decontamination per 1–1/2 days for 3 months. (7.35 ft^3 = 55-gal drum), which results in 180 ft^3 or approximately 25 55-gal drums.

e. Assume facility shutdown and layup activities to be 1 month (30 days) in duration. Assume three sets of PPE per day. Each set of PPE is assumed to be approximately 1 ft^3, which will result in 90 ft^3 (3 ft^3/day × 30 days = 90 ft^3).

f. Volume estimates for the deactivation, decontamination, and decommissioning (D&D&D) phase are based on values developed for PLN-343, "OU 7-10 Glovebox Excavator Method Project Facility Shutdown Plan and Deactivation, Decontamination, and Decommissioning Pre-Plan." These values are preliminary rough-order-of-magnitude estimates and have been provided for initial waste planning purposes only. More detailed estimates of waste quantities, volumes, and types will be developed for the final D&D&D plan to be written.

g. The container types and quantities inputted are for planning purposes only. These containers are not the final waste material containers selected by the Packaging and Transportation organization.

References

40 CFR 268.45(c), 2002, "Conditioned Exclusion of Treated debris," *Code of Federal Regulations*, Office of the Federal Register, July 2002.

15 USC § 2601 et seq., 1976, "The Toxic Substances Control Act (TSCA) of 1976," *United States Code.*

PLN-343, 2002, "OU 7-10 Glovebox Excavator Method Project Facility Shutdown Plan and Deactivation, Decontamination, and Decommissioning Pre-Plan," Rev. 0, July 2002.