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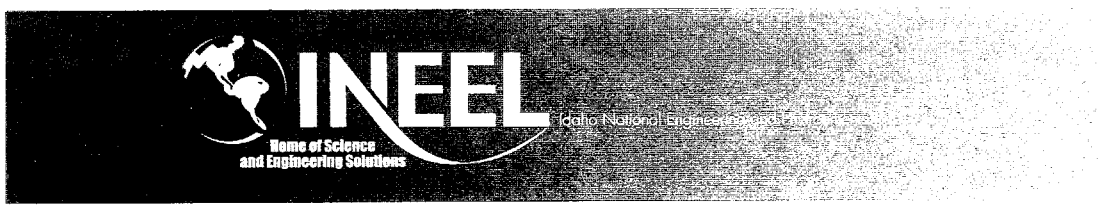
U.S. Department of Energy
Idaho Operations Office

Action Memorandum for Accelerated Retrieval of a Described Area within Pit 4



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August 2004

Prepared for the
U.S. Department of Energy
Idaho Operations Office

Signature sheet for the Action Memorandum for Accelerated Retrieval of a Described Area within Pit 4, at the Radioactive Waste Management Complex, Subsurface Disposal Area of the Idaho National Engineering and Environmental Laboratory. This action is conducted by the U.S. Department of Energy, with the concurrence of the U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality.

Lisa A. Brenn for

Richard B. Provencher
Deputy Manager
U.S. Department of Energy Idaho Operations Office

8/19/04
Date

Signature sheet for the Action Memorandum for Accelerated Retrieval of a Described Area within Pit 4 at the Radioactive Waste Management Complex, Subsurface Disposal Area of the Idaho National Engineering and Environmental Laboratory. This action is conducted by the U.S. Department of Energy, with the concurrence of the U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality.

Nicholas Ceto III

Nicholas Ceto
INEEL Program Manager
Region 10
U.S. Environmental Protection Agency

19 August 2004
Date

Signature sheet for the Action Memorandum for Accelerated Retrieval of a Described Area within Pit 4 at the Radioactive Waste Management Complex, Subsurface Disposal Area of the Idaho National Engineering and Environmental Laboratory. This action is conducted by the U.S. Department of Energy, with the concurrence of the U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality.

Daryl F. Koch
Acting Remediation Manager
Waste Management and Remediation Division
Idaho Department of Environmental Quality

August 17, 2005
Date

ABSTRACT

This action memorandum documents the decision process for a non-time-critical removal action to perform limited excavation and retrieval of selected waste streams from a designated portion of the Subsurface Disposal Area at the Radioactive Waste Management Complex. The selected retrieval area is approximately 1/2 acre in size and is located in the eastern portion of Pit 4. The waste in this area is primarily from the Rocky Flats Plant. The area was selected by the U.S. Department of Energy, State of Idaho Department of Environmental Quality, and U.S. Environmental Protection Agency based on inventory evaluations identifying significant quantities of transuranic and other contaminated waste disposed of in the area. The project is referred to as the Accelerated Retrieval Project.

The focused objective of the non-time-critical removal action is to perform a targeted retrieval of certain Rocky Flats Plant waste streams that are highly contaminated with transuranic radionuclides, volatile organic compounds, and various isotopes of uranium. Performance of the action will:

- Remove targeted waste streams and associated contaminants from a portion of the Subsurface Disposal Area
- Reduce the overall transuranic, volatile organic compound, and uranium inventory buried within the Subsurface Disposal Area
- Establish the administrative process for certifying and transferring the resulting retrieved transuranic waste streams to the Waste Isolation Pilot Plant in New Mexico
- Provide information to support remedial work at the Radioactive Waste Management Complex as defined by future Comprehensive Environmental Response, Compensation, and Liability Act removal action documentation, or the Operable Unit 7-13/14 Record of Decision.

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ACRONYMS

ABRA	ancillary basis for risk analysis
ALARA	as low as reasonably achievable
AMWTP	Advanced Mixed Waste Treatment Project
ARAR	applicable or relevant and appropriate requirement
ARP	Accelerated Retrieval Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
DEQ	(Idaho) Department of Environmental Quality
DOE	U.S. Department of Energy
DOT	Department of Transportations
EDF	engineering design file
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
FFA/CO	Federal Facility Agreement and Consent Order
HLW	high-level waste
ICDF	INEEL CERCLA Disposal Facility
INEEL	Idaho National Engineering and Environmental Laboratory
LDR	land disposal restriction
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NRC	Nuclear Regulatory Commission
NTCRA	non-time-critical removal action
OU	Operable Unit
PCB	polychlorinated biphenyl
PPE	personal protective equipment

RCRA	Resource Conservation and Recovery Act
RCRA/HWMA	Resource Conservation and Recovery Act/Hazardous Waste Management Act
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
TBC	to be considered
TBD	to be determined
TSA	Transuranic Storage Area
TSCA	Toxic Substances Control Act
TRU	transuranic
VOC	volatile organic compound
WAG	Waste Area Group
WIPP	Waste Isolation Pilot Plant

Action Memorandum for Accelerated Retrieval of a Described Area within Pit 4

1. STATEMENT OF BASIS AND PURPOSE

This action memorandum documents selection of the non-time-critical removal action (NTCRA) recommended in the *Engineering Evaluation/Cost Analysis for the Accelerated Retrieval of a Designated Portion of Pit 4* (EE/CA) (DOE-ID 2004a). The basis for selection of the focused retrieval alternative described in the EE/CA is provided within this memorandum. The focused retrieval alternative involves retrieval of selected Rocky Flats Plant waste streams from a portion of Pit 4 within the Radioactive Waste Management Complex (RWMC) Subsurface Disposal Area (SDA) (see Figure 1). The area of focus is approximately 1/2 acre in size and is located in the eastern portion of Pit 4 (see Figure 2). Selecting the specific retrieval area required evaluating shipping and burial records for containerized radioactive materials and sludge from the Rocky Flats Plant and radioactive waste generated at the Idaho National Engineering and Environmental Laboratory (INEEL). This evaluation considered specific high-density waste target areas (i.e., areas with high concentrations of contaminants of concern) within the SDA. The U.S. Department of Energy (DOE) Idaho Operations Office, with agreement from the U.S. Environmental Protection Agency (EPA) and Idaho Department of Environmental Quality (DEQ), has selected the described portion of Pit 4 (see Figure 2) as the retrieval area. The project is referred to as the Accelerated Retrieval Project (ARP).

The scope of the NTCRA in this action memorandum is limited to addressing the designated portion of Pit 4. Implementation of the action, which addresses a portion of the SDA, is one element in the overall strategy for managing risk associated with the RWMC. Operable Unit (OU) 7-13/14 is the comprehensive remedial investigation/feasibility study for the entire facility. Additional remedial work at the RWMC will be conducted as defined by future Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal action documentation or the OU 7-13/14 Record of Decision (ROD).

This action memorandum has been developed in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for the Site.

2. BACKGROUND AND FACILITY DESCRIPTION

The following sections provide historical background of the SDA and the inventory of waste recorded as being disposed of in Pit 4. The EE/CA (DOE-ID 2004a) contains further background of the operational history of the RWMC and the INEEL.

2.1 Background of the Subsurface Disposal Area and Operations

Currently, the RWMC covers 71.6 ha (177 acres) in the southwestern quadrant of the INEEL. This includes the administration area of approximately 8.9 ha (22 acres), the SDA, and the TSA (established in 1970 at 23.3 ha [58 acres]). Figure 2 provides a map of the RWMC showing the location of pits, trenches, and soil vaults in the SDA. Pit 4, which includes the designated retrieval area, is located in the approximate center of the SDA. In 1952, the SDA was established at 5.26 ha (13 acres) for disposal of solid radioactive waste. Burial of defense waste with transuranic (TRU) elements from the Rocky Flats Plant began in 1954; by 1957, the original SDA was nearly full. In 1958, the SDA was expanded to 35.6 ha (88 acres), which remained the same until 1988 when the security fence was relocated outside the

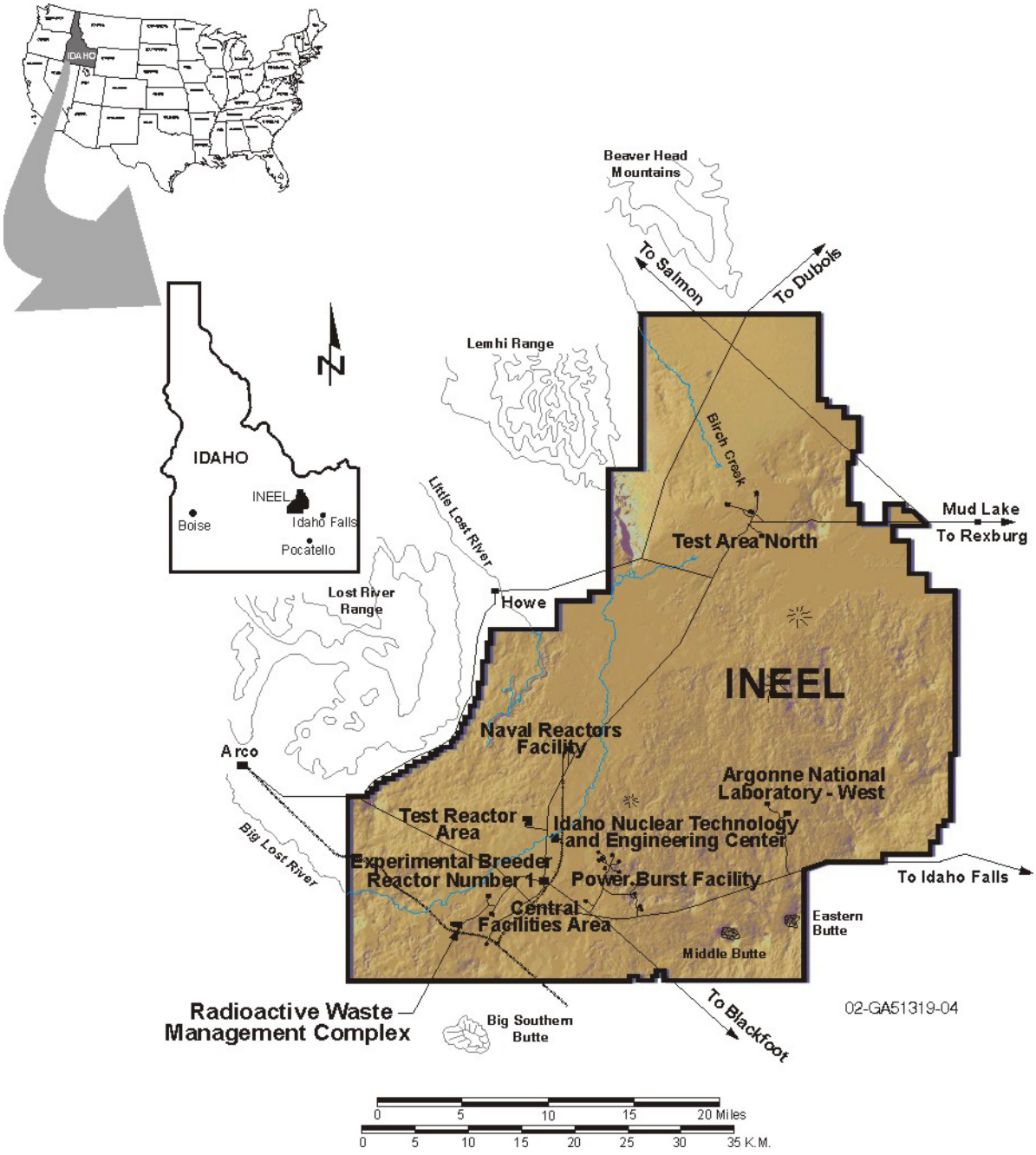

Figure 1. Map of the Idaho National Engineering and Environmental Laboratory showing locations of the Radioactive Waste Management Complex and other major facilities.

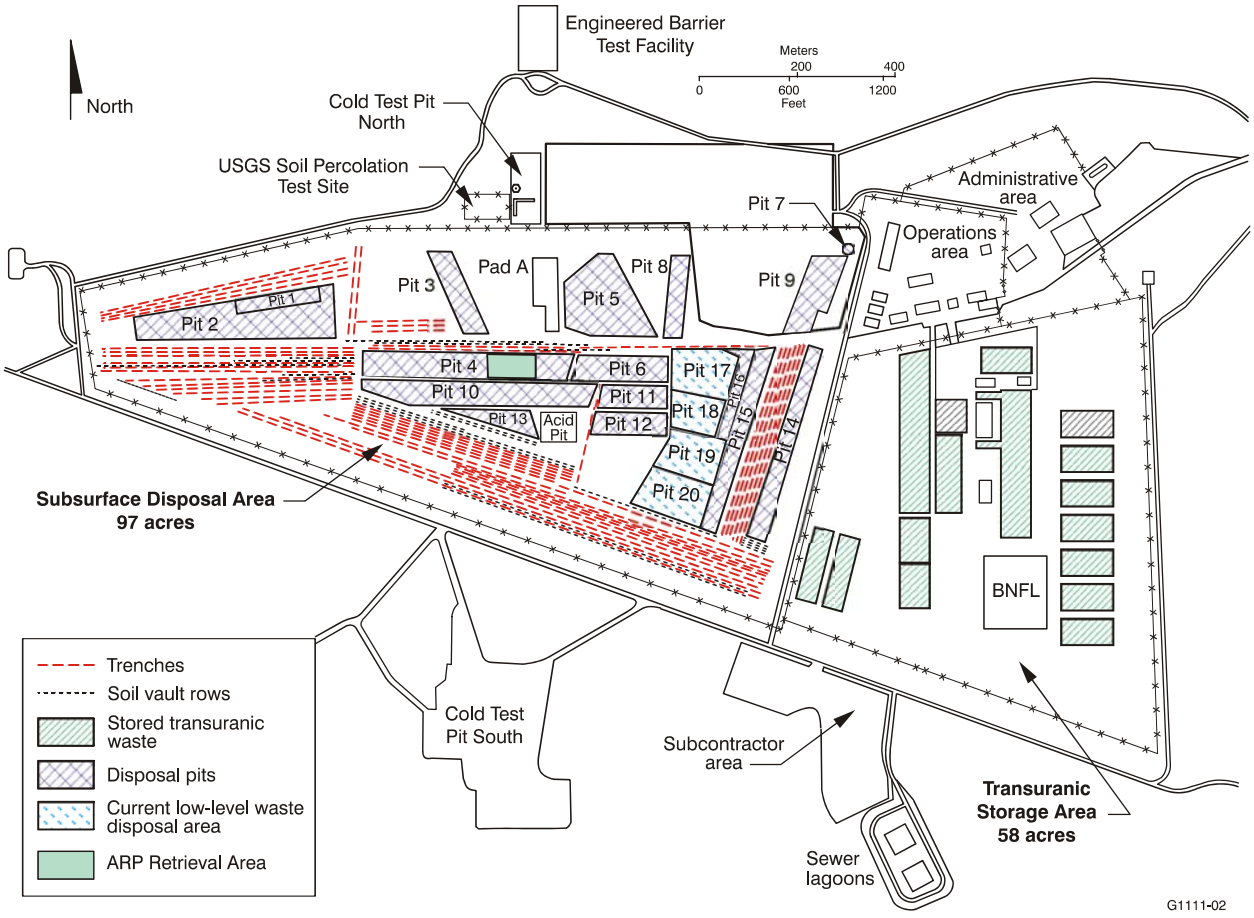

Figure 2. Accelerated Retrieval Project area within the Subsurface Disposal Area.

dike surrounding the SDA and the current size of 39.3 ha (97 acres) was established. Approximately 62 of the total 97 acres are open areas that do not contain waste (e.g., area between pits and trenches and dikes surrounding the entire landfill).

From 1952 to 1970, radioactive waste was buried in pits, trenches, and soil vault rows excavated into a veneer of surficial sediment. This sediment is underlain by a thick series of basaltic lava intercalated with sedimentary deposits. In 1970, the shallow burial of TRU waste ended, burial of other radioactive waste has continued. Since 1970, TRU waste has been stored on aboveground asphalt pads in retrievable containers. Since 1985, waste disposal in the SDA has been limited to low-level radioactive waste from INEEL operations. Between 1952 and 1997, approximately 215,000 m^3 (281,209.4 yd^3) of radioactive waste containing about 12.6 million Ci of radioactivity was buried at the SDA (French and Taylor 1998). A 1998 inventory of amounts of 38 radioactive buried contaminants (Becker et al. 1998) was updated in 2002 for 25 radionuclides in the *Ancillary Basis for Risk Analysis of the Subsurface Disposal Area* (Holdren et al. 2002).

Between 1960 and 1963, the RWMC accepted radioactive waste from private sources such as universities, hospitals, and research institutes. This service stopped in September 1963 when commercial burial sites became available for contaminated waste from private industry. When the TSA became operational, asphalt pads were constructed on which TRU waste was stacked and then covered with plywood, plastic sheeting, and 1 m (3 ft) of soil. From 1975 to 1996, air-support buildings were used to

protect recently received waste containers during stacking operations. These support structures were emptied in 1996 and decommissioned in 1998.

In the fall of 1988, the INEEL stopped receiving shipments of TRU waste to the RWMC from out-of-state sources.

Contaminants in the SDA radioactive waste landfill include elements resulting from weapons component manufacturing at the Rocky Flats Plant, fission and activation products resulting from reactor operations on and off INEEL, and hazardous chemicals associated with all waste sources.

2.2 Source, Nature, and Extent of Contamination

The following sections describe the general disposal practices in the SDA and the waste in Pit 4. See Figure 2 for the layout of the pits and trenches in the SDA.

The SDA is a radioactive waste landfill with shallow subsurface disposal units consisting of pits, trenches, and soil vaults. The buried Rocky Flats Plant TRU waste is located primarily in disposal Pits 1–6, Pits 9–12, and Trenches 1–10. Trenches 11–15 also may contain Rocky Flats Plant waste. Contaminants in the SDA including chemicals, contact and remote-handled fission and activation products, and TRU radionuclides are discussed in greater detail in the next section. Waste disposal practices and inventory estimates are presented in subsections that follow.

2.2.1 Waste Disposal Practices

Pit 4 was open to receive waste from January 1963 through September 1967. Based on disposal practices at the time, containerized waste, primarily from the Rocky Flats Plant in Colorado, was initially stacked in the pit. In November 1963, this practice was changed, and containers were dumped into pits rather than stacked to reduce labor costs and personnel exposures. Based on this operational change and the timeframe of disposal, it is expected that the Rocky Flats Plant waste within the designated retrieval area was dumped rather than stacked. Additional waste from INEEL waste generators and some waste from off-Site generators also was disposed of in the pit.

The disposal process in the 1960s involved excavating an area in the SDA with tractor-drawn scrapers down to underlying basalt outcroppings then backfilling and leveling the newly constructed pit floor with a layer of native soil approximately 0.6 m (2 ft) thick. Waste in drums; cardboard, wood, and metal boxes; and other containers was disposed of. Soil was sometimes added as an interim step as waste was being emplaced and while the pits remained open. After a large area was full, pits were backfilled and initially covered with about 1 m (3 ft) of soil, commonly referred to as overburden soil. Additional overburden was added over time to repair subsidence and promote surface drainage. The estimated overburden thickness currently over Pit 4 ranges from 1.2 to 2.1 m (4 to 7 ft). After approximately 40 years of burial, original disposal containers, including the carbon steel drums, are expected to be significantly corroded and degraded similar to drums removed from Pit 9 in early 2004 by the Glovebox Excavator Method Project.[a]

Pits were excavated to various sizes. Pit 4, shown on Figure 2, is located in the approximate center of the SDA and shares a common eastern boundary with Pit 6. Pit 4 has a surface area of 9,948.2 m^2 (107,082 ft^2). The total volume of Pit 4 is estimated at 45,307 m^3 (1,600,000 ft^3) (Holdren et al. 2002). The retrieval area of focus comprises approximately 21% of the overall area of Pit 4 with approximate dimensions of 38.4 × 80.2 m (126 × 263 ft). As discussed in Section 1, the designated portion of Pit 4 was

a. See Remedial Action Report for the OU 7-10 Glovebox Excavator Method Project (Draft), DOE/NE-ID-11155, July 2004.

selected because it contains high concentrations of TRU waste and also contains significant volumes of other targeted waste forms, including volatile organic compounds (VOCs) and uranium. The approximate 1/2-acre size was selected based on the estimated distribution of waste in the pit and other engineering factors (e.g., economies of scale associated with retrieval).

2.2.2 Estimated Waste Inventory in the Designated Retrieval Area

The OU 7-13/14 program has developed extensive information defining the waste inventories disposed of in pits, trenches, and soil vault rows in the SDA. Disposal records and corresponding shipment information from the Rocky Flats Plant are the ultimate sources of available information for disposal locations and waste type designations. The OU 7-13/14 program has developed buried waste information system applications to document waste inventory type, quantity, and location. Based on this information, an engineering design file (EDF) was developed, "Waste Inventory of Area G in Pit 4 for the Accelerated Retrieval Project within the Radioactive Waste Management Complex" (EDF-4478). The EDF summarizes information on volumes and types of waste that were disposed of in the designated portion of Pit 4. Table 1 provides a summary of information contained in the EDF.

Table 1. Rocky Flats Plant waste content in the designated retrieval area of Pit 4 within the Subsurface Disposal Area.

Waste Stream	Summary Characteristics	Packaging	Estimated Number of Containers
Series 741 first-stage sludge	Salt precipitate containing plutonium and americium oxides, depleted uranium, metal oxides, and organic constituents.	Drum lined with two plastic bags, added 18.1 to 22.7 kg (40 to 50 lb) of Portland cement to top and bottom of drum to absorb any free liquids.	886 drums
Series 742 second-stage sludge	Salt precipitate containing plutonium and americium oxides, metal oxides, and organic constituents.	Drum lined with two plastic bags, added 18.1 to 22.7 kg (40 to 50 lb) of Portland cement added in layers to absorb any free liquids.	770 drums
Series 743 sludge organic setups	Organic liquid waste solidified using calcium silicate (pastelike or greaselike).	Drum lined with two plastic bags, added 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.	634 drums
Series 744 sludge special setups	Complexing chemicals (liquids) including Versenes, organic acids, and alcohols solidified with cement.	Drum lined with two plastic bags, added 86.2 kg (190 lb) of Portland cement and 22.7 kg (50 lb) of magnesia cement followed by 99.9 L (26.4 gal) of liquid waste. Additional cement top and bottom.	81 drums
Combustible, noncombustible, and mixed debris	Solid, radioactively-contaminated combustible debris such as paper, rags, cardboard, and wood. Noncombustible debris including pipe, empty drums, glass, and sand. Some waste is contaminated with beryllium metal.	Varied by process line generating the waste. Waste may have been wrapped in plastic or placed directly into the waste container.	5,024 drums and boxes
Roaster oxide waste	Incinerated, depleted uranium. Primary chemical form is uranium oxide with some metal possible.	Packaged in metal drums with inner plastic bag.	109 drums

Table 1. (continued).

Waste Stream	Summary Characteristics	Packaging	Estimated Number of Containers
Graphite	Graphite molds broken into large pieces after excess plutonium removal. Graphite fines (e.g., scarfings).	Drums lined with polyethylene bags and, most likely, a cardboard liner. Bottles of graphite fines were individually wrapped in plastic bags.	490 drums
Filters	Discarded high-efficiency particulate air filters contaminated with RFP radionuclides such as plutonium and americium.	Cardboard cartons and boxes.	681 boxes and cartons

The Rocky Flats Plant waste forms contain various radiological and nonradiological contaminants. Material shipped to Pit 4 from the Rocky Flats Plant included plutonium and uranium isotopes. Plutonium isotopes included Pu-238, Pu-239, Pu-240, Pu-241, and Pu-242. Uranium isotopes (i.e., U-234, U-235, U-236, and U-238) were shipped to the RWMC in the form of depleted uranium oxides. Also included in waste shipments were Am-241 and trace quantities of Np-237. The isotopes Am-241 and Np-237 are daughter products resulting from radioactive decay of Pu-241. In addition to Am-241 produced by the decay of the Pu-241, Am-241 removed from plutonium during processing at the Rocky Flats Plant was disposed of in Pit 4. This extra Am-241 is a significant contributor to the total radioactivity located in Pit 4. A number of radionuclides (e.g., Co-60, Cs-137, Sr-90, Y-90, and Ba-137) primarily from INEEL waste generators also are expected in the project area. The non-Rocky Flats Plant waste streams include radioactively contaminated sewage sludge and a number of combustible and noncombustible debris waste forms.

Organic chemicals in Pit 4 include carbon tetrachloride, trichloroethylene, 1,1,1-trichloroethane, tetrachloroethylene, lubricating oils, Freon-113, alcohols, organic acids, and Versenes (ethylenediaminetetraacetic acid). Inorganic chemicals in the waste include hydrated iron, zirconium, beryllium, lead, sodium nitrate, potassium nitrate, cadmium, dichromates, potassium phosphate, potassium sulfate, silver, asbestos, and calcium silicate. Table 1 describes and summarizes major waste streams located in the designated retrieval area from the Rocky Flats Plant. As the table shows, major waste streams consist of containerized (e.g., drums) sludge, combustible and noncombustible debris, graphite materials, and discarded filter media.

Discussion of potential PCB contamination, based on Glovebox Excavator Method Project analytical data, is included in Appendix A.

Waste management activities will be based on information from various inventory documents identified in preceding paragraphs and additional acceptable knowledge documentation being prepared to support the NTCRA. In addition, analytical data collected during project activities will be used to determine appropriate management of waste streams.

Buried waste in Pit 4 contains TRU and other radioactive waste. The TRU radionuclides in Pit 4 are primarily contained in the drummed sludge and other Rocky Flats Plant waste (e.g., graphite). Waste definitions are provided below for purposes of clarification:

- **Transuranic radionuclides**—radionuclides with an atomic number greater than 92 (DOE O 435.1).

- **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. Primary radionuclides

associated with SDA Rocky Flats Plant TRU waste are Pu-238, Pu-239, Pu-240, and Pu-242 and Am-241.

- **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 "Atomic Energy Act of 1954" [42 USC § 2011-2259, 1954]), or naturally occurring radioactive material (DOE O 435.1).

2.3 Previous and Current Actions

A number of previous actions have been completed within the SDA that are relevant to the risk, operational, and design basis of the Accelerated Retrieval Project NTCRA.

- Five early waste retrieval activities were performed in the SDA in the 1970s and 1980s
- Fencing was installed and is maintained around the perimeter of the SDA to control unapproved access
- Type A and Type B probes were installed to support verification of disposal records and investigate various parameters (e.g., leachate chemistry and infiltration)
- The Glovebox Excavator Method Project was completed
- Cumulative human health and ecological risks of the SDA were analyzed and estimated (Holdren et al. 2002)
- Alternatives for remediating the SDA were evaluated (Zitnik et al. 2002).

Current actions include:

- Continued maintenance of controls at the RWMC preventing unapproved access to the SDA
- Waste zone, vadose zone, and aquifer monitoring
- Ongoing preparation of the OU 7-13/14 comprehensive remedial investigation/baseline risk assessment/feasibility study
- In situ grouting NTCRA of beryllium blocks within the SDA.

3. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

The NCP (Section 300.415(b)) identifies factors that must be considered in determining whether performance of a removal action is appropriate. The primary factor applicable to Pit 4 is:

- Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release; (40 CFR 300.415 [b][2][iii]).

As discussed in Section 2.0, the designated retrieval area contains numerous waste streams that contain a significant volume of hazardous substances including both radiological and chemical substances. Current OU 7-13/14 risk documentation (i.e., *Ancillary Basis for Risk Analysis of the*

Subsurface Disposal Area [Holdren et al. 2002]) identifies CERCLA hazardous substances within Pit 4 that are contaminants of concern. Contaminants of concern include VOCs, uranium, and various TRU isotopes that are contained within waste streams targeted for removal as part of the selected NTCRA.

Information collected during the Glovebox Excavator Method Project verified expectations that original disposal containers are significantly deteriorated and have generally lost their integrity. However, despite the poor condition of the drums a significant portion of the original VOC inventory is still retained within plastic bags that lined the drums. Site monitoring data indicate that an extensive plume of volatile organic contamination is present within the subsurface beneath the SDA. In addition, groundwater monitoring in the vicinity of the SDA has shown a consistent trend of carbon tetrachloride concentrations in excess of the Safe Drinking Water Act Maximum Contaminant Levels (Holdren et al. 2002). This plume is the focus of the treatment operations being performed by the OU 7-08 Organic Contamination in the Vadose Zone remedial action. Removal of targeted waste streams with high concentrations of VOCs (e.g., Series 743 sludge) will help to mitigate this ongoing release of VOCs to the subsurface.

The release and migration potential of the Rocky Flats Plant radiological COCs are reduced in comparison to VOCs. In general, radionuclide release and migration rates are much slower with peak estimated aquifer concentrations generally resulting after hundreds or even thousands of years. In spite of this slower release rate and migration potential, however, modeling indicates that relatively long term migration into the subsurface will occur. Removal of targeted waste streams containing COCs will reduce the source term radiological inventory thereby lessening potential future subsurface and aquifer contamination that could require much more complicated and costly remedial action.

4. ENDANGERMENT DETERMINATION

Materials located within Pit 4 contain hazardous substances that have been released to the surrounding environment, and hazardous substances that pose a threat of continuing future release without remedial action (Holdren et al., 2002). Based upon this ongoing release of hazardous substances and the associated threat to the environment, removal action is consistent with CERCLA Section 104(a)(1) criteria for authorization of a CERCLA response action. The NTCRA is consistent with relevant NCP criteria for determining appropriateness of a removal action because the area contains "Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release" (40 CFR 300.415[b][2][iii]).

5. PROPOSED ACTIONS AND ESTIMATED COST

5.1 Proposed Actions and Objectives

The focused objective of the NTCRA is targeted retrieval of certain Rocky Flats Plant waste streams that are highly contaminated with TRU radionuclides, VOCs, and isotopes of uranium. To achieve this objective, the NTCRA targets removal of only the following Rocky Flats Plant waste streams: Series 741 and 743 sludge; graphite; filters; and roaster oxide waste.

It is possible that during the process of excavation other waste will be revealed that is not within these targeted waste streams. This nontargeted waste will also be removed from the excavation during this removal action if the DOE remedial project manager and the EPA and DEQ Waste Area Group (WAG) 7 remedial project managers agree that retrieval is warranted because the information concerning the nontargeted waste that is available from visual inspection (such as package labeling or distinctive packaging) identifies the nontargeted waste as being of a nature that (1) it poses a potential risk of contamination to the underlying aquifer if left in place; (2) the potential risk is sufficient to warrant

removal at that time rather than leaving it to be addressed by the OU 7-13/14 final remedial action for WAG 7; and (3) the waste can safely be managed by retrieval using the personnel, facilities, and equipment readily available onsite for retrieval of the targeted waste streams.

Performance of the alternative will remove targeted Rocky Flats Plant waste streams from the retrieval area and significantly reduce curies of TRU radionuclides and uranium isotopes within the retrieval area. In addition, removal of the Series 743 sludge will deplete the source of VOCs that remain in waste containers in the retrieval area. The following section describes the selected alternative in greater detail.

The DOE has determined that the removal action described in this EE/CA shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned. The removal action, in addition to addressing a significant portion of the contaminants of concern in the retrieval area, will provide characterization and technical and cost information from full-scale waste retrieval activities that will support the RI/FS for OU 7-13/14. The preliminary feasibility study work underway for OU 7-13/14 will address three types of remedial alternatives: retrieval, in situ grouting, and capping. This removal action is consistent with this range of alternatives and will not prevent future implementation of any of the alternatives evaluated.

5.1.1 Site Location

The project retrieval site is located at the approximate center of the SDA within Pit 4 (refer to Figure 2). The storage site will be located in the SDA, north of the retrieval area between Pad A and Pit 3 (see Figure 3).

A new road will provide access between the retrieval operations and storage site. A paved area (i.e., 0.2-ft-thick asphalt) will be included as a retrieval area approach and to provide parking for support trailers. The designated retrieval area comprises an approximately 38.4 × 80.2 m (126 × 263 ft) area within Pit 4. Pit 4 is bound on all sides by waste pits (Pit 6 to the east and Pit 10 to the south) or trenches to the north. Probing data indicate depth to basalt in the area ranges from 4.9 to 8.5 m (16 to 28 ft). A treatment unit with three vapor-vacuum extraction wells belonging to the Organic Contamination in the Vadose Zone Project is located to the east.

5.1.2 Retrieval and Storage Facilities

To provide protection from weather and control the spread of contamination, a Retrieval Enclosure and airlock (see Figure 4) will cover the retrieval area during all retrieval operations.

The Retrieval Enclosure is a temporary, relocatable structure that will house excavation, packaging, sampling, package decontamination, and personnel and equipment ingress and egress. The Retrieval Enclosure provides weather protection and supports year-round operations. The Retrieval Enclosure is a commercially available, fabric-tensioned structure, approximately 51.8 m (170 ft) wide × 87.8 m (288 ft) long with a 6.1-m minimum (20-ft minimum) interior clearance at the eaves. The perimeter foundation frame will sit on the ground surface. Two attached structures, 21.3 × 15.2 m (70 × 50 ft) in size, house airlock operations such as waste examination and drum packaging.

Ventilation is provided by a high-efficiency-particulate-air-filtered exhaust system. The exhaust stack will minimize local worker exposure and permit proper radiological emissions monitoring. The ventilation system is equipped with a monitoring system to sample and record possible releases of radioactive substances.

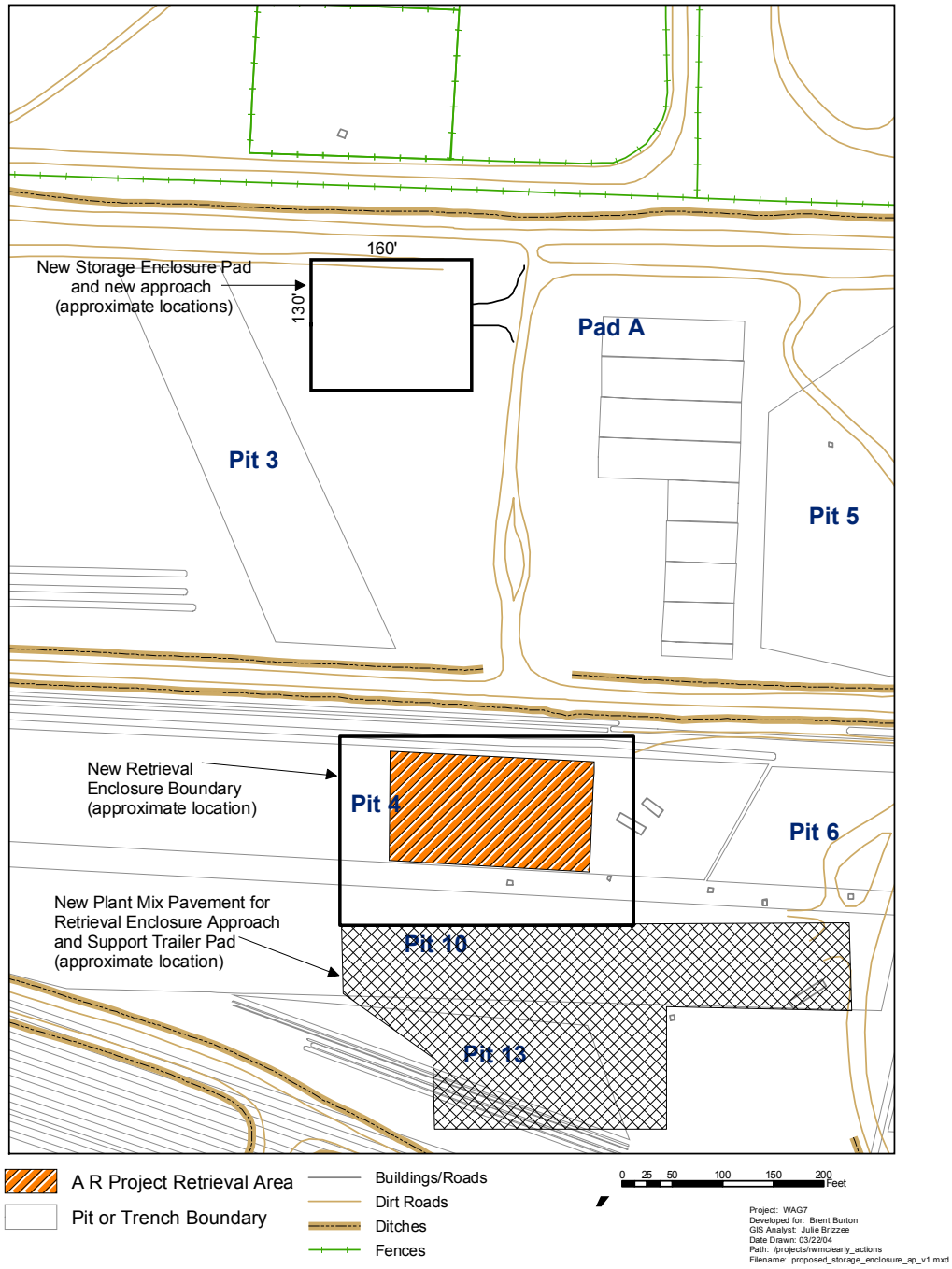

Figure 3. The Retrieval Enclosure and Storage Enclosure for the Accelerated Retrieval Project.

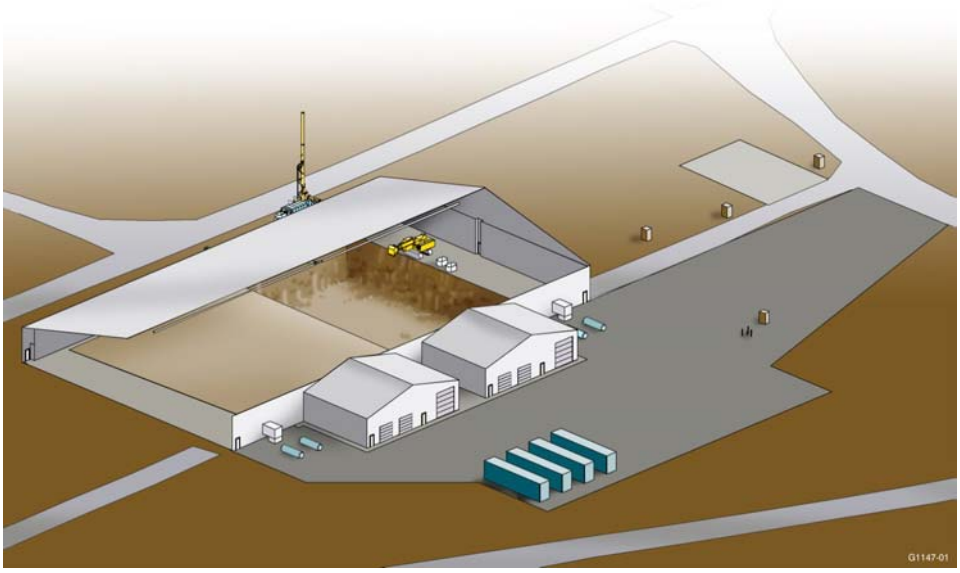

Figure 4. The Retrieval Enclosure and airlock covering the retrieval area.

The temporary Storage Enclosure provides indoor storage and staging of packaged waste for transfer to Waste Isolation Pilot Plant (WIPP) in New Mexico (see Figure 5). The Storage Enclosure is a commercially available, fabric-tensioned structure, approximately 39.6 m (130 ft) wide × 48.8 m (160 ft) long with 6.1-m minimum (20-ft minimum) interior clearance at the eaves. The interior floor is reinforced concrete. The Storage Enclosure is not heated but may be ventilated to minimize accumulation of VOCs if required. As Figure 5 illustrates, a modified dense pack drum storage configuration similar to that employed at RWMC in the Resource Conservation and Recovery Act (RCRA) -permitted, Type II storage buildings will be implemented. Modified dense pack storage involves a drum-stacking arrangement that is four drums wide by five drums high. Depth of the drum stack is limited by the size of the building and the necessary aisle space to accommodate access to the drums and access of emergency response equipment. The aisle space in the center of the building will be a minimum of 20 ft, with a minimum aisle space of 3 ft between the rows and the perimeter of the building.

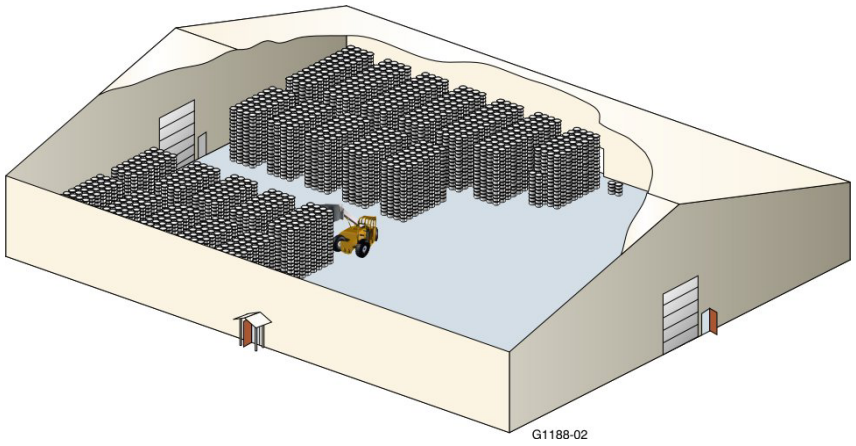

Figure 5. The Storage Enclosure showing an example of modified dense pack storage.

5.1.3 Retrieval and Handling Operations

Initially, 0.6–1.5 m (2–3 ft) of overburden soil was removed as part of construction before starting the NTCRA operational activities. This soil is stockpiled within the SDA and will ultimately be reused as Pit 4 overburden or as grading material elsewhere in the SDA. The remaining 0.6 m (2 ft) of overburden will be removed as the first phase of operations and will be piled or returned directly to the pit. This layer of soil is expected to be non-TRU and, before removal, will provide a stable working surface for retrieval operations.

Waste-zone material will be retrieved using excavators. Operators in personal protective equipment (PPE) will operate Gradall XL-5200 excavators to retrieve and place material from Pit 4 into trays for subsequent examination in airlock enclosures. Excavator and forklift cabs will be equipped with a high-efficiency-particulate-air-filtered, forced-air ventilation system and a breathing air system to provide additional protection for the operator. Personnel access to the Retrieval Enclosure will be limited during excavation activities, but there may be other individuals in PPE allowed inside, such as radiological control technicians. The excavator will operate primarily above grade. The pit is approximately 5.2–6.1 m (17–20 ft) deep, and walls will be sloped to maintain an angle of repose of approximately one to one.

At the digface, excavators will retrieve targeted waste (i.e., graphites, filters, Series 741 and 743 sludge, and uranium roaster oxides) and place the waste in a tray that has been lined with a plastic/fabric liner. The targeted and nontargeted determination will be made by an operator assisting the excavator operator by way of closed-circuit television cameras at the digface and on the excavator. Nontargeted waste (e.g., debris and soil) will be placed on the opposite face of the open pit or otherwise consolidated within the retrieval enclosure. Trays of targeted waste will be transported to a drum packaging station by forklift. At the drum packaging station, operators will visually examine the waste, perform functions supporting transfer of the waste to WIPP (e.g., removal of prohibited items and sampling). If results from the visual inspection within the drum packaging station indicate that the material is actually nontargeted waste, the waste does not require removal from the Retrieval Enclosure. Field screening with radiological instrumentation will be employed to identify wastes associated with high-energy gamma and neutron radiation to ensure that the associated wastes are managed appropriately and that potential radiation exposure of operations personnel is appropriately controlled. Figure 6 illustrates the major process steps, associated decision points, and potential waste disposal options associated with the project.

Once targeted waste has been visually examined and characterized, the tray liner is hoisted and loaded into a drum. The drum is then removed from the drum port, closed, and transferred from the area.

Newly packaged waste materials will be evaluated for potential transfer to WIPP. Payload containers (e.g., individual drums, standard waste boxes, and 10-drum overpacks) will be assembled for transfer to WIPP in TRUPACT-II containers. Payload containers that are certified to meet waste acceptance criteria will be transported to WIPP for final disposition.

Retrieved waste materials that do not satisfy WIPP waste acceptance criteria (e.g., non-TRU waste streams) will be characterized and evaluated for alternate treatment and disposal at available onsite or off-Site disposal facilities. Depending upon waste stream characteristics, treatment of these materials may be necessary to satisfy applicable or relevant and appropriate requirements (ARARs) and other health-based or facility-specific waste acceptance criteria. Other waste streams, which are not TRU waste, such as uranium roaster oxides, may require further analysis and treatment before disposal. In particular, it is expected that some portion of the materials will require treatment to reduce the VOC concentrations of the materials before returning materials to the pit or other alternate disposal. These materials will be located in the CERCLA storage facility within the SDA pending final evaluation for treatment and disposal. In summary, DOE will give preference to disposal options that do not involve return to pit, such as offsite treatment and disposal, and will only consider returning wastes to the pit that do not present unacceptable risk to the aquifer subject to agreement with the DEQ and EPA.

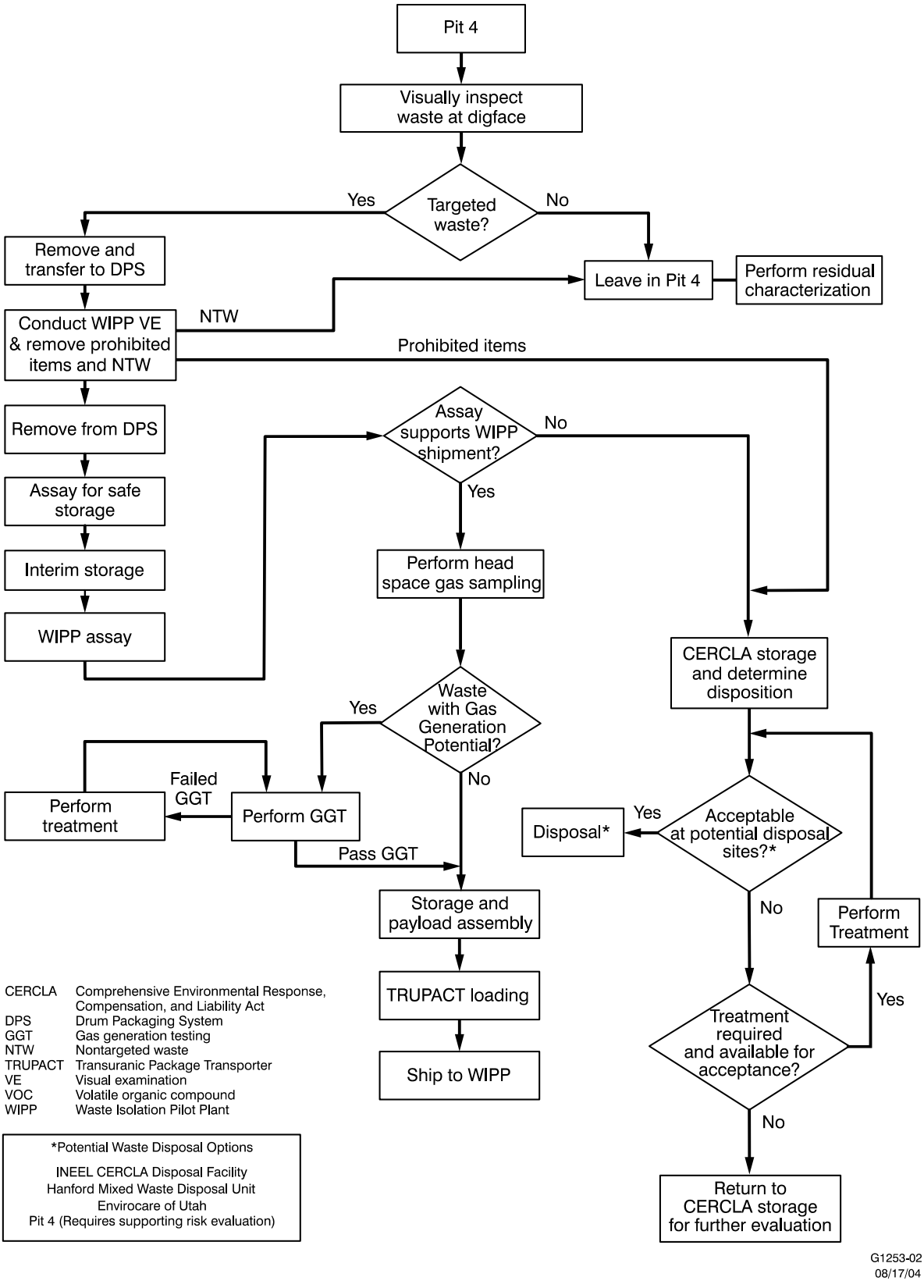

Figure 6. Conceptual process flowchart.

Further discussion of the anticipated treatment process is included in the next section.

Further characterization and certification will be required before stored drums can be transferred for disposal at WIPP. WIPP-related support functions are part of the NTCRA and will be performed in a mobile WIPP Central Characterization Project Facility. The facility will be located at the RWMC and will consist of mobile facilities and trailer units that support required WIPP certification functions (e.g., radiological assay, gas generation testing, and headspace gas sampling).

The Glovebox Excavator Method project facility underwent final regulatory agency inspection in May 2004 and is currently being maintained in standby condition to support potential future operational needs. Characterization or other processing activities (e.g., waste examination) in support of this NTCRA may be performed within the Glovebox Excavator Method project facility if needed and determined appropriate through consultation with regulatory agencies.

Sampling activities will be implemented to characterize selected radionuclides within nontargeted waste and underburden that is not removed as part of the action. The resulting data will be used by the Agencies to assess residual risk considerations and evaluate the effectiveness of the planned visual waste segregation approach. Data quality objectives documentation and a field sampling plan are being prepared to define the characterization activity and will be submitted to DEQ and EPA for their review and concurrence before removal operations are started.

5.1.4 Treatment

Treatment for constituents such as VOCs may be required for TRU material that does not pass WIPP-related acceptance criteria (e.g., gas-generation testing) and other non-TRU wastes that are not eligible for transfer to WIPP. Thermal desorption processes for treatment of VOCs are being evaluated to support these functions. In general, thermal desorption processes entail heating waste materials to desorb organic materials from the waste. The resulting organic vapor would then be condensed, collected in tanks, and transferred offsite for further treatment or disposal. Any noncondensible fraction would be removed using activated carbon. Details of the potential VOC and other treatment processes will be fully developed during the design process. Waste treatment options at available off-Site treatment facilities are being evaluated and may also be performed as part of the action.

5.1.5 Interim Closure

Final closure of the excavated area will not occur as part of the NTCRA but will occur for the overall SDA as specified in the future OU 7-13/14 ROD. Final closure of the SDA is assumed to include an engineered surface barrier that will encompass Pit 4 (Holdren and Broomfield 2003). Interim closure steps will be implemented as part of the NTCRA, including covering the pit with a layer of soil from remaining overburden material or other native soil from the INEEL. The cover layer will be compacted and graded consistent with an overall SDA grading and drainage plan.

5.2 Applicable or Relevant and Appropriate Requirements

The ARARs identified for the selected NTCRA are identified in Appendix B. Implementation is discussed in the appendix and will be expanded in the project removal action plan. As is appropriate for a CERCLA action, only substantive provisions of cited ARARs must be implemented for the project. Specific ARAR citations and implementation information are provided in Table B-1.

The ARARs implementation for a CERCLA removal action is prescribed by the NCP (40 CFR 300). Removal actions must “to the extent practicable considering the exigencies of the

situation, attain ARARs under federal environmental or state environmental or facility siting laws" (40 CFR 300.415[j]). The same subsection of the NCP further states, "In determining whether compliance with ARARs is practicable, the lead agency may consider appropriate factors, including (1) The urgency of the situation; and (2) The scope of the removal action to be conducted."

Appendix B identifies chemical, location, and action-specific ARARs. Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies that produce numerical values when applied to site-specific conditions. Location-specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are in specific locations. Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous waste. These requirements are triggered by the particular remedial activities that are selected to accomplish the remedy.

The selected response action will be protective of human health and the environment and will be performed in a cost-effective manner. The removal action complies with those federal and state ARARs as identified for the scope of this action. Appendix B subsections discuss chemical-specific, action-specific, and location-specific ARARs pertinent to this removal action.

As discussed in Appendix A, generation of Toxic Substances Control Act (TSCA) -regulated PCB remediation waste is possible as part of the NTCRA. Consequently, the TSCA regulations of "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions" (40 CFR 761) governing management, characterization, storage, treatment, and disposal requirements for PCB remediation waste are applicable. The TSCA storage ARARs must be satisfied for any portion of the waste population identified or assumed to contain PCBs at concentrations of 50 ppm or greater. Because the Storage Enclosure does not meet all TSCA ARARs provisions for PCB storage, compliant storage will be accomplished through a risk-based storage demonstration and approval as is allowed by "PCB Remediation Waste" (40 CFR 761.61[c]). That demonstration is presented in Appendix A and is approved through this action memorandum.

5.3 Engineering Evaluation/Cost Analysis

The *Engineering Evaluation/Cost Analysis for the Accelerated Retrieval of a Designated Portion of Pit 4* (EE/CA) (DOE-ID 2004a) is contained in the administrative record. The Engineering Evaluation/Cost Analysis (EE/CA) evaluated two alternatives: (1) No Action (continued monitoring) and (2) the focused retrieval alternative selected for implementation through this action memorandum.

The DOE Idaho Operations Office, in line with the commitment to solicit public participation on remedial action in the *Community Relations Plan: A Guide to CERCLA Public Involvement in the Cleanup Program at the INEEL* (DOE-ID 2004b), made the EE/CA available in the Administrative Record file for OU 7-13/14 and on the Internet. The Administrative Record is located at the DOE Reading Room of the Technical Library in Idaho Falls; copies also were available at Albertsons Library at Boise State University. The EE/CA was available on the Internet at http://ar.inel.gov. In addition to public availability of the EE/CA, 13 informal briefings of citizens' groups and public officials were held. Five formal public meetings also were held in May 2004 at the following locations: Idaho Falls, Idaho; Twin Falls, Idaho; Boise, Idaho; Ketchum, Idaho; and Jackson, Wyoming. Numerous comments were received through the public availability of the EE/CA and the other public meetings. These comments and responses have been added to the Administrative Record file and are attached as Appendix C.

5.3.1 No Action Alternative (Monitoring)

The No Action alternative provides an environmental baseline against which impacts of the recommended removal action can be compared. Under the No Action alternative, no removal action would be taken at the SDA beyond the current Sitewide monitoring of environmental media. Buried waste, institutional controls, and monitoring at the SDA would remain as they currently are until an appropriate remedy is selected through the OU 7-13/14 ROD. The key element of the No Action alternative evaluated in this EE/CA is implementation of the existing monitoring system from 2004 to 2020. This monitoring would occur until the final long-term monitoring program is implemented after 2020. The Year 2020 was identified as the approximate time when a long-term monitoring action would be implemented through the OU 7-13/14 ROD process. The 2020 date is assumed in order to have a basis for calculating a total cost for the No Action alternative. The No Action alternative includes only monitoring and requires no direct action to treat, stabilize, or remove contaminants. Costs for this alternative include monitoring of air, vadose zone soil moisture, and the aquifer for 15 years. The existing monitoring system for the SDA will proceed regardless of either action. The No Action alternative offers no reduction in toxicity, mobility, or volume of contaminants within the SDA and does not mitigate the release of COCs from the disposed waste that will be addressed through the selected action.

5.3.2 Focused Retrieval

This alternative was evaluated in the EE/CA, is selected through this action memorandum, and is described in Section 5.1 above.

5.4 Estimated Cost

This section provides the estimated cost for the focused retrieval alternative as detailed in the EE/CA (DOE-ID 2004a). Costs for the TRU retrieval option are presented for the entire project life cycle (Fiscal Year 2004–2007), including management and oversight, engineering, construction, procurement, retrieval operations, transfer of waste materials to WIPP, waste storage, and interim closure. Treatment and disposal costs (except for WIPP) are not included. The existing monitoring system for the SDA will proceed regardless of either action. Consequently, the $3 million in monitoring costs is included as a cost element for the NTCRA (see Table 2).

Table 2. Total estimated costs for the Focused Retrieval alternative.

Cost Element	Focused Retrieval Alternative ($M)
Engineering	6.6
Procurement	19.0
Management and oversight	13.6
Construction	4.2
Operation and maintenance support	76.4
Waste Isolation Pilot Plant certification and support	85.7
Surveillance and monitoring installation	3.0
Total	208.5

The U.S. Department of Energy has done a subsequent cost review, which assumes increased efficiency of a number of processes. This resulted in a revised cost estimate for the project at $175M.

5.5 Project Schedule

The NTCRA schedule shows design and facility construction in Fiscal Year 2004 to support commencement of retrieval operations in October, 2004. The planned retrieval operational period for the project is approximately 12 months long, followed by a 6-month deactivation, decontamination, and decommissioning phase. Performance of WIPP-related processing and certification activities will be a fundamental element of proposed NTCRA activities and is expected to require several years to complete, although a final schedule is not available at this time.

5.6 Project Deliverables

The following table identifies the project deliverables that will be submitted to the regulatory agencies for their review and comment.

Deliverable	Submittal Timeframe
Draft Removal Action Plan	August 2004
Draft Data Quality Objectives	September 2004
Draft Sampling and Analysis Plan	September 2004
Volatile organic contaminant treatment system design and associated risk documentation	To be determined based on characterization and volume information for waste generated.
Design Fact Sheet for volatile organic contaminant treatment system design	To be determined based on characterization and volume information for waste generated.

6. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delaying performance of the removal action or accepting the No Action Alternative would not contribute to the overall OU 7-13/14 cleanup effort by removing source materials that pose a threat of ongoing release, primarily from VOCs, from the site. A decision to not implement the action does not actively support the regulatory agencies' desire to accelerate site cleanup and would essentially defer the decision to the future OU 7-13/14 ROD.

7. OUTSTANDING POLICY ISSUES

No outstanding policy issues are associated with this action.

8. ENFORCEMENT

The DOE Idaho Operations Office is conducting this removal action as the lead agency under the authority of 40 CFR 300.415 (Removal Action) of the NCP.

9. RECOMMENDATION

This action memorandum serves as a decision document, was developed in accordance with CERCLA, and is consistent with the "National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300). Conditions at this site meet 40 CFR 300.415(b)(2) criteria for a removal action.

The agencies have determined that implementation of the ARP (i.e., Focused Retrieval alternative as described in the EE/CA) represents an appropriate step forward in the process to achieve a comprehensive remedial solution for the SDA. The ARP NTCRA will provide an effective method for retrieving and managing the targeted waste while maintaining protection of workers, public health, and the environment. Performance of the action will satisfy the NTCRA objective for removal of targeted waste streams and associated contaminants from a portion of the SDA and will reduce the overall TRU, VOC, and uranium inventory buried within the SDA.

10. REFERENCES

40 CFR 300, 2004, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 300.415, 2004, "Removal Action," *Code of Federal Regulations,* Office of the Federal Register.

40 CFR 761, 2003, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*, Office of the Federal Register, July 2003.

40 CFR 761.61[c], 2003, "PCB Remediation Waste," *Code of Federal Regulations*, Office of the Federal Register, July 2003.

42 USC § 2011-2259, 1954, "Atomic Energy Act of 1954," *United States Code*.

Becker, B. H., J. D. Burgess, K. J. Holdren, D. K. Jorgensen, S. O. Magnuson, and A. J. Sondrup, 1998, *Interim Risk Assessment and Contaminant Screening for the Waste Area Group 7 Remedial Investigation*, DOE/ID-10569, Rev. 0, U.S. Department of Energy Idaho Operations Office.

DOE O 435.1, 2001, "Radioactive Waste Management," Change 1, U.S. Department of Energy.

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DOE-ID, 2004b, *Community Relations Plan: A Guide to CERCLA Public Involvement in the Cleanup Program at the INEEL*, DOE/NE-ID-11149, Rev. 0, Idaho National Engineering and Environmental Laboratory.

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French, D. L. and K. A. Taylor, 1998, *Radioactive Waste Information for 1997 and Record-To-Date*, DOE/ID-10054(97), U.S. Department of Energy Idaho Operations Office.

Holdren, K. Jean, Bruce H. Becker, Nancy L. Hampton, L. Don Koeppen, Swen O. Magnuson, T. J. Meyer, Gail L. Olson, and A. Jeffrey Sondrup, 2002, *Ancillary Basis for Risk Analysis of the Subsurface Disposal Area,* INEEL/EXT-02-01125, Rev. 0, Idaho National Engineering and Environmental Laboratory.

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Zitnik, James F., Aran T. Armstrong, Brian K. Corb, Mark H. Edens, Douglas B. Holsten, Patricia M. O'Flaherty, Janet Rodriguez, Tamara N. Thomas, Russell L. Treat, Wayne Schofield, and Kira L. Sykes, 2002, *Preliminary Evaluation of Remedial Alternatives for the Subsurface Disposal Area,* INEEL/EXT-02-01258, prepared by CH2MHILL for the Idaho National Engineering and Environmental Laboratory.

Appendix A

Risk-Based Polychlorinated Biphenyl Remediation Waste Storage Approval

Appendix A

Risk-Based Polychlorinated Biphenyl Remediation Waste Storage Approval

A-1. PURPOSE

The purpose of this appendix is to document the justification for Toxic Substances Control Act (TSCA) risk-based storage approval of waste materials generated during the Accelerated Retrieval Project (ARP) non-time-critical removal action (NTCRA) that potentially contain polychlorinated biphenyls (PCBs) at concentrations of 50 parts per million (ppm) or greater. The TSCA allows for alternative storage of PCBs based on risk at 40 CFR 761.61(c). Because the TSCA storage provisions of 40 CFR 761.65 are applicable or relevant and appropriate requirements (ARARs) and the storage facility will not fully satisfy all ARAR provisions, a risk-based storage approval is implemented through this action memorandum as the mechanism for achieving ARAR compliance and demonstrating storage that is protective of human health and the environment.

Several provisions of the TSCA storage requirements of 40 CFR 761.65 are not included in the CERCLA storage facility design and operational planning. The provisions not included relate to the facility floor design and implementation of the typical container inspection protocol and are discussed in greater detail below. Deviation from the standard approach to waste storage is warranted in this case due to (1) the short-term nature of the project, (2) the expected absence of free liquids within the waste streams to be generated, and (3) the modified dense pack storage arrangement that has historically been implemented at RWMC for storage of transuranic waste streams. The collective actions and additional mitigative and preventative features described below ensure that PCB waste will be managed safely, that appropriate safeguards are in place, and that any impact to the worker, public, or the environment is extremely unlikely.

A-2. WASTE INVENTORY BACKGROUND

Section 2.2 of this action memorandum provides detailed background information on the chemical and radiological inventory and the major waste streams located in the designated retrieval area. Polychlorinated biphenyls have been recognized as a possible chemical constituent within the Rocky Flats Plant targeted waste streams, but definitive information on the presence or concentration of the PCBs has not been available. Glovebox Excavator Method Project characterization results have been analyzed for PCBs. Glovebox Excavator Method Project analytical data collection was designed to characterize the average PCB concentration within the overall project waste stream retrieved. It is noted that the general waste types within the project retrieval area and the designated Pit 4 retrieval area are similar. Based on the analysis performed, the project waste UCL_{90} PCB concentration is 37 ppm. Of course, this is below the PCB regulatory threshold of 50 ppm or greater. However, analysis of the data indicated that a significant number of the samples analyzed did contain PCBs, some at elevated concentrations. Based on this, and differences in the composition of the waste streams to be generated (i.e., reduced interstitial soil quantity), the presence of PCBs in the ARP waste inventory at or above the TSCA regulatory threshold cannot be ruled out without analytical verification. Consequently, a project assumption is that a portion of the waste population requiring storage exhibits PCB concentrations $\geq$ 50 ppm.

A-3. WASTE STORAGE BACKGROUND

The ARP storage facility layout and general description is presented in Section 5.0 of this action memorandum. The project will retrieve targeted waste zone material for repackaging and interim storage within a newly constructed Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) storage building located within the Subsurface Disposal Area (SDA) at the Radioactive Waste Management Complex (RWMC). The Storage Enclosure is a commercially available, standard fabric-tensioned structure, approximately 39.6 m (130 ft) wide × 48.8 m (160 ft) long with 6.1-m minimum (20-ft minimum) interior clearance at the eaves. Significant elements of the storage approach are as follows:

- Approximately 12,500 drums will require storage.
- All targeted waste will be repackaged within new containers (primarily 55-gal drums)
- The general waste population will be solid waste. If liquid waste is encountered, the liquids will be absorbed. In the event that liquid waste requires storage (not a planned event), the drums containing liquids will be stored on spill containment pallets that provide appropriate secondary containment for the stored waste contents.
- Storage will be arranged in a modified dense pack arrangement patterned after that implemented within the Resource Conservation and Recovery Act/Hazardous Waste Management Act (RCRA/HWMA) -permitted waste management facilities located within the RWMC Transuranic Storage Area (TSA). Modified dense pack storage involves storage in a drum array that is no more than 4 drums wide, 5 drums high, and 28 drums deep.
- Mandatory aisle space within the storage building will accommodate a center aisle down the length of the building that is wide enough to accommodate necessary emergency response equipment (20 ft planned width) and a minimum of 3 ft between drum stacks and around the perimeter of the building.
- A reinforced concrete floor.

Inspections will be performed in a manner that is generally consistent with those performed for stored TRU and alpha low-level waste within the RCRA/HWMA-permitted waste management facilities located within the RWMC TSA. Inspection details will be finalized, with regulatory agency concurrence, in the project Removal Action Plan.

As is appropriate for storing PCB contaminated waste, ARARs provisions of 40 CFR 761.65 are considered applicable to storage of waste contaminated with PCBs at concentrations $\geq$ 50 ppm. The primary substantive storage ARARs listed in 40 CFR 761.65 are as follows:

> (b) Except as provided in paragraphs (b)(2), (c)(1), (c)(7), (c)(9), and (c)(10) of this section, after July 1, 1978, owners or operators of any facilities used for the storage of PCBs and PCB Items designated for disposal shall comply with the following storage unit requirements:
>
> (1) The facilities shall meet the following criteria:
>
> (i) Adequate roof and walls to prevent rain water from reaching the stored PCBs and PCB Items;

(ii) An adequate floor that has continuous curbing with a minimum 6 inch high curb. The floor and curbing must provide a containment volume equal to at least two times the internal volume of the largest PCB Article or PCB Container or 25 percent of the total internal volume of all PCB Articles or PCB Containers stored there, whichever is greater. PCB/radioactive wastes are not required to be stored in an area with a minimum 6 inch high curbing. However, the floor and curbing must still provide a containment volume equal to at least two times the internal volume of the largest PCB Container or 25 percent of the total internal volume of all PCB Containers stored there, whichever is greater.

(iii) No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area;

(iv) Floors and curbing constructed of Portland cement, concrete, or a continuous, smooth, non-porous surface as defined at §761.3, which prevents or minimizes penetration of PCBs.

(v) Not located at a site that is below the 100-year flood water elevation.

The planned CERCLA storage facility meets all of the above listed requirements with the exception of items (b)(ii) and (b)(iii). The floor, while constructed of reinforced concrete, does not provide containment and does contain joints that would permit the flow of liquids. The TSCA also contains provisions that mandate periodic container storage area inspections. The requirement that, "All PCB items in storage shall be checked for leaks at least once every 30 days," cannot be directly accommodated for all containers in storage because of the modified dense pack storage configuration.

Because of these issues, ARARs compliance is achieved through the provision of 761.61(c) for remediation waste management. The following sections present the preventive and mitigative features that are part of the CERCLA storage process that will ensure storage that is protective of human health and the environment.

A-4. PREVENTIVE AND MITIGATIVE FEATURES

The following section presents the preventive and mitigative measures that will be implemented to ensure protective CERCLA storage. The requirements listed below are either required for TSCA compliant storage, are required RCRA hazardous waste storage ARARs, or are implemented as best management practice:

- Retrieved waste will be placed in new containers that meet Department of Transportation (DOT) hazardous materials regulations at 49 CFR 171 through 180.

- Inspections will be performed that are consistent with those implemented in the RCRA/HWMA-permitted waste management facilities located within the RWMC TSA. Container inspection requirements, frequencies, and criteria will be documented, with agency concurrence, in the CERCLA Removal Action Plan.

- Containers will be properly labeled and marked for CERCLA waste management.

- The area in which the waste will be stored shall be designated and marked as a CERCLA waste storage area.

- The area will be registered in the INEEL database as a CERCLA waste storage area and included in the Sitewide contingency plan/emergency action plan addendum for RWMC.

- Containers will be closed except when waste is being added or removed.

- Run-on and run-off protection will be provided to ensure the containers are protected from flooding.

- The general waste population will be solid waste. If liquid waste is encountered, the liquids will be absorbed. In the event that liquid waste requires storage (not a planned event), the drums containing liquids will be stored on spill containment pallets that provide appropriate secondary containment for the stored waste contents.

- Storage will be arranged in a modified dense pack arrangement patterned after that implemented within the RCRA/HWMA-permitted waste management facilities located within the RWMC TSA. Modified dense pack storage involves storage in a drum array that is no more than 4 drums wide, 5 drums high, and 28 drums deep.

- Mandatory aisle space within the storage building will accommodate a center aisle down the length of the building that is wide enough to accommodate necessary emergency response equipment (20 ft planned width) and a minimum of 3 ft between drum stacks and around the perimeter of the building.

- Storage will occur on a reinforced concrete floor.

- Procedures will be implemented to control drum handling and management activities and to address potential spills and releases of PCB contaminated material.

- RCRA ARARs, including hazardous waste container management ARARs that are identified within this action memorandum, will be implemented.

The following Sitewide administrative controls also perform preventive functions: access control, 24-hour security, fire watch, monitoring, and surveillance. The contribution of the above-mentioned actions will ensure that the waste is being properly managed to prevent any additional risk for exposure to human health and the environment.

A-5. QUALITATIVE RISK EVALUATION

Risk to workers, members of the public, or the environment from exposure to PCBs depends upon completion of an exposure pathway between the contaminant in the environment and the receptor. In the ARP storage context, the completion of an exposure pathway must first be preceded by a release of PCB-contaminated waste material from a newly packaged waste container. A number of factors indicate that such a release is not likely to occur. The primary factors mitigating or preventing a release for the stored ARP waste, identified above, include the use of new DOT-compliant containers, provisions preventing the storage of free liquids, and implementation of operational procedures for container management and inspections. In the event of a release, exposure of workers, members of the public, or the

environment to the associated PCB contamination will be mitigated by (1) planned engineering and operational controls and (2) planned emergency response measures.

The radiological contamination associated with the waste streams necessitates stringent application of radiological controls when managing the material. The transuranic contaminated waste streams primarily contain radionuclides that decay through the emission of alpha particles. The waste streams are therefore associated with significant risk through the inhalation pathway. Consequently, all project waste management activities are conducted in a very controlled manner involving the use of extensive engineering (e.g., radiological enclosures, filtered exhaust systems), administrative controls, and the use of personal protective equipment. The associated rigorous radiological controls will also function to protect workers from potential exposures from PCBs in the event that a release occurs in storage that would present a potential exposure risk.

Implementation of container management activities under the current RCRA/HWMA permit was initiated in 1995. Since that time, operations has managed, in a similar manner to that proposed for the ARP, the stored waste inventory without an event that triggered a release in the storage facility. This significant operational history at the RWMC demonstrates the safe management of waste in storage and the associated low release potential for the stored material.

A-6. QUANTITATIVE RISK EVALUATION

The INEEL submitted, and the U.S. Environmental Protection Agency (EPA) Region 10 approved, a quantitative risk assessment titled "Application for the Risk-Based Storage of PCB Remediation Waste at the INEEL RWMC TSA-RE" in March of 2001. In the quantitative risk assessment referenced, the INEEL determined that storage of PCBs for a twenty-year period did not unreasonably expose workers, visitors, or the groundwater through soil ingestion, inhalation, or groundwater pathways. Although these situations are somewhat different, it is still instructive to compare the referenced risk approach and its results to the risks associated with the ARP storage. The application for the Transuranic Storage Area-Retrieval Enclosure (TSA-RE) presented quantified risk evaluation for various hypothetical PCB exposure scenarios associated with TSA-RE storage that are relevant to the Pit 4 storage context. A worker/visitor exposure scenario was assessed based on projected site use for a 20-year period. Based on these scenarios, assessment was performed for the incidental soil ingestion, inhalation of fugitive dust, and inhalation of volatile organic exposure pathways. Most instructive for the Pit 4 comparison is the soil ingestion analysis for the worker. The scenario evaluated a conservative, yet reasonable exposure scenario involving a worker who performs a weekly inspection of the TSA-RE waste storage pad. The inspection was assumed to take less than 4 hours. The inspection was assumed to be performed 50 weeks out of the year (the other two weeks would be inspected by a different worker). The inspections were assumed to occur over a twenty-year period. For a target risk of 1E-04, the associated soil contamination concentration was calculated as 1.96 mg/g. The scenario conservatively assumed that 100% of the TSA-RE stored drums failed completely and that the PCBs had homogeneously mixed throughout the waste volume and surrounding cover. The resulting average soil concentration was assumed to be 1.7 mg/g. Because the risk-based concentration exceeded the assumed, conservative soil concentration, the document concluded that the potential soil pathway exposure was acceptable. This evaluation bounds any potential exposure scenario associated with Pit 4. Based on Glovebox Excavator Method analytical data, this concentration far exceeds the expected concentration associated with the uncontainerized waste in the designated retrieval area. Thus, considering that the waste will be stored within containers and managed as described above, thereby limiting the likelihood of any release at all, the actual quantitative risk from the planned PCB storage associated with the NTCRA is considered to be well below the EPA acceptable risk range, and the proposed storage approach is considered protective of human health and the environment.

A-7. CONCLUSION

This qualitative and referenced quantitative discussion demonstrates that there are adequate protections in place to ensure no unacceptable risk to human health and the environment from the storage of PCB waste associated with the planned NTCRA. The collective actions and additional mitigative and preventative features ensure that PCB waste will be managed safely, that appropriate safeguards are in place, and that any impact to the worker, public, or the environment is extremely unlikely. Based on these conclusions, a risk-based storage approval, consistent with 40 CFR 761.61(c), is implemented and approved through the approval of this action memorandum.

A-8. REFERENCES

40 CFR 761.61, 2003, "PCB Remediation Waste," *Code of Federal Regulations,* Office of the Federal Register.

40 CFR 761.65, 2003, "Storage for Disposal," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 171, 2004, "General Information, Regulations, and Definitions," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 172, 2004, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 173, 2004, "Shippers—General Requirements for Shipments and Packagings," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 174, 2004, "Carriage by Rail," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 175, 2004, "Carriage by Aircraft," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 176, 2004, "Carriage by Vessel," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 177, 2004, "Carriage by Public Highway," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 178, 2004, "Specifications for Packagings," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 179, 2004, "Specifications for Tank Cars," *Code of Federal Regulations,* Office of the Federal Register.

49 CFR 180, 2004, "Continuing Qualification and Maintenance of Packagings," *Code of Federal Regulations,* Office of the Federal Register.

Appendix B

Applicable or Relevant and Appropriate Requirements for the Accelerated Retrieval Project Non-Time-Critical Removal Action

Appendix B

Applicable or Relevant and Appropriate Requirements for the Accelerated Retrieval Project Non-Time-Critical Removal Action

B-1. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS BACKGROUND

This appendix provides identification of applicable or relevant and appropriate requirements (ARARs) for the Accelerated Retrieval Project (ARP) non-time-critical removal action (NTCRA) (Alternative Two—Focused Retrieval as described in the *Engineering Evaluation/Cost Analysis for the Accelerated Retrieval of a Designated Portion of Pit 4* [EE/CA]). As is appropriate for a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) action, only the substantive provisions of the cited ARARs require implementation for the on-site CERCLA activities. For the purposes of this NTCRA, Accelerated Retrieval Project activities that are conducted at the RWMC, as described in this Action Memorandum, are on-site as defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300). Specific ARAR citations and implementation information are provided in Table B-1.

The ARARs implementation for a CERCLA removal action is prescribed by the NCP. Removal actions must "to the extent practicable considering the exigencies of the situation, attain ARARs under federal environmental or state environmental or facility siting laws" (40 CFR 300.415[j]). The same subsection of the NCP further states, "In determining whether compliance with ARARs is practicable, the lead agency may consider appropriate factors, including: (1) The urgency of the situation; and (2) The scope of the removal action to be conducted." Consideration of these factors is discussed in the following sections relative to the identification of appropriate ARARs for this NTCRA.

B-2. CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The chemical-specific ARARs identified in Table B-1 for this NTCRA are primarily limited to ARARs controlling air emissions from the site. Examples of chemical-specific ARARs that will be attained through the NTCRA include the requirements of Idaho's toxic air pollutant standards for releases of carcinogenic and other hazardous chemicals to the ambient air. For radionuclide emissions, the requirements of "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities" (40 CFR 61, Subpart H) will apply. The provisions of Subpart H limit the effective dose equivalent from all U.S. Department of Energy (DOE) Idaho National Engineering and Environmental (INEEL) facilities to a level of 10 mrem/year.

It is noted that the chemical-specific ARARs of the Idaho groundwater quality rules and associated maximum contaminant levels (IDAPA 58.01.11) are anticipated to be ARARs for the comprehensive OU 7-13/14 remedy but are not relevant and appropriate to the limited scope of this NTCRA. This conclusion is based on the limited scope of the NTCRA in the context of the overall OU 7-13/14 program. As stated in the *CERCLA Compliance with Other Laws Manual: Interim Final* (EPA 1988) "…a removal action may be conducted to remove a large number of leaking drums and

associated contaminated soil. In this situation, because the removal focuses only on partial control, chemical-specific ARARs for groundwater restoration would not be considered." Other chemical-specific ARARs are presented in Table B-1.

Table B-1. Applicable or relevant and appropriate requirements evaluation summary for the Focused Retrieval alternative.

Applicable or Relevant and Appropriate Requirements or To-Be-Considered Requirements	Type	Relevancy[a]	Implementation Comments
Idaho toxic air pollutants (IDAPA 58.01.01.585; IDAPA 58.01.01.586)	Chemical	A	The requirements of Idaho's toxic air pollutants have been determined to be applicable because carcinogenic and noncarcinogenic air contaminants may be present. The release of carcinogenic and noncarcinogenic contaminants into the air must be estimated and controlled if necessary based on estimated emissions.
Idaho ambient air quality standards for specific air pollutants (IDAPA 58.01.01.577)	Chemical	A	These standards establish ambient air quality standards for particulate matter, sulfur oxides, ozone, nitrogen dioxide, fluorides and lead. Project air emissions estimates must provide a basis for assessing compliance with the standards.
National emission standards for emissions of radionuclides other than radon from DOE facilities (40 CFR 61.92–94, Subpart H)	Chemical	A	Emission of radionuclides to the ambient air from DOE facilities will not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/year (40 CFR 61.92). Project air emissions estimates must provide a basis for assessing compliance with the substantive standards.
National Historic Preservation Act of 1966 (16 USC § 470 et seq., 2002)	Location	RA	The National Historic Preservation Act covers a variety of historic properties such as buildings, structures, archaeological sites, Native American resources, and significant artifacts. The law requires that properties of this type be identified before disturbance by any federal undertaking, including cleanup activities under CERCLA. Implementation of associated substantive requirements will be coordinated with the INEEL cultural resources office personnel in the event that archaeological remains or other artifacts are encountered during overburden removal activities.
Idaho control of fugitive dust emissions (IDAPA 58.01.01.650; IDAPA 58.01.01.651)	Action	A	The fugitive dust requirements are applicable if fugitive dust is generated during remediation or construction activities.
Idaho visible emissions (IDAPA 58.01.01.625)	Action	A	Discharge of any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than 3 minutes in any 60-minute period, which is greater than 20% opacity, is prohibited.

Table B-1. (continued).

Applicable or Relevant and Appropriate Requirements or To-Be-Considered Requirements	Type	Relevancy[a]	Implementation Comments
Hazardous waste determination (IDAPA 58.01.05.006 [40 CFR 262.11])	Action	A	Performance of an appropriate hazardous waste determination is required for waste that is newly generated.
Standards for owners and operators of treatment, storage, and disposal facilities—use and management of containers (IDAPA 58.01.05 [40 CFR 264, Subpart I])	Action	A	Container storage areas for containers of hazardous waste will be managed in compliance with Subpart I requirements as modified by the modified dense pack storage arrangement that will be implemented. Container inspection provisions appropriate for the modified dense pack arrangement will be implemented through inspection checklists documented in the Removal Action Plan.
Subpart B—General facility standards (IDAPA 58.01.05 [40 CFR 264]) General waste analysis—(IDAPA 58.01.05 [40 CFR 264.13(a)(1)(2)]) General inspection requirements—(IDAPA 58.01.05 [40 CFR 264.15 (a)(c)]) General requirements for ignitable, reactive, or incompatible waste—(IDAPA 58.01.05 [40 CFR 264.17 (a)(b)])	Action	A	Substantive provisions of the Resource Conservation and Recovery Act general facility standards will be implemented as ARARs for the CERCLA storage facility. Waste analysis requirements will be implemented through generation of a CERCLA field sampling plan defining required characterization for management of the CERCLA waste retrieved during project activities as well as through available acceptable knowledge documentation. Substantive inspection requirements will be implemented as appropriate for the CERCLA storage facility. Inspection areas and frequencies will be documented in subsequent removal action documentation (i.e., Removal Action Plan).
Subpart C—Preparedness and Prevention (IDAPA 58.01.05 [40 CFR 264.31–35])	Action	A	Substantive requirements of Subpart C will be implemented for the CERCLA storage facility as is appropriate for the CERCLA waste being managed at the site. Appropriate emergency equipment and communications systems will be provided to support the facility. Aisle space requirements will be implemented consistent with those for the modified dense pack storage configuration used in the Resource Conservation and Recovery Act-permitted, Type II storage buildings located in the Radioactive Waste Management Complex Transuranic Storage Area. Definition of required equipment and procedures for implementation of Subpart C will be documented in the subsequent removal action documentation (i.e., Removal Action Work Plan).
Subpart X—Miscellaneous units (40 CFR 264.600–603)	Action	A	Subpart X is identified as an ARAR for the thermal treatment system. As part of Subpart X implementation, additional substantive ARAR provisions deemed necessary to protect human health and the environment will be identified through consultation among DOE, Idaho Department of Environmental Quality, and U.S. Environmental Protection Agency

Table B-1. (continued).

Applicable or Relevant and Appropriate Requirements or To-Be-Considered Requirements	Type	Relevancy[a]	Implementation Comments
			representatives as part of the removal action treatment design process. Additional ARARs for consideration include provisions of Subparts I through O and Subparts AA through CC of 40 CFR 264, 40 CFR 270, 40 CFR 63 Subpart EEE, and 40 CFR 146 that are appropriate for the miscellaneous unit (i.e., thermal treatment unit) and the site-specific circumstances of the CERCLA action.
Land disposal restrictions (40 CFR 268.40, 268.44, 268.45, 268.48, and 268.49)	Action	A	These requirements are applicable to the treatment and disposal of Resource Conservation and Recovery Act hazardous waste if placement of restricted waste occurs.
Polychlorinated biphenyls storage and disposal (40 CFR 761)	Action	A	The Toxic Substances Control Act regulations governing management, characterization, storage, treatment, and disposal requirements for PCB remediation waste are applicable. Inventory information indicates that there is a potential for PCB contamination in the Pit 4 waste inventory at concentrations above the Toxic Substances Control Act regulatory threshold for PCBs (i.e., 50 ppm or greater). Documentation of a risk-based storage approval under 40 CFR 761.61(c), is included as Appendix A.
Radioactive waste management (DOE O 435.1; DOE M 435.1-1)	Action	TBC	The objective of "Radioactive Waste Management" (DOE O 435.1) is to ensure that all DOE radioactive waste is managed in a manner that is protective of the worker, public health and safety, and the environment. The "Radioactive Waste Management Manual" (DOE M 435.1-1) establishes specific responsibilities for implementing radioactive waste management practices for DOE's high-level waste, transuranic waste, low-level waste, and the radioactive component of mixed waste. Pit 4 is a past disposal site rather than a new radioactive waste disposal facility. Therefore, the substantive low-level waste disposal requirements contained in that order and manual do not apply to the pit. The substantive requirements in the DOE order, other than the disposal requirements (e.g., storage requirements), will apply and require implementation to relevant radioactive waste management activities.

Table B-1. (continued).

Applicable or Relevant and Appropriate Requirements or To-Be-Considered Requirements	Type	Relevancy[a]	Implementation Comments
Radiation protection of the public and the environment (DOE O 5400.5)	Action and Chemical	TBC	This DOE order establishes standards for DOE operations with respect to protection of the public and the environment against undue risk to radiation. This order sets limits for the annual effective dose equivalent for relevant pathways of exposure.

a. Relevancy refers to the type of requirement: A = applicable, RA = relevant and appropriate, or TBC = to-be-considered guidance

ARAR = applicable or relevant and appropriate requirement
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
DOE = U.S. Department of Energy
PCB = polychlorinated biphenyl

B-3. LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Location-specific requirements that may apply to the action relate to cultural resource requirements such as those from the National Historic Preservation Act. Although the Subsurface Disposal Area (SDA) is a disturbed area with prior clearance, the associated regulations are considered ARARs, and substantive provisions must be addressed in the event that archaeological remains are encountered during excavation of overburden soil.

B-4. ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Substantive Resource Conservation and Recovery Act (RCRA) generator requirements for hazardous waste identification and management would be applicable to waste that is retrieved and generated as part of the action. Generally, it is assumed that the waste forms from the Rocky Flats Plant will be associated with various listed and characteristic hazardous waste numbers based on similarity to the Radioactive Waste Management Complex (RWMC) Rocky Flats Plant stored waste. The Area of Contamination (AOC) for Waste Area Group 7 has not been formally defined in CERCLA documentation under the INEEL FFA/CO. For the purposes of this NTCRA, the AOC encompasses the SDA as bounded by the flood control dike that surrounds the SDA perimeter. As defined in Superfund LDR Guide #5: Determining When Land Disposal Restrictions (LDRs) are Applicable to CERCLA Response Actions [Office of Solid Waste and Emergency Response (OSWER) Directive 9347.3-05FS, July 1989] an AOC is delineated by the areal extent (or boundary) of contiguous contamination. Such contamination must be continuous but may contain varying types and concentrations of hazardous substances. The AOC does not include any contaminated surface or groundwater that may be associated with the land-based waste source. Accordingly, the SDA AOC designation for this NTCRA is based on the presence of a continuous plume of volatile organic contamination in the SDA subsurface. Although this continuous volatile organic contaminant plume extends beyond the SDA boundary, the AOC is limited to the confines of the SDA for the purposes of implementing this NTCRA.

The requirements for storage (40 CFR 264, Subpart I) are identified as ARARs to address the interim storage of containerized waste within the project area of contamination. The storage duration likely will exceed one year. The planned storage facility will satisfy the substantive Subpart I requirements for storage of solid waste forms. In the event that liquid containing waste requires storage, the project will need to implement appropriate containment provisions such as the use of spill pallets. The

need to implement RCRA ARARs will be based on the hazardous waste determination that will be completed before implementation of the action.

The RCRA land disposal restrictions prohibit the placement of restricted RCRA hazardous waste in land-based units such as landfills, surface impoundments, and waste piles until treated to standards considered protective for disposal. Specific treatment standards are included in requirements. These requirements are applicable to the treatment and disposal of RCRA hazardous waste if placement of restricted waste occurs. The land disposal restrictions do not apply to materials disposed of at the Waste Isolation Pilot Plant (WIPP) in New Mexico, based on WIPP Land Withdrawal Act exemption. The land disposal restrictions generally will apply to treated waste, secondary waste streams, other waste that is RCRA listed, or characteristic waste that is disposed of at off-Site treatment, storage, and disposal facilities.

The RCRA closure requirements for landfills are not considered ARARs for the limited scope of the removal action. As referenced above, the limited scope of the removal action can be considered in determining whether an ARAR is practicable for implementation in a removal action context. In the case of Alternative Two—Focused Retrieval, the U.S. Department of Energy has determined that implementation of closure ARARs is not practicable. Implementation of closure requirements and associated monitoring provisions is not meaningful considering the limited portion of the overall landfill (i.e., SDA) being retrieved and considering that final closure ARARs for the facility will be satisfied through the OU 7-13/14 Record of Decision. It is not possible to construct a meaningful closure scenario for the retrieved area considering the scope of the retrieval and the magnitude of surrounding existing waste forms that are not addressed by the action.

The thermal treatment process to be potentially employed for treatment of volatile organic compounds would be subject to substantive ARARs as a miscellaneous unit under RCRA. As part of Subpart X (40 CFR 264) implementation, additional substantive ARAR provisions deemed necessary to protect human health and the environment will be identified through consultation among U.S. Department of Energy, Idaho Department of Environmental Quality, and the U.S. Environmental Protection Agency representatives as part of the removal action treatment design process. Additional ARARs for consideration include provisions of Subparts I through O and Subparts AA through CC of 40 CFR 264, 40 CFR 270, 40 CFR 63 Subpart EEE, and 40 CFR 146 that are appropriate for the miscellaneous unit (i.e., thermal treatment unit) and the site-specific circumstances of the CERCLA action.

The Toxic Substances Control Act regulations of "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions" (40 CFR 761) governing management, characterization, storage, treatment, and disposal requirements for PCB remediation waste are applicable. Inventory information indicates that there is a potential for PCB contamination in the Pit 4 waste inventory at concentrations above the Toxic Substances Control Act regulatory threshold for PCBs (i.e., 50 ppm or greater). The Toxic Substances Control Act storage ARARs will need to be satisfied for any portion of the waste population identified to contain PCBs at 50 ppm or greater. This is accomplished through the risk-based storage approval in Appendix A as is allowed by "PCB Remediation Waste" (40 CFR 761.61[c]). In the event that excavated waste-zone materials are identified to contain PCBs $\geq$ 50 ppm, the materials will not be eligible for return to the pit if absent of supporting risk-based disposal approval. Disposal of these potential materials will be addressed in future documentation.

The State of Idaho regulations for fugitive dust emissions are applicable to fugitive dust generated during remediation or construction activities. In addition, State of Idaho visible emission standards are identified as ARARs. The requirements prohibit discharge of any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than 3 minutes in any 60-minute period that is greater than 20% opacity.

Relevant substantive requirements of "Radiation Protection of the Public and the Environment" (DOE O 5400.5) and "Radioactive Waste Management" (DOE O 435.1), which specify DOE radiation protection and management requirements, would be met as to-be-considered requirements.

B-5. REFERENCES

40 CFR 61, Subpart H, 2004, "National Emission Standards for Hazardous Air Pollutants," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61.92, 2004, "Standard—National Emission Standards for Hazardous Air Pollutants," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61.93, 2004, "Emission Monitoring and Test Procedures," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61.94, 2004, "Compliance and Reporting," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 262.11, 2004, "Hazardous Waste Determination," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264, Subpart I, 2004, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.13, 2004, "General Waste Analysis," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.15, 2004 "General Inspection Requirements," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.17, 2004, "General Requirements for Ignitable, Reactive, or Incompatible Wastes," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.31, 2004, "Design and Operation of Facility," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.32, 2004, "Required Equipment," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.33, 2004, "Testing and Maintenance of Equipment," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.34, 2004, "Access to Communications or Alarm System," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.35, 2004, "Required Aisle Space," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.600, 2004, "Applicability—Standards for Operators and Owners of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.601, 2004, "Environmental Performance Standards," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.602, 2004, "Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264.603, 2004, "Post-Closure Care," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 268.40, 2004, "Applicability of Treatment Standards—Protection of Environment," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 268.44, 2004, "Variance from a Treatment Standard," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 268.45, 2004, "Treatment Standards for Hazardous Debris," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 268.48, 2004, "Universal Treatment Standards," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 268.49, 2004, "Alternative LDR Treatment Standards for Contaminated Soil," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 300, 2004, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 300.415, 2004, "Removal Action," *Code of Federal Regulations,* Office of the Federal Register.

40 CFR 761, 2003, "Polycholorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 761.61, 2003, "PCB Remediation Waste," *Code of Federal Regulations,* Office of the Federal Register.

16 USC § 470 et seq., 1966, "National Historic Preservation Act of 1966," *United States Code*.

DOE M 435.1-1, 2001, "Radioactive Waste Management Manual" Change 1, U.S. Department of Energy.

DOE O 435.1, 2001, "Radioactive Waste Management," Change 1, U.S. Department of Energy.

DOE O 5400.5, 1993, "Radiation Protection of the Public and the Environment," Change 2, U.S. Department of Energy.

EPA, 1988, *CERCLA Compliance with Other Laws Manual: Interim Final*, EPA/540/G-89/006, U.S. Environmental Protection Agency.

IDAPA 58.01.01.577, 1994, "Ambient Air Quality Standards for Specific Air Pollutants," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.01.585, 1995, "Toxic Air Pollutants Non-Carcinogenic Increments," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.01.586, 2001, "Toxic Air Pollutants Carcinogenic Increments," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.01.625, 2000, "Visible Emissions," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.01.650, 1994, "Rules for Control of Fugitive Dust," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.01.651, 1994, "General Rules," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.05, 1993, "Rules and Standards for Hazardous Waste," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.05.006, 2004, "Standards Applicable to Generators of Hazardous Waste," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

IDAPA 58.01.11, 1997, "Ground Water Quality Rule," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.

Appendix C

Summary of Public Involvement Activities

Appendix C

Summary of Public Involvement Activities

During the public comment period 31 individuals submitted a total of 134 written comments. A total of 12 individuals provided oral comments at the public meetings in Idaho Falls, Twin Falls, Boise, Jackson Hole, and Ketchum. The public comment period began on May 6, 2004, and ended June 4, 2004. Public comments received during the 30-day public comment period were summarized according to the general topics they focused on and are responded to below. Responses to individual comments are included in a separate memorandum located in the administrative record at http://ar.inel.gov.

General public support for the proposed removal of waste from the Subsurface Disposal Area was evident through review of the comments. The majority of commenters share the paramount agency objective to ensure protection of the aquifer through effective cleanup actions at the Radioactive Waste Management Complex. Divergence of opinion was evident regarding some implementation details associated with the action including the extent of waste removal and the specifics of the retrieval process. Considerable public inquiry was also focused on measures to be taken to ensure compliance and ensure worker and public safety. Future Agency efforts will be focused on ensuring that the action achieves the removal action objectives, is consistent with the overall Waste Area Group 7 program, and is implemented in a manner that is protective of human health and the environment and protective of the workers that are in the field implementing the action.

C-1. Responsiveness Summary

Topic #1: Public concern was expressed as to whether an approach other than visual screening should be used to identify the waste that will be retrieved from the pit and whether random sampling and/or screening should be performed in addition to the visual screening that is proposed.

Response: The proposed process for visually identifying targeted waste streams at the dig face was selected primarily because of experience from the Glovebox Excavator Method Project. Consideration was also given to lessons learned through early waste and initial drum retrievals that occurred in the 1970s. The recent Glovebox Excavator Method Project experience did show that the original distinguishing characteristics of the disposed waste forms (e.g., color, cement in layers, packaging) were indeed still present such that visual identification of waste forms was possible. In the Pit 4 case, the targeted wastes include graphite waste, contaminated HEPA filters, Series 741 sludge, Series 743 sludge, and Uranium roaster oxides. Glovebox Excavator Method experience indicates that the expected distinguishing characteristics for graphite and filters will lead to relatively easy dig face identification. A similar conclusion is true for the sludges.It is also important to note that the vast majority of nontargeted waste is combustible and noncombustible debris (e.g., metal scrap, piping, plastics) that looks very different from the targeted waste streams.

The selective removal of targeted waste streams will result in significant waste management efficiencies by avoiding removal of waste streams that may not be eligible for disposal at the Waste Isolation Pilot Plant (WIPP). The gross removal of all waste streams and soils in the Glovebox Excavator Method Project resulted in only 60 drums of a total of 454 drums that exhibited high enough transuranic radionuclide content to satisfy the WIPP transuranic waste acceptance criteria. Targeting the identified waste streams as will occur in this removal action will help to avoid this situation.

The segregation approach will be verified through operational experience and will be implemented with operational controls, training, procedures, and characterization activities designed to verify the effectiveness of the visual method. Specific measures to be implemented include the following:

- A procedural approach will be implemented that defaults to a decision to *remove* nontargeted waste in the event that the waste cannot definitively be distinguished from targeted waste. In other words, for a given waste batch that visually looks like targeted waste, the waste will be removed rather than left in the pit.

- The targeted/nontargeted waste determination will be made by an individual assisting the excavator operator by way of closed circuit television cameras at the digface and mounted on the excavator. Further assessment of the targeted/nontargeted determination will be made by personnel viewing the waste through the windows of the drum packaging system.

- Field screening instrumentation will be employed to identify wastes associated with high-energy gamma radiation to ensure that the associated wastes are managed appropriately and that potential radiation exposure of operations personnel is appropriately controlled.

- Sampling activities are being planned to characterize selected radionuclides within nontargeted waste and underburden that is not removed as part of the action. The resulting data will be used by the Agencies to assess residual risk considerations and evaluate the effectiveness of the planned visual waste segregation approach.

Topic #2: Why isn't all waste, not just the "targeted" waste, being removed from the retrieval area? Once retrieved, will waste be returned to the pit?

Response: The objective of this removal action is focused on removing certain targeted wastes from the designated portion of Pit 4 rather than removal of all wastes. As planned, the action will remove the waste streams that contain a significant portion of the contaminants of concern (COCs). These COCs include volatile organic compounds (VOCs), uranium, and transuranic (TRU) radionuclides including plutonium. By targeting Series 743 sludge and uranium roaster oxide waste, it is expected that most of the VOC and uranium inventory in the pit will be removed. In addition, based on waste inventory data, approximately 90% of the TRU (i.e., alpha-emitting transuranic isotopes with half-lives greater than 20 years) curies are contained within the Series 741 sludge, graphite, and contaminated HEPA filters. Combined, all targeted waste streams contain a large portion of contaminants of concern in approximately 20% of the retrieval area waste volume. By focusing removal on these targeted waste streams, efficiency of the action is increased while significantly reducing waste inventory and risk within the retrieval area.

While removing the majority of the contaminants of concern, the proposed approach does leave both chemical and radiological residuals in the pit. A significant amount of risk assessment work has been completed to date and is part of the administrative record file for Waste Area Group (WAG) 7. The primary document is the *Ancillary Basis for Risk Analysis of the Subsurface Disposal Area* (INEEL/EXT-02-01125) referred to in the Engineering Evaluation and Cost Analysis (EE/CA) for this proposed action. Based on this and other documentation, the DOE, U. S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (DEQ) have proposed a removal action that addresses the contaminants of concern located in the Pit 4 Rocky Flats Plant waste that have been identified in the risk documentation prepared to date. Consequently, it is concluded that the proposed removal approach, when combined with implementation of the final action for WAG 7, will be protective of human health and the environment. Final evaluation of the comprehensive risk for the site and the full range of associated remedial options will be documented in the Operable Unit (OU) 7-13/14 Record of Decision (ROD).

DOE is evaluating a range of disposal options for the waste that is removed from the pit. It is expected that the majority of the waste removed will be eligible for disposal at WIPP. For waste that is not eligible for disposal at WIPP, DOE will give preference to disposal options that do not involve return to pit, such as offsite treatment and disposal, and will only consider returning wastes to the pit that do not present unacceptable risk to the aquifer subject to agreement with the DEQ and EPA.

Topic #3: Why is the proposed action being pursued at this time rather than waiting until the OU 7-13/14 Remedial Investigation/Feasibility Study (RI/FS) is complete? How will the agencies ensure that future excavation of the same area is not required?

Response: A significant amount of remedial investigation/baseline risk assessment and feasibility study related work has been completed under the WAG 7 program to date. Based on that work, the resulting understanding of the contaminants of concern at the site, and anticipated State and community considerations, the DOE, in consultation with the DEQ and the EPA, has concluded that the proposed waste removal is appropriately implemented at this time. Furthermore, the action is consistent with overall DOE programmatic objectives to accelerate completion of remedial work and achieve early risk reduction where possible. The removal action process is a streamlined process for accomplishing these objectives and, when conducted with close regulatory agency coordination, results in actions that are supportive of the final remedial action. The Federal Facility Agreement and Consent Order (FFA/CO) process (i.e., Tri-party process for conducting cleanup at the Idaho National Engineering and Environmental Laboratory [INEEL]) does recognize DOE's authority to conduct removal actions as part of the overall cleanup program. Finally, the DOE has determined that this proposed removal action shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned. Specifically, the proposed removal action, in addition to addressing a significant portion of the hazardous substances in the Subsurface Disposal Area, will provide characterization and technical and cost information from full-scale waste retrieval activities that will support the ROD for OU 7-13/14. It also will establish process details for certification and transfer of retrieved TRU waste to the Waste Isolation Pilot Plant (WIPP) in New Mexico.

The preliminary feasibility study work currently underway will address three types of remedial alternatives: (1) retrieval, (2) in situ grouting, and (3) capping. This removal action is consistent with this range of alternatives and will not prevent the future implementation of any of the alternatives being evaluated. If the RI/FS determines that additional measures are needed, the OU 7-13/14 ROD will determine if in situ treatment, capping, retrieval, or a combination will be selected. The proposed action was developed by considering the likely future actions that will be implemented through the OU 7-13/14 ROD and the body of existing RI/FS-related documentation available for this site that forms the technical basis for the wastes to be addressed (i.e., wastes containing identified contaminants of concern).

The agencies will continue to tailor the project's approach to minimize the potential that future retrievals in this area will be required. We will still, however, maintain the ability to require additional measures if needed to protect human health and the environment.

Topic #4: Why haven't more alternatives been evaluated in the Engineering Evaluation and Cost Analysis?

Response: The alternatives for performance of the removal action were purposely limited for consistency with the focused removal objective (i.e., targeted retrieval of certain Rocky Flats Plant waste streams that are highly contaminated with transuranic radionuclides, VOCs, and various isotopes of uranium). The monitoring scenario is included simply as a baseline for comparing the costs for either option: implementing the removal action or not implementing the removal action. The monitoring costs are meant

to represent the costs for existing Subsurface Disposal Area monitoring for an assumed period of time that will be incurred regardless of the removal action implementation.

Topic #5: Public concern was expressed related to air emissions (radionuclide and nonradionuclide) that would result from the implementation of the project, monitoring that would be performed, and efficiency of the control equipment (i.e., HEPA filtration).

Response: Evaluation of radiological and chemical air emissions has been finalized for the project. The evaluation quantifies radiological and chemical exposures to an appropriate hypothetical collocated worker receptor and to required public receptor locations. The evaluation is documented in the engineering design file, *Air Emission Evaluation for the Accelerated Retrieval Project for a Described Area within Pit 4*, EDF-4692. The analysis shows that chemical and radiological exposures are within health-based thresholds required by identified Applicable or Relevant and Appropriate Requirements (ARARs) and that carcinogenic risk is below the EPA recommended risk range typically applied in a remedial action context. The evaluation also indicates that continuous radiological emissions monitoring for compliance with radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAPS) ARARs is required and will be implemented. Monitoring for VOC emissions is not required based on the estimates, but is being considered for data gathering and other purposes. It is noted that similar emissions calculations were performed for the Glovebox Excavator Method Project and resulting monitoring results indicated that the actual emissions were less than estimated emissions for both radionuclides and VOCs.

Use of HEPA filters in the manner proposed is consistent with state-of-the-art industry practice, and the associated control efficiencies are widely accepted throughout DOE and Nuclear Regulatory Commission facilities.

Topic #6: Public concern was expressed about the ability to transfer waste to WIPP and what will happen to waste that is not eligible for disposal at WIPP.

Response: The project is actively working with WIPP officials to ensure retrieved transuranic waste meets WIPP requirements. Retrieved targeted waste forms will be visually examined for compliance with WIPP requirements during repackaging at the drum packaging station. The waste will be placed in a safe and compliant storage until additional characterization steps, such as assay and headspace gas sampling, can be performed. Alternative disposal options are currently being evaluated for waste that does not qualify for disposal at WIPP. A diagram is presented as Figure C-1 below to illustrate the general process flow and disposal logic for the major waste streams resulting from the project.

Topic #7: Public concern was expressed about compliance with legal requirements such as Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions, the dense-pack drum storage arrangement, and Toxic Substances Control Act requirements for polychlorinated biphenyl management.

Response: The Engineering Evaluation/Cost Analysis and this Action Memorandum identify ARARs for the chemicals, activities, and location involved in the removal action. Included in this listing of ARARs are substantive standards of RCRA and TSCA and other relevant environmental statutes and state of Idaho regulations. Detailed activities for implementing the ARARs will be developed further in subsequent documentation (e.g., Removal Action Plan) and operational procedures that the project will follow. Review of the documentation and associated ARARs implementation will be coordinated with DEQ and EPA personnel to ensure compliance with the substantive ARARs.

In some cases, unique compliance approaches are being implemented to support compliance with the ARARs. One example of this is the risk-based storage approval documented in the Action Memorandum (see Appendix A). The risk-based storage approval is being implemented as part of the CERCLA action

and is provided for by the TSCA regulations identified as ARARs for the project. An additional example is the dense-pack storage arrangement that is planned for implementation within the CERCLA storage building. The dense-pack storage arrangement is being implemented as a modification to the normal RCRA container storage practice, is considered appropriate for the radiological waste being managed, and is being implemented through consultation with DEQ and EPA personnel. Supporting operational requirements for implementation of the dense-pack storage approach (which ensure meeting the objectives of the RCRA requirements, particularly inspection) will be included in the project Removal Action Plan and reviewed by the regulatory agencies to ensure that appropriate measures are included.

At the suggestion of a commenter, a generalized process flow chart (see Figure C-1) has been developed to illustrate the major process steps, associated decision points, and potential waste disposal options that are being evaluated as part of the proposed action.

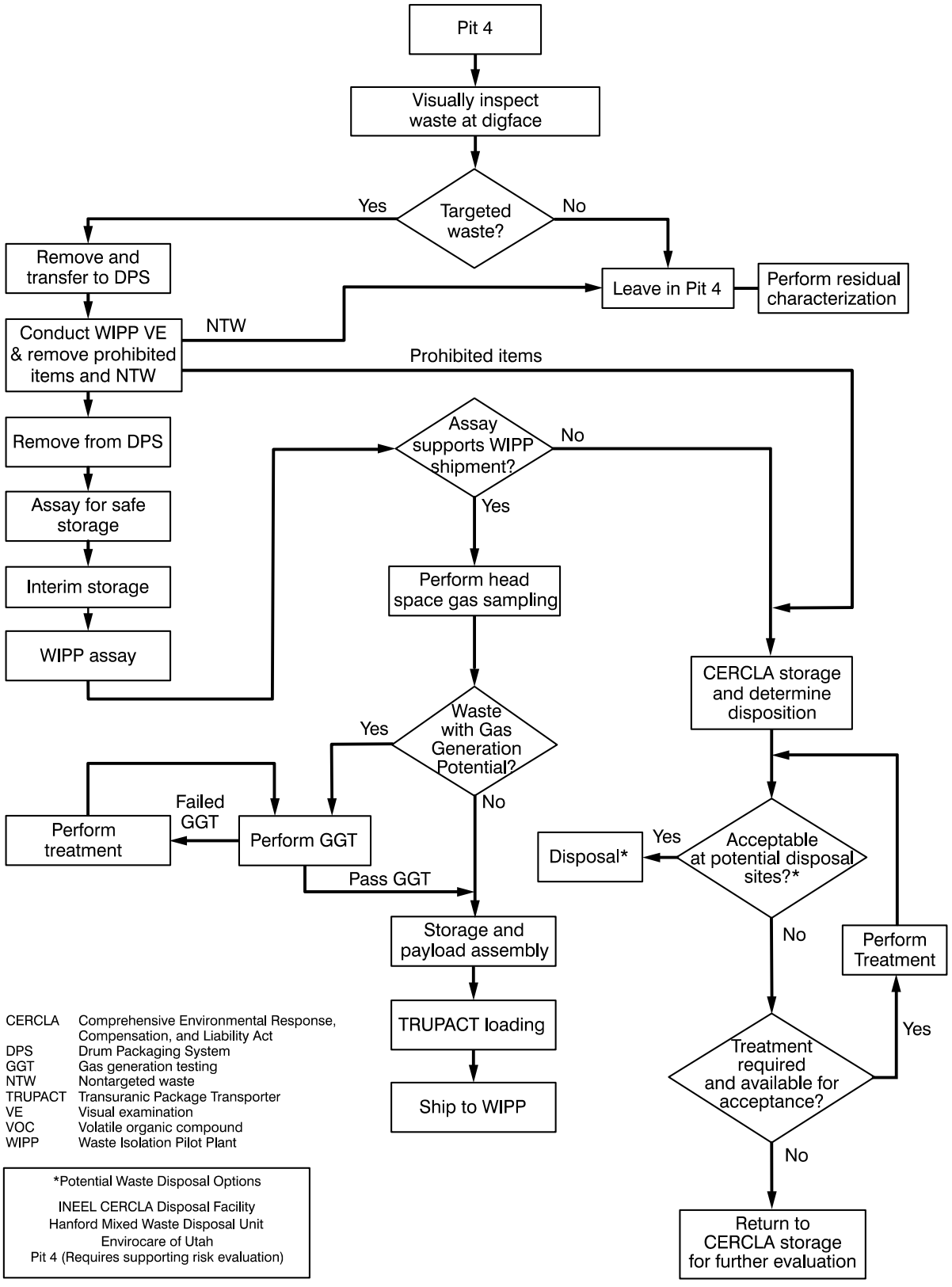

Figure C-1. Conceptual process flowchart.