

DRAFT 08-11-11

Class 2 Permit Modification Request

Addition of a Shielded Container

**Waste Isolation Pilot Plant
Carlsbad, New Mexico**

WIPP Permit Number NM4890139088-TSDF

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Acronyms and Abbreviations

AK	Acceptable Knowledge
CFR	Code of Federal Regulations
CH	Contact Handled
DAC	Drum Age Criteria
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ft	feet
gal	gallon
HWDU	Hazardous Waste Disposal Unit
L	Liter
lbs	pounds
m ³	Cubic Meters
mrem/h	Millirems Per Hour
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
PMR	Permit Modification Request
RCRA	Resource Conservation and Recovery Act
RH	Remote Handled
SLB	Standard Large Box
TDOP	Ten Drum Overpack
TRU	transuranic
TSDf	Treatment, Storage and Disposal Facility
WHB	Waste Handling Building
WIPP	Waste Isolation Pilot Plant
WTS	Washington TRU Solutions LLC
WWIS	WIPP Waste Information System

Overview of the Permit Modification Request

This document contains one Class 2 Permit Modification Request (**PMR**) for the Waste Isolation Pilot Plant (**WIPP**) Hazardous Waste Facility Permit (**Permit**) Number NM4890139088-TSDF.

This PMR is being submitted by the U.S. Department of Energy (**DOE**) Carlsbad Field Office and Washington TRU Solutions LLC (**WTS**), collectively referred to as the Permittees, in accordance with the WIPP Permit, Part 1, Condition 1.3.1. (20.4.1.900 New Mexico Administrative Code (**NMAC**) incorporating Title 40 Code of Federal Regulations (**CFR**) §270.42(b)). The modification provides for the following changes:

- addition of a new gamma shielded container for managing remote-handled (**RH**) transuranic (**TRU**) mixed waste processed as contact handled (**CH**) TRU mixed waste,
- description of how the volume of RH TRU mixed waste which disposed in gamma shielded containers will be tracked upon arrival through emplacement, and,
- related changes to waste handling descriptions.

The gamma shielded container will be used to package RH TRU mixed waste that is approved for shipment to the WIPP facility for disposal.

These changes do not reduce the ability of the Permittees to provide continued protection to human health and the environment.

The requested modification to the WIPP Permit and related supporting documents are provided in this PMR. The proposed modification to the text of the WIPP Permit has been identified using red text and a double underline and a ~~strikeout~~ font for deleted information. All direct quotations are indicated by italicized text. The following information specifically addresses how compliance has been achieved with the WIPP Permit Part 1, Condition 1.3.1. for submission of this Class 2 PMR.

1. **20.4.1.900 NMAC (incorporating 40 CFR §270.42(b)(1)(i)) requires the applicant to describe the exact change to be made to the permit conditions and supporting documents referenced by the Permit.**

The Permittees are proposing to package a portion of the RH TRU mixed waste inventory in gamma shielded containers for emplacement at the WIPP facility. The use of the shielded containers will enable the DOE to simplify the packaging and management of RH TRU mixed waste.

Shielded containers will be transported to the WIPP facility in the HalfPACT transportation package. The shielded containers comply with the U.S. Department of Transportation (**DOT**) Type 7A standards.

The RH TRU mixed waste that will be packaged in shielded containers is the same kind as that included in the current inventory for disposal at the WIPP facility. Candidate RH TRU mixed waste streams for shipment and disposal in gamma shielded containers will be selected based

on the requirement to keep the radiation surface dose rate at the external surface of the shielded container below 200 millirems per hour (**mrem/h**) in accordance with Permit Part 1, Condition 1.5.1. RH TRU mixed waste emplaced at the WIPP facility in shielded containers will remain designated as RH TRU mixed waste in the WIPP Waste Information System (**WWIS**). The emplaced volume will be counted against the RH repository limit of 7,080 cubic meters (**m³**) and RH TRU mixed waste volume limits specified in the Permit. The shielded container allows the WIPP facility to manage the shipment in a manner consistent with management of a CH TRU mixed waste shipment.

The shielded container is designed to hold an inner 30-gallon container. The cylindrical sidewall of the shielded container has approximately a 1-inch-thick lead shield sandwiched between a double-walled carbon steel shell as shown in Figure 1. The external wall is approximately 1/8-inch thick, and the internal wall has a thickness of approximately 3/16-inch. The lid and the bottom of the shielded container are made of carbon steel and are approximately 3 inches thick. The empty weight of the shielded container is approximately 1,726 pounds. The shielded container and the inner 30-gallon container will be vented.

The shielded containers will be assembled in a 3-pack configuration on a triangular pallet surrounded by radial and axial dunnage components. They will be transported as a single 3-pack configuration within the existing HalfPACT packaging. The 3-pack configuration will remain intact throughout transportation and emplacement (Figure 2).

Upon arrival at the WIPP facility, the shielded containers will be processed as CH TRU mixed waste. After receipt at the WIPP facility, the 3-pack assembly will be removed from the HalfPACT transportation container using existing lifting fixtures and equipment in the CH Bay portion of the Waste Handling Building. The 3-pack assembly will remain intact. The radial and axial dunnage will be removed. The 3-pack will be processed, tracked and downloaded to the underground repository and emplaced along with CH TRU mixed waste containers. The 3-pack assembly will be placed singly on the floor with no waste placed on top in the interstitial spaces around CH waste (see Figure 3). Emplacement of the 3-pack assembly of shielded containers will be performed using existing waste handling equipment and fixtures.

The handling and emplacement of shielded containers will have minimal impact on waste handling operations. The Permittees will track waste components, packaging, transportation and emplacement information using the same method as other waste that is transported and emplaced at the WIPP facility. The shielded container waste will be reported as RH TRU mixed waste as the volume of waste in the inner waste container.

The Permittees have evaluated the Drum Age Criteria (**DAC**) for the shielded container packaging configuration (Drum Age Criteria Values for the Shielded Container, June 2009). The evaluation indicates that no new DAC values are necessary because existing 55-gallon DAC values bound the shielded container.

The Permittees are proposing the following changes in this PMR:

1. Add a new container (Part 3, Condition 3.3.1., Part 4, Table 4.1.1., Condition 4.3.1., Attachment A1, Section A1-1b(1), Section A1-1c(1), Section A1-1d(2), Section A1-1d(3), Table A1-2, Figure A1-37,

Attachment A2, Section A2-1, Section A2-2a(1), Section A2-2b, Table A2-1, Attachment A4, Section A4-3, Attachment C1, Section C1-1a, Section C1-1a(1), Table C1-8 footnote, Attachment D, Section D-1d, Section D-1e(1), Attachment E, Section E-1b(1), Attachment H1, Introduction.

2. Revise Part 4, Table 4.1.1 to remove the container equivalent column since RH TRU mixed waste will be disposed of in both canisters and shielded containers.
3. Add figure of shielded container (Attachment A1).
4. Add "Shielded Containers" to Attachment C1, Sections C1-1a and C1-1a(1) and revise Table C1-8 indicating that the 55-gallon drum DAC bounds the shielded container.

Appendix A provides a detailed list of changes by Permit section. Proposed text changes are included in Appendix B of this PMR.

2. 20.4.1.900 NMAC (incorporating 40 CFR §270.42(b)(1)(ii)), requires the applicant to identify that the modification is a Class 2 modification.

This PMR proposes to add a new container to the Permit. The Permittees request that these changes be reviewed as a Class 2 as specified in 20.4.1.900 NMAC (incorporating 40 CFR, §270.42(a)(3)) to allow for public comment on this requested change.

3. 20.4.1.900 NMAC (incorporating 40 CFR §270.42(b)(1)(iii)), requires the applicant to explain why the modification is needed.

This PMR is necessary to add a shielded container as an acceptable waste container at the WIPP facility.

The Permittees are proposing to package a portion of the RH TRU mixed waste inventory in shielded containers for emplacement at the WIPP facility. The use of the shielded containers will enable DOE to simplify the packaging and management of RH TRU mixed waste. The shielded containers will be transported to the WIPP facility in the HalfPACT transportation container. The shielded containers will be managed and emplaced in the rooms of the repository as CH TRU mixed waste. The containers comply with DOT Type 7A standards and they will have a surface dose rate of less than 200 mrem/h.

The RH TRU mixed waste that will be packaged in shielded containers is included in the current inventory for the WIPP facility. No change in the permitted aboveground hazardous waste storage or underground disposal unit capacity is required. Candidate RH TRU mixed waste streams for shipment and disposal in shielded containers will be selected based on the requirement to keep the radiation surface dose rate at the external surface of the shielded containers below 200 mrem/h. The volume of waste emplaced in shielded containers will remain designated as RH TRU mixed waste in the WWIS and will be counted against the RH TRU mixed waste repository limit of 7,080 m³.

The Table of Changes in this PMR describes each change that has been made and why that change is necessary.

4. **20.4.1.900 NMAC (incorporating 40 CFR §270.42 (b)(1)(iv)) requires the applicant to provide the applicable information required by 40 CFR §270.13 through §270.21, §270.62 and §270.63.**

The attached regulatory crosswalk describes those portions of the WIPP Permit that are affected by this PMR. Where applicable, regulatory citations in this modification reference Title 20, Chapter 4, Part 1, NMAC, revised March 2009, incorporating the CFR, Title 40 (40 CFR Parts 264 and 270). 40 CFR §270.16 through §270.22, §270.62, §270.63 and §270.66 are not applicable at WIPP. Consequently, they are not listed in the regulatory crosswalk table. 40 CFR §270.23 is applicable to the WIPP Hazardous Waste Disposal Units (**HWDUs**). This modification does not impact the conditions associated with the HWDUs.

5. **20.4.1.900 NMAC (incorporating 40 CFR §270.11(d)(1) and 40 CFR §270.30(k)) require that any person signing under paragraph a and b must certify the document in accordance with 20.4.1.900 NMAC.**

The transmittal letter for this PMR contains the signed certification statement in accordance with Permit Part 1, Condition 1.9. of the WIPP Permit.

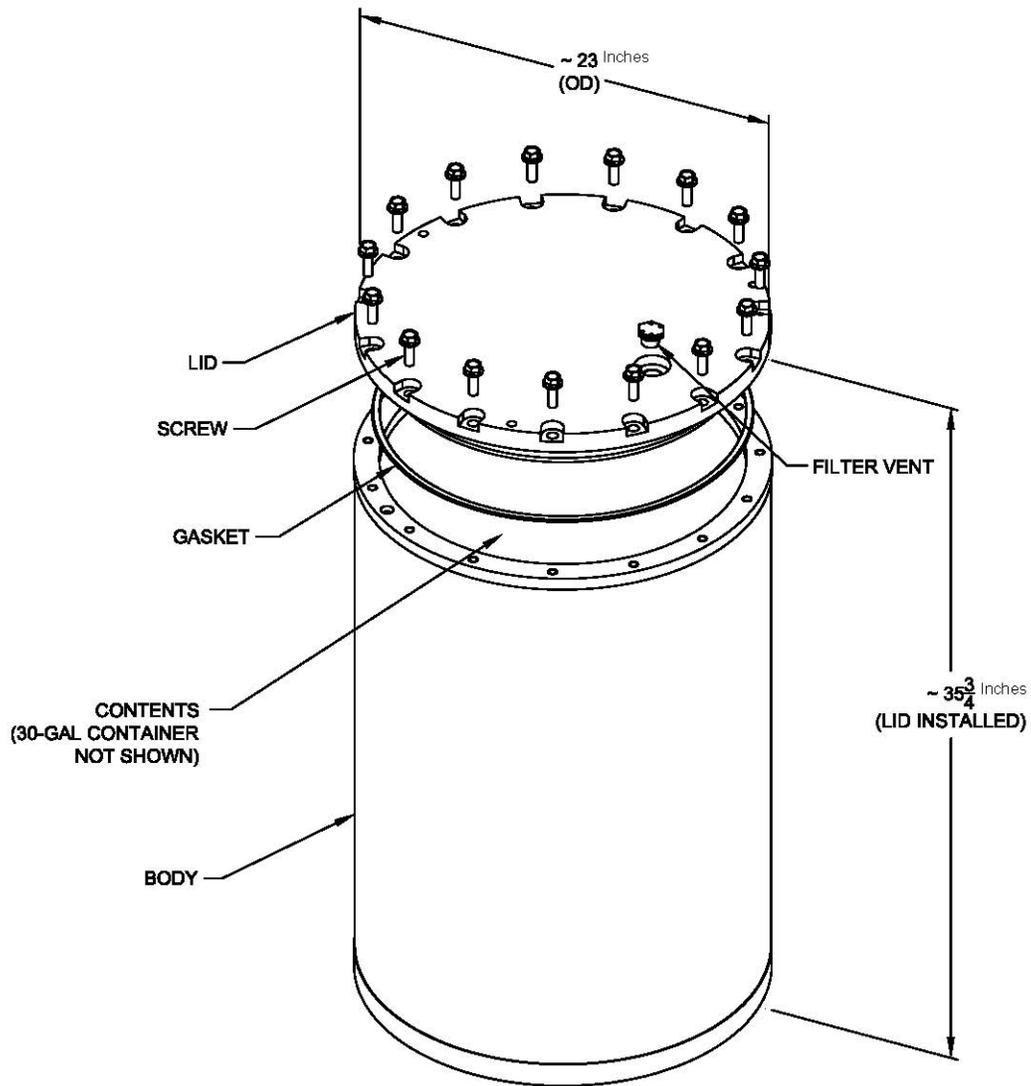


Figure 1
Shielded Container

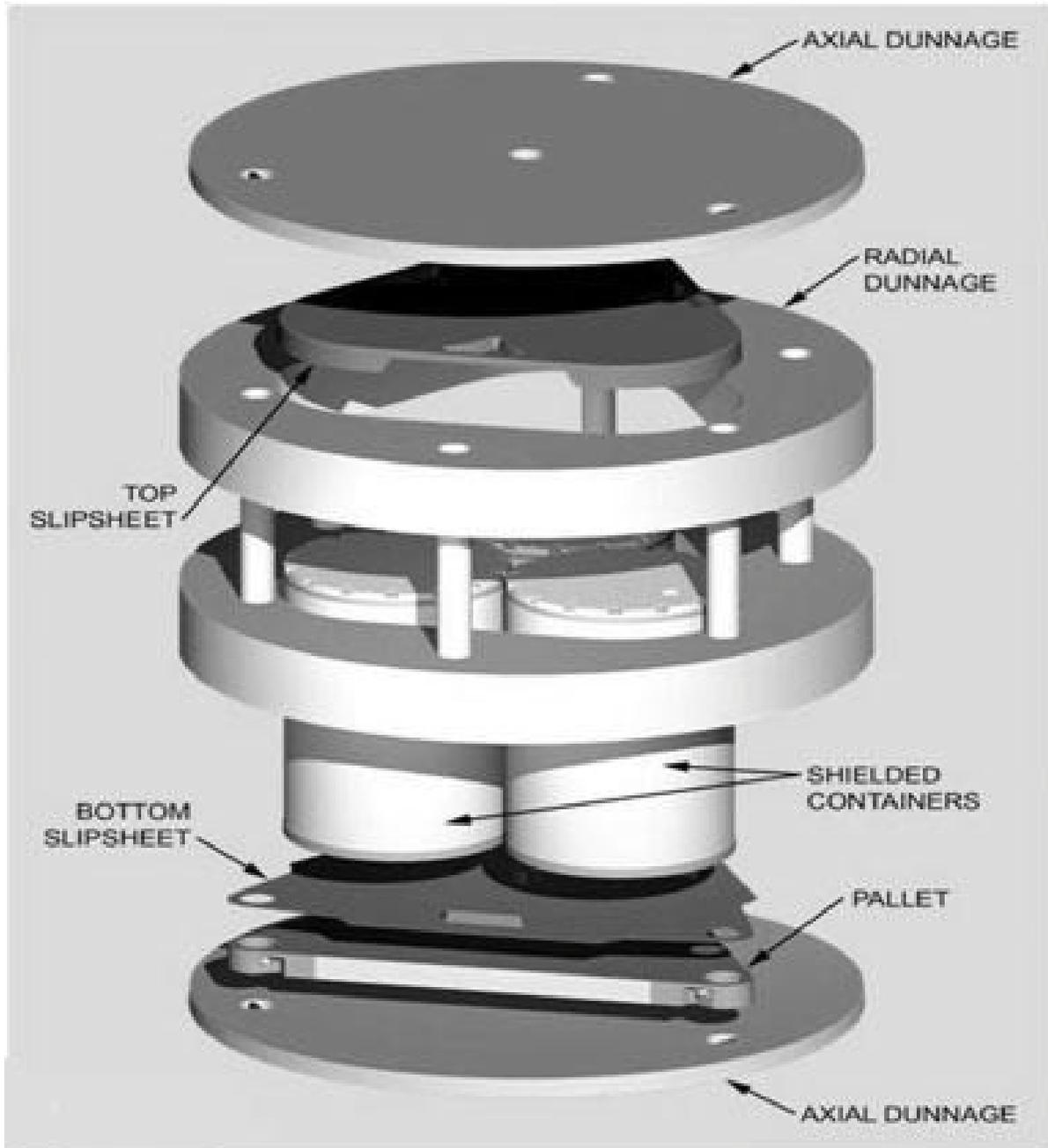


Figure 2
3-Pack Assembly of Shielded Containers with Axial and Radial Dunnage

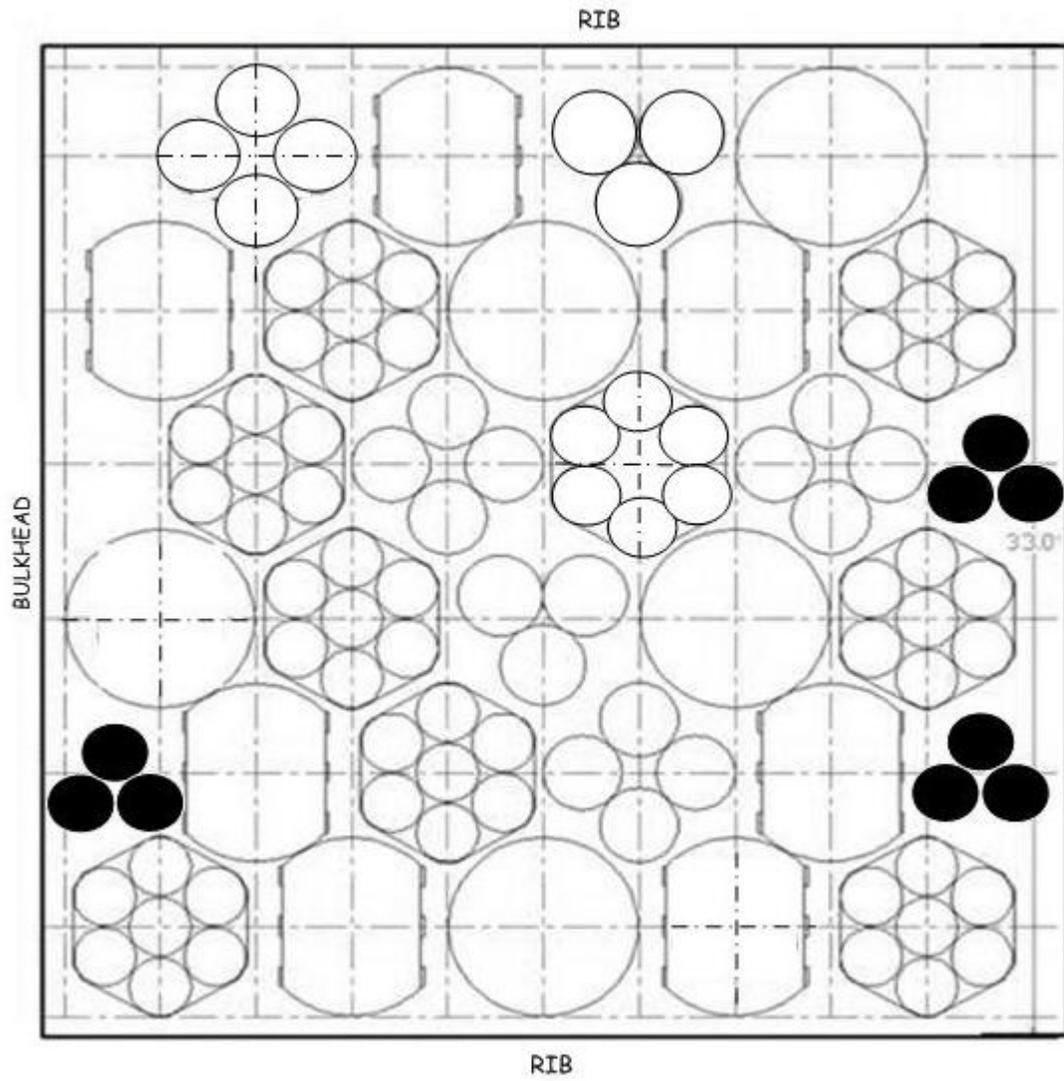


Figure 3
Shielded Containers – Randomly Placed in the Interstitial Spaces in Waste Rows

Regulatory Crosswalk

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the Permit or Permit Application	Yes	No
§270.13		Contents of Part A permit application	Attachment B, Part A		✓
§270.14(b)(1)		General facility description	Attachment A		✓
§270.14(b)(2)	§264.13(a)	Chemical and physical analyses	Attachment C		✓
§270.14(b)(3)	§264.13(b)	Development and implementation of waste analysis plan	Attachment C		✓
	§264.13(c)	Off-site waste analysis requirements	Attachment C		✓
§270.14(b)(4)	§264.14(a-c)	Security procedures and equipment	Part 2.6		✓
§270.14(b)(5)	§264.15(a-d)	General inspection requirements	Attachment E		✓
	§264.174	Container inspections	Attachment E	✓	
§270.23(a)(2)	§264.602	Miscellaneous units inspections	Attachment E		✓
§270.14(b)(6)		Request for waiver from preparedness and prevention requirements of Part 264 Subpart C	NA		
§270.14(b)(7)	264 Subpart D	Contingency plan requirements	Attachment D		✓
	§264.51	Contingency plan design and implementation	Attachment D		✓
	§264.52 (a) & (c-f)	Contingency plan content	Attachment D	✓	
	§264.53	Contingency plan copies	Attachment D		✓
	§264.54	Contingency plan amendment	Attachment D		✓
	§264.55	Emergency coordinator	Attachment D		✓
	§264.56	Emergency procedures	Attachment D		✓
§270.14(b)(8)		Description of procedures, structures or equipment for:	Part 2.10		✓
§270.14(b)(8) (i)		Prevention of hazards in unloading operations (e.g., ramps and special forklifts)	Part 2.10		✓
§270.14(b)(8) (ii)		Runoff or flood prevention (e.g., berms, trenches, and dikes)	Part 2.10		✓
§270.14(b)(8) (iii)		Prevention of contamination of water supplies	Part 2.10		✓
§270.14(b)(8) (iv)		Mitigation of effects of equipment failure and power outages	Part 2.10		✓
§270.14(b)(8) (v)		Prevention of undue exposure of personnel (e.g., personal protective equipment)	Part 2.10		✓
§270.14(b)(8) (vi) §270.23(a)(2)	§264.601	Prevention of releases to the atmosphere	Part Part 4 Attachment A2 Attachment N		✓
	264 Subpart C	Preparedness and Prevention	Part 2.10		✓
	§264.31	Design and operation of facility	Part 2.10		✓
	§264.32	Required equipment	Part 2.10 Attachment D		✓
	§264.33	Testing and maintenance of equipment	Attachment E		✓
	§264.34	Access to communication/alarm system	Part 2.10		✓
	§264.35	Required aisle space	Part 2.10		✓
	§264.37	Arrangements with local authorities	Attachment D		✓
§270.14(b)(9)	§264.17(a-c)	Prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes	Part 2.10		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the Permit or Permit Application	Yes	No
§270.14(b)(10)		Traffic pattern, volume, and controls, for example: Identification of turn lanes Identification of traffic/stacking lanes, if appropriate Description of access road surface Description of access road load-bearing capacity Identification of traffic controls	Attachment A4	✓	
§270.14(b)(11)(i) and (ii)	§264.18(a)	Seismic standard applicability and requirements	Part B, Rev. 6 Chapter B		✓
§270.14(b)(11)(iii-v)	§264.18(b)	100-year floodplain standard	Part B, Rev. 6 Chapter B		✓
	§264.18(c)	Other location standards	Part B, Rev. 6 Chapter B		✓
§270.14(b)(12)	§264.16(a-e)	Personnel training program	Part 2 Attachment F		✓
§270.14(b)(13)	264 Subpart G	Closure and post-closure plans	Attachment G & H		✓
§270.14(b)(13)	§264.111	Closure performance standard	Attachment G		✓
§270.14(b)(13)	§264.112(a), (b)	Written content of closure plan	Attachment G		✓
§270.14(b)(13)	§264.112(c)	Amendment of closure plan	Attachment G		✓
§270.14(b)(13)	§264.112(d)	Notification of partial and final closure	Attachment G		✓
§270.14(b)(13)	§264.112(e)	Removal of wastes and decontamination/dismantling of equipment	Attachment G		✓
§270.14(b)(13)	§264.113	Time allowed for closure	Attachment G		✓
§270.14(b)(13)	§264.114	Disposal/decontamination	Attachment G		✓
§270.14(b)(13)	§264.115	Certification of closure	Attachment G		✓
§270.14(b)(13)	§264.116	Survey plat	Attachment G		✓
§270.14(b)(13)	§264.117	Post-closure care and use of property	Attachment H		✓
§270.14(b)(13)	§264.118	Post-closure plan; amendment of plan	Attachment H		✓
§270.14(b)(13)	§264.178	Closure/containers	Attachment G		✓
§270.14(b)(13)	§264.601	Environmental performance standards-Miscellaneous units	Attachment G		✓
§270.14(b)(13)	§264.603	Post-closure care	Attachment G		✓
§270.14(b)(14)	§264.119	Post-closure notices	Attachment H		✓
§270.14(b)(15)	§264.142	Closure cost estimate	NA		✓
	§264.143	Financial assurance	NA		✓
§270.14(b)(16)	§264.144	Post-closure cost estimate	NA		✓
	§264.145	Post-closure care financial assurance	NA		✓
§270.14(b)(17)	§264.147	Liability insurance	NA		✓
§270.14(b)(18)	§264.149-150	Proof of financial coverage	NA		✓
§270.14(b)(19)(i), (vi), (vii), and (x)		Topographic map requirements Map scale and date Map orientation Legal boundaries Buildings Treatment, storage, and disposal operations	Attachment B Part A		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the Permit or Permit Application	Yes	No
		Run-on/run-off control systems Fire control facilities			
§270.14(b)(19)(ii)	§264.18(b)	100-year floodplain	Attachment B Part A		✓
§270.14(b)(19)(iii)		Surface waters	Attachment B Part A		✓
§270.14(b)(19)(iv)		Surrounding Land use	Attachment B Part A		✓
§270.14(b)(19)(v)		Wind rose	Attachment B Part A		✓
§270.14(b)(19)(viii)	§264.14(b)	Access controls	Attachment B Part A		✓
§270.14(b)(19)(ix)		Injection and withdrawal wells	Attachment B Part A		✓
§270.14(b)(19)(xi)		Drainage on flood control barriers	Attachment B Part A		✓
§270.14(b)(19)(xii)		Location of operational units	Attachment B Part A		✓
§270.14(b)(20)		Other federal laws Wild and Scenic Rivers Act National Historic Preservation Act Endangered Species Act Coastal Zone Management Act Fish and Wildlife Coordination Act Executive Orders	Attachment B Part A		✓
§270.15	§264 Subpart I	Containers	Attachment A1	✓	
	§264.171	Condition of containers	Attachment A1		✓
	§264.172	Compatibility of waste with containers	Attachment A1		✓
	§264.173	Management of containers	Attachment A1	✓	
	§264.174	Inspections	Attachment E Attachment A1		✓
§270.15(a)	§264.175	Containment systems	Attachment A1		✓
§270.15(c)	§264.176	Special requirements for ignitable or reactive waste	Part 2		✓
§270.15(d)	§264.177	Special requirements for incompatible wastes	Part 2		✓
	§264.178	Closure	Attachment G		✓
§270.15(e)	§264.179	Air emission standards	Part 4 Attachment N	✓	
§270.23	264 Subpart X	Miscellaneous units	Attachment A2	✓	
§270.23(a)	§264.601	Detailed unit description	Attachment A2		✓
§270.23(b)	§264.601	Hydrologic, geologic, and meteorologic assessments	Part 5 Attachment L		✓
§270.23(c)	§264.601	Potential exposure pathways	Part 4 Attachment A2 Attachment N		✓
§270.23(d)		Demonstration of treatment	NA		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the Permit or Permit Application	Yes	No
		effectiveness			
	§264.602	Monitoring, analysis, inspection, response, reporting, and corrective action	Part 2 Part 4 Part 5 Attachment A2 Attachment N		✓
	§264.603	Post-closure care	Attachment H Attachment H1	✓	
	264 Subpart E	Manifest system, record keeping, and reporting	Part 2 Attachment C		✓

**Appendix A
Table of Changes**

Table of Changes

Affected Permit Section	Explanation of Change	Page Number
Part 3, Condition 3.3.1.	Add 3.3.1.8. to add shielded container as an acceptable container at the WIPP facility.	B-2
Part 4, Table 4.1.1.	Remove "container equivalent" column since the RH TRU mixed waste may now be disposed at the WIPP facility in containers other than canisters.	B-3
Part 4, Condition 4.3.1.	Add 4.3.1.8 to add a shielded container as an acceptable container at the WIPP facility.	B-4
Attachment A1, Section A1-1b(1)	Add shielded container to the Container Description section of the Permit. Add Figure A1-37.	B-5
Attachment A1, Section A1-1c(1)	Add shielded container to CH Bay Operations description.	B-5
Attachment A1, Section A1-1d(2)	Revise the contents of what may be received in a HalfPACT relative to container management practices.	B-5
Attachment A1, Section A1-1d(3)	Revise what containers RH TRU mixed waste may be shipped in.	B-6
Attachment A1, Table A1-2	Revise Table A1-2 to add shielded containers.	B-7
Attachment A1, Figure A1-37	Add figure A1-37 Typical Shielded Container.	B-8
Attachment A2, Section A2-1	Add container to the Description of the Geologic Repository. Add "disposed in the panel".	B-9
Attachment A2, Section A2-2a(1)	Add shielded container to Geologic Repository Design and Process Description.	B-9
Attachment A2, Section A2-2b	Add shielded container to Geologic Repository Design and Process Description.	B-9
Attachment A2, Table A2-1	Revise Table A2-1 to add shielded containers.	B-10
Attachment A4, Section A4-3	Add shielded container to Waste Handling Building Traffic description.	B-11
Attachment C1, Section C1-1a	Clarify that the shielded containers are bounded by the 55-gallon drum DAC.	B-12
Attachment C1, Section C1-1a(1)	Clarify that the shielded containers are bounded by the 55-gallon drum DAC.	B-12
Attachment C1, Table C1-8	Clarify that the shielded containers are bounded by the 55-gallon drum DAC.	B-14
Attachment D, Section D-1d	Add shielded container to the Description of Containers section of the Contingency Plan.	B-16
Attachment D, Section D-1e(1)	Add shielded container to the Description of Containers section of the Contingency Plan.	B-16
Attachment E, Section E-1b(1)	Add shielded container to CH Bay Operations description.	B-17
Attachment H1, Introduction	Add shielded container to the description of CH Containers.	B-18

Proposed Revised Permit Text

Proposed Revised Permit Text:

3.3.1. Acceptable Storage Containers

The Permittees shall use containers that comply with the requirements for U.S. Department of Transportation shipping container regulations (49 CFR §173 - Shippers - General Requirements for Shipment and Packaging, and 49 CFR §178 - Specifications for Packaging) for storage of TRU mixed waste at WIPP. The Permittees are prohibited from storing TRU mixed waste in any container not specified in Permit Attachment A1, Section A1-1b, as set forth below:

3.3.1.8. Shielded Container

Each 30-gallon inner container has a gross internal volume of 4.0 ft³ (0.11 m³). This container will be used to emplace RH TRU mixed waste, but the shielding will allow it to be managed as CH TRU mixed waste. For the purpose of this Permit, shielded containers are managed and handled as CH TRU mixed waste containers, but will remain counted towards the volume of RH TRU mixed waste containers.

Table 4.1.1

Table 4.1.1 - Underground HWDUs				
Description¹	Waste Type	Maximum Capacity²	Container Equivalent	Final Waste Volume
Panel 1	CH TRU	636,000ft ³ (18,000 m ³)		370,800 ft ³ (10,500 m ³)
Panel 2	CH TRU	636,000 ft ³ (18,000 m ³)		635,600 ft ³ (17,998 m ³)
Panel 3	CH TRU	662,150 ft ³ (18,750 m ³)		603,600 ft ³ (17,092 m ³)
Panel 4	CH TRU	662,150 ft ³ (18,750 m ³)		503,500 ft ³ (14,258 m ³)
	RH TRU	12,570 ft ³ (356 m ³)	400 RH TRU Canisters	6,200 ft ³ (176 m ³)
Panel 5	CH TRU	662,150 ft ³ (18,750 m ³)		
	RH TRU	15,720 ft ³ (445 m ³)	500 RH TRU Canisters	
Panel 6	CH TRU	662,150 ft ³ (18,750 m ³)		
	RH TRU	18,860 ft ³ (534 m ³)	600 RH TRU Canisters	
Panel 7	CH TRU	662,150 ft ³ (18,750 m ³)		
	RH TRU	22,950 ft ³ (650 m ³)	730 RH TRU Canisters	
Panel 8	CH TRU	662,150 ft ³ (18,750 m ³)		
	RH TRU	22,950 ft ³ (650 m ³)	730 RH TRU Canisters	
Total	CH TRU	5,244,900 ft³ (148,500 m³)		
	RH TRU	93,050 ft³ (2,635 m³)	2960 RH TRU Canisters	

¹ The area of each panel is approximately 124,150 ft² (11,533 m²).

² "Maximum Capacity" is the maximum volume of TRU mixed waste that may be emplaced in each panel. The maximum repository capacity of "6.2 million cubic feet of transuranic waste" is specified in the WIPP Land Withdrawal Act (Pub. L. 102-579, as amended).

4.3. DISPOSAL CONTAINERS

4.3.1 Acceptable Disposal Containers

The Permittees shall use containers that comply with the requirements for U.S. Department of Transportation shipping container regulations (49 CFR §173 - Shippers - General Requirements for Shipment and Packaging, and 49 CFR §178 - Specifications for Packaging) for disposal of TRU mixed waste at WIPP. The Permittees are prohibited from disposing TRU mixed waste in any container not specified in Permit Attachment A1 (Container Storage), Section A1-1b, as set forth below:

4.3.1.8. Shielded container

Shielded containers are configured as a 3-pack.

A1-1b(1) CH TRU Mixed Waste Containers

Contact handled (CH) TRU mixed waste containers will be either 55-gal (208-L) drums singly or arranged into 7-packs, 85-gal (322-L) drums singly or arranged into 4-packs, 100-gal (379 L) drums singly or arranged into 3-packs, shielded containers arranged as 3-packs, ten-drum overpacks (TDOP), standard large box 2s (SLB2), or SWBs. A summary description of each CH TRU mixed waste container type is provided below.

Shielded Container

The shielded container meets the requirements for DOT specification 7A (Figure A1-37).

Shielded containers having a 30-gallon inner container which has a gross internal volume of 4.0 ft³ (0.11 m³). One or more filter vents will be installed in the shielded container lid to prevent the escape of radioactive particulates and to prevent internal pressurization. This container will be used to emplace RH TRU mixed waste, but the shielding will allow it to be managed as CH TRU mixed waste.

A1-1c(1) Waste Handling Building Container Storage Unit (WHB Unit)CH TRU Mixed Waste

- TRUPACT-II and HalfPACT Management

Once unloaded from the Contact-Handled Packaging, CH TRU mixed waste containers (7-packs, 3-packs, 4-packs, 3-packs of shielded containers, SWBs, or TDOPs or any combination thereof) are placed in one of two positions on the facility pallet or on a containment pallet. The waste containers are stacked, on the facility pallets (one- or two-high, depending on weight considerations). Waste on containment pallets will be stacked one-high. The use of facility or containment pallets will elevate the waste at least 6 in. (15 cm) from the floor surface. Pallets of waste will then be relocated to the CH Bay Storage Area of the WHB Unit for normal storage.

A1-1d(2) CH TRU Mixed Waste Handling

The TRUPACT-II may hold up to two 7-packs, two 4-packs, two 3-packs, two SWBs, or one TDOP. A HalfPACT may hold seven 55-gal (208-L) drums, one SWB, one 3-pack of shielded containers, or four 85-gallon drums. The TRUPACT-III holds a single SLB2. An overhead bridge crane or Facility Transfer Vehicle will be used to remove the contents of the Contact-Handled Package and place them on a facility pallet. The containers will be visually inspected for physical damage (severe rusting, apparent structural defects, signs of pressurization, etc.) and leakage to ensure they are in good condition prior to storage. Waste containers will also be checked for external surface contamination. If a primary waste container is not in good condition, the Permittees will overpack the container, repair/patch the container in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or return the container to the generator.

A1-1d(3) RH TRU Mixed Waste Handling

The RH TRU mixed waste that is not in a shielded container will be received in the RH-TRU 72-B cask or CNS 10-160B cask loaded on a trailer, as illustrated in process flow diagrams in Figures A1-26 and A1-27, respectively. RH TRU mixed waste received in shielded containers will be handled as CH TRU mixed waste. These are shown schematically in Figures A1-28 and A1-29. Upon arrival at the gate, external radiological surveys, security checks, shipping documentation reviews are performed and the Uniform Hazardous Waste Manifest is signed. The generator's copy of the Uniform Hazardous Waste Manifest is returned to the generator. Should the results of the contamination survey exceed acceptable levels, the shipping cask and transport trailer remain outside the WHB in the Parking Area Unit, and the appropriate radiological boundaries (i.e., ropes, placards) are erected around the shipping cask and transport trailer. A determination will be made whether to return the cask to the originating site or to decontaminate the cask.

**Table A1-2
Waste Handling Equipment Capacities**

CAPACITIES FOR EQUIPMENT	
CH Bay overhead bridge crane	12,000 lbs.
Surface forklifts	26,000 lbs. (CH Bay forklift) 70,000 lbs. (TRUPACT-III Handler forklift)
Facility Pallet	25,000 lbs.
Adjustable center-of-gravity lift fixture	10,000 lbs.
Facility Transfer Vehicle	30,000 lbs.
Yard Transfer Vehicle	60,000 lbs.
MAXIMUM GROSS WEIGHTS OF CONTAINERS	
Seven-pack of 55-gallon drums	7,000 lbs.
Four-pack of 85-gallon drums	4,500 lbs.
Three-pack of 100-gallon drums	3,000 lbs.
Ten-drum overpack	6,700 lbs.
Standard waste box	4,000 lbs.
Standard large box 2	10,500 lbs.
<u>Shielded container</u>	<u>2,260 lbs.</u>
MAXIMUM NET EMPTY WEIGHTS OF EQUIPMENT	
TRUPACT-II	13,140 lbs.
HalfPACT	10,500 lbs.
TRUPACT-III	43,600 lbs.
Adjustable center of gravity lift fixture	2,500 lbs.
Facility pallet	4,120 lbs.

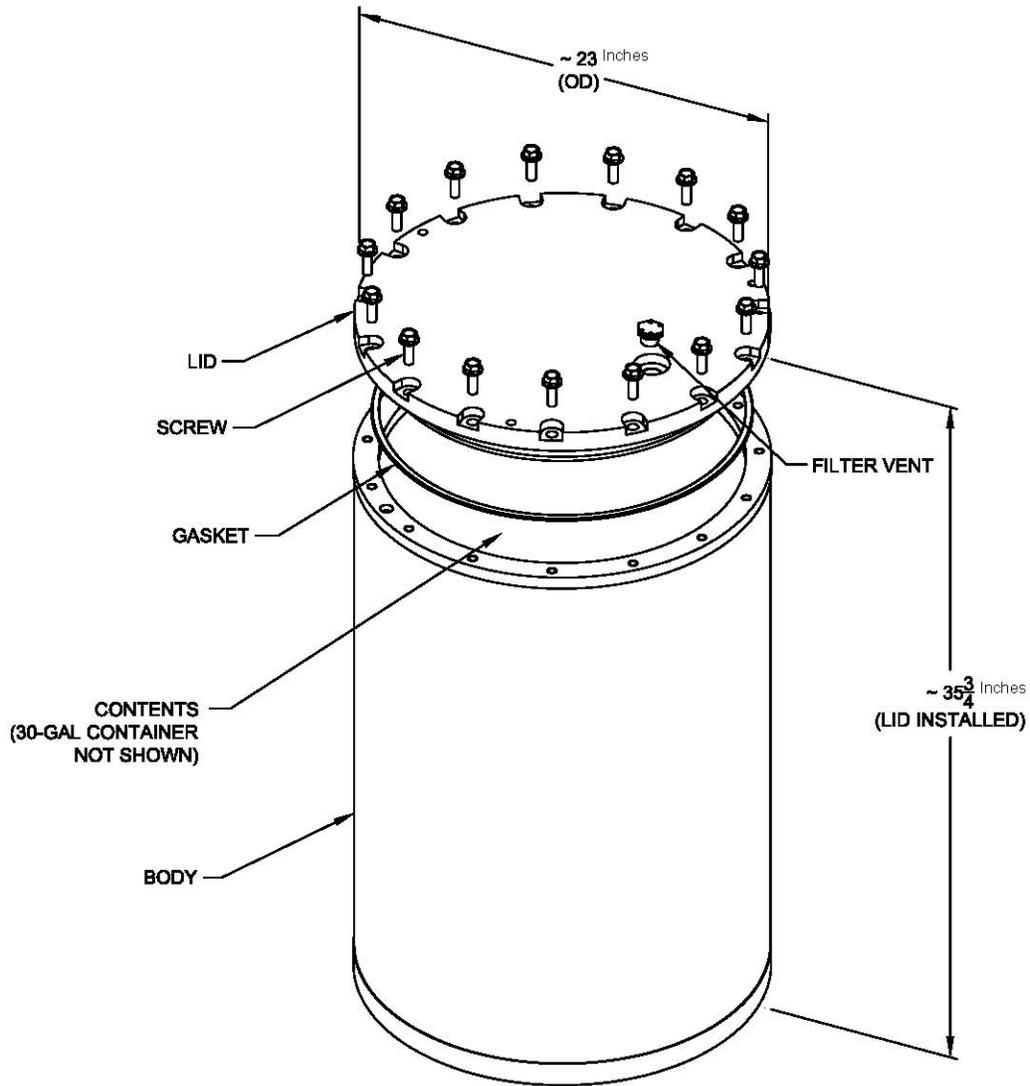


Figure A1-37
Typical Shielded Container

A2-1 Description of the Geologic Repository

Panels 4 through 8 provide room for up to 93,050 ft³ (2,635 m³) of RH TRU mixed waste. RH TRU mixed waste containers may be disposed of in up to 730 boreholes per panel, subject to the limitations in Permit Part 4, Section 4.1.1.2.ii. These boreholes shall be drilled on nominal eight-foot centers, horizontally, about mid-height in the ribs of a disposal room. The thermal loading from RH TRU mixed waste disposed in the panel shall not exceed 10 kilowatts per acre when averaged over the area of a panel, as shown in Permit Attachment A3, plus 100 feet of each of a Panel's adjoining barrier pillars.

A2-2a(1) CH TRU Mixed Waste Handling Equipment

Facility Pallets

The facility pallet is a fabricated steel unit designed to support 7-packs, 3-packs, or 4-packs of drums, standard waste boxes (**SWBs**), ten-drum overpacks (**TDOPs**), or a standard large box 2 (**SLB2**), and has a rated load of 25,000 pounds (lbs.) (11,430 kilograms (kg)). The facility pallet will accommodate up to four 7-packs, four 3-packs, two 3-packs of shielded containers, or four 4-packs of drums, four SWBs (in two stacks of two units), two TDOPs, or one SLB2. Loads are secured to the facility pallet during transport to the emplacement area. Facility pallets are shown in Figure A2-3. Fork pockets in the side of the pallet allow the facility pallet to be lifted and transferred by forklift to prevent direct contact between TRU mixed waste containers and forklift tines. This arrangement reduces the potential for puncture accidents. WIPP facility operational documents define the operational load of the facility pallet to ensure that the rated load of a facility pallet is not exceeded.

A2-2b Geologic Repository Process Description

CH TRU Mixed Waste Emplacement

CH TRU mixed waste containers will arrive by tractor-trailer at the WIPP facility in sealed shipping containers (e.g., TRUPACT-IIs or HalfPACTs), at which time they will undergo security and radiological checks and shipping documentation reviews. The trailers carrying the shipping containers will be stored temporarily at the Parking Area Container Storage Unit (Parking Area Unit). A forklift will remove the Contact Handled Packages from the transport trailers and a forklift or Yard Transfer Vehicle will transport them into the Waste Handling Building Container Storage Unit for unloading of the waste containers. Each TRUPACT-II may hold up to two 7-packs, two 4-packs, two 3-packs, two SWBs, or one TDOP. Each HalfPACT may hold up to seven 55-gal (208 L) drums, one SWB, one 3-pack of shielded containers, or four 85-gal (322 L) drums. Each TRUPACT-III will hold one SLB2. An overhead bridge crane or Facility Transfer Vehicle with transfer table will be used to remove the waste containers from the Contact Handled Packaging and place them on a facility or containment pallet. Each facility pallet has two recessed pockets to accommodate two sets of 7-packs, two sets of 3-packs, two sets of 4-packs, two SWBs stacked two-high, two TDOPs, or one SLB2. Each stack of waste containers will be secured prior to transport underground (see Figure A2-3). A forklift or the facility transfer vehicle will transport the loaded facility pallet to the conveyance loading room adjacent to the Waste Shaft. The facility transfer vehicle will be driven onto the waste shaft conveyance deck, where the loaded facility pallet will be transferred to the waste shaft conveyance, and the facility transfer vehicle will be backed off. Containers of CH TRU mixed waste (55-gal (208 L) drums,

SWBs, 85-gal (322 L) drums, 100-gal (379 L) drums, and TDOPs) can be handled individually, if needed, using the forklift and lifting attachments (i.e., drum handlers, parrot beaks).

**Table A2-1
CH TRU Mixed Waste Handling Equipment Capacities**

Capacities for Equipment	
Facility Pallet	25,000 lbs.
Facility Transfer Vehicle	26,000 lbs.
Underground transporter	28,000 lbs.
Underground forklift	12,000 lbs.
Maximum Gross Weights of Containers	
Seven-pack of 55-gallon drums	7,000 lbs.
Four-pack of 85-gallon drums	4,500 lbs.
Three-pack of 100-gallon drums	3,000 lbs.
Ten-drum overpack	6,700 lbs.
Standard waste box	4,000 lbs.
Standard large box 2	10,500 lbs.
<u>Shielded container</u>	<u>2,260 lbs.</u>
Maximum Net Empty Weights of Equipment	
TRUPACT-II	13,140 lbs.
HalfPACT	10,500 lbs.
TRUPACT-III	43,600 lbs.
Facility pallet	4,120 lbs.

A4-3 Waste Handling Building Traffic

The TRUPACT-II may hold up to two 55-gallon drum seven-packs, two 85-gallon drum four-packs, two 100-gallon drum three-packs, two standard waste boxes (SWB), or one ten-drum overpack (**TDOP**). A HalfPACT may hold seven 55-gallon drums, one SWB, one 3-pack of shielded containers, or four 85-gallon drums. The TRUPACT-III holds a single SLB2. A six-ton overhead bridge crane or Facility Transfer Vehicle with a transfer table will be used to remove the contents of the Contact Handled Package. Waste containers will be surveyed for radioactive contamination and decontaminated or returned to the Contact Handled Package as necessary.

Each facility pallet will accommodate four 55-gallon drum seven-packs, four SWBs, four 85-gallon drum four-packs, four 100-gallon drum three-packs, two 3-packs of shielded containers, two TDOPs, or an SLB2. Waste containers will be secured to the facility pallet prior to transfer. A forklift or facility transfer vehicle will transport the loaded facility pallet the air lock at the Waste Shaft (Figures A4-3, A4-3a, and A4-3b). The facility transfer vehicle will be driven onto the waste shaft conveyance deck, where the loaded facility pallet will be transferred to the waste shaft conveyance and downloaded for emplacement.

C1-1a Method Requirements

For those waste streams without an acceptable knowledge (**AK**) Sufficiency Determination approved by the U.S. Department of Energy (**DOE**), containers shall be randomly selected from waste streams designated as summary category S5000 (Debris waste) and shall be categorized under one of the sampling scenarios shown in Table C1-5 and depicted in Figure C1-1. If the container is categorized under Scenario 1, the applicable drum age criteria (**DAC**) from Table C1-6 must be met prior to headspace gas sampling. If the container is categorized under Scenario 2, the applicable Scenario 1 DAC from Table C1-6 must be met prior to venting the container and then the applicable Scenario 2 DAC from Table C1-7 must be met after venting the container. The DAC for Scenario 2 containers that contain filters or rigid liner vent holes other than those listed in Table C1-7 shall be determined using footnotes “a” and “b” in Table C1-7. Containers that have not met the Scenario 1 DAC at the time of venting must be categorized under Scenario 3. Containers categorized under Scenario 3 must be placed into one of the Packaging Configuration Groups listed in Table C1-8. If a specific packaging configuration cannot be determined based on the data collected during packaging and/or repackaging (Attachment C, Section C-3d(1)), a conservative default Packaging Configuration Group of 3 for 55-gallon drums and shielded containers, 6 for Standard Waste Boxes (**SWBs**) ten-drum overpacks (**TDOPs**), and standard large box 2s (**SLB2s**), and 8 for 85-gallon and 100-gallon drums must be assigned, provided the drums do not contain pipe component packaging. If a container is designated as Packaging Configuration Group 4 (i.e., a pipe component), the headspace gas sample must be taken from the pipe component headspace. Drums, TDOPs, SLB2s, or SWBs that contain compacted 55-gallon drums containing a rigid liner may not be disposed of under any packaging configuration unless headspace gas sampling was performed before compaction in accordance with this waste analysis plan (**WAP**). The DAC for Scenario 3 containers that contain rigid liner vent holes that are undocumented during packaging, repackaging, and/or venting (Section C1-1a[4][ii]) shall be determined using the default conditions in footnote “b” in Table C1-9. The DAC for Scenario 3 containers that contain filters that are either undocumented or are other than those listed in Table C1-9 shall be determined using footnote ‘a’ in Table C1-9. Each of the Scenario 3 containers shall be sampled for headspace gas after waiting the DAC in Table C1-9 based on its packaging configuration (note: Packaging Configuration Groups 4, 5, 6, 7, and 8 are not summary category group dependent, and 85-gallon drum, 100-gallon drum, SWB, TDOP, and SLB2 requirements apply when the 85-gallon drum, 100-gallon drum, SWB, TDOP, or SLB2 is used for the direct loading of waste).

C1-1a(1) General Requirements

For all retrievably stored waste containers, the rigid liner vent hole diameter must be assumed to be 0.3 inches unless a different size is documented during drum venting or repackaging. For all retrievably stored waste containers, the filter hydrogen diffusivity must be assumed to be the most restrictive unless container-specific information clearly identifies a filter model and/or diffusivity characteristic that is less restrictive. For all retrievably stored waste containers that have not been repackaged, acceptable knowledge shall not be used to justify any packaging configuration less conservative than the default (i.e., Packaging Configuration Group 3 for 55-gallon drums and shielded containers, 6 for SWBs TDOPs, and SLB2s, and 8 for 85-gallon and 100-gallon drums). For information reporting purposes listed above, sites may report the default packaging configuration for retrievably stored waste without further verification.

Drum age criteria apply only to 55-gallon drums, 85-gallon drums, 100-gallon drums, SWBs, TDOPs, and SLB2s and shielded containers. Drum age criteria for all other container types must be established through permit modification prior to performing headspace gas sampling.

**Table C1-8
Scenario 3 Packaging Configuration Groups**

Packaging Configuration Group	Covered S5000 Packaging Configuration Groups
Packaging Configuration Group 1, 55-gal drums ^a	<ul style="list-style-type: none"> • No layers of confinement, filtered inner lid ^b • No inner bags, no liner bags (bounding case)
Packaging Configuration Group 2, 55-gal drums ^a	<ul style="list-style-type: none"> • 1 inner bag • 1 filtered inner bag • 1 liner bag • 1 filtered liner bag • 1 inner bag, 1 liner bag • 1 filtered inner bag, 1 filtered liner bag • 2 inner bags • 2 filtered inner bags • 2 inner bags, 1 liner bag • 2 filtered inner bags, 1 filtered liner bag • 3 inner bags • 3 filtered inner bags • 3 filtered inner bags, 1 filtered liner bag • 3 inner bags, 1 liner bag (bounding case)
Packaging Configuration Group 3, 55-gal drums <u>and shielded containers</u> ^a	<ul style="list-style-type: none"> • 2 liner bags • 2 filtered liner bags • 1 inner bag, 2 liner bags • 1 filtered inner bag, 2 filtered liner bags • 2 inner bags, 2 liner bags • 2 filtered inner bags, 2 filtered liner bags • 3 filtered inner bags, 2 filtered liner bags • 4 inner bags • 3 inner bags, 2 liner bags • 4 inner bags, 2 liner bags (bounding case)
Packaging Configuration Group 4, pipe components	<ul style="list-style-type: none"> • No layers of confinement inside a pipe component • 1 filtered inner bag, 1 filtered metal can inside a pipe component • 2 inner bags inside a pipe component • 2 filtered inner bags inside a pipe component • 2 filtered inner bags, 1 filtered metal can inside a pipe component • 2 inner bags, 1 filtered metal can inside a pipe component (bounding case)
Packaging Configuration Group 5, Standard Waste Box, Ten-Drum Overpack, or Standard Large Box 2 ^a	<ul style="list-style-type: none"> • No layers of confinement • 1 SWB liner bag (bounding case)
Packaging Configuration Group 6, Standard Waste Box, Ten-Drum Overpack, or Standard Large Box 2 ^a	<ul style="list-style-type: none"> • any combination of inner and/or liner bags that is less than or equal to 6 • 5 inner bags, 1 SWB liner bag (bounding case)
Packaging Configuration Group 7, 85-gal. drums and 100-gal. drums ^a	<ul style="list-style-type: none"> • No inner bags, no liner bags, no rigid liner, filtered inner lid (bounding case) ^b • No inner bags, no liner bags, no rigid liner

Packaging Configuration Group	Covered S5000 Packaging Configuration Groups
Packaging Configuration Group 8, 85-gal. drums and 100-gal. drums ^a	<ul style="list-style-type: none"> 4 inner bags and 2 liner bags, no rigid liner, filtered inner lid (bounding case)^b

^a If a specific Packaging Configuration Groups cannot be determined based on the data collected during packaging and/or repackaging, a conservative default Packaging Configuration Group of 3 for 55-gallon drums and shielded containers, 6 for SWBs, TDOPs, and SLB2s, and 8 for 85-gallon and 100-gallon drums must be assigned provided the drums do not contain pipe component packaging. If pipe components are present as packaging in the drums, the pipe components must be sampled following the requirements for Packaging Configuration Group 4.

^b A “filtered inner lid” is the inner lid on a double lid drum that contains a filter.

Definitions:

Liner Bags: One or more optional plastic bags that are used to control radiological contamination. Liner bags for drums have a thickness of approximately 11 mils. Liner bags are typically similar in size to the container. SWB liner bags have a thickness of approximately 14 mils. TDOPs and SLB2s use SWB liner bags.

Inner Bags: One or more optional plastic bags that are used to control radiological contamination. Inner bags have a thickness of approximately 5 mils and are typically smaller than liner bags.

D-1d Description of Containers

CH TRU mixed waste containers will be either 55-gallon (gal) (208-liter (L)) drums singly or arranged into seven (7)-packs, 85-gal (322-L) drums (used as singly or arranged into four (4)-packs, 100-gal (379 L) drums singly or arranged into three (3)-packs, shielded containers arranged as 3-packs, ten-drum overpacks (**TDOP**), 66.3 ft³ (1.88 m³) SWBs, or standard large box 2s (**SLB2**).

D-1e(1) CH Bay Operations

Once unloaded from the Contact-Handled Package, CH TRU mixed waste containers (7-packs of 55-gal drums, 3-packs of 100-gal drums, 4-packs of 85-gal drums, 3-packs of shielded containers, SWBs, TDOPs, or one SLB2) are placed on the facility pallet. The waste containers are stacked on the facility pallets (one- or two-high, depending on weight considerations). The use of facility pallets will elevate the waste at least 6 inches (in.) (15 centimeters [cm]) from the floor surface. Pallets of waste will then be stored in the CH bay. This storage area will be clearly marked to indicate the lateral limits of the storage area. This storage area will have a maximum capacity of thirteen facility pallets of waste during normal operations. These pallets will typically be in the CH Bay storage area for a period of up to five days.

E-1b(1) Container Inspection

Containers are used to manage TRU mixed waste at the WIPP facility. These containers are described in Permit Part 3. Off-site CH TRU mixed waste will arrive in 55-gallon drums arranged as seven (7)-packs, in Ten Drum Overpacks (**TDOP**), in 85-gallon drums arranged as four (4) packs, in 100-gallon drums arranged as three (3) packs, in standard waste boxes (**SWB**), or in standard large box 2s (**SLB2s**) or shielded containers as three (3) packs. The waste containers will be visually inspected to ensure that the waste containers are in good condition and that there are no signs that a release has occurred. This visual inspection shall not include the center drums of 7-packs and waste containers positioned such that visual observation is precluded due to the arrangement of waste assemblies on the facility pallets. If CH TRU mixed waste handling operations should stop for any reason with containers located on the TRUPACT-II Unloading Dock (**TRUDOCK** storage area of the WHB Unit) or in room 108 while still in the Contact-Handled Packages, primary waste container inspections could not be accomplished until the containers of waste are removed from the shipping containers.

ATTACHMENT H1

ACTIVE INSTITUTIONAL CONTROLS DURING POST-CLOSURE

Introduction

Upon receipt of the necessary certifications and permits from the EPA and the New Mexico Environment Department, the Permittees will begin disposal of contact-handled (**CH**) and remote-handled (**RH**) TRU and TRU mixed waste in the WIPP. This waste emplacement and disposal phase will continue until the regulated capacity of the repository of 6,200,000 cubic feet (175,588 cubic meters) of TRU and TRU mixed waste has been reached, and as long as the Permittees comply with the requirements of the Permit. For the purposes of this Permit Attachment, this time period is assumed to be 25 years. The waste will be shipped from DOE facilities across the country in specially designed transportation containers certified by the Nuclear Regulatory Commission. The transportation routes from these facilities to the WIPP have been predetermined. The CH TRU mixed waste will be packaged in 55-gallon (208-liter), 85-gallon (322-liter), 100-gallon (379-liter) steel drums, standard waste boxes (**SWBs**), ten drum overpacks (**TDOPs**), and/or standard large box 2s (**SLB2s**), or shielded containers. An SWB is a steel container having a free volume of 66.3 cubic feet (1.88 cubic meters). Figure H1-2 shows the general arrangement of a seven-pack of drums and an SWB as received in a Contact-Handled Package. RH TRU mixed waste inside a Remote-Handled Package is contained in one or more of the allowable containers described in Permit Attachment A1.