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January 12, 2023

Mr. Rick Shean, Chief
 Hazardous Waste Bureau
 New Mexico Environment Department
 2905 Rodeo Park Drive East, Building 1
 Santa Fe, New Mexico 87505-6303

Subject: Class 1* Permit Modification Notification Requiring Prior Agency Approval, Waste Isolation Pilot Plant Hazardous Waste Facility Permit Number: NM4890139088-TSDF

Reference: CBFO letter 22-1210 from Daniel Burke to Ms. Dena Volovar, dated November 8, 2022; Subject: Notice to Proceed – Contract 89303322DEM000077, Waste Isolation Pilot Plant Management and Operating

Dear Mr. Shean:

Enclosed is a Class 1* Permit Modification Notification (PMN) requiring prior agency approval for the following item:

- Addition of four new Shielded Containers

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. Michael Gerle at (575) 988-5372.

Sincerely,

Signatures on File

Reinhard Knerr
 Manager
 Carlsbad Field Office

Sean Dunagan
 President and Project Manager
 Nuclear Waste Partnership LLC

Enclosure

cc: w/enclosure
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*ED denotes electronic distribution

Class 1* Permit Modification Notification

Addition of Four New Shielded Containers

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

WIPP Permit Number - NM4890139088-TSDF

January 2023

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Acronyms and Abbreviations

CFR	Code of Federal Regulations
CH	contact-handled
DOE	United States Department of Energy
HWDU	Hazardous Waste Disposal Unit
in	inch(es)
NRC	Nuclear Regulatory Commission
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
Permit	Waste Isolation Pilot Plant Hazardous Waste Facility Permit
Permittees	U.S. Department of Energy and Nuclear Waste Partnership LLC
PMN	Permit Modification Notification
RH	remote-handled
SER	Safety Evaluation Report
TRU	transuranic
WHB	Waste Handling Building
WIPP	Waste Isolation Pilot Plant

Overview of the Permit Modification Notification

This document contains a Class 1* Permit Modification Notification (**PMN**) requiring prior agency approval for the Waste Isolation Pilot Plant (**WIPP**), Hazardous Waste Facility Permit (**Permit**) Number NM4890139088-TSDF.

This PMN is being submitted by the U.S. Department of Energy (**DOE**) and Nuclear Waste Partnership LLC, collectively referred to as the **Permittees**, in accordance with Permit Part 1, Section 1.3.1. (20.4.1.900 New Mexico Administrative Code (**NMAC**) incorporating Title 40 of the Code of Federal Regulations (**CFR**) §270.42(a)(2)). The PMN in this document is necessary to notify the New Mexico Environment Department (**NMED**) of a change, which impacts the WIPP facility. This change does not reduce the ability of the Permittees to provide continued protection to human health and the environment.

This modification to the Permit and any related supporting documents are provided in this PMN. The proposed modification to the text of the Permit has been identified using **red** text and **double underline** and a ~~strikeout~~ font for deleted information. All direct quotations are indicated by italicized text.

Appendix A
Description of the Class 1* Permit Modification Notification

Table 1. Class 1* Hazardous Waste Facility Permit Modification Notification

Item No.	Affected Permit Sections	Explanation of Change	Category
1	<p>Permit Part 3, <i>Container Storage</i></p> <p>Permit Part 4, <i>Geologic Repository Disposal</i></p> <p>Permit Attachment A1, <i>Container Storage</i></p> <p>Permit Attachment A2, <i>Geologic Repository</i></p> <p>Permit Attachment A4, <i>Traffic Patterns</i></p> <p>Permit Attachment E, <i>Inspection Schedule, Process and Forms</i></p>	<p>This PMN adds four new shielded containers to the Permit (SC-30G2, SC-30G3, SC-55G1, and SC-55G2). On April 28, 2022, the Nuclear Regulatory Commission (NRC) issued an updated certificate of compliance for the HalfPACT shipping container, which includes the four new shielded containers, to certify that the packaging and contents meet the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, <i>Packaging and Transportation of Radioactive Material</i>. The additional shielded containers support the continued management of remote-handled (RH) transuranic (TRU) mixed waste as contact-handled (CH) TRU mixed waste at the WIPP facility.</p> <p>The four new shielded containers are similar to the permitted shielded container (subsequently referred to as SC-30G1). They provide the shielding necessary for RH TRU mixed waste to be managed, stored, and disposed of as CH TRU mixed waste at the WIPP facility using waste management practices already included in the Permit. The four new shielded containers differ in their exterior dimensions, weights, and shielding material thicknesses. The SC-30G1 shielded container is currently authorized in the Permit for the management of RH TRU mixed waste as CH TRU mixed waste; therefore, no change in management standards are required for the addition of the four new shielded containers.</p>	F.4.b

Item 1

Description

This PMN adds four new shielded containers to the Permit (SC-30G2, SC-30G3, SC-55G1, and SC-55G2). On April 28, 2022, the Nuclear Regulatory Commission (NRC) issued an updated certificate of compliance for the HalfPACT shipping container,¹ which includes the four new shielded containers, to certify that the packaging and contents meet the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, *Packaging and Transportation of Radioactive Material*. The additional shielded containers support the continued management of remote-handled (RH) transuranic (TRU) mixed waste as contact-handled (CH) TRU mixed waste at the WIPP facility. The four new shielded containers being added to the Permit are provided below. As shown in the descriptions, these containers are extremely robust.

- SC-30G2 Shielded Container
 - The SC-30G2 shielded container has an overall diameter of approximately 24.5-inches (in.) and an overall height of approximately 36.625-in. The SC-30G2 nominally has 1.5-in. (1.40-in. minimum) of lead shielding between 0.30-in. thick inner and outer shells. The shells attach to an upper flange and a 3-in. thick steel base. The base integrates a 21.5-in. diameter, 0.50-in. thick lower lead plate, and a 20-in. diameter, 0.70-in. thick upper lead plate. The 3.89-in. thick steel lid integrates a 19.5-in. diameter, 0.75-in. thick lead plate. The lid also utilizes a 4-in. diameter, 0.25-in. thick lead disk that aligns under the vent port feature. The lid bolts to the container. A gasket of silicone rubber is used for lid closure. The empty weight of the SC-30G2 is approximately 2,610 pounds. The SC-30G2 accommodates a 30-gallon steel drum, which will contain RH TRU mixed waste. The SC-30G2 is configured as a two-pack on a circular pallet surrounded by radial and axial dunnage components and will be transported as a two-pack configuration within the HalfPACT package.
- SC-30G3 Shielded Container
 - The SC-30G3 shielded container has an overall diameter of approximately 28-in. and an overall height of 42.25-in. The SC-30G3 has a 2.75-in. minimum of lead shielding between 0.50-in. thick inner and outer shells. The shells connect to an upper flange and a 5.75-in. thick steel base. The base integrates a 23-in. diameter, 0.75-in. thick lower lead plate, and a 20-in. diameter, 1.75-in. thick upper lead plate. The 6.79-in. thick steel lid integrates a 19-in. diameter, 2.25-in. thick lead plate. The lid also integrates a 23.5-in. outside diameter, 17.75-in. inside diameter, 0.75-in. thick lead ring. The lid is bolted to the container. A gasket of silicone rubber is used for lid closure. The empty weight of the SC-30G3 is approximately 5,750 pounds. The SC-30G3 accommodates a 30-gallon steel drum, which will contain RH TRU mixed waste. The SC-30G3 is configured as a lateral single unit on a circular pallet surrounded and supported by upper

¹ Nuclear Regulatory Commission (NRC). 2022. Certification of Compliance No. 9279 for HalfPACT Shipping Package, Docket No. 71-9279. Revision 10. April 28, 2022. NRC Storage and Transportation Licensing Branch, Division of Fuel Management, Office of Nuclear Material Safety and Safeguards. Washington, D.C.

and lower lateral dunnage components and will be transported as one single unit within the HalfPACT package.

- SC-55G1 Shielded Container
 - The SC-55G1 shielded container has an overall diameter of approximately 29.375-in. and an overall height of approximately 40.5-in. The 2.20-in. thick sidewall connects to a 2.35-in. thick steel base. The 2.40-in. thick steel lid integrates a 4-in. diameter, 0.40-in. thick lead disk that is aligned under the vent port feature. The lid is bolted to the container. A gasket of silicone rubber is utilized for lid closure. The empty weight of the SC-55G1 is approximately 2,810 pounds. The SC-55G1 accommodates a 55-gallon steel drum, which will contain RH TRU mixed waste. The SC-55G1 is configured as a two-pack on a circular pallet surrounded by radial dunnage components and will be transported as a two-pack configuration within the HalfPACT package.

- SC-55G2 Shielded Container
 - The SC-55G2 shielded container has an overall diameter of approximately 31-in. and an overall height of approximately 45.75-in. The SC-55G2 nominally has 2-in. (1.98-in. minimum) of lead shielding between 0.50-in. thick inner and outer shells. The shells connect to an upper flange and a 4.25-in. thick steel base. The base integrates a 27-in. diameter, 0.75-in. thick lower lead plate, and a 24.5-in. diameter, 1.00-in. thick upper lead plate. The 5.76-in. thick steel lid integrates a 23.75-in. diameter, 1.50-in. thick lead plate. The lid also integrates a 26.625-in. outside diameter, 21.625-in. inside diameter, 0.50-in. thick lead ring. The lid is bolted to the container. A gasket of silicone rubber is utilized for lid closure. The empty weight of the SC-55G2 is approximately 5,900 pounds. The SC-55G2 accommodates a 55-gallon steel drum, which will contain RH TRU mixed waste. The SC-55G2 is configured as a lateral single unit on a circular pallet surrounded and supported by upper and lower lateral dunnage components and will be transported as one single unit within the HalfPACT package.

When the four new shielded containers are loaded and secured onto facility pallets, they will be transported safely into the underground, similar to other permitted disposal containers. The four new shielded containers will be unloaded from the facility pallet and emplaced in an active Hazardous Waste Disposal Unit (**HWDU**) in a safe and stable configuration.

For the laterally shipped single units (i.e., the SC-30G3 and the SC-55G2), a lifting attachment and overhead crane will be used to move the lateral single units to an emplacement rack secured onto a facility pallet. When ready for waste emplacement, the facility pallet is transported into the underground HWDU using the facility transfer vehicle, similar to other permitted disposal containers. Once in the underground HWDU, a forklift will lift the loaded emplacement rack from the facility pallet and place the loaded emplacement rack into the underground HWDU in a safe configuration.

The exact changes to the Permit are described in Appendix B (Table of Changes), and are shown in redline/strikeout in the Revised Permit Text section of this PMN.

Basis

On November 1, 2012, the NMED approved a Class 2 PMR that authorized the Permittees to use the shielded container for management of RH TRU mixed waste as CH TRU mixed waste at the WIPP facility. The original shielded container (SC-30G1) was added to Permit Part 3, Section 3.3.1., as an acceptable storage container and Permit Part 4, Section 4.3.1., as an acceptable disposal container. This SC-30G1 shielded container is described in Permit Attachment A1, Section A1-1b(2) and illustrated in Permit Figure A1-37.

The four new shielded containers (i.e., SC-30G2, SC-30G3, SC-55G1, and SC-55G2) are similar to the approved SC-30G1 in that they provide the shielding necessary for RH TRU mixed waste to be managed, stored, and disposed of as CH TRU mixed waste at the WIPP facility using waste management practices already included in the Permit. The four new shielded containers differ in their exterior dimensions, weights, and shielding material thicknesses. The SC-30G1 shielded container is currently authorized in the Permit for the management of RH TRU mixed waste as CH TRU mixed waste; therefore, no change in management standards is required for the addition of the four new shielded containers.

Since the permitted shielded container entered the Permit as a Class 2 modification, this classification was originally considered. Upon further regulatory analysis and since this is not a change in how this waste is managed, this modification is classified as *"Storage or treatment of different wastes in containers... That do not require the addition of units or a change in the treatment process or management standards, and provided that the units have previously received wastes of the same type"* and is, therefore, a Class 1* modification, requiring prior agency approval, pursuant to 20.4.1.900 NMAC (incorporating 40 CFR 270.42(a)(2) and Appendix I, F.4.b). The Permittees have identified this as the appropriate classification for the following reasons:

- The SC30-G1 shielded container can only handle a portion of the RH TRU mixed waste inventory due to its size and its radiation shielding material limitations; therefore, to accommodate the remainder of the RH TRU mixed waste inventory (i.e., different wastes in containers), four new shielded containers are needed.
- The four new shielded containers will be managed and stored in an existing unit (i.e., the Waste Handling Building Container Storage Unit). No additional storage unit is required.
- The WIPP facility is not authorized to treat hazardous waste; therefore, there is no change in treatment process. The Permittees manage containers as specified in Permit Attachment A1 including keeping containers closed during storage. The four new shielded containers will be managed the same as other designated storage and disposal containers pursuant to the Permit.
- The four new shielded containers are subject to the same management standards as the permitted SC-30G1 shielded container pursuant to 40 CFR Part 264, Subpart I, *Use and Management of Containers*. Therefore, there is no change in management standards.
- The Waste Handling Building Container Storage Unit is currently and has previously received RH TRU mixed waste within a shielded container in the CH portion of the unit (i.e., this storage unit has previously received this type of waste).

- Lastly, RH TRU mixed waste within a shielded container is currently and has previously been handled and disposed of in underground HWDUs at the WIPP facility (i.e., these units have previously received this type of waste).

Discussion

The shielded container was developed as a method to expedite packaging and shipment of RH TRU mixed waste to the WIPP facility. However, the permitted SC-30G1 shielded container can only handle a portion of the RH TRU mixed waste inventory at the generator/storage sites due to its size and its radiation shielding material limitations. The four new shielded containers will allow the Permittees to manage and emplace more of the RH TRU mixed waste inventory as CH TRU mixed waste at the WIPP facility. The shielded containers, when compared to RH-Canisters, reduce the time required to handle and process RH TRU mixed waste by personnel at the generator/storage sites. It will also allow the sites to optimize their RH TRU mixed waste shipping campaigns.

This PMN adds four new shielded containers to the Permit (SC-30G2, SC-30G3, SC-55G1, and SC-55G2) as TRU mixed waste storage and disposal containers. These four new shielded containers were approved by the Nuclear Regulatory Commission (**NRC**) in April 2022 as part of a recent revision to the certificate of compliance for the HalfPACT.¹ These containers were subjected to rigorous testing and analysis, which is discussed in the NRC Safety Evaluation Report (**SER**). The revised certificate of compliance for the HalfPACT and the NRC SER are publicly available in the NRC library (i.e., web-based ADAMS database [<https://adams.nrc.gov/wba/>]) or at the following link: <https://rampac.energy.gov/docs/default-source/certificates/1019279.pdf>. The four new shielded containers also comply with the United States Department of Transportation Type 7A specifications.

The management practices of the four new shielded containers will not differ from those of the permitted SC-30G1 shielded container. Pursuant to Permit Part 3, Section 3.3.1.8., the four new shielded containers will be managed, stored, and disposed of as CH TRU mixed waste, but will be counted towards the RH TRU mixed waste volume limits. The volume of waste emplaced in the four new shielded containers will be designated as RH TRU mixed waste in the WIPP Waste Information System and will also be tracked and reported as such by the DOE.

¹ Nuclear Regulatory Commission (NRC). 2022. Certification of Compliance No. 9279 for HalfPACT Shipping Package, Docket No. 71-9279. Revision 10. April 28, 2022. NRC Storage and Transportation Licensing Branch, Division of Fuel Management, Office of Nuclear Material Safety and Safeguards. Washington, D.C.

Revised Permit Text:

3.3.1. Acceptable Storage Containers

3.3.1.8 Shielded Container*

~~Each shielded container has a~~ The gross internal volume of each shielded container is of 7.4 ft³ (0.21 m³) specified in Table 3.3.1.8. Shielded containers contain RH TRU mixed waste, but shielding allows them ~~will allow it~~ to be managed and stored as CH TRU mixed waste. For the purpose of this Permit, shielded containers will be managed, stored, and disposed as CH TRU mixed waste, but will be counted towards the RH TRU mixed waste volume limits.

Table 3.3.1.8 - Gross Internal Volumes for Shielded Containers

<u>Shielded Container</u>	<u>Gross Internal Volume</u>
<u>SC-30G1</u>	<u>7.4 ft³ (0.21 m³)</u>
<u>SC-30G2</u>	<u>8.3 ft³ (0.24 m³)</u>
<u>SC-30G3</u>	<u>11.4 ft³ (0.33 m³)</u>
<u>SC-55G1</u>	<u>10.4 ft³ (0.30 m³)</u>
<u>SC-55G2</u>	<u>16.1 ft³ (0.46 m³)</u>

4.3.1. Acceptable Disposal Containers

4.3.1.8. Shielded Container

Shielded containers are configured as either a three-pack, a two-pack, or a single unit. The SC-30G1 is configured as a three-pack. The SC-30G2 and SC-55G1 are configured as two-packs. The SC-30G3 and SC-55G2 are configured as single units.

A1-1b(2) RH TRU Mixed Waste Containers

~~Shielded Container~~ Shielded Container

Shielded containers, which are used to emplace RH TRU mixed waste received at the WIPP facility as CH TRU mixed waste, are Remote-Handled TRU mixed waste received at the WIPP facility in shielded containers will be arranged as either a three-pack three-packs, a two-pack, or a single unit. A summary description of the shielded containers container is provided below. Shielded containers meet The shielded container meets the requirements for DOT specification 7A (Figure A1-37).

The gross internal volume of each shielded container is specified in Permit Part 3, Section 3.3.1.8. ~~Each shielded container has a gross internal volume of 7.4ft³ (0.21m³).~~ One or more filter vents will be installed in each the shielded container lid to prevent the escape of radioactive particulates and to prevent internal pressurization. ~~The shielded~~ These containers container ~~is~~ are constructed with varying thicknesses approximately one inch of lead shielding or lead equivalent shielding on the sides, and approximately three inches of steel on the top, and bottom of the container, and will be used to emplace RH TRU mixed waste. ~~The shielding allows these containers will allow it to be managed, and stored, and disposed as CH TRU mixed waste; however, these containers will be counted towards the RH TRU mixed waste volume limits.~~

A1-1d(4) Handling Waste in Shielded Containers

Shielded containers will be received as either a three-pack assembly, a two-pack assembly, or a single unit within a HalfPACT assemblies in HalfPACTs. An overhead bridge crane will be used to remove the contents of the HalfPACT to allow shielded container assembly and place placement of the shielded containers onto 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.

Once the 3-pack or 2-pack of shielded containers container assembly or single units of shielded containers are is on the facility pallet, the TRU mixed waste container identification numbers will be verified against the Uniform Hazardous Waste Manifest and the WWIS. Inconsistencies will be resolved as discussed in Section A1-1d(2). Up to two 3-packs or two 2-packs of shielded containers three-pack assemblies or two single units of shielded containers may will be placed onto on a facility pallet. The use of facility 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 or will be transported to the conveyance loading room as described in Section A1-1d(2).

**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.
Shielded container	2,260 lbs.
Three-pack of shielded containers (SC-30G1)	7,000 lbs.
Two-pack of shielded containers (SC-30G2)	6,320 lbs.
Shielded container single unit (SC-30G3)	6,300 lbs.
Two-pack of shielded containers (SC-55G1)	6,820 lbs.
Shielded container single unit (SC-55G2)	6,500 lbs.
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.

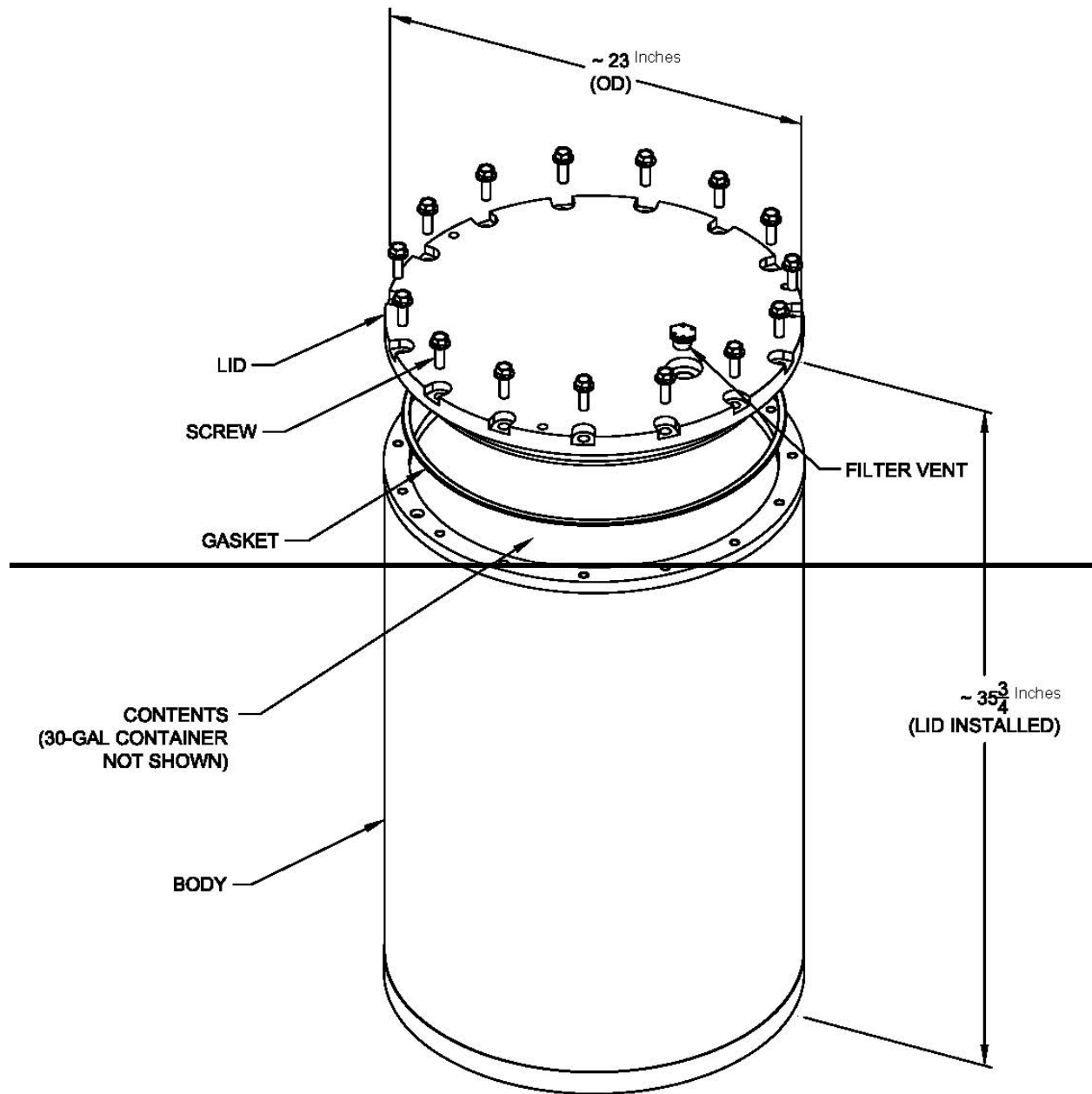


Figure A1-37
Typical Shielded Container

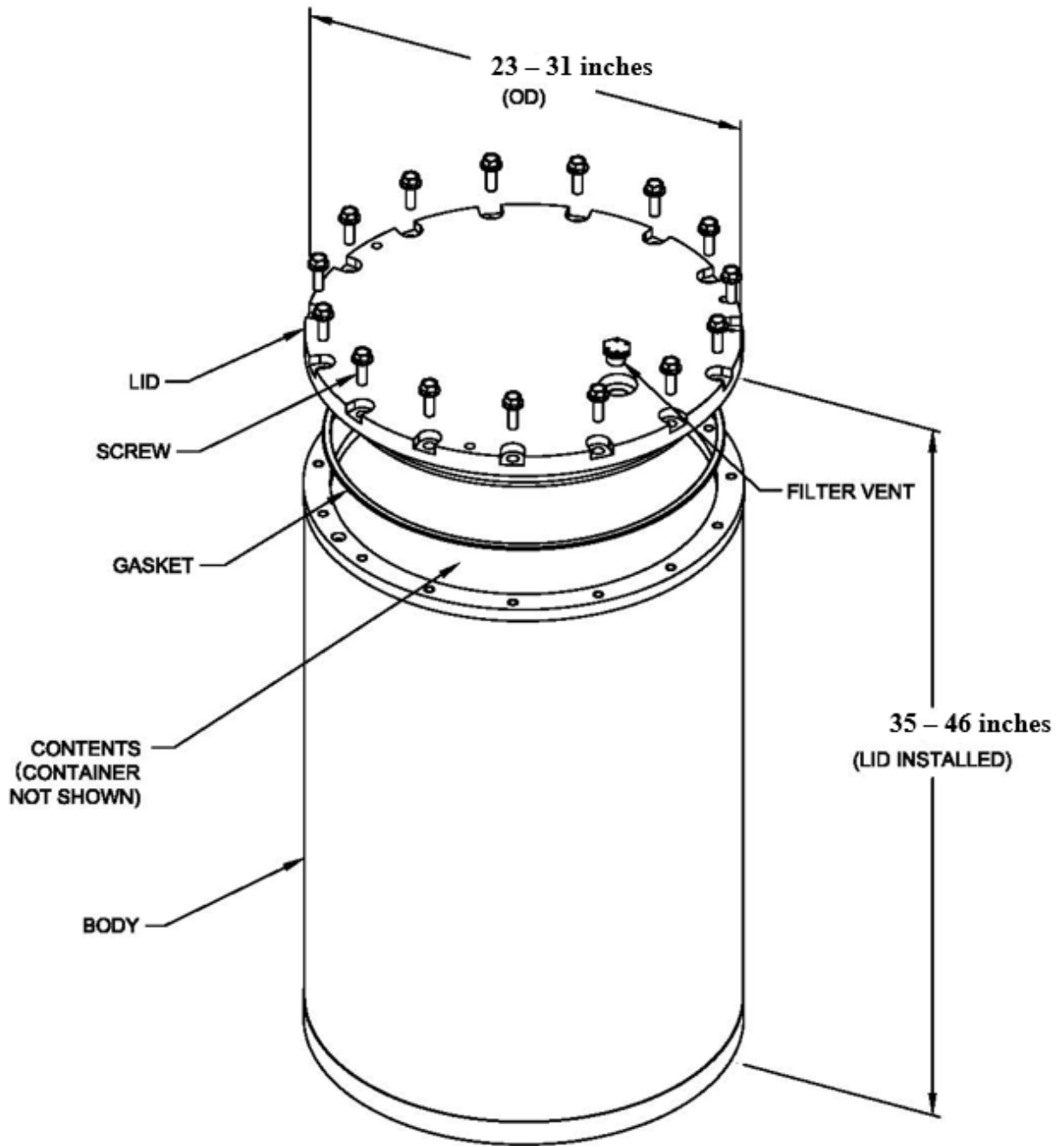


Figure A1-37
Range of Typical Shielded Container Dimensions

Facility Pallets

The facility pallet is a fabricated steel unit designed to support ~~different~~ 7-packs, 3-packs, or 4-packs of drums drum types (i.e., 55-gallon, 85-gallon, and 100-gallon), standard waste boxes (**SWBs**), ten-drum overpacks (**TDOPs**), shielded containers, 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 (55-gallon drums), four 3-packs (100-gallon drums), ~~two 3-packs of shielded containers~~, four 4-packs (85-gallon drums) ~~of drums~~, two 3-packs of shielded containers (SC-30G1), two 2-packs of shielded containers (SC-30G2 or SC-55G1), two single units of shielded containers (SC-30G3 or SC-55G2), 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.

CH TRU Mixed Waste Emplacement

CH TRU mixed waste containers and shielded containers will arrive by tractor-trailer at the WIPP facility in sealed shipping containers. Prior to unloading the packages from the trailer, 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 (55-gallon drums), two 4-packs (85-gallon drums), two 3-packs (100-gallon drums), two SWBs, or one TDOP. Each HalfPACT may hold up to seven 55-gal (208 L) drums, one SWB, one three-pack of shielded containers (SC-30G1), one two-pack of shielded containers (SC-30G2 or SC55G1), one single shielded container (SC-30G3 or SC-55G2), 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 (55-gallon drums), two sets of 3-packs (100-gallon drums), two sets of 4-packs (85-gallon drums), a set of 3-packs of shielded containers (SC-30G1), a set of 2-packs of shielded containers (SC-30G2 or SC-55G1), a set of single unit shielded containers (SC-30G3 or SC-55G2), 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) or shielded containers can be handled individually, if needed, using the forklift and lifting attachments (i.e., drum handlers, parrot beaks).

A forklift in the HWDU near the waste stack will be used to remove the waste containers from the facility pallets ~~and~~ to place them in the waste stack using a push-pull attachment ~~or, in the case of an SLB2, the~~ The SLB2 or shielded containers will be lifted from the facility pallet and placed directly on the floor of the emplacement room. The waste will be emplaced room by room in Panels 1 through 8. Each panel will be closed off when filled. If a waste container is damaged during the Disposal Phase, it will be immediately overpacked or repaired. CH TRU mixed waste containers will be continuously vented. The filter vents will allow aspiration, preventing internal pressurization of the container and minimizing the buildup of flammable gas concentrations.

**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.
Shielded container	2,260 lbs.
Three-pack of shielded containers <u>(SC-30G1)</u>	7,000 lbs.
<u>Two-pack of shielded containers (SC-30G2)</u>	<u>6,320 lbs.</u>
<u>Shielded container single unit (SC-30G3)</u>	<u>6,300 lbs.</u>
<u>Two-pack of shielded containers (SC-55G1)</u>	<u>6,820 lbs.</u>
<u>Shielded container single unit (SC-55G2)</u>	<u>6,500 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 three-pack of shielded containers (SC-30G1), one two-pack of shielded containers (SC-30G2 or SC-55G1), one single shielded container (SC-30G3 or SC-55G2), 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 TDOPs, two three-packs of shielded containers (SC-30G1), two two-packs of shielded containers (SC-30G2 or SC-55G1), two single units of shielded containers (SC-30G3 or SC-55G2), 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 to 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.

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 waste that will be managed and stored as 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), in standard large box 2s (SLB2s) or shielded containers as (3)-packs (SC-30G1), shielded containers as (2)-packs (SC-30G2 or SC55G1), or shielded containers as single units (SC-30G3 or SC-55G2). 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 1 Contact-Handled Packages, primary waste container inspections could not be accomplished until the containers of waste are removed from the shipping containers.

Appendix B
Table of Changes

Affected Permit Section	Explanation of Change
Permit Part 3, Section 3.3.1.8., <i>Shielded Container*</i>	Modified the language in the first sentence to refer to a new Table 3.3.1.8 for the different shielded container types and their respective gross internal volumes. Changed the Permit language from “Each shielded container has a gross internal volume of 7.4 ft ³ (0.21 m ³).” to “The gross internal volume of each shielded container is specified in Table 3.3.1.8.”
	Modified the second sentence from future tense to present tense [‘allows’ versus ‘will allow’] and described the use of shielded containers using a plural noun versus a singular noun [‘them’ versus ‘it’]. Changed the Permit language from “Shielded containers contain RH TRU mixed waste, but shielding will allow it to be managed and stored as CH TRU mixed waste.” to “Shielded containers contain RH TRU mixed waste, but shielding allows them to be managed and stored as CH TRU mixed waste.”
	Added Table 3.3.1.8, Gross Internal Volumes for Shielded Containers. <ul style="list-style-type: none"> ○ Table 3.3.1.8 shows two columns, labeled: [Shielded Container] and [Gross Internal Volume] ○ Table 3.3.1.8 shows five rows beneath the column headers to indicate the gross internal volume of each shielded container: <ul style="list-style-type: none"> • SC-30G1; 7.4 ft³ (0.21 m³) • SC-30G2; 8.3 ft³ (0.24 m³) • SC-30G3; 11.4 ft³ (0.33 m³) • SC-55G1; 10.4 ft³ (0.30 m³) • SC-55G2; 16.1 ft³ (0.46 m³)
Permit Part 4, Section 4.3.1.8., <i>Shielded Container</i>	Modified the sentence to include different configurations used for shielded containers. Changed the Permit language from “Shielded containers are configured as a three-pack.” to “Shielded containers are configured as either a three-pack, a two-pack, or a single unit.”
	Added three new sentences after the first sentence to state the configuration for each shielded container type (SC-30G1, SC-30G2, SC-30G3, SC-55G1, and SC-55G2). Added the following Permit language: “The SC-30G1 is configured as a three-pack. The SC-30G2 and SC-55G1 are configured as two-packs. The SC-30G3 and SC-55G2 are configured as single units.”

Affected Permit Section	Explanation of Change
Permit Attachment A1, Section A1-1b(2), <i>RH TRU Mixed Waste Containers, Shielded Container</i>	Underlined the subsection heading; modified the Permit text as follows: “Shielded Container” to “ <u>Shielded Container</u> ”
	Modified the language in the first paragraph, first sentence to include different configurations used for shielded containers and their use. Changed the Permit language from “Remote Handled TRU mixed waste received at the WIPP facility in shielded containers will be arranged as three-packs.” to “Shielded containers, which are used to emplace RH TRU mixed waste received at the WIPP facility as CH TRU mixed waste, are arranged as either a three-pack, a two-pack, or a single unit.”
	Modified the language in the first paragraph, second sentence to refer to shielded containers using a plural noun versus a singular noun [‘containers’ versus ‘container’]. Changed the Permit language from “A summary description of the shielded container is provided below.” to “A summary description of shielded containers is provided below.”
	Modified the language in the first paragraph, third sentence to describe shielded containers as plural versus singular [‘containers’ versus ‘container’]. Changed the Permit language from “The shielded container meets the requirements for DOT specification 7A (Figure A1-37).” to “Shielded containers meet the requirements for DOT specification 7A (Figure A1-37).”
	Modified the language in the second paragraph, first sentence to refer to Permit Part 3, Section 3.3.1.8. for shielded container internal volumes. Changed the Permit language from “Each shielded container has a gross internal volume of 7.4ft ³ (0.21m ³).” to “The gross internal volume of each shielded container is specified in Permit Part 3, Section 3.3.1.8.”
	Modified the language in the second paragraph, second sentence to refer to shielded containers as plural versus singular [‘each’ versus ‘the’]. Changed the Permit language from “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.” to “One or more filter vents will be installed in each shielded container lid to prevent the escape of radioactive particulates and to prevent internal pressurization.”
	Modified the language in the second paragraph, third sentence to refer to shielded containers as plural versus singular [‘containers’ versus ‘container’] and moved the last part of the sentence to the first paragraph, first sentence. Changed the Permit language from “The shielded container is constructed with approximately one inch of lead shielding on the sides and approximately three inches of steel on the top and bottom of the container and will be used to emplace RH TRU mixed waste.” to “These containers are constructed with varying thicknesses of lead shielding or lead equivalent shielding on the sides, top, and bottom of the container.”
	Modified the language in the second paragraph, fourth sentence to describe shielded containers as plural versus singular [‘them’ versus ‘it’] and to clarify that they will be counted towards the RH TRU mixed waste volume limits. Changed the Permit language from “The shielding will allow it to be managed and stored as CH TRU mixed waste.” to “The shielding allows them to be managed and stored as CH TRU mixed waste; however, these containers will be counted towards the RH TRU mixed waste volume limits.”

Affected Permit Section	Explanation of Change
Permit Attachment A1, Section A1-1d(4), <i>Handling Waste in Shielded Containers</i>	Modified the language in the third paragraph, first sentence to describe the different configurations of shielded containers. Changed the Permit language from “Shielded containers will be received as three-pack assemblies in HalfPACTs.” to “Shielded containers will be received as either a three-pack, a two-pack, or a single unit within a HalfPACT.”
	Modified the language in the third paragraph, second sentence to clarify removal of the contents of the HalfPACT to allow placement of shielded containers onto a facility pallet. Changed the Permit language from “An overhead bridge crane will be used to remove the contents of the shielded container assembly and place them on a facility pallet.” to “An overhead bridge crane will be used to remove the contents of the HalfPACT to allow placement of the shielded containers onto a facility pallet.”
	Modified the language in the fourth paragraph, first sentence to clarify that single unit shielded containers exist in addition to 3-packs and 2-packs. Changed the Permit language from “Once the shielded container assembly is on the facility pallet, the TRU mixed waste container identification numbers will be verified against the Uniform Hazardous Waste Manifest and the WWIS.” to “Once the 3-pack or 2-pack of shielded containers or single units of shielded containers are on the facility pallet, the TRU mixed waste container identification numbers will be verified against the Uniform Hazardous Waste Manifest and the WWIS.”
	Modified the language in the fourth paragraph, third sentence to clarify that single unit shielded containers exist in addition to 3-packs and 2-packs. Changed the Permit language from “Up to two three-pack assemblies of shielded containers will be placed on a facility pallet.” to “Up to two 3-packs or two 2-packs of shielded containers or two single units of shielded containers may be placed onto a facility pallet.”

Affected Permit Section	Explanation of Change
Permit Attachment A1, Table A1-2, <i>Waste Handling Equipment Capacities</i>	Removed the row [Shielded container] and its corresponding maximum gross weight. Deleted Permit language "Shielded container" and "2,260 lbs."
	Modified the row [Three-pack of shielded containers] to clarify that this configuration is for the SC-30G1 shielded container type. Changed the Permit language from "Three-pack of shielded containers" to "Three-pack of shielded containers (SC-30G1)"
	Added a new row to the table to describe the configuration of the SC-30G2 shielded container type including the maximum gross weight of the assembly. Added "Two-pack of shielded containers (SC-30G2)" and "6,320 lbs."
	Added a new row to the table to describe the configuration of the SC-30G3 shielded container type including the maximum gross weight of the single unit. Added "Shielded container single unit (SC-30G3)" and "6,300 lbs."
	Added a new row to the table to describe the configuration of the SC-55G1 shielded container type including the maximum gross weight of the assembly. Added "Two-pack of shielded containers (SC-55G1)" and "6,820 lbs."
	Added a new row to the table to describe the configuration of the SC-55G2 shielded container type including the maximum gross weight of the single unit. Added "Shielded container single unit (SC-55G2)" and "6,500 lbs."
Permit Attachment A1, Figure A1-37, <i>Typical Shielded Container</i>	Modified Permit Figure A1-37 to include a range of dimensions for the height and outside diameter of typical shielded containers. These ranges encompass the five shielded container types. Changed the outside diameter figure text from "~23 inches" to "23 – 31 inches" and the height from "~35 ³ / ₄ inches" to "35 – 46 inches"
	Modified the [Contents] label by removing the word [30-gal] because the new shielded container types can accommodate 55-gallon drums as well. Changed figure label from "Contents (30-gal container not shown)" to "Contents (container not shown)"
	Modified the figure title to clarify that the figure illustrates a range of dimensions to encompass the five different shielded container types. Change Permit text from "Typical Shielded Container" to "Range of Typical Shielded Container Dimensions"

Affected Permit Section	Explanation of Change
Permit Attachment A2, Section A2-2a(1), <i>CH TRU Mixed Waste Handling Equipment, Facility Pallets</i>	<p>Modified the language in the first sentence to clarify and distinguish the different configurations of contact-handled drums from configurations of shielded containers. Changed the Permit language from “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)).” to “The facility pallet is a fabricated steel unit designed to support different drum types (i.e., standard 55-gallon, 85-gallon, and 100-gallon), standard waste boxes (SWBs), ten-drum overpacks (TDOPs), shielded containers, or a standard large box 2 (SLB2), and has a rated load of 25,000 pounds (lbs.) (11,430 kilograms [kg]).”</p>
	<p>Modified the language in the second sentence to clarify and distinguish the different configurations of contact-handled drums from configurations of shielded containers. Changed the Permit language from “The facility pallet will accommodate up to four 7-packs, four 3-packs, two 3-packs of shielded containers, four 4- packs of drums, four SWBs (in two stacks of two units), two TDOPs, or one SLB2.” to “The facility pallet will accommodate up to four 7-packs (55-gallon drums), four 3-packs (100-gallon drums), four 4-packs (85-gallon drums), two 3-packs of shielded containers (SC-30G1), two 2-packs of shielded containers (SC-30G2 or SC-55G1), two single units of shielded containers (SC-30G3 or SC-55G2), four SWBs (in two stacks of two units), two TDOPs, or one SLB2.”</p>

Affected Permit Section	Explanation of Change
Permit Attachment A2, Section A2-2b, <i>Geologic Repository Process Description, CH TRU Mixed Waste Emplacement</i>	Modified the language in the first paragraph, fifth sentence to clarify and distinguish the different configurations of contact-handled drums from configurations of shielded containers. Changed Permit language from “Each TRUPACT-II may hold up to two 7-packs, two 4-packs, two 3-packs, two SWBs, or one TDOP.” to “Each TRUPACT-II may hold up to two 7-packs (55-gallon drums), two 4-packs (85-gallon drums), two 3-packs (100-gallon drums), two SWBs, or one TDOP.”
	Modified the language in the first paragraph, sixth sentence to clarify and distinguish the different configurations of other containers from configurations of shielded containers. Changed the Permit language from “Each HalfPACT may hold up to seven 55-gal (208 L) drums, one SWB, one three-pack of shielded containers or four 85-gal (322 L) drums.” to “Each HalfPACT may hold up to seven 55-gal (208 L) drums, one SWB, one three-pack of shielded containers (SC-30G1), one two-pack of shielded containers (SC-30G2 or SC-55G1), one single shielded container (SC-30G3 or SC-55G2), or four 85-gal (322 L) drums.”
	Modified the language in the first paragraph, ninth sentence to clarify and distinguish the different configurations of contact-handled drums from configurations of shielded containers. Changed Permit language from “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.” to “Each facility pallet has two recessed pockets to accommodate two sets of 7-packs (55-gallon drums), two sets of 3-packs (100-gallon drums), two sets of 4-packs (85-gallon drums), a set of 3-packs of shielded containers (SC-30G1), a set of 2-packs of shielded containers (SC-30G2 or SC-55G1), a set of single unit shielded containers (SC-30G3 or SC-55G2), two SWBs stacked two-high, two TDOPs, or one SLB2.”
	Separated the first sentence of the third paragraph into two sentences. Added Permit language to describe that shielded containers will be lifted from the facility pallet and placed directly on the floor of the emplacement room. Changed Permit language from “A forklift in the HWDU near the waste stack will be used to remove the waste containers from the facility pallets and to place them in the waste stack using a push-pull attachment or, in the case of an SLB2, the SLB2 will be lifted from the facility pallet and placed directly on the floor of the emplacement room.” to “A forklift in the HWDU near the waste stack will be used to remove the waste containers from the facility pallets to place them in the waste stack using a push-pull attachment. The SLB2 or shielded containers will be lifted from the facility pallet and placed directly on the floor of the emplacement room.”

Affected Permit Section	Explanation of Change
Permit Attachment A2, Table A2-1, <i>CH TRU Mixed Waste Handling Equipment Capacities</i>	Removed the row [Shielded container] and its corresponding maximum gross weight. Deleted Permit language "Shielded container" and "2,260 lbs."
	Modified the row [Three-pack of shielded containers] to clarify that this configuration is for the SC-30G1 shielded container type. Changed the Permit language from "Three-pack of shielded containers" to "Three-pack of shielded containers (SC-30G1)"
	Added a new row to the table to describe the configuration of the SC-30G2 shielded container type including the maximum gross weight of the assembly. Added "Two-pack of shielded containers (SC-30G2)" and "6,320 lbs."
	Added a new row to the table to describe the configuration of the SC-30G3 shielded container type including the maximum gross weight of the single unit. Added "Shielded container single unit (SC-30G3)" and "6,300 lbs."
	Added a new row to the table to describe the configuration of the SC-55G1 shielded container type including the maximum gross weight of the assembly. Added "Two-pack of shielded containers (SC-55G1)" and "6,820 lbs."
	Added a new row to the table to describe the configuration of the SC-55G2 shielded container type including the maximum gross weight of the single unit. Added "Shielded container single unit (SC-55G2)" and "6,500 lbs."
Permit Attachment A4, Section A4-3, <i>Waste Handling Building Traffic</i>	Modified the language in the second paragraph, second sentence to distinguish the different configurations of shielded containers. Changed Permit language from "A HalfPACT may hold seven 55-gallon drums, one SWB, or four 85-gallon drums." to "A HalfPACT may hold seven 55-gallon drums, one SWB, one three-pack of shielded containers (SC-30G1), one two-pack of shielded containers (SC-30G2 or SC-55G1), one single shielded container (SC-30G3 or SC-55G2), or four 85-gallon drums."
	Modified the language in the third paragraph, first sentence to distinguish the different configurations of shielded containers. Changed Permit language from "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 TDOPs, or an SLB2." to "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 TDOPs, two three-packs of shielded containers (SC-30G1), two two-packs of shielded containers (SC-30G2 or SC-55G1), two single units of shielded containers (SC-30G3 or SC-55G2), or an SLB2."
	Modified the language in the third paragraph, third sentence to correct grammar. Changed Permit language from "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)." to "A forklift or facility transfer vehicle will transport the loaded facility pallet to the air lock at the Waste Shaft (Figures A4-3, A4-3a, and A4-3b)."

Affected Permit Section	Explanation of Change
Permit Attachment E, Section E-1b(1), <i>Container Inspection</i>	Modified the language in the first paragraph, second sentence to include additional configurations of shielded containers. Changed the Permit language from “Off-site waste that will be managed and stored as 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), in standard large box 2s (SLB2s) or shielded containers as (3)-packs.” to “Off-site waste that will be managed and stored as 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), in standard large box 2s (SLB2s) shielded containers as (3)-packs (SC-30G1), shielded containers as (2)-packs (SC-30G2 or SC55G1), or shielded containers as single units (SC-30G3 or SC-55G2).”

Appendix C
Illustrations of Shielded Containers and Container Assemblies

Shielded Container Information

Current
Permit

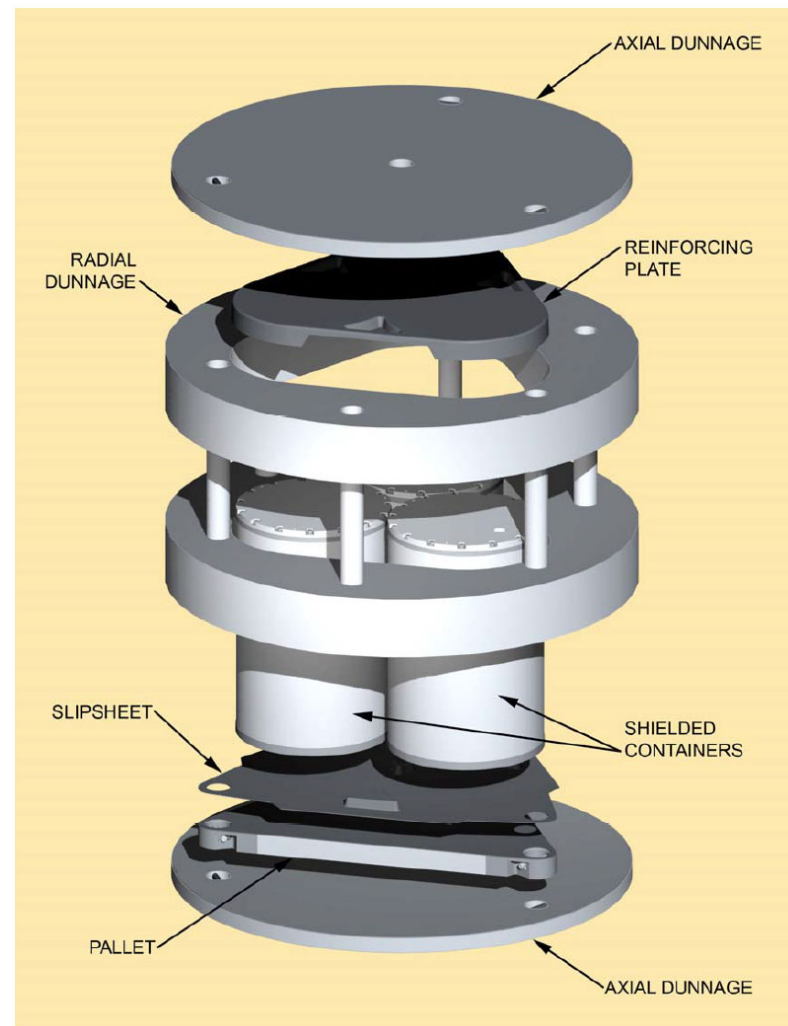
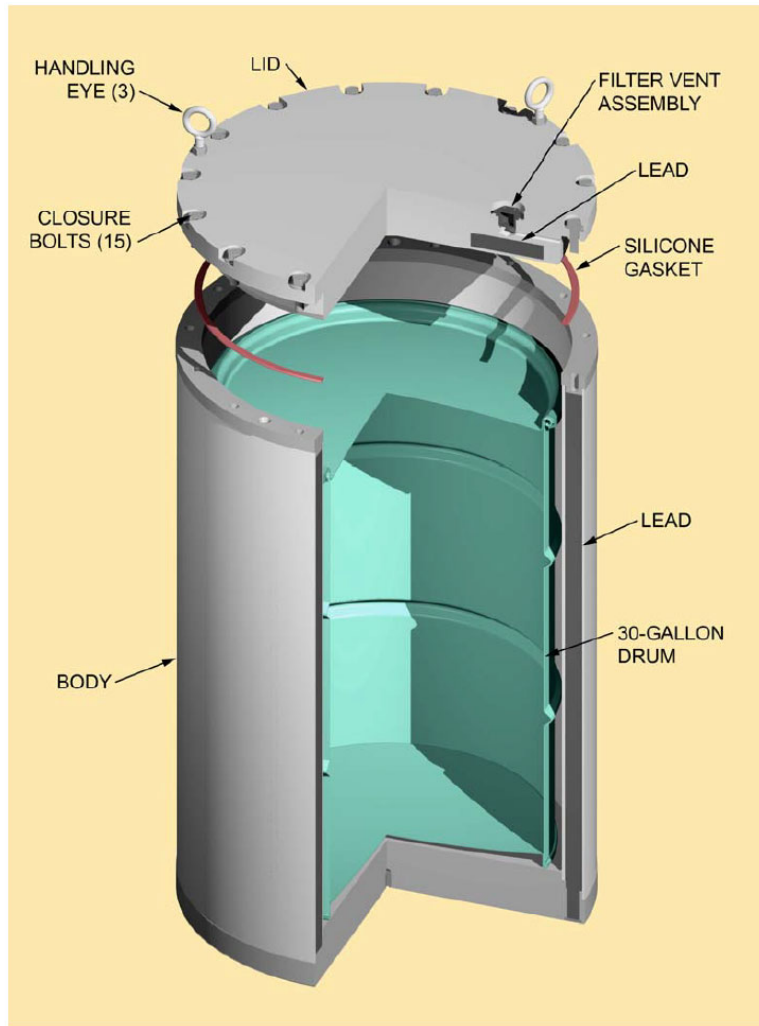
Shielded Container
Configuration

Parameter	SC-30G1	SC-30G2	SC-30G3	SC-55G1	SC-55G2
— Overall Shielded Container Configuration —					
• Approximate Lead Equivalency (in)	1	1¾	3¼	¾	2¼
• Approximate HDPE Thickness (in)	—	—	—	—	—
• Quantity per HalfPACT/TRUPACT-II Package	3	2	1	2	1
• Payload Drum Size	30-Gallon	30-Gallon	30-Gallon	55-Gallon	55-Gallon
— Shielded Container Component Weights —					
• Container Body (lb)	1,423	2,175	4,870	2,405	4,865
• Container Lid (lb)	303	435	880	405	1,035
• Container Tare (lb)	1,726	2,610	5,750	2,810	5,900
• Payload Drum & Contents (lb)	534	550	550	600	600
• Container Gross (lb)	2,260	3,160	6,300	3,410	6,500
• Pallet and Dunnage (lb)	820	940	1,300	700	1,100
• HalfPACT Package Total (7,600-lb Limit)	7,600	7,260	7,600	7,520	7,600
— Shielded Container Component Dimensions and Sizes —					
• Outside Diameter (in)	23	24½	28	29⅝	31
• Outside Height (in)	35¾	36⅝	42¼	40½	45¾
• Payload Cavity Diameter (in)	20⅝	20⅝	20⅝	25	25
• Payload Cavity Height (in)	29¾	29¾	29¾	35¾	35¾
• Base Thickness (in)	3	3	5¾	2⅝	4¼
• Lid Thickness (in)	3	3⅝	6¾	2⅝	5¾
• Sidewall Thickness (in)	1 ⁵ / ₁₆	2 ¹ / ₁₆	3 ¹³ / ₁₆	2 ³ / ₁₆	3
• Closure Screw Size	1/2	5/8	3/4	5/8	3/4
• Number of Closure Screws	15	12	12	12	12

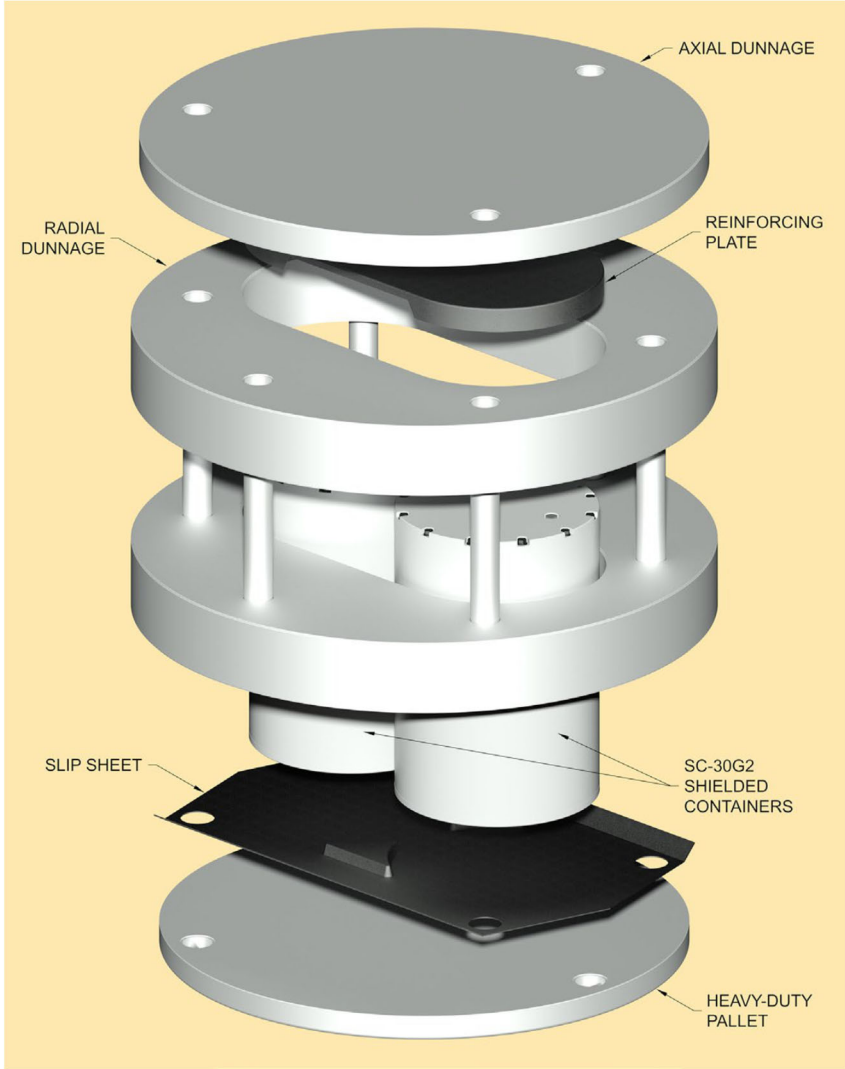
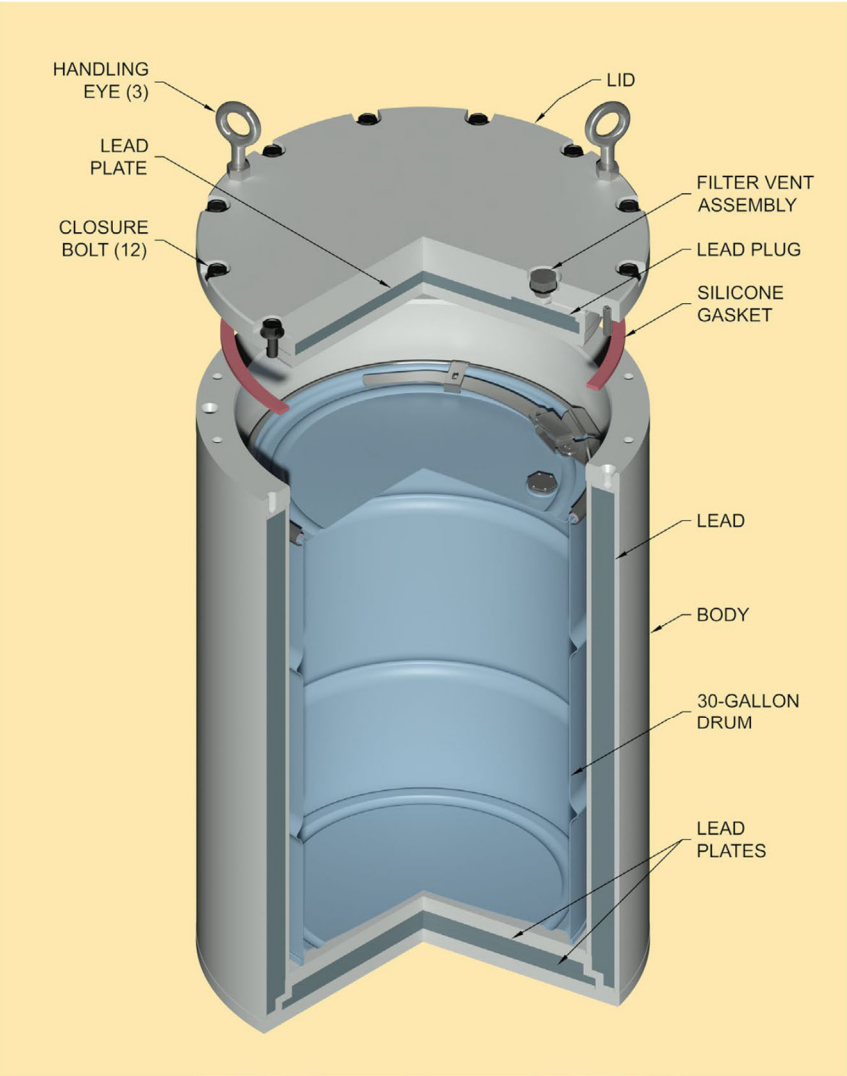
SC-30G1 Shielded Container and Container Assembly

(Authorized under the Permit)

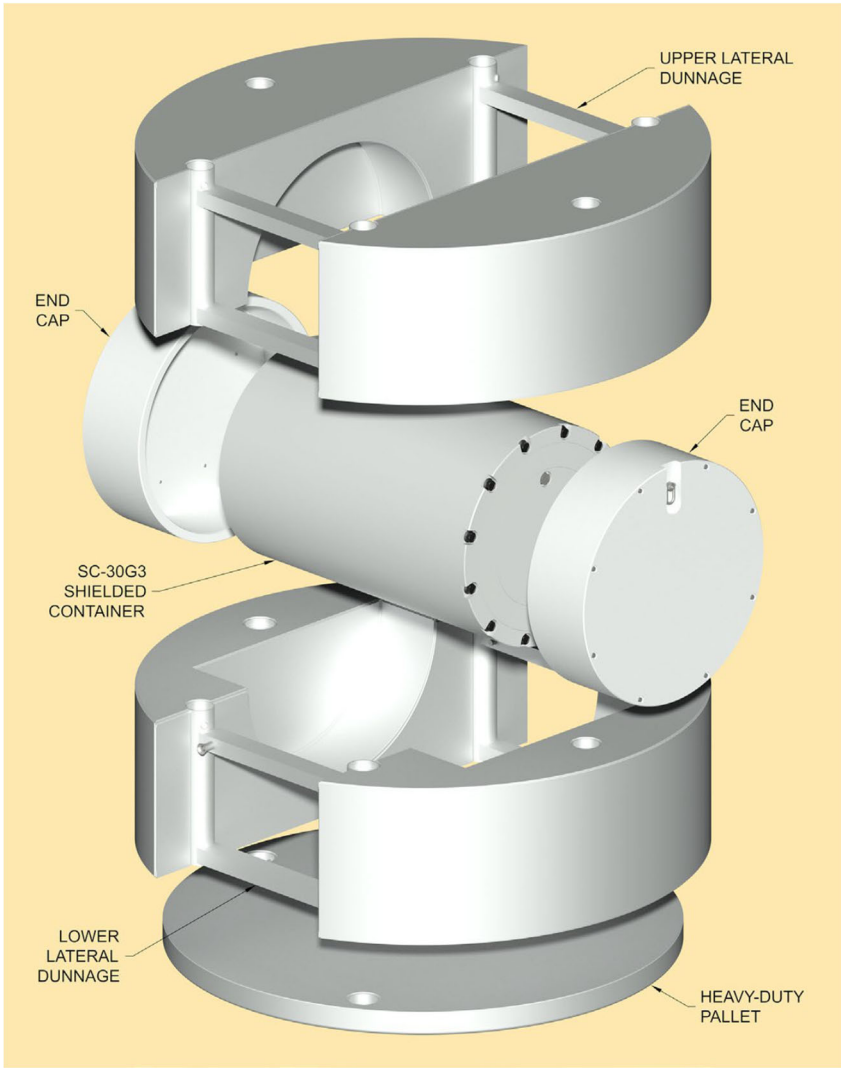
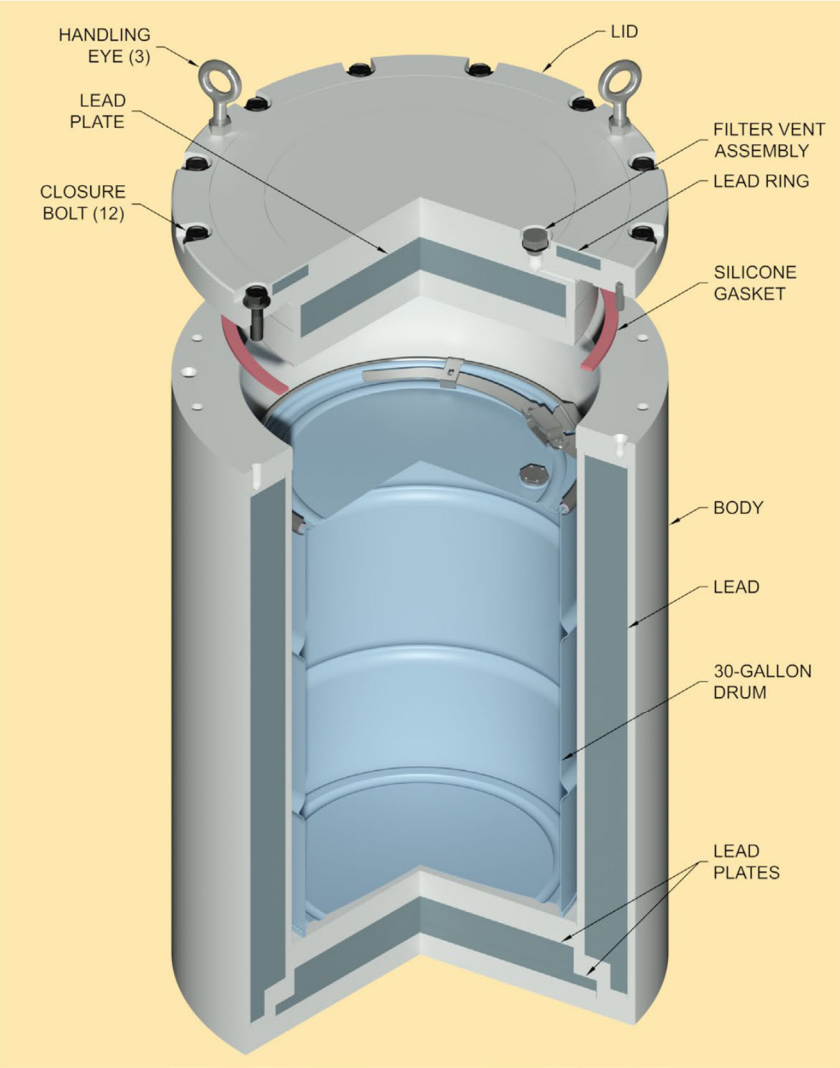
[The NMED approved a Permit modification on November 1, 2012]



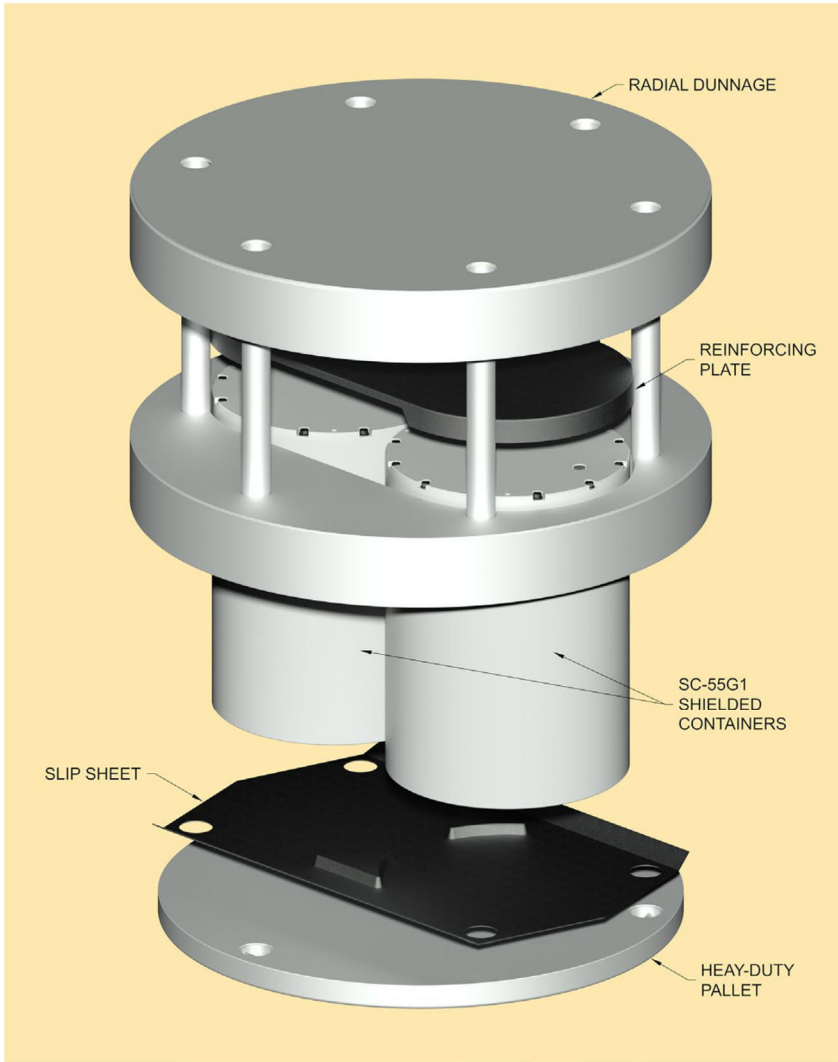
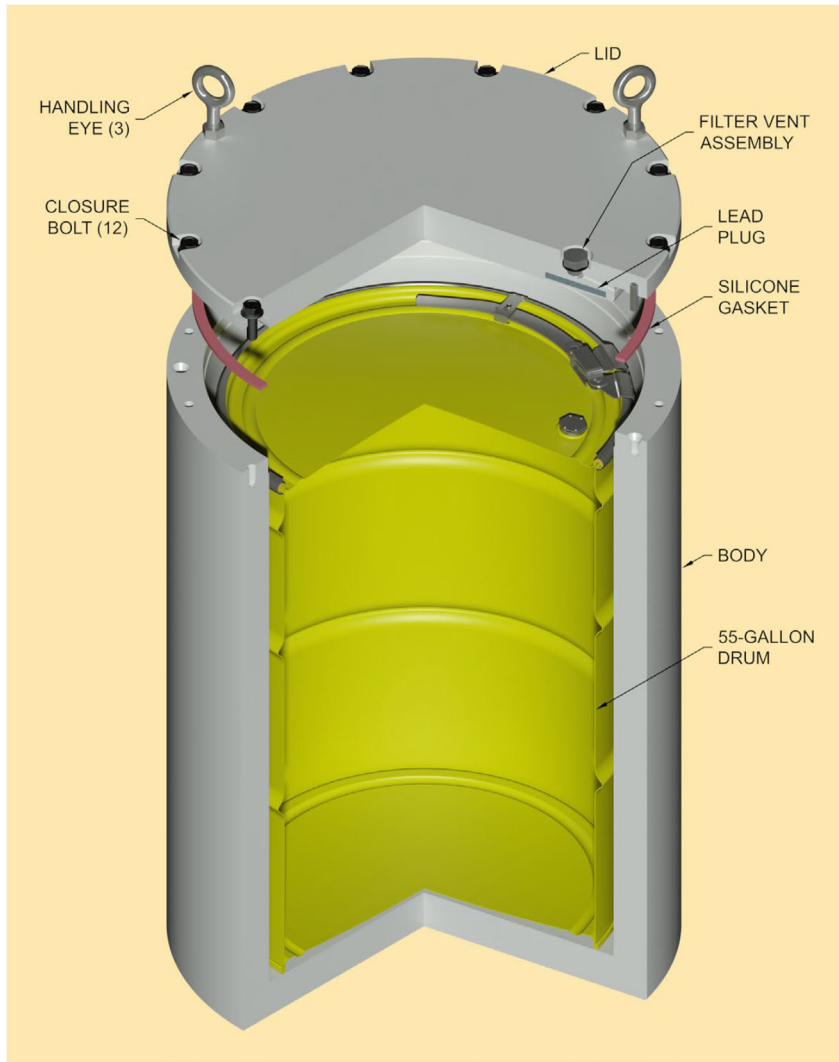
New SC-30G2 Shielded Container and Container Assembly



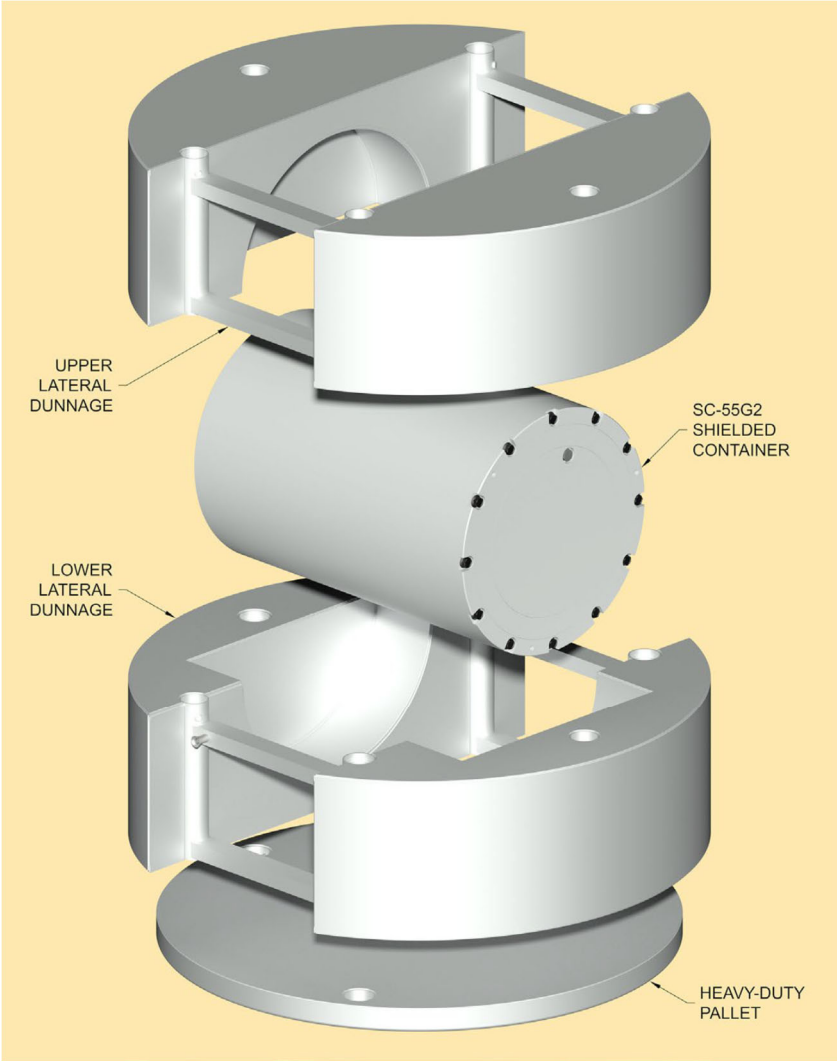
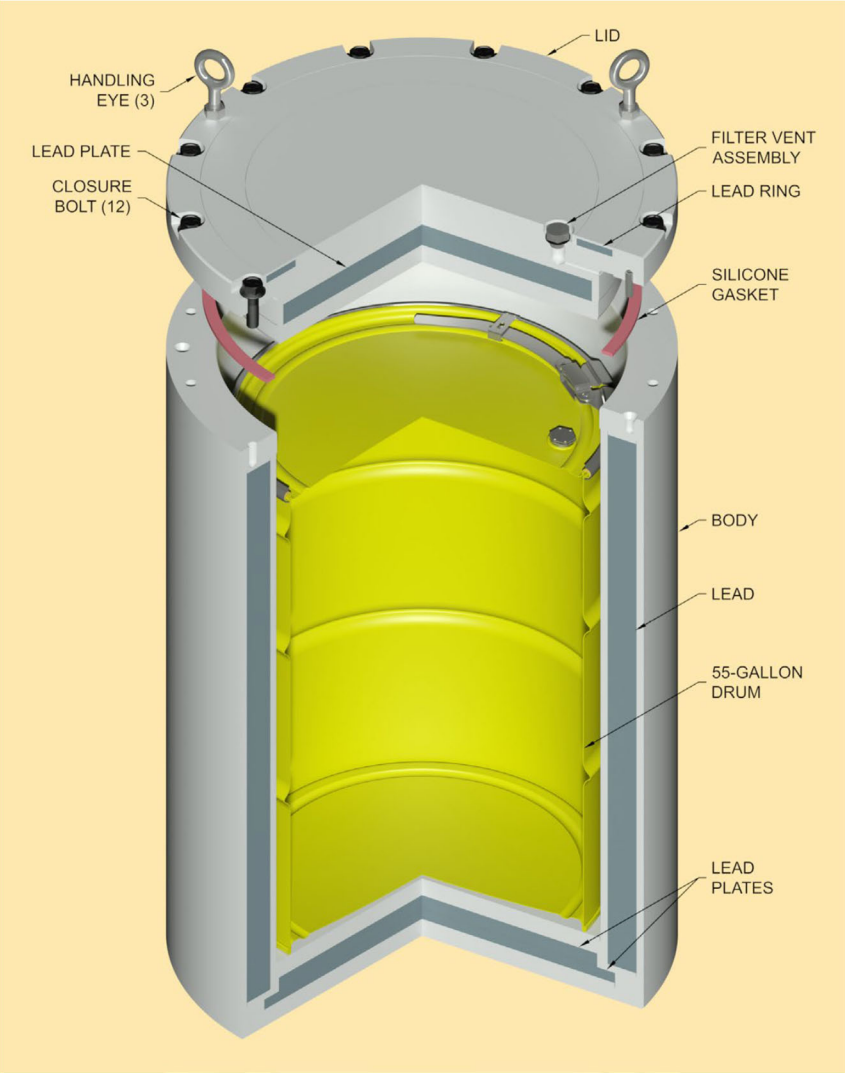
New SC-30G3 Shielded Container and Container Assembly



New SC-55G1 Shielded Container and Container Assembly



New SC-55G2 Shielded Container and Container Assembly



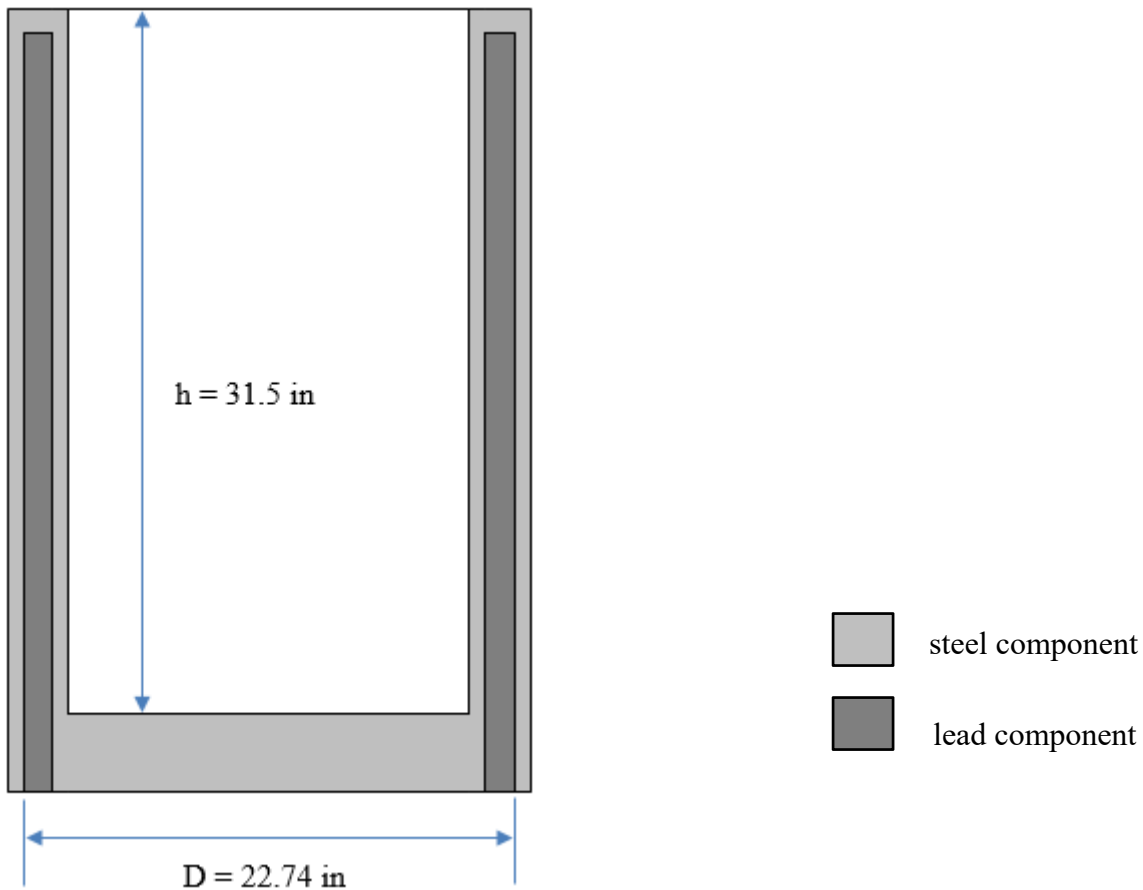
Appendix D
Determination of Gross Internal Volumes for Each Shielded Container

SC-30G1 Shielded Container

(Authorized under the Permit)

[The NMED approved a Permit modification on November 1, 2012]

The SC-30G1 shielded container has an overall diameter of approximately 23-in. and an overall height of approximately 35.75-in. The SC-30G1 body side wall is constructed of 1-in. nominal lead integrated with 0.3-in. nominal steel. The SC-30G1 base is constructed of 3-in. steel. The SC-30G1 has an internal cavity height of approximately 31.5-inches. The SC-30G1 accommodates a 30-gallon steel drum, which will contain RH TRU mixed waste.



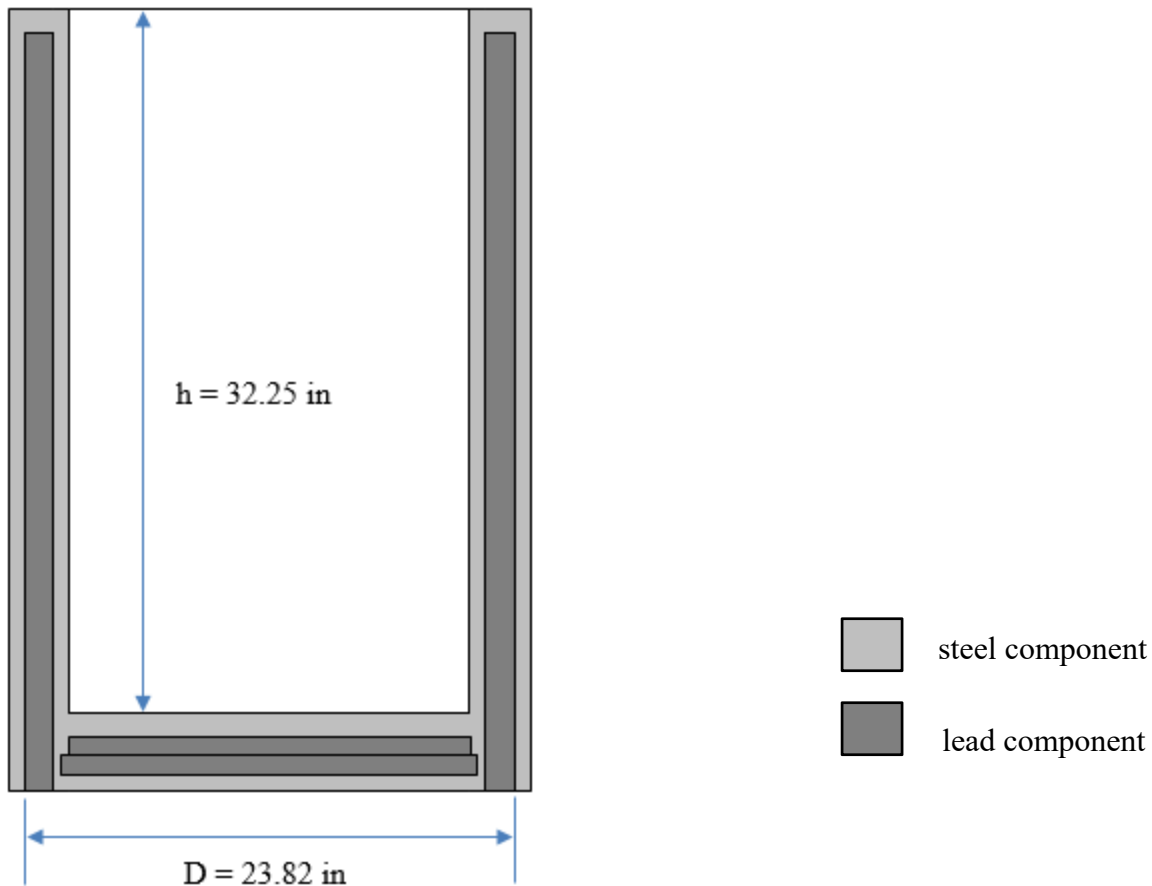
$$\text{Volume} = \left[\left(\pi \right) \times \left(\frac{D}{2} \right)^2 \times (h) \right] \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in})^3} \right)$$

$$\text{Volume} = \left[(3.14) \times \left(\frac{22.74 \text{ in}}{2} \right)^2 \times (31.5 \text{ in}) \right] \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in}) \times (12 \text{ in}) \times (12 \text{ in})} \right)$$

$$\text{Volume} = 7.4 \text{ ft}^3$$

New SC-30G2 Shielded Container

The SC-30G2 shielded container has an overall diameter of approximately 24.5-in. and an overall height of approximately 36.625-in. The SC-30G2 nominally has 1.5-in. (1.40-in. minimum) of lead shielding between 0.30-in. thick inner and outer shells. The shells attach to an upper flange and a 3-in. thick steel base. The base integrates a 21.5-in. diameter, 0.50-in. thick lower lead plate, and a 20-in. diameter, 0.70-in. thick upper lead plate. The SC-30G2 has an internal cavity height of approximately 32.25-inches. The SC-30G2 accommodates a 30-gallon steel drum, which will contain RH TRU mixed waste.



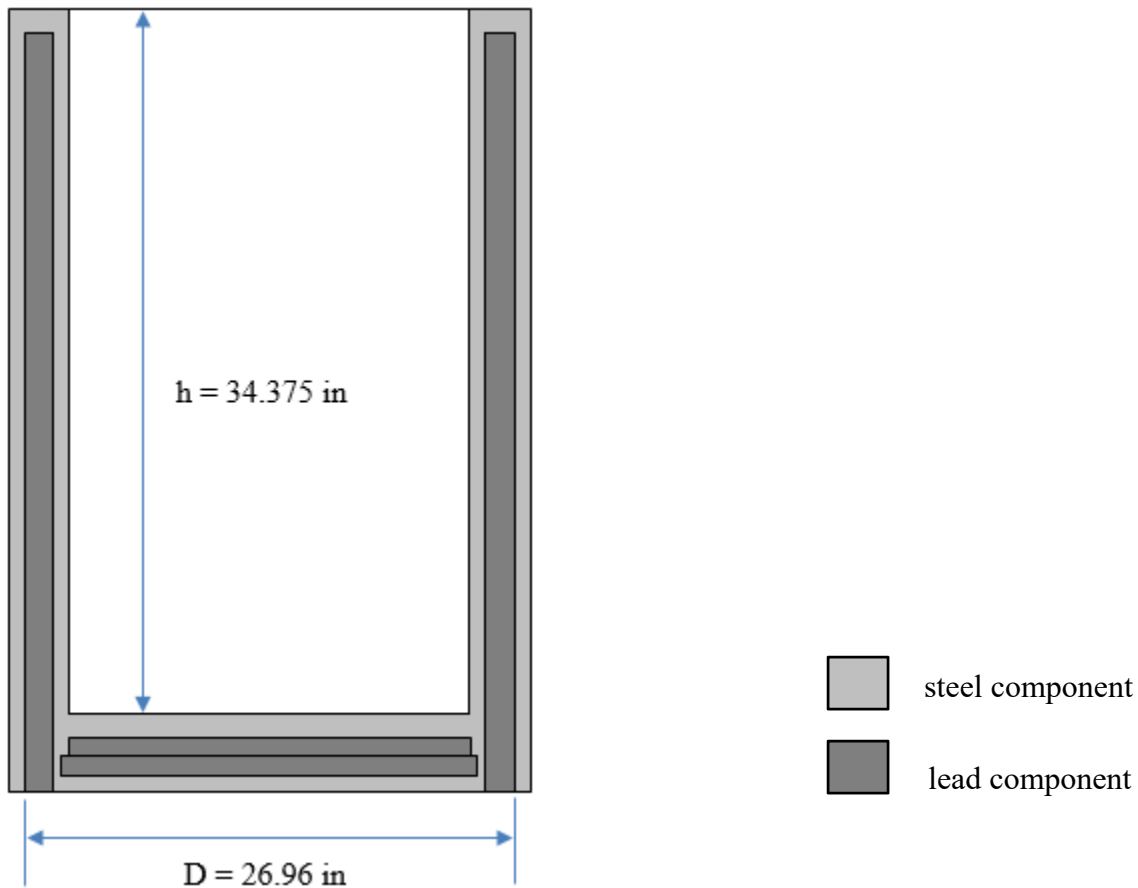
$$\text{Volume} = \left[\left(\pi \times \left(\frac{D}{2} \right)^2 \times (h) \right) \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in})^3} \right) \right]$$

$$\text{Volume} = \left[\left(3.14 \times \left(\frac{23.82 \text{ in}}{2} \right)^2 \times (32.25 \text{ in}) \right) \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in}) \times (12 \text{ in}) \times (12 \text{ in})} \right) \right]$$

$$\text{Volume} = 8.3 \text{ ft}^3$$

New SC-30G3 Shielded Container

The SC-30G3 shielded container has an overall diameter of approximately 28-in. and an overall height of 42.25-in. The SC-30G3 has a 2.75-in. minimum of lead shielding between 0.50-in. thick inner and outer shells. The shells connect to an upper flange and a 5.75-in. thick steel base. The base integrates a 23-in. diameter, 0.75-in. thick lower lead plate, and a 20-in. diameter, 1.75-in. thick upper lead plate. The SC-30G3 has an internal cavity height of approximately 34.375-inches. The SC-30G3 accommodates a 30-gallon steel drum, which will contain RH TRU mixed waste.



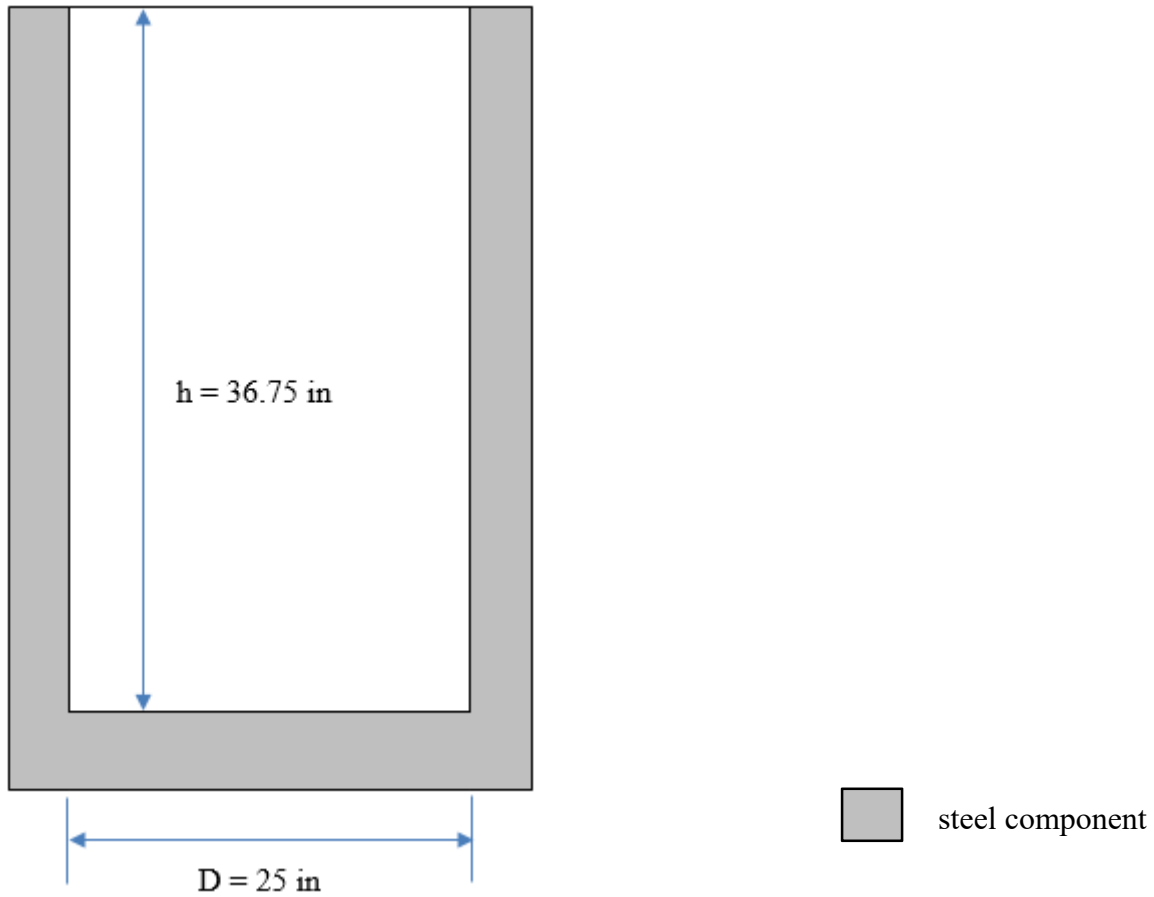
$$\text{Volume} = \left[\left(\pi \right) \times \left(\frac{D}{2} \right)^2 \times (h) \right] \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in})^3} \right)$$

$$\text{Volume} = \left[(3.14) \times \left(\frac{26.96 \text{ in}}{2} \right)^2 \times (34.375 \text{ in}) \right] \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in}) \times (12 \text{ in}) \times (12 \text{ in})} \right)$$

$$\text{Volume} = 11.4 \text{ ft}^3$$

New SC-55G1 Shielded Container

The SC-55G1 shielded container has an overall diameter of approximately 29.375-in. and an overall height of approximately 40.5-in. The 2.20-in. thick steel sidewall connects to a 2.35-in. thick steel base. The SC-55G1 has an internal cavity height of approximately 36.75-inches. The SC-55G1 accommodates a 55-gallon steel drum, which will contain RH TRU mixed waste.



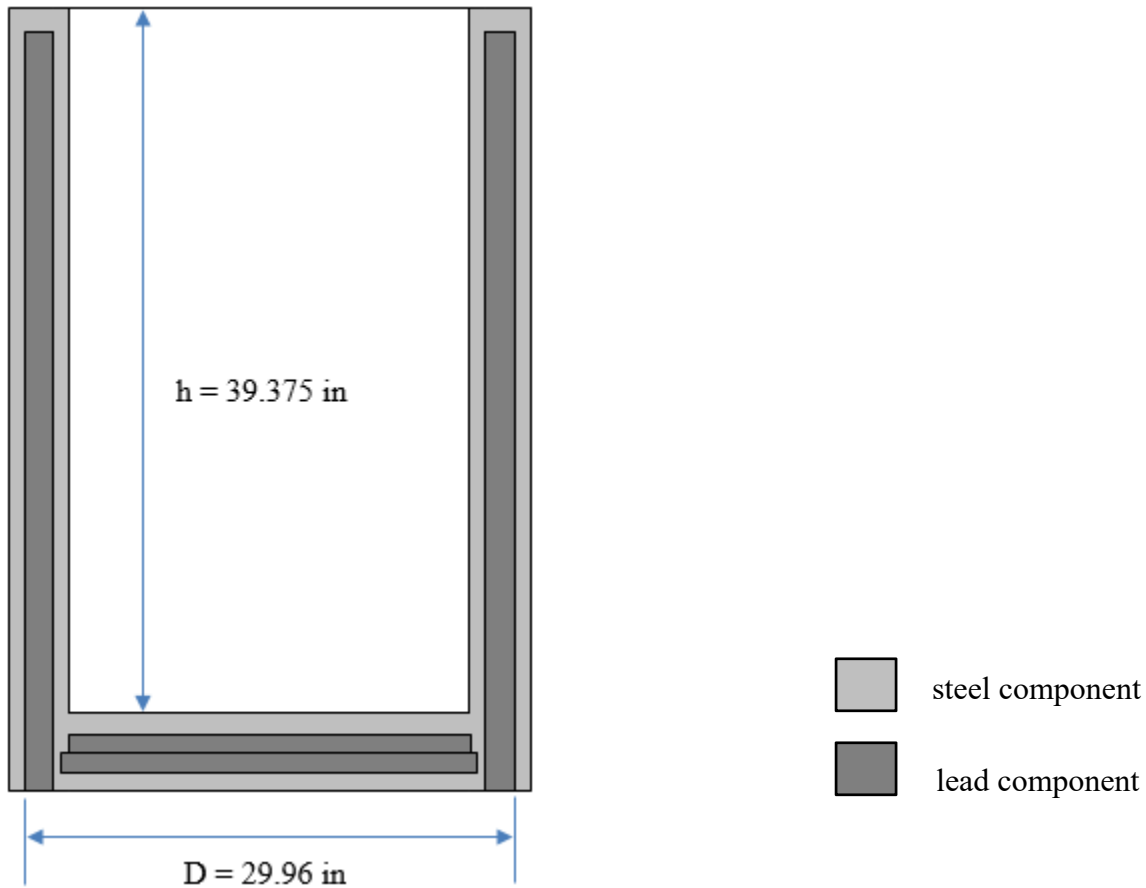
$$\text{Volume} = \left[\left(\pi \times \left(\frac{D}{2} \right)^2 \times (h) \right) \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in})^3} \right) \right]$$

$$\text{Volume} = \left[\left(3.14 \times \left(\frac{25 \text{ in}}{2} \right)^2 \times (36.75 \text{ in}) \right) \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in}) \times (12 \text{ in}) \times (12 \text{ in})} \right) \right]$$

$$\text{Volume} = 10.4 \text{ ft}^3$$

New SC-55G2 Shielded Container

The SC-55G2 shielded container has an overall diameter of approximately 31-in. and an overall height of approximately 45.75-in. The SC-55G2 nominally has 2-in. (1.98-in. minimum) of lead shielding between 0.50-in. thick inner and outer shells. The shells connect to an upper flange and a 4.25-in. thick steel base. The base integrates a 27-in. diameter, 0.75-in. thick lower lead plate, and a 24.5-in. diameter, 1.00-in. thick upper lead plate. The SC-55G2 has an internal cavity height of approximately 39.375-inches. The SC-55G2 accommodates a 55-gallon steel drum, which will contain RH TRU mixed waste.



$$\text{Volume} = \left[\left(\pi \times \left(\frac{D}{2} \right)^2 \times (h) \right) \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in})^3} \right) \right]$$

$$\text{Volume} = \left[(3.14) \times \left(\frac{29.96 \text{ in}}{2} \right)^2 \times (39.375 \text{ in}) \right] \times \left(\frac{(1 \text{ ft})^3}{(12 \text{ in}) \times (12 \text{ in}) \times (12 \text{ in})} \right)$$

Volume = 16.1 ft³