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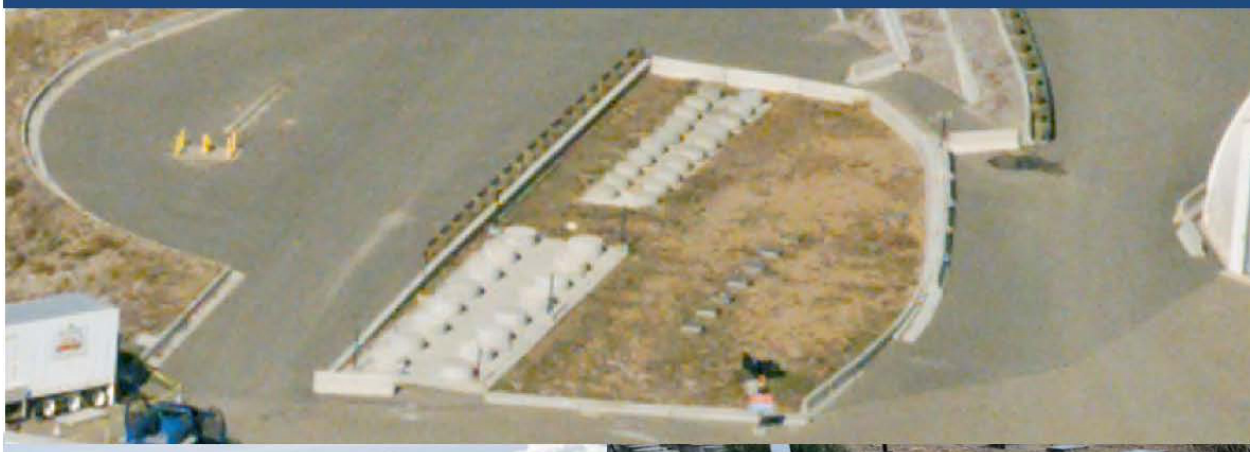

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Tritium Packages and 17th RH Canister Categories of Transuranic Waste Stored Below Ground within Area G

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Table of Contents

Index of Figures

Index of Tables

Abbreviations and Acronyms

AEC	Atomic Energy Commission
BG	below ground
BIO	Basis for Interim Operations
CCP	Central Characterization Program
CMP	corrugated metal pipe
CMR	Chemistry and Metallurgy Research Facility (Building 3-29)
Consent Order	New Mexico Environment Department Compliance Order on Consent
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FGE	plutonium-239 fissile gram equivalents
ft	feet
FY	fiscal year
g	grams
gal	gallon
GFSI	government furnished services and items
HEPA	high efficiency particulate air (filter)
HSE-1	Health Physics Group
HSE-7	Waste Management Group
LANL	Los Alamos National Laboratory
m^3	cubic meters
MAR	material at risk
MCNP	Monte Carlo N-Particle (model)
MDA	Material Disposal Area
mrem/hr	millirem per hour
nCi/g	nanocuries per gram
NEPA	National Environmental Policy Act
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
Np-237	neptunium-237
PE-Ci	plutonium-239 equivalent curies
Pu-238	plutonium-238
Pu-239	plutonium-239
Pu-240	plutonium-240
Pu-241	plutonium-241
RH	remote handled
SPO	Standard Pipe Overpack
STP	Site Treatment Plan
TA	Technical Area
TWSR	TRU Waste Storage Record
TRU	transuranic (elements with atomic number greater than 92)

U-233	uranium-233
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant
WPF	Waste Profile Form

1. Executive Summary

A large wildfire called the Las Conchas Fire burned large areas near Los Alamos National Laboratory (LANL) in 2011 and heightened public concern and news media attention over transuranic (TRU) waste stored at LANL's Technical Area 54 (TA-54) Area G waste management facility. The removal of TRU waste from Area G had been placed at a lower priority in budget decisions for environmental cleanup at LANL because TRU waste removal is not included in the March 2005 *Compliance Order on Consent* (Reference 1) that is the primary regulatory driver for environmental cleanup at LANL. The Consent Order is a settlement agreement between LANL and the New Mexico Environment Department (NMED) that contains specific requirements and schedules for cleaning up historical contamination at the LANL site. After the Las Conchas Fire, discussions were held by the U.S. Department of Energy (DOE) with the NMED on accelerating TRU waste removal from LANL and disposing it at the Waste Isolation Pilot Plant (WIPP).

In January 2012, the DOE National Nuclear Security Administration (DOE/NNSA) and the NMED announced the issuance of the *Framework Agreement: Realignment of Environmental Priorities* (Framework Agreement) (Reference 2). The Framework Agreement is a non-binding agreement that outlines DOE/NNSA commitments to further accelerate TRU waste disposition at LANL. Commitments under the Framework Agreement related to TRU waste include a commitment to develop by December 31, 2012, a schedule with pacing milestones for disposition of below-ground (BG) TRU waste requiring retrieval at Area G based on projected funding profiles.

Within the schedule for disposition of BG TRU waste submitted to the NMED in December 2012 (Reference 3), the DOE/NNSA committed to disposition of six BG categories of TRU waste no later than September 30, 2018. These six categories were identified as (1) Pit 9; (2) Trenches A-D; (3) Corrugated Metal Pipes (CMPs); (4) Hot Cell Liners; (5) Tritium Packages; and (6) the 17th Remote-Handled (RH) Canister. For a seventh BG category that may require retrieval, identified as the 33 Shafts, DOE/NNSA will complete (1) a determination as to whether this category contains TRU waste that requires retrieval; and (2) to the extent necessary, its decision process under the National Environmental Policy Act (NEPA) regarding retrieval, by no later than September 30, 2015.

As the result of a fire in an underground salt haul truck and radiological release that occurred in February 2014, the WIPP repository is shut down and is not accepting any waste shipments. A recovery plan is currently being developed but a date for resumption of waste shipments to WIPP has not been established. Preliminary guidance provided to LANL by the DOE/NNSA Los Alamos Field Office for an updated Life-Cycle Baseline for work funded by DOE Environmental Management was to assume that shipments from LANL to WIPP will resume in October 2016. Based on that assumption and expected budget targets, removal of the six categories of BG TRU would not be completed until approximately March 2021.

Detailed planning has begun on retrieval and processing of the first six categories of below-ground TRU waste, with the CMPs, Trenches A-D, Pit 9, and the Hot Cell Liners as the categories to be retrieved and processed for disposition first. Because the CMPs present less of a challenge in terms of both retrieval and processing, it is likely retrieval and processing will begin with the CMPs category and retrieval will begin on containers in Trenches A-D, Pit 9, and Hot Cell Liner shafts as the CMPs are processed. The Tritium Packages and 17th RH Canister categories are expected to be the last categories to be retrieved and processed of these six categories of below-ground TRU waste.

The Tritium Packages and the 17th RH Canister are stored in vertical shafts that were augured into the mesa top near the east end of Area G and lined with corrugated metal pipes. The tops of the corrugated metal pipes are surrounded by a concrete pad and the shafts have concrete covers. Both the Tritium Packages and the 17th RH Canister categories have a configuration that consists of a cigar-shaped outer container designed to hold three drums that are the primary containers for the waste contents. The outer containers for the Tritium

Packages were called “tritium containment vessels” or “tritium pressure vessels” and the outer container for the 17th RH canister was called an “RH canister.” Four of the five Tritium Packages consist of stainless-steel tritium containment vessels that each hold three 55-gallon (gal) drums, and the fifth Tritium Package consists of a stainless steel tritium containment vessel that holds three 30-gal drums or a tank (reports of the contents are inconsistent.) The 17th RH Canister consists of a carbon-steel RH canister that holds three 55-gal drums.

The Tritium Packages hold waste that is contaminated with both TRU isotopes and tritium that was generated in decommissioning of the Special Recovery Line at the TA-55 Plutonium Processing Facility in the 1994 to 1996 period. The four Tritium Packages that hold three 55-gal drums have molecular sieve material surrounding the drums inside the tritium containment vessels to absorb tritium contaminants, but information could not be located on whether the fifth Tritium Package has molecular sieve material surrounding the contents.

The 17th RH Canister holds three lead-lined 55-gal drums that contain waste items contaminated with neptunium-237 (Np-237) that were generated at TA-55. One of the drums contains items that are considered RH because they have radiation levels at the exterior surface of the items that exceed 200 millirem per hour (mrem/hr), with one item reported as high as 2,000 mrem/hr. Because of the lead shielding, the exterior of the drums are all below 200 mrem/hr.

The five Tritium Packages and the 17th RH canister must be retrieved from BG storage and processed for disposition. The tritium containment vessels are not WIPP-approved containers and the drums (or possibly a tank in one of the vessels) must be removed from the vessels. Drums will be radiographed to identify any items prohibited at WIPP and assayed to confirm that they have TRU levels of contamination. Based on information provided by the waste generator, it appears that three of the drums may have contamination levels that are below TRU levels and would be reclassified to low-level waste (LLW) or mixed low-level waste (MLLW). If one of the Tritium Packages contains a tank, the tank may require size-reduction and packaging into a standard waste box (SWB) for disposition.

Although the RH canister is an approved WIPP container, the three drums contained within the 17th RH canister must be removed from the canister for processing. Drums will be radiographed to identify any items prohibited at WIPP and assayed to confirm that they have TRU levels of contamination. Based on generator information, it is expected that all three drums have TRU levels of contamination and would be characterized for disposition at WIPP. Two of the drums contain no items that have high dose rates and could be packaged into 55-gallon drums, but one of the drums has some waste items with very high dose rates. An evaluation was performed by the Central Characterization Program (CCP) to determine if the items with high dose rates could be packaged in standard pipe overpack (SPO) drums. Based on this evaluation, it is expected that all of the waste items with high dose rates could be packaged in SPO drums, but the item with a dose rate of 2,000 mrem/hr must be placed into the SPO as the only waste item with a dunnage can placed beneath it.

This report summarizes available information on the origin, configuration, and composition of the waste containers within the Tritium Packages and 17th RH Canister categories; their physical and radiological characteristics; the results of the radioassays; and potential issues in retrieval and processing of the waste containers.

2. Introduction

2.1 Purpose and Introduction

Purpose of Report. This report presents a general description of categories of TRU waste in below-ground storage configurations at LANL TA-54 Material Disposal Area (MDA) G (the below-ground portion of Area G), with a detailed description of the Tritium Packages and 17th RH Canister categories of BG TRU waste. The report is intended to support work packages or statements of work for subcontracting task orders for disposition of the waste containers in the Tritium Packages and 17th RH Canister. Information is presented on the historical source of the waste stored in the Tritium Packages and 17th RH Canister shafts, the configuration of the containers stored in shafts, and characteristics of the Tritium Packages and 17th RH Canister waste categories.

Framework Agreement. A large wildfire called the Las Conchas Fire burned more than 150,000 acres south and west of LANL in late June and July 2011. The fire came within about 3.5 miles of TA-54, Area G, which is the primary location where solid radioactive waste is managed at LANL, and heightened public concern and news media attention on TRU waste storage at Area G. Following the fire, New Mexico Governor Susana Martinez asked the DOE to provide sufficient funding for cleanup of defense legacy wastes from LANL and for TRU waste disposal at WIPP.

The primary regulatory driver for environmental cleanup at LANL is the *Compliance Order on Consent* (Consent Order), a 2005 settlement agreement between LANL and the NMED that contains specific requirements and schedules for cleaning up historical contamination of the LANL TA-54 Area G site, and has a final deliverable date of December 2015 (Reference 1). The Consent Order does not address requirements and deliverables for removing TRU waste from the LANL site, which placed TRU waste removal at a lower priority in budget decisions. Disposition of TRU waste stored above ground at Area G and below ground in pits, shafts, and trenches within MDA G is required before a remedy for cleanup of MDA G can be implemented under the Consent Order. After the Las Conchas Fire, discussions were held with the NMED on accelerating TRU waste removal from LANL.

In January 2012, the DOE/NNSA and the NMED announced issuance of the *Framework Agreement: Realignment of Environmental Priorities* (Framework Agreement). The Framework Agreement is a non-binding agreement that outlines DOE/NNSA commitments to further accelerate TRU waste disposition at LANL (Reference 2). Commitments under the Framework Agreement related to TRU waste include:

- Removal of all non-cemented above-ground TRU waste stored at Area G as of October 1, 2011, by no later than June 30, 2014. This inventory was defined as 3,706 cubic meters (m^3) of material;
- Removal of all newly-generated TRU waste received in Area G during Fiscal Years (FY) 2012 and 2013 by December 31, 2014;
- Based on projected funding profiles, develop by December 31, 2012, a schedule with pacing milestones for disposition of below-ground TRU waste requiring retrieval at Area G; and
- Removal of the above-ground cemented TRU waste in an efficient and effective manner protective of human health and safety of workers and the public.

Within the schedule for disposition of below-ground TRU waste submitted to the NMED in December 2012, the DOE/NNSA determined that there are seven below-ground waste unit categories within MDA G that potentially contain TRU waste that may require retrieval (Reference 3). These seven categories were identified as (1) Pit 9; (2) Trenches A-D; (3) Corrugated Metal Pipes; (4) Hot Cell Liners; (5) Tritium Packages; (6) the 17th RH Canister; and (7) the 33 Shafts. The seven categories have an approximate total volume of 2,399 m^3 and approximate radioactive MAR of 110,751 PE-Ci. Of these

seven categories, approximately 99.86% of the waste volume and approximately 99.9% of the MAR is contained within the first six categories. For the remaining category, the 33 Shafts (which have a total approximate volume of 3.4 m^3 and total MAR of 97 PE-Ci), the DOE/NNSA concluded that additional evaluation is warranted.

The DOE/NNSA committed to disposition the below-ground TRU waste in the first six categories no later than September 30, 2018. For the 33 Shafts, DOE/NNSA will complete (1) a determination as to whether this category contains TRU waste that requires retrieval; and (2) to the extent necessary, its decision process under NEPA regarding retrieval, by no later than September 30, 2015. As the result of a fire in an underground salt haul truck and radiological release that occurred in February 2014, the WIPP repository is shut down and is not accepting any waste shipments. A recovery plan is currently being developed but a date for resumption of waste shipments to WIPP has not been established. Preliminary guidance provided to LANL by the DOE/NNSA Los Alamos Field Office for an updated Life-Cycle Baseline for work funded by DOE Environmental Management was to assume that shipments from LANL to WIPP will resume in October 2016. Based on that assumption and expected budget targets, removal of the six categories of BG TRU would not be completed until approximately March 2021.

2.2 Background

Historical Perspective. Radioactive waste has been generated at LANL since the 1940's during research and development activities for nuclear weapons, nuclear reactors, and plutonium science. Historically, radioactive waste was buried in shallow landfills at LANL called MDAs. MDA G at TA-54 (below-ground portion of Area G) first received radioactive waste in 1957 and has served as the primary radioactive solid waste management facility at LANL since 1959 (Reference 4). Figure 1 shows a high-level aerial photograph of TA-54 Area G and location of Area G on a map of LANL technical areas and the surrounding area. MDA G underlies most of the portion of Area G shown in the aerial photograph.

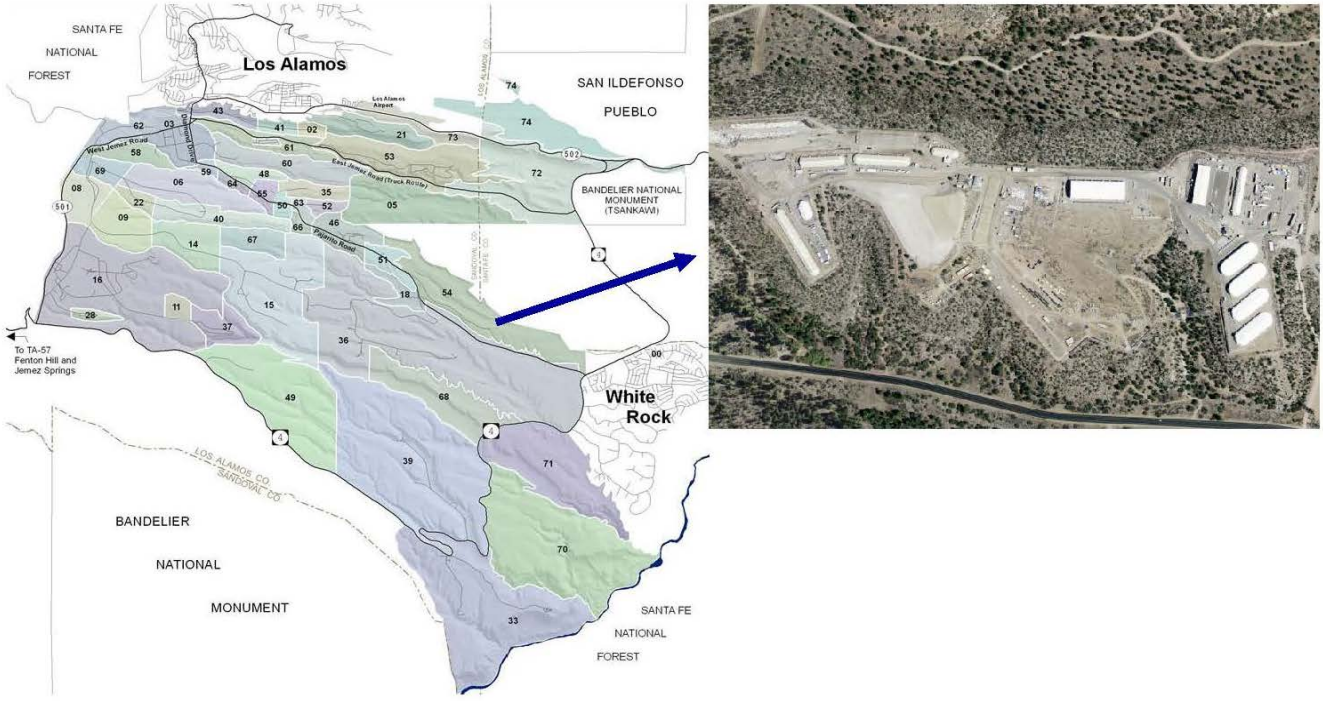

Figure 1. Location and Aerial Photo of TA-54 Area G

In 1970, the Atomic Energy Commission (AEC) issued Immediate Action Directive 0511-21 that directed AEC sites to segregate wastes with "known or detectable concentrations of transuranium nuclides" and that such wastes be "packaged and buried in such a fashion that they can be readily retrievable as contamination-free packages within an interim period of 20 years; beyond that period retrievability should continue to be possible" (Reference 5). This waste was to be stored for disposition in a future deep geologic repository (ultimately, WIPP).

Segregation requirements for TRU waste were clarified in 1973 with issuance of the *Atomic Energy Commission Manual*, Chapter 0511, "*Radioactive Waste Management*" to material contaminated with certain alpha-emitting radionuclides and activity greater than10 nanocuries per gram (nCi/g) for plutonium-239 (Pu-239) and uranium-233 (U-233). Both plutonium-238 (Pu-238) and plutonium-241 (Pu-241) were excluded unless indicated by Pu-239 impurities or when required by local burial criteria (LANL established a segregation limit for Pu-238 of 100 nCi/g). The value of 10 nCi/g was derived from the upper range of concentrations of radium-226 in the earth and was "subject to modification based on long-term studies of nuclide migration in soil" (Reference 6).). In September 1982, DOE issued DOE Order 5820.1, *Management of Transuranic Contaminated Material*, which defined "TRU contaminated material" as "alpha-emitting radionuclides of atomic number greater than 92 and half-lives greater than 20 years in concentrations greater than 100 nCi/g" (Reference 7). The term "TRU waste" was defined as TRU contaminated material which has been declared as having no significant economic value or use.

This definition was essentially retained by DOE Manual 435.1, *Radioactive Waste Management Manual* (Reference 8), issued in July 1999 under DOE Order 435.1, *Radioactive Waste Management*, which stated:

> "Transuranic waste is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for:
>
> (1) High-level radioactive waste;
>
> (2) Waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or
>
> (3) Waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61."

This definition of TRU waste is still applicable today, and in practice has been consistent since 1982. Waste segregated before that time may be determined not to be TRU waste under the current definition because it may have concentrations of alpha-emitting TRU isotopes with half-lives greater than 20 years that are less than 100 nCi/g or may contain radionuclides such as U-233 that are no longer included in the definition of TRU waste.

Like a number of DOE sites, LANL initially developed storage configurations for TRU waste that involved placing the waste containers in trenches, pits, and shafts that were excavated into the ground surface (Reference 4). LANL also began storing TRU waste in large fabric-covered storage domes in 1985 (white structures in the aerial photograph in Figure 1). By the time that WIPP opened in 1999, LANL had built up an inventory of about 9,100 m^3 of TRU waste at Area G, with about 2,416 m^3 stored below ground in trenches, pits, and shafts and about 6,700 m^3 stored above ground (Reference 9).

TRU Waste Disposition. Through August 24, 2014, LANL has shipped a total of 6,848 m^3 of TRU waste to WIPP or to temporary storage at the Waste Control Specialists, LLC site. Some TRU waste containers shipped to Idaho National Laboratory for characterization or size reduction and repackaging are also included. An additional 1,394 m^3 of TRU waste that was reclassified to MLLW after radioassay showed TRU isotope concentrations less than 100 nCi/g has also been shipped off-site to commercial

facilities for treatment and disposal at the Nevada National Security Site or commercial MLLW disposal facilities. Total disposition of TRU waste through September 30, 2013, was 8,501 m^3. There is not a one-to-one correlation between TRU waste volumes shipped to WIPP, or reclassified and shipped as MLLW, and inventory reduction because some containers were over-packed into standard waste boxes or repackaged into multiple drums because of their high activity.

Although the focus of shipments of TRU waste from LANL to WIPP has been on TRU waste stored above ground, LANL retrieved and shipped below-ground remote-handled (RH) waste in 16 shafts (Shafts 236-243 and 246-253) with a total volume of about 17 m^3 to WIPP in 2009. All other waste segregated and stored below ground as TRU waste remains below ground.

Below-Ground TRU Waste. Figure 2 presents a high-level aerial photograph of Area G with locations of the seven remaining below-ground waste unit categories. These locations are shaded in red and labels identify the seven waste unit categories.

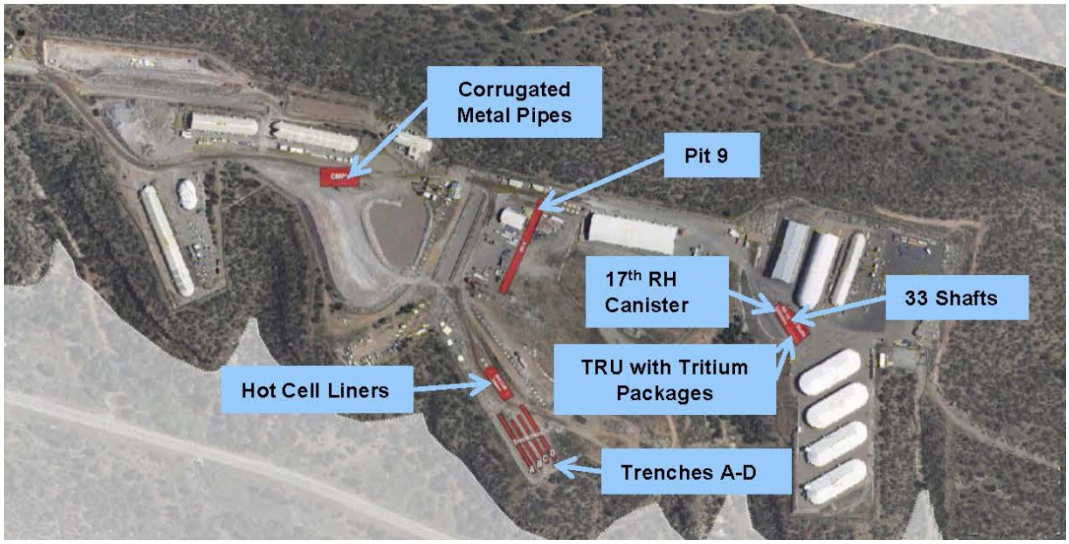

Figure 2. Aerial Photo of Area G with Below-Ground TRU Waste Storage Areas Shaded in Red

Table 1 presents a summary of the seven TRU waste unit categories stored below-ground at MDA G. The rows of the table that provide information on the Tritium Packages and 17th RH Canister categories are highlighted in yellow. The table provides a general description of each category, the approximate volume of each category, the percentage each category makes up of the total volume of the seven below-ground categories, the approximate MAR of each category, and the percentage each category makes up of the total MAR of the seven below-ground categories. The first six categories (Pit 9, Trenches A-D, CMPs, Hot Cell Liners, Tritium Packages, and 17th RH Canister) that were scheduled to be retrieved and dispositioned in the FY 2015 to FY 2018 period under the schedule submitted under the Framework Agreement. These categories make up 99.84% of the total volume and 99.92% of the total MAR of the seven categories. The 33 shafts make up only 0.14% of the total volume and 0.09% of the total MAR of the seven below-grade categories.

The Tritium Packages waste category makes up approximately 0.3% of the total volume of potential TRU waste required to be retrieved from below ground, but only approximately 0.01% of the total activity of TRU waste to be retrieved from below ground; the 17th RH Canister category makes up only approximately 0.04% of the volume and 0.001% of the total activity of below-ground TRU waste to be retrieved.

TABLE 1
Overview of Below-Ground TRU Waste Categories

Category	General Description	Approximate Volume (m^3)	Percentage Total Volume	Approximate MAR (PE-Ci)	Percentage Total MAR
Trenches A-D	Approx. 710 30-gal. drums in 4 trenches	335	14.0	93,870	84.8
Pit 9	Approx. 3,882 55-gal., 30-gal. and 85-gal. drums, 191 fiberglass-reinforced plywood boxes, and 6 other containers	1,560	65.0	6,019	5.4
Corrugated Metal Pipes (CMPs) above Pit 29	158 CMP, each ~ 30 in. diameter x 20 ft. long	442	18.4	10,775	9.7
Hot Cell Liners (RH Waste)	5 Shafts with glovebox liners from hot cells, each in a steel box 6 ft. x 6 ft. x 10 ft. long (Shafts 302-306)	51	2.1	0.5	0.0005
Tritium Packages	4 tritium packages, each containing 3 55-gal. drums, and one tritium package with 3 30-gal drums or small tank (Shafts 262-266)	6.7	0.3	8	0.01
17th RH Canister	Canister containing 3 55-gal. drums (Shaft 235)	1	0.04	1.5	0.001
33 Shafts (RH Waste)	32 lined shafts with pipes containing 1 or 2 gal. cans of hot-cell debris; 1 shaft with reactor vessel (Shafts 200-232)	3.4	0.14	97	0.09
Total		**2,399**	**100%**	**110,771**	**100%**

Records of waste generated 30 to 40 years ago are not always complete or consistent, and some differences in container numbers for Trenches A-D and Pit 9 have been identified as records were reviewed in detail. It is also important to note that the volumes shown in the table based on current records are not the final volumes that will be certified and shipped to WIPP. Some containers in the waste unit categories may be determined to be LLW or MLLW that would not be dispositioned at WIPP. Some containers with high MAR such as those in the Trenches A-D waste category are expected to be repackaged and produce a number of daughter drums. Other containers such as the oversize boxes in Pit 9 are expected to result in a much smaller volume that will be shipped to WIPP after being repackaged.

The values shown for MAR are also expected to change as containers are retrieved and processed for disposition. The Environmental Protection Agency (EPA) approved assay methods used for WIPP characterization may produce different values than the historical methods used by the waste generators during the period when the containers in these waste categories were generated.

Figure 3 presents LANL's planned TRU waste disposition timeline for all TRU waste stored at Area G based on the schedule contained in the EM Lifecycle Baseline submittal on June 30, 2014 (Reference 10). This schedule was constrained by specific budget targets for TRU waste disposition and the assumption that LANL will resume shipments to WIPP at the start of FY 2017 (October 2016). This timeline may change as a more certain date for resumption of shipments to WIPP is identified, by changes in budget targets for TRU waste disposition, and other factors such as the priority of LANL shipments to WIPP relative to other DOE sites.

Under this timeline, retrieval of the CMP category of BG waste would begin at the end of FY 2015, and retrieval and processing of CMPs would continue in FY 2016. Shipments of TRU waste from the CMPs category would begin with resumption of shipments of TRU waste from LANL at the start of FY 2017. Retrieval and processing of other BG categories except the 33 Shafts category would begin later in FY

2017. The Hot Cell Liners category is included within the Other Shafts timelines in the figure, with retrieval and processing beginning near the end of FY 2017 and continuing through FY 2018 and into FY 2019. Shipments of the Pit 9 category of BG TRU waste would be completed in mid FY 2021. This figure assumes that a decision will be made to retrieve and process the 33 Shafts category of TRU waste, and shipping of this category would be completed at the end of FY 2022.

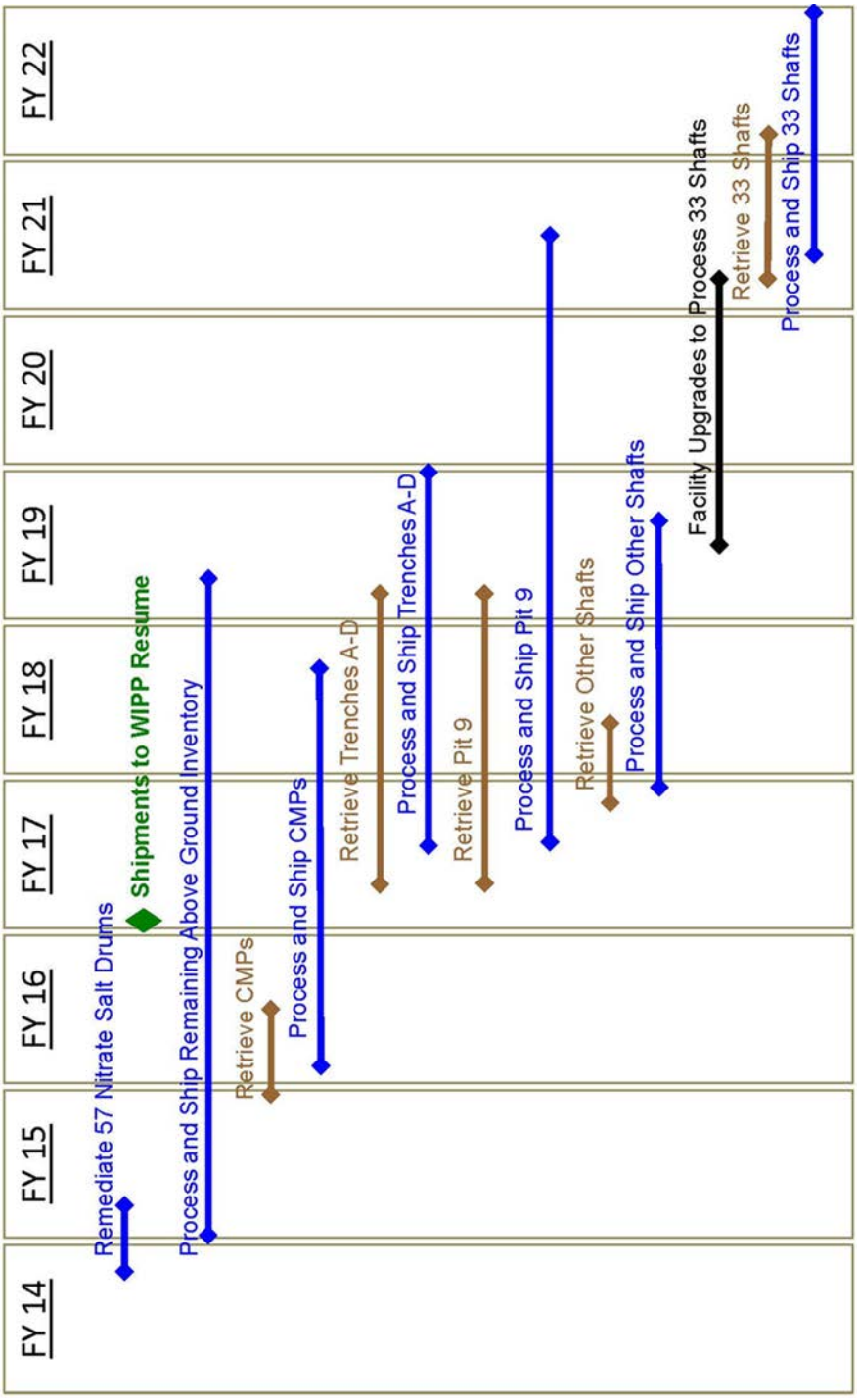

Figure 3. TRU Waste Disposition Timeline under Lifecycle Baseline Submittal of June 2014

3. Origin of Tritium Packages and 17th RH Canister Waste

Tritium Packages. The Tritium Packages category of TRU waste stored below-ground consists of five cigar-shaped stainless steel tritium containment vessels or "tritium pressure vessels" that hold waste contaminated with both TRU isotopes and tritium. The waste was generated at the TA-55 Plutonium Processing Facility (Building PF-4) during the decommissioning of the Special Recovery Line. Four of the waste packages were closed at TA-55 in 1994 and transported to TA-54 Area G in 1995. The fifth container was closed at TA-55 in 1996 and transported to Area G in 1997. The five waste packages were apparently stored above ground at Area G from receipt until they were placed into Shafts 262-266 in September 1999.

The four Tritium Packages that were closed in 1994 each hold three 55-gallon (gal) drums of waste. Reports are inconsistent on the contents of the waste package that was closed in 1996. This waste package likely contains three 30-gal drums, but one report describes the contents as a tank that is 20 feet (ft) long (Reference 11). The contents of all five of the Tritium Packages are discussed in detail in Section 5 that begins on Page 16.

17th RH Canister. The 17th RH Canister category of below-ground TRU waste consists of waste packaged in a single remote-handled (RH) waste canister. The canister holds three 55-gal lead-lined drums of TRU waste generated at TA-55 Building PF-4. The drums were closed at TA-55 in December 1994 to January 1995, and transported to the Chemistry and Metallurgy Research (CMR) Facility (TA-3, Building SM-29) in August 1995. The three 55-gal drums were loaded into a WIPP RH canister and the lid to the canister welded onto the canister in Wing 9 of CMR. The RH canister was transported to TA-54 Area G and placed into Shaft 235 in August 1995. The canister in Shaft 235 has been identified as the 17th RH canister because the canister is physically identical to 16 RH canisters that were retrieved and shipped to WIPP in 2009, and Shaft 235 is adjacent to the shafts that held the 16 canisters. However, the waste contained within the 17th RH canister is from a different waste stream than the waste packaged in the 16 RH canisters.

Figure 4 shows an aerial photograph of the East Shaft Field at Area G with labels that show the locations of Shafts 262-266 that hold the five tritium packages and Shaft 235 that holds the 17th RH canister. The tops of all of these shafts are sealed with concrete covers that are visible in the photograph. The view in the photograph is from the southeast.

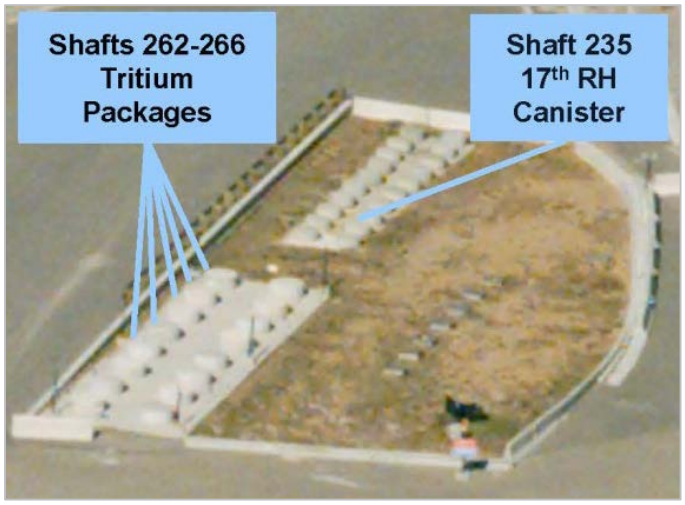

Figure 4. East Shaft Field at Area G

4. Configuration of Tritium Packages and 17th RH Canister Shafts

4.1 Construction and Configuration of Waste Containers in Shafts

The five shafts that hold the Tritium Packages (Shafts 262 through 266) and the shaft that holds the 17th RH Canister (Shaft 235) are located in a shaft field in the eastern portion of Area G. Figure 2 on Page 6 shows the location relative to all of Area G. Figure 5 below presents an engineering drawing that identifies all of the shafts in the shaft field and shows that the shafts are oriented northwest-southeast. The shafts that hold the Tritium Packages and 17th RH Canister are identified with red labels.

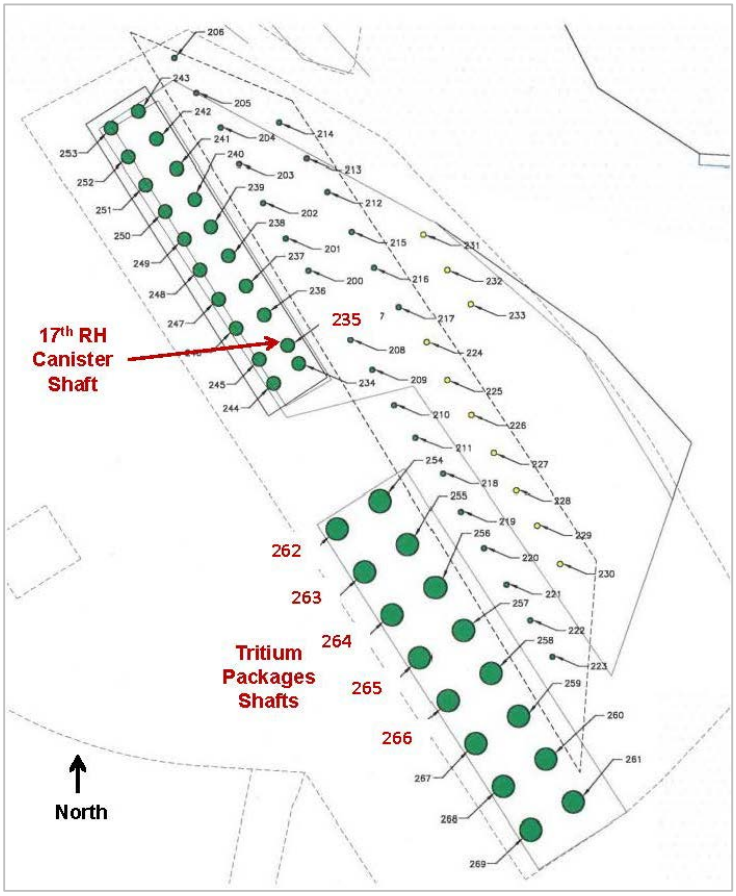

Figure 5. Locations of Tritium Packages and 17th RH Canister Shafts in East Shaft Field

Construction of Shafts for Tritium Packages. Shafts 262-266 were constructed by augering or boring vertical holes that were approximately four feet (ft) in diameter and 16 ft deep (Reference 12). The bottoms of the shafts were filled with approximately one foot of gravel to facilitate drainage. The shafts were then lined with 42-inch diameter by 16-ft long CMPs and the annular space between the vertical holes and the CMPs was filled with crushed tuff. A concrete pad was placed around the top of the shafts (the pad is shared with Shafts 254-269). Shaft covers that are approximately 4 ft in diameter and 2 ft high were constructed from concrete and include a steel lifting ring embedded in the concrete. Measurements in 2013 of 11 adjacent empty shafts in the same concrete pad (Shafts 254-261, 267-269) confirmed an inside diameter of approximately 42.5 inches and depth to the gravel at the bottom of the shafts of approximately 15 to 16 feet (Reference13). Figure 6 provides a photograph of the concrete pad and shaft covers for shafts that hold the Tritium Packages.

Figure 6. Covers for Shafts that Hold Tritium Packages

Configuration of Tritium Packages in Shafts 262-265. Figure 7 is a sketch of the shaft configuration (which is not to scale) for Shafts 262-265 that hold four of the five Tritium Packages. Each shaft contains one cigar-shaped stainless steel tritium containment vessel that holds three 55-gal drums. The containment vessels sit on gravel at the bottom of the shafts. Each containment vessel was fitted with a valve, pressure release valve, pressure gauge, and quick-connect fitting at the top of the vessel. The vessels may not be uniform as the reported volume and tare weight of the four vessels vary somewhat. No information on the dimensions, thickness, and lifting mechanism of the containment vessels was located. The packaging of drums in the tritium containment vessels is described in the waste characterization section that begins on Page 16.

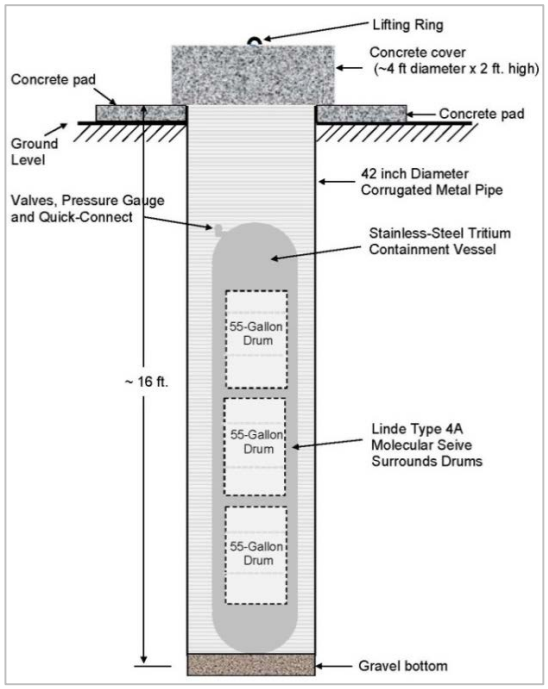

Figure 7. Configuration of Tritium Packages in Shafts 262-265

Configuration of Tritium Package in Shaft 266. The configuration and contents of Shaft 266 are inconsistent and somewhat confusing in the available documents. The TRU Waste Storage Record (TWSR) completed by the waste generator that is included as Appendix F of this report indicates that the waste package is comprised of a tritium pressure vessel with a volume of 0.7075 m^3 that contains three 30-gal drums. A 1996 memo on neutron assay of the waste (Reference 14) included in the TWSR package describes the item that was assayed as a "Tritium Tank that is a 12 ft. long by 20 in. diameter stainless steel tube." A 1993 memo (Reference 15) included in the TWSR package shows a configuration of three drums in a secondary tritium containment vessel. However, a 2005 report (Reference 11) describes the waste package as a 20 ft long tritium tank, and this description was used in a table included in the schedule for below ground TRU waste that was submitted to the NMED in December 2012 (Reference 3).

Two personnel who were listed in the TWSR as being involved in packaging of the waste in 1996 were contacted in the preparation of this report (References 16 and 17). One of these personnel is still actively involved in TRU waste operations at TA-55 and the other is now retired. Both recalled that all of the waste packages for tritium contaminated TRU waste consisted of a tritium containment vessel that contained drums. This would mean that the "tritium tank" in this shaft is likely the secondary tritium containment vessel, and that the vessel is 20 inches in diameter and 12 ft long based on the TWSR for the waste package. Both the reported volume for this waste package (0.7075 m^3) and the reported depth of the shaft (16 ft) are also both consistent with a vessel that is 12 ft long rather than 20 ft long. The calculated volume for a cylinder with spherical ends that is 20 inches in diameter and 12 ft long is approximately 0.71 m^3, while the calculated volume for a cylinder with spherical ends that is 20 inches in diameter and 20 ft long is approximately 1.20 m^3.

Figure 9 shows a likely configuration for the Tritium Package in Shaft 266 based on the above information. The shaft contains one cigar-shaped stainless steel tritium containment vessel that is 20 inches in diameter and 12 ft long, and holds three 30-gal drums. The containment vessel sits on gravel at the bottom of the shaft. A valve,

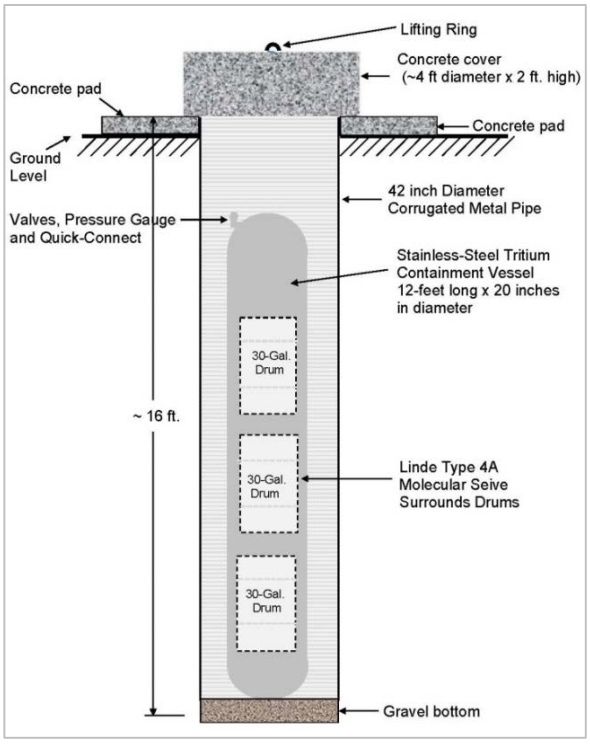

Figure 8. Likely Configuration of Tritium Package in Shaft 266

pressure release valve, pressure gauge, and quick-connect fitting are located within a skirt at the top of the vessel. No information on the thickness and lifting mechanism of the containment vessel was located.

Construction of Shaft for 17th RH Canister. Shafts 235 was constructed by boring a vertical hole that was approximately 36 inches in diameter and 16 ft deep (Reference 18). The bottom of the shaft was filled with approximately one foot of gravel to facilitate drainage. The shaft was then lined with a 32-inch diameter by 16-ft long CMP and the annular space between the vertical hole and the CMP was filled with crushed tuff. A concrete pad was placed around the shafts (the pad is shared with Shafts 234-253 which are all reported to be the same size and construction). A mushroom shaped shaft cover that is approximately 38 inches in diameter and 16 inches high was constructed from concrete and includes a steel lifting ring embedded in the concrete. The mushroom shape of the concrete cover serves as a plug in the top of the shaft. An elastomeric O-ring was also placed under the cover to seal the shaft from water, dust, and debris (Reference 19). Figure 9 shows a photograph of the concrete pad and shaft covers for the group of shafts that includes the shaft for the 17th RH Canister (located in the foreground at the right side of the photo). The building in the background is Building 54-412.

Figure 9. Covers of Shafts for RH Canisters

Configuration of 17th RH Canister in Shaft 235. Figure 10 is a sketch of the shaft configuration (which is not to scale) for Shaft 235 that holds the 17th RH Canister based on observed dimensions and configuration of the shaft in Reference 18. The shaft stores one carbon steel canister designed to hold RH waste for emplacement at WIPP. Wooden alignment guides were bolted to the inner surface of the corrugated metal pipe to align the canister within the shaft. The canister holds three 55-gal drums, and is constructed of ¼ inch thick carbon steel. The exterior of the canister is 26 inches in diameter and 121 inches (approximately 10 ft) long. There is a lifting pintle with a high efficiency particulate air (HEPA) vent filter in a recess at the top of the canister. The top of the canister has three inches of lead shielding, and the top of the canister was welded to the canister after the three 55-gal drums were loaded. A package of engineering drawings with details of the RH canister is provided in Appendix A.

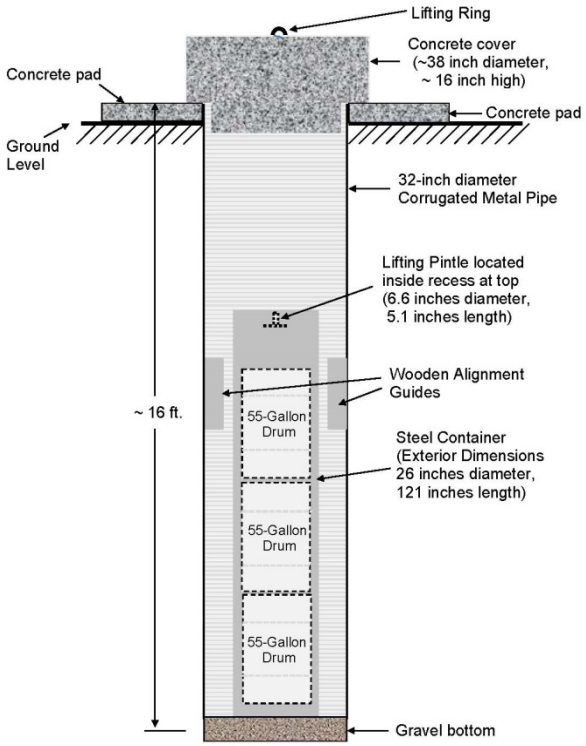

Figure 10. Configuration of 17th RH Canister in Shaft 235

4.2 Current Configuration of Tritium Packages and 17th RH Canister Shafts

While the development of Area G has continued to evolve since 1995, the Tritium Packages and 17th RH Canister shafts and the immediate surrounding area have essentially remained unchanged. Figure 11 is a photograph of the Tritium Packages shafts taken in July 2013 as seen from a location to the south of the pad. The covers for the shafts that hold the Tritium Packages are the furthest five in the second row that starts at the middle of the left side of the photo.

Figure 11. Concrete Pad and Shaft Covers for Tritium Packages Shafts

Figure 12 is a photograph of the shaft cover for the 17th RH Canister shaft taken in July 2013 that provides a closer view of the lifting ring for the cover.

Figure 12. Concrete Cover for 17th RH Canister Shaft

5. Characteristics of Tritium Packages and 17th RH Cansiter Waste

There are a number of sources of information on the characteristics of the waste containers within the five Tritium Packages shafts and the one 17th RH Canister shaft. The most readily accessible information is that contained within the LANL waste database, the Waste Compliance and Tracking System or WCATS. Information contained in WCATS is based primarily on the information from the Transuranic Waste Storage Record (TWSR) and Waste Profile Form (WPF) that were prepared by generators of the waste. For each waste package, the TWSR forms recorded origin of the waste, type of container, gross weight, waste radioactive content in either grams or curies, waste generator, container dose, and location at which the container was placed at TA-54 Area G. The form required the signature of the waste generator, the HSE-1 (Health Physics Group) area representative, and the Waste Management Group (HSE-7) representative. The original TWSR forms for the five Tritium Package waste containers were located in the Documents section of WCATS. The original TWSR form for the 17th RH Canister was not located in WCATS, but was obtained from the Environmental Programs Records Management System. These forms along with corresponding TWSR forms and Container Profile reports generated by WCATS are attached as appendices to this report. Appendix B provides the information for Tritium Package container 55618 placed in Shaft 262; Appendix C provides the information for Tritium Package container 55432 placed in Shaft 263; Appendix D provides the information for Tritium Package container 55449 placed in Shaft 264; Appendix E provides the information for Tritium Package container 55516 placed in Shaft 265; Appendix F provides the information for Tritium Package container 56197 placed in Shaft 266; and Appendix G provides the information for the 17th RH Canister container 19 placed in Shaft 235.

None of the containers used for these waste categories are standard waste containers, and all required submittal and approval of an exception request by the Waste Management Group. Attachments to the original TWSR forms include memos with clarifying information on packaging configuration, radionuclide content, and shipping information. These are not consistent for all containers but provide a great deal of supplemental information. Specific information on the drums within the secondary containers is available for all of the waste packages except Tritium Package container 56197 placed in Shaft 266. A laboratory notebook with information collected during packaging of items in two of the drums contained within the 17th RH Canister was also located and portions that are relevant to the packaging of those drums are included as Appendix H. Listings of items placed into the drums contained within the 17th RH canister are also included in Appendix H.

5.1 Physical Characteristics

Type and Size of Tritium Package Containers. The waste containers are cigar-shaped stainless steel tritium containment vessels or "tritium pressure vessels" that hold waste contaminated with both TRU isotopes and tritium. Figure 13 (from Reference 15) shows the configuration of the tritium containment vessels in Shafts 262 – 265 (vessels with container or waste package identification numbers 55618, 55432, 55449, and 55516). Each of the tritium containment vessels in these shafts contains three 55-gal drums surrounded by Linde Type 4A molecular sieve material. A carbon composite filter was placed in the top of each drum before it was placed into the tritium containment vessel, the drums were surrounded by the molecular sieve material, and the tritium containment vessel was welded closed. The original TWSR form for the tritium containment vessel with container ID 55516 lists Unistrut® rails inside the vessel in addition to the molecular sieve material, but no mention is made of such rails in the TWSR forms for the other vessels.

Each of the containment vessels is fitted with a valve, pressure release valve, pressure gauge, and quick-connect fitting at the top of the vessel. Figure 14 provides a blow-up sketch of the valve train (from Reference 15). The figure is not to scale. The memo that contained this figure also mentions that the valve train is surrounded by a skirt with holes cut to allow viewing of the pressure gauge and access to the valve. The specific dimensions of the four vessels could not be located, but the volumes of the vessels are consistent with cylindrical vessels with

spherical ends that are approximately 27 to 30 inches in diameter and lengths of approximately 11 to 14 feet. This size range also provides room for three 55-gal drums and molecular sieve material.

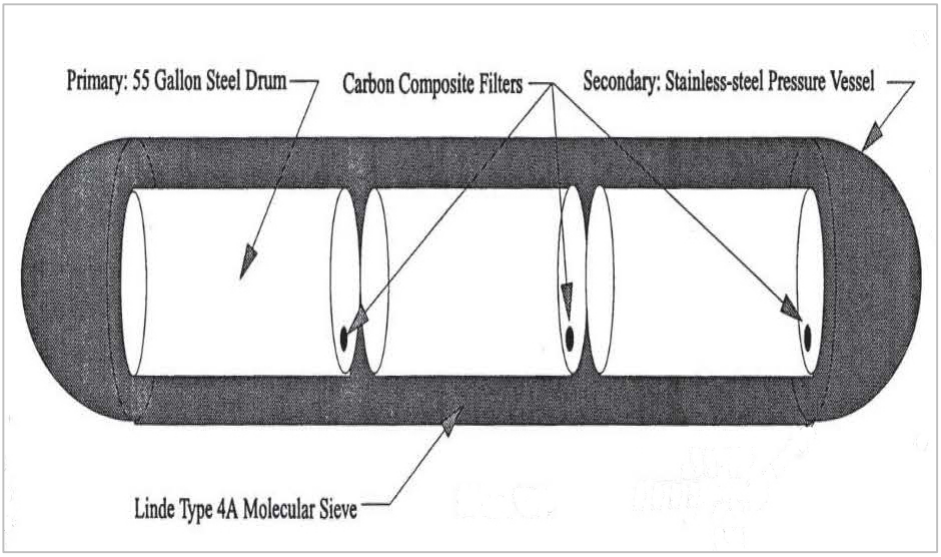

Figure 13. Configuration of Tritium Containment Vessels (Tritium Packages)

Based on the TWSR form in Appendix E and discussions with personnel involved in packaging the container (References 16 and 17), the tritium containment vessel in Shaft 266 with container or waste package ID 56197 likely consists of a tritium containment vessel that contains three 30-gal drums surrounded by Linde Type 4A molecular sieve material. Both of the personnel indicated that all five of the packages followed the agreement for packaging of the waste, and that all waste was placed into drums. However, unlike the TWSR forms for the other four tritium packages, no information was provided in the TWSR for the individual drums placed within the tritium containment vessel or the quantity of molecular sieve material that was placed around the drums in the containment vessel. A diameter of 20 inches is sufficient for a 30-gal drum, but allows very limited space for molecular sieve material except for the ends of the vessel and between the drums.

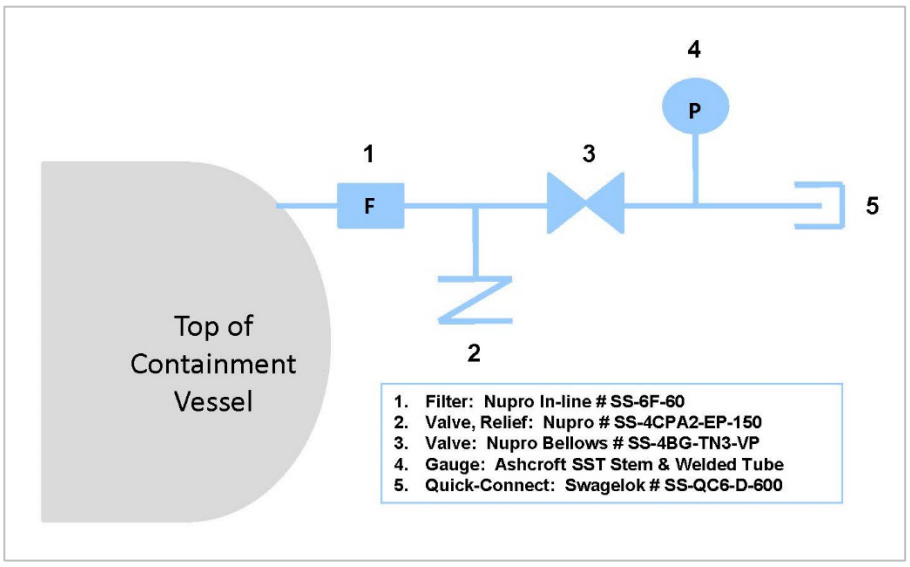

Figure 14. Valve Train Located at Top of Tritium Containment Vessels (Tritium Packages)

Type and Size of 17th RH Canister Waste Container.
Figure 15 provides a sketch of the WIPP RH waste canister (from Reference 19) that shows the lifting pintle in the recess at the top of the steel canister. A package of engineering drawings with details of the canister is also provided in Appendix A. The canister holds three 55-gal drums and the original TWSR package provides information on each of the drums. The TWSR generated by the WCATS system provides information on the entire package, but not the individual drums.

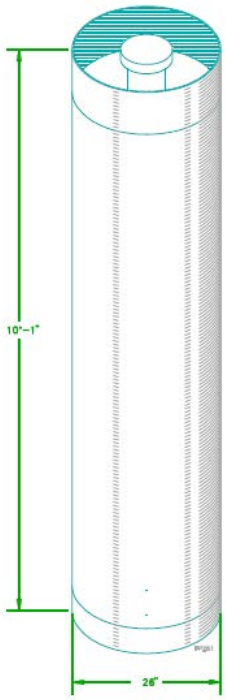

Figure 15. WIPP RH Canister

Physical Characteristics of the Waste Containers. Table 2 provides a summary of the physical characteristics of the five Tritium Packages and the 17th RH Canister. The volumes of the Tritium Packages range from approximately 0.7 to 1.6 m^3, and the gross weights of the packages range from approximately 2,100 to 2,700 pounds. Only two of the five Tritium Packages were reported to have the same volume, which may indicate that the tritium pressure vessels were not uniform even though four of them were fabricated to hold the same number and size of drums. The waste package that likely holds three 30-gal drums was reported to have only about half the volume of the containers that hold three 55-gal drums.

Gross weights of the individual drums within the containers were available for four of the Tritium Packages and for the 17th RH Canister, but were not available for Tritium Package ID 56197. Individual drums within the tritium packages ranged from approximately 40 pounds to 335 pounds. The weight of molecular sieve material placed around the drums was also available for the Tritium Packages that hold three 55-gal drums. The weight of molecular sieve material ranged from approximately 80 to 200 pounds. No information was reported for molecular sieve material for Waste Package ID 56197. Individual drums within the 17th RH Canister ranged from approximately 115 to 520 pounds. Molecular sieve material was not used in packaging of the 17th RH Canister because the waste did not have tritium contamination.

Contents and Packaging of Waste Containers. Most of the waste within the drums contained within the Tritium Packages was listed as scrap metal, with the WPF describing the contents as "system components: piping, flanges, valves, tanks, equipment from decommissioning operations with no known hazardous

TABLE 2
Waste Container Physical Characteristics

Waste Category	Shaft Number	Waste Package Number	Number of Containers in Shaft	Container Volume (m^3)	Approx. Container Gross Weight (pounds)	Number and Type of Internal Containers	Drum ID Number	Approx. Drum Gross Weight (pounds)	Approx. Weight of Molecular Sieve Material (pounds)
Tritium Packages	262	55618	1	1.5	2,130	Three 55-gallon drums	55617	183	80
							55619	176	
							55629	105	
	263	55432	1	1.4	2,590	Three 55-gallon drums	55443	172	150
							55442	262	
							55444	40	
	264	55449	1	1.6	2,670	Three 55-gallon drums	55446	178	203
							55447	335	
							55448	108	
	265	55516	1	1.5	2,340	Three 55-gallon drums	55551	89	123
							55620	134	
							55628	238	
	266	56197	1	0.7	2,480	Three 30-gallon drums (or one tank)	Specific Information Not Available	791	NA
17th RH Canister	235	19	1	0.99	2,880	Three 55-gallon drums	55569	116	0
							55637	510	
							55639	522	

constituents." One drum (Drum ID 55444 in Tritium Package ID 55432) contains glass. One of the drums within Tritium Package ID 55516 (believed to be Drum ID 55628 because that drum does not have a carbon composite filter) contains an estimated 20 gallons of a contaminated vacuum pump oil/vermiculite mixture (Reference 20). Specific information is not available for drums within Tritum Package 56197 but the waste is described in the WPF as "non-Pu238 waste metal from plutonium processing activities with no known hazardous constituents."

The Waste Management Group stated several requirements for packaging of the tritium contaminated waste (Reference 21) in response to the proposed plans for packaging of the waste (Reference 15). These included:

- Bracing massive objects such as vacuum pumps to prevent them from shifting during handling;
- Using a single plastic bagout with a "horsetail seal";
- Lining each 55gal drum with a 90 mil plastic drum liner and lid to provide a little extra "dent" protection for the drum; and
- Placing enough hydrogen getter material with the molecular sieve material in the secondary vessel to absorb all of the hydrogen that may be generated due to alpha radiolysis of hydrogenous wastes for a period of 20 years.

No information was located in the TWSR and WPF documents to indicate whether these requirements were actually met or not when the Tritium Packages were generated.

A laboratory notebook and listing of items to be packaged was provided by one of the persons involved in packaging drums for the 17th RH canister (relevant pages are in Appendix H) that included lists of items

packaged in the 55-gal drums contained within the canister. All three drums were lined with 1/8 inch thick lead sheet. Drum ID 55569 contains 31 items of contaminated plastics and 4 items that resulted from solutions that were either cemented or treated by hydroxide precipitation and calcining of the precipitated material. These 35 items were probably packaged in paint cans or slip-top metal cans (Reference 22). Drum ID 55637 contains 20 one-gal metal paint cans of salt residues that resulted from hydroxide precipitation and calcining of the precipitated material. Drum ID 55639 contains 25 items (probably slip-top metal cans) containing crucibles (7 items) and salt residues (18 items) that resulted from hydroxide precipitation and calcining of the precipitated material (Appendix H and Reference 22). Weights of individual items are listed for Drum ID 55637 and Drum ID 55639.

5.2 *Radiological Characteristics*

Radiological Content of Tritium Packages. The WCATS database provides radionuclide content for each of the five Tritium Packages based on the TWSR form and WPF form completed by the generator in 1994 and 1996. Documents attached to the original TWSR forms also provide information on the individual drums within the tritium containment vessels for four of the five Tritium Packages. The Tritium Packages contain nuclear Material Type (MT) 52 (weapons-grade plutonium) and MT87 (tritium). The average isotopic values in weight percent for MT52 used at TA-55 was reported in an attachment to the TWSR forms to be Pu-238 (0.01%), Pu-239 (93.78%), Pu-240 (6.0%), Pu-241 (0.2%), and Pu-242 (0.02%). The TWSR forms provided radionuclide content for each of these plutonium isotopes and for tritium. The TWSR for Tritium Package ID 56197 also provides an estimate of the americium-241 (Am-241) content.

Table 3 provides a summary of the radiological characteristics of the Tritium Packages related to TRU isotopes. In general, the radiological content as expressed in PE-Ci and Pu-239 fissile gram equivalents (Pu-239 FGE) is relatively low for all five of the Tritium Packages. Almost 75% of the TRU activity for the five Tritium Packages is contained within Tritium Package 55516. Radiological information for individual drums was located for four

TABLE 3
Radiological Characteristics (TRU Isotopes) for Tritium Packages

Shaft Number	Waste Package Number	Number of Containers	PE-Ci	Pu-239 FGE	Radiation at Contact with Surface, mrem/hr	Number and Type of Internal Containers	Drum ID Number	Approx. Drum PE-Ci	Approx. Drum Pu-239 FGE
262	55618	1	0.2	2.6	0.3	Three 55-gallon drum	55617	0.2	2.2
							55619	0	0
							55629	<0.1	0.4
263	55432	1	0.1	1.3	0.1	Three 55-gallon drums	55443	<0.1	0.5
							55442	0	0
							55444	<0.1	0.8
264	55449	1	0.1	1.6	0.3	Three 55-gallon drums	55446	<0.1	0.5
							55447	<0.1	0.9
							55448	<0.1	0.2
265	55516	1	2.3	27.6	0.3	Three 55-gallon drums	55551	0.7	8.3
							55620	1.6	19.3
							55628	0	0
266	56197	1	0.4	4.1	0.1	Three 30-gallon drums (or one tank)	Specific Information Not Available	Specific Information Not Available	Specific Information Not Available

of the Tritium Packages, and this is also provided in Table 3. The analysis for three of the twelve drums with individual radionuclide content showed 0.00 grams of MT52 material; the drums were classified as TRU waste based on two times the uncertainty in the analysis. One of these drums (Drum ID 55628) is believed to be the drum that contains a mixture of vacuum pump oil and vermiculite in Tritium Package 55516. As discussed below, that drum also contained essentially all of the tritium within that Tritium Package.

Table 4 provides a summary of the radiological characteristics related to tritium of the Tritium Packages. Reference 20 discusses the basis for the tritium content for all of the Tritium Packages except Waste Package 56197 (which was generated about two years later than the first four packages). Calculations for decay of tritium to 2009 were reported in Reference 11. Three of the Tritium Packages (Waste Packages IDs 55618, 55432, and 55449) contain only surface contaminated metal and plastic trash, mostly piping and equipment (Reference 20). The estimate of the tritium of these three Tritium packages was based on the highest swipe sample of surface contamination of the type of material in these containers and an estimate of the total surface area within each of the containers. This was characterized as a conservative estimate of the tritium content of the containers.

Reference 20 also discusses the basis for the quantity of waste vacuum pump oil and vermiculite in one of the drum in what is believed to be Drum ID 55628 in Tritium Package 55516. The estimate of tritium in the vacuum pump oil was not based on analysis of the oil, but on the average value of tritium reported in vacuum pump oil at the Mound Laboratory (Reference 20). This reference also indicates that essentially all of the tritium in Tritium Package 55516 was contained within the drum containing the mixture of vacuum pump oil and vermiculite. The method used to determine the tritium content of 56197 could not be located but the quantity was reported on a form that provided assay information in the original TWSR package.

TABLE 4
Radiological Characteristics (Tritium) for Tritium Packages

Shaft Number	Waste Package Number	Tritium (Ci) on Date Package Closed (Date)	Tritium (Ci) Decayed to 2009
262	55618	0.032 (Nov 10, 1994)	0.015
263	55432	0.032 (Jan 10, 1994)	0.015
264	55449	0.032 (Jan 6, 1994)	0.015
265	55516	1,100 (Nov 8, 1994)	530
266	56197	2,710 (Sept 12, 1996)	1,390

Radiological Content of 17th RH Canister. The WCATS database does not reflect the overall radiological characteristics of the 17th RH canister. The TWSR generated by WCATS shows the radionuclide content is Pu-239, while Appendix H shows the radionuclide contained within all three drums in the 17th RH Canister is actually MT82, neptunium-237 (Np-237). The presence of Np-237 in these drums was controlled information at the time that the drums were packaged in 1994, and the original TWSR reported the radionuclide content in Pu-239 FGE curies.

Waste contaminated with Np-237 may have high gamma radiation levels. The drums were packaged in the WIPP RH canister because Drum ID 55639 contained 10 individual items that exceeded 200 mrem/hr and ranged up to 2,000 mrem/hr (Appendix H). None of the waste items in Drums 55569 and 55637 were remote-handled (exceeded 200 mrem/hr), but were included in the 17th RH Canister because three drums were needed to fill the RH canister. All three drums were lined with 1/8 inch lead sheet, and the radiation dose at the exterior surface of the three drums was reported as less than 200 mrem/hr in an attachment to the original TWSR:

- Drum 55639 was reported as 190 mrem/hr;
- Drum 55569 was reported as 36 mrem/hr; and
- Drum 55637 was reported as 25 mrem/hr.

The radiation dose at the exterior of the RH canister that held the three drums was reported as 0.1 mrem/hr.

Table 5 provides a summary of the radiological characteristics of the 17th RH Canister. Values for PE-Ci and Pu-239 FGE are based on WCATS (and which is consistent with the original TWSR), and Np-237 values for Drums 55637 and 55639 are based on information from the log book when the drums were packaged. The specific quantity of Np-237 in Drum 55569 was not available in the log book, but was calculated based on the fraction of the Pu-239 FGE that was not accounted for by Drums 55637 and 55639.

TABLE 5
Radiological Characteristics of the 17th RH Canister

Shaft Number	Waste Package Number	Number of Containers	PE-Ci	Pu-239 FGE	Radiation at Contact with Surface, mrem/hr	Number and Type of Internal Containers	Drum ID Number	Approx. Np-237 Content (g)	Approx. Drum PE-Ci	Approx. Drum Pu-239 FGE	Radiation at Contact with Surface, mrem/hr
235	19	1	1.5	24.2	0.1	Three 55-gallon drums	55569	20	<0.1	0.3	36
							55637	405	0.4	6.1	25
							55639	1,154	1.1	17.8	190

5.3 Chemical Characteristics

The 1994 and 1996 WPFs for the five Tritium Packages list all of the waste as non-hazardous or containing no hazardous constituents. The 1995 WPF for the 17th RH Canister also lists the waste as non-hazardous.

6. Retrieval and Processing Tritium Packages and 17th RH Canister

The five Tritium Packages and the 17th RH Canister must be retrieved from below ground storage and characterized to determine the processing and disposition path of the internal containers. The tritium pressure vessels that make up the five Tritium Packages are not containers that are approved for WIPP, and the contents would need to be removed from the vessels and processed for disposition at WIPP or another site for any contents determined not to be TRU waste. Although the 17th RH Canister is a container that is approved for WIPP, the drums within the canister have not been adequately characterized for WIPP and would need to be removed from the canister for processing. Available information indicates that two of the three drums are not RH, and it is likely that these would be managed as contact-handled waste after removal from the canister.

Retrieval of the Tritium Packages and the 17th RH Canister appears to be straight forward, but there will be considerable effort in project engineering, development of project plans and work control documents, and readiness before either retrieval or processing can begin. Processing of both the Tritium Packages and the 17th RH Canister appears more complex because of the potential for higher levels of tritium contamination in the Tritium Packages than processed in TRU waste in the past, and the presence of RH items within one of the drums within the 17th RH Canister. The current Area G Basis for Interim Operation (BIO) and Technical Safety Requirements (TSRs) (References 23 and 24) do not address retrieval of the Tritium Packages and 17th RH Canister, and plans for development of the nuclear safety basis for below-ground retrievals will need to include these waste categories.

6.1 Retrieval and Processing of Tritium Packages

Retrieval of Tritium Packages from Below-Ground Storage. Characterization/field inspection of the Tritium Packages in Shafts 262-266 is recommended as part of retrieval planning to verify the condition of the containers and feasibility for retrieval. This field work would be similar to that conducted in 2006 for the 16 RH Canisters in Shafts 236-243 and 246-253 (before their retrieval in 2009) and the hot cell liners in Shafts 302-306 at Area G (References 25 and 26 respectively). Since the Tritium Packages do not contain RH waste, shielding to control gamma exposures during the field work would not be required. Removal of the shaft covers and inspection of the Tritium Packages would confirm the size and condition of the tritium containment vessels in the shafts (of particular interest is the vessel stored in Shaft 266 since this package has been described both as a tank that is 20 inches in diameter by 12 feet in length and a tank that is 20 inches in diameter by 20 feet in length). The inspection would also determine the lifting mechanism and its condition for all five of the Tritium Packages. The original TWSR forms indicate the containment vessels were constructed of stainless steel and should be in excellent condition stored inside the lined and covered shafts, but inspection will confirm the condition of welds and the valve train on the vessels.

Inspection of the valve train on the tritium containment vessels would provide information on pressure within the tritium containment vessels (viewing of the pressure gauge), and the feasibility of obtaining gas samples from the vessels via the valve and quick-connect fittings. Obtaining headspace gas samples from Tritium Packages 55516 and 56197 (the two packages with the highest tritium levels at when packaged) and analysis of the samples for tritium would provide important information for storage and processing of the vessels after retrieval. Air sampling should also be performed within the shafts to evaluate tritium and other radionuclides, and swipe samples should be collected on the vessel surfaces to determine the presence of any contamination on the outsides surfaces of the vessels.

If inspection confirms the five Tritium Packages are in good condition, physical retrieval should consist primarily of removing the concrete shaft covers using the lifting hooks embedded in the concrete, lifting the packages from the shafts, and placing them onto a truck or trailer for transport to a storage dome to await processing. A great deal of effort will be required to develop all of the plans, work control documents, and demonstrating readiness before retrieval can be performed.

Processing of Tritium Packages after Retrieval. Processing of the Tritium Packages is planned in the oversize container remediation line in Dome 375. One or both of the spherical ends of the tritium containment vessels would be cut off the vessel and the molecular sieve material and drums would be extracted from the vessels. Depending on the tritium concentration in the headspace gas of the vessels, cutting and extracting the contents of the vessel may need to be conducted in a bagout system or some other containment to control tritium exposures. The molecular sieve material was added to the vessels to absorb tritium and this material will be repackaged into another container as tritium-contaminated material. The drums are likely to have tritium contamination on the outer surfaces and will likely need to be overpacked or decontaminated before further processing.

Since information in the TWSRs indicates that all but one of the 55-gal drums is vented, the drums would go to radiography and assay to determine if the drums contain prohibited items and if they contain TRU levels of contamination. As noted in the discussion of radiological characteristics, three of the 55-gal drums were listed as containing no measureable contamination, but were identified as TRU based on the uncertainty of the analysis. The assay for these three drums may show the waste is not TRU and they would be reclassified to LLW or MLLW. One of the three drums is believed to be the drum that contains the vacuum pump oil/vermiculite mixture, and this drum may not require venting if determined to have less than TRU levels of contamination for TRU isotopes. This drum was also described as containing essentially all of the tritium for Tritium Package 55516.

Most of the drums contain scrap metals of various types, but have the potential for items that are prohibited as WIPP such as free liquids that remain in pumps or tanks. One of the drums contains glass, which could also hold free liquids. Drums with prohibited items would require remediation to address the prohibited items before they could be characterized and certified to the WIPP WAC.

The configuration of the waste in Tritium Package 55197 is not known, and was described as containing three 30-gal drums in a note on the TWSR but simply described as a tank in another report (Reference 11). No information was provided on the drums, if present, including whether they are vented. The content of this Tritium Package was described as scrap metal, but this could also apply to a tank.

The molecular sieve material should not contain contamination by TRU isotopes since the drums were equipped with carbon filters or sealed. No hazardous constituents were identified in the waste. It seems likely that the molecular sieve material can be managed as LLW, unless a drum is found to be damaged or have poor integrity.

6.2 Retrieval and Processing of 17th RH Canister

Retrieval of 17th RH Canister from Below-Ground Storage. Characterization/field inspection of the 17th RH Canister in Shafts 235 is recommended as part of retrieval planning to verify the condition of the container and feasibility for retrieval. This field work would be similar to that conducted in 2006 for the 16 RH Canisters that were stored in the adjacent Shafts 236-243 and 246-253 (Reference 25), but controls for gamma exposure will not be required for characterization/field inspection of the 17th RH Canister because the external radiation dose at the surface of the canister is very low. The 2006 inspection of the 16 RH canisters in the adjacent shafts showed those canisters to be in good condition with no visible rust. Alpha and beta surface contamination was below release criteria, and no tritium was detected in the shafts. All of the 16 canisters were retrieved in 2009 without incident.

The 17th RH canister was placed into Shaft 235 after the 16 canisters, and it is expected that it will also be in good condition for retrieval. The proposed field characterization/inspection of Shaft 235 would provide up-to-date information for planning of the 17th RH Canister.

Figure 16 shows a 2009 photograph of retrieval of an RH canister from one of the shafts adjacent to Shaft 235. The canister was lifted from the shaft using a special grapple that grasps and holds the lifting pintle in the top of the canister (see Figure 17 on Page 18). This canister grapple was provided as government furnished services and items (GFSI) for retrieval of the 16 RH canisters in 2009, and will need to be requested as GFSI from the WIPP Mobile Loading Team for retrieval of the 17th RH canister.

Figure 16. Retrieval of RH Canister in 2009

Figure 17 provides photographs (from Reference 19) of the special grapple that was designed to lift the WIPP RH canister. The photo on the left shows the exterior top and sides of the canister grapple, and the photo on the right has a close-up view of the underside of the grapple that shows the guide bars and lifting latches. The canister grapple is equipped with a remote control panel that provides indication of contact with the canister pintle and the position of the grapple latches (either open or closed) and includes an electrical interlock to prevent the latches from being rotated to their open position if there is a load on the grapple (Reference 19). This feature reduces the potential for accidently dropping a canister due to inadvertent opening of the grapple latches during operation.

A number of documents are available from the 2009 retrieval of the 16 RH canisters that may be helpful in developing the plans, work control documents, and demonstrating readiness before retrieval can be performed. These include a retrieval plan (Reference 27) and traffic control plan (Reference 28), and the interim safety basis for the RH 16 canisters (Reference 19).

Processing of 17th RH Canister after Retrieval. Although the RH canister was a WIPP-approved container, the three 55-gal drums that are within the canister lack the characterization to be certified to the WIPP WAC (Reference 29). The available information on radiation levels of individual items in the drums in Appendix G also indicates that only one of the three 55-gal drums contained within the canister actually has waste items that exceed 200 mrem/hr. These will require removal of the three 55-gal drums from the 17th RH Canister.

Figure 17. RH Canister Grapple

The two drums with Drum IDs 55569 and 55637 were reported to have no individual items within the drums that exceed 200 mrem/hour, and the radiation levels on contact with the exterior of the drum are well below 200 mR/hour. Based on this information, these drums should be managed as contact-handled (CH) waste. The drums are vented, and should be able to go to radiography and characterization to determine if they contain prohibited items and have TRU levels of contamination. If prohibited items are present, then the cans will require repackaging to address the prohibited items. If these drums are repackaged, daughter or secondary waste containers that receive the lead liners will probably require labeling as D008 hazardous or mixed waste because the lead will no longer provide shielding of the waste container. Unless dispositioned within one year, the containers with the lead liners would also need to be added to the Site Treatment Plan (STP) for mixed waste that was implemented under a Federal Facilities Compliance Order issued by the NMED in October 1995 (Reference 33).

Information on the Drum ID 55639, which contains 10 waste items with dose rates that exceed 200 mrem/hr and one waste item with a dose rate of 2,000 mrem/hr, was provided to the CCP for an evaluation of possible repackaging options for this drum. One possible way of shipping the waste items as CH waste is to repack them into SPO drums, which are described in the CH-TRAMPAC document (Reference 30). The CCP performed dose rate modeling using the Monte Carlo N-Particle (MCNP) code to determine if such a packaging configuration would be suitable to ship the items as CH waste (Reference 31 and Appendix I). The modeling indicates it is likely that all of the waste items could be repackaged into SPO drums with 12-inch pipe components. All of the waste items except the item with a dose rate of 2,000 mrem/hr could be packaged with three items in each SPO drum, but the item with a dose rate of 2,000 mrem/hr would need to be packaged into an SPO as a single waste item with a dunnage can placed beneath it in the SPO. The MCNP modeling required assumptions on specific dimensions of the items in Drum ID 55639 and the density of the items because this information is currently unknown. However, projected dose rates obtained using the MCNP model were considerably below 200 mrem/hr at the bottom surface of the SPO drum.

Any daughter or secondary waste containers that receive the lead liner from repackaging Drum ID 55639 will probably require labeling as D008 hazardous or mixed waste because the lead will no longer provide shielding of the waste container, and will need to be added to the STP unless dispositioned within one year.

Potential Issues in Processing 17th RH Canister. The 55-gal drums that are contained within the 17th RH canister may contain prohibited items. The cans are not believed to be vented, and radiography of the cans may identify them as potentially being sealed cans greater than four liters in size.

The person involved in packaging of two of the three drums (Reference 22) indicated that the calcined hydroxide precipitants in at least two and possibly all three drums are very hygroscopic and the cans that hold them may be in poor condition if moisture reached these cans. Neptunium was also described as being extremely difficult to assay in dense materials such as the calcined salts (Reference 22).

The waste streams that are addressed in the CCP Acceptable Knowledge Summary Report for TA-55 mixed TRU waste streams (Reference 32) describe the isotope Np-237 as being present in trace amounts, and a revision to describe waste with NP-237 as the primary isotope may be needed. Another potential issue relates to whether the calcined salts may require treatment to achieve WIPP requirements for mixed inorganic waste streams that may result from changes to the WIPP WAC as a result of the incident at WIPP on February 14, 2014.

7. References

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2. *Los Alamos National Laboratory Framework Agreement: Realignment of Environmental Priorities*, Department of Energy National Nuclear Security Administration and State of New Mexico Environment Department, January 2012.
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4. M. A. Rogers, *History and Environmental Setting of LASL Near-Surface Land Disposal Facilities for Radioactive Wastes (Areas A, B, C, D, E, R, G, and T)*, LA-6848-MS, Vol. I and II, June 1977.
5. R. E. Hollingsworth, *Immediate Action Directive 0511-21, Policy Statement Regarding Solid Waste Burial*, U.S. Atomic Energy Commission, March 20, 1970.
6. *AEC Manual, Chapter 0511, Radioactive Waste Management*, U.S. Atomic Energy Commission, September 19, 1973.
7. *Management of Transuranic Contaminated Material*, DOE Order 5820.1, U.S. Department of Energy, Washington, D.C., September 30, 1982
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10. K. Johns-Hughes, "Legacy Waste Disposition," presentation to DOE Headquarters Review of *Los Alamos National Laboratory Environmental Management Program Lifecycle Baseline Fiscal Year 2015 Forward*, EP2014-0273, LA-CP-14-20037, July 15, 2014.
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13. S. B. French, *FW: Shaft Depth in the RH-16 Area*, e-mail to Kenneth Hargis, April 4, 2014.
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16. Personal communication by Kenneth Hargis with Michael V. Gallegos (April 15, 2014).
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19. *Interim Safety Basis (ISB) for the Remote Handled Waste Canister Retrieval and Transfer Project, ABD-yyy-xxx.R.0 (May 2006 Draft).*
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24. *Technical Safety Requirements (TSRs) for Technical Area 54, Area G,* ABD-WFM-002, Rev. 2.0, June 2013.
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33. *Federal Facilities Compliance Order (Los Alamos National Laboratory),* State of New Mexico Environment Department, October 4, 1995.

Appendix A

Engineering Drawings for WIPP RH Canister

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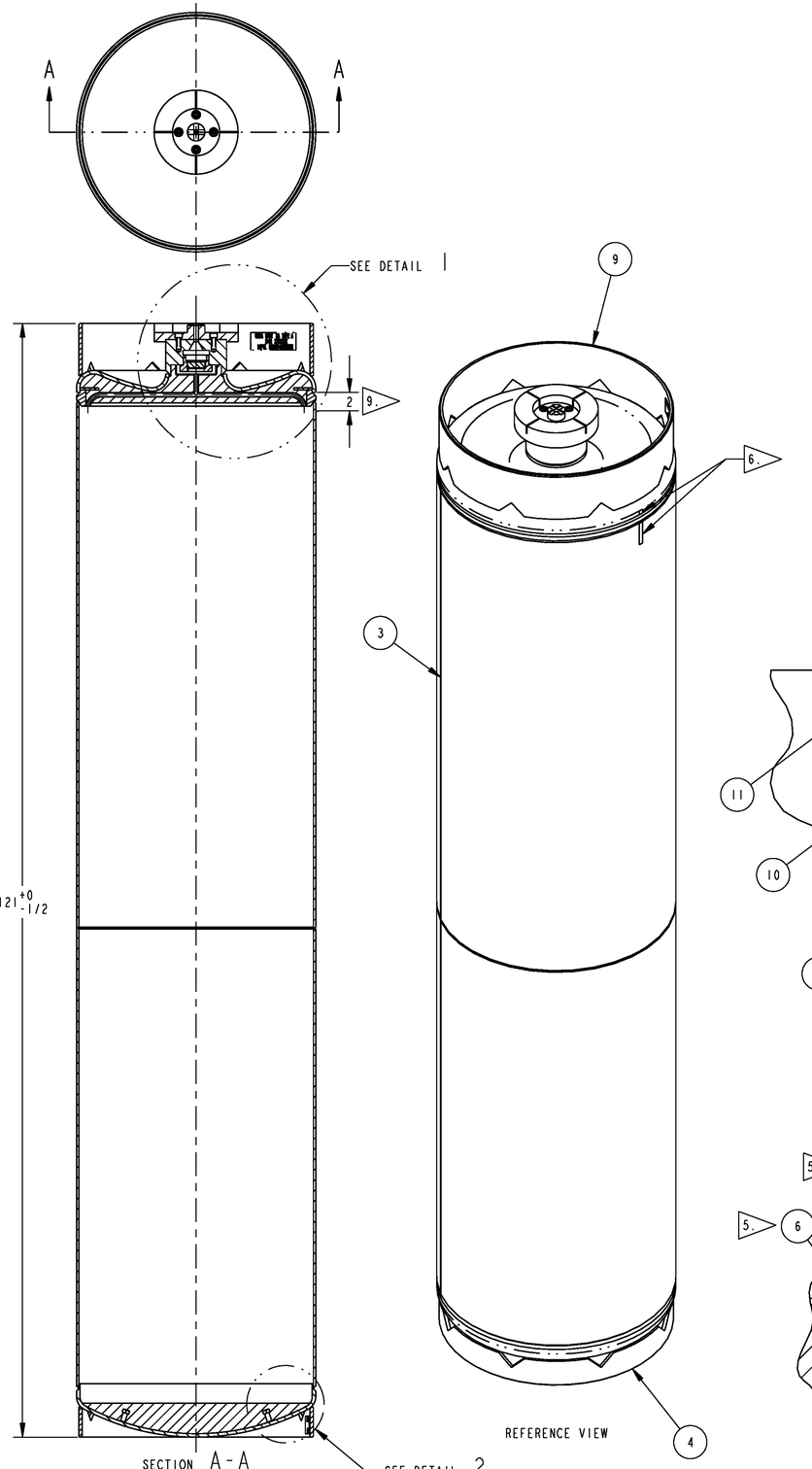
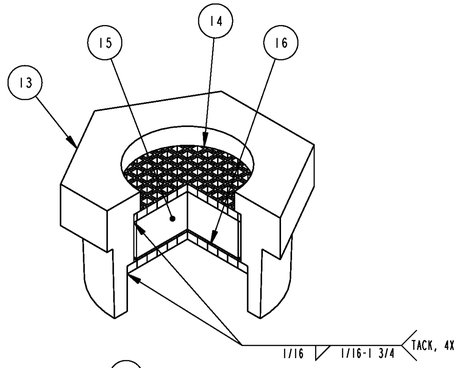
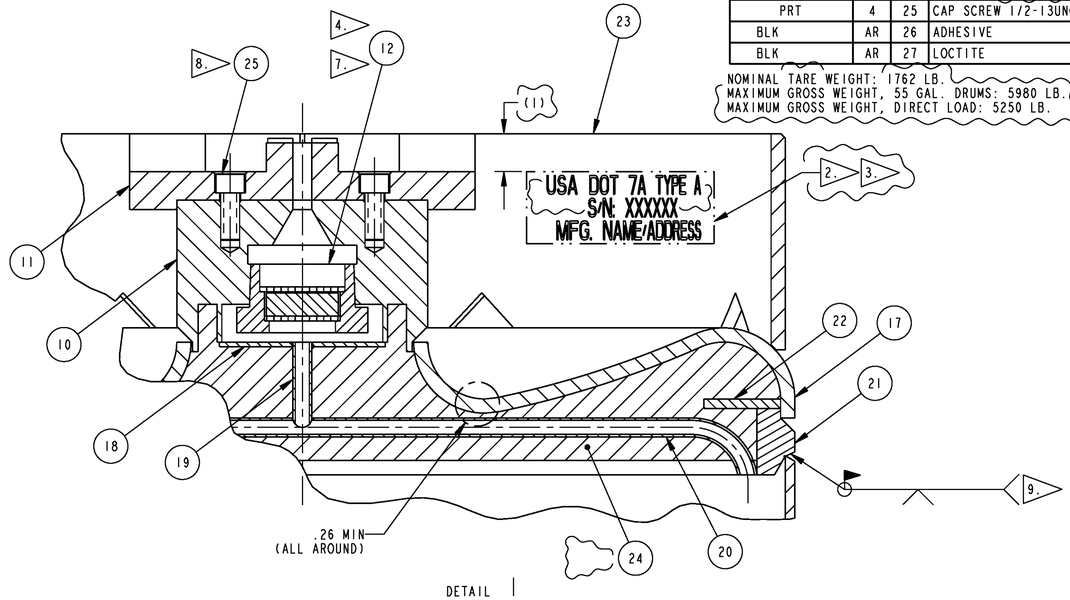


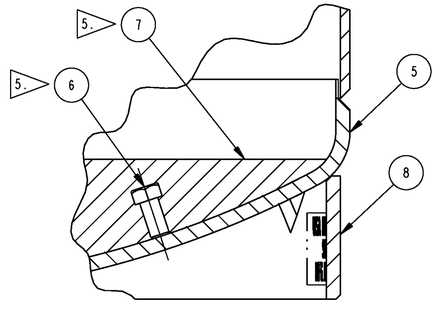
(1) WELDED LID CANISTER ASSEMBLY



(12) FILTER ASSEMBLY
REFERENCE VIEW
SCALE 1:1



DETAIL 1
SCALE 1:2



DETAIL 2
SCALE 1:2

LIST OF MATERIAL

TYPE/LEVEL	QTY REQ'D	ITEM NO.	NAME/DESCRIPTION	NOTE NO.	DRAWING NUMBER OR PART ID. NUMBER	MATERIAL SPECIFICATION MATERIAL	MATERIAL SPECIFICATION STD/NUMBER
ASM	1	1	WELDED LID CANISTER ASSEMBLY		-	-	-
ASM	1	2	BODY ASSEMBLY		165-F-011-W2	-	-
PRT	1	3	BODY		165-F-011-W3	SEE NOTE 10	SEE NOTE 10
ASM	1	4	BODY PAN ASSEMBLY		165-F-011-W2	-	-
PRT	1	5	DISHED BOTTOM PAN		165-F-011-W4	SEE NOTE 10	SEE NOTE 10
PRT	4	6	HEX BOLT 1/2-13UNC X 1 LG. (OPTIONAL)	A	92865A712	CS	SAE J429
PRT	1	7	BODY PIG (OPTIONAL)		-	LEAD	-
PRT	1	8	LOWER FLANGE		165-F-011-W5	SEE NOTE 10	SEE NOTE 10
ASM	1	9	LID ASSEMBLY		165-F-011-W2	-	-
PRT	1	10	PINTLE BAR		165-F-011-W3	SEE NOTE 10	SEE NOTE 10
PRT	1	11	PINTLE BAR CAP		165-F-011-W4	SEE NOTE 10	SEE NOTE 10
ASM	1	12	FILTER ASSEMBLY	D	165-F-011-WI	-	34486
PRT	1	13	FILTER HOUSING		165-F-011-W3	SS	-
PRT	1	14	SPACE CLOTH, 1/8 SPACE, Ø.063	A	9253T551	SS	TYPE 304
PRT	1	15	FILTER ELEMENT, Ø1.90 X .61 LG.		-	CARBON	
PRT	1	16	SPACE CLOTH, 1/8 SPACE, Ø.063	A	9253T551	SS	TYPE 304
PRT	1	17	REVERSE DISHED HEAD		165-F-011-W4	SEE NOTE 10	SEE NOTE 10
PRT	1	18	BACKING		165-F-011-W5	CS	ASTM A1011
PRT	1	19	EXTENSION TUBE		165-F-011-W5	CS	ASTM A-519 GR1020
PRT	1	20	BREATHER TUBE		165-F-011-W4	CS	ASTM A-519 GR1020
PRT	1	21	RING GUIDE		165-F-011-W5	CS	ASTM A-106 GR B
PRT	1	22	LEAD RETAINING RING		165-F-011-W5	CS	ASTM A-36
PRT	1	23	UPPER FLANGE		165-F-011-W5	SEE NOTE 10	SEE NOTE 10
PRT	1	24	LID PIG		-	LEAD	-
PRT	4	25	CAP SCREW 1/2-13UNC-2A X 1.25 LG	A	91251A714	ALLOY	ASTM A574
BLK	AR	26	ADHESIVE	B	503	CERAMABOND	-
BLK	AR	27	LOCTITE	C	262	-	-

NOMINAL TARE WEIGHT: 1762 LB.
MAXIMUM GROSS WEIGHT, 55 GAL. DRUMS: 5980 LB.
MAXIMUM GROSS WEIGHT, DIRECT LOAD: 5250 LB.

SUPPLIERS

A. MCMASTER-CARR OR EQUIVALENT
B. AREMCO OR EQUIVALENT
C. LOCTITE OR EQUIVALENT
D. LADISH OR EQUIVALENT

NOTES (CONTINUES ON SHT. 2)

1. FABRICATE IN ACCORDANCE WITH WASHINGTON SPECIFICATION E-1-458.
2. MARK AS SHOWN USING .50 IN. HIGH CHARACTERS RAISED OR INDENTED BY FORGING OR DYE-STAMPING INTO THE SURFACE. OPTIONAL: SEAL WELD A METAL IDENTIFICATION TAG STATING AS SHOWN.
3. UNIQUE 6-DIGIT SERIAL NUMBER SHALL BE MATCHED TO BODY AND LID ASSEMBLY.
4. TORQUE THE FILTER ASSEMBLY (ITEM 12) TO 50 FT-LBS.
5. ITEMS 6 & 7 ARE OPTIONAL AT THE USERS DESCRETION. THE BODY PIG IS PROVIDED FOR PROTECTION DURING LOADING OF PIERCING OBJECTS IF NECESSARY.
6. PAINT 1/2 WIDE MATCH MARK FOR LID ALIGNMENT USING STANDARD INDUSTRIAL ENAMEL, COLOR: BLACK.
7. TREAT THREADS WITH ADHESIVE (ITEM 26) PRIOR TO ASSEMBLY, PERMIT 24 HOURS CURE TO SEAL.

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		DATE	DATE	DATE	DATE		

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CHKR: J.L.JACKSON 7/24/03
COG: TODD ALLEN 7/24/03
CM: M.L.CAVINESS 7/24/03
QA: P.HARVEY 7/25/03
DM: BOB BEEMAN 7/30/03

DIM. IN INCHES U.N.O.
[ ] DENOTES mm U.N.O.
UNLESS OTHERWISE SPECIFIED TOLERANCES
2 PL DEC ±.03 | 3 PL DEC ±.010 | ANGLES ±.5° | 125
FRACTIONS: ±1/16
CAD SOURCE: PRO/ENGINEER

U.S. DEPARTMENT OF ENERGY
Washington TRU Solutions LLC
Waste Isolation Pilot Plant — Carlsbad, NM

TITLE
RH-TRU 72-B CASK
WELDED LID CANISTER ASSEMBLY

SIZE D | SYS PT03 | DWG NO 165-F-011-WI | REV A
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INTERPRET DWG PER ANSI Y14

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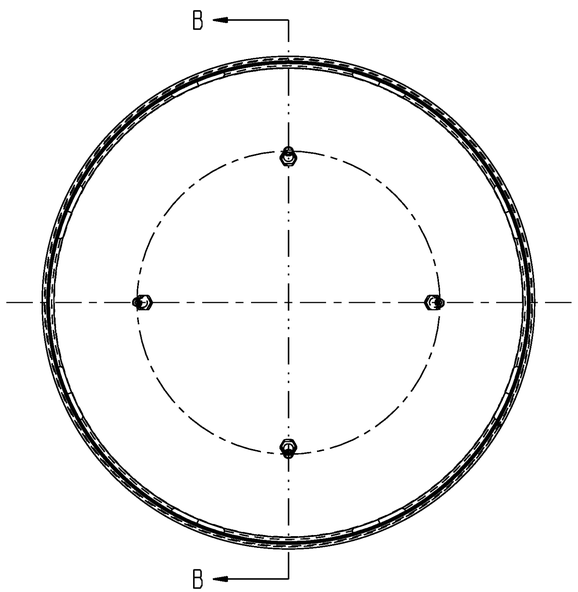
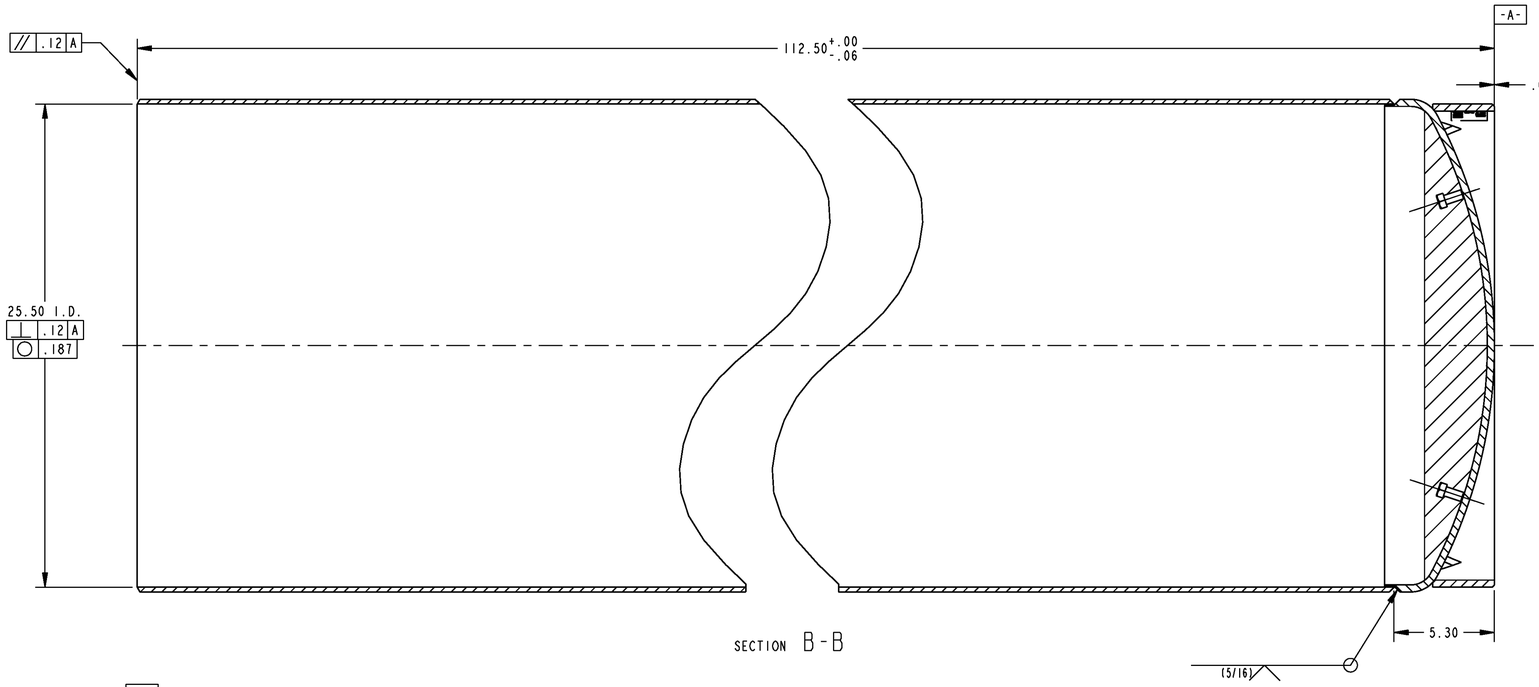
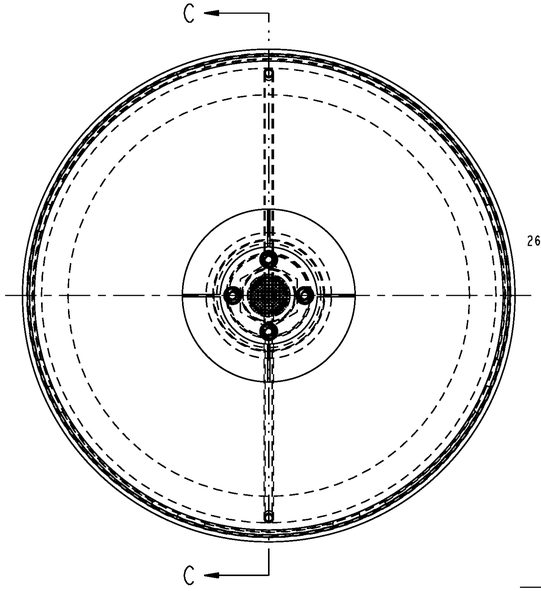


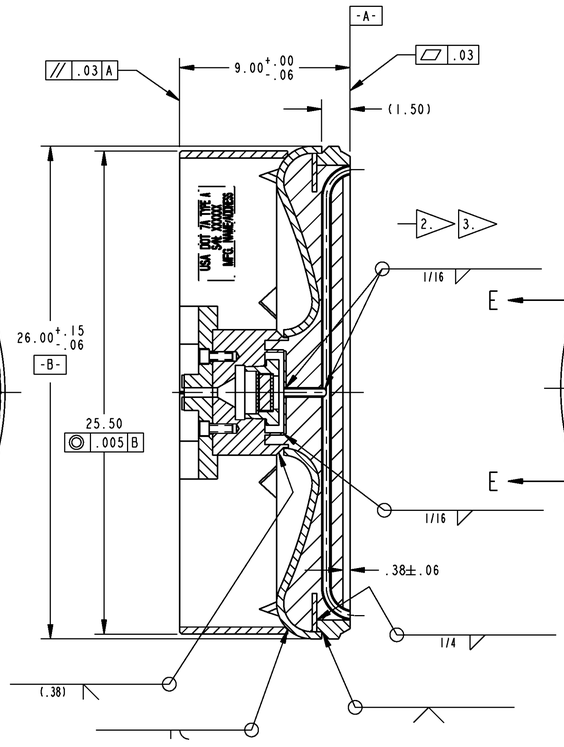
2 BODY ASSEMBLY



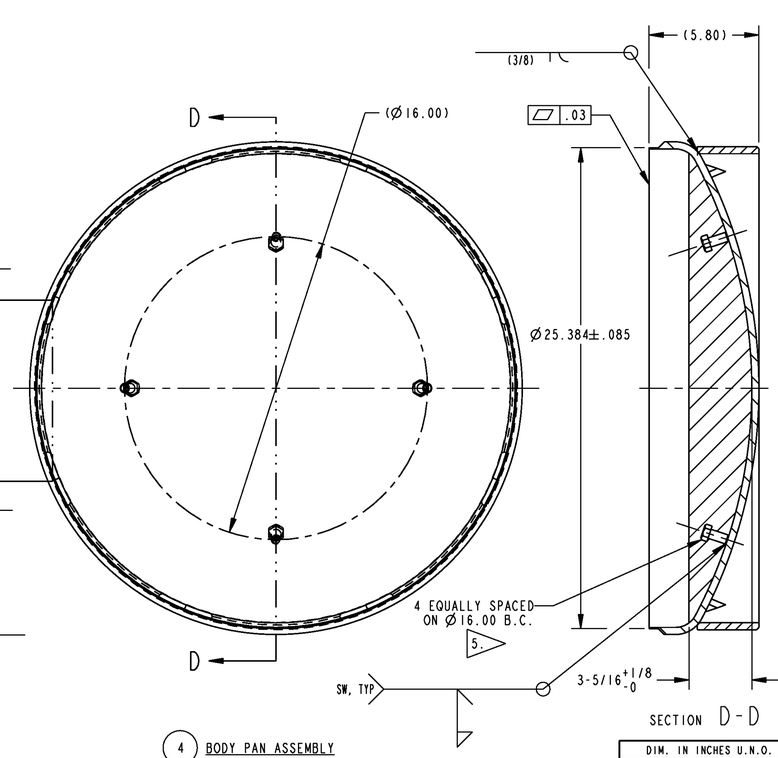
SECTION B-B



9 LID ASSEMBLY



SECTION C-C



4 BODY PAN ASSEMBLY

SECTION D-D

NOTES

8. USE LOCTITE (ITEM 27) OR EQUIVALENT ON CAP SCREWS (ITEM 25).
9. BEFORE SHIPPING TO CUSTOMER, PAINT WELD AREA WITH CARBO WELD II PER MANUFACTURERS SPECIFICATIONS, MADE BY CARBOLINE OR APPROVED EQUIVALENT BY STR. CUSTOMER WILL PERFORM FINAL CLOSURE WELD.
10. MATERIAL REQUIREMENTS
    - CARBON STEEL: ASTM A516 GRADE 55, 60 OR 70.
    OPTION - STAINLESS STEEL: ASTM A240/276 TYPE 304 OR 304L.
11. WELD REQUIREMENTS
    - CARBON STEEL: ALL WELDS SHALL CONFORM AND BE VISUALLY INSPECTED TO THE REQUIREMENTS OF AWS D1.1. ALL WELDS (EXCEPT THE FINAL CLOSURE WELD IF A FIELD WELD) SHALL BE MAGNETIC PARTICLE INSPECTED TO THE REQUIREMENTS OF ASME B&PV CODE, SECTION VIII, DIVISION 1, APPENDIX 6. OPTIONALLY: WELDS MAY BE LIQUID PENETRANT INSPECTED TO THE REQUIREMENTS OF ASME B&PV CODE, SECTION VIII, DIVISION 1, APPENDIX 8.
    - STAINLESS STEEL: ALL WELDS SHALL CONFORM AND BE VISUALLY INSPECTED TO THE REQUIREMENTS OF AWS D1.6. ALL WELDS (EXCEPT THE FINAL CLOSURE WELD IF A FIELD WELD) SHALL BE LIQUID PENETRANT INSPECTED TO THE REQUIREMENTS OF ASME B&PV CODE, SECTION VIII, DIVISION 1, APPENDIX 8.
12. FINISH REQUIREMENTS
    - CARBON STEEL: BLAST AND PAINT/COAT ALL EXTERIOR SURFACES.
    - STAINLESS STEEL: BLAST ALL EXTERIOR SURFACES.

INDEX CODE NUMBER				
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QA: P.HARVEY 7/25/03
DM: BOB BEEMAN 7/30/03

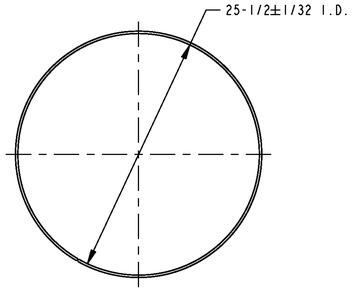
DIM. IN INCHES U.N.O.
[ ] DENOTES mm U.N.O.
UNLESS OTHERWISE SPECIFIED TOLERANCES
2 PL DEC ±.03 | 3 PL DEC ±.010 | ANGLES ±.5° | 125
FRACTIONS: ±1/16
CAD SOURCE: PRO/ENGINEER

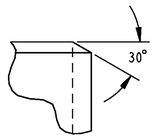
U.S. DEPARTMENT OF ENERGY

Washington TRU Solutions LLC
Waste Isolation Pilot Plant — Carlsbad, NM

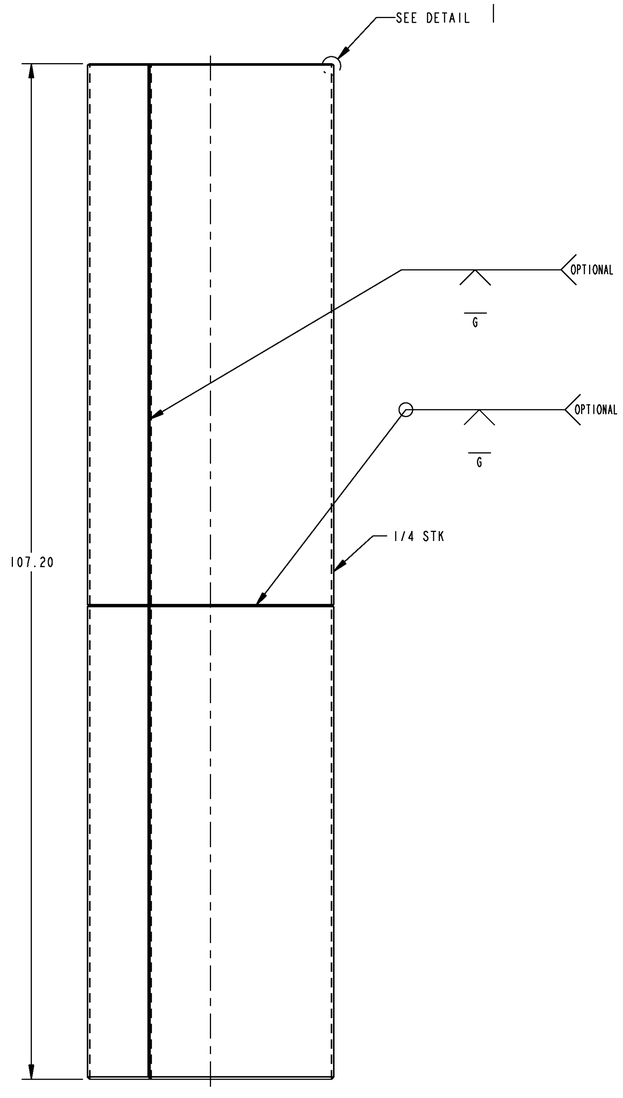
TITLE
RH-TRU 72-B CASK
WELDED LID CANISTER ASSEMBLY

SIZE D | SYS PT03 | DWG NO 165-F-011-W2 | REV A
SCALE: 1:4 | INTERPRET DWG PER ANSI Y14
THIS DRAWING TAKEN FROM: H-2-91273
VENDOR: ROCKWELL HANFORD OPERATIONS

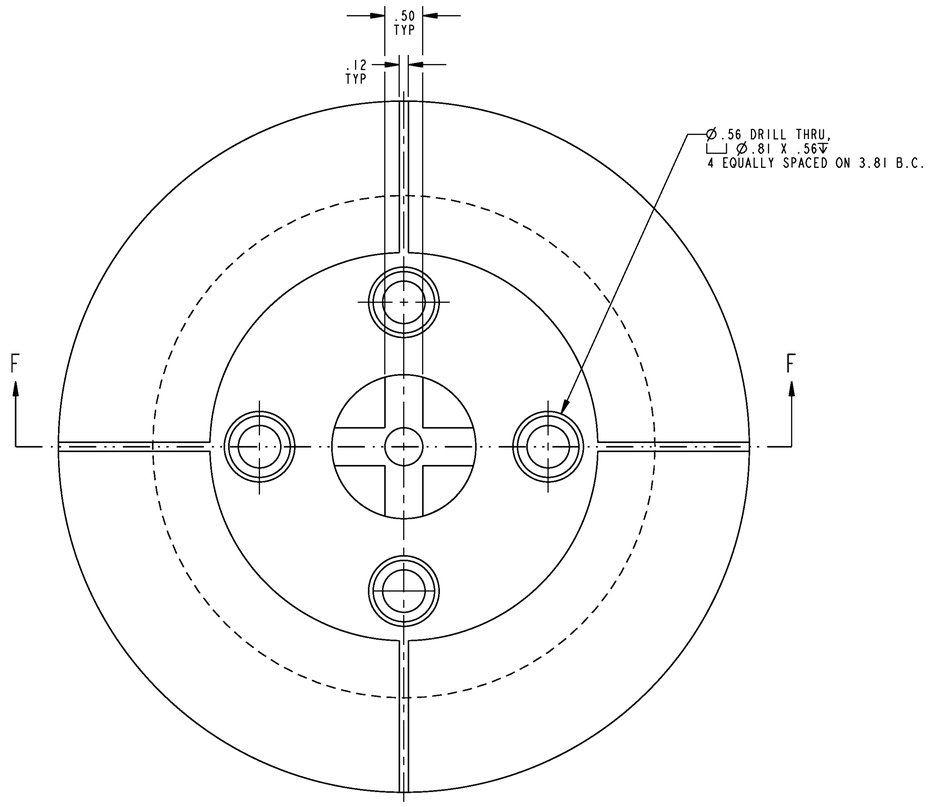


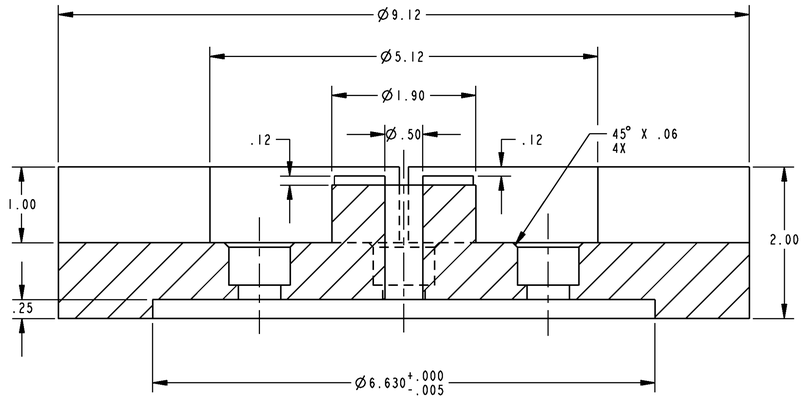


DETAIL |
SCALE 1:1
2X



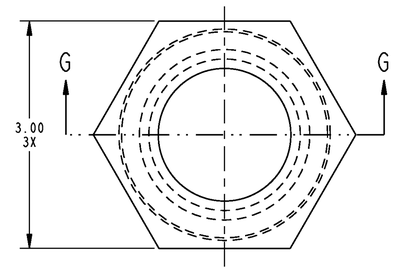
(3) BODY
SCALE 1:8

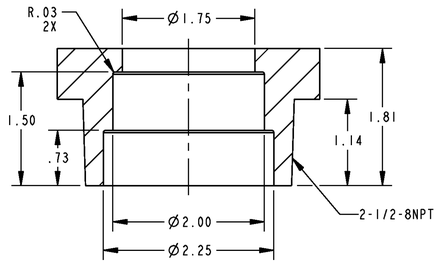




SECTION F-F

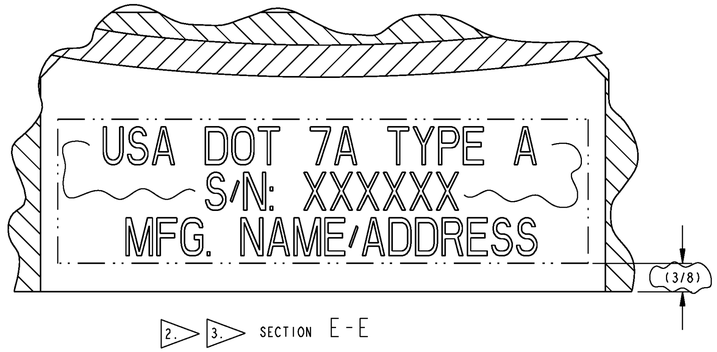
(10) PINTLE BAR





SECTION G-G

(13) FILTER HOUSING



2. 3. SECTION E-E

INDEX CODE NUMBER				
SYSTEM	WBE	DWG TYPE	CL	VENDOR
PT03	165	01300	44	240

REV	ISSUE DESCRIPTION					ECO	PWR
A	REVISED PER ECO	JMN	JG	TD	PA	11380	N/A
		3/31/06	4/18/06	4/17/06	4/20/06		
REV	ISSUE DESCRIPTION	DFTR	CHKR	COG	DFTG MGR	ECO	PWR
		DATE	DATE	DATE	DATE		

THIS DRAWING CREATED BY ENGINEERING CHANGE ORDER (ECO): 10736 PWR: N/A

DFTR: J.M.NEVAREZ 4/13/03
CHKR: J.L.JACKSON 7/24/03
COG: TODD ALLEN 7/24/03
CM: M.L.CAVINESS 7/24/03
QA: P.HARVEY 7/25/03
DM: BOB BEEMAN 7/30/03

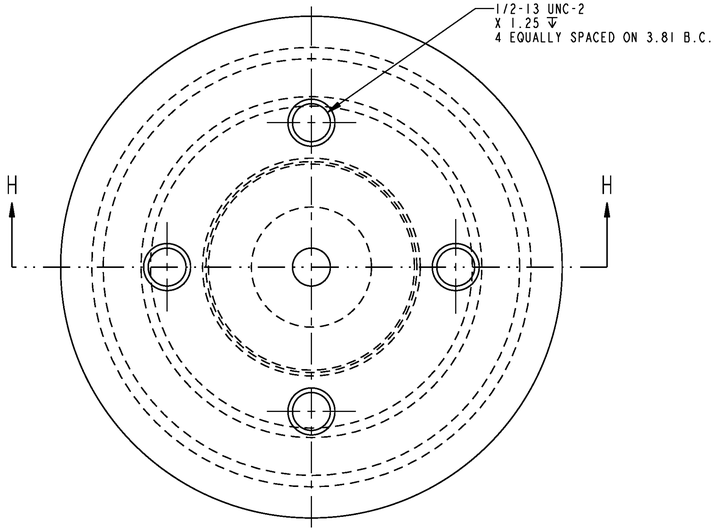
U.S. DEPARTMENT OF ENERGY

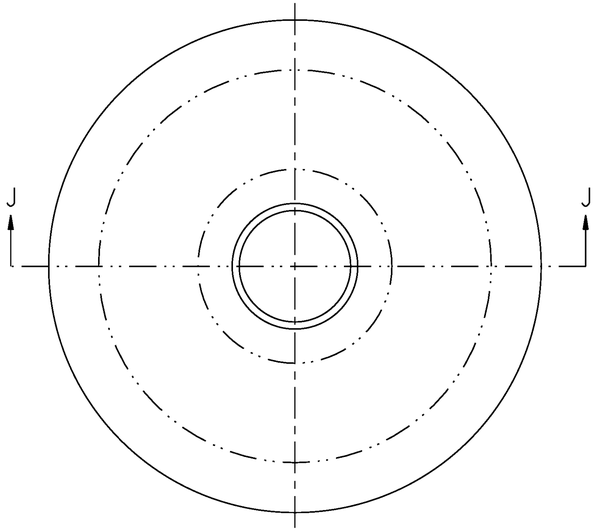
Washington TRU Solutions LLC
Waste Isolation Pilot Plant Carlsbad, NM

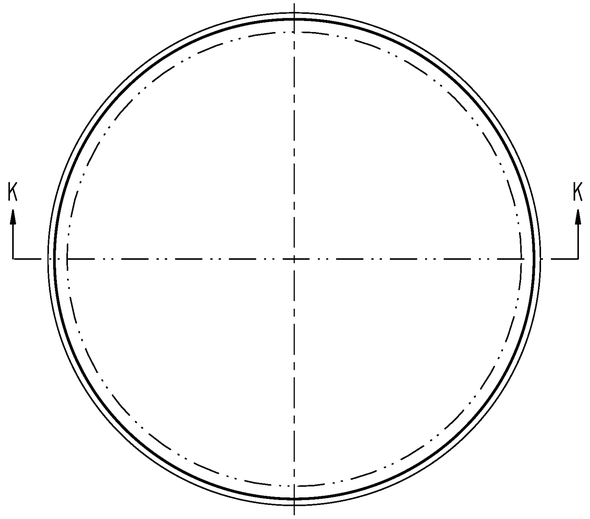
DIM. IN INCHES U.N.O.
[ ] DENOTES mm U.N.O.
UNLESS OTHERWISE SPECIFIED TOLERANCES
2 PL DEC ±.03 | 3 PL DEC ±.010 | ANGLES ±.5° | 125
FRACTIONS: ±1/16
CAD SOURCE PRO/ENGINEER

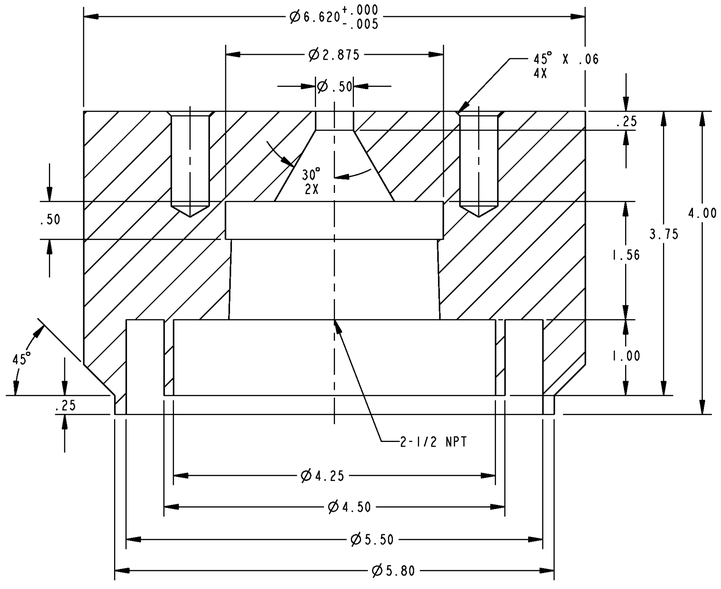
TITLE
RH-TRU 72-B CASK
WELDED LID CANISTER ASSEMBLY

SIZE D | SYS PT03 | DWG NO 165-F-011-W3 | REV A
SCALE: 1:1
INTERPRET DWG PER ANSI Y14
THIS DRAWING TAKEN FROM: H-2-91273
VENDOR: ROCKWELL HANFORD OPERATIONS



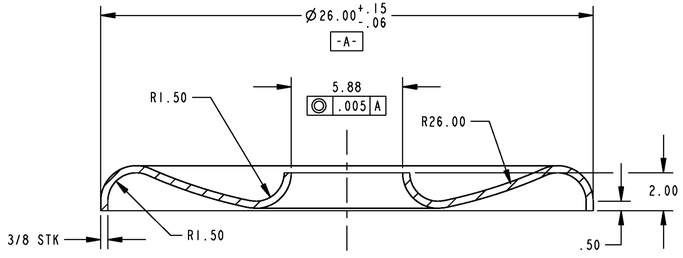






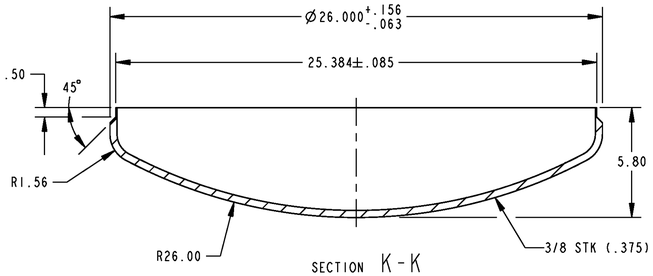
SECTION H-H

(11) PINTLE BAR CAP
SCALE 1:1



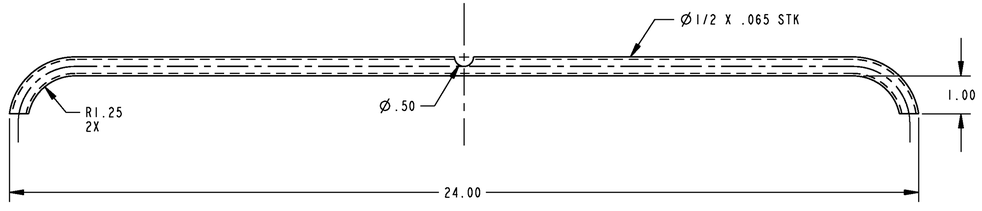
SECTION J-J

(17) REVERSED DISHED HEAD



SECTION K-K

(5) DISHED BOTTOM PAN



(20) BREATHER TUBE
SCALE 1:2

INDEX CODE NUMBER				
SYSTEM	WBE	DWG TYPE	CL	VENDOR
PT03	165	01300	44	240

REV	ISSUE DESCRIPTION						
		JMN	JG	TD	PA		
A	REVISED PER ECO	3/31/06	4/18/06	4/17/06	4/20/06	11380	N/A
		DFTR	CHKR	COG	DFTG MGR	ECO	PWR
		DATE	DATE	DATE	DATE		

THIS DRAWING CREATED BY ENGINEERING CHANGE ORDER (ECO): 10736 PWR: N/A

DFTR: J.M.NEVAREZ 4/13/03
CHKR: J.L.JACKSON 7/24/03
COG: TODD ALLEN 7/24/03
CM: M.L.CAVINESS 7/24/03
QA: P.HARVEY 7/25/03
DM: BOB BEEMAN 7/30/03

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DIM. IN INCHES U.N.O.
[ ] DENOTES mm U.N.O.
UNLESS OTHERWISE SPECIFIED TOLERANCES

2 PL DEC	3 PL DEC	ANGLES
±.03	±.010	±.5°

FRACTIONS: ±1/16

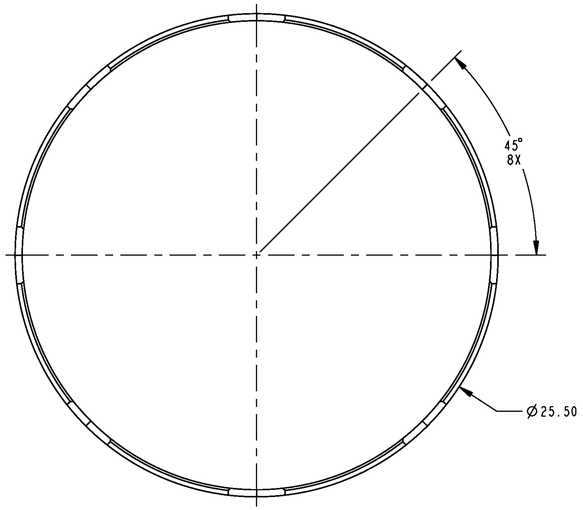
CAD SOURCE: PRO/ENGINEER

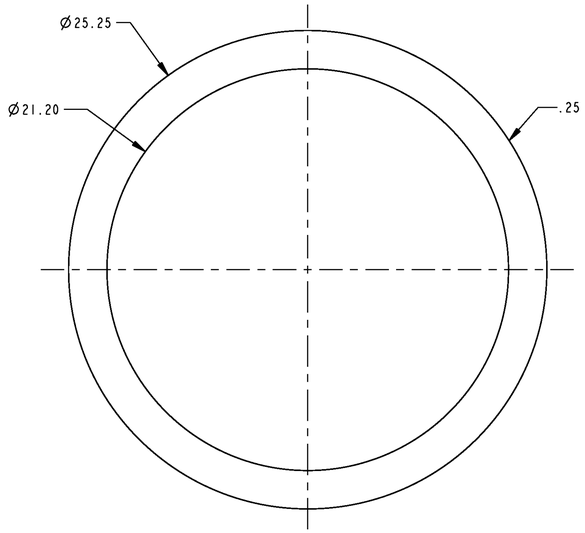
TITLE
RH-TRU 72-B CASK
WELDED LID CANISTER ASSEMBLY

SIZE	SYS	DWG NO	REV
D	PT03	165-F-011-W4	A

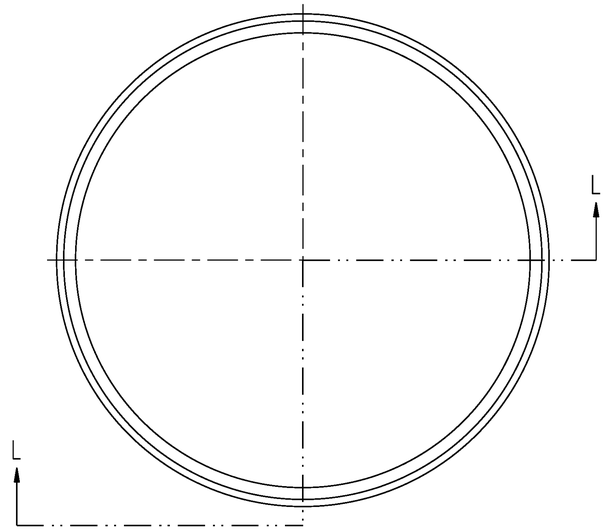
SCALE: 1:4 — INTERPRET DWG PER ANSI Y14

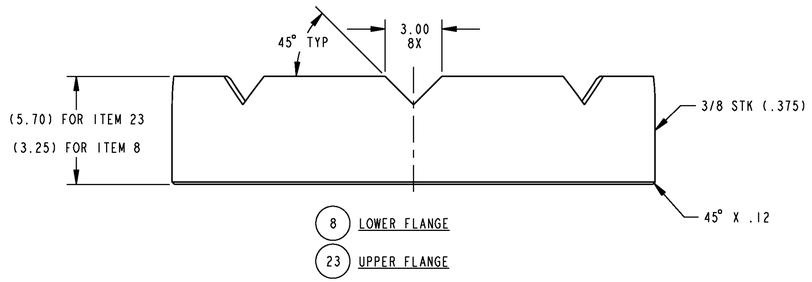
THIS DRAWING TAKEN FROM: H-2-91273
VENDOR: ROCKWELL HANFORD OPERATIONS





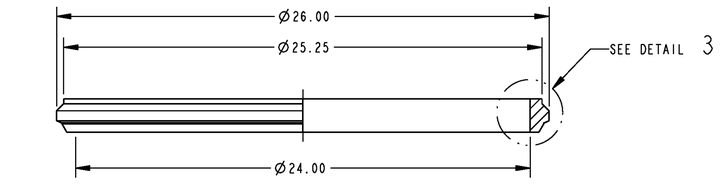
22 LEAD RETAINING RING





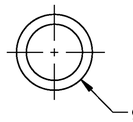
8 LOWER FLANGE

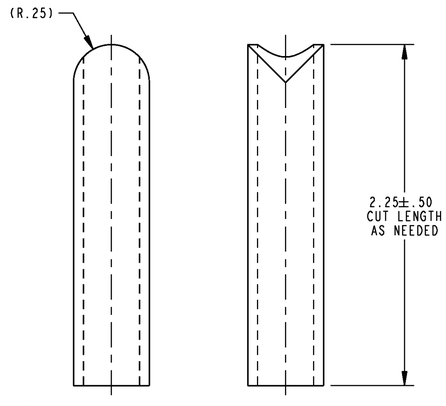
23 UPPER FLANGE



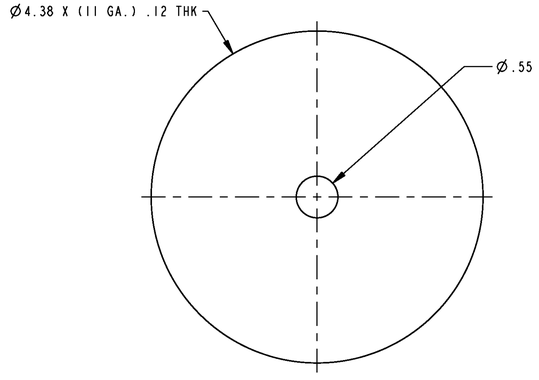
SECTION L-L

21 RING GUIDE

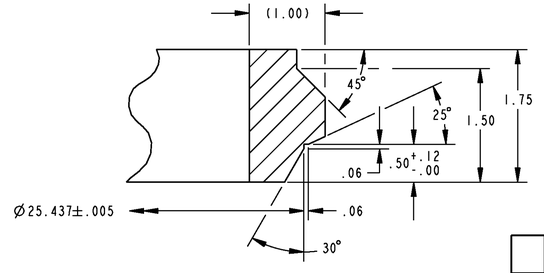




19 EXTENSION TUBING
SCALE 2:1



18 BACKING
SCALE 1:1



DETAIL 3
SCALE 1:1

A	REVISED PER ECO	JMN	JG	TD	PA	11380	N/A
		3/31/06	4/18/06	4/17/06	4/20/06		
REV	ISSUE DESCRIPTION	DFTR	CHKR	COG	DFTG MGR	ECO	PWR
		DATE	DATE	DATE	DATE		

THIS DRAWING CREATED BY ENGINEERING CHANGE ORDER (ECO): 10736 PWR: N/A

DFTR: J.M.NEVAREZ 4/13/03
CHKR: J.L.JACKSON 7/24/03
COG: TODD ALLEN 7/24/03
CM: M.L.CAVINESS 7/24/03
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DIM. IN INCHES U.N.O.
[ ] DENOTES mm U.N.O.
UNLESS OTHERWISE SPECIFIED TOLERANCES

2 PL DEC	3 PL DEC	ANGLES	125
±.03	±.010	±.5°	

FRACTIONS: ±1/16

DM: BOB BEEMAN 7/30/03

CAD SOURCE: PRO/ENGINEER

TITLE

RH-TRU 72-B CASK
WELDED LID CANISTER ASSEMBLY

SIZE	SYS	DWG NO	REV
D	PT03	165-F-011-W5	A

SCALE: 1:4 — INTERPRET DWG PER ANSI Y14

THIS DRAWING TAKEN FROM: H-2-91273
VENDOR: ROCKWELL HANFORD OPERATIONS

INDEX CODE NUMBER				
SYSTEM	WBE	DWG TYPE	CL	VENDOR
PT03	165	01300	44	240

Appendix B

TRU Waste Storage Information
Container 55618 Stored in Shaft 262

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TRU WASTE STORAGE RECORD

55618

1. Generator's Pre-Use Visual Inspection

Purchase Order #	Inspected Items		
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
	☑ Lid and Gasket	☑ Gouges	☑ Paint

Printed Name	Signature	Sig. Date	Oper. Date
WCATS APPLICATION (000000)	*WCATS Electronic*	11-10-94	11-10-94

2. Generator's Package Information

Group	Technical Area	Building	Cost Center	Program Code	Cost Account	Work Package
WM-SVS	55	000004				

Additional Information

☐ DP ☐ Non-DP If Non-DP waste, attach DOE approval doc.

Container	Liner
☐ Steel Drum (55 gal.)	☑ None
☐ Pipe Overpack Type:	☐ 90 mil liner
☐ Steel Drum (85 gal Overpack)	☐ 125 mil liner
☐ Standard Waste Box	☐ Fiberboard Liner
☐ Standard Waste Box Overpack	**Internal Shielding**
☐ RH Canister	☑ None
☐ Other (Call TWCO)	Type / Thickness

Radionuclide Content

Nuclide	Amount	Uncertainty	C= Curie M = Gram
H-3	3.200E-002	3.200E-002	C
Pu-238	4.959E-003	2.558E-003	C
Pu-239	1.641E-001	8.464E-002	C
Pu-240	3.865E-002	1.993E-002	C
Pu-241	6.384E-001	3.293E-001	C
Pu-242	2.223E-006	1.147E-006	C

Filter Serial No.			
	01		
	02		

Hazardous Materials

Name	EPA Code	Qty (g)

Waste Profile Number	22873 (WS ID 499)
Gross Weight (lb.)	2.13E+003
Net Weight (lb.)	1.30E+002
Shipping Category	
LANL Waste Stream ID	
TRUCON Code	LA117I

Date Closed (MM/DD/YY):	Accumulation Start Date (MM/DD/YY):
11/10/1994	11/10/94

The data in this section were collected, and waste described herein was packaged and labeled according to approved procedures.

Printed Name	Signature	Date:

3. Generator Site Health Physics Information

		Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Gamma Dose Rate (mrem/h) (contact)	2.00E-001				
Neutron Dose Rate (mrem/h) (contact)	1.00E-001	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	3.00E-001				
Total Dose Rate (mrem/h) (1 meter)		*The data in this section were collected according to approved procedures.*			
Alpha Contamination (dpm/100cm2)	0.00E+000	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	0.00E+000	Signature			

TRU WASTE STORAGE RECORD

55618

4. TRU Waste Management Review/Authorization

The data package for this waste has been reviewed. Basedon the information provided, this waste meets the WAC requirements for storage at TA-54.	Printed Name	Date:
	Signature	

5. Preload Visual Inspection

This waste package was visually inspected prior to transport according to approved procedures. It meets WAC packaging and labeling requirements and is free from obvious damage and defects.	Printed Name	Date:

6. Receiving Site Health Physics Information

Gamma Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	*The data in this section were collected according to approved procedures.*			
Total Dose Rate (mrem/h) (1 meter)				
Alpha Contamination (dpm/100cm2)	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	Signature			

7. Storage Site Information

Received by (Initials)	Date Received	**Original Storage Data**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (MM/DD/YY)	
Printed Name	Date:	Printed Name	Date:	
Signature		Signature		

8. Waste Acceptance Office

Intials/Date	WE Description

NCR Number	Intials/Date	NCR Description

TRU WASTE STORAGE RECORD

55618

9. Continuation Sheet for Radionuclide Content (from Page 1, Section 2)

Radionuclide Content - Continued			
Nuclide	**Amount**	**Uncertainty**	**C= Curie M = Gram**
No Additional Radionuclides			

10. Continuation Sheet for Hazardous Materials (from Page 1, Section 2)

Hazardous Materials		
Name	**EPA Code**	**Qty (g)**
No Additional Hazardous Materials		

CONTAINER PROFILE
55618
T-TRU-TEMP

WS ID: 499
C ID: 767869
ACTIVE

GENERAL INFORMATION

Container ID:	767869		
Labeled ID:	55618		
Optional ID:		**Status:**	ACTIVE
Chemical Barcode:		**Decommissioned:**	YES
Physical State:	SOLID	**Container Type:**	OT: Other (WCATS Specific)
Waste Stream ID:	499	**Container Subtype:**	Unspecified
Work Path:	T-TRU-TEMP	**Origin Date:**	10-Nov-1994 12:00 am
Quantity (Univ):		**Accum Start Date:**	10-Nov-1994
Compactible:		**Closed Date:**	10-Nov-1994

Discard Matrix:

TID(s):

Gen Contact: DENNIS R WULFF (093089)

Insert By: WCATS APPLICATION (000000)

Waste Desc: TRUCON CODE 117B, NON PU238 WASTE METALS IN 55 GALLON DRUMS. SCRAP METAL FROM PLUTONIUM PROCESSING OPERATIONS WITH NO...

WEIGHTS AND VOLUMES

Container Volume:	1.50 CM	**Gross Weight:**	2130.00 lb
Waste Volume:	NOT SPECIFIED	**Tare Weight:**	2000.00 lb
		Net Weight:	130.00 lb

LOCATION

Pickup (Origin): LANL: 55-PF4: GEN-AREAS

Current: LANL: 54-G-DISP: SHAFT262

CONTAINER PROFILE
55618
T-TRU-TEMP

WS ID: 499
C ID: 767869
ACTIVE

PAYLOAD INFORMATION

Container Procurement

P.O. Number: **Year of Manuf:**

Lot No.: **Serial No:**

Solution Package: 54: SP BG Boxes - H3 Canisters

TRUCON Code: LA117I: NON-PU238 METALS; 55-GALLON DRUM

Shipping Category:

CCP AK Report:

WIPP Waste Stream:

Matrix Code:

Defense Waste: **Equiv. Comb. Matrix:**

Adeq. Ventilation: **Compliant Metal Cont.:** NO

Overpack (1 to 1): NO **Retrievable:** **BIR WS Code:** LA-T10

Content Code:

COST CODES

Cost Center	Prog Code	Cost Account	Work Package	Percent Allocation	Cost Center Status	Cost Code Status	Recharge Mode
------	KB12	----	----	100.00			*UNCONSTRAINED*

RADIOLOGICAL SURVEY

Survey Type	Instrument Number	Survey Date	At Contact mrem/hr	At 30 cm mrem/hr	At 1 M mrem/hr	Alpha dpm/100cm2	Beta/Gama dpm/100 cm2
Survey ID: 73535, Status: Active							
B/G Survey			= 0.20	=	=	Not Applicable	
Neutron Survey			= 0.10	=	=	Not Applicable	
Smear Results			Not Applicable			= 0.00	= 0.00

CONTAINER PROFILE
55618
T-TRU-TEMP

WS ID: 499
C ID: 767869
ACTIVE

RADIONUCLIDES

Nuclide	Amount	Unit	Uncert	MT Derived (Y/N)	Activated (Y/N)	MDA Result (Y/N)	Normal Form (Y/N)	Measurement Code/Comment
Status: Active, Assay Page: 338480, Date: 11/10/1994, Derivation: Generator Entered Results (e.g., Offsite Assay)								
H-3	3.20E-002	Ci	3.20E-002	N			Y	
Pu-238	4.96E-003	Ci	2.56E-003	N			Y	
Pu-239	1.64E-001	Ci	8.46E-002	N			Y	
Pu-240	3.86E-002	Ci	1.99E-002	N			Y	
Pu-241	6.38E-001	Ci	3.29E-001	N			Y	
Pu-242	2.22E-006	Ci	1.15E-006	N			Y	

RAD CALCULATIONS

Total Activity (nCi/g):	1.48916E+04	**DOTFissile Mat (g):**	2.64981E+00
Alpha (nCi/g):	3.52276E+03	**Transport Index:**	
TRU Alpha (nCi/g):	3.52250E+03	**NRC Class:**	GTCC
Pu-239 FGE:	2.66139E+00	**DOT Type:**	B
Pu-239 FGE [2U]:	5.38851E+00	**LSA-I Fraction:**	4.47794E+03 N
Pu-239 Eq-Ci:	2.19743E-01	**LSA-II Fraction:**	1.37009E+00 N
Pu-239 Eq-Ci [2U]:	3.94192E-01	**LSA-III Fraction:**	6.85046E-02 Y
TRU Pu-239 Eq-Ci:	2.19743E-01	**Reportable Quantity:**	2.14098E+01 Y
TRU Pu-239 Eq-Ci [2U]:	3.94192E-01	*** ALC Ratio:**	2.29179E+06 NE
Decay Heat [U] (W):	9.29483E-03	*** ACM Ratio:**	1.34338E+05 NE
Tritium (Ci/m3):	2.13333E-02	**Limited Quantity:**	8.07902E+03 N
TRU ECW PE-Ci:	2.19743E-01		

Weight/Volume Used:

1 Container Net Weight: 5.89670E+01 kg
2 Container Volume: 1.50000E+00 m3

**ALC (Activity Limit for Exempt Consignment)*
**ACM (Activity Concentration for Exempt Material)*
U = 1 Uncertainty, 2U = 2 Uncertainty

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
11/10/1994 12:00 AM	1812154 EXECUTED	LANL:55-PF4 - DRMPRP-SW	NO
03/25/1996 12:00 AM	689531 EXECUTED	LANL:55-PF4 » 54-G:000283 STAGING	NO

CONTAINER PROFILE
55618
T-TRU-TEMP

WS ID: 499
C ID: 767869
ACTIVE

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
09/24/1998 12:00 AM	700448 EXECUTED	LANL:54-G » 54-G:000153	NO
09/22/1999 12:00 AM	700449 EXECUTED	LANL:54-G - SHAFT262	NO

Note: Highlighted row indicates container was output or receiving container for the indicated task

DOCUMENTATION

Doc. Number	Title	Uploaded By
1	55618-TWSR	WCATS APPLICATION (000000)

COMMENTS

Date Time/ User Name	Comment
08/23/2013 9:37 AM WCATS APPLICATION (000000)	TID WELDED, ROUGH SWIPES (ALPHA) N.D.A., LUDLUM 139 #8304 VOID DATE 5/27/96

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
08/23/2013 9:44 PM WCATS APPLICATION (000000)	NO	TRUP.TRUPKG TABLE (WASTEDB): [PKG_ID] = 55618, [ALPHA_CONT] = 0, [APPROVE_BY] = 112196, [APPROVE_DATE] = 1996-02-15 00:00:00, [BETA_GAMMA_CONT] = 0, [BLDG_CD] = 55-PF4, [BX_SERIAL] = , [CERT_STATUS] = N, [COLOR_CD] = , [COMMENTS] = TID WELDED, ROUGH SWIPES (ALPHA) N.D.A., LUDLUM 139 #8304 VOID DATE 5/27/96, [CONTENT_CODE] = , [CONTROL] = CST7, [DATE_CLOSED] = 1994-11-10 00:00:00, [GAMMA_DOSE] = .2, [GROSS_WT] = 2130, [GRP] = NMT7, [NEUTRON_DOSE] = .1, [NORMAL] = N, [OLDDRUMNUM] = , [OLDVOL_UNIT] = , [OLDWT_UNIT] = , [ORG_VOL] = 0, [ORG_WT] = 0, [PKG_CD] = 03, [PKG_CD_DESC] = VESSEL, [PKG_DATE] = 1996-03-20 00:00:00, [PKG_FISS_GRAMS] = 2.626532128168370187848579200182079292 08, [PKG_LOT] = , [PKG_PE_ACT] = . 219742562823529424043044982698995642961, [PKG_TARE_WT] = 2000, [PKG_VOLUME] = 1.5, [PROC_BTCH_CD] = , [PROG_CODE] = KB12, [ROOM] = , [SAMPLE_ID] = , [THERMAL] = . 00647626038582163183090658600551406435 6, [TOTAL_DOSE] = .3, [TOT_ANCG] = 215.000505520703227227437850654273373596, [TRUCON_CD] = LA117I, [WASTE_CD] = , [WPRF_CD] = 22873, [YR_MFG] = , [WASTE_TYPE] = , [INSP_DATE] = 1994-11-10 00:00:00, [AUA_VUA] = 960301, [PROCESS_ID] = , [WGEN_CD] = 093089, [DOT_TYPE] = B, [BIR_ID] = LAT005, [RQ] = , [LSA_SCO_CD] = , [LSA] = , [A_START_DATE] = , [BIR_WS] = LA-T10, [LA_WS] = , [SWBOP] = , [RETRIEVABLE] = , [OFFSITE] = , [LINER_CD] = , [NET_WT] = , [SHIP_CD] = , [WASTE_STREAM] = , [OVERPACK] = N, [REPACKED] = , [INVENTORY_NO] = 3, [INVENTORY_DT] = 1999-09-09 00:00:00, [CHCD_CC_CD] = , [CHCD_CA_CD] = , [CHCD_WP_CD] = , [DOT_DP] = , [WASTE_VERIF] = , [VERIF_COMPLETE] = , [HDL_CD] = , [UPD_WHEN] = 2004-06-30 11:56:26, [UPD_WHO] = 114644, [PHY_STATE] = S, [PKG_H3_ACT] = .032, [QTW] = N, [AK_REPORT] = , [STP] = 0
08/23/2013 9:44 PM WCATS APPLICATION (000000)	NO	TRUP.PKG_DOT TABLE (WASTEDB): [PKG_ID] = 55618, [CHEM_STATE] = ELEMENTAL, [DOT_DESC_CD] = , [DOTHAZ_CD] = 7, [DOTSHIP] = RADIOACTIVE MATERIAL, N.O.S., [DOTUNNA_CD] = UN2982, [ERGNO] = 63, [FISSILE_CLASS] = EXEMPT, [HAZ_SUB] = RADIOACTIVE MATERIAL, [HMTF_NO] = , [LABEL_CAT] = RADIOACTIVE WHITE I, [LABEL_SEC] = , [OTHERCONID] = , [PLAC_REQ] = , [TRANS_INDEX] = , [UPD_WHEN] = 1996-02-16 00:00:00, [UPD_WHO] = Z112196
08/23/2013 12:32 PM WCATS APPLICATION (000000)	NO	TRUP.UPD_HISTORY TABLE: [UPD_ID]= 30677, [AUTH_BY]= 090510 -> CHEN ANITA I-LI , [AUTH_NUM]= , [PKG_ID]= 55618, [UPD_WHEN]= 10-22-1996, [UPD_WHO]= Z105468 -> CHAN MARGARET K , [WHAT]= Changed from Normal to Off-Normal, [WHY]= Requested by Andy Montoya,TA55

CONTAINER PROFILE
55618
T-TRU-TEMP

WS ID: 499
C ID: 767869
ACTIVE

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
08/23/2013 12:32 PM WCATS APPLICATION (000000)	NO	TRUP.UPD_HISTORY TABLE: [UPD_ID]= 29804, [AUTH_BY]= 090510 -> CHEN ANITA I-LI , [AUTH_NUM]= , [PKG_ID]= 55618, [UPD_WHEN]= 04-30-1996, [UPD_WHO]= Z111491 -> FERNANDEZ CHARLOTTE G , [WHAT]= ADDED/CHANGED AUA_VUA: 960301, [WHY]= NEW FIELD SR188, 2/1/95
08/23/2013 8:47 AM WCATS APPLICATION (000000)	NO	INITWORKPATH (C_ID=767869/PATH_ID=466): SKIPPED (NO WORKPATH UNITS)

Los Alamos
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

LA00000055618

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code	N/A
Year of Manufacture	N/A
Box Serial Number	N/A

Inspected Items: [x] Ring, Bolt, and Nut; [x] Chime; [x] Dents; [x] Lid and Gasket; [x] Gouges; [ ] Paint

This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.

Printed Name: Dennis R Wulff — Date: 11-10-94
Signature: Dennis Wulff

2. GENERATOR'S PACKAGE INFORMATION

Group: NMT-7 — Technical Area: TA55 — Building: PF-4 — Program Code: 1212 5C00 — Normal: [x] Yes [ ] No

Additional Information: TID Welded. Rough swipes (alpha) N.D.A. Ludlum-139 #8304 void date 5-27-96.

RADIONUCLIDE CONTENT — Material Type [x] Yes [ ] No — 52

Nuclide	Amount	E	Uncertainty	E	C=Curie M=Gram
PU238	4.959	-13	2.558	-13	C
PU239	1.641	-11	8.464	-12	C
PU240	3.865	-12	1.993	-12	C
PU241	6.384	-11	3.293	-11	C
PU242	2.223	-16	1.147	-16	C
H3	3.200	-12	3.200	-12	C

CODE	CONTAINER	INTERNAL SHIELDING
01	[ ] Steel Drum (55 gal.)	[x] None
02	[ ] Standard Waste Box	Type / Thickness (in.)
03	[x] Other (Call TWCO)	
04	[ ] RH Canister	

Waste Profile Request Number	22873 ~~16594~~
Carbon Filter ID	01 N/A 02
Process Batch Code	N/A
Gross Weight (lb.)	2.13 E+3
Organic Material Wt. (lb.)	0.00 E+0
Organic Material Volume (%)	0
TRUCON Code	117I
Date Closed (MMDDYY)	110694

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
NONE		

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures.

Printed Name: Dennis R Wulff — Signature: Dennis Wulff — Date: 11-27-95

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (mrem/h)	0.2 E+0	Survey Meter Model: R03C	Property Number: 2679	Calibration Void Date: 03-15-96
Neutron Dose Rate (mrem/h)	0.3 E+0	Survey Meter Model: PNR-4	Property Number: 5229	Calibration Void Date: 04-11-96
Total Dose Rate (mrem/h)	0.5 E+0	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (dpm/100cm²)	0.0 E+0	Printed Name: EDUARDO ESTRADA		Date: 01-31-96
Beta-Gamma Cont. (dpm/100cm²)	0.0 E+0	Signature: Eduardo Estrada		

4. CST-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by CST-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.

Printed Name: J. Minton-Hughes — Date: 2/15/96
Signature: Julia Minton-Hughes

Form 1562 (2/94)

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	02	15	96	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	03	22	96	Margaret CHAN	Margaret

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number	Date (*Inspection Valid for 30 Days*)
	INSPECTOR Rm	3-12-96

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	0.2 E ± 0	Survey Meter Model	Ludlum 102	Property Number 3408	Calibration Void Date 7/17/96
Neutron Dose Rate (*mrem/h*)	0.1 E ± 0	Survey Meter Model	Eberline PRM-10	Property Number 6105	Calibration Void Date 7/16/96
Total Dose Rate (*mrem/h*)	0.3 E ± 0	*The data in this section were collected according to approved procedures.*			
Alpha Contamination (*dpm/100cm²*)	0.0 E + 0	Printed Name	[illegible]	Date	3/21/96
Beta-Gamma Cont. (*dpm/100cm²*)	0.0 E + 0	Signature	[signature]		

8. STORAGE SITE INFORMATION

Received By (*Initials*) Rm	Date Received 3-25-96	**ORIGINAL STORAGE DATA**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number Holding AREA-903	Layer	Row Number
		Column Number	Date Stacked (*MM,DD,YY*)	
Printed Name [illegible]	Date 3-21-96	Printed Name [illegible]		Date 3-25-96
Signature Rick Martinez		Signature Rick Martinez		

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name [illegible]	Date 3-26-96
	Signature Rick Martinez	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date

11. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered In Database	03	27	96	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	03	29	96	Margaret CHAN	Margaret

12. DUPLICATE COPY

	M M	D D	Y Y	Printed Name	Signature
Date Duplicate Filed	04	03	96	Charlotte Fernandez	Charlotte Fernandez

UNCERTAINTY

Drum or Box ID	LA000000 55618	Name: K.M. Gruetzmacher	01/25/96

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%)	PU 240 (gram%)	PU 241 (gram%)	PU 242 (gram%)	PU 244 (gram%)	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.90	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	1.47	0.000147	1.378566	0.0882	0.00294	0.000294	0	1.470147
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	1.47	1.47E-04	1.38E+00	8.82E-02	2.94E-03	2.94E-04	0.00E+00	1.47E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	1.47	0.0025578	0.084643952	0.0199332	0.32928	1.1466E-06	0	0.436416099
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
	total weight (gm)	**PU 238 (Ci)**	**PU 239 (Ci)**	**PU 240 (Ci)**	**PU 241 (Ci)**	**PU 242 (Ci)**	**PU 244 (Ci)**	**sum by MT (Ci)**
TOTALS	**1.470E+00**	**2.558E-03**	**8.464E-02**	**1.993E-02**	**3.293E-01**	**1.147E-06**	**0.000E+00**	**4.364E-01**

	AM 241 (gm)	AM 241(gram%)	AM 241 (Ci)
MT 44	0	99.99	**0.000E+00**

Drum or Box ID	LA000000 55618	Name: K.M. Gruetzmacher	01/25/96

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%)	PU 240 (gram%)	PU 241 (gram%)	PU 242 (gram%)	PU 244 (gram%)	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.90	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	2.85	0.000285	2.67273	0.171	0.0057	0.00057	0	2.850285
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	2.85	2.85E-04	2.67E+00	1.71E-01	5.70E-03	5.70E-04	0.00E+00	2.85E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	2.85	0.004959	0.164105622	0.038646	0.6384	0.000002223	0	0.846112845
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
	total weight (gm)	**PU 238 (Ci)**	**PU 239 (Ci)**	**PU 240 (Ci)**	**PU 241 (Ci)**	**PU 242 (Ci)**	**PU 244 (Ci)**	**sum by MT (Ci)**
TOTALS	**2.850E+00**	**4.959E-03**	**1.641E-01**	**3.865E-02**	**6.384E-01**	**2.223E-06**	**0.000E+00**	**8.461E-01**

	AM 241 (gm)	AM 241(gram%)	AM 241 (Ci)
MT 44	0	99.99	**0.000E+00**

LA000000055618

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 22873

Generator :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z#:	099731		
WMC :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z#:	099731		
CSR :	PRIMOZIC, FRANK	MS :	J593	PH :	75909	Z#:	116057		
Status :	ACTIVE	Activated Date :	05-JAN-96			Expired Date:	05-JAN-97		
Account Info-CC :	6407	PC: KB12	CA :	5000	WP :		VI:		
Group :	NMT7		TA :	55	BLDG :	000004	ROOM:	432	

RMMA : **RADIOACTIVE MATERIALS MANAGEMENT AREA (RMMA) 55003**

Waste Accumu : N/A

Method of Char : **KNOWLEDGE OF PROCESS (KOP)**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**

Waste Classes: **ON-GOING GENERATION**
RADIOACTIVE

Assoc Docum: **WM SOP# DP-01**
Other SOP# WODF

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**
MAINTENANCE
MATERIAL PROCESSING
RESEARCH AND DEVELOPMENT

Waste Matrix : **SOLID**

Matrix Type : **HETEROGENEOUS**

Waste/Proc Desc : TRUCON CODE 117B, OR 117I NON PU238 WASTE METALS IN 55 GALLON DRUMS. SCRAP METAL FROM PLUTONIUM PROCESSING OPERATIONS WITH NO KNOWN HAZARDOUS CONSTITUENTS. ALSO CONTAMINATED WITH TRITIUM. TRUWM-TA55-DP-01, INSPECTION AND PACKAGING OF CERTIFIABLE COMBUSTIBLE AND NON-COMBUSTIBLE TRU WASTE. WASTE ORIGINATION AND DISPOSTION FORM (WODF).

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				
BARIUM	Y				
CADMIUM	Y				
CHROMIUM	Y				
LEAD	Y				
MERCURY	Y				
SELENIUM	Y				
SILVER	Y				

Toxicity Characteristic Organic Compounds: N/A

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
BAGOUT BAGS		**1**	**50**	**%**
DISCARDED TOOLS		**0**	**99**	**%**
FLANGES		**0**	**99**	**%**
PIPING		**0**	**99**	**%**
SCRAP METAL (BERYLLIUM, STEEL, COPPER)		**0**	**99**	**%**
TANKS (EMPTY)		**0**	**99**	**%**
VALVES		**0**	**99**	**%**

Radiological Characteristics:

Radionuclide	Min	Max	Unit
AM241	0.000E+00	5.660E-02	CIG
H3	1.000E-07	1.000E-02	CIG
NP237	0.000E+00	1.000E-08	CIG
PU238	0.000E+00	1.320E-03	CIG
PU239	0.000E+00	9.770E-04	CIG
PU240	0.000E+00	8.170E-04	CIG
PU241	0.000E+00	4.990E-02	CIG
PU242	0.000E+00	1.330E-05	CIG
PU244	0.000E+00	1.850E-11	CIG
U235	0.000E+00	2.690E-08	CIG
U238	0.000E+00	4.100E-09	CIG

Rad Contamination Type : **SURFACE CONTAMINATION**

Waste Water Contaminants : N/A

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **TRANSURANIC**

Waste Classification : **NON-HAZARDOUS CHEMICAL WASTE**

EPA Hazardous Waste Code : N/A

ESH-1 SMEAR SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: 13/10/95 No. Of Samples: 20

TA: 55 Bldg: PF-4, BSMT - Room 305

RCT: L. R. JARAMILLO Z Number: 098314

Phone/Fax: 7-2311, 7-2377

Tritium Smear Survey of Tz waste tubes

SAMPLE TRACKING NUMBER

ESH-1 SAMPLE TRACKING

95010830

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB

☐ ITEM RELEASE ☒ OFFSITE SHIPMENT ☐ ONSITE SHIPMENT

☐ NON-ROUTINE/OTHER: _____

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF	BKG

ADDITIONAL INFORMATION

☐ Occurrence No.: _____

☐ Incident No.: _____

☐ RWP No.: _____

Smear No.	Location	Alpha*	Beta*	Gamma*
1	CONTROL			
2	TORPEDO TUBE LA0000055516			
3	" "			
4	" "			
5	" "			
6	" "			
7	" "			
8	" "			
9	" "			
10	" "			
11	TORPEDO TUBE LA0000055618			
12	" "			
13	" "			
14	" "			
15	" "			

Smear No.	Location	Alpha*	Beta*	Gamma*
16	TORPEDO TUBE LA0000055618			
17	" "			
18	" "			
19	" "			
20	" "			
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

* dpm/100 cm2

E:\CORELDRW\HPALMST.CDR

Rev: 10/94

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: M. S. Blau, NMT-5, MS E501 DATE: January 9, 1994

THRU: J. J. Balkey, NMT-2, MS E501 MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2 SYMBOL: NMT-2-NiTR-94-010

SUBJECT: **MC&A CONSIDERATIONS FOR THE PACKAGING OF SPECIAL RECOVERY LINE WASTE**

This memo addresses the Material Control and Accountability concerns associated with the packaging of tritium and tritium contaminated transuranic wastes from the Special Recovery Line tear-out in PF-4. Waste Management personnel must be present to inspect the 55 gallon drums as they are loaded into the stainless steel secondary. They will record the drum identification numbers, note their position inside of the secondary and place bar code labels on the secondary containment for identification. The inside of the secondary will be inspected prior to loading to assure that no unauthorized materials have been placed inside of it. They will also verify the integrity of Tamper Indicating Devices on the drums as they are loaded. The secondary cannot be left unattended until the head has been tacked in place and a paper TID placed over the pipe nipple so that no unauthorized material may be placed inside of the secondary container.

By following these procedures, the need for performing a confirmation assay (which would be very difficult and time consuming) will be waived. Contact me if you have any questions on these requirements.

Distribution: R. L. Price, NMT-4, MS E513
D. R. Wulff, NMT-2, MS E501
Author file
NiTR file

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Daniel Taggart, EM-7, MS J595 DATE: July 20, 1993

FROM: Michael Blau MSB MAIL STOP/TELEPHONE: E506/7-9371

SYMBOL: NMT-5:93-411

SUBJECT: **GLOVEBOX TRITIUM TEST RESULTS**

As agreed to at the June 28 Tritium Waste Packaging Meeting the following tests will be performed in order for EM-7 to agree to accept all waste generated during the Special Recovery Line (SRL) Upgrades.

1. SRL glovebox 370 will be purged with argon until a low tritium concentration is reached, then the purging will stop and the increase in tritium concentration with time will be recorded until it is about constant.

2. Take a 50 cc molecular sieve bed material sample from the molecular sieve bed tower that is currently hooked to the SRL. Using that sample, determine the amount of tritium present in the tower using tritium results from HPAL. Then based on this value and the history of this tower and that of the two towers now stored in the basement calculate an estimate for the two towers in the basement. The history of service for the towers was: First tower 1980 to 1985; second tower 1985 to 1988; and last tower 1988 to 1991. Also, the amount of tritium processed when the first tower was in service was lower than for the first and third tower.

3. Get plutonium and tritium swipes inside the third molecular sieve tower.

The results of these tests are shown below.

1. The glovebox was purged with argon at a rate of about 1CFM for three days at which time the tritium level reached 14 mCi/m^3. The argon flow was then shut off and the tritium level recorded with time for 55 hours at which time the tritium level reached 81 mCi/m^3. A graph of these results is attached.

2. The molecular sieve sample was mixed with water and the water sample sent to HPAL. HPAL reported the water sample contained 60 ci/liter. From this value a

To summarize, the following table is an update to the table in my earlier memo containing the current best estimates of the tritium content of the five welded containers filled by SRL:

Container number	Account	Lot-Identification	Location	Tritium on MASS	Estimates from this memo
#1	774	LA00000055432	yard	0 g	3.2×10^{-2} Ci
#2	774	T2SIEVEMW	yard	0.16 g 0.1347	1800 Ci 18 mo decay (0.17 ?)
#3	776	LA00000055449	B45	0 g	3.2×10^{-2} Ci
#4	731	LA00000055516	FTOP	0 g .1127	1100 Ci 24 mo decay (0.10 ?)
#5	731	LA00000055618	F309	0 g ~3.2×10^{-4} g	3.2×10^{-2} Ci

JMB:jmb

Attachments: memo NMT-5:93-411

Distribution:
W. R. Dworzak, NMT-6
G. R. Lucero, NMT-6
D. Christiansen, ESA-TSE/C348
NMT-6 File
NMT-6 Records Management

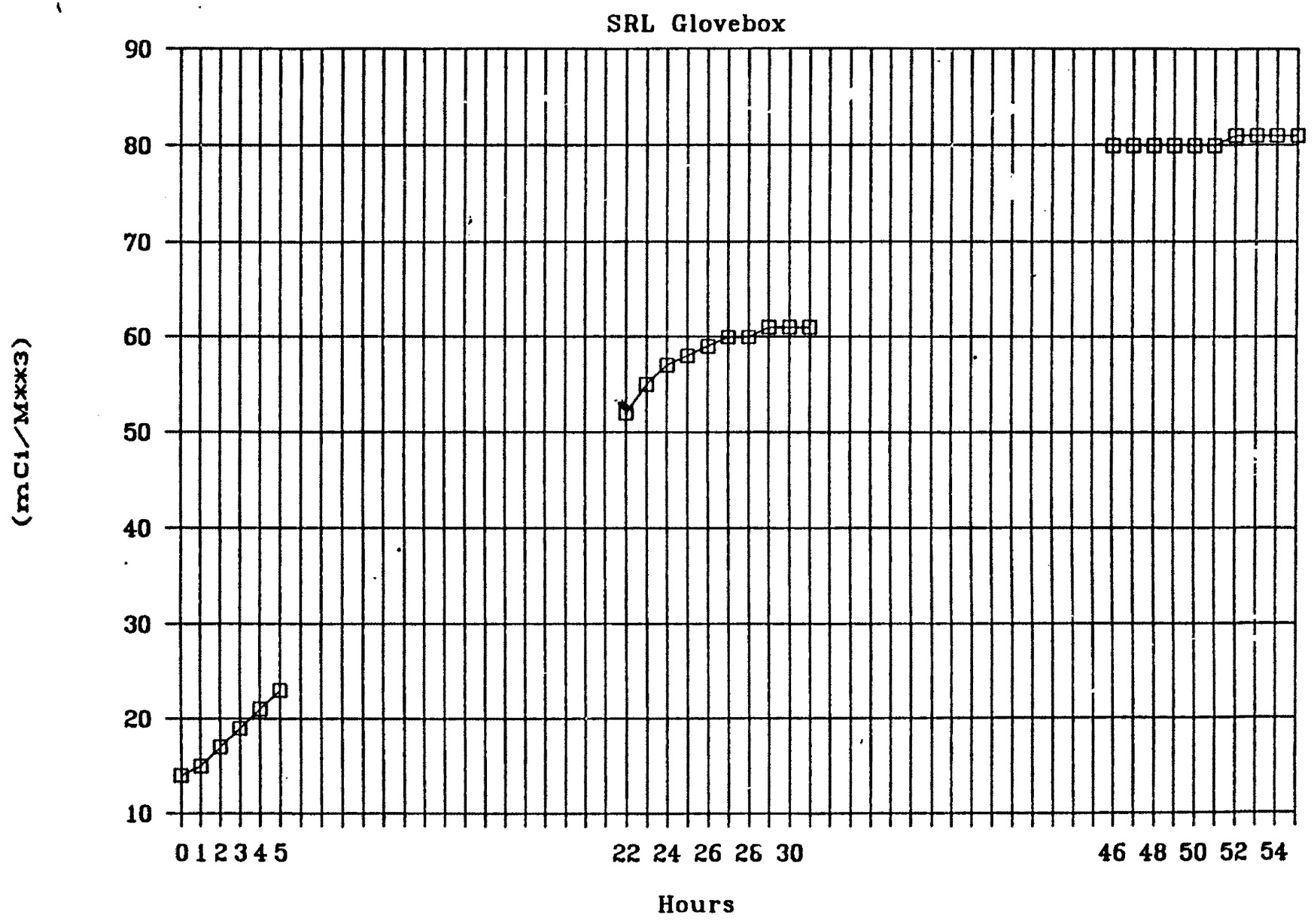
maximum tritium amount for the third molecular tower is 3200 curies. Based upon the history of all three towers it is believed that a maximum of 3200 curies is present in each of the three towers.

3. The plutonium swipes came back negative. The tritium swiped were 49,100,000 DPM/15 cm^2 or ten microcuries per square inch.

MB/blr

Distribution:
T. Bieniewski, MST-3, MS C348
C. Christensen, EM-7, MS J595
B. McKerley, NMT-2, MS E501
D. Taggert, EM-7, MS J595
L. Trujillo, NMT-2, MS E501
J. Wicker, HS-1, MS E503
D. Zerwikh, HS-1, MS E503
J. Blakey, NMT-2, MS E501
J. Damran, MEE-9, MS G736
R. Wieneke, NMT-2, MS E501
M. Stevens, NMT-5, MS E506
Author File
NMT-5 File

TRITIUM BUILDUP



HPAL ANALYSIS REPORT FORM

FILE [redacted]

SAMPLE DESCRIPTION	ANALYSIS REQUESTED	RCT
Sample Date: 03/10/95	Tritium Swipes	Name: Louie Jaramillo
TA: 55	LLD: Alpha-15 Beta-16	TA: 55 Bldg: 4
BLDG: PF-4	Analyst: Michael Jensen	MS: E503
Room/Area: 305	Reviewer: Joe Lopez	PH: 7-2311 FAX: 7-1009

Sample ID #	Alpha Activity dpm	2*sigma %	Beta Activity dpm	2*sigma %
1	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA
3	NDA	NDA	20	35.35
4	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA
6	NDA	NDA	NDA	NDA
7	NDA	NDA	272	16.55
8	NDA	NDA	NDA	NDA
9	NDA	NDA	NDA	NDA
10	NDA	NDA	NDA	NDA
11	NDA	NDA	NDA	NDA
12	NDA	NDA	NDA	NDA
13	NDA	NDA	NDA	NDA
14	NDA	NDA	NDA	NDA
15	NDA	NDA	NDA	NDA
16	NDA	NDA	NDA	NDA
17	NDA	NDA	NDA	NDA
18	NDA	NDA	NDA	NDA
19	NDA	NDA	NDA	NDA
20	NDA	NDA	NDA	NDA

(END OF REPORT)

ESH-1 SMEAR SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: 03/23/95 No. Of Samples: 28

TA: 55 Bldg: PF-4 Room 432

RCT: E. ESTRADA Z Number: 96005

Phone/Fax: 7-2311

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB

☐ ITEM RELEASE ☐ OFFSITE SHIPMENT ☐ ONSITE SHIPMENT

☐ NON-ROUTINE/OTHER: WIPP drums

ADDITIONAL INFORMATION

☐ Occurrence No.:

☐ Incident No.:

☐ RWP No.:

SAMPLE TRACKING NUMBER

ESH-1 SAMPLE TRACKING

95010990

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF	BKG

Smear No.	Location	Alpha*	Beta*	Gamma*
1	Drum # 55811 Top	N.D.A.	N.D.A.	
2	" RT.			
3	" LT.			
4	" Bottom			
5	Drum # 55286 Top			
6	" RT.			
7	" LT.			
8	" Bottom			
9	Drum # 55850 Top			
10	" RT.			
11	" LT.			
12	"			
13	Torpedo #5618 Top			
14	RT.			
15	LT.			
16	Bottom	N.D.A.	N.D.A.	
17	END			
18	Front (Gauge)			
19	Torpedo #55516 Top			
20	RT.			
21	LT.			
22	Bottom			
23	END			
24	Front (Gauge)			
25	Drum # 5518 Top			
26	" RT.			
27	" LT.			
28	" Bottom			
29				
30				

* dpm/100 cm2

E:\CORELDRW\HPALMST.CDR

Rev: 10/94

Los Alamos
NATIONAL LABORATORY

memorandum

Nuclear Materials Technology Division
Actinide Materials Chemistry
NMT-6

To/MS: R. Wieneke, NMT-7
Thru: T. O. Nelson, T. R. Mills, NMT-6
From/MS: John M. Berg, NMT-6, E510
Phone/FAX: 5-8262/5-4459
Symbol: NMT-6-ENG/SRL-95-006
Date: February 7, 1995

Additional Information on Tritium Content of Five Secondary Waste Containers

Since issuing a memo on this same subject on January 27, 1995 (Symbol: NMT-6-ENG/SRL-95-002) I have obtained additional information affecting the estimated tritium content of the five secondary waste containers. The purpose of this memo is to report that new information and revise the estimated tritium inventories.

I stated in the earlier memo that the molecular sieve material in the second welded secondary container had not been analyzed for tritium content. I have since located a memo from Mike Blau to Dan Taggert (NMT-5:93-411, July 20, 1993) stating that this material was indeed analyzed and giving the results. Mike's memo estimated a maximum of 3200 Curies of tritium in one molecular sieve tank that is in the second container. I could not locate Mike's calculations. After some digging I found notes on the analytical results on which they were based in the log book of Louis Jaramillo (RCT, ESH-1) who was the RCT involved in the sampling. I then did my own calculation, which is detailed below.

The molecular sieve material in the third of three molecular sieve towers that the SRL used while in operation was sampled by withdrawing 30 ml of solid material in July 1993. This material was then subjected to the analytical procedure for tritium swipes detailed in the SOP 397-SRL-R04. Briefly, the solid material was boiled in 20 ml of pure water, 10 ml of the water was distilled into a separate vessel, and 1 ml of this distillate was sent to HPAL for tritium analysis. HPAL did three dilutions of the 1 ml sample before they could get a good reading on their instruments. Their results showed that the original 1 ml sample had an activity of 60 Ci/l. If I assume that all of the tritium in the 30 ml molecular sieve sample migrated into the 20 ml of water during the boiling step, then the 30 ml sample of molecular sieve had an activity of 0.02 l x 60 Ci/l = 1.2 Ci. The specific activity of the molecular sieve material is then 40 Ci/l. I estimate the dimensions of the molecular sieve tower at no greater than 6" outer diameter by 96" long. A container of these dimensions could contain at most 44 liters of molecular sieve material, which at 40 Ci/l gives a total activity of 1800 Ci in the tower.

This result is in reasonable agreement with the 0.16 g of tritium that was assigned on MASS to the secondary container in which this sieve tower is currently located. It significantly lower than the 3200 Ci from Mike Blau's memo, but he states that his number is a maximum, so he may have made more conservative assumptions about the extraction of tritium from the molecular sieve in the analytical procedure or about the homogeneity of the material in the tower.

I also need to clarify that the second container is loaded with two molecular sieve tanks of a newer design in addition to the one whose contents were analyzed. Those two are not expected to contain significant quantities of tritium because they were not put into service until after the SRL stopped processing any significant quantities of material.

I also have additional information about the contaminated pump oil in the fourth welded secondary container. Since I issued NMT-6-ENG/SRL-95-002, I talked with Mike Blau on the telephone and he confirmed that the contents of the drum of waste pump oil in the fourth secondary container was not analyzed for tritium because of safety concerns. I also got an estimate of the volume of oil in the tank from Gerald Lucero. He had banged on the side of the oil drum and found it to be about two thirds full. We estimate the total volume of the drum to be 30 gallons, so we estimate that 20 gallons or about 80 liters is occupied by the oil/vermiculite mixture. If we assume that the vermiculite does not displace much oil, then the oil volume is approximately 80 liters.

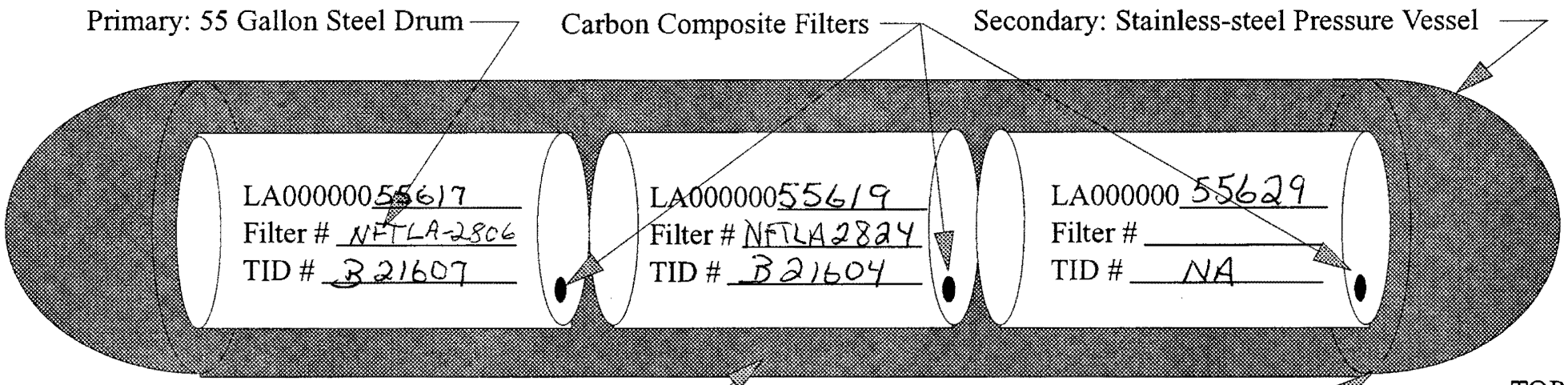
Since the oil was not analyzed for tritium, we must estimate the tritium content based on the best available information. You (R. Wieneke) were able to get an estimate from Paul Lamberger of EG&G Mound Applied Technologies of the range of vacuum pump oil contamination experienced at Mound as 10 to 30 Curies per liter. This was discussed in *Packaging of Tritium Contaminated Waste at Mound,* P. H. Lamberger and R. E. Bernheisel, Proceedings of the Sixth Annual Participants Information Meeting: DOE Low-level Waste Management Program, held Sept. 11-13, 1994 in Denver, CO (#CONF-84-09115).

Using 20 Curies per liter as the average contamination level, 80 liters of oil would contain 1600 Curies of tritium. However, the oil in question was removed from the tritium line over a period from about 1980 to 1992, so the tritium has decayed somewhat. If we assume for the sake of simplicity that the tritium has been in the waste tank seven years and the original specific activity averaged 20 Ci/l, then the current activity will be about 1100 Curies. Other items in the fourth secondary container have only trace surface contamination, so 1100 Ci is our best estimate of the total inventory of tritium in that container.

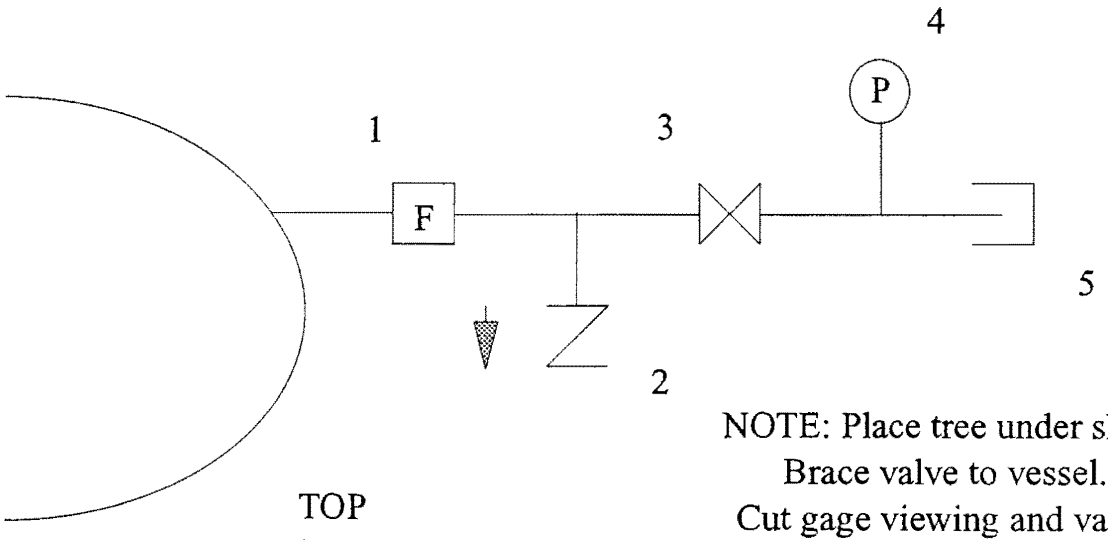
For completeness I also revisit the basis for my estimates in NMT-6-ENG/SRL-95-002 of the tritium content of the other three secondary containers. All three contain only surface contaminated metal and plastic trash, mostly piping and equipment removed from SRL. The highest swipe count obtained was 9.6×10^{7} dpm/100 cm^2, which is equivalent to 4.4×10^{-5} Curies. Note that this is a higher count than I used in NMT-6-ENG/SRL-95-002 because I since located a few more swipe results. While the contents of the three secondary containers in question vary somewhat, a conservative estimate is that they each contain three drums of 50 feet of 2" diameter pipe, or 150 feet of 2" diameter pipe in total in each container. This amount of pipe has an inner surface area of 7.2×10^{4} cm^2. At the maximum surface contamination level of 4.4×10^{-5} Ci/100 cm^2, there would be a total of 3.2×10^{-2} Curies in each of the remaining three secondary waste containers.

Tritium Co-contaminated Transuranic Waste Package

LA000000 55618



NOTE: Skirts not shown.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve
access hole in skirt.

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wieneke 08/23/93

DISCARDABLE WASTE LOG SHEET

Effective Date 08/01/94

Page 1 of 1 Pages

LA000000055618
WASTE PACKAGE SERIAL NUMBER

N-Comb ☑ Comb ☐ Pu-238 ☐

Two Drum Liners Installed: N/A

Install/Tighten Carbon Filter(s): NA

RH waste: N
Lead shielding: N
1/8 Inch Drum Liner: N

CONTAINER: Open ☑ In-Line ☐

NEUTRON GAMMA
Assay Instrument Type: ☑ ☐

Tighten Locknut or Box Plugs: NA

TID# NA Welded

Date TIDed NA

ITM NO	ITEM ID	PKG WT Kg	MATRIX (MATERIAL)	MT	SNM GRAMS	UNCRT +/- GRAMS	ITEM SNM g + 2X UNCERT	SNMg+2x UNCERT. running total	CERTIFIED PERSONNEL	REMARKS (Wt in kg) ORGANICS V%	ORGANICS WT.	HAZARDOUS MATERIALS	OTHER REMARKS	AUTH. PG/LN	DATE mm/dd/yy
0	LA000000055617	82.86	METAL	52	2.38	0.84	4.06	4.06		0.0	0.0	Tritium		8/14	11/10/94
1	LA000000055619	79.77	METAL	52	0.00	0.33	0.66	4.72		0.0	0.0	Tritium		8/14	11/10/94
2	LA000000055629	47.65	METAL	52	0.47	0.30	1.07	5.79		0.0	0.0	Tritium		8/14	11/10/94
3															
4															
5															
6	MOLECULAR SIEVE	36.48													
7															
8															
9															
	TOTAL Pkg wt Kg X 2.2046 = Pkg wt Lbs(#)	246.76 / 544.08#	NMT-2 Gross Wt. Check Initials	52	2.85	1.47	☒		TOTALS	0.0	0.0	Haz-Mat	None		
	+DRUM/BX TARE #	1585.80							Organics wt (kg) x 2.2046 = wt (lbs)	0.0		NMT-4 Assay Value	N/A		
	= CALC GROSS #	2129.81	Acntability Check Init.									Instrument ID			
	SCALE GROSS #	2129.80							QA Pkg Approval			Date			
									M.G.Mu	8-13-96		NMT-4 Sign.			

This container's waste was packaged and the NMT-2 data on the DWLS and the CWSR were collected according to procedures defined in the Los Alamos Certification Plan and the appropriate attachment(s).

NMT-2 Signature KWGuetzmacher

TRUWM-TA55-DR-02, R00

$$\frac{0.8461\ Ci}{246.76\ kg} \times 10^6 = 3.43 \times 10^3\ \frac{nCi}{g}$$

16-FEB-96 TRU WASTE MANIFEST Page 1
55618

*** IN CASE OF EMERGENCY CALL 505-667-6211 ***

SHIP FROM	SHIP TO
TWSR #: 55618 Requestor: DENNIS R WULFF Z #: 093089 Phone: TA: 55 Bldg: PF4	CST-14 Phone: 505-667-6095 Solid Radioactive Waste Management Los Alamos National Laboratory Location TA-54___ Area-L___ Area-G___ TA-50___ Bldg-1___ Bldg-37___ Transporter: LANL

Line Item	HM	DOT Shipping Description	Containers No./Type		Total Quantity	Unit / Vol
1	x	RQ, RADIOACTIVE MATERIAL, N.O.S.,7,UN2982	1	OT	2130	P

55618: Solid,Elemental, H3, PU238, PU239, PU240, PU241, PU242, 8.781e-01Ci, RADIOACTIVE WHITE I, Fissile Exempt

HMTF REVIEW
APPROVED ☑
DISCREPANCY ☐
2/20/96
11:20
GM

RMTF # 13726

KBI2 5000

ADDITIONAL DESCRIPTIONS FOR MATERIALS LISTED ABOVE
ERG#: 63

SPECIAL HANDLING INSTRUCTIONS AND ADDITIONAL INFORMATION

THIS IS TO CERTIFY THAT THE ABOVE-NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, LABELED, AND PLACARDED; ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION; AND MEET THE WASTE ACCEPTANCE CRITERIA OF CST-5, CST-13, OR CST-14.

PRINTED/TYPED NAME	SIGNATURE	DATE
Tina Forsman	x Tina Forsman	3/20/96

TRANSPORTER ACKNOWLEDGEMENT OF RECEIPT OF MATERIALS

PRINTED/TYPED NAME	SIGNATURE	DATE
FRED MOYA	x Fred Moya	3/19/96

55618

Los Alamos
NATIONAL LABORATORY

Environmental Management
Environmental Stewardship Program
EM, J591
Los Alamos, New Mexico 87545
(505) 667-6639
FAX (505) 665-8118

Date: October 2, 1996
Refer to: EM/ES:96-253

Ms. Cynthia Longenbaugh
Waste Management Division
U.S. Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, NM 87185-5400

Dear Ms. Longenbaugh:

SUBJECT: TRU WASTE GENERATION BASELINE CHANGE

In a recent data validation review of FY 1993, 1994, and 1995 Laboratory waste volumes, it was determined that the routine TRU/MTRU reported in 1993 was incorrect. Only 53 m^3 of the 284 m^3 of TRU/MTRU reported as routine waste was correctly characterized as routine waste from that year. The remainder was either non-routine, or prior year waste that happened to be sent from TA-55 to TA-54 in 1993.

ACTIVITY	VOLUME (M3)
a. Routine wastes generated at TA-55 during 1993	53
b. Overpack of drums (~233 ea.) generated before 93	68
c. Legacy gloveboxes from previous years	156
d. One-meter diameter steel vessels (12 ea.) cleaned out during previous years	07
	284

This 1993 waste volume correction is significant as the Department of Energy Pollution Prevention goals and the University of California contract performance measures both determine routine waste minimization performance by comparing present year waste volumes with 1993 volumes (see enclosed graph). We request that the 1993 baseline numbers for routine TRU waste generation at Los Alamos National Laboratory be corrected.

Sincerely,

Thomas P. Starke

Thomas P. Starke
Environmental Stewardship Program Manager
Los Alamos National Laboratory

Enclosure: a/s

TS:lma

Appendix C

TRU Waste Storage Information
Container 55432 Stored in Shaft 263

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TRU WASTE STORAGE RECORD

55432

1. Generator's Pre-Use Visual Inspection

Purchase Order #	Inspected Items		
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
	☑ Lid and Gasket	☑ Gouges	☑ Paint

Printed Name	Signature	Sig. Date	Oper. Date
WCATS APPLICATION (000000)	*WCATS Electronic*	01-11-94	01-11-94

2. Generator's Package Information

Group	Technical Area	Building	Cost Center	Program Code	Cost Account	Work Package
MET-2	55	000004				

Additional Information

☐ DP ☐ Non-DP If Non-DP waste, attach DOE approval doc.

Container	Liner
☐ Steel Drum (55 gal.)	☑ None
☐ Pipe Overpack Type:	☐ 90 mil liner
☐ Steel Drum (85 gal Overpack)	☐ 125 mil liner
☐ Standard Waste Box	☐ Fiberboard Liner
☐ Standard Waste Box Overpack	**Internal Shielding**
☐ RH Canister	☑ None
☐ Other (Call TWCO)	Type / Thickness

Radionuclide Content

Nuclide	Amount	Uncertainty	C= Curie M = Gram
H-3	3.220E-002	3.220E-002	C
Pu-238	2.399E-003	1.378E-003	C
Pu-239	8.206E-002	4.715E-002	C
Pu-240	1.921E-002	1.103E-002	C
Pu-241	2.917E-001	1.676E-001	C
Pu-242	1.104E-006	6.342E-007	C

Filter Serial No.			
	01		
	02		

Waste Profile Number	6593 (WS ID 33416)
Gross Weight (lb.)	2.59E+003
Net Weight (lb.)	4.71E+002
Shipping Category	
LANL Waste Stream ID	TA-00-01
TRUCON Code	

Hazardous Materials

Name	EPA Code	Qty (g)

Date Closed (MM/DD/YY): 01/10/1994

Accumulation Start Date (MM/DD/YY): 01/10/94

The data in this section were collected, and waste described herein was packaged and labeled according to approved procedures.

Printed Name	Signature	Date:

3. Generator Site Health Physics Information

		Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Gamma Dose Rate (mrem/h) (contact)	1.00E-001				
Neutron Dose Rate (mrem/h) (contact)	0.00E+000				
Total Dose Rate (mrem/h) (contact)	1.00E-001				
Total Dose Rate (mrem/h) (1 meter)					
Alpha Contamination (dpm/100cm2)	0.00E+000				
Beta-Gamma Cont (dpm/100 cm2)	0.00E+000				

The data in this section were collected according to approved procedures.

Printed Name	Date

Signature

TRU WASTE STORAGE RECORD

55432

4. TRU Waste Management Review/Authorization

The data package for this waste has been reviewed. Basedon the information provided, this waste meets the WAC requirements for storage at TA-54.	Printed Name	Date:
	Signature	

5. Preload Visual Inspection

This waste package was visually inspected prior to transport according to approved procedures. It meets WAC packaging and labeling requirements and is free from obvious damage and defects.	Printed Name	Date:

6. Receiving Site Health Physics Information

Gamma Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	*The data in this section were collected according to approved procedures.*			
Total Dose Rate (mrem/h) (1 meter)				
Alpha Contamination (dpm/100cm2)	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	Signature			

7. Storage Site Information

Received by (Initials)	Date Received	**Original Storage Data**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (MM/DD/YY)	
Printed Name	Date:	Printed Name	Date:	
Signature		Signature		

8. Waste Acceptance Office

Intials/Date	WE Description

NCR Number	Intials/Date	NCR Description

TRU WASTE STORAGE RECORD

55432

9. Continuation Sheet for Radionuclide Content (from Page 1, Section 2)

Radionuclide Content - Continued			
Nuclide	**Amount**	**Uncertainty**	**C= Curie M = Gram**
No Additional Radionuclides			

10. Continuation Sheet for Hazardous Materials (from Page 1, Section 2)

Hazardous Materials		
Name	**EPA Code**	**Qty (g)**
No Additional Hazardous Materials		

CONTAINER PROFILE
55432
T-TRU-TEMP

WS ID: 33416
C ID: 761806
ACTIVE

GENERAL INFORMATION

Container ID:	761806		
Labeled ID:	55432		
Optional ID:		**Status:**	ACTIVE
Chemical Barcode:		**Decommissioned:**	YES
Physical State:	SOLID	**Container Type:**	OT: Other (WCATS Specific)
Waste Stream ID:	33416	**Container Subtype:**	Unspecified
Work Path:	T-TRU-TEMP	**Origin Date:**	10-Jan-1994 12:00 am
Quantity (Univ):		**Accum Start Date:**	10-Jan-1994
Compactible:		**Closed Date:**	10-Jan-1994

Discard Matrix:

TID(s):

Gen Contact:

Insert By: WCATS APPLICATION (000000)

Waste Desc: (LEGACY WCCP) SYSTEM COMPONENTS: VALVES, PIPING, FLANGES, TANKS, EQUIPMENT FROM DECOMMISSIONING OPERATIONS WITH NO KNO

WEIGHTS AND VOLUMES

Container Volume:	1.39 CM	**Gross Weight:**	2590.00 lb
Waste Volume:	NOT SPECIFIED	**Tare Weight:**	2119.14 lb
		Net Weight:	470.86 lb

LOCATION

Pickup (Origin): LANL: 55-PF4: GEN-AREAS

Current: LANL: 54-G-DISP: SHAFT263

CONTAINER PROFILE
55432
T-TRU-TEMP

WS ID: 33416
C ID: 761806
ACTIVE

PAYLOAD INFORMATION

Container Procurement

P.O. Number: **Year of Manuf:**

Lot No.: **Serial No:**

Solution Package: 54: SP BG Boxes - H3 Canisters

TRUCON Code:

Shipping Category:

CCP AK Report:

WIPP Waste Stream: TA-00-01: MISCELLANEOUS

Matrix Code:

Defense Waste: **Equiv. Comb. Matrix:**

Adeq. Ventilation: **Compliant Metal Cont.:** NO

Overpack (1 to 1): NO **Retrievable:** **BIR WS Code:** LA-M17

Content Code: 005: Noncombustible Scrap - Small tools, cans, small equipment items, broken glass, etc., which may contain some small fraction of combustible solids.

COST CODES

Cost Center	Prog Code	Cost Account	Work Package	Percent Allocation	Cost Center Status	Cost Code Status	Recharge Mode
------	K567	----	----	100.00			*SELECTION LIST*

RADIOLOGICAL SURVEY

Survey Type	Instrument Number	Survey Date	At Contact mrem/hr	At 30 cm mrem/hr	At 1 M mrem/hr	Alpha dpm/100cm2	Beta/Gama dpm/100 cm2
Survey ID: 72275, Status: Active							
B/G Survey			= 0.10	=	=	Not Applicable	
Neutron Survey			= 0.00	=	=	Not Applicable	
Smear Results			Not Applicable			= 0.00	= 0.00

CONTAINER PROFILE
55432
T-TRU-TEMP

WS ID: 33416
C ID: 761806
ACTIVE

RADIONUCLIDES

Nuclide	Amount	Unit	Uncert	MT Derived (Y/N)	Activated (Y/N)	MDA Result (Y/N)	Normal Form (Y/N)	Measurement Code/Comment
Status: Active, Assay Page: 336154, Date: 01/10/1994, Derivation: Generator Entered Results (e.g., Offsite Assay)								
H-3	3.33E-006	g	3.33E-006	N			Y	
Pu-238	1.40E-004	g	8.04E-005	N			Y	
Pu-239	1.32E+000	g	7.60E-001	N			Y	
Pu-240	8.46E-002	g	4.86E-002	N			Y	
Pu-241	2.82E-003	g	1.62E-003	N			Y	
Pu-242	2.80E-004	g	1.61E-004	N			Y	

RAD CALCULATIONS

Total Activity (nCi/g):	2.00175E+03	**DOTFissile Mat (g):**	1.32482E+00
Alpha (nCi/g):	4.85429E+02	**Transport Index:**	
TRU Alpha (nCi/g):	4.85396E+02	**NRC Class:**	GTCC
Pu-239 FGE:	1.33027E+00	**DOT Type:**	B
Pu-239 FGE [2U]:	2.84949E+00	**LSA-I Fraction:**	6.15497E+02 N
Pu-239 Eq-Ci:	1.09154E-01	**LSA-II Fraction:**	1.88019E-01 Y
Pu-239 Eq-Ci [2U]:	2.06258E-01	**LSA-III Fraction:**	9.40095E-03 Y
TRU Pu-239 Eq-Ci:	1.09154E-01	**Reportable Quantity:**	1.06590E+01 Y
TRU Pu-239 Eq-Ci [2U]:	2.06258E-01	*** ALC Ratio:**	1.13114E+06 NE
Decay Heat [U] (W):	4.79657E-03	*** ACM Ratio:**	1.84649E+04 NE
Tritium (Ci/m3):	2.31637E-02	**Limited Quantity:**	4.01568E+03 N
TRU ECW PE-Ci:	1.09154E-01		

Weight/Volume Used:

1 Container Net Weight:	2.13579E+02 kg	**ALC (Activity Limit for Exempt Consignment)*
2 Container Volume:	1.39000E+00 m3	**ACM (Activity Concentration for Exempt Material)*
		U = 1 Uncertainty, 2U = 2 Uncertainty

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
01/11/1994 12:00 AM	1811046 EXECUTED	LANL:55-PF4 - DRMPRP-SW	NO
07/24/1995 12:00 AM	679364 EXECUTED	LANL:55-PF4 » 54-G:000283 STAGING	NO

CONTAINER PROFILE
55432
T-TRU-TEMP

WS ID: 33416
C ID: 761806
ACTIVE

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
09/24/1998 12:00 AM	692480 EXECUTED	LANL:54-G » 54-G:000153	NO
09/22/1999 12:00 AM	692481 EXECUTED	LANL:54-G - SHAFT263	NO

Note: Highlighted row indicates container was output or receiving container for the indicated task

DOCUMENTATION

Doc. Number	Title	Uploaded By
1	55432-TWSR	WCATS APPLICATION (000000)

COMMENTS

Date Time/ User Name	Comment
08/23/2013 9:37 AM WCATS APPLICATION (000000)	ROUGH SWIPE NDA LUD 139 #7737, VOID 11/23/94, TRITIUM PRESSURE VESSEL CONTAINING 3 55-GAL. DRUMS (55444, 55442, 55443) BRUCE L. 8/9/94 Added CONTENT_CODE = 005 per meeting with Davis Christensen to aid in STP reporting 6/4/01 vea.

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
08/23/2013 9:44 PM WCATS APPLICATION (000000)	NO	TRUP.TRUPKG TABLE (WASTEDB): [PKG_ID] = 55432, [ALPHA_CONT] = 0, [APPROVE_BY] = 090666, [APPROVE_DATE] = 1994-08-09 00:00:00, [BETA_GAMMA_CONT] = 0, [BLDG_CD] = 55-PF4, [BX_SERIAL] = , [CERT_STATUS] = N, [COLOR_CD] = , [COMMENTS] = ROUGH SWIPE NDA LUD 139 #7737, VOID 11/23/94, TRITIUM PRESSURE VESSEL CONTAINING 3 55-GAL. DRUMS (55444, 55442, 55443) BRUCE L. 8/9/94 Added CONTENT_CODE = 005 per meeting with Davis Christensen to aid in STP reporting 6/4/01 vea., [CONTENT_CODE] = 005, [CONTROL] = CST7, [DATE_CLOSED] = 1994-01-10 00:00:00, [GAMMA_DOSE] = .1, [GROSS_WT] = 2590, [GRP] = NMT2, [NEUTRON_DOSE] = 0, [NORMAL] = N, [OLDDRUMNUM] = , [OLDVOL_UNIT] = , [OLDWT_UNIT] = , [ORG_VOL] = 0, [ORG_WT] = 0, [PKG_CD] = 03, [PKG_CD_DESC] = TRITIUM PRESSURE VESSEL, [PKG_DATE] = 1995-07-20 00:00:00, [PKG_FISS_GRAMS] = 1.33026642, [PKG_LOT] = , [PKG_PE_ACT] = .11054798346666667266346789696272311309 5, [PKG_TARE_WT] = 2119.14, [PKG_VOLUME] = 1.39, [PROC_BTCH_CD] = , [PROG_CODE] = K567, [ROOM] = , [SAMPLE_ID] = , [THERMAL] = .003274314216, [TOTAL_DOSE] = .1, [TOT_ANCG] = 89.41082207808470919899491328062756634 19, [TRUCON_CD] = , [WASTE_CD] = , [WPRF_CD] = 6593, [YR_MFG] = , [WASTE_TYPE] = , [INSP_DATE] = 1994-01-11 00:00:00, [AUA_VUA] = , [PROCESS_ID] = , [WGEN_CD] = , [DOT_TYPE] = , [BIR_ID] = LAT009, [RQ] = , [LSA_SCO_CD] = , [LSA] = , [A_START_DATE] = , [BIR_WS] = LA-M17, [LA_WS] = TA-00-01, [SWBOP] = , [RETRIEVABLE] = , [OFFSITE] = , [LINER_CD] = , [NET_WT] = , [SHIP_CD] = , [WASTE_STREAM] = , [OVERPACK] = N, [REPACKED] = , [INVENTORY_NO] = 3, [INVENTORY_DT] = 1999-09-09 00:00:00, [CHCD_CC_CD] = , [CHCD_CA_CD] = , [CHCD_WP_CD] = , [DOT_DP] = , [WASTE_VERIF] = , [VERIF_COMPLETE] = , [HDL_CD] = , [UPD_WHEN] = 2004-07-02 12:01:13, [UPD_WHO] = 114644, [PHY_STATE] = S, [PKG_H3_ACT] = .03247152, [QTW] = N, [AK_REPORT] = , [STP] = 0
08/23/2013 12:32 PM WCATS APPLICATION (000000)	NO	TRUP.UPD_HISTORY TABLE: [UPD_ID]= 8142, [AUTH_BY]= 113199 -> CHRISTENSEN DAVIS V , [AUTH_NUM]= SR318, [PKG_ID]= 55432, [UPD_WHEN]= 03-25-1996, [UPD_WHO]= Z111142 -> LONGLEY JOHN M , [WHAT]= tgrams, tcuries, fiss_grams, thermal, pkg_pe_act,pkg_fiss_grams, [WHY]= Correct errors
08/23/2013 12:32 PM WCATS APPLICATION (000000)	NO	TRUP.UPD_HISTORY TABLE: [UPD_ID]= 30672, [AUTH_BY]= 090510 -> CHEN ANITA I-LI , [AUTH_NUM]= , [PKG_ID]= 55432, [UPD_WHEN]= 10-22-1996, [UPD_WHO]= Z105468 -> CHAN MARGARET K , [WHAT]= Changed from Normal to Off-Normal, [WHY]= Requested by Andy Montoya,TA55
08/23/2013 8:46 AM WCATS APPLICATION (000000)	NO	INITWORKPATH (C_ID=761806/PATH_ID=466): SKIPPED (NO WORKPATH UNITS)

LOS ALAMOS
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

LA00000055432

TRITIUM PRESSURE VESSEL 8/9/94

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code: N/A	Inspected Items		
Year of Manufacture: N/A	☐ Ring, Bolt, and Nut NA	☐ Chime	☑ Dents
Box Serial Number: N/A	☐ Lid ~~and Gasket~~ welded	☑ Gouges	☐ Paint NA
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	Printed Name: Dennis R Wulf		Date: 1-11-94
	Signature: Dennis R Wulff		

2. GENERATOR'S PACKAGE INFORMATION

ORIGIN OF WASTE	Group: NMT-2	Technical Area: TA 55	Building: PF4	Program Code: K967

Additional Information: [illegible] - RIDA Tare Secondary 1704.84 Lbs, 49ft^3 [illegible] #7157 [illegible] 11/08/94 [illegible]

CODE	CONTAINER	INTERNAL SHIELDING	
01	☐ Steel Drum (55 gal.)	☑ None	
02	☐ Standard Waste Box	Type	Thickness (in.)
03	☑ Other (Call TWCO)		. E
04	☐ RH Canister		. E

Field	Value
Waste Profile Request Number	6593
Carbon Filter ID 01	14
Carbon Filter ID 02	
Process Batch Code	NH
Gross Weight (lb.)	2.514 E 3
Organic Material Wt. (lb.)	0.0 E 0
Organic Material Volume (%)	0
TRUCON Code	N/A
Date Closed (MMDDYY)	01/10/94

RADIONUCLIDE CONTENT

Nuclide	Amount +/-			Uncertainty +/-			C=Curie M=Gram
Pu238	1.400	E	-14	8.043	E	-15	M
Pu239	1.322	E	+0	7.596	E	-11	M
Pu240	8.460	E	-12	4.860	E	-12	M
Pu241	2.820	E	-13	1.620	E	-13	M
Pu242	2.890	E	-14	1.699	E	-14	M
H003	2.327	E	-6	3.327	E	-6	M

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
None		. E
		. E
		. E

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures. The data are correct and complete to the best of my knowledge.

Printed Name	Signature	Date
Dennis R Wulff	Dennis R Wulff	7-11-94

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (mrem/h)	0.1 E +0	Survey Meter Model: R0-3C	Property Number: 2626
Neutron Dose Rate (mrem/h)	0.0 E +0	Survey Meter Model: PNR-4	Property Number: 4920
Total Dose Rate (mrem/h)	0.1 E +0	*The data in this section were collected according to approved procedures.*	
Alpha Contamination (dpm/100cm^2)	NA . E	Printed Name: Michael C. Loibl	Date: 7/26/94
Beta-Gamma Cont. (dpm/100cm^2)	0.1 E 0	Signature: Michael C Loibl	

4. EM-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by EM-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.	Printed Name: BRUCE LE BRUN	Date: 8/9/94
	Signature: Bruce Le Brun	

THIS PAGE FOR EM-7 USE ONLY

WASTE PACKAGE SERIAL NUMBER

05-05-95

5. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	08	10	94	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	07	25	95	V.G. Harkleroad	V.G. Harkleroad

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected at the time of pickup according to approved procedures and was found to be free of obvious damage or defects.

Comments

Printed Name	Signature	Date
Rick Martinez	Rick Martinez	7-18-95

7-26-95 7-27-95 CH

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	0.1E0	Survey Meter Model R03C	Property Number 2676
Neutron Dose Rate (*mrem/h*)	0.0E0	Survey Meter Model EGP-Z	Property Number 6116
Total Dose Rate (*mrem/h*)	0.1E0	*The data in this section were collected according to approved procedures.*	
Alpha Contamination (*dpm/100cm²*)	0.0E+0	Printed Name A. Moore	Date 7/21/95
Beta Gamma Cont. (*dpm/100cm²*)	0.0E+0	Signature Andrew T. Moore	

8. STORAGE SITE INFORMATION

Received By (*Initials*) RM	Date Received 7-26-95	CY Build.	ORIGINAL STORAGE DATA
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Pad Number 283	Layer / Row Number
		Column Number	Date Stacked (*MM,DD,YY*) 07 24 95
Printed Name Rick Martinez	Date 7-24-95	Printed Name	Date 7-24-95
Signature Rick Martinez		Signature Rick Martinez	

9. EM-7 REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name Rick Martinez	Date 7-28-95
	Signature Rick Martinez	

10. TRU WASTE CERTIFICATION OFFICE INFORMATION

COMMENTS	NONCONFORMANCE REPORT NUMBER(S)	HOLD-TAG NUMBER(S)
Printed Name	Signature	Date

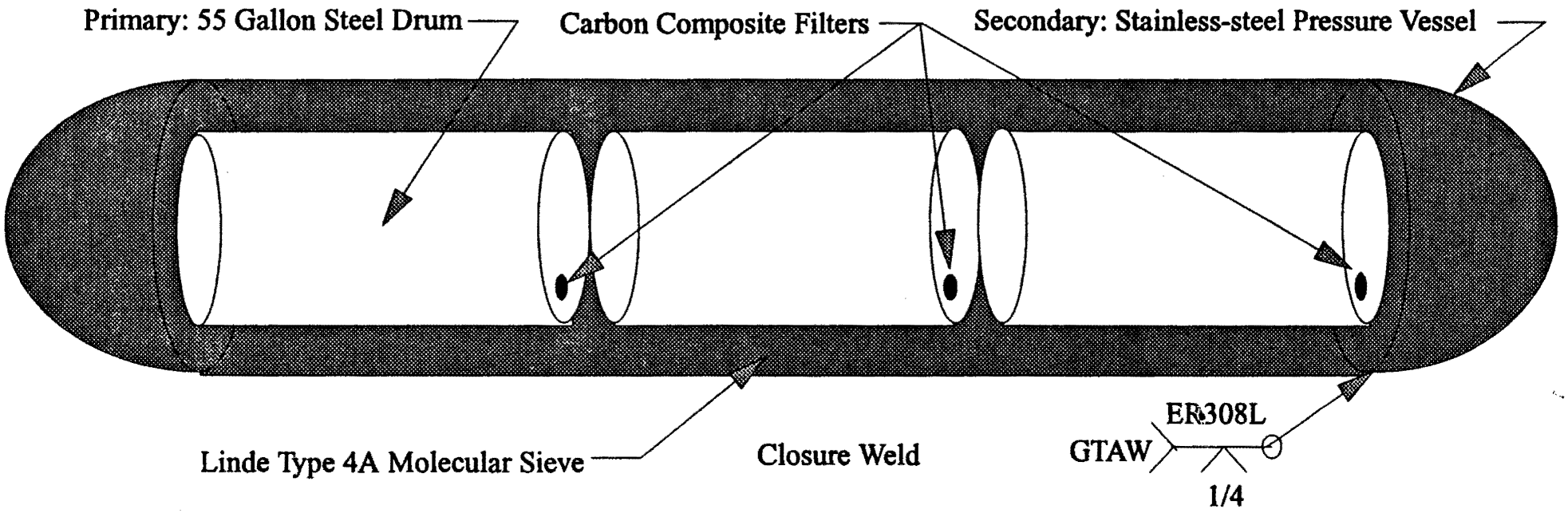
11. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	08	02	95	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	08	02	95	V.G. Harkleroad	V.G. Harkleroad

12. DUPLICATE COPY

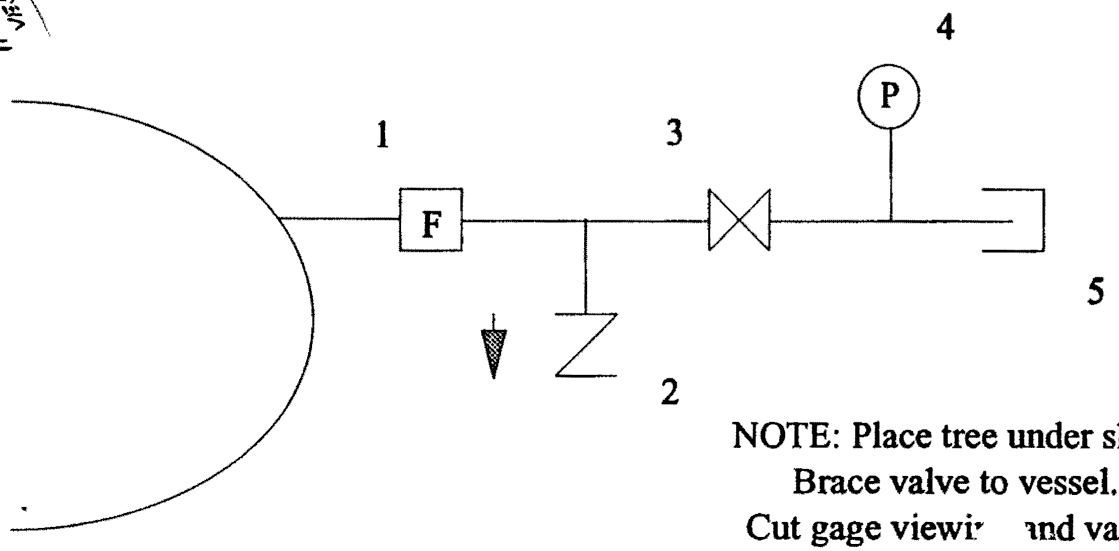
	M M	D D	Y Y	Printed Name	Signature
Date Duplicate Filed	08	02	95	Charlotte Fernandez	Charlotte Fernandez

Tritium Co-contaminated Transuranic Waste Package



NOTE: Skirts not shown.

Full penetration
Inert gas blanket back side of weld.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewi[illegible] and valve
access hole [illegible] skirt.

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wie[illegible]e 08/23/93

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: D. P. Taggart, EM-7, MS J595

DATE: August 23, 1993

THRU: B. J. McKerley, NMT-2, MS E501
J. J. Balkey, NMT-2, MS E501

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-93-168

SUBJECT: **PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

This memo outlines the packaging agreement for tritium contaminated transuranic waste from the Special Recovery Line (SRL) tear-out at TA-55, PF-4. This agreement was reached at a meeting at TA-54 on Tuesday, August 17, 1993 by the following personnel; Tom Bieniewski, Mike Blau, Davis Chistensen, Dan Taggart and Ron Wieneke.

The packaging configuration shall be as follows; 1) Tritium co-contaminated transuranic waste will be bagged out of the glovebox line in accordance with TA-55 procedures, or in the case of the decommissioned processing system; disassembled and bagged. Bags shall be sealed by the twist and tape method. 2) The bagged waste will be placed inside of 55 gallon drums which have had their interior surfaces painted with asphalt as a barrier to tritium permeation and are painted white on the outside with a red "T" for identification, as is the practice for packaging tritium contaminated wastes. The 55 gallon drum will act as the primary containment for the waste. This packaging configuration will protect JCI, Waste Management and NDA Personnel from the tritium in the waste. 3) The 55 gallon drums shall be closed and sealed with a TID, then sent to the Nondestructive Assay Laboratory for plutonium assay. 4) Upon completion of the assay, the drum shall be returned to Room 307/308 where tritium monitoring equipment and proper ventilation is available and the bung in the drum lid shall be replaced with a carbon composite filter. The carbon composite filter will contain the transuranics but allow gases, including tritium to vent to the secondary. The installation of the carbon composite filter will be done immediately prior to over-packing. 5) the drum shall then be placed inside of the special stainless-steel tritium containment vessel which will serve as a secondary containment. 6) As each drum is placed into the secondary, the annulus between the 55 gallon drum OD and the vessel ID will be filled with Linde® Type 4A molecular sieve which will absorb any tritium dioxide escaping the primary through the carbon composite filter. 7) The stainless-steel vessels will hold up to three 55 gallon drums. Upon filling the vessels, the heads will be welded in place sealing the vessel. 8) The top of the vessel will have a penetration for the attachment of a valve, pressure gauge, pressure relief valve and quick-connect. 9) The vessel shall be flushed and back-filled with helium for leak testing the closure weld. Helium back pressure and acceptable leak rate will be determined by EM-7.

Documentation will be in accordance with the LANL TRU Waste Certification Plan and Safe Operating Procedures (SOPs) at TA-55. Each 55 gallon drum will have a Waste Origination and Disposition Form filled out by the Generator, Waste Management and Nondistructive Analysis; a Waste Profile Form filled out by the generator and approved by EM-8; a Discardable Waste Log Sheet for each drum and a Transuranic Waste Storage Record for each drum. Drums will be identified with the standard bar code labels (LA0000000XXXXX) used for transuranic waste. In addition, a Transuranic Waste Storage Record shall be generated for the secondary. It will be a

summary of the TWSRs corresponding to the three 55 gallon drums enclosed within it. Additional information on the tare of the secondary and its internal volume will be recorded in the "additional information" section on the form. The secondary will be identified with its own bar code label.

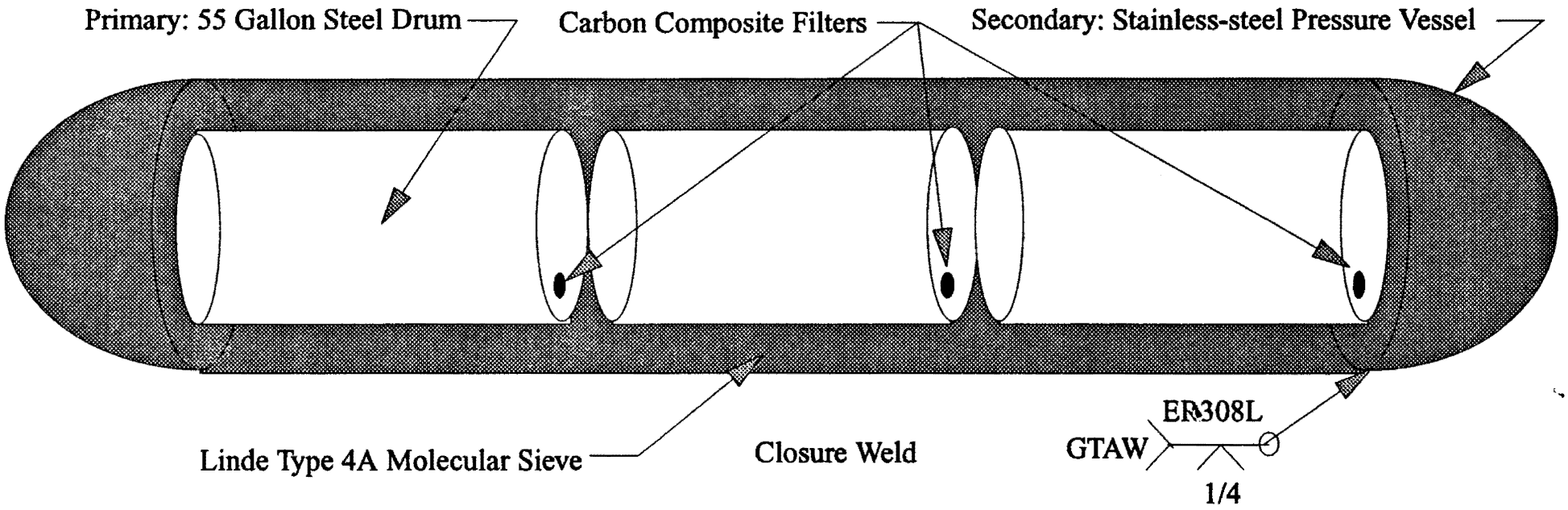
Mike Blau estimates that two vessels (six 55 gallon drums) will be needed to accommodate all of the tritium co-contaminates transuranic waste from the Special Recovery Line tear-out. Waste will not be segregated according to combustible and noncombustible categories, although the majority of the waste will be scrap metal (valves, fittings, piping, vessels, pumps and other equipment).

The system which is replacing the SRL will be used to conduct similar work and generate tritium co-contaminated transuranic waste. Although the volume of waste from this operation is not anticipated to be great, the packaging requirements need to be established. Please contact waste NMT-2 Waste Management when you are prepared the address this issue.

Your acceptance of this packaging configuration for interim storage of tritium co-contaminated transuranic waste at TA-54 is requested so that the decommissioning may proceed to meet programmatic commitments. If you need any further information or clarification of the packaging requirements as outlined above, please contact me at 5-0269 immediately.

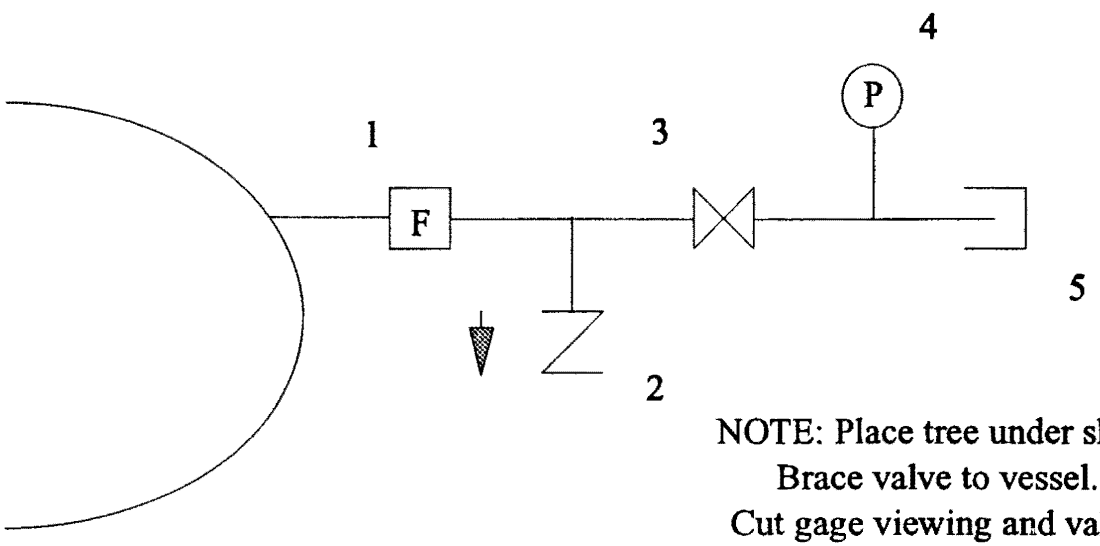
Distribution: T. Bieniewski, MST-3, MS C345
M. S. Blau, NMT-5, MS E506
D. Christensen, EM-7, MS J595
E. D. Derr, EM-7, MS J595
L. R. Field, MST-5, MS G730
J. R. Harper, EM-7, MS J595
D. E. Harvey, NMT-4, MS E513
J. W. Kreuger, EM-7, MS J595
D. B. LeBrun, NMT-7, MS J594
B. T. Reich, NMT-7, MS J594
M. F. Stevens, NMT-5, MS E506
Author file
NiTR file

Tritium Co-contaminated Transuranic Waste Package



NOTE: Skirts not shown.

Full penetration
Inert gas blanket back side of weld.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve
access hole in skirt.

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wieneke 08/23/93

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: R. E. Wieneke, NMT-2, MS E501

DATE: October 1, 1993

FROM: Dan Taggart, EM-7
Technical Staff Member

MAIL STOP/TELEPHONE: J595/5-6149

SYMBOL: EM-7G-93-536

SUBJECT: **RESPONSE TO NMT-2 NiTR-93-168; "PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

We agree with the packaging configuration described in NMT-2-NiTR-93-168 for the tritium and TRU contaminated waste from TA-55 with the following provisions. These provisions will help assure that each of the overpacked 55 gallon drums will be acceptable to WIPP in its own right and provide protection against pressurization of the secondary vessel by alpha radiolysis of the hydrogenous components of the waste.

- Massive objects, like vacuum pumps, must be braced to prevent them from shifting during handling.

- A single plastic bagout is acceptable with a "horsetail" seal.

- Each 55 gallon drum shall have a standard 90 mil plastic drum liner. If the drum liner does not come with a lid, please place a 90 mil (approx.) sheet of plastic across the top. These plastic linings are intended to provide a little extra "dent" protection for the drum.

- Enough getter should be included to absorb all of the H_2 which may be generated due to alpha radiolysis of hydrogenous wastes for a period of 20 years. This will have the added effect of binding any HT which may be present in the waste. We estimate that 20 grams of ^{239}Pu could generate up to 6 atm-liters of H_2 per year in contact with hydrogenous materials, or 120 atm-liters in a 20 year period. If each waste drum contained hydrogenous wastes and 20 grams of ^{239}Pu, then the total H_2 production per year would have to be assumed to be 36 atm-liters.

Organic getters such as DEB (Allied Signal, Kansas City Division) can bind up to about 0.2 atm-liters/gram and have the advantage over other types of getters of not being poisoned by other gases. The getter need not be placed in the 55 gallon drum but could be placed where the molecular sieve will be.

We are currently reviewing the proposed valve tree arrangement for the secondary container and will advise you of any changes we may require early next week.

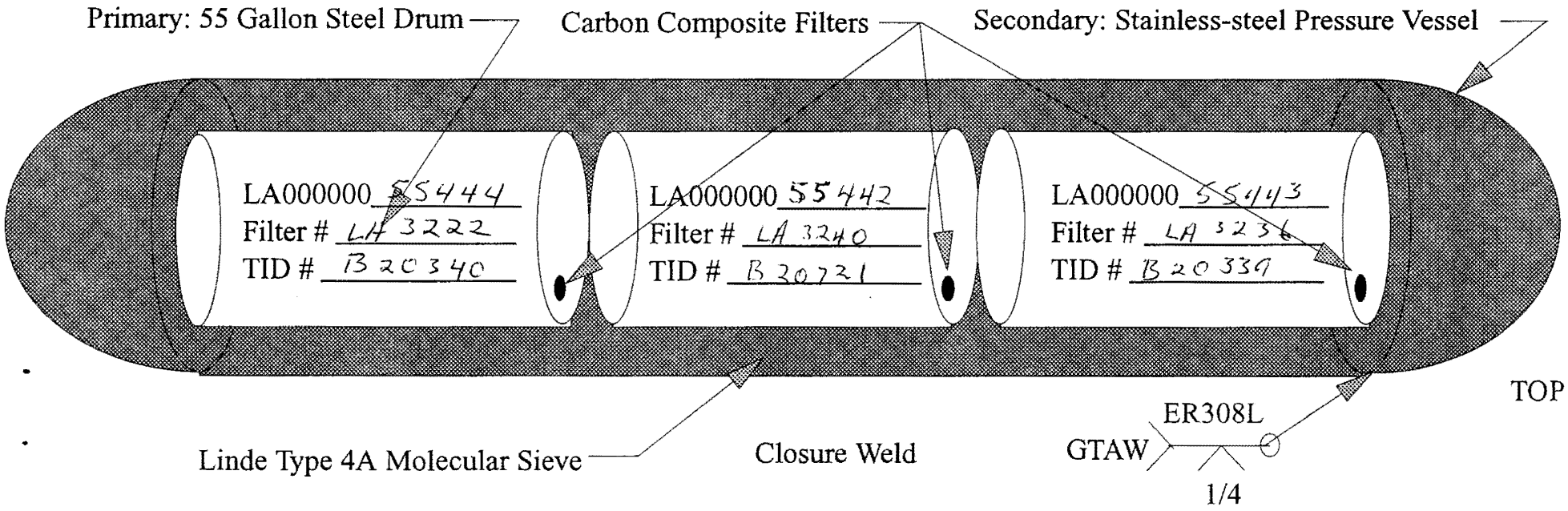
If you have any comments, questions, or concerns about these additional provisions, please call.

DT:lpc

Cy: A. Drypolcher, EM-7, MS E517
J. Kelly, EM-7, MS J593
S. Meyers, BEC, MS J593
A. Montoya, EM-7, J593
J. Krueger, EM-7, MS J595
M. Banks, EM-7, MS J595
S. Betts, EM-7, MS J594
D. Christensen, EM-7, MS J595
E. Derr, EM-7, MS J586
R. Glenn, EM-7, MS J595
J. Harper, EM-7, J586
D. Keller, BEC/EM-7, MS J595
B. LeBrun, EM-7, MS J586
T. Stanford, EM-7, MS J595
E. Vold, EM-7, MS J586
Preapproval Office, EM-7, MS J593
EM-7 Group Office, E517
EM-7 RMDC, MS J594
EM-7 File, MS J592

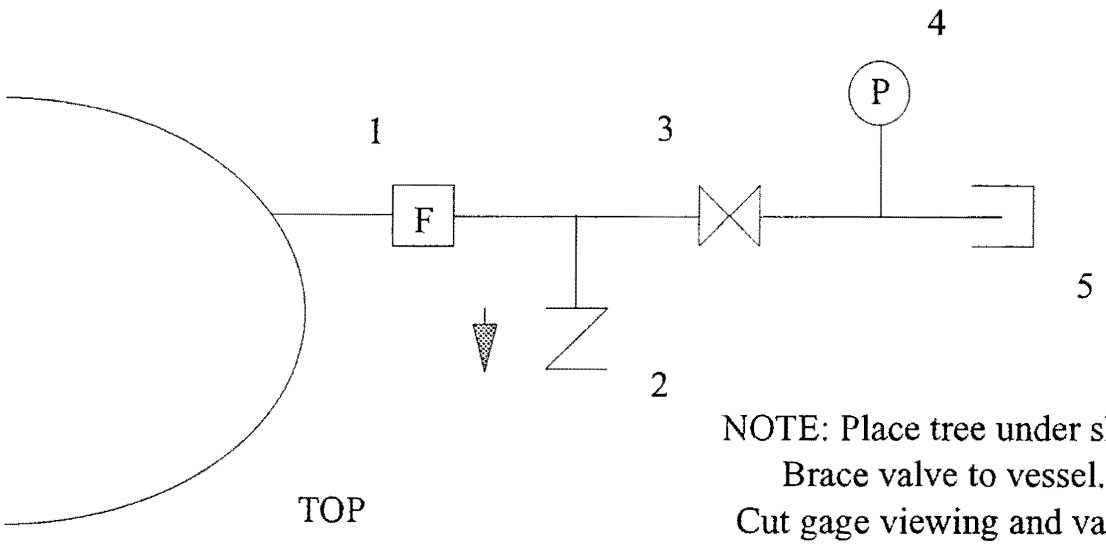
Tritium Co-contaminated Transuranic Waste Package

LA000000 55432



NOTE: Skirts not shown.

Full penetration
Inert gas blanket back side of weld.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve
access hole in skirt.

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wieneke 08/23/93

DISCARDABLE WASTE LOG SHEET

For Stainless Steel Secondary Containment

Effective Date 07/12/93

Page 1 of 1 Pages

LA000000055432 — WASTE PACKAGE SERIAL NUMBER

N-Comb: 1 | Comb: | Pu-238:

Two drum liners Installed: NA

Install/Tighten Carbon Filter(s): NA

Lead Lined: N

90 Mil Drum Liner: N

1/8 Inch Drum Liner: N

CONTAINER: 1 Open | In-Line

Liners Closed and Taped: NA

Tighten Lockmut or Box Plugs: NA

TID#: NA

Date TIDed: NA

ITM NO	ITEM ID	PKG WT Kg	MATRIX (MATERIAL)	MT	SNM GRAMS	UNCRT +/- GRAMS	ITEM SNM g + 2X UNCERT	SNMg+2x UNCERT. running total	CERTIFIED PERSONNEL	REMARKS (Wt in kg) ORGANICS V%	ORGANICS WT.	HAZARDOUS MATERIALS	OTHER REMARKS	AUTH. PG/LN	DATE mm/dd/yy
0	LA000000055432	118.67	METAL	52	0.57	0.22	1.01	1.01	[signature]		0.00	NONE		8/14	12/14/93
1	LA000000055443	77.94	METAL	52	0.00	0.36	0.72	1.73	[signature]		0.00	NONE		8/14	12/14/93
2	LA000000055444	18.14	Glass	52	0.84	0.23	~~0.73~~ 1.39 PSD 84	3.03	[signature]		0.00	NONE		8/5	12/14/93
3															
4															
5															
6															
7	molecular sieve	(68.04	PART OF TARE WEIGHT)												
8															
9															

TOTAL Pkg wt Kg X 2.2046 = Pkg wt Lbs(#)	214.75 / 473.44	NMT-2 Gross Wt. Check Initials: DHW	52	1.41	0.81	X		TOTALS	0.00	0.00	Haz-Mat: NONE
+DRUM/BX TARE #	2119.14	Acntability Check Init.: DHW						Organics wt (kg) x 2.2046 = wt (lbs): 0.00			NMT-4 Assay Value:
= CALC GROSS #	2592.58							QA Pkg Approval: [signature] 8/04/94			Instrument ID:
SCALE GROSS #	2592.60										Date: Not Required per
											NMT-4 Sign.: NMT-2-NTR-94-010

This container's waste was packaged and the NMT-2 data on the DWLS and the CWSR were collected according to procedures defined in the Los Alamos Certification Plan and the appropriate attachment(s).

NMT-2 Signature: [signature]

LA 000 000 55 432

TO: MS:

JOB # A 5101 RECEIPT # FORM B: K578 DATE 02/08/94

JOB NAME : SHIPPING CASK TORPEDO
OF ITEMS : 1
ITEM NO's : NUMBER 1 IN SEQUENCE RADIOGRAPHED ON MONDAY THE 7TH FEB.1994

SOURCE : NMT5

REPORT TO : MIKE BLAU NMT-5 MS E506 PH 7-9371

MATERIAL TO : RETAINED AT TA-55

INFORMATION DESIRED:
GENERAL CONDITION OF FIRST WELD. LOOKING FOR CRACKS,POROSITY,LACK OF PENE - TRATION, AND OFFSET OF TUBE AND DOME TO EACH OTHER.
DATE COMPLETED : 04/08/94

PROCEDURE		FILM #	OPERATOR
(RAD)	RADIOGRAPHY	A 5101 SP	GB
(RAD)	RADIOGRAPHY	A 5101 SP	GB

** RESULTS/REPORT :
THE WELD ON THIS UNIT #1 HAS NO VISIBLE POROSITY OR CRATER CRACKS. THE ONLY INDICATION THAT APPEARS IRREGULAR IS THE OFF-SET OF THE MAIN BODY AND THE DOME. THE IMAGE ON THE RAD- IOGRAPH SHOWS A STRAIGHT LINE THAT WOULD NORMALLY INDICATE A LACK OF PENETRATION,BUT BECAUSE IT ALSO SHOWS MELT-THRU WHERE THE GAP IS,THEN I INTERPET THIS AS OFF-SET. THEREFOR UNIT #1 IS ACCEPTABLE BY RADIOGRAPHIC INSPECTION.
GEORGE H BROOKS

Drum or Box ID LA00000055432 Name: Ronald E. Wieneke Date: 08/02/94

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate th

TABLE I
AVERAGE ISOTOPIC VALUES FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-5

MT	PU 238	PU 239	PU 240	PU 241	PU 242	check total % by MT
MT 51	0.006	96.77	3.13	0.076	0.018	100
MT 52	0.01	93.78	6	0.2	0.02	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	100.003
MT 42						
84%	1.02	1.37	10.32	3.13	84.14	99.98
90%	0.72	1.26	6.4	1.86	89.77	100.01
95%	0.45	0.56	2.47	0.906	95.58	99.966
MT 83						
83%	83.89	13.8	1.9	0.32	0.09	100
89%	89.26	10.07	0.633	0.021	0.015	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gra

TABLE II
ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (	PU 238 (g	PU 239 (g	PU 240 (g	PU 241 (g	PU 242 (gm)	check sum by MT
MT 51	0	0	0	0	0	0	0
MT 52	1.41	0.00014	1.3223	0.0846	0.00282	0.00028	1.410141
MT 53	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0
MT 42							
84%	0	0	0	0	0	0	0
90%	0	0	0	0	0	0	0
95%	0	0	0	0	0	0	0
MT 83							
83%	0	0	0	0	0	0	0
89%	0	0	0	0	0	0	0
TOTAL	1.41	0.00014	1.3223	0.0846	0.00282	0.00028	1.410141

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

Uncertainty = $\frac{0.81}{1.41} = 0.574 \sim 57\%$

TABLE III
ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (	PU 238 (	PU 239 (	PU 240 (	PU 241 (	PU 242 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0
MT 52	1.41	0.00245	0.08119	0.01912	0.31584	1E-06	0.418603197
MT 53	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0
MT 42							
84%	0	0	0	0	0	0	0
90%	0	0	0	0	0	0	0
95%	0	0	0	0	0	0	0
MT 83							
83%	0	0	0	0	0	0	0
89%	0	0	0	0	0	0	0
TOTAL	1.41	0.00245	0.08119	0.01912	0.31584	1E-06	0.418603197

Table III above is used to calculate the per cent of total Curie values for each MT by isotope in Table I

TABLE IV
PER CENT OF TOTAL ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR

MT	total by MT (	PU 238 (	PU 239 (	PU 240 (	PU 241 (	PU 242 (%)	sum by MT (%)
MT 51	0	ERR	ERR	ERR	ERR	ERR	ERR
MT 52	0.4186032	0.58609	19.3952	4.56748	75.4509	0.00026	100
MT 53	0	ERR	ERR	ERR	ERR	ERR	ERR
MT 54	0	ERR	ERR	ERR	ERR	ERR	ERR
MT 55	0	ERR	ERR	ERR	ERR	ERR	ERR
MT 56	0	ERR	ERR	ERR	ERR	ERR	ERR
MT 57	0	ERR	ERR	ERR	ERR	ERR	ERR
MT 42							
84%	0	ERR	ERR	ERR	ERR	ERR	ERR
90%	0	ERR	ERR	ERR	ERR	ERR	ERR
95%	0	ERR	ERR	ERR	ERR	ERR	ERR
MT 83							
83%	0	ERR	ERR	ERR	ERR	ERR	ERR
89%	0	ERR	ERR	ERR	ERR	ERR	ERR

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: D. P. Taggart, EM-7, MS J595

DATE: August 23, 1993

THRU: B. J. McKerley, NMT-2, MS E501
J. J. Balkey, NMT-2, MS E501

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-93-168

SUBJECT: **PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

This memo outlines the packaging agreement for tritium contaminated transuranic waste from the Special Recovery Line (SRL) tear-out at TA-55, PF-4. This agreement was reached at a meeting at TA-54 on Tuesday, August 17, 1993 by the following personnel; Tom Bieniewski, Mike Blau, Davis Chistensen, Dan Taggart and Ron Wieneke.

The packaging configuration shall be as follows; 1) Tritium co-contaminated transuranic waste will be bagged out of the glovebox line in accordance with TA-55 procedures, or in the case of the decommissioned processing system; disassembled and bagged. Bags shall be sealed by the twist and tape method. 2) The bagged waste will be placed inside of 55 gallon drums which have had their interior surfaces painted with asphalt as a barrier to tritium permeation and are painted white on the outside with a red "T" for identification, as is the practice for packaging tritium contaminated wastes. The 55 gallon drum will act as the primary containment for the waste. This packaging configuration will protect JCI, Waste Management and NDA Personnel from the tritium in the waste. 3) The 55 gallon drums shall be closed and sealed with a TID, then sent to the Nondestructive Assay Laboratory for plutonium assay. 4) Upon completion of the assay, the drum shall be returned to Room 307/308 where tritium monitoring equipment and proper ventilation is available and the bung in the drum lid shall be replaced with a carbon composite filter. The carbon composite filter will contain the transuranics but allow gases, including tritium to vent to the secondary. The installation of the carbon composite filter will be done immediately prior to over-packing. 5) the drum shall then be placed inside of the special stainless-steel tritium containment vessel which will serve as a secondary containment. 6) As each drum is placed into the secondary, the annulus between the 55 gallon drum OD and the vessel ID will be filled with Linde® Type 4A molecular sieve which will absorb any tritium dioxide escaping the primary through the carbon composite filter. 7) The stainless-steel vessels will hold up to three 55 gallon drums. Upon filling the vessels, the heads will be welded in place sealing the vessel. 8) The top of the vessel will have a penetration for the attachment of a valve, pressure gauge, pressure relief valve and quick-connect. 9) The vessel shall be flushed and back-filled with helium for leak testing the closure weld. Helium back pressure and acceptable leak rate will be determined by EM-7.

Documentation will be in accordance with the LANL TRU Waste Certification Plan and Safe Operating Procedures (SOPs) at TA-55. Each 55 gallon drum will have a Waste Origination and Disposition Form filled out by the Generator, Waste Management and Nondistructive Analysis; a Waste Profile Form filled out by the generator and approved by EM-8; a Discardable Waste Log Sheet for each drum and a Transuranic Waste Storage Record for each drum. Drums will be identified with the standard bar code labels (LA0000000XXXXX) used for transuranic waste. In addition, a Transuranic Waste Storage Record shall be generated for the secondary. It will be a

Need TWSRs for each Drum!

49 ft^3

summary of the TWSRs corresponding to the three 55 gallon drums enclosed within it. Additional information on the tare of the secondary and its internal volume will be recorded in the "additional information" section on the form. The secondary will be identified with its own bar code label.

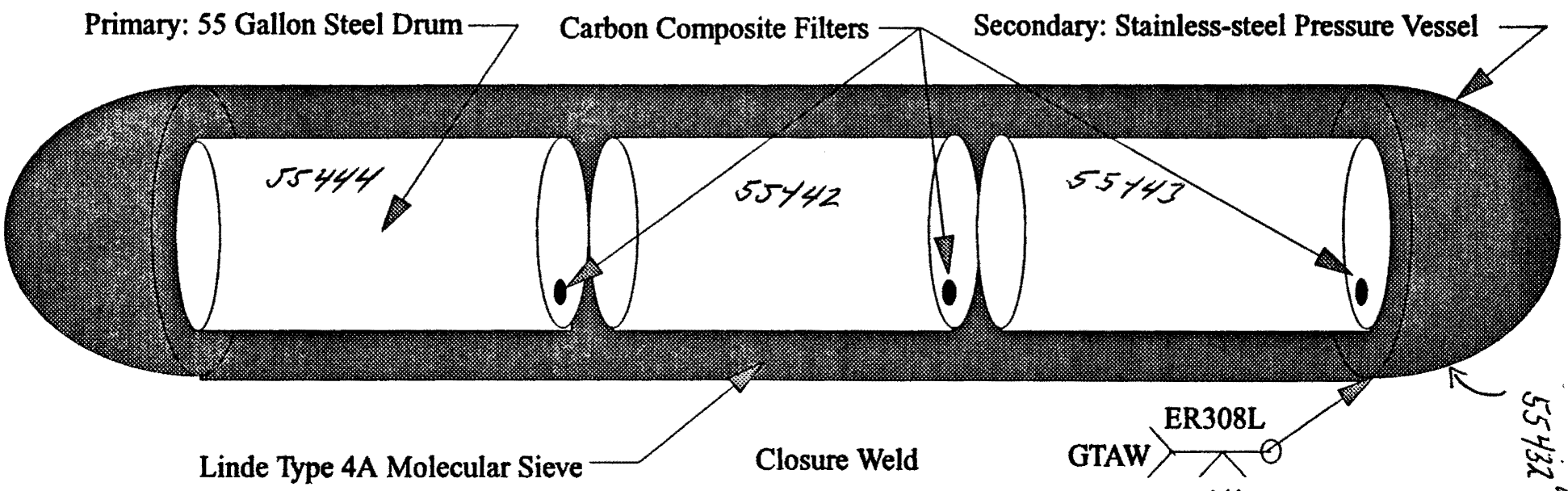
Mike Blau estimates that two vessels (six 55 gallon drums) will be needed to accommodate all of the tritium co-contaminates transuranic waste from the Special Recovery Line tear-out. Waste will not be segregated according to combustible and noncombustible categories, although the majority of the waste will be scrap metal (valves, fittings, piping, vessels, pumps and other equipment).

The system which is replacing the SRL will be used to conduct similar work and generate tritium co-contaminated transuranic waste. Although the volume of waste from this operation is not anticipated to be great, the packaging requirements need to be established. Please contact waste NMT-2 Waste Management when you are prepared the address this issue.

Your acceptance of this packaging configuration for interim storage of tritium co-contaminated transuranic waste at TA-54 is requested so that the decommissioning may proceed to meet programmatic commitments. If you need any further information or clarification of the packaging requirements as outlined above, please contact me at 5-0269 immediately.

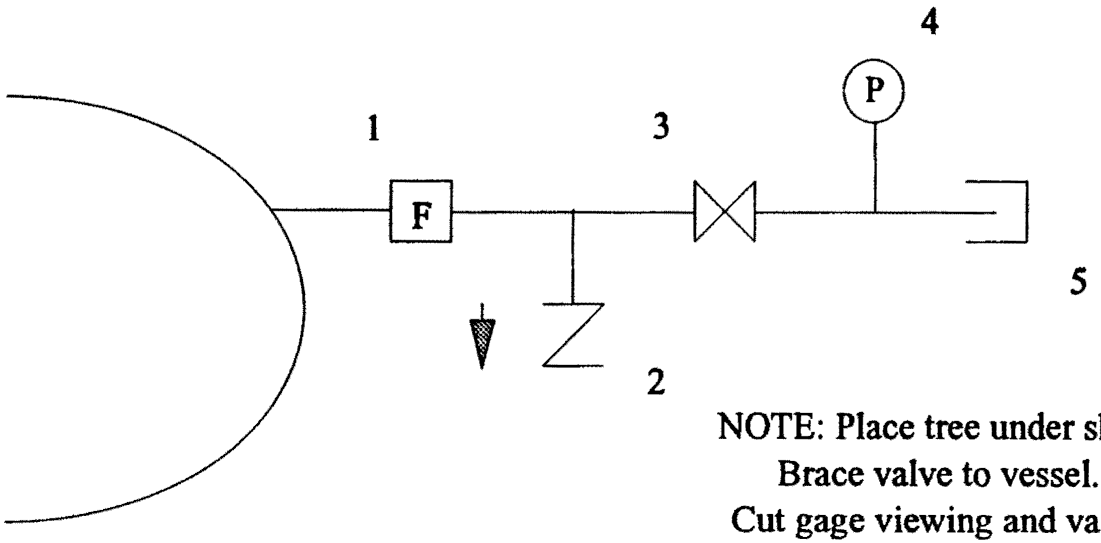
Distribution: T. Bieniewski, MST-3, MS C345
M. S. Blau, NMT-5, MS E506
D. Christensen, EM-7, MS J595
E. D. Derr, EM-7, MS J595
L. R. Field, MST-5, MS G730
J. R. Harper, EM-7, MS J595
D. E. Harvey, NMT-4, MS E513
J. W. Kreuger, EM-7, MS J595
D. B. LeBrun, NMT-7, MS J594
B. T. Reich, NMT-7, MS J594
M. F. Stevens, NMT-5, MS E506
Author file
NiTR file

Tritium Co-contaminated Transuranic Waste Package



NOTE: Skirts not shown.

Full penetration
Inert gas blanket back side of weld.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve
access hole in skirt.

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wieneke 08/23/93

Enclosure 2 to Doc Package

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: M. S. Blau, NMT-5, MS E501 DATE: January 9, 1994

THRU: J. J. Balkey, NMT-2, MS E501 MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2 SYMBOL: NMT-2-NiTR-94-010

SUBJECT: **MC&A CONSIDERATIONS FOR THE PACKAGING OF SPECIAL RECOVERY LINE WASTE**

This memo addresses the Material Control and Accountability concerns associated with the packaging of tritium and tritium contaminated transuranic wastes from the Special Recovery Line tear-out in PF-4. Waste Management personnel must be present to inspect the 55 gallon drums as they are loaded into the stainless steel secondary. They will record the drum identification numbers, note their position inside of the secondary and place bar code labels on the secondary containment for identification. The inside of the secondary will be inspected prior to loading to assure that no unauthorized materials have been placed inside of it. They will also verify the integrity of Tamper Indicating Devices on the drums as they are loaded. The secondary cannot be left unattended until the head has been tacked in place and a paper TID placed over the pipe nipple so that no unauthorized material may be placed inside of the secondary container.

By following these procedures, the need for performing a confirmation assay (which would be very difficult and time consuming) will be waived. Contact me if you have any questions on these requirements.

Distribution: R. L. Price, NMT-4, MS E513
D. R. Wulff, NMT-2, MS E501
Author file
NiTR file

Appendix D

TRU Waste Storage Information
Container 55449 Stored in Shaft 264

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TRU WASTE STORAGE RECORD

55449

1. Generator's Pre-Use Visual Inspection

Purchase Order #	Inspected Items		
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
	☑ Lid and Gasket	☑ Gouges	☑ Paint

Printed Name	Signature	Sig. Date	Oper. Date
WCATS APPLICATION (000000)	*WCATS Electronic*	12-14-93	12-14-93

2. Generator's Package Information

Group	Technical Area	Building	Cost Center	Program Code	Cost Account	Work Package
MET-2	55	000004				

Additional Information

☐ DP ☐ Non-DP If Non-DP waste, attach DOE approval doc.

Container	Liner
☐ Steel Drum (55 gal.)	☑ None
☐ Pipe Overpack Type:	☐ 90 mil liner
☐ Steel Drum (85 gal Overpack)	☐ 125 mil liner
☐ Standard Waste Box	☐ Fiberboard Liner
☐ Standard Waste Box Overpack	**Internal Shielding**
☐ RH Canister	☑ None
☐ Other (Call TWCO)	Type / Thickness

Radionuclide Content

Nuclide	Amount	Uncertainty	C= Curie M = Gram
H-3	3.220E-002	3.220E-002	C
Pu-238	2.982E-003	1.131E-003	C
Pu-239	1.012E-001	3.842E-002	C
Pu-240	2.361E-002	8.991E-003	C
Pu-241	3.599E-001	1.365E-001	C
Pu-242	1.372E-006	5.203E-007	C

Filter Serial No.			
	01		
	02		

Waste Profile Number	6593 (WS ID 33416)
Gross Weight (lb.)	2.67E+003
Net Weight (lb.)	6.17E+002
Shipping Category	
LANL Waste Stream ID	TA-00-01
TRUCON Code	

Hazardous Materials

Name	EPA Code	Qty (g)

Date Closed (MM/DD/YY): 01/06/1994

Accumulation Start Date (MM/DD/YY): 12/14/93

The data in this section were collected, and waste described herein was packaged and labeled according to approved procedures.

Printed Name	Signature	Date:

3. Generator Site Health Physics Information

		Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Gamma Dose Rate (mrem/h) (contact)	2.00E-001				
Neutron Dose Rate (mrem/h) (contact)	1.00E-001	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	3.00E-001				
Total Dose Rate (mrem/h) (1 meter)		*The data in this section were collected according to approved procedures.*			
Alpha Contamination (dpm/100cm2)	0.00E+000	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	0.00E+000	Signature			

TRU WASTE STORAGE RECORD

55449

4. TRU Waste Management Review/Authorization

The data package for this waste has been reviewed. Basedon the information provided, this waste meets the WAC requirements for storage at TA-54.	Printed Name	Date:
	Signature	

5. Preload Visual Inspection

This waste package was visually inspected prior to transport according to approved procedures. It meets WAC packaging and labeling requirements and is free from obvious damage and defects.	Printed Name	Date:

6. Receiving Site Health Physics Information

Gamma Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	*The data in this section were collected according to approved procedures.*			
Total Dose Rate (mrem/h) (1 meter)				
Alpha Contamination (dpm/100cm2)	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	Signature			

7. Storage Site Information

Received by (Initials)	Date Received	**Original Storage Data**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (MM/DD/YY)	
Printed Name	Date:	Printed Name	Date:	
Signature		Signature		

8. Waste Acceptance Office

Intials/Date	WE Description

NCR Number	Intials/Date	NCR Description

TRU WASTE STORAGE RECORD

55449

9. Continuation Sheet for Radionuclide Content (from Page 1, Section 2)

Radionuclide Content - Continued			
Nuclide	**Amount**	**Uncertainty**	**C= Curie M = Gram**
No Additional Radionuclides			

10. Continuation Sheet for Hazardous Materials (from Page 1, Section 2)

Hazardous Materials		
Name	**EPA Code**	**Qty (g)**
No Additional Hazardous Materials		

CONTAINER PROFILE
1004025
WDB-ITEM-HAZ

WS ID: 35723
C ID: 55449
ACTIVE

GENERAL INFORMATION

Container ID:	55449		
Labeled ID:	1004025		
Optional ID:		**Status:**	ACTIVE
Chemical Barcode:		**Decommissioned:**	YES
Physical State:		**Container Type:**	OT: Other (WCATS Specific)
Waste Stream ID:	35723	**Container Subtype:**	Unspecified
Work Path:	WDB-ITEM-HAZ	**Origin Date:**	03-Oct-1990 12:00 am
Quantity (Univ):		**Accum Start Date:**	
Compactible:		**Closed Date:**	

Discard Matrix:

TID(s):

Gen Contact: STEVE J CHIPERA (099349)

Insert By: WCATS APPLICATION (000000)

Waste Desc: FUCHIN STAIN - NAPTHA

WEIGHTS AND VOLUMES

Container Volume:	0.00 CM	**Gross Weight:**	0.91 kg
Waste Volume:	0.00 CM	**Tare Weight:**	0.00 kg
		Net Weight:	0.91 kg

LOCATION

Pickup (Origin): LANL: 03: 000494: 102

Current: LANL: 03: C-CONSOLID

COST CODES

Cost Center	Prog Code	Cost Account	Work Package	Percent Allocation	Cost Center Status	Cost Code Status	Recharge Mode
							UNCONSTRAINED

EPA CODES

System Code	Hazardous Waste No.	Waste Description & Treatment Subcategory
D001C	D001	Ignitable: Unspecified

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
10/03/1990 12:00 AM	131779 PENDING	LANL:03 - C-WDR-NRAD	NO
11/09/1990 10:00 AM	334011 EXECUTED	LANL:03 - C-CONSOLID	NO

CONTAINER PROFILE
1004025
WDB-ITEM-HAZ

WS ID: 35723
C ID: 55449
ACTIVE

Note: Highlighted row indicates container was output or receiving container for the indicated task

COMMENTS

Date Time/ User Name	Comment
02/25/2012 4:21 AM WCATS APPLICATION (000000)	FUCHIN STAIN - NAPTHA

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
02/25/2012 2:35 PM WCATS APPLICATION (000000)	NO	CHEMLL.ITEM TABLE (WASTEDB): [NORMAL]= , [NUM_ITEM]= 1, [OLD_WPRF_CD]= , [PROCESS_ID]= , [RAD_CONTENT]= , [RAREA]= , [TA]= 03, [BLDG]= 000494, [ROOM]= 102, [SEQ#]= , [SFE]= , [SPENT]= , [WASTE_CD]= 0 -> CHEMICAL WASTES, [WASTE_TYPE]= C, [NEVER_RCVD]= , [RMTCON_DOTCON_CD]= , [RMTCON_RCV_VOL]= , [RMTCON_TARE_WGT] = , [RMTCON_VUNIT_CD]= , [RMTCON_WUNIT_CD]= , [OFFSITE]= , [IRCV_DATE]= 1990-11-09 10:00:00, [ACIS_ID]= 0, [CRWSS_DATE]= , [PAREA]= , [HWSA_DATE]= , [WASTEGEN.LOCKED]= , [CONSOLIDATED]= , [OTHERCONID]= , [BULB_SIZE]= , [BULB_NUM]= , [CON_TYPE]= -> , [CON_VOL]= , [CON_VUNIT]= , [CON_TARE_WGT]= , [CON_TWGT_UNIT]= , [BULB_TYPE]= , [ORIG_WDR_ID]= , [QUANTITY]= , [WMC_CD]= -> , [HWSA_SITE_ID]= , [HWSA_FACILITY_CD]= , [USRSTAMP]= -> , [TMESTAMP]= .
02/24/2012 6:12 PM WCATS APPLICATION (000000)	NO	INITWORKPATH (C_ID=55449/PATH_ID=94): FAILED (NO WORKPATH UNITS)

LOS ALAMOS
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

LA00000055449

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code	N/A	Inspected Items		
Year of Manufacture	93	☐ Ring, Bolt, and Nut	☐ Chime	☑ Dents
Box Serial Number	N/A	☐ Lid and Gasket	☑ Gouges	☐ Paint
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	Printed Name: DENNIS RWULFF	Date: 12-14-93		
	Signature: D R Wulff			

2. GENERATOR'S PACKAGE INFORMATION

ORIGIN OF WASTE	Group: NMT-7	Technical Area: TA 55	Building: PF-4	Program Code: KBIA, 5000
Additional Information: Welded			

CODE	CONTAINER	INTERNAL SHIELDING	
01	☐ Steel Drum (55 gal.)	☒ None	
02	☐ Standard Waste Box	Type	Thickness (in.)
03	☒ Other (Cal TWCO)		
04	☐ RH Canister		

MT-52

RADIONUCLIDE CONTENT

Nuclide	Activity +-	Uncertainty +-	C=Curie M=Gram
PU238	1.74 E-4	6.60 E-5	M
PU239	1.63 E+0	6.19 E-1	M
PU240	1.04 E-1	3.96 E-2	M
PU241	3.48 E-3	1.32 E-3	M
PU242	3.48 E-4	1.32 E-4	M
H003	3.327 E-6	3.327 E-6	M

Waste Profile Request Number	6593
Carbon Filter ID 01	N/A
02	N/A
Process Batch Code	N/A
Gross Weight (lb.)	2.67 E+3
Organic Matrix Wt. (lb.)	0.00 E+0
Organic Material Volume (%)	0
TRUCON Code	N/A
Date Closed (MMDDYY)	010694

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
None		

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures. The data are correct and complete to the best of my knowledge.

Printed Name: Dennis R Wulff | Signature: Dennis R Wulff | Date: 2/28/95

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (mrem/h)	0.2 E+0	Survey Meter Model: LUD-139	Property Number: 7647
Neutron Dose Rate (mrem/h)	0.2 E+0	Survey Meter Model: PNR-4	Property Number: 2507
Total Dose Rate (mrem/h)	0.4 E+0	*The data in this section were collected according to approved procedures.*	
Alpha Contamination (dpm/100cm²)	0.0 E+0	Printed Name: EDUARDO ESTRADA	Date: 05/09/95
Beta-Gamma Cont. (dpm/100cm²)	0.0 E+0	Signature: Eduardo Estrada	

4. EM-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by EM-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.	Printed Name: J. Minton-Hughes	Date: 5-4-95
	Signature: Julia Minton-Hughes	

Form 1562 (10/92)

THIS PAGE FOR EM-7 USE ONLY

WASTE PACKAGE SERIAL NUMBER

5. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	06	06	95	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	06	15	95	**V.G. Harkleroad**	V.G. Harkleroad

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected at the time of pickup according to approved procedures and was found to be free of obvious damage or defects.

Comments

TRU 1 INSPECTION

Printed Name: Rick Martinez 6-15-95 CF | Signature: Rick Martinez | Date: 6-6-95

6-15-95

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	0.2 E 0	Survey Meter Model: RO-2	Property Number: 3409
Neutron Dose Rate (*mrem/h*)	0.1 E 0	Survey Meter Model: ESP-2	Property Number: 6110
Total Dose Rate (*mrem/h*)	0.3 E 0	*The data in this section were collected according to approved procedures.*	
Alpha Contamination (*dpm/100cm²*)	00 E + 0	Printed Name: Andrew T. Moore	Date: 6-8-95
Beta Gamma Cont. (*dpm/100cm²*)	00 E + 0	Signature: Andrew T. Moore	

8. STORAGE SITE INFORMATION

Received By (*Initials*): RM	Date Received: 6-7-95	**ORIGINAL STORAGE DATA**	
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Pad Number: 283	Layer:	Row Number:
		Column Number:	Date Stacked (*MM,DD,YY*): 06/07/96
Printed Name: Rick Martinez	Date: 6-9-95	Printed Name: Charlotte Fernandez	Date: 6/16/95
Signature: Rick Martinez		Signature: Charlotte Fernandez	

9. EM-7 REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name: Rick Martinez	Date: 6-16-95
	Signature: Rick Martinez	

10. TRU WASTE CERTIFICATION OFFICE INFORMATION

COMMENTS	NONCONFORMANCE REPORT NUMBER(S)	HOLD-TAG NUMBER(S)
Printed Name	Signature	Date

11. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered In Database	06	16	95	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	06	19	95	**V.G. Harkleroad**	V.G. Harkleroad

12. DUPLICATE COPY

	M M	D D	Y Y	Printed Name	Signature
Date Duplicate Filed	06	21	95	Charlotte Fernandez	Charlotte Fernandez

LA000000 55449

Los Alamos
NATIONAL LABORATORY
memorandum

Nuclear Materials Technology Division
Actinide Materials Chemistry
NMT-6

To/MS: R. Wieneke, NMT-7
Thru: T. O. Nelson, T. R. Mills, NMT-6
From/MS: John M. Berg, NMT-6, E510
Phone/FAX: 5-8262/5-4459
Symbol: NMT-6-ENG/SRL-95-006
Date: February 7, 1995

Additional Information on Tritium Content of Five Secondary Waste Containers

Since issuing a memo on this same subject on January 27, 1995 (Symbol: NMT-6-ENG/SRL-95-002) I have obtained additional information affecting the estimated tritium content of the five secondary waste containers. The purpose of this memo is to report that new information and revise the estimated tritium inventories.

I stated in the earlier memo that the molecular sieve material in the second welded secondary container had not been analyzed for tritium content. I have since located a memo from Mike Blau to Dan Taggert (NMT-5:93-411, July 20, 1993) stating that this material was indeed analyzed and giving the results. Mike's memo estimated a maximum of 3200 Curies of tritium in one molecular sieve tank that is in the second container. I could not locate Mike's calculations. After some digging I found notes on the analytical results on which they were based in the log book of Louis Jaramillo (RCT, ESH-1) who was the RCT involved in the sampling. I then did my own calculation, which is detailed below.

The molecular sieve material in the third of three molecular sieve towers that the SRL used while in operation was sampled by withdrawing 30 ml of solid material in July 1993. This material was then subjected to the analytical procedure for tritium swipes detailed in the SOP 397-SRL-R04. Briefly, the solid material was boiled in 20 ml of pure water, 10 ml of the water was distilled into a separate vessel, and 1 ml of this distillate was sent to HPAL for tritium analysis. HPAL did three dilutions of the 1 ml sample before they could get a good reading on their instruments. Their results showed that the original 1 ml sample had an activity of 60 Ci/l. If I assume that all of the tritium in the 30 ml molecular sieve sample migrated into the 20 ml of water during the boiling step, then the 30 ml sample of molecular sieve had an activity of 0.02 l x 60 Ci/l = 1.2 Ci. The specific activity of the molecular sieve material is then 40 Ci/l. I estimate the dimensions of the molecular sieve tower at no greater than 6" outer diameter by 96" long. A container of these dimensions could contain at most 44 liters of molecular sieve material, which at 40 Ci/l gives a total activity of 1800 Ci in the tower.

This result is in reasonable agreement with the 0.16 g of tritium that was assigned on MASS to the secondary container in which this sieve tower is currently located. It significantly lower than the 3200 Ci from Mike Blau's memo, but he states that his number is a maximum, so he may have made more conservative assumptions about the extraction of tritium from the molecular sieve in the analytical procedure or about the homogeneity of the material in the tower.

I also need to clarify that the second container is loaded with two molecular sieve tanks of a newer design in addition to the one whose contents were analyzed. Those two are not expected to contain significant quantities of tritium because they were not put into service until after the SRL stopped processing any significant quantities of material.

I also have additional information about the contaminated pump oil in the fourth welded secondary container. Since I issued NMT-6-ENG/SRL-95-002, I talked with Mike Blau on the telephone and he confirmed that the contents of the drum of waste pump oil in the fourth secondary container was not analyzed for tritium because of safety concerns. I also got an estimate of the volume of oil in the tank from Gerald Lucero. He had banged on the side of the oil drum and found it to be about two thirds full. We estimate the total volume of the drum to be 30 gallons, so we estimate that 20 gallons or about 80 liters is occupied by the oil/vermiculite mixture. If we assume that the vermiculite does not displace much oil, then the oil volume is approximately 80 liters.

Since the oil was not analyzed for tritium, we must estimate the tritium content based on the best available information. You (R. Wieneke) were able to get an estimate from Paul Lamberger of EG&G Mound Applied Technologies of the range of vacuum pump oil contamination experienced at Mound as 10 to 30 Curies per liter. This was discussed in *Packaging of Tritium Contaminated Waste at Mound,* P. H. Lamberger and R. E. Bernheisel, Proceedings of the Sixth Annual Participants Information Meeting: DOE Low-level Waste Management Program, held Sept. 11-13, 1994 in Denver, CO (#CONF-84-09115).

Using 20 Curies per liter as the average contamination level, 80 liters of oil would contain 1600 Curies of tritium. However, the oil in question was removed from the tritium line over a period from about 1980 to 1992, so the tritium has decayed somewhat. If we assume for the sake of simplicity that the tritium has been in the waste tank seven years and the original specific activity averaged 20 Ci/l, then the current activity will be about 1100 Curies. Other items in the fourth secondary container have only trace surface contamination, so 1100 Ci is our best estimate of the total inventory of tritium in that container.

For completeness I also revisit the basis for my estimates in NMT-6-ENG/SRL-95-002 of the tritium content of the other three secondary containers. All three contain only surface contaminated metal and plastic trash, mostly piping and equipment removed from SRL. The highest swipe count obtained was 9.6×10^7 dpm/100 cm^2, which is equivalent to 4.4×10^{-5} Curies. Note that this is a higher count than I used in NMT-6-ENG/SRL-95-002 because I since located a few more swipe results. While the contents of the three secondary containers in question vary somewhat, a conservative estimate is that they each contain three drums of 50 feet of 2" diameter pipe, or 150 feet of 2" diameter pipe in total in each container. This amount of pipe has an inner surface area of 7.2×10^4 cm^2. At the maximum surface contamination level of 4.4×10^{-5} Ci/100 cm^2, there would be a total of 3.2×10^{-2} Curies in each of the remaining three secondary waste containers.

ESH-1 SMEAR SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: 02/17/95, 0830 No. Of Samples: 8
TA: 55 Bldg: PF-4, BSMT.
RCT: E. ESTRADA Z Number: 96005
Phone/Fax: 7-2311

SAMPLE TRACKING NUMBER

ESH-1 SAMPLE TRACKING

95011436

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB
☐ ITEM RELEASE ☐ OFFSITE SHIPMENT ☒ ONSITE SHIPMENT
☐ NON-ROUTINE/OTHER: Being put on Pad Mass Location 774 (Next to spheres) LA000000 55449 MT-52.

ADDITIONAL INFORMATION

☐ Occurrence No.:
☐ Incident No.:
☐ RWP No.:

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF	BKG

Smear No.	Location (Torpedo #55449 Long Tube)	Alpha*	Beta*	Gamma*
1	Front AREA by Gauge AREA	N.D.A	N.D.A	
2	"			
3	Left Side of Body of Torpedo			
4	Rt. Side of Body of Torpedo			
5	END portion of torpedo (Bottom)			
6	"			
7	Left side of Body, Bottom portion			
8	Rt. side of Body, Bottom portion.	✓	✓	
9				
10				
11				
12				
13				
14				
15				

Smear No.	Location	Alpha*	Beta*	Gamma*
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

* dpm/100 cm2

HEALTH PHYSICS RADIOACTIVE MATERIALS SURVEY TAG

Item Description Torpedo #55449 Tag Number 020136
P/N

Check one or more, as applicable:

- ☐ Surface Contaminated (fixed and removable) Item
- ☒ Potential Internal Contamination
- ☒ Internal Contamination
- ☐ Fixed Contamination
- ☐ Induced "Volume" Contamination
- ☐ Contaminated Laundry Enclosed (no contamination on exterior of bag at time of survey)
- ☒ Radioactive Material/Source Radionuclide(s) Pu 239 / T2

If Source; Activity N/A Date of Assay

Manufacturer & Source Model N/A Source Serial No.

Source Custodian N/A Custodian Phone No.

Contamination Survey Results (Check one or more, as applicable)*

- ☒ Alpha N.D.A. dpm Direct Ø dpm/100cm² Removable
- ☐ Beta-Gamma N/A dpm/mR/hr Direct dpm/100cm² Removable
- ☐ "Volume" Contamination: Yes/No N/A uR/hr at Contact ☐ Tritium dpm/100cm² Removable

External Radiation Survey Results (Check one or more, as applicable)*

	At Contact		At 30 cm (1 foot)		At 1 Meter	
☒ Beta-Gamma	0.2	mrem/hr	Ø	mrem/hr	Ø	mrem/hr
☒ Neutron	0.2	mrem/hr	Ø	mrem/hr	Ø	mrem/hr
☒ Total	0.4	mrem/hr	Ø	mrem/hr	Ø	mrem/hr

	Instrument	Model Number	HSE Number
1.	Luc-139	139	7627
2.	PNR-	-4	2507
3.	RO	3C	2671

Comments/Controls: Smear Results, N.D.A.

RCT E. Estrada (Print Name) Eo. Estrada (Signature) Survey Date 02/24/95

Note — Signature verifies that monitoring information is complete and correct.

Complete below if conditional (controlled) release of contaminated item for use only in a Controlled or Radiological Area:

Individual Removing Item Eduardo Estrada (Print Name) Group ESH-1 Phone 7-2311

Individual Removing Item Eduardo Estrada (Signature) Date 02/24/95

Note — Signature verifies that exterior and interior surfaces of the item have been monitored according to LANL requirements.

*(NA = not applicable; NDA = no detectable activity/dose rate)

HPAL ANALYSIS REPORT FORM

FILE 95011436

SAMPLE DESCRIPTION	ANALYSIS REQUESTED	RCT
Sample Date: 02/17/95	Nucon Smear	Name: Eduardo Estrada
TA: 55	LLD: Alpha-3 Beta-8	TA: 55 Bldg: 4
BLDG: PF-4	Analyst: Luis Pocaterra	MS: E503
Room/Area: BSMT	Reviewer: Joe Lopez	PH: 7-2311 FAX: 7-1009

Sample ID #	Alpha Activity dpm	2*sigma %	Beta Activity dpm	2*sigma %
15	NDA	NDA	NDA	NDA
17	NDA	NDA	NDA	NDA
18	NDA	NDA	NDA	NDA
19	NDA	NDA	NDA	NDA
20	NDA	NDA	NDA	NDA
21	NDA	NDA	NDA	NDA
22	NDA	NDA	NDA	NDA
23	NDA	NDA	NDA	NDA

(END OF REPORT)

TA-55 TRITIUM SWIPE COUNT RECORD

DATE 8/31/94 AREA 300-west

TAKEN BY L.R. Jaramillo ANALYZED BY [illegible] ANALYSIS DATE 9-1-94

REASON FOR SWIPE SHIPMENT [illegible]

SWIPE NUMBER	LOCATION	ALPHA d/m	BETA d/m	SWIPE NUMBER	LOCATION	ALPHA d/m	BETA d/m
1	Control		NDA				
2	T2 Torpedo Tube #LA 000000055449						
3	" "						
4	" "						
5	" "						
6	" "						
7	" "						
8	" "						
9	" "						
10	" "						

COMMENTS Copy: D. Zelwekh, ESH-1

Drum or Box ID LA000000 55449 **Name:William Schueler Date:3/31/95**

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%)	PU 240 (gram%)	PU 241 (gram%)	PU 242 (gram%)	PU 244 (gram%)	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.9	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	1.74	0.000174	1.631772	0.1044	0.00348	0.000348	0	1.740174
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	1.74	1.74E-04	1.63E+00	1.04E-01	3.48E-03	3.48E-04	0.00E+00	1.74E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	1.74	0.0030276	0.1001908008	0.0235944	0.38976	1.35720E-06	0	0.516574158
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0

	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
TOTAL	**1.740E+00**	**3.028E-03**	**1.002E-01**	**2.359E-02**	**3.898E-01**	**1.357E-06**	**0.000E+00**	**5.166E-01**

	AM 241 (gm)	AM 241(gram%)	AM 241 (Ci)
MT 44	0	99.99	**0.000E+00**

Drum or Box ID LA000000 55449 **Name:William Schueler Date:3/31/95**

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

uncertainty

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%)	PU 240 (gram%)	PU 241 (gram%)	PU 242 (gram%)	PU 244 (gram%)	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.9	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	0.66	0.000066	0.618948	0.0396	0.00132	0.000132	0	0.660066
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	0.66	6.60E-05	6.19E-01	3.96E-02	1.32E-03	1.32E-04	0.00E+00	6.60E-01

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

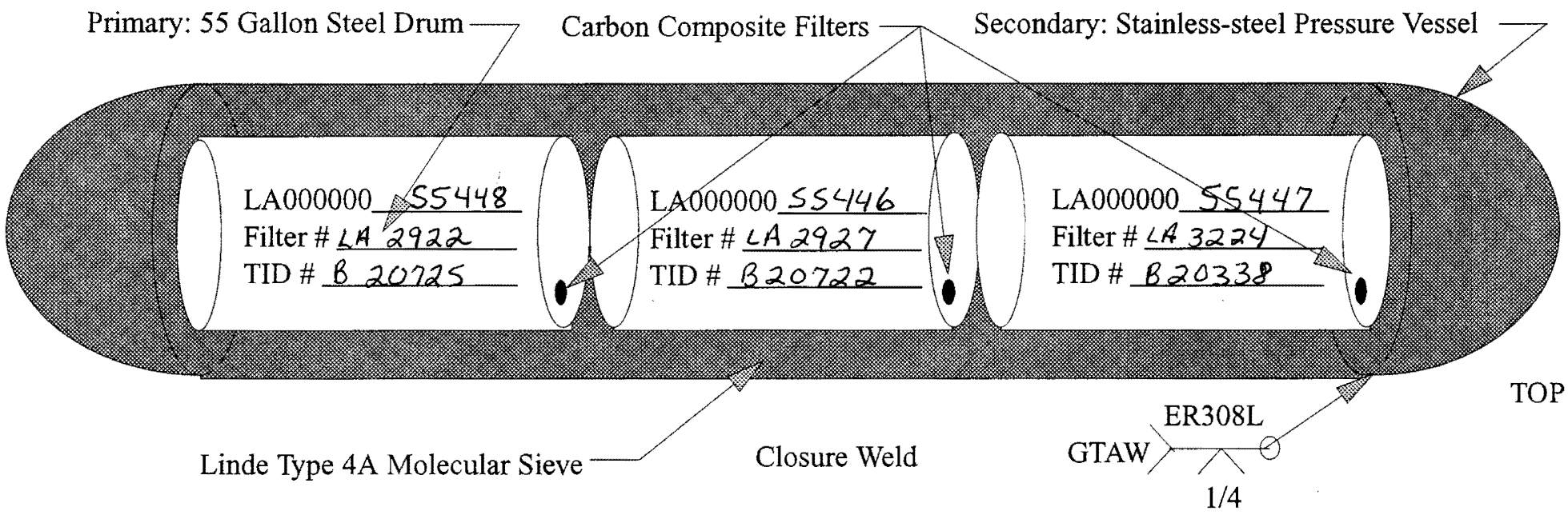
MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	0.66	0.0011484	0.0380034072	0.0089496	0.14784	5.14800E-07	0	0.195941922
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
	total weight (gm)	**PU 238 (Ci)**	**PU 239 (Ci)**	**PU 240 (Ci)**	**PU 241 (Ci)**	**PU 242 (Ci)**	**PU 244 (Ci)**	**sum by MT (Ci)**
TOTAL	**6.600E-01**	**1.148E-03**	**3.800E-02**	**8.950E-03**	**1.478E-01**	**5.148E-07**	**0.000E+00**	**1.959E-01**

	AM 241 (gm)	AM 241(gram%)	AM 241 (Ci)
MT 44	0	99.99	**0.000E+00**

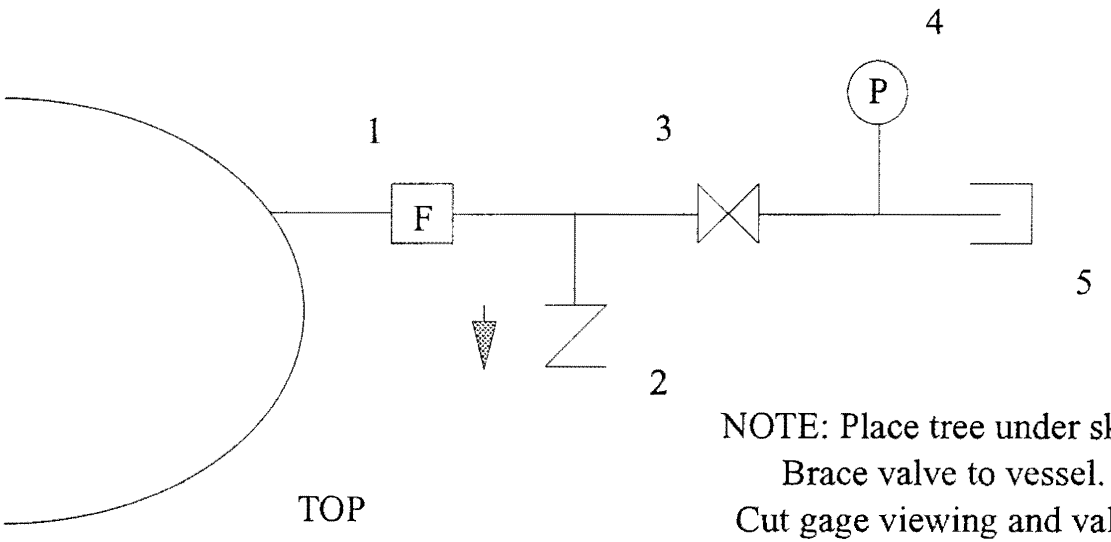
Tritium Co-contaminated Transuranic Waste Package

S/N 3

LA000000 55449



NOTE: Skirts not shown.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve
access hole in skirt.

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wieneke 08/23/93

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: M. S. Blau, NMT-5, MS E501

DATE: January 9, 1994

THRU: J. J. Balkey, NMT-2, MS E501 JJB

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-94-010

SUBJECT: **MC&A CONSIDERATIONS FOR THE PACKAGING OF SPECIAL RECOVERY LINE WASTE**

This memo addresses the Material Control and Accountability concerns associated with the packaging of tritium and tritium contaminated transuranic wastes from the Special Recovery Line tear-out in PF-4. Waste Management personnel must be present to inspect the 55 gallon drums as they are loaded into the stainless steel secondary. They will record the drum identification numbers, note their position inside of the secondary and place bar code labels on the secondary containment for identification. The inside of the secondary will be inspected prior to loading to assure that no unauthorized materials have been placed inside of it. They will also verify the integrity of Tamper Indicating Devices on the drums as they are loaded. The secondary cannot be left unattended until the head has been tacked in place and a paper TID placed over the pipe nipple so that no unauthorized material may be placed inside of the secondary container.

By following these procedures, the need for performing a confirmation assay (which would be very difficult and time consuming) will be waived. Contact me if you have any questions on these requirements.

Distribution: R. L. Price, NMT-4, MS E513
D. R. Wulff, NMT-2, MS E501
Author file
NiTR file

DISCARDABLE WASTE LOG SHEET

Effective Date 08/01/94

Page 1 of 1 Pages

LA0000005544 9 — WASTE PACKAGE SERIAL NUMBER

N-Comb ☑ Comb ☐ Pu-238 ☐

Two Drum Liners Installed: NA

Install/Tighten Carbon Filter(s): NA

RH waste: N

Lead shielding: N

1/8 Inch Drum Liner: N

CONTAINER: Open ☑ In-Line ☐

NEUTRON GAMMA

Assay Instrument Type: ☑ ☐

Tighten Locknut or Box Plugs: NA

TID# NA welded

Date TIDed NA

ITEM NO	ITEM ID	PKG WT Kg	MATRIX (MATERIAL)	MT	SNM GRAMS	UNCRT +/- GRAMS	ITEM SNM g + 2X UNCERT	SNMg+2x UNCERT. running total	CERTIFIED PERSONNEL	REMARKS (Wt in kg) ORGANICS V%	ORGANICS WT.	HAZARDOUS MATERIALS	OTHER REMARKS	AUTH. PG/LN	DATE mm/dd/yy
0	LA000000 55446	80.52	Metal	52	0.60	0.20	1.00	1.00	[signature]	0.00	0.00	None		8/14	12/14/93
1	LA000000 55447	152.12	Metal	52	0.96	0.19	1.34	2.34	[signature]	0.00	0.00	None		8/14	12/14/93
2	LA000000 55448	48.84	Metal	52	0.18	0.27	0.72	3.06	[signature]	0.00	0.00	None		8/14	12/14/93 12/06/94
3															
4															
5															
6															
7	(Molecular Sieve	203.45	Lbs) Part of Tare (WT.)												
8			- -												
9															

TOTAL Pkg wt Kg X 2.2046 = Pkg wt lbs (#)	281.48 / 620.55	NMT-2 Gross Wt. Check Initials	52	1.74	0.66		TOTALS	0.00	0.00	Haz-Mat	None	
+DRUM/BX TARE #	305.25	DRW					Organics wt (kg) x 2.2046 = wt (lbs)	0.00		NMT-4 Assay Value		
= CALC GROSS #	2,673.8	Acntability Check Init.								Instrument ID	See Memo NMT-2-NITR-94-010	
SCALE GROSS #	2673.8	DRW					QA Pkg Approval M.G. May 4-7-95			Date		
										NMT-4 Sign.	JRW 4/7/95	Confirmation Assay not applicable

This container's waste was packaged and the NMT-2 data on the DWLS and the CWSR were collected according to procedures defined in the Los Alamos Certification Plan and the appropriate attachment(s).

NMT-2 Signature William Schuller

Appendix E

TRU Waste Storage Information
Container 55516 Stored in Shaft 265

This page intentionally left blank.

TRU WASTE STORAGE RECORD

55516

1. Generator's Pre-Use Visual Inspection

Purchase Order #	Inspected Items		
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
	☑ Lid and Gasket	☑ Gouges	☑ Paint

Printed Name	Signature	Sig. Date	Oper. Date
WCATS APPLICATION (000000)	*WCATS Electronic*	11-08-94	11-08-94

2. Generator's Package Information

Group	Technical Area	Building	Cost Center	Program Code	Cost Account	Work Package
WM-SVS	55	000004				

Additional Information

☐ DP ☐ Non-DP If Non-DP waste, attach DOE approval doc.

Container	Liner
☐ Steel Drum (55 gal.)	☑ None
☐ Pipe Overpack Type:	☐ 90 mil liner
☐ Steel Drum (85 gal Overpack)	☐ 125 mil liner
☐ Standard Waste Box	☐ Fiberboard Liner
☐ Standard Waste Box Overpack	**Internal Shielding**
☐ RH Canister	☑ None
☐ Other (Call TWCO)	Type / Thickness

Filter Serial No.			
	01		
	02		

Radionuclide Content

Nuclide	Amount	Uncertainty	C= Curie M = Gram
H-3	1.100E+003	1.100E+003	C
Pu-238	5.136E-002	6.960E-003	C
Pu-239	1.700E+000	2.303E-001	C
Pu-240	4.003E-001	5.424E-002	C
Pu-241	6.612E+000	8.960E-001	C
Pu-242	2.303E-005	3.120E-006	C

Waste Profile Number	22873 (WS ID 499)
Gross Weight (lb.)	2.34E+003
Net Weight (lb.)	3.40E+002
Shipping Category	
LANL Waste Stream ID	
TRUCON Code	LA117I

Hazardous Materials

Name	EPA Code	Qty (g)

Date Closed (MM/DD/YY): 11/08/1994

Accumulation Start Date (MM/DD/YY): 11/08/94

The data in this section were collected, and waste described herein was packaged and labeled according to approved procedures.

Printed Name	Signature	Date:

3. Generator Site Health Physics Information

		Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Gamma Dose Rate (mrem/h) (contact)	2.00E-001				
Neutron Dose Rate (mrem/h) (contact)	1.00E-001	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	3.00E-001				
Total Dose Rate (mrem/h) (1 meter)		*The data in this section were collected according to approved procedures.*			
Alpha Contamination (dpm/100cm2)	0.00E+000	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	0.00E+000	Signature			

Los Alamos NATIONAL LABORATORY EST.1943

TRU WASTE STORAGE RECORD

55516

4. TRU Waste Management Review/Authorization

The data package for this waste has been reviewed. Basedon the information provided, this waste meets the WAC requirements for storage at TA-54.	Printed Name	Date:
	Signature	

5. Preload Visual Inspection

This waste package was visually inspected prior to transport according to approved procedures. It meets WAC packaging and labeling requirements and is free from obvious damage and defects.	Printed Name	Date:

6. Receiving Site Health Physics Information

Gamma Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	*The data in this section were collected according to approved procedures.*			
Total Dose Rate (mrem/h) (1 meter)				
Alpha Contamination (dpm/100cm2)	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	Signature			

7. Storage Site Information

Received by (Initials)	Date Received	**Original Storage Data**			
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number	
		Column Number	Date Stacked (MM/DD/YY)		
Printed Name	Date:	Printed Name	Date:		
Signature		Signature			

8. Waste Acceptance Office

Intials/Date	WE Description

NCR Number	Intials/Date	NCR Description

TRU WASTE STORAGE RECORD

55516

9. Continuation Sheet for Radionuclide Content (from Page 1, Section 2)

Radionuclide Content - Continued			
Nuclide	**Amount**	**Uncertainty**	**C= Curie M = Gram**
No Additional Radionuclides			

10. Continuation Sheet for Hazardous Materials (from Page 1, Section 2)

Hazardous Materials		
Name	**EPA Code**	**Qty (g)**
No Additional Hazardous Materials		

CONTAINER PROFILE
1003181
WDB-ITEM-NON-H

WS ID: 35724
C ID: 55516
ACTIVE

GENERAL INFORMATION

Container ID:	55516		
Labeled ID:	1003181		
Optional ID:		**Status:**	ACTIVE
Chemical Barcode:		**Decommissioned:**	YES
Physical State:		**Container Type:**	OT: Other (WCATS Specific)
Waste Stream ID:	35724	**Container Subtype:**	Unspecified
Work Path:	WDB-ITEM-NON-H	**Origin Date:**	16-Jul-1990 12:00 am
Quantity (Univ):		**Accum Start Date:**	
Compactible:		**Closed Date:**	

Discard Matrix:

TID(s):

Gen Contact: SUE E HARPER (090990)

Insert By: WCATS APPLICATION (000000)

Waste Desc: VACUUM PUMP OIL, FLUORINATED

WEIGHTS AND VOLUMES

Container Volume:	0.02 CM	**Gross Weight:**	20.00 kg
Waste Volume:	0.02 CM	**Tare Weight:**	0.00 kg
		Net Weight:	20.00 kg

LOCATION

Pickup (Origin): LANL: 35: 000207: 102

Current: LANL: 35: C-CONSOLID

COST CODES

Cost Center	Prog Code	Cost Account	Work Package	Percent Allocation	Cost Center Status	Cost Code Status	Recharge Mode
							UNCONSTRAINED

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
07/16/1990 12:00 AM	131295 PENDING	LANL:35 - C-WDR-NRAD	NO
07/20/1990 3:00 PM	233400 EXECUTED	LANL:35 - C-CONSOLID	NO

Note: Highlighted row indicates container was output or receiving container for the indicated task

CONTAINER PROFILE
1003181
WDB-ITEM-NON-H

WS ID: 35724
C ID: 55516
ACTIVE

COMMENTS

Date Time/ User Name	Comment
02/25/2012 4:21 AM WCATS APPLICATION (000000)	VACUUM PUMP OIL, FLUORINATED

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
02/25/2012 2:35 PM WCATS APPLICATION (000000)	NO	CHEMLL.ITEM TABLE (WASTEDB): [NORMAL]= , [NUM_ITEM]= 1, [OLD_WPRF_CD]= , [PROCESS_ID]= , [RAD_CONTENT]= , [RAREA]= , [TA]= 35, [BLDG]= 000207, [ROOM]= 102, [SEQ#]= , [SFE]= , [SPENT]= , [WASTE_CD]= 0 -> CHEMICAL WASTES, [WASTE_TYPE]= C, [NEVER_RCVD]= , [RMTCON_DOTCON_CD]= , [RMTCON_RCV_VOL]= , [RMTCON_TARE_WGT] = , [RMTCON_VUNIT_CD]= , [RMTCON_WUNIT_CD]= , [OFFSITE]= , [IRCV_DATE]= 1990-07-20 15:00:00, [ACIS_ID]= 0, [CRWSS_DATE]= , [PAREA]= , [HWSA_DATE]= , [WASTEGEN.LOCKED]= , [CONSOLIDATED]= , [OTHERCONID]= , [BULB_SIZE]= , [BULB_NUM]= , [CON_TYPE]= -> , [CON_VOL]= , [CON_VUNIT]= , [CON_TARE_WGT]= , [CON_TWGT_UNIT]= , [BULB_TYPE]= , [ORIG_WDR_ID]= , [QUANTITY]= , [WMC_CD]= -> , [HWSA_SITE_ID]= , [HWSA_FACILITY_CD]= , [USRSTAMP]= -> , [TMESTAMP]= .
02/24/2012 6:12 PM WCATS APPLICATION (000000)	NO	INITWORKPATH (C_ID=55516/PATH_ID=128): FAILED (NO WORKPATH UNITS)

Los Alamos
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

LA00000055516

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code: N/A	Inspected Items		
Year of Manufacture: N/A	☐ NA Ring, Bolt, and Nut	☐ NA Chime	☑ Dents
Box Serial Number: N/A	☐ NA Lid and Gasket	☑ NA Gouges	☑ Paint
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	Printed Name: Dennis R Wolff	Date: ~~11-27-93~~ 11-8-94	
	Signature: Dennis R Wolff		

2. GENERATOR'S PACKAGE INFORMATION

Group: NMT-1	Technical Area: TA-55	Building: PF-4	Program Code: KB125600
Normal: ☑ Yes ☐ No			
Additional Information: Welded Shut			
Rough swipes (Alpha) N.O.A. Radium-139 = 8304 void 05-22-96.			

RADIONUCLIDE CONTENT

Material Type: ☒ Yes ☐ No — 52

Nuclide	Amount	Uncertainty	C=Curie M=Gram
Pu-238	5.1316 E-12	6.9610 E-13	C
Pu-239	1.7010 E-10	2.3013 E-11	C
Pu-240	4.0103 E-11	5.4124 E-12	C
Pu-241	6.6112 E-10	8.9610 E-11	C
Pu-242	2.3013 E-15	3.1210 E-16	C
H-3	1.1010 E-13	1.1010 E-13	C
	E	E	
	E	E	

CODE	CONTAINER	INTERNAL SHIELDING	
		Type	Thickness (in.)
01	☐ Steel Drum (55 gal.)	☒ None	
02	☐ Standard Waste Box		
03	☑ Other (Call TWCO)		
04	☐ RH Canister		

Waste Profile Request Number: 2-2-8-7-3

Carbon Filter ID: 01 N/A 02

Process Batch Code: N/A

Gross Weight (lb.): 2.34 E+3 ~~2.0 E+3~~

Organic Material Wt. (lb.): 10.0 E+0

Organic Material Volume (%): 10

TRUCON Code: 71

Date Closed (MMDDYY): 01-05-94

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
None		

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures.

Printed Name: Dennis R Wolff — Signature: Dennis R Wolff — Date: 11-8-94

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*): 0.2 E+0	Survey Meter Model: RO3C	Property Number: 2629	Calibration Void Date: 03-15-96
Neutron Dose Rate (*mrem/h*): 0.3 E+0	Survey Meter Model: PNR-4	Property Number: 5229	Calibration Void Date: 04-11-96
Total Dose Rate (*mrem/h*): 0.5 E+0	The data in this section were collected according to approved procedures.		
Alpha Contamination (*dpm/100cm²*): 0.0 E+0	Printed Name: EDUARDO ESTRADA		Date: 01-31-96
Beta-Gamma Cont. (*dpm/100cm²*): 0.0 E+0	Signature: Eduardo Estrada		

4. CST-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by CST-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.	Printed Name: J. Minton-Hughes	Date: 2/15/96
	Signature: J. Minton-Hughes	

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	02	15	96	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	03	22	96	Margaret CHAN	Margaret

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number  RM	Date (*Inspection Valid for 30 Days*) 3-12-96

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	0.2 E ± 0	Survey Meter Model RO2	Property Number 3408	Calibration Void Date 7-25-96
Neutron Dose Rate (*mrem/h*)	0.1 E ± 0	Survey Meter Model ESP-2/NRD	Property Number 10105	Calibration Void Date 7-16-96
Total Dose Rate (*mrem/h*)	0.3 E ± 0	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*)	0.0 E + 0	Printed Name Ethel Schwiker		Date 3-21-96
Beta-Gamma Cont. (*dpm/100cm²*)	0.0 E + 0	Signature Ethel Schwiker		

8. STORAGE SITE INFORMATION

Received By (*Initials*) RM	Date Received 3-20-96	ORIGINAL STORAGE DATA		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number Holding	Layer Area-903	Row Number
		Column Number	Date Stacked (*MM,DD,YY*)	
Printed Name	Date 3-21-96	Printed Name Rick Martinez		Date 03-25-96
Signature Rick Martinez		Signature Rick Martinez		

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name Rick Martinez	Date 3-26-96
	Signature Rick Martinez	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date

11. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered In Database	03	21	96	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	03	29	96	Margaret CHAN	Margaret

12. DUPLICATE COPY

	M M	D D	Y Y	Printed Name	Signature
Date Duplicate Filed	04	03	96	Charlotte Fernandez	Charlotte Fernandez

DISCARDABLE WASTE LOG SHEET

Effective Date 08/01/94

Page 1 of 1 Pages

WASTE PACKAGE SERIAL NUMBER: LA000000555516

N-Comb: ✓ Comb: ☐ Pu-238: ☐

Two Drum Liners Installed: NA

Install/Tighten Carbon Filter(s): NA

RH waste: n

Lead shielding: n

1/8 Inch Drum Liner: n

CONTAINER: Open: ✓ In-Line: ☐

Assay Instrument Type: NEUTRON GAMMA ✓ ☐

Tighten Locknut or Box Plugs: NA

TID# NA - welded

Date TIDed NA

ITM NO	ITEM ID	PKG WT Kg	MATRIX (MATERIAL)	MT	SNM GRAMS	UNCRT +/- GRAMS	ITEM SNM g + 2X UNCERT	SNMg+2x UNCERT. running total	CERTIFIED PERSONNEL	REMARKS (Wt in kg) ORGANICS V%	ORGANICS WT.	HAZARDOUS MATERIALS	OTHER REMARKS	AUTH. PG/LN	DATE mm/dd/yy
0	LA000000555516	40.30	METAL	52	8.88	0.12	9.12	9.12		0.00	0.00	T2 none		8/14	11-14-94
1	LA000000556220	60.67	METAL	52	20.64	3.42	27.48	36.60		0.00	0.00	T2 none	8/14	8/14	11-14-94
2	LA000000556228	107.91	METAL	52	0.00	0.46	0.92	37.52		0.00	0.00	T2 none		8/14	11-14-94
3															
4															
5															
6												78.92 KG IS UNISTRUT			
7	RAILS	78.92										RAIL INSID TORPEDO			
8	molecular sieve	55.63													
9															

TOTAL Pkg wt Kg X 2.2046 = Pkg wt Lbs(#)	343.43 / 757.13	NMT-2 Gross Wt. Check Initials	52	29.52	4.00	✓		TOTALS	0.00	0.00	Haz-Mat: none
+DRUM/BX TARE #	1585.80							Organics wt (kg) x 2.2046 = wt (lbs)	0.00		NMT-4 Assay Value: NA
= CALC GROSS #	2342.93	Acntability Check Init.									Instrument ID
SCALE GROSS #	2343.00							QA Pkg Approval: M.S. May 2-13-96			Date / NMT-4 Sign.

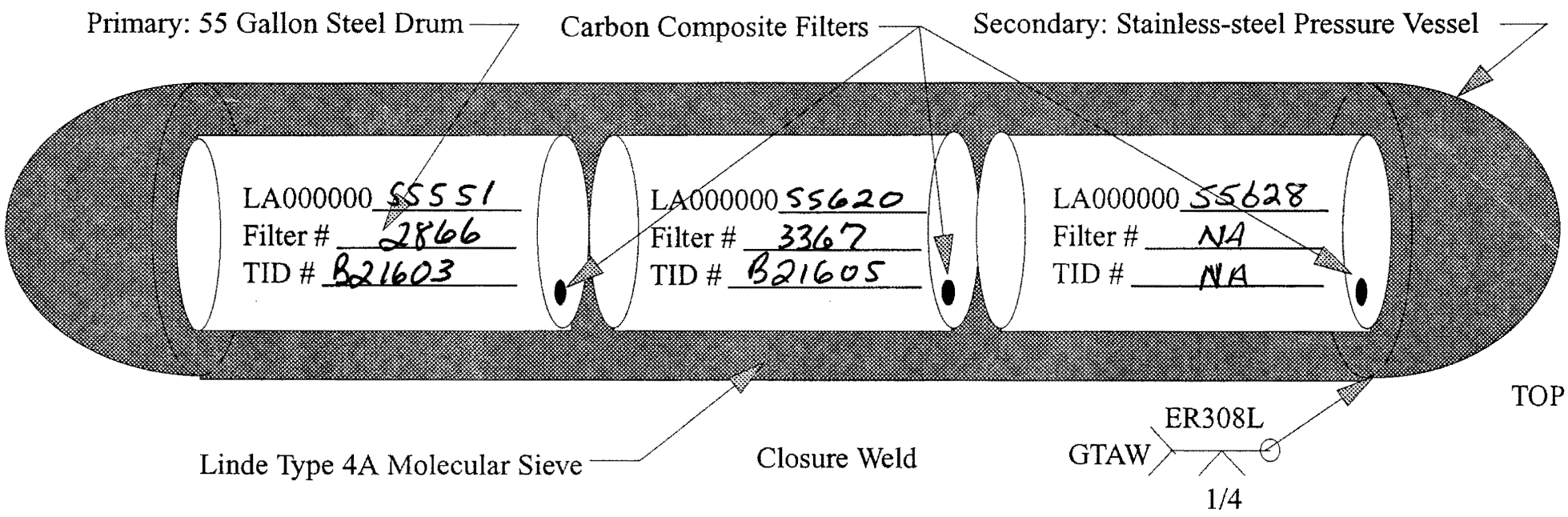
This container's waste was packaged and the NMT-2 data on the DWLS and the CWSR were collected according to procedures defined in the Los Alamos Certification Plan and the appropriate attachment(s).

NMT-2 Signature: K M Luetzmach

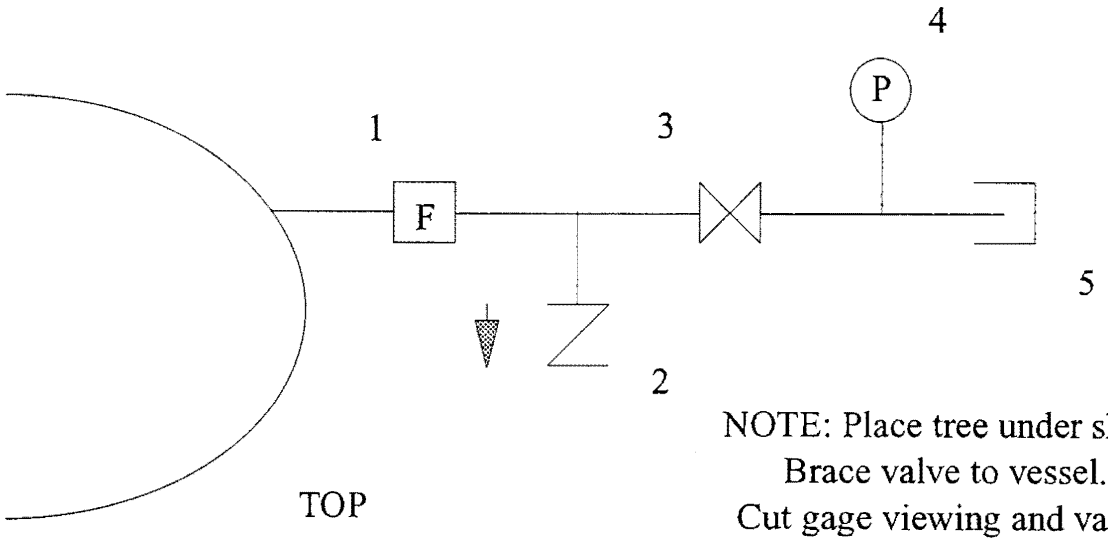
$\frac{8.764\ Ci}{208.88\ kg} \times 10^6 = 4.20 \times 10^4\ \frac{nCi}{g}$

Tritium Co-contaminated Transuranic Waste Package

LA000000 55516



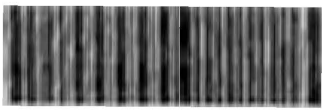
NOTE: Skirts not shown.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve access hole in skirt.

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wieneke 08/23/93



LA00000055516

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 22873

08-Jan-1996 01:04 AM

Generator :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z# :	099731		
WMC :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z# :	099731		
CSR :	PRIMOZIC, FRANK	MS :	J593	PH :	75909	Z# :	116057		
Status :	ACTIVE	Activated Date :	05-JAN-96			Expired Date :	05-JAN-97		
Account Info-CC :	6407	PC : KB12	CA :	5000	WP :		VI :		
Group :	NMT7		TA :	55	BLDG :	000004	ROOM :	432	

RMMA : **RADIOACTIVE MATERIALS MANAGEMENT AREA (RMMA) 55003**

Waste Accumu : N/A

Method of Char : **KNOWLEDGE OF PROCESS (KOP)**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**

Waste Classes: **ON-GOING GENERATION**
RADIOACTIVE

Assoc Docum: **WM SOP# DP-01**
Other SOP# WODF

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**
MAINTENANCE
MATERIAL PROCESSING
RESEARCH AND DEVELOPMENT

Waste Matrix : **SOLID**

Matrix Type : **HETEROGENEOUS**

Waste/Proc Desc : TRUCON CODE 117B, OR 117I NON PU238 WASTE METALS IN 55 GALLON DRUMS. SCRAP METAL FROM PLUTONIUM PROCESSING OPERATIONS WITH NO KNOWN HAZARDOUS CONSTITUENTS. ALSO CONTAMINATED WITH TRITIUM. TRUWM-TA55-DP-01, INSPECTION AND PACKAGING OF CERTIFIABLE COMBUSTIBLE AND NON-COMBUSTIBLE TRU WASTE. WASTE ORIGINATION AND DISPOSTION FORM (WODF).

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				
BARIUM	Y				
CADMIUM	Y				
CHROMIUM	Y				
LEAD	Y				
MERCURY	Y				
SELENIUM	Y				
SILVER	Y				

Toxicity Characteristic Organic Compounds: N/A

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
BAGOUT BAGS		**1**	**50**	%
DISCARDED TOOLS		**0**	**99**	%
FLANGES		**0**	**99**	%
PIPING		**0**	**99**	%
SCRAP METAL (BERYLLIUM, STEEL, COPPER)		**0**	**99**	%
TANKS (EMPTY)		**0**	**99**	%
VALVES		**0**	**99**	%

Radiological Characteristics :

Radionuclide	Min	Max	Unit
AM241	0.000E+00	5.660E-02	CIG
H3	1.000E-07	1.000E-02	CIG
NP237	0.000E+00	1.000E-08	CIG
PU238	0.000E+00	1.320E-03	CIG
PU239	0.000E+00	9.770E-04	CIG
PU240	0.000E+00	8.170E-04	CIG
PU241	0.000E+00	4.990E-02	CIG
PU242	0.000E+00	1.330E-05	CIG
PU244	0.000E+00	1.850E-11	CIG
U235	0.000E+00	2.690E-08	CIG
U238	0.000E+00	4.100E-09	CIG

Rad Contamination Type : **SURFACE CONTAMINATION**

Waste Water Contaminants : N/A

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **TRANSURANIC**

Waste Classification : **NON-HAZARDOUS CHEMICAL WASTE**

EPA Hazardous Waste Code : N/A

Drum or Box ID	LA000000 55516	Name: K.M. Gruetzmacher	02/05/96

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%)	PU 240 (gram%)	PU 241 (gram%)	PU 242 (gram%)	PU 244 (gram%)	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.90	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	29.52	0.002952	27.683856	1.7712	0.05904	0.005904	0	29.522952
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	29.52	2.95E-03	2.77E+01	1.77E+00	5.90E-02	5.90E-03	0.00E+00	2.95E+01

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	29.52	0.0513648	1.699788758	0.4002912	6.61248	2.30256E-05	0	8.763947784
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
	total weight (gm)	**PU 238 (Ci)**	**PU 239 (Ci)**	**PU 240 (Ci)**	**PU 241 (Ci)**	**PU 242 (Ci)**	**PU 244 (Ci)**	**sum by MT (Ci)**
TOTALS	**2.952E+01**	**5.136E-02**	**1.700E+00**	**4.003E-01**	**6.612E+00**	**2.303E-05**	**0.000E+00**	**8.764E+00**

	AM 241 (gm)	AM 241(gram%)	AM 241 (Ci)
MT 44	0	99.99	**0.000E+00**

UNCERTAINTY

Drum or Box ID	LA000000 55516	Name: K.M. Gruetzmacher	02/05/96

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%)	PU 240 (gram%)	PU 241 (gram%)	PU 242 (gram%)	PU 244 (gram%)	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.90	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	4	0.0004	3.7512	0.24	0.008	0.0008	0	4.0004
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	4	4.00E-04	3.75E+00	2.40E-01	8.00E-03	8.00E-04	0.00E+00	4.00E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	4	0.00696	0.23032368	0.05424	0.896	0.00000312	0	1.1875268
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0

	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
TOTALS	4.000E+00	6.960E-03	2.303E-01	5.424E-02	8.960E-01	3.120E-06	0.000E+00	1.188E+00

	AM 241 (gm)	AM 241(gram%)	AM 241 (Ci)
MT 44	0	99.99	0.000E+00

Los Alamos
NATIONAL LABORATORY
memorandum

Nuclear Materials Technology Division
Actinide Materials Chemistry
NMT-6

To/MS: R. Wieneke, NMT-7
Thru: T. O. Nelson, T. R. Mills, NMT-6
From/MS: John M. Berg, NMT-6, E510
Phone/FAX: 5-8262/5-4459
Symbol: NMT-6-ENG/SRL-95-006
Date: February 7, 1995

Additional Information on Tritium Content of Five Secondary Waste Containers

Since issuing a memo on this same subject on January 27, 1995 (Symbol: NMT-6-ENG/SRL-95-002) I have obtained additional information affecting the estimated tritium content of the five secondary waste containers. The purpose of this memo is to report that new information and revise the estimated tritium inventories.

I stated in the earlier memo that the molecular sieve material in the second welded secondary container had not been analyzed for tritium content. I have since located a memo from Mike Blau to Dan Taggert (NMT-5:93-411, July 20, 1993) stating that this material was indeed analyzed and giving the results. Mike's memo estimated a maximum of 3200 Curies of tritium in one molecular sieve tank that is in the second container. I could not locate Mike's calculations. After some digging I found notes on the analytical results on which they were based in the log book of Louis Jaramillo (RCT, ESH-1) who was the RCT involved in the sampling. I then did my own calculation, which is detailed below.

The molecular sieve material in the third of three molecular sieve towers that the SRL used while in operation was sampled by withdrawing 30 ml of solid material in July 1993. This material was then subjected to the analytical procedure for tritium swipes detailed in the SOP 397-SRL-R04. Briefly, the solid material was boiled in 20 ml of pure water, 10 ml of the water was distilled into a separate vessel, and 1 ml of this distillate was sent to HPAL for tritium analysis. HPAL did three dilutions of the 1 ml sample before they could get a good reading on their instruments. Their results showed that the original 1 ml sample had an activity of 60 Ci/l. If I assume that all of the tritium in the 30 ml molecular sieve sample migrated into the 20 ml of water during the boiling step, then the 30 ml sample of molecular sieve had an activity of 0.02 l x 60 Ci/l = 1.2 Ci. The specific activity of the molecular sieve material is then 40 Ci/l. I estimate the dimensions of the molecular sieve tower at no greater than 6" outer diameter by 96" long. A container of these dimensions could contain at most 44 liters of molecular sieve material, which at 40 Ci/l gives a total activity of 1800 Ci in the tower.

This result is in reasonable agreement with the 0.16 g of tritium that was assigned on MASS to the secondary container in which this sieve tower is currently located. It significantly lower than the 3200 Ci from Mike Blau's memo, but he states that his number is a maximum, so he may have made more conservative assumptions about the extraction of tritium from the molecular sieve in the analytical procedure or about the homogeneity of the material in the tower.

I also need to clarify that the second container is loaded with two molecular sieve tanks of a newer design in addition to the one whose contents were analyzed. Those two are not expected to contain significant quantities of tritium because they were not put into service until after the SRL stopped processing any significant quantities of material.

I also have additional information about the contaminated pump oil in the fourth welded secondary container. Since I issued NMT-6-ENG/SRL-95-002, I talked with Mike Blau on the telephone and he confirmed that the contents of the drum of waste pump oil in the fourth secondary container was not analyzed for tritium because of safety concerns. I also got an estimate of the volume of oil in the tank from Gerald Lucero. He had banged on the side of the oil drum and found it to be about two thirds full. We estimate the total volume of the drum to be 30 gallons, so we estimate that 20 gallons or about 80 liters is occupied by the oil/vermiculite mixture. If we assume that the vermiculite does not displace much oil, then the oil volume is approximately 80 liters.

Since the oil was not analyzed for tritium, we must estimate the tritium content based on the best available information. You (R. Wieneke) were able to get an estimate from Paul Lamberger of EG&G Mound Applied Technologies of the range of vacuum pump oil contamination experienced at Mound as 10 to 30 Curies per liter. This was discussed in *Packaging of Tritium Contaminated Waste at Mound,* P. H. Lamberger and R. E. Bernheisel, Proceedings of the Sixth Annual Participants Information Meeting: DOE Low-level Waste Management Program, held Sept. 11-13, 1994 in Denver, CO (#CONF-84-09115).

Using 20 Curies per liter as the average contamination level, 80 liters of oil would contain 1600 Curies of tritium. However, the oil in question was removed from the tritium line over a period from about 1980 to 1992, so the tritium has decayed somewhat. If we assume for the sake of simplicity that the tritium has been in the waste tank seven years and the original specific activity averaged 20 Ci/l, then the current activity will be about 1100 Curies. Other items in the fourth secondary container have only trace surface contamination, so 1100 Ci is our best estimate of the total inventory of tritium in that container.

For completeness I also revisit the basis for my estimates in NMT-6-ENG/SRL-95-002 of the tritium content of the other three secondary containers. All three contain only surface contaminated metal and plastic trash, mostly piping and equipment removed from SRL. The highest swipe count obtained was 9.6×10^{7} dpm/100 cm^2, which is equivalent to 4.4×10^{-5} Curies. Note that this is a higher count than I used in NMT-6-ENG/SRL-95-002 because I since located a few more swipe results. While the contents of the three secondary containers in question vary somewhat, a conservative estimate is that they each contain three drums of 50 feet of 2" diameter pipe, or 150 feet of 2" diameter pipe in total in each container. This amount of pipe has an inner surface area of 7.2×10^{4} cm^2. At the maximum surface contamination level of 4.4×10^{-5} Ci/100 cm^2, there would be a total of 3.2×10^{-2} Curies in each of the remaining three secondary waste containers.

To summarize, the following table is an update to the table in my earlier memo containing the current best estimates of the tritium content of the five welded containers filled by SRL:

Container number	Account	Lot-Identification	Location	Tritium on MASS	Estimates from this memo
#1	774	LA00000055432	yard	0 g	3.2×10^{-2} Ci
#2	774	T2SIEVEMW	yard	0.16 g 0.1314	1800 Ci 18 mo decay (0.17 Ci)
#3	776	LA00000055449	B45	0 g	3.2×10^{-2} Ci
#4	731	LA00000055516	FTOP	0 g 0.1127	1100 Ci 24 mo decay (0.10 Ci)
#5	731	LA00000055618	F309	0 g	3.2×10^{-2} Ci

JMB:jmb

Attachments: memo NMT-5:93-411

Distribution:
W. R. Dworzak, NMT-6
G. R. Lucero, NMT-6
D. Christiansen, ESA-TSE/C348
NMT-6 File
NMT-6 Records Management

$\frac{1100\ Ci}{209\ kg} = 5.26 \times 10^{-3}\ Ci/g$

$\frac{0.032\ Ci}{247\ kg} = 1.30 \times 10^{-7}\ Ci/g$

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Daniel Taggart, EM-7, MS J595 DATE: July 20, 1993

FROM: Michael Blau MB MAIL STOP/TELEPHONE: E506/7-9371

SYMBOL: NMT-5:93-411

SUBJECT: **GLOVEBOX TRITIUM TEST RESULTS**

As agreed to at the June 28 Tritium Waste Packaging Meeting the following tests will be performed in order for EM-7 to agree to accept all waste generated during the Special Recovery Line (SRL) Upgrades.

1. SRL glovebox 370 will be purged with argon until a low tritium concentration is reached, then the purging will stop and the increase in tritium concentration with time will be recorded until it is about constant.

2. Take a 50 cc molecular sieve bed material sample from the molecular sieve bed tower that is currently hooked to the SRL. Using that sample, determine the amount of tritium present in the tower using tritium results from HPAL. Then based on this value and the history of this tower and that of the two towers now stored in the basement calculate an estimate for the two towers in the basement. The history of service for the towers was: First tower 1980 to 1985; second tower 1985 to 1988; and last tower 1988 to 1991. Also, the amount of tritium processed when the first tower was in service was lower than for the first and third tower.

3. Get plutonium and tritium swipes inside the third molecular sieve tower.

The results of these tests are shown below.

1. The glovebox was purged with argon at a rate of about 1CFM for three days at which time the tritium level reached 14 mCi/m^3. The argon flow was then shut off and the tritium level recorded with time for 55 hours at which time the tritium level reached 81 mCi/m^3. A graph of these results is attached.

2. The molecular sieve sample was mixed with water and the water sample sent to HPAL. HPAL reported the water sample contained 60 ci/liter. From this value

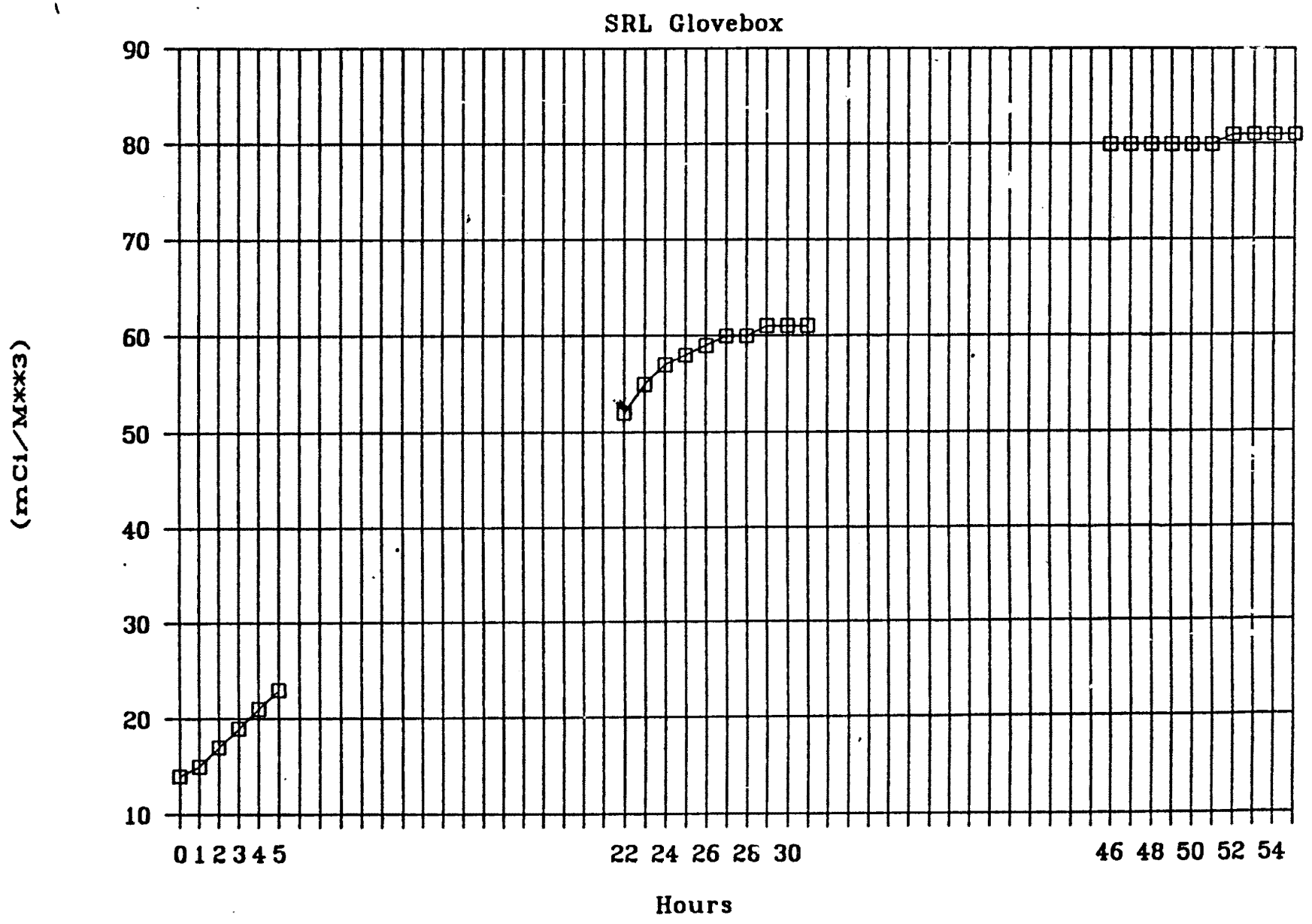
maximum tritium amount for the third molecular tower is 3200 curies. Based upon the history of all three towers it is believed that a maximum of 3200 curies is present in each of the three towers.

3. The plutonium swipes came back negative. The tritium swiped were 49,100,000 DPM/15 cm^2 or ten microcuries per square inch.

MB/blr

Distribution:
T. Bieniewski, MST-3, MS C348
C. Christensen, EM-7, MS J595
B. McKerley, NMT-2, MS E501
D. Taggert, EM-7, MS J595
L. Trujillo, NMT-2, MS E501
J. Wicker, HS-1, MS E503
D. Zerwikh, HS-1, MS E503
J. Blakey, NMT-2, MS E501
J. Damran, MEE-9, MS G736
R. Wieneke, NMT-2, MS E501
M. Stevens, NMT-5, MS E506
Author File
NMT-5 File

TRITIUM BUILDUP



ESH-1 SMEAR SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: 3/10/95 No. Of Samples: 20

TA: 55 Bldg: PF-4, BSMT - Room 305

RCT: L. R. JARAMILLO Z Number: 098314

Phone/Fax: 7-2311, 7-2372

Tritium Smear Survey of Tr waste tubes

SAMPLE TRACKING NUMBER

ESH-1 SAMPLE TRACKING

95010830

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB

☐ ITEM RELEASE ☒ OFFSITE SHIPMENT ☐ ONSITE SHIPMENT

☐ NON-ROUTINE/OTHER: _____

ADDITIONAL INFORMATION

☐ Occurrence No.: _____

☐ Incident No.: _____

☐ RWP No.: _____

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF	BKG

Smear No.	Location	Alpha*	Beta*	Gamma*
1	CONTROL			
2	TORPEDO TUBE LA000000 55516			
3	" "			
4	" "			
5	" "			
6	" "			
7	" "			
8	" "			
9	" "			
10	" "			
11	TORPEDO TUBE LA000000 55618			
12	" "			
13	" "			
14	" "			
15	" "			

Smear No.	Location	Alpha*	Beta*	Gamma*
16	TORPEDO TUBE LA000000 55618			
17	" "			
18	" "			
19	" "			
20	" "			
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

* dpm/100 cm2

SMEAR SURVEY FORM

Smear No.	Location	Alpha*	Beta*	Gamma*
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				

Smear No.	Location	Alpha*	Beta*	Gamma*
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				

ESH-1 SMEAR SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: 03/23/95 No. Of Samples: 28

TA: 55 Bldg: PF-4 Room 432

RCT: E. ESTRADA Z Number: 96005

Phone/Fax: 7-2311

SAMPLE TRACKING NUMBER

ESH-1 SAMPLE TRACKING

95010990

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB

☐ ITEM RELEASE ☐ OFFSITE SHIPMENT ☐ ONSITE SHIPMENT

☐ NON-ROUTINE/OTHER: WIPP drums

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF	BKG

ADDITIONAL INFORMATION

☐ Occurrence No.:

☐ Incident No.:

☐ RWP No.:

Smear No.	Location	Alpha*	Beta*	Gamma*
1	Drum # 55811 Top	N.D.A.	N.D.A.	
2	" RT.			
3	" LT.			
4	" Bottom			
5	Drum # 55286 Top			
6	" RT.			
7	" LT.			
8	" Bottom			
9	Drum # 55850 Top			
10	" RT.			
11	" LT.			
12	" Bottom			
13	Torpedo ~~#56~~ 18 Top			
14	RT.			
15	LT.			

Smear No.	Location	Alpha*	Beta*	Gamma*
16	Bottom	N.D.A.	N.D.A.	
17	END			
18	Front			
19	Torpedo #55516 Top			
20	RT.			
21	LT.			
22	Bottom			
23	END			
24	Front (Gauge)			
25	Drum [illegible] Top			
26	" RT.			
27	" LT.			
28	" Bottom			
29				
30				

* dpm/100 cm2

E:\CORELDRW\HPALMST.CDR

Rev: 10/94

HPAL ANALYSIS REPORT FORM

FILE [redacted]

SAMPLE DESCRIPTION	ANALYSIS REQUESTED	RCT
Sample Date: 03/10/95	Tritium Swipes	Name: Louie Jaramillo
TA: 55	LLD: Alpha-15 Beta-16	TA: 55 Bldg: 4
BLDG: PF-4	Analyst: Michael Jensen	MS: E503
Room/Area: 305	Reviewer: Joe Lopez	PH: 7-2311 FAX: 7-1009

Sample ID #	Alpha Activity dpm	2*sigma %	Beta Activity dpm	2*sigma %
1	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA
3	NDA	NDA	20	35.35
4	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA
6	NDA	NDA	NDA	NDA
7	NDA	NDA	272	16.55
8	NDA	NDA	NDA	NDA
9	NDA	NDA	NDA	NDA
10	NDA	NDA	NDA	NDA
11	NDA	NDA	NDA	NDA
12	NDA	NDA	NDA	NDA
13	NDA	NDA	NDA	NDA
14	NDA	NDA	NDA	NDA
15	NDA	NDA	NDA	NDA
16	NDA	NDA	NDA	NDA
17	NDA	NDA	NDA	NDA
18	NDA	NDA	NDA	NDA
19	NDA	NDA	NDA	NDA
20	NDA	NDA	NDA	NDA

(END OF REPORT)

Appendix F

TRU Waste Storage Information
Container 56197 Stored in Shaft 266

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TRU WASTE STORAGE RECORD

56197

1. Generator's Pre-Use Visual Inspection

Purchase Order #	Inspected Items		
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
	☑ Lid and Gasket	☑ Gouges	☑ Paint

Printed Name	Signature	Sig. Date	Oper. Date
WCATS APPLICATION (000000)	*WCATS Electronic*	09-12-96	09-12-96

2. Generator's Package Information

Group	Technical Area	Building	Cost Center	Program Code	Cost Account	Work Package
WM-SVS	55	000004				

Additional Information

☐ DP ☐ Non-DP If Non-DP waste, attach DOE approval doc.

Container	Liner
☐ Steel Drum (55 gal.)	☑ None
☐ Pipe Overpack Type:	☐ 90 mil liner
☐ Steel Drum (85 gal Overpack)	☐ 125 mil liner
☐ Standard Waste Box	☐ Fiberboard Liner
☐ Standard Waste Box Overpack	**Internal Shielding**
☐ RH Canister	☑ None
☐ Other (Call TWCO)	Type / Thickness

Radionuclide Content

Nuclide	Amount	Uncertainty	C= Curie M = Gram
Am-241	2.348E-002	7.644E-003	C
H-3	2.710E+003	0.000E+000	C
Pu-238	7.369E-003	2.399E-003	C
Pu-239	2.503E-001	8.150E-002	C
Pu-240	5.858E-002	1.907E-002	C
Pu-241	8.895E-001	2.896E-001	C
Pu-242	3.390E-006	1.104E-006	C

Filter Serial No.			
	01		
	02		

Waste Profile Number	26048 (WS ID 522)
Gross Weight (lb.)	2.48E+003
Net Weight (lb.)	7.95E+002
Shipping Category	
LANL Waste Stream ID	
TRUCON Code	LA117B

Hazardous Materials

Name	EPA Code	Qty (g)

Date Closed (MM/DD/YY): 09/12/1996

Accumulation Start Date (MM/DD/YY): 09/12/96

The data in this section were collected, and waste described herein was packaged and labeled according to approved procedures.

Printed Name	Signature	Date:

3. Generator Site Health Physics Information

		Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Gamma Dose Rate (mrem/h) (contact)	1.00E-001				
Neutron Dose Rate (mrem/h) (contact)	0.00E+000	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	1.00E-001				
Total Dose Rate (mrem/h) (1 meter)		*The data in this section were collected according to approved procedures.*			
Alpha Contamination (dpm/100cm2)	0.00E+000	Printed Name		Date	
Beta-Gamma Cont (dpm/100 cm2)	0.00E+000	Signature			

TRU WASTE STORAGE RECORD

56197

4. TRU Waste Management Review/Authorization

The data package for this waste has been reviewed. Basedon the information provided, this waste meets the WAC requirements for storage at TA-54.	Printed Name	Date:
	Signature	

5. Preload Visual Inspection

This waste package was visually inspected prior to transport according to approved procedures. It meets WAC packaging and labeling requirements and is free from obvious damage and defects.	Printed Name	Date:

6. Receiving Site Health Physics Information

Gamma Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	*The data in this section were collected according to approved procedures.*			
Total Dose Rate (mrem/h) (1 meter)				
Alpha Contamination (dpm/100cm2)	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	Signature			

7. Storage Site Information

Received by (Initials)	Date Received	**Original Storage Data**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (MM/DD/YY)	
Printed Name	Date:	Printed Name	Date:	
Signature		Signature		

8. Waste Acceptance Office

Intials/Date	WE Description

NCR Number	Intials/Date	NCR Description

TRU WASTE STORAGE RECORD

56197

9. Continuation Sheet for Radionuclide Content (from Page 1, Section 2)

Radionuclide Content - Continued			
Nuclide	**Amount**	**Uncertainty**	**C= Curie M = Gram**
No Additional Radionuclides			

10. Continuation Sheet for Hazardous Materials (from Page 1, Section 2)

Hazardous Materials		
Name	**EPA Code**	**Qty (g)**
No Additional Hazardous Materials		

CONTAINER PROFILE
56197
T-TRU-TEMP

WS ID: 522
C ID: 773328
ACTIVE

GENERAL INFORMATION

Container ID:	773328		
Labeled ID:	56197		
Optional ID:		**Status:**	ACTIVE
Chemical Barcode:		**Decommissioned:**	YES
Physical State:	SOLID	**Container Type:**	OT: Other (WCATS Specific)
Waste Stream ID:	522	**Container Subtype:**	Unspecified
Work Path:	T-TRU-TEMP	**Origin Date:**	12-Sep-1996 12:00 am
Quantity (Univ):		**Accum Start Date:**	12-Sep-1996
Compactible:		**Closed Date:**	12-Sep-1996

Discard Matrix:

TID(s):

Gen Contact: MICHAEL GALLEGOS (087896)

Insert By: WCATS APPLICATION (000000)

Waste Desc: TRUCON CODE 117A, 117B, 117D, NON-PU238 WASTE METAL FROM PLUTONIUM PROCESSING ACTIVITIES WITH NO KNOWN HAZARDOUS CONS...

WEIGHTS AND VOLUMES

Container Volume:	0.71 CM	**Gross Weight:**	2480.00 lb
Waste Volume:	NOT SPECIFIED	**Tare Weight:**	1684.96 lb
		Net Weight:	795.04 lb

LOCATION

Pickup (Origin): LANL: 55-PF4: GEN-AREAS

Current: LANL: 54-G-DISP: SHAFT266

CONTAINER PROFILE
56197
T-TRU-TEMP

WS ID: 522
C ID: 773328
ACTIVE

PAYLOAD INFORMATION

Container Procurement

P.O. Number: **Year of Manuf:**

Lot No.: **Serial No:**

Solution Package: 54: SP BG Boxes - H3 Canisters

TRUCON Code: LA117B: METAL -- 55-GAL

Shipping Category:

CCP AK Report:

WIPP Waste Stream:

Matrix Code:

Defense Waste: **Equiv. Comb. Matrix:**

Adeq. Ventilation: **Compliant Metal Cont.:** NO

Overpack (1 to 1): NO **Retrievable:** **BIR WS Code:** LA-T10

Content Code:

COST CODES

Cost Center	Prog Code	Cost Account	Work Package	Percent Allocation	Cost Center Status	Cost Code Status	Recharge Mode
------	KF14	----	----	100.00			*UNCONSTRAINED*

RADIOLOGICAL SURVEY

Survey Type	Instrument Number	Survey Date	At Contact mrem/hr	At 30 cm mrem/hr	At 1 M mrem/hr	Alpha dpm/100cm2	Beta/Gama dpm/100 cm2
Survey ID: 75138, Status: Active							
B/G Survey			= 0.10	=	=	Not Applicable	
Neutron Survey			= 0.00	=	=	Not Applicable	
Smear Results			Not Applicable			= 0.00	= 0.00

CONTAINER PROFILE
56197
T-TRU-TEMP

WS ID: 522
C ID: 773328
ACTIVE

RADIONUCLIDES

Nuclide	Amount	Unit	Uncert	MT Derived (Y/N)	Activated (Y/N)	MDA Result (Y/N)	Normal Form (Y/N)	Measurement Code/Comment
Status: Active, Assay Page: 342582, Date: 09/12/1996, Derivation: Generator Entered Results (e.g., Offsite Assay)								
Am-241	6.84E-003	g	2.23E-003	N			Y	
H-3	2.80E-001	g	0.00E+000	N			Y	
Pu-238	4.30E-004	g	1.40E-004	N			Y	
Pu-239	4.03E+000	g	1.31E+000	N			Y	
Pu-240	2.58E-001	g	8.40E-002	N			Y	
Pu-241	8.60E-003	g	2.80E-003	N			Y	
Pu-242	8.60E-004	g	2.80E-004	N			Y	

RAD CALCULATIONS

Total Activity (nCi/g):	7.51745E+06	**DOTFissile Mat (g):**	4.04160E+00
Alpha (nCi/g):	9.42240E+02	**Transport Index:**	
TRU Alpha (nCi/g):	9.42179E+02	**NRC Class:**	GTCC
Pu-239 FGE:	4.05834E+00	**DOT Type:**	B
Pu-239 FGE [2U]:	6.68437E+00	**LSA-I Fraction:**	1.20171E+03 N
Pu-239 Eq-Ci:	3.57286E-01	**LSA-II Fraction:**	4.33321E-01 Y
Pu-239 Eq-Ci [2U]:	5.25857E-01	**LSA-III Fraction:**	2.16661E-02 Y
TRU Pu-239 Eq-Ci:	3.56951E-01	**Reportable Quantity:**	6.19642E+01 Y
TRU Pu-239 Eq-Ci [2U]:	5.25523E-01	*** ALC Ratio:**	3.63721E+06 NE
Decay Heat [U] (W):	1.05264E-01	*** ACM Ratio:**	3.60513E+04 NE
Tritium (Ci/m3):	3.83003E+03	**Limited Quantity:**	1.56266E+04 N
TRU ECW PE-Ci:	3.56951E-01		

Weight/Volume Used:

1 Container Net Weight:	3.60624E+02 kg	**ALC (Activity Limit for Exempt Consignment)*
2 Container Volume:	7.07500E-01 m3	**ACM (Activity Concentration for Exempt Material)*
		U = 1 Uncertainty, 2U = 2 Uncertainty

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
09/12/1996 12:00 AM	1813568 EXECUTED	LANL:55-PF4 - DRMPRP-SW	NO

CONTAINER PROFILE
56197
T-TRU-TEMP

WS ID: 522
C ID: 773328
ACTIVE

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
05/29/1997 12:00 AM	707051 EXECUTED	LANL:55-PF4 » 54-G:000283 STAGING	NO
09/24/1998 12:00 AM	717888 EXECUTED	LANL:54-G » 54-G:000153	NO
09/22/1999 12:00 AM	718064 EXECUTED	LANL:54-G - SHAFT266	NO

Note: Highlighted row indicates container was output or receiving container for the indicated task

DOCUMENTATION

Doc. Number	Title	Uploaded By
1	56197-TWSR	WCATS APPLICATION (000000)

COMMENTS

Date Time/ User Name	Comment
08/23/2013 9:37 AM WCATS APPLICATION (000000)	ROUGH SWIPES (ALPHA) N.D.A. LUDLUM-139 #7604 VOID 5-31-97

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
08/23/2013 9:44 PM WCATS APPLICATION (000000)	NO	TRUP.PKGLOC TABLE (WASTEDB): [PKG_ID] = 56197, [ASSIGN_TO] = 999003, [ASSIGN_BY] = 110010, [CUR_DATE] = 1997-05-16 10:41:13, [NOTE] = TRANSPORT, [UPD_WHEN] = 1997-05-16 00:00:00, [UPD_WHO] = Z110010, [RECID] = 860
08/23/2013 9:44 PM WCATS APPLICATION (000000)	NO	TRUP.PKG_DOT TABLE (WASTEDB): [PKG_ID] = 56197, [CHEM_STATE] = ELEMENTAL, [DOT_DESC_CD] = , [DOTHAZ_CD] = 7, [DOTSHIP] = RADIOACTIVE MATERIAL, N.O.S., [DOTUNNA_CD] = UN2982, [ERGNO] = 163, [FISSILE_CLASS] = EXCEPTED, [HAZ_SUB] = RADIOACTIVE MATERIAL, [HMTF_NO] = , [LABEL_CAT] = RADIOACTIVE YELLOW II, [LABEL_SEC] = , [OTHERCONID] = , [PLAC_REQ] = , [TRANS_INDEX] = 0.2, [UPD_WHEN] = 1997-05-14 00:00:00, [UPD_WHO] = Z110010
08/23/2013 9:44 PM WCATS APPLICATION (000000)	NO	TRUP.TRUPKG TABLE (WASTEDB): [PKG_ID] = 56197, [ALPHA_CONT] = 0, [APPROVE_BY] = 110010, [APPROVE_DATE] = 1997-05-14 00:00:00, [BETA_GAMMA_CONT] = 0, [BLDG_CD] = 55-PF4, [BX_SERIAL] = , [CERT_STATUS] = N, [COLOR_CD] = , [COMMENTS] = ROUGH SWIPES (ALPHA) N.D.A. LUDLUM-139 #7604 VOID 5-31-97, [CONTENT_CODE] = , [CONTROL] = CST7, [DATE_CLOSED] = 1996-09-12 00:00:00, [GAMMA_DOSE] = .1, [GROSS_WT] = 2480, [GRP] = NMT7, [NEUTRON_DOSE] = 0, [NORMAL] = Y, [OLDDRUMNUM] = , [OLDVOL_UNIT] = , [OLDWT_UNIT] = , [ORG_VOL] = 10, [ORG_WT] = 14.6, [PKG_CD] = 03, [PKG_CD_DESC] = TORPEDO TUBE, [PKG_DATE] = 1997-05-22 00:00:00, [PKG_FISS_GRAMS] = 4.0583378919, [PKG_LOT] = , [PKG_PE_ACT] = .36145542865882354213884684352177431 4936, [PKG_TARE_WT] = 1684.96, [PKG_VOLUME] = .7075, [PROC_BTCH_CD] = , [PROG_CODE] = KF14, [ROOM] = , [SAMPLE_ID] = , [THERMAL] = .10261967862, [TOTAL_DOSE] = .1, [TOT_ANCG] = 305.97874637871980703653922739944245320 6, [TRUCON_CD] = LA117B, [WASTE_CD] = , [WPRF_CD] = 26048, [YR_MFG] = , [WASTE_TYPE] = , [INSP_DATE] = 1996-09-12 00:00:00, [AUA_VUA] = 970501, [PROCESS_ID] = , [WGEN_CD] = 087896, [DOT_TYPE] = B, [BIR_ID] = LAT005, [RQ] = , [LSA_SCO_CD] = L2, [LSA] = , [A_START_DATE] = , [BIR_WS] = LA-T10, [LA_WS] = , [SWBOP] = , [RETRIEVABLE] = , [OFFSITE] = , [LINER_CD] = , [NET_WT] = , [SHIP_CD] = , [WASTE_STREAM] = , [OVERPACK] = N, [REPACKED] = , [INVENTORY_NO] = 3, [INVENTORY_DT] = 1999-09-09 00:00:00, [CHCD_CC_CD] = , [CHCD_CA_CD] = , [CHCD_WP_CD] = , [DOT_DP] = , [WASTE_VERIF] = , [VERIF_COMPLETE] = , [HDL_CD] = , [UPD_WHEN] = 2004-06-30 11:56:43, [UPD_WHO] = 114644, [PHY_STATE] = S, [PKG_H3_ACT] = 2732.8, [QTW] = N, [AK_REPORT] = , [STP] = 0

CONTAINER PROFILE
56197
T-TRU-TEMP

WS ID: 522
C ID: 773328
ACTIVE

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
08/23/2013 12:32 PM WCATS APPLICATION (000000)	NO	TRUP.UPD_HISTORY TABLE: [UPD_ID]= 31555, [AUTH_BY]= 090510 -> CHEN ANITA I-LI , [AUTH_NUM]= , [PKG_ID]= 56197, [UPD_WHEN]= 07-28-1997, [UPD_WHO]= Z111491 -> FERNANDEZ CHARLOTTE G , [WHAT]= ADDED/CHANGED AUA_VUA: 970501, [WHY]= NEW FIELD SR188, 2/1/95
08/23/2013 8:48 AM WCATS APPLICATION (000000)	NO	INITWORKPATH (C_ID=773328/PATH_ID=466): SKIPPED (NO WORKPATH UNITS)

Los Alamos
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TRU WASTE STORAGE RECORD

TRITIUM Pressure Vessel DES 5/12/97

LA00000056197

1. GENERATOR'S PRE-USE VISUAL INSPECTION

		Inspected Items		
Drum Lot Code	N/A	☐ Ring, Bolt, and Nut (N/A)	☐ Chime (N/A)	☑ Dents
Year of Manufacture	N/A	☑ Lid and Gasket	☑ Gouges	☑ Paint
Box Serial Number	N/A	Printed Name: MICHAEL V GALLEGOS		Date: ~~SEP 12-96~~ 9/12/96 DES [illegible] 5/12/97
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.		Signature: Michael Gallegos		

2. GENERATOR'S PACKAGE INFORMATION

Group	Technical Area	Building	Program Code	Normal
NMT-7	TA-55	PF-4	~~[illegible]~~ KF14	☑ Yes ☐ No

Additional Information: [illegible] Tritium Pressure Vessel [illegible] 0.7675 in³ Tri-fill Tube [illegible] Rough swipes (Alpha) N.D.A. Ludlum-139 # 7604 void 5-31-97

CODE	CONTAINER	INTERNAL SHIELDING		
		☒ None		
01	☐ Steel Drum (55 gal.)	Type	Thickness (in.)	
02	~~☑ Standard Waste Box~~ DES [illegible]			
03	☒ Other (Call TWCO)		.	
04	☐ RH Canister		.	

Waste Profile Request Number	260418
Carbon Filter ID 01	N/A
Carbon Filter ID 02	N/A
Process Batch Code	N/A
Gross Weight (lb.)	2.48 E+13
Organic Material Wt. (lb.)	1.46 E+11
Organic Material Volume (%)	10
TRUCON Code	118
Date Closed (MMDDYY)	09 12 96

RADIONUCLIDE CONTENT

Material Type ☒ Yes ☐ No 5487

Nuclide	Amount		Uncertainty **		C=Curie M=Gram
PU238	4.3100	E -04	1.4100	E -04	M
PU239	4.0130	E 10	1.3113	E 10	M
PU240	2.5800	E -11	8.4100	E -12	M
PU241	8.6100	E -13	2.8100	E -13	M
PU242	8.6100	E -04	2.8100	E -04	M
AM241	6.8317	E -13	2.2126	E -13	M
H3	2.8100	E -11	0.0000	E 10	M
	.	E	.	E	

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
NONE		. E
		. E
		. E
		. E
		. E

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures. 2/24/97 DES [illegible] 5/12/97

Printed Name	Signature	Date
Michael V GALLEGOS	Michael V Gallegos	2-24-96

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (mrem/h)	0.0 E 00	Survey Meter Model: RO3C	Property Number: 2628	Calibration Void Date: 11-15-96
Neutron Dose Rate (mrem/h)	3.0 E 00	Survey Meter Model: PNR-4	Property Number: 24904	Calibration Void Date: 12-17-96
Total Dose Rate (mrem/h)	3.0 E 00	The data in this section were collected according to approved procedures.		
Alpha Contamination (dpm/100cm²)	0.0 E+00	Printed Name: EDUARDO ESTRADA		Date: 09-20-96
Beta-Gamma Cont. (dpm/100cm²)	0.0 E+00	Signature: Eduardo Estrada		

Note/ T.I. = 0.2 mrem/h DES [illegible]

4. CST-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by CST-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.	Printed Name: Derik G. Stafford	Date: 5/12/97
	Signature: [illegible]	

Shipping Category - NONE, tritium contaminated

* see memo NMT-7-WM/EC-96-032 ** $\sqrt{\Sigma \sigma^2}$

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	05	30	97	KAREN WILDER	Karen Wilder
Date Entry Verified	05	30	97	Charlotte Fernandez	Charlotte Fernandez

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number	Date (*Inspection Valid for 30 Days*)
	1 INSPECTOR RM	5-21-97

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	0.1 E + 0	Survey Meter Model RO-20	Property Number 3448	Calibration Void Date 7/9/97
Neutron Dose Rate (*mrem/h*)	0.0 E + 0	Survey Meter Model ESP-2	Property Number 6110	Calibration Void Date 8/25/97
Total Dose Rate (*mrem/h*)	0.1 E + 0	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*)	0.0 E + 0	Printed Name Gary Hagerman		Date 5/23/97
Beta-Gamma Cont. (*dpm/100cm²*)	0.0 E + 0	Signature Gary D Hagerman		

8. STORAGE SITE INFORMATION

Received By (*Initials*) RM	Date Received 5-22-97	ORIGINAL STORAGE DATA	
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number 283 +53 RM	Layer Holding Area / Row Number
		Column Number	Date Stacked (*MM,DD,YY*)
Printed Name Rick MARTINEZ	Date 5-22-97	Printed Name Rick Martinez	Date 5-29-97
Signature Rick Martz		Signature Rick Martz	

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name Rick Martinez	Date 6-27-97
	Signature Rick Martz	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date

11. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	06	27	97	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	06	27	97	Tammy Lash	Tammy Lash

12. DUPLICATE COPY

	M M	D D	Y Y	Printed Name	Signature
Date Duplicate Filed	06	27	97	Charlotte Fernandez	Charlotte Fernandez

Torpedo Tube

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 26048

LA00000056197

Generator :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z#:	099731
WMC :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z#:	099731
CSR :	STAFFORD, DARRIK	MS :	J593	PH :	54000	Z#:	110010
Status :	ACTIVE	Activation Date :	10-APR-97		Expiration Date:		10-APR-98
Group :	NMT7	TA :	55	Bldg :	000004	Room:	432

RMMA : **RADIOACTIVE MATERIALS MANAGEMENT AREA (RMMA)**
Waste Accumu : N/A
Method of Char : **KNOWLEDGE OF PROCESS (KOP)**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **ON-GOING GENERATION**
RADIOACTIVE
Assoc Docum: **WM SOP# DP01**
Other SOP# WODF

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**
MAINTENANCE
MATERIAL PROCESSING
RESEARCH AND DEVELOPMENT

Waste Matrix : **SOLID**

Matrix Type : **HETEROGENEOUS**

Waste/Proc Desc : TRUCON CODE 117A, 117B, 117D, NON-PU238 WASTE METAL FROM PLUTONIUM PROCESSING ACTIVITIES WITH NO KNOWN HAZARDOUS CONSTITUENTS, ALSO CONTAMINATED WITH TRITIUM. TRUWM-TA55-DP-01, INSPECTION AND PACKAGING OF CERTIFIABLE COMBUSTIBLE AND NON-COMBUSTIBLE TRU WASTE. WASTE ORIGINATION AND DISPOSITION FORM (WODF).

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				
BARIUM	Y				
CADMIUM	Y				
CHROMIUM	Y				
LEAD	Y				
MERCURY	Y				
SELENIUM	Y				
SILVER	Y				

Toxicity Characteristic Organic Compounds: N/A

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
BAGOUT BAGS		**1**	**5**	**%**
DISCARDED TOOLS		**0**	**10**	**%**
FLANGES		**0**	**10**	**%**
PIPING		**0**	**20**	**%**
SCRAP METAL (BERYLLIUM, STEEL, COPPER)		**50**	**80**	**%**
TANKS (EMPTY)		**0**	**10**	**%**
VALVES		**0**	**10**	**%**

Radiological Characteristics:

Radionuclide	Min	Max	Unit
AM241	0.000E+00	5.660E-02	CIG
PU238	0.000E+00	1.320E-03	CIG
PU239	0.000E+00	9.770E-04	CIG
PU240	0.000E+00	8.170E-04	CIG
PU242	0.000E+00	1.330E-05	CIG
H3	0.000E+00	2.000E-02	CIG
PU241	0.000E+00	4.990E-02	CIG
U235	0.000E+00	2.690E-08	CIG
U238	0.000E+00	4.180E-09	CIG
NP237	0.000E+00	3.660E-08	CIG
PU244	0.000E+00	1.850E-11	CIG

Rad Contamination Type : **SURFACE CONTAMINATION**

Waste Water Contaminants : N/A

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **Transuranic Waste**

RCRA Category : **Non-hazardous Waste**

Misc. Category : N/A

Waste Classification : **TRANSURANIC WASTE**

EPA Hazardous Waste Code : N/A

Los Alamos
NATIONAL LABORATORY

DISCARDABLE WASTE LOG SHEET

LA00000056197

Item ID	Matrix	Pkg Wt (kg)	Qty	Org Vol %	Org Wt(kg)	Packed By	Date	MT	SNM(g)	Uncert(g)	Pg/Section/Ln OR Memo
METSRL4	Metal (Non-Pu Scrap)	358.68		6.60	6.60	WULFF	MAR 25 1997	52	4.300	1.400	8/14
								87	0.280	0.000	5/0

Total Pkg Wt (lbs)	790.75
Drum Tare (lbs)	1684.96
Calc Gross Wt (lbs)	2475.71
Meas Gross Wt (lbs)	2475.99
Organic Wt (lbs)	14.55
Organic Volume %	10.00

MT	Total SNM	Total Uncert
52	4.300	1.400
87	0.280	0.000

DISCARDABLE WASTE LOG SHEET

Effective Date 08/01/94

Page 1 of 1 Pages

LA000000056197 — WASTE PACKAGE SERIAL NUMBER

N-Comb ☑ Comb ☐ Pu-238 ☐

Two Drum Liners Installed: NA

Install/Tighten Carbon Filter(s): NA

RH waste: N

Lead shielding: N

1/8 Inch Drum Liner: N

CONTAINER: Open ☑ In-Line ☐

Assay Instrument Type: NEUTRON ☑ GAMMA ☐

Tighten Locknut or Box Plugs: NA

TID#: Welded Shut

Date TIDed: ____

ITM NO	ITEM ID	PKG WT Kg	MATRIX (MATERIAL)	MT	SNM GRAMS	UNCRT +/- GRAMS	ITEM SNM g + 2X UNCERT	SNMg+2x UNCERT. running total	CERTIFIED PERSONNEL	REMARKS (Wt in kg) ORGANICS V%	ORGANICS WT.	HAZARDOUS MATERIALS	OTHER REMARKS	AUTH. PG/LN	DATE mm/dd/yy
0	METSRL4	346.32	METAL	81	0.28	0.00	0.00	0.28	[illegible]			none		8/14	
1				52	4.3	1.4									
2															
3															
4															
5															
6															
7	STYRA FOAM	10.16													
8	Welded	2.20													
9															

TOTAL Pkg wt Kg X 2.2046 = Pkg wt Lbs (#)	358.68 / 790.75	NMT-2 Gross Wt, Check Initials: MG	81	0.28	0.00	X		TOTALS	12.36	12.36	Haz-Mat	none	
+DRUM/BX TARE #	1684.95	Acntability Check Init.						Organics wt (kg) x 2.2046 = wt (lbs)	27.25		NMT-4 Assay Value		
= CALC GROSS #	2475.70							QA Pkg Approval			Instrument ID	SEE MEMO FOR	
SCALE GROSS #	2475.99										Date	RESULTS NMT.04.96-463	
											NMT-4 Sign.		

This container's waste was packaged and the NMT-2 data on the DWLS and the CWSR were collected according to procedures defined in the Los Alamos Certification Plan and the appropriate attachment(s).

NMT-2 Signature: ____

Los Alamos
NATIONAL LABORATORY

memorandum

Nuclear Materials Technology Division
NMT-4, Nuclear Materials Measurement & Accountability

To/MS: Timothy A. Ayers, FSS-12, MS G735
Thru: Dennis L. Brandt, NMT-4, MS E513
From/MS: Jack E. Malcom, NMT-4, MS E513
Charles A. Bonner, NMT-4, MS E513
Phone/FAX: 5-0913/FAX 5-6160
Symbol: NMT-04-96-463
Date: December 11, 1996

SUBJECT: NEUTRON MEASUREMENT OF WASTE ITEMS IN NMT-7'S PAD STORAGE AREA

Neutron assay (i.e. measurement code NNMT) has been completed on the following items located at the waste management's outside storage area.

METSRL4

LA000000
56197

DATE	ITEM	TOTAL Pu (g)	
6-Nov-96	METSRL4 Tritium Tank	4.3	+/- 1.4
14-Nov-96	Rm106GB/2046039	0.1	+/- 0.85

ITEM DESCRIPTIONS: Tritium Tank is a 12 ft. long by 20 in. diameter stainless steel tube.
Glove box and pieces packed in a white metal box

	Width	Height	Length
Rm106GB/2046039	4 ft.	7 ft.	8 ft.

MEASUREMENT SYSTEM: He^3 in four poly slabs 15"wide by 46"tall by 6" thick with JSR 11 coincidence counter

MEASUREMENT PERSONNEL: Jack E. Malcom and Jody E. Martinez

CALIBRATION STANDARD: STDSGPD1

MINIMUM DETECTABLE QUANTITY: The 3-sigma detection limit was calculated by dividing the standard deviation of the background runs by the calibration constant times three. This value, 1.0 gram plutonium at three sigma, is used to estimate the sensitivity of the system for this application.

BACKGROUND AND CALIBRATION CONSTANT (K)

BKG REALS = 0.2 +/- 0.016 reals/sec K = 0.06 reals/gram

CAB / JEM
Distribution:
Lorenzo A. Trujillo, NMT-7, MS E501
Teresa L. Cremers, NMT-4, MS E513
R. Naomi Hapke, NMT-4, MS E513
Victoria L. Longmire, NMT-4, MS E513
Relf L. Price, NMT-4, MS E513
Dennis R Wulff, NMT-7, MS E501
Eddie A. Trujillo, NMT-6, MS E510
NMT-4 Reading File

To: SMTP[ksmith@lanl.gov]
From: Kathleen Gruetzmacher@NMT7
Cc:
Bcc:
Subject: "Torpedo" LA00000056197
Attachment:
Date: 3/26/97 10:31 AM

Kathy - no confirmation assay will be done on this container. The measurement done by NMT-4 has been approved by FSS and NMT-4 Accountability. We can put a note on the drum package in the WMS or ask Lynn Foster to approve the lack of a confirmation assay. How would you like to handle this?

Thanks, Kathleen

Los Alamos
NATIONAL LABORATORY

memorandum

Waste Management and Environmental Compliance
NMT-7, MS E501

To/MS: Kathleen Gruetzmacher, NMT-7, MS E501

From/MS: William Schueler
Phone/FAX: 667-1193/667-9201
Symbol: NMT-7-WM/EC-96-032
Date: March 6, 1996

SUBJECT: Am-241 CONTENT IN SOLID TRANSURANIC WASTE

Using an Excel program from NMT-4, ISOPOW, I have calculated the Am-241 content of Plutonium contaminated waste. Several assumptions were made to derive these numbers. They were:

1) The oldest weapons grade plutonium in inventory dates back to 1 January, 1960. Pu-238 dates back to 1 January, 1982
2) The original Am-241 content is zero.
3) The isotopic breakdown of the original plutonium is the same that is being used now.
4) The processes that generate solid waste do not involve the concentration of Am-241.
5) Parts per million is one-to-one equivalent to grams Am-241 to grams plutonium.
6) For ease of calculation, the date the waste is packaged on is 1 January, 1996, making the plutonium 36 years old.

This information is to be used until such a time that Am-241 can be reliably measured with NDA equipment, and at that time the NDA results should be used for future waste generated.

MT		PPM	g Am/g Pu	Ci Am/g Pu	mW/g Pu
51		605.03	6.05E-4	2.099E-3	2.18433
52		1593.79	1.59E-3	5.530e-3	2.46255
53		2921.37	2.92E-3	1.014E-2	2.82607
54		6412.58	6.41E-3	2.225E-2	3.45258
55		8268.19	8.27E-3	2.869E-2	3.89203
56		9503.57	9.50E-3	3.298E-2	4.12256
57		20754	2.08E-2	7.202E-2	7.25042
42	84%	25611.05	2.56E-2	8.887E-2	8.30671
	90%	15044.19	1.50E-2	5.220E-2	5.36232
	95%	7263.76	7.26E-3	2.521E-2	3.07238
83	83%	1706.00	1.71E-3	5.920E-3	468.82149
	89%	112.47	1.12E-4	3.903E-4	500.69611

Drum or Box ID . LA000000 56197	Name: K.M. Gruetzmacher	04/03/97

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%	PU 240 (gram%	PU 241 (gram%	PU 242 (gram%	PU 244 (gram%	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.90	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	4.3	0.00043	4.03254	0.258	0.0086	0.00086	0	4.30043
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	4.3	4.300E-04	4.033E+00	2.580E-01	8.600E-03	8.600E-04	0.000E+00	4.30E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	4.3	0.007439	0.253646766	0.05934	0.8944	3.4142E-06	0	1.21482918
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0

	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Totals (Ci)	7.439E-03	2.536E-01	5.934E-02	8.944E-01	3.414E-06	0.000E+00	1.215E+00
Totals (TBq)	2.752E-04	9.385E-03	2.196E-03	3.309E-02	1.263E-07	0.000E+00	4.495E-02

	total weight (g)	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Grams	4.300E+00	4.300E-04	4.033E+00	2.580E-01	8.600E-03	8.600E-04	0.000E+00	4.300E+00
Curies		7.439E-03	2.536E-01	5.934E-02	8.944E-01	3.414E-06	0.000E+00	1.215E+00
Pu FGE		4.859E-05	4.033E+00	5.805E-03	1.935E-02	6.450E-06	0.000E+00	4.058E+00
Decay Heat (W)		2.464E-04	7.863E-03	1.847E-03	2.847E-05	1.006E-07	0.000E+00	9.986E-03
PE Activity (Ci)		6.763E-03	2.536E-01	5.934E-02	1.720E-02	3.104E-06	0.000E+00	3.370E-01

	Weight (g)	Ci	Pu FGE	Decay Heat (W)	PE Activity (Ci)
Am 241	6.837E-03	2.372E-02	1.279E-04	7.931E-04	2.372E-02
Other	4.300E+00	1.215E+00	4.058E+00	9.986E-03	3.370E-01
Total for Drum	4.307E+00	1.239E+00	4.058E+00	1.078E-02	3.607E-01
alpha Ci		3.442E-01			

specific activity
TRUPACT-II SAR
this sheet rev. 6/24/96

$\frac{0.3442\ Ci}{358.68\ kg} \times 10^6 = 9.60 \times 10^2\ nCi/g$

UNCERTAINTY

Drum or Box ID	LA000000 56197	Name: K.M. Gruetzmacher	04/03/97

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%	PU 240 (gram%	PU 241 (gram%	PU 242 (gram%	PU 244 (gram%	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.90	0.7	1.26	6.4	1.86	89.77	0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

$\sqrt{\Sigma o^2}$

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	1.4	0.00014	1.31292	0.084	0.0028	0.00028	0	1.40014
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	1.4	1.400E-04	1.313E+00	8.400E-02	2.800E-03	2.800E-04	0.000E+00	1.40E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	1.4	0.002422	0.082582668	0.01932	0.2912	1.1116E-06	0	0.39552578
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0

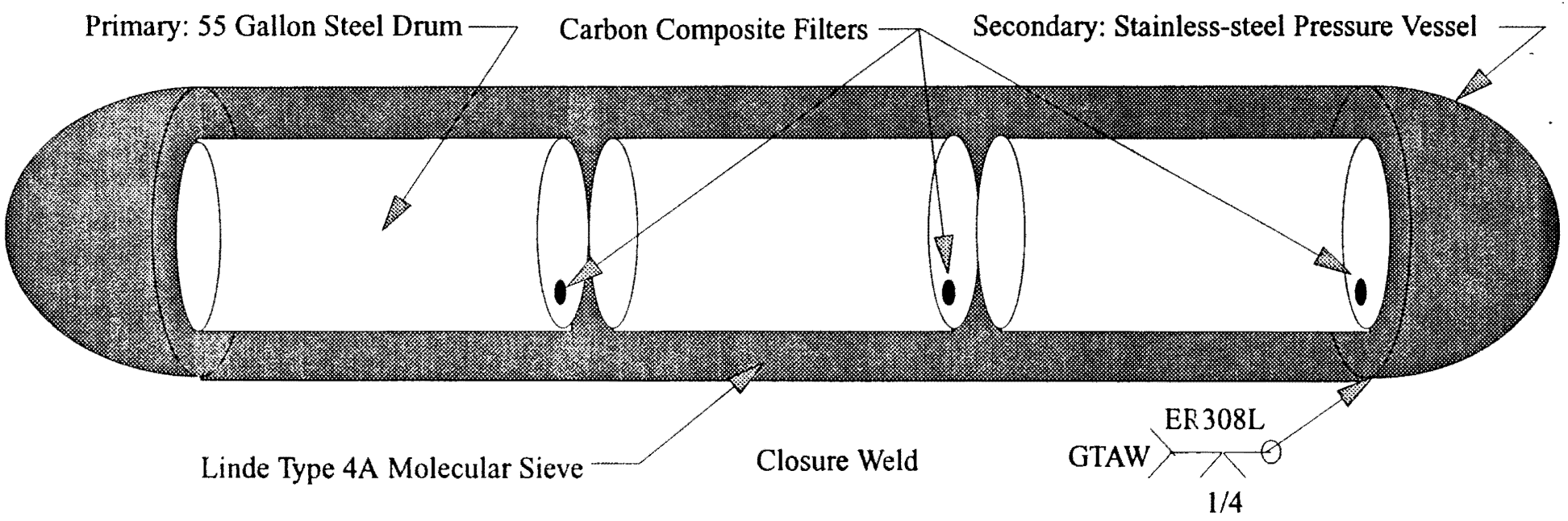
	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Totals (Ci)	2.422E-03	8.258E-02	1.932E-02	2.912E-01	1.112E-06	0.000E+00	3.955E-01
Totals (TBq)	8.961E-05	3.056E-03	7.148E-04	1.077E-02	4.113E-08	0.000E+00	1.463E-02

	total weight (g)	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Grams	1.400E+00	1.400E-04	1.313E+00	8.400E-02	2.800E-03	2.800E-04	0.000E+00	1.400E+00
Curies		2.422E-03	8.258E-02	1.932E-02	2.912E-01	1.112E-06	0.000E+00	3.955E-01
Pu FGE		1.582E-05	1.313E+00	1.890E-03	6.300E-03	2.100E-06	0.000E+00	1.321E+00
Decay Heat (W)		8.022E-05	2.560E-03	6.014E-04	9.268E-06	3.276E-08	0.000E+00	3.251E-03
PE Activity (Ci)		2.202E-03	8.258E-02	1.932E-02	5.600E-03	1.011E-06	0.000E+00	1.097E-01

	Weight (g)	Ci	Pu FGE	Decay Heat (W)	PE Activity (Ci)
Am 241	2.226E-03	7.724E-03	4.163E-05	2.582E-04	7.724E-03
Other	1.400E+00	3.955E-01	1.321E+00	3.251E-03	1.097E-01
Total for Drum	1.402E+00	4.032E-01	1.321E+00	3.509E-03	1.174E-01
alpha Ci		1.120E-01			

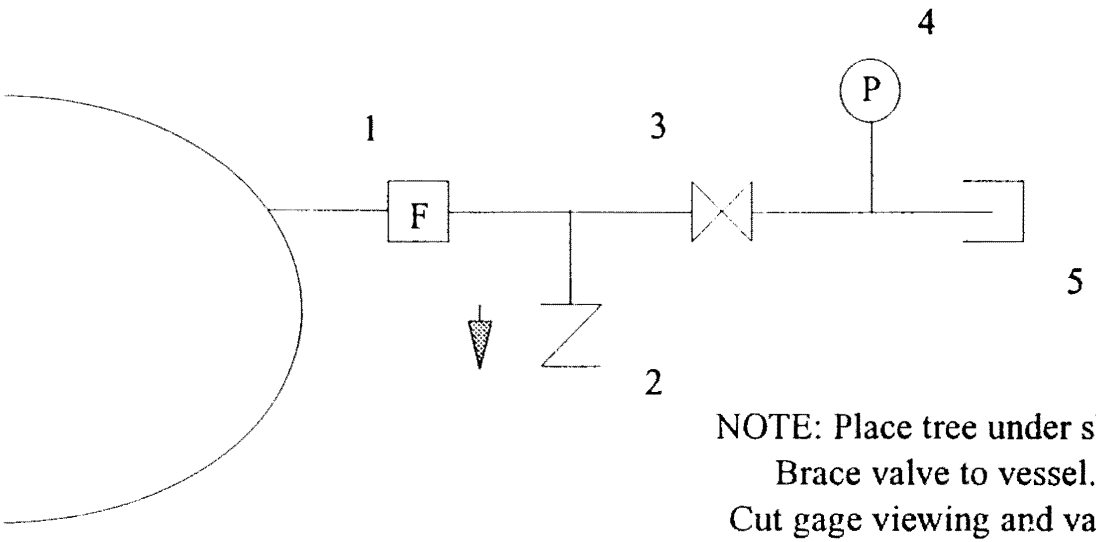
specific activity
TRUPACT-II SAR
this sheet rev. 6/24/96

Tritium Co-contaminated Transuranic Waste Package



NOTE: Skirts not shown.

Full penetration
Inert gas blanket back side of weld.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve
access hole in skirt

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R. Wieneke 08/23/93

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: D. P. Taggart, EM-7, MS J595

DATE: August 23, 1993

THRU: B. J. McKerley, NMT-2, MS E501
J. J. Balkey, NMT-2, MS E501

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-93-168

SUBJECT: **PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

This memo outlines the packaging agreement for tritium contaminated transuranic waste from the Special Recovery Line (SRL) tear-out at TA-55, PF-4. This agreement was reached at a meeting at TA-54 on Tuesday, August 17, 1993 by the following personnel; Tom Bieniewski, Mike Blau, Davis Chistensen, Dan Taggart and Ron Wieneke.

The packaging configuration shall be as follows; 1) Tritium co-contaminated transuranic waste will be bagged out of the glovebox line in accordance with TA-55 procedures, or in the case of the decommissioned processing system; disassembled and bagged. Bags shall be sealed by the twist and tape method. 2) The bagged waste will be placed inside of 55 gallon drums which have had their interior surfaces painted with asphalt as a barrier to tritium permeation and are painted white on the outside with a red "T" for identification, as is the practice for packaging tritium contaminated wastes. The 55 gallon drum will act as the primary containment for the waste. This packaging configuration will protect JCI, Waste Management and NDA Personnel from the tritium in the waste. 3) The 55 gallon drums shall be closed and sealed with a TID, then sent to the Nondestructive Assay Laboratory for plutonium assay. 4) Upon completion of the assay, the drum shall be returned to Room 307/308 where tritium monitoring equipment and proper ventilation is available and the bung in the drum lid shall be replaced with a carbon composite filter. The carbon composite filter will contain the transuranics but allow gases, including tritium to vent to the secondary. The installation of the carbon composite filter will be done immediately prior to over-packing. 5) the drum shall then be placed inside of the special stainless-steel tritium containment vessel which will serve as a secondary containment. 6) As each drum is placed into the secondary, the annulus between the 55 gallon drum OD and the vessel ID will be filled with Linde® Type 4A molecular sieve which will absorb any tritium dioxide escaping the primary through the carbon composite filter. 7) The stainless-steel vessels will hold up to three 55 gallon drums. Upon filling the vessels, the heads will be welded in place sealing the vessel. 8) The top of the vessel will have a penetration for the attachment of a valve, pressure gauge, pressure relief valve and quick-connect. 9) The vessel shall be flushed and back-filled with helium for leak testing the closure weld. Helium back pressure and acceptable leak rate will be determined by EM-7.

Documentation will be in accordance with the LANL TRU Waste Certification Plan and Safe Operating Procedures (SOPs) at TA-55. Each 55 gallon drum will have a Waste Origination and Disposition Form filled out by the Generator, Waste Management and Nondistructive Analysis; a Waste Profile Form filled out by the generator and approved by EM-8; a Discardable Waste Log Sheet for each drum and a Transuranic Waste Storage Record for each drum. Drums will be identified with the standard bar code labels (LA0000000XXXXX) used for transuranic waste. In addition, a Transuranic Waste Storage Record shall be generated for the secondary. It will be a

summary of the TWSRs corresponding to the three 55 gallon drums enclosed within it. Additional information on the tare of the secondary and its internal volume will be recorded in the "additional information" section on the form. The secondary will be identified with its own bar code label.

Mike Blau estimates that two vessels (six 55 gallon drums) will be needed to accommodate all of the tritium co-contaminates transuranic waste from the Special Recovery Line tear-out. Waste will not be segregated according to combustible and noncombustible categories, although the majority of the waste will be scrap metal (valves, fittings, piping, vessels, pumps and other equipment).

The system which is replacing the SRL will be used to conduct similar work and generate tritium co-contaminated transuranic waste. Although the volume of waste from this operation is not anticipated to be great, the packaging requirements need to be established. Please contact waste NMT-2 Waste Management when you are prepared the address this issue.

Your acceptance of this packaging configuration for interim storage of tritium co-contaminated transuranic waste at TA-54 is requested so that the decommissioning may proceed to meet programmatic commitments. If you need any further information or clarification of the packaging requirements as outlined above, please contact me at 5-0269 immediately.

Distribution: T. Bieniewski, MST-3, MS C345
M. S. Blau, NMT-5, MS E506
D. Christensen, EM-7, MS J595
E. D. Derr, EM-7, MS J595
L. R. Field, MST-5, MS G730
J. R. Harper, EM-7, MS J595
D. E. Harvey, NMT-4, MS E513
J. W. Kreuger, EM-7, MS J595
D. B. LeBrun, NMT-7, MS J594
B. T. Reich, NMT-7, MS J594
M. F. Stevens, NMT-5, MS E506
Author file
NiTR file

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO:	M. S. Blau, NMT-5, MS E501	DATE:	January 9, 1994
THRU:	J. J. Balkey, NMT-2, MS E501	MAIL STOP/TELEPHONE:	MS E501 / 5-0269
FROM:	R. E. Wieneke, NMT-2	SYMBOL:	NMT-2-NiTR-94-010

SUBJECT: **MC&A CONSIDERATIONS FOR THE PACKAGING OF SPECIAL RECOVERY LINE WASTE**

This memo addresses the Material Control and Accountability concerns associated with the packaging of tritium and tritium contaminated transuranic wastes from the Special Recovery Line tear-out in PF-4. Waste Management personnel must be present to inspect the 55 gallon drums as they are loaded into the stainless steel secondary. They will record the drum identification numbers, note their position inside of the secondary and place bar code labels on the secondary containment for identification. The inside of the secondary will be inspected prior to loading to assure that no unauthorized materials have been placed inside of it. They will also verify the integrity of Tamper Indicating Devices on the drums as they are loaded. The secondary cannot be left unattended until the head has been tacked in place and a paper TID placed over the pipe nipple so that no unauthorized material may be placed inside of the secondary container.

By following these procedures, the need for performing a confirmation assay (which would be very difficult and time consuming) will be waived. Contact me if you have any questions on these requirements.

Distribution: R. L. Price, NMT-4, MS E513
D. R. Wulff, NMT-2, MS E501
Author file
NiTR file

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO R. E. Wieneke, NMT-2, MS E501

DATE October 1, 1993

FROM Dan Taggart, EM-7
Technical Staff Member

MAIL STOP/TELEPHONE J595/5-6149

SYMBOL EM-7G-93-536

SUBJECT **RESPONSE TO NMT-2 NiTR-93-168; "PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

We agree with the packaging configuration described in NMT-2-NiTR-93-168 for the tritium and TRU contaminated waste from TA-55 with the following provisions. These provisions will help assure that each of the overpacked 55 gallon drums will be acceptable to WIPP in its own right and provide protection against pressurization of the secondary vessel by alpha radiolysis of the hydrogenous components of the waste.

- Massive objects, like vacuum pumps, must be braced to prevent them from shifting during handling.

- A single plastic bagout is acceptable with a "horsetail" seal.

- Each 55 gallon drum shall have a standard 90 mil plastic drum liner. If the drum liner does not come with a lid, please place a 90 mil (approx.) sheet of plastic across the top. These plastic linings are intended to provide a little extra "dent" protection for the drum.

- Enough getter should be included to absorb all of the H_2 which may be generated due to alpha radiolysis of hydrogenous wastes for a period of 20 years. This will have the added effect of binding any HT which may be present in the waste. We estimate that 20 grams of ^{239}Pu could generate up to 6 atm-liters of H_2 per year in contact with hydrogenous materials, or 120 atm-liters in a 20 year period. If each waste drum contained hydrogenous wastes and 20 grams of ^{239}Pu, then the total H_2 production per year would have to be assumed to be 36 atm-liters.

Organic getters such as DEB (Allied Signal, Kansas City Division) can bind up to about 0.2 atm-liters/gram and have the advantage over other types of getters of not being poisoned by other gases. The getter need not be placed in the 55 gallon drum but could be placed where the molecular sieve will be.

We are currently reviewing the proposed valve tree arrangement for the secondary container and will advise you of any changes we may require early next week.

If you have any comments, questions, or concerns about these additional provisions, please call.

DT:lpc

Cy: A. Drypolcher, EM-7, MS E517
J. Kelly, EM-7, MS J593
S. Meyers, BEC, MS J593
A. Montoya, EM-7, J593
J. Krueger, EM-7, MS J595
M. Banks, EM-7, MS J595
S. Betts, EM-7, MS J594
D. Christensen, EM-7, MS J595
E. Derr, EM-7, MS J586
R. Glenn, EM-7, MS J595
J. Harper, EM-7, J586
D. Keller, BEC/EM-7, MS J595
B. LeBrun, EM-7, MS J586
T. Stanford, EM-7, MS J595
E. Vold, EM-7, MS J586
Preapproval Office, EM-7, MS J593
EM-7 Group Office, E517
EM-7 RMDC, MS J594
EM-7 File, MS J592

Waste Exception Form

WEF No. 97-002

Completed by Waste Generator

☐ On-going ☒ One-time	WPF No. 26048	CWDR/TWSR No. 56197	Item Nos.

☐ Hazardous/Chemical ☐ Low-Level Waste ☒ Transuranic Waste
☐ Low-Level Mixed Waste ☐ Radioactive Liquid Waste ☐ Other _____

Waste Acceptance Criteria

Currently approved TRU containers include the following:
- White DOT-17C or 17H, 55-gal steel drums
- 85-gal steel drums used for overpacks
- 71-in.-by-54.25 in.-by-37 in. steel standard waste boxes (SWBs)

Other containers may be used for packaging TRU waste, but their use must be requested by the generator on a Waste Exception Form

Reason for Variance from WAC and Justification

see attached

Requested by: (Print)	Requested by: (Signature)	Z Number	Date
KM GRUETZMACHER	KM Gruetzmacher	099731	5/14/97

Waste Management Facility Approval

Special Instructions and Comments

☐ Approved ☐ Rejected	Approved by: (Signature)	Z Number	Date
	[signature]	113199	5/15/97

WM-F054, R.1 (3/97)

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: D. P. Taggart, EM-7, MS J595

DATE: August 23, 1993

THRU: B. J. McKerley, NMT-2, MS E501
J. J. Balkey, NMT-2, MS E501

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-93-168

SUBJECT: **PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

This memo outlines the packaging agreement for tritium contaminated transuranic waste from the Special Recovery Line (SRL) tear-out at TA-55, PF-4. This agreement was reached at a meeting at TA-54 on Tuesday, August 17, 1993 by the following personnel; Tom Bieniewski, Mike Blau, Davis Chistensen, Dan Taggart and Ron Wieneke.

The packaging configuration shall be as follows; 1) Tritium co-contaminated transuranic waste will be bagged out of the glovebox line in accordance with TA-55 procedures, or in the case of the decommissioned processing system; disassembled and bagged. Bags shall be sealed by the twist and tape method. 2) The bagged waste will be placed inside of 55 gallon drums which have had their interior surfaces painted with asphalt as a barrier to tritium permeation and are painted white on the outside with a red "T" for identification, as is the practice for packaging tritium contaminated wastes. The 55 gallon drum will act as the primary containment for the waste. This packaging configuration will protect JCI, Waste Management and NDA Personnel from the tritium in the waste. 3) The 55 gallon drums shall be closed and sealed with a TID, then sent to the Nondestructive Assay Laboratory for plutonium assay. 4) Upon completion of the assay, the drum shall be returned to Room 307/308 where tritium monitoring equipment and proper ventilation is available and the bung in the drum lid shall be replaced with a carbon composite filter. The carbon composite filter will contain the transuranics but allow gases, including tritium to vent to the secondary. The installation of the carbon composite filter will be done immediately prior to over-packing. 5) the drum shall then be placed inside of the special stainless-steel tritium containment vessel which will serve as a secondary containment. 6) As each drum is placed into the secondary, the annulus between the 55 gallon drum OD and the vessel ID will be filled with Linde® Type 4A molecular sieve which will absorb any tritium dioxide escaping the primary through the carbon composite filter. 7) The stainless-steel vessels will hold up to three 55 gallon drums. Upon filling the vessels, the heads will be welded in place sealing the vessel. 8) The top of the vessel will have a penetration for the attachment of a valve, pressure gauge, pressure relief valve and quick-connect. 9) The vessel shall be flushed and back-filled with helium for leak testing the closure weld. Helium back pressure and acceptable leak rate will be determined by EM-7.

Documentation will be in accordance with the LANL TRU Waste Certification Plan and Safe Operating Procedures (SOPs) at TA-55. Each 55 gallon drum will have a Waste Origination and Disposition Form filled out by the Generator, Waste Management and Nondistructive Analysis; a Waste Profile Form filled out by the generator and approved by EM-8; a Discardable Waste Log Sheet for each drum and a Transuranic Waste Storage Record for each drum. Drums will be identified with the standard bar code labels (LA0000000XXXXX) used for transuranic waste. In addition, a Transuranic Waste Storage Record shall be generated for the secondary. It will be a

summary of the TWSRs corresponding to the three 55 gallon drums enclosed within it. Additional information on the tare of the secondary and its internal volume will be recorded in the "additional information" section on the form. The secondary will be identified with its own bar code label.

Mike Blau estimates that two vessels (six 55 gallon drums) will be needed to accommodate all of the tritium co-contaminates transuranic waste from the Special Recovery Line tear-out. Waste will not be segregated according to combustible and noncombustible categories, although the majority of the waste will be scrap metal (valves, fittings, piping, vessels, pumps and other equipment).

The system which is replacing the SRL will be used to conduct similar work and generate tritium co-contaminated transuranic waste. Although the volume of waste from this operation is not anticipated to be great, the packaging requirements need to be established. Please contact waste NMT-2 Waste Management when you are prepared the address this issue.

Your acceptance of this packaging configuration for interim storage of tritium co-contaminated transuranic waste at TA-54 is requested so that the decommissioning may proceed to meet programmatic commitments. If you need any further information or clarification of the packaging requirements as outlined above, please contact me at 5-0269 immediately.

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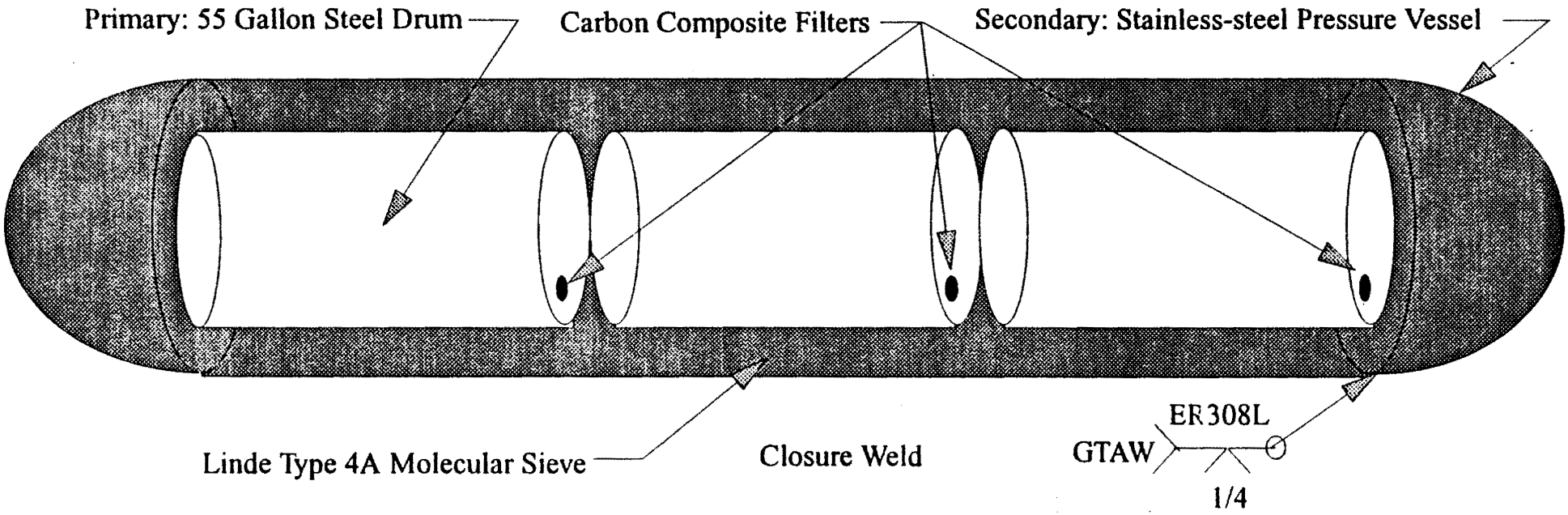
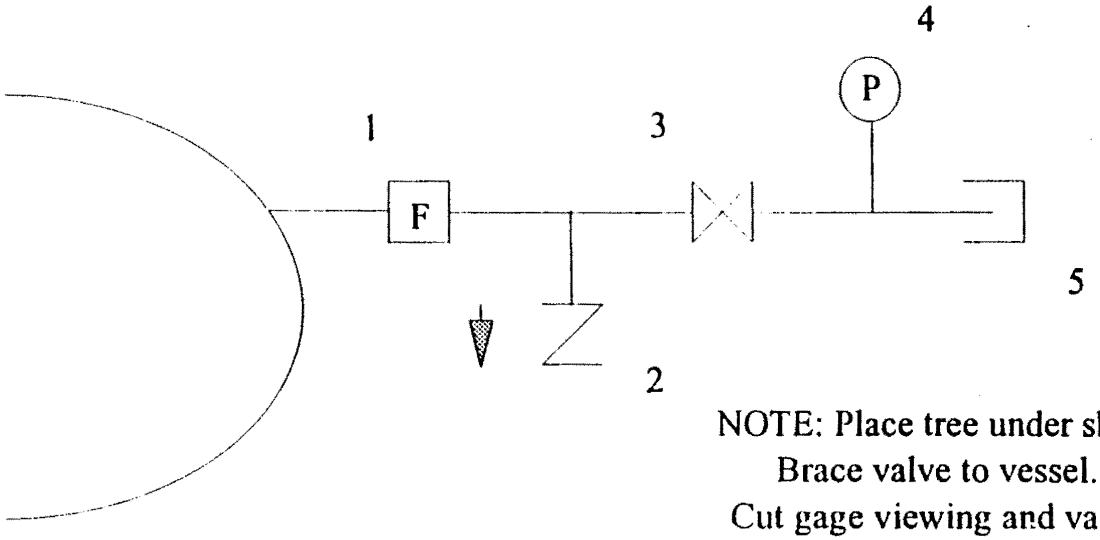
B. T. Reich, NMT-7, MS J594
M. F. Stevens, NMT-5, MS E506
Author file
NiTR file

Tritium Co-contaminated Transuranic Waste Package



NOTE: Skirts not shown.

Full penetration
Inert gas blanket back side of weld.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve
access hole in skirt

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3. Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale
R Wieneke 08/23/9

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: M. S. Blau, NMT-5, MS E501

DATE: January 9, 1994

THRU: J. J. Balkey, NMT-2, MS E501 9/B

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-94-010

SUBJECT: **MC&A CONSIDERATIONS FOR THE PACKAGING OF SPECIAL RECOVERY LINE WASTE**

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D. R. Wulff, NMT-2, MS E501
Author file
NiTR file

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO R. E. Wieneke, NMT-2, MS E501 DATE October 1, 1993

FROM Dan Taggart, EM-7 MAIL STOP/TELEPHONE J595/5-6149
Technical Staff Member

SYMBOL EM-7G-93-536

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05/14/97 07:43 FAX 001

HEALTH PHYSICS RADIOACTIVE MATERIALS SURVEY TAG

PM #5/6/97 Tag Number A 002946

Item Description torpedo

Check categories that apply:

- ☐ Surface Contamination
- ☒ Potential Internal Contamination
- ☐ Induced "Volume" Contamination
- ☐ Contaminated Laundry Enclosed (no contamination on exterior of bag at time of survey)
- ☒ Radioactive Material/Source Radionuclide(s) _____

Survey of Bare Materials

Contamination Survey Results

Alpha	N/A	dpm/100 cm² direct	N/A	dpm/100 cm² removable
Beta/Gamma	N/A	dpm/100 cm² direct	N/A	dpm/100 cm² removable
		tritium	N/A	dpm/100 cm² removable

External Radiation Survey Results (measured or estimated)

	At Contact	At 30 cm (1 foot)	At 1 meter
Beta - Gamma	N/A mrem/hr	N/A mrem/hr	N/A mrem/hr
Neutron	N/A mrem/hr	N/A mrem/hr	N/A mrem/hr
Total	N/A mrem/hr	N/A mrem/hr	N/A mrem/hr

Survey of Packaged/Shielded Material

Removable Contamination Survey Results (dpm/100 cm²)

Alpha NDA Beta/gamma NDA Tritium N/A

External Radiation Survey Results

	At Contact	At 30 cm (1 foot)	At 1 meter
Beta - Gamma	0 mrem/hr	0 mrem/hr	0 mrem/hr
Neutron	0.3 mrem/hr	0.2 mrem/hr	0.2 mrem/hr
Total	0.3 mrem/hr	0.2 mrem/hr	0.2 mrem/hr

	Instrument Manufacturer	Model Number	HSE Number (PN)
1.	LUDLUM	139	7604-5-31-96
2.	Eberline	903C	2625-11-15-96
3.	Eberline	PNR-4	5211-2-21-97
4.			
5.			

Comments/Controls: High Swipes (NDA) Wipe Smears (NDA)

RCT Ronald Chavez (Print name) (Signature) Survey Date 09/20/96

Complete below if conditional (controlled) release of contaminated item for use only in a Controlled or Radiological Area:

Individual Authorizing Release _____ (Print name) Group _____ Phone _____

_____ (Signature) Date _____

Note: Signature verifies that exterior and interior surfaces of the item have been monitored according to LANL requirements.

☐ Based on knowledge of process, no interior monitoring is required.

ESH 02-3048

Attachment 1

A FORM
DRUMS

EDO
/96

432 Drums

al. Void Date 5-31-96
al. Void Date 11-15-96
al. Void Date 2-21-97

er rough swipe Yes ___ No X

iner	Ø	mR/hr
iner	Ø	mR/hr
tainer	0.3	mrem/hr
tainer	0.2	mrem/hr
	0.3	mrem/hr

ial Survey Room 401 Drums

/96

er rough swipe Yes ___ No X

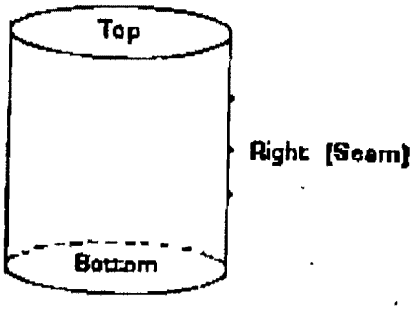
al. Void Date 5-31-96
al. Void Date 11-15-96
al. Void Date 2-21-97
al. Void Date ___

ner	Ø	mR/hr
ner	Ø	mR/hr
ainer	Ø	mR/hr
ainer	0.3	mrem/hr
ainer	0.2	mrem/hr
Highest Neutron Dose Rate, one meter from container	0.2	mrem/hr
Total of CONTACT readings:	0.3	mrem/hr

Maximum Alpha Smear HPAL Results NDA dpm/100 cm²

Maximum Beta Smear HPAL Results NDA dpm/100 cm²

Date HPAL results returned 9/12/96



znumber	event	edate	valid
087896	CERTIFIED	8/13/96	0
093089	CERTIFIED	8/13/96	0
093089	CERTIFIED	8/13/96	0
093089	CERTIFIED	8/13/96	0
093089	CERTIFIED	8/13/96	0
093089	CERTIFIED	8/13/96	-1
087896	ACCOUNT	9/12/96	0
087896	CLOSED	9/12/96	0
087896	CLOSED	9/12/96	0
087896	CLOSED	9/12/96	0
087896	CLOSED	9/12/96	0
087896	CLOSED	9/12/96	0
087896	CLOSED	9/12/96	0
087896	CLOSED	9/12/96	-1
093089	CERTIFIED	9/12/96	0
093089	CONFIRMED	9/12/96	-1
112026	SURVEYED	10/18/96	0
112026	SURVEYED	10/18/96	0
112026	SURVEYED	10/18/96	0
113319	CONFIRMED	2/10/97	0
087896	TEAM	2/24/97	0
112026	SURVEYED	2/25/97	-1
093089	ACCOUNT	3/25/97	0
093089	TEAM	3/25/97	0
093089	ACCOUNT	4/3/97	0
093089	ACCOUNT	4/3/97	0
093089	TEAM	4/3/97	0
093089	TEAM	4/3/97	0
093089	ACCOUNT	4/17/97	-1
093089	TEAM	4/17/97	-1
099731	GROUP	4/17/97	-1
078418	QA	4/22/97	-1
095222	PRINT	4/24/97 12:46:21 PM	-1
095222	PRINT	4/24/97 12:46:22 PM	-1
095222	PRINT	4/24/97 12:47:00 PM	-1
095222	PRINT	4/24/97 12:47:01 PM	-1

~~Michael~~ Hallezos

← Michael

14-MAY-97 TRU WASTE MANIFEST Page 1
56197

*** IN CASE OF EMERGENCY CALL 505-667-6211 ***

SHIP FROM	SHIP TO
TWSR #: 56197 Requestor: MICHAEL E GALLEGOS Z #: 076118 Phone: 70541 TA: 55 Bldg: PF4	EM-SWO Phone: 505-665-6158 Solid Radioactive Waste Management Los Alamos National Laboratory Location TA-54___ Area-L___ Area-G___ TA-50___ Bldg-1___ Bldg-37___ Transporter: LANL

Line Item	HM	DOT Shipping Description	Containers No./Type		Total Quantity	Unit / Vol
1	x	RQ, RADIOACTIVE MATERIAL, N.O.S.,7,UN2982	1	CM	2480	P

56197: Solid,Elemental, AM241, H3, PU238, PU239, PU240, PU241, PU242, ~~1.002e+02TBq(2.707e+03Ci)~~ 100.5 TBq, T.I.=0.2 RADIOACTIVE YELLOW II, Fissile EXCEPTED 2717 Ci

WASTE REVIEW
APPROVED ☑
DISCREPANCY ☐
5/15/97 12:20 JB

7.663

ADDITIONAL DESCRIPTIONS FOR MATERIALS LISTED ABOVE
ERG#: 163

Road Closure Required
SPECIAL HANDLING INSTRUCTIONS AND ADDITIONAL INFORMATION

THIS IS TO CERTIFY THAT THE ABOVE-NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, LABELED, AND PLACARDED; ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION; AND MEET THE WASTE ACCEPTANCE CRITERIA OF EM-SWO

PRINTED/TYPED NAME	SIGNATURE	DATE
Jackie Bustamante	X Jackie Bustamante	5/22/97

TRANSPORTER ACKNOWLEDGEMENT OF RECEIPT OF MATERIALS

PRINTED/TYPED NAME	SIGNATURE	DATE
J. J. LUJAN	X J. J. Lujan	5/22/97

Los Alamos
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

TRITIUM Pressure Vessel TA-55-1376

LA00000056197

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code	N/A	Inspected Items	
Year of Manufacture	N/A	☐ N/A Ring, Bolt, and Nut	☐ N/A Chime	☑ Dents
Box Serial Number	N/A	☑ Lid and Gasket	☑ Gouges	☑ Paint
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.		Printed Name MICHAEL V GALLEGOS	Date ~~SEP 12-96~~ 9/12/96 DGS per WMC 5/13/97
		Signature Michael Gallegos	

2. GENERATOR'S PACKAGE INFORMATION

Group NMT-7	Technical Area DGS TA-55	Building 2F-4	Program Code ~~KB14~~ KF14	Normal ☑ Yes ☐ No	
Additional Information Liner = ~~304S~~ 3x30gal drums Twice Secondary 168#.96Lbs (56193) DGS Per					
0.7075m³ Torpedo Tube WMC 5/13/97					
Rough swipes (alpha) N.D.A.					
Ludlum-139 # 76047 void 5-31-97					

CODE	CONTAINER	INTERNAL SHIELDING	
		Type	Thickness (in.)
01	☐ Steel Drum (55 gal.)	☒ None	
02	~~☒ Standard Waste Box~~ DGS Per WMC 5/13/97		
03	☒ Other (Call TWCO)		
04	☐ RH Canister		

Waste Profile Request Number	216018
Carbon Filter ID 01	N/A
02	N/A
Process Batch Code	N/A
Gross Weight (lb.)	2.48E+3
Organic Material Wt. (lb.)	1.46E+1
Organic Material Volume (%)	10
TRUCON Code	117B
Date Closed (MMDDYY)	091296

RADIONUCLIDE CONTENT

Material Type ☒ Yes ☐ No 5287

Nuclide	Amount	Uncertainty **	C=Curie M=Gram
Pu-238	4.3101E-04	1.4101E-04	M
Pu-239	4.0133E-10	1.3113E-10	M
Pu-240	2.5180E-01	8.4101E-02	M
Pu-241	8.6101E-03	2.8101E-03	M
Pu-242	8.6101E-04	2.8101E-04	M
Am-241	6.8317E-03	2.2126E-03	M
H-3	2.8101E-01	0.0101E-10	M
	E	E	

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
None		

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures. 2/24/97 PG Per

Printed Name	Signature	Date
MICHAEL V GALLEGOS	Michael V Gallegos	~~2-24-96~~ 2/24/97

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (mrem/h)	0.0E+0	Survey Meter Model B03C	Property Number 3628	Calibration Void Date 11-15-96
Neutron Dose Rate (mrem/h)	3.0E+0	Survey Meter Model PNR-4	Property Number 4904	Calibration Void Date 12-17-96
Total Dose Rate (mrem/h)	3.0E+0	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (dpm/100cm²)	0.0E+0	Printed Name EDUARDO ESTRADA		Date 09-30-96
Beta-Gamma Cont. (dpm/100cm²)	0.0E+0	Signature Eduardo Estrada		

Water T.I. = 0.2 mrem/h PG 5/14/97

4. CST-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by CST-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.	Printed Name Darrick G. Stafford	Date 5/14/97
	Signature Darrick G. Stafford	

Form 1562 (2/94) Shipping Category - NONE, tritium contaminated

* See memo NMT-7-WM/EC-96-133 ** $\sqrt{\Sigma \sigma^2}$

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered in Database	05	30	97	[illegible]	[illegible]
Date Entry Verified	05	31	97	Charlotte Fernandez	Charlotte Fernandez

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number	Date (*Inspection Valid for 30 Days*)
	1 INSPECTOR Rm	5-21-97

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	0.1 E +/- 0	Survey Meter Model RO-7D	Property Number 3448	Calibration Void Date 7/9/97
Neutron Dose Rate (*mrem/h*)	0.0 E +/- 0	Survey Meter Model ESP-2	Property Number 6110	Calibration Void Date 8/25/97
Total Dose Rate (*mrem/h*)	0.1 E +/- 0	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*)	0.0 E + 0	Printed Name Gary Hagerman		Date 5/23/97
Beta-Gamma Cont. (*dpm/100cm²*)	0.0 E + 0	Signature [signature]		

8. STORAGE SITE INFORMATION

Received By (*Initials*)	Date Received	ORIGINAL STORAGE DATA		
Rm	5-22-97	Building Number 283 +53 RM	Layer Holding Area	Row Number
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Column Number	Date Stacked (*MM,DD,YY*)	
Printed Name Ricky MARTINEZ	Date 5-22-97	Printed Name Rick Martinez		Date 5-29-97
Signature [signature]		Signature [signature]		

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name Rick Martinez	Date 6-27-97
	Signature [signature]	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date
				97-002	DG 05/14/97

11. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y	Printed Name	Signature
Date Entered In Database	06	27	97	Charlotte Fernandez	Charlotte Fernandez
Date Entry Verified	06	27	97	Tammy Lash	Tammy Lash

12. DUPLICATE COPY

	M M	D D	Y Y	Printed Name	Signature
Date Duplicate Filed	06	27	97	Charlotte Fernandez	Charlotte Fernandez

To: cgf@lanl.gov
From: "Darrik Stafford, FWO-SWO" <dstafford@lanl.gov>
Subject: TRU Package 56197
Cc: kja@lanl.gov, jemh@lanl.gov, andym@lanl.gov, kkg@lanl.gov, armijoj@lanl.gov
Bcc:
Attached:

Kellie et. al.,

I have completed updating the WAC Exception notation on the TWSR originals identified that had this entry missing (back side of TWSR). However, TRU Package 56197 (A Torpedo Tube shipped 05/22/97) appears to have been mis-filed, or is missing (Original only).

We have a COPY of the package in our backup files. I have placed another COPY of the backup file in place of the Original as a place holder, until the missing package is found.

A hardcopy of this e-mail will be attached to the 56197 file.

Thanks, Darrik

DCS 04/04/00

LA00000056197

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 26048

11-Apr-1997 01:00 AM (Version: 1) p.1

Generator :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z#:	099731
WMC :	GRUETZMACHER, KATHLE	MS :	E501	PH :	54356	Z#:	099731
CSR :	STAFFORD, DARRIK	MS :	J593	PH :	54000	Z#:	110010
Status :	ACTIVE	Activation Date :	10-APR-97		Expiration Date:		10-APR-98
Group :	NMT7	TA :	55	Bldg :	000004	Room:	432

RMMA : **RADIOACTIVE MATERIALS MANAGEMENT AREA (RMMA)**
Waste Accumu : N/A
Method of Char : **KNOWLEDGE OF PROCESS (KOP)**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **ON-GOING GENERATION**
RADIOACTIVE
Assoc Docum: **WM SOP# DP01**
Other SOP# WODF

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**
MAINTENANCE
MATERIAL PROCESSING
RESEARCH AND DEVELOPMENT

Waste Matrix : **SOLID**

Matrix Type : **HETEROGENEOUS**

Waste/Proc Desc : TRUCON CODE 117A, 117B, 117D, NON-PU238 WASTE METAL FROM PLUTONIUM PROCESSING ACTIVITIES WITH NO KNOWN HAZARDOUS CONSTITUENTS, ALSO CONTAMINATED WITH TRITIUM. TRUWM-TA55-DP-01, INSPECTION AND PACKAGING OF CERTIFIABLE COMBUSTIBLE AND NON-COMBUSTIBLE TRU WASTE. WASTE ORIGINATION AND DISPOSITION FORM (WODF).

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				
BARIUM	Y				
CADMIUM	Y				
CHROMIUM	Y				
LEAD	Y				
MERCURY	Y				
SELENIUM	Y				
SILVER	Y				

Toxicity Characteristic Organic Compounds: N/A

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
BAGOUT BAGS		1	5	%
DISCARDED TOOLS		0	10	%
FLANGES		0	10	%
PIPING		0	20	%
SCRAP METAL (BERYLLIUM, STEEL, COPPER)		50	80	%
TANKS (EMPTY)		0	10	%
VALVES		0	10	%

Radiological Characteristics :

Radionuclide	Min	Max	Unit
AM241	0.000E+00	5.660E-02	CIG
PU238	0.000E+00	1.320E-03	CIG
PU239	0.000E+00	9.770E-04	CIG
PU240	0.000E+00	8.170E-04	CIG
PU242	0.000E+00	1.330E-05	CIG
H3	0.000E+00	2.000E-02	CIG
PU241	0.000E+00	4.990E-02	CIG
U235	0.000E+00	2.690E-08	CIG
U238	0.000E+00	4.130E-09	CIG
NP237	0.000E+00	3.660E-08	CIG
PU244	0.000E+00	1.850E-11	CIG

Rad Contamination Type : **SURFACE CONTAMINATION**

Waste Water Contaminants : N/A

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **Transuranic Waste**

RCRA Category : **Non-hazardous Waste**

Misc. Category : N/A

Waste Classification : **TRANSURANIC WASTE**

EPA Hazardous Waste Code : N/A

Los Alamos
NATIONAL LABORATORY

DISCARDABLE WASTE LOG SHEET

LA00000056197

Item ID	Matrix	Pkg Wt (kg)	Qty	Org Vol %	Org Wt(kg)	Packed By	Date	MT	SNM(g)	Uncert(g)	Pg/Section/Ln OR Memo
METSRL4	Metal (Non-Pu Scrap)	358.68		6.60	6.60	WULFF	MAR 25 1997	52	4.300	1.400	8/14
								87	0.280	0.000	5/0

Total Pkg Wt (lbs)	790.75
Drum Tare (lbs)	1684.96
Calc Gross Wt (lbs)	2475.71
Meas Gross Wt (lbs)	2475.99
Organic Wt (lbs)	14.55
Organic Volume %	10.00

MT	Total SNM	Total Uncert
52	4.300	1.400
87	0.280	0.000

DISCARDABLE WASTE LOG SHEET

Effective Date 08/01/94

Page 1 of 1 Pages

LA000000056197 — WASTE PACKAGE SERIAL NUMBER

N-Comb ☑ Comb ☐ Pu-238 ☐

Two Drum Liners Installed: NA

Install/Tighten Carbon Filter(s): NA

RH waste: N

Lead shielding: N

1/8 Inch Drum Liner: N

CONTAINER: Open ☑ In-Line ☐

Assay Instrument Type: NEUTRON ☑ GAMMA ☐

Tighten Lockout or Box Plugs: NA

TID#: Welded Shut

Date TIDed: _____

ITEM NO	ITEM ID	PKG WT Kg	MATRIX (MATERIAL)	MT	SNM GRAMS	UNCRT +/- GRAMS	ITEM SNM g + 2x UNCERT	SNM g+2x UNCERT. running total	CERTIFIED PERSONNEL	REMARKS (Wt in Kg) ORGANICS V%	ORGANICS WT.	HAZARDOUS MATERIALS	OTHER REMARKS	AUTH. PG/LN	DATE mm/dd/yy
0	METSRL4	346.32	METAL	81	0.28	0.00	0.00	0.28	[illegible]			None		8/14	
1				≤2	4.3	1.4									
2															
3															
4															
5															
6															
7	STYROFOAM	10.16													
8	Welded	2.20													
9															

TOTAL Pkg wt Kg X 2.2046 = Pkg wt Lbs (#)	358.68	790.15	NMT-2 Gross Wt. Check Initials: MG	81	0.28	0.00	X		TOTALS	12.36	12.36	Haz-Mat	None
+DRUM/BX TARE #	1684.95								Organics wt (kg) x 2.2046 = wt (lbs)	27.25		NMT-4 Assay Value	
= CALC GROSS #	2475.10		Acntability Check Init.						QA Pkg Approval			Instrument ID	SEE MEMO FOR
SCALE GROSS #	2475.99											Date	RESULTS NMT-04-96-463
												NMT-4 Sign.	

This container's waste was packaged and the NMT-2 data on the DWLS and the CWSR were collected according to procedures defined in the Los Alamos Certification Plan and the appropriate attachment(s).

NMT-2 Signature _____

Los Alamos
NATIONAL LABORATORY

memorandum

Nuclear Materials Technology Division
NMT-4, Nuclear Materials Measurement & Accountability

To/MS: Timothy A. Ayers, FSS-12, MS G735
Thru: Dennis L. Brandt, NMT-4, MS E513
From/MS: Jack E. Malcom, NMT-4, MS E513
Charles A. Bonner, NMT-4, MS E513
Phone/FAX: 5-0913/FAX 5-6160
Symbol: NMT-04-96-463
Date: December 11, 1996

SUBJECT: NEUTRON MEASUREMENT OF WASTE ITEMS IN NMT-7'S PAD STORAGE AREA

Neutron assay (i.e. measurement code NNMT) has been completed on the following items located at the waste management's outside storage area.

METSRL4

DATE	ITEM	TOTAL Pu (g)	
6-Nov-96	METSRL4 Tritium Tank	4.3	+/- 1.4
14-Nov-96	Rm106GB/2046039	0.1	+/- 0.85

ITEM DESCRIPTIONS: Tritium Tank is a 12 ft. long by 20 in. diameter stainless steel tube. Glove box and pieces packed in a white metal box

	Width	Height	Length
Rm106GB/2046039	4 ft.	7 ft.	8 ft.

MEASUREMENT SYSTEM: He^3 in four poly slabs 15"wide by 46"tall by 6" thick with JSR 11 coincidence counter

MEASUREMENT PERSONNEL: Jack E. Malcom and Jody E. Martinez

CALIBRATION STANDARD: STDSGPD1

MINIMUM DETECTABLE QUANTITY: The 3-sigma detection limit was calculated by dividing the standard deviation of the background runs by the calibration constant times three. This value, 1.0 gram plutonium at three sigma, is used to estimate the sensitivity of the system for this application.

BACKGROUND AND CALIBRATION CONSTANT (K)

BKG REALS = 0.2 +/- 0.016 reals/sec K = 0.06 reals/gram

CAB / JEM

Distribution:
Lorenzo A. Trujillo, NMT-7, MS E501
Teresa L. Cremers, NMT-4, MS E513
R. Naomi Hapke, NMT-4, MS E513
Victoria L. Longmire, NMT-4, MS E513
Relf L. Price, NMT-4, MS E513
Dennis R Wulff, NMT-7, MS E501
Eddie A. Trujillo, NMT-6, MS E510
NMT-4 Reading File

To: SMTP[ksmith@lanl.gov]
From: Kathleen Gruetzmacher@NMT7
Cc:
Bcc:
Subject: "Torpedo" LA00000056197
Attachment:
Date: 3/26/97 10:31 AM

Kathy - no confirmation assay will be done on this container. The measurement done by NMT-4 has been approved by FSS and NMT-4 Accountability. We can put a note on the drum package in the WMS or ask Lynn Foster to approve the lack of a confirmation assay. How would you like to handle this?

Thanks, Kathleen

Los Alamos
NATIONAL LABORATORY
memorandum

Waste Management and Environmental Compliance
NMT-7, MS E501

To/MS: Kathleen Gruetzmacher, NMT-7, MS E501

From/MS: William Schueler
Phone/FAX: 667-1193/667-9201
Symbol: NMT-7-WM/EC-96-032
Date: March 6, 1996

SUBJECT: Am-241 CONTENT IN SOLID TRANSURANIC WASTE

Using an Excel program from NMT-4, ISOPOW, I have calculated the Am-241 content of Plutonium contaminated waste. Several assumptions were made to derive these numbers. They were:

1) The oldest weapons grade plutonium in inventory dates back to 1 January, 1960. Pu-238 dates back to 1 January, 1982
2) The original Am-241 content is zero.
3) The isotopic breakdown of the original plutonium is the same that is being used now.
4) The processes that generate solid waste do not involve the concentration of Am-241.
5) Parts per million is one-to-one equivalent to grams Am-241 to grams plutonium.
6) For ease of calculation, the date the waste is packaged on is 1 January, 1996, making the plutonium 36 years old.

This information is to be used until such a time that Am-241 can be reliably measured with NDA equipment, and at that time the NDA results should be used for future waste generated.

MT		PPM	g Am/g Pu	Ci Am/g Pu	mW/g Pu
51		605.03	6.05E-4	2.099E-3	2.18433
52		1593.79	1.59E-3	5.530e-3	2.46255
53		2921.37	2.92E-3	1.014E-2	2.82607
54		6412.58	6.41E-3	2.225E-2	3.45258
55		8268.19	8.27E-3	2.869E-2	3.89203
56		9503.57	9.50E-3	3.298E-2	4.12256
57		20754	2.08E-2	7.202E-2	7.25042
42	84%	25611.05	2.56E-2	8.887E-2	8.30671
	90%	15044.19	1.50E-2	5.220E-2	5.36232
	95%	7263.76	7.26E-3	2.521E-2	3.07238
83	83%	1706.00	1.71E-3	5.920E-3	468.82149
	89%	112.47	1.12E-4	3.903E-4	500.69611

Drum or Box ID	LA000000 56197	Name: K.M. Gruetzmacher	04/03/97

Table I below is a table of average values prepared by Joe Wachter, NMT-4, to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%	PU 240 (gram%	PU 241 (gram%	PU 242 (gram%	PU 244 (gram%	sum by MT (gram%)
MT 51	0.006	96.77	3.13	0.076	0.018	0	100
MT 52	0.01	93.78	6	0.2	0.02	0	100.01
MT 53	0.03	91.08	8.45	0.366	0.071	0	99.997
MT 54	0.046	87.4	11.5	0.8	0.2	0	99.946
MT 55	0.06	83.88	14.73	1.03	0.304	0	100.004
MT 56	0.061	81.9	16.31	1.18	0.355	0	99.806
MT 57	0.433	74.63	20.7	2.55	1.69	0	100.003
MT 42							
0.84	1.02	1.37	10.32	3.13	84.14	0.02	100
0.90	0.7	1.26	6.4	1.86	89.77	. 0	99.99
0.95	0.45	0.56	2.47	0.906	95.58	0.029	99.995
MT 83							
0.83	83.89	13.8	1.9	0.32	0.09	0	100
0.89	89.26	10.07	0.633	0.021	0.015	0	99.999

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III.

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	4.3	0.00043	4.03254	0.258	0.0086	0.00086	0	4.30043
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
TOTALS	4.3	4.300E-04	4.033E+00	2.580E-01	8.600E-03	8.600E-04	0.000E+00	4.30E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	4.3	0.007439	0.253646766	0.05934	0.8944	3.4142E-06	0	1.21482918
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0.84	0	0	0	0	0	0	0	0
0.9	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
MT 83								
0.83	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0

	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Totals (Ci)	7.439E-03	2.536E-01	5.934E-02	8.944E-01	3.414E-06	0.000E+00	1.215E+00
Totals (TBq)	2.752E-04	9.385E-03	2.196E-03	3.309E-02	1.263E-07	0.000E+00	4.495E-02

	total weight (g)	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Grams	4.300E+00	4.300E-04	4.033E+00	2.580E-01	8.600E-03	8.600E-04	0.000E+00	4.300E+00
Curies		7.439E-03	2.536E-01	5.934E-02	8.944E-01	3.414E-06	0.000E+00	1.215E+00
Pu FGE		4.859E-05	4.033E+00	5.805E-03	1.935E-02	6.450E-06	0.000E+00	4.058E+00
Decay Heat (W)		2.464E-04	7.863E-03	1.847E-03	2.847E-05	1.006E-07	0.000E+00	9.986E-03
PE Activity (Ci)		6.763E-03	2.536E-01	5.934E-02	1.720E-02	3.104E-06	0.000E+00	3.370E-01

	Weight (g)	Ci	Pu FGE	Decay Heat (W)	PE Activity (Ci)
Am 241	6.837E-03	2.372E-02	1.279E-04	7.931E-04	2.372E-02
Other	4.300E+00	1.215E+00	4.058E+00	9.986E-03	3.370E-01
Total for Drum	4.307E+00	1.239E+00	4.058E+00	1.078E-02	3.607E-01
alpha Ci		3.442E-01			

specific activity
TRUPACT-II SAR
this sheet rev. 6/24/98

Drum or Box ID	LA000000 56197	Name: K.M. Gruetzmacher	04/03/97

Table I below is a table of average values prepared by Joe Wachter, NMT-4 to be used to calculate the Curie values by isotope for different material types (see 11/10/93 and 11/23/93 memos from Joe)

TABLE I

AVERAGE ISOTOPIC VALUES (% BY GRAMS) FOR VARIOUS MATERIAL TYPES AND ENRICHMENTS USED AT TA-55

MT	PU 238 (gram%)	PU 239 (gram%	PU 240 (gram%	PU 241 (gram%	PU 242 (gram%	PU 244 (gram%	sum by MT (gram%)
MT 51	0 006	96 77	3 13	0 076	0 018	0	100
MT 52	0 01	93 78	6	0 2	0 02	0	100 01
MT 53	0 03	91 08	8 45	0 366	0 071	0	99 997
MT 54	0 046	87 4	11 5	0 8	0 2	0	99 946
MT 55	0 06	83 88	14 73	1 03	0 304	0	100 004
MT 56	0 061	81 9	16 31	1 18	0 355	0	99 806
MT 57	0 433	74 63	20 7	2 55	1 69	0	100 003
MT 42							
0 84	1 02	1 37	10 32	3 13	84 14	0 02	100
0 90	0 7	1 26	6 4	1 86	89 77	0	99 99
0 95	0 45	0 56	2 47	0 906	95 58	0 029	99 995
MT 83							
0 83	83 89	13 8	1 9	0 32	0 09	0	100
0 89	89 26	10 07	0 633	0 021	0 015	0	99 999

-1 2027

Table I above is used to calculate the gram values for each MT by isotope in Table II below. Fill in gram amount of material type in shaded area of Table II to have Curie amounts calculated in Table III

TABLE II

ISOTOPIC GRAM VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (gm)	PU 239 (gm)	PU 240 (gm)	PU 241 (gm)	PU 242 (gm)	PU 244 (gm)	sum by MT (gm)
MT 51	0	0	0	0	0	0	0	0
MT 52	1 4	0 00014	1 31292	0 084	0 0028	0 00028	0	1 40014
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0 84	0	0	0	0	0	0	0	0
0 90	0	0	0	0	0	0	0	0
0 95	0	0	0	0	0	0	0	0
MT 83								
0 83	0	0	0	0	0	0	0	0
0 89	0	0	0	0	0	0	0	0
TOTALS	1 4	1 400E-04	1 313E+00	8 400E-02	2 800E-03	2 800E-04	0 000E+00	1 40E+00

Table II above is used to calculate the Curie values for each MT by isotope in Table III below

TABLE III

ISOTOPIC CURIE VALUES FOR MATERIAL TYPE FOR THIS WASTE DRUM OR BOX

MT	total weight (gm)	PU 238 (Ci)	PU 239 (Ci)	PU 240 (Ci)	PU 241 (Ci)	PU 242 (Ci)	PU 244 (Ci)	sum by MT (Ci)
MT 51	0	0	0	0	0	0	0	0
MT 52	1 4	0 002422	0 082582668	0 01932	0 2912	1 1116E-06	0	0 39552578
MT 53	0	0	0	0	0	0	0	0
MT 54	0	0	0	0	0	0	0	0
MT 55	0	0	0	0	0	0	0	0
MT 56	0	0	0	0	0	0	0	0
MT 57	0	0	0	0	0	0	0	0
MT 42								
0 84	0	0	0	0	0	0	0	0
0 9	0	0	0	0	0	0	0	0
0 95	0	0	0	0	0	0	0	0
MT 83								
0 83	0	0	0	0	0	0	0	0
0 89	0	0	0	0	0	0	0	0

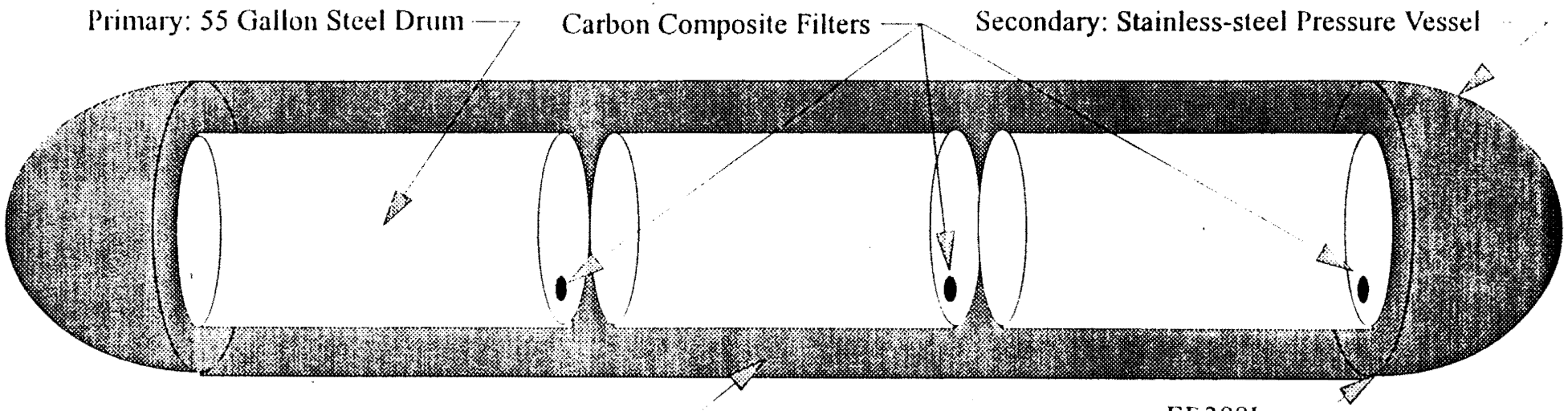
	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Totals (Ci)	**2.422E-03**	**8.258E-02**	**1.932E-02**	**2.912E-01**	**1.112E-06**	**0.000E+00**	**3.955E-01**
Totals (TBq)	8.961E-05	3.056E-03	7.148E-04	1.077E-02	4.113E-08	0.000E+00	1.463E-02

	total weight (g)	PU 238	PU 239	PU 240	PU 241	PU 242	PU 244	sum by Pu MT
Grams	1.400E+00	1.400E-04	1.313E+00	8.400E-02	2.800E-03	2.800E-04	0.000E+00	1.400E+00
Curies		2.422E-03	8.258E-02	1.932E-02	2.912E-01	1.112E-06	0.000E+00	3.955E-01
Pu FGE		1.582E-05	1.313E+00	1.890E-03	6.300E-03	2.100E-06	0.000E+00	1.321E+00
Decay Heat (W)		8.022E-05	2.560E-03	6.014E-04	9.268E-06	3.276E-08	0.000E+00	3.251E-03
PE Activity (Ci)		2.202E-03	8.258E-02	1.932E-02	5.600E-03	1.011E-06	0.000E+00	1.097E-01

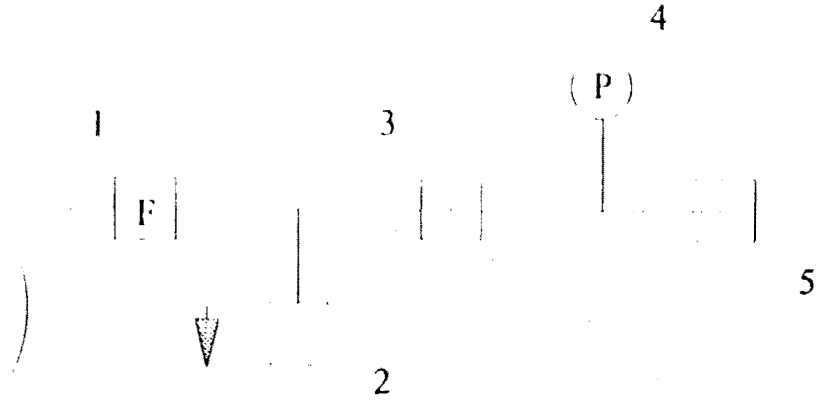
	Weight (g)	Ci	Pu FGE	Decay Heat (W)	PE Activity (Ci)
Am 241	2.226E-03	7.724E-03	4.163E-05	2.582E-04	7.724E-03
Other	1.400E+00	3.955E-01	1.321E+00	3.251E-03	1.097E-01
Total for Drum	**1.402E+00**	**4.032E-01**	**1.321E+00**	**3.509E-03**	**1.174E-01**
alpha Ci		**1.120E-01**			

specific activity
TRUPACT-II SAR
this sheet rev 6/24/98

Tritium Co-contaminated Transuranic Waste Package



NOTE: Skirts not shown.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve

1. Filter: Nupro In-line
SS-6F-60
2. Valve, Relief: Nupro
SS-4CPA2-EP-150
3.Valve: Nupro Bellows
SS-4BG-TN3-VP
4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: D. P. Taggart, EM-7, MS J595

DATE: August 23, 1993

THRU: B. J. McKerley, NMT-2, MS E501
J. J. Balkey, NMT-2, MS E501

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-93-168

SUBJECT: **PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

This memo outlines the packaging agreement for tritium contaminated transuranic waste from the Special Recovery Line (SRL) tear-out at TA-55, PF-4. This agreement was reached at a meeting at TA-54 on Tuesday, August 17, 1993 by the following personnel; Tom Bieniewski, Mike Blau, Davis Chistensen, Dan Taggart and Ron Wieneke.

The packaging configuration shall be as follows; 1) Tritium co-contaminated transuranic waste will be bagged out of the glovebox line in accordance with TA-55 procedures, or in the case of the decommissioned processing system; disassembled and bagged. Bags shall be sealed by the twist and tape method. 2) The bagged waste will be placed inside of 55 gallon drums which have had their interior surfaces painted with asphalt as a barrier to tritium permeation and are painted white on the outside with a red "T" for identification, as is the practice for packaging tritium contaminated wastes. The 55 gallon drum will act as the primary containment for the waste. This packaging configuration will protect JCI, Waste Management and NDA Personnel from the tritium in the waste. 3) The 55 gallon drums shall be closed and sealed with a TID, then sent to the Nondestructive Assay Laboratory for plutonium assay. 4) Upon completion of the assay, the drum shall be returned to Room 307/308 where tritium monitoring equipment and proper ventilation is available and the bung in the drum lid shall be replaced with a carbon composite filter. The carbon composite filter will contain the transuranics but allow gases, including tritium to vent to the secondary. The installation of the carbon composite filter will be done immediately prior to over-packing. 5) the drum shall then be placed inside of the special stainless-steel tritium containment vessel which will serve as a secondary containment. 6) As each drum is placed into the secondary, the annulus between the 55 gallon drum OD and the vessel ID will be filled with Linde® Type 4A molecular sieve which will absorb any tritium dioxide escaping the primary through the carbon composite filter. 7) The stainless-steel vessels will hold up to three 55 gallon drums. Upon filling the vessels, the heads will be welded in place sealing the vessel. 8) The top of the vessel will have a penetration for the attachment of a valve, pressure gauge, pressure relief valve and quick-connect. 9) The vessel shall be flushed and back-filled with helium for leak testing the closure weld. Helium back pressure and acceptable leak rate will be determined by EM-7.

Documentation will be in accordance with the LANL TRU Waste Certification Plan and Safe Operating Procedures (SOPs) at TA-55. Each 55 gallon drum will have a Waste Origination and Disposition Form filled out by the Generator, Waste Management and Nondistructive Analysis; a Waste Profile Form filled out by the generator and approved by EM-8; a Discardable Waste Log Sheet for each drum and a Transuranic Waste Storage Record for each drum. Drums will be identified with the standard bar code labels (LA0000000XXXXX) used for transuranic waste. In addition, a Transuranic Waste Storage Record shall be generated for the secondary. It will be a

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The system which is replacing the SRL will be used to conduct similar work and generate tritium co-contaminated transuranic waste. Although the volume of waste from this operation is not anticipated to be great, the packaging requirements need to be established. Please contact waste NMT-2 Waste Management when you are prepared the address this issue.

Your acceptance of this packaging configuration for interim storage of tritium co-contaminated transuranic waste at TA-54 is requested so that the decommissioning may proceed to meet programmatic commitments. If you need any further information or clarification of the packaging requirements as outlined above, please contact me at 5-0269 immediately.

Distribution: T. Bieniewski, MST-3, MS C345
M. S. Blau, NMT-5, MS E506
D. Christensen, EM-7, MS J595
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L. R. Field, MST-5, MS G730
J. R. Harper, EM-7, MS J595
D. E. Harvey, NMT-4, MS E513
J. W. Kreuger, EM-7, MS J595
D. B. LeBrun, NMT-7, MS J594
B. T. Reich, NMT-7, MS J594
M. F. Stevens, NMT-5, MS E506
Author file
NiTR file

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: M. S. Blau, NMT-5, MS E501 DATE: January 9, 1994

THRU: J. J. Balkey, NMT-2, MS E501 MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2 SYMBOL: NMT-2-NiTR-94-010

SUBJECT: **MC&A CONSIDERATIONS FOR THE PACKAGING OF SPECIAL RECOVERY LINE WASTE**

This memo addresses the Material Control and Accountability concerns associated with the packaging of tritium and tritium contaminated transuranic wastes from the Special Recovery Line tear-out in PF-4. Waste Management personnel must be present to inspect the 55 gallon drums as they are loaded into the stainless steel secondary. They will record the drum identification numbers, note their position inside of the secondary and place bar code labels on the secondary containment for identification. The inside of the secondary will be inspected prior to loading to assure that no unauthorized materials have been placed inside of it. They will also verify the integrity of Tamper Indicating Devices on the drums as they are loaded. The secondary cannot be left unattended until the head has been tacked in place and a paper TID placed over the pipe nipple so that no unauthorized material may be placed inside of the secondary container.

By following these procedures, the need for performing a confirmation assay (which would be very difficult and time consuming) will be waived. Contact me if you have any questions on these requirements.

Distribution: R. L. Price, NMT-4, MS E513
D. R. Wulff, NMT-2, MS E501
Author file
NiTR file

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: R. E. Wieneke, NMT-2, MS E501 DATE: October 1, 1993

FROM: Dan Taggart, EM-7 TELEPHONE: 1595/5-6149
Technical Staff Member

SYMBOL: EM-7G-93-536

SUBJECT: **RESPONSE TO NMT-2 NiTR-93-168: "PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

We agree with the packaging configuration described in NMT-2-NiTR-93-168 for the tritium and TRU contaminated waste from TA-55 with the following provisions. These provisions will help assure that each of the overpacked 55 gallon drums will be acceptable to WIPP in its own right and provide protection against pressurization of the secondary vessel by alpha radiolysis of the hydrogenous components of the waste.

- Massive objects, like vacuum pumps, must be braced to prevent them from shifting during handling.

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- Each 55 gallon drum shall have a standard 90 mil plastic drum liner. If the drum liner does not come with a lid, please place a 90 mil (approx.) sheet of plastic across the top. These plastic linings are intended to provide a little extra "dent" protection for the drum.

- Enough getter should be included to absorb all of the H_2 which may be generated due to alpha radiolysis of hydrogenous wastes for a period of 20 years. This will have the added effect of binding any HT which may be present in the waste. We estimate that 20 grams of ^{239}Pu could generate up to 6 atm-liters of H_2 per year in contact with hydrogenous materials, or 120 atm-liters in a 20 year period. If each waste drum contained hydrogenous wastes and 20 grams of ^{239}Pu, then the total H_2 production per year would have to be assumed to be 36 atm-liters.

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Waste Exception Form

WEF No. 97-002

Completed by Waste Generator

☐ On-going ☒ One-time	WPF No. 2604	CWDR/TWSR No.	Item Nos.

☐ Hazardous/Chemical ☐ Low-Level Waste ☒ Transuranic Waste
☐ Low-Level Mixed Waste ☐ Radioactive Liquid Waste ☐ Other _____

Waste Acceptance Criteria

Currently approved TRU containers include the following:
- 4-inch DOT-17C or 17H, 55-gal steel drums
- 85-gal steel drums used as overpacks
- 21-in. long - std. 25 in. long - 37 in. steel/stainless steel waste boxes (SWBs

other containers may be used for packaging TRU waste, but their use must be approved by the issuance of a Waste Exception Form

Reason for Variance from WAC and Justification

see attached

Requested by: (Print)	Requested by: (Signature)	Z Number	Date
KM GRUETZMACHER	KM Gruetzmacher	099731	5/14/97

Waste Management Facility Approval

Special Instructions and Comments

☐ Approved ☐ Rejected	Approved by: (Signature)	Z Number	Date
		113199	5/15/97

WM-F054, R.1 (3/97)

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: D. P. Taggart, EM-7, MS J595

DATE: August 23, 1993

THRU: B. J. McKerley, NMT-2, MS E501
J. J. Balkey, NMT-2, MS E501

MAIL STOP/TELEPHONE: MS E501 / 5-0269

FROM: R. E. Wieneke, NMT-2

SYMBOL: NMT-2-NiTR-93-168

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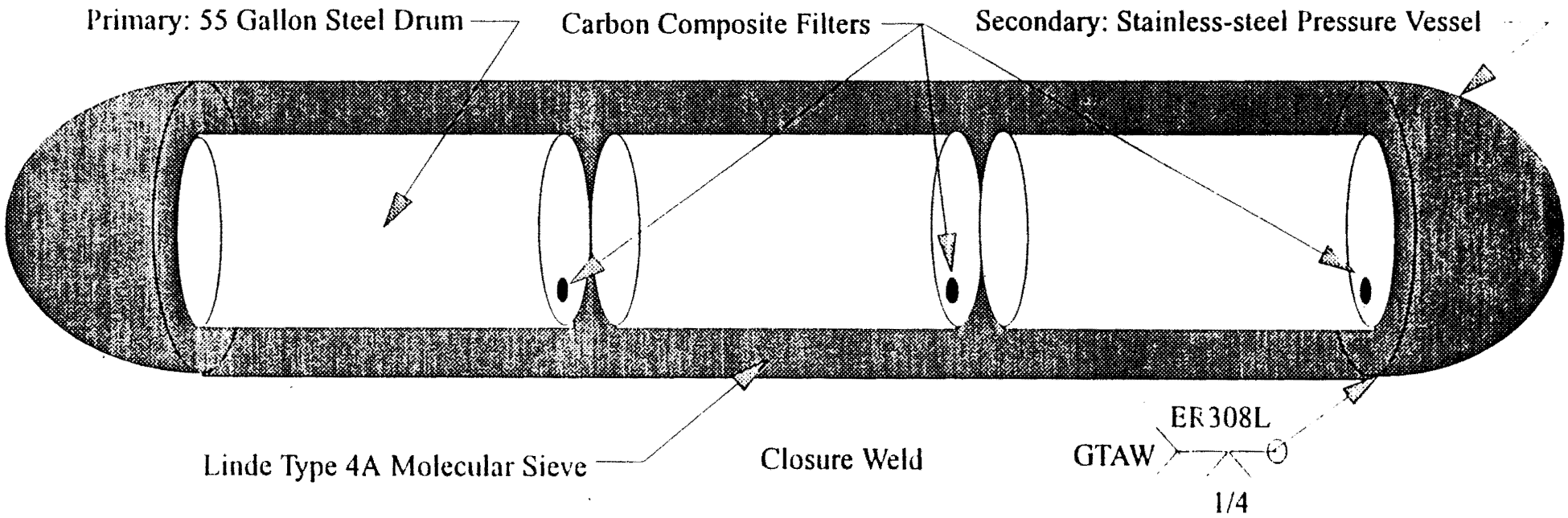
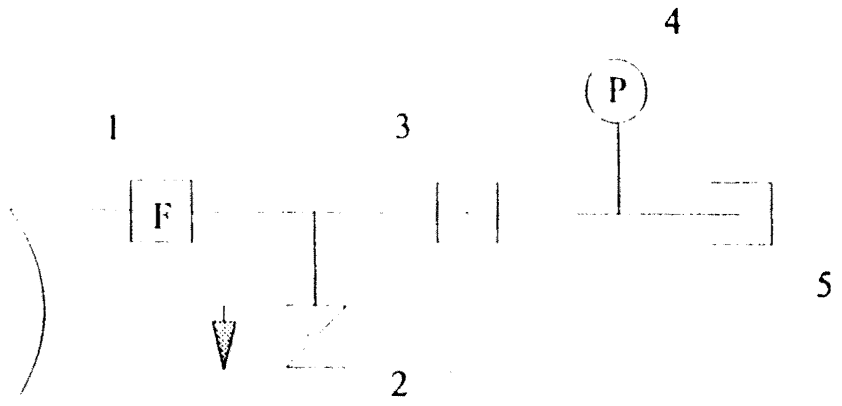
Author file
NiTR file

Tritium Co-contaminated Transuranic Waste Package



NOTE: Skirts not shown.

Full penetration
Inert gas blanket back side of weld.



NOTE: Place tree under skirt.
Brace valve to vessel.
Cut gage viewing and valve

1. Filter: Nupro In-line
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4. Gauge: Ashcroft SST
Stem & Welded Tube
5. Quick-Connect: Swagelok
SS-QC6-D-600

Not To Scale

R. Wiencke 08/23

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO	M. S. Blau, NMT-5, MS E501	DATE	January 9, 1994
THRU	J. J. Balkey, NMT-2, MS E501 JJB	MAIL STOP/TELEPHONE	MS E501 / 5-0269
FROM	R. E. Wieneke, NMT-2	SYMBOL	NMT-2-NiTR-94-010

SUBJECT: MC&A CONSIDERATIONS FOR THE PACKAGING OF SPECIAL RECOVERY LINE WASTE

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D. R. Wulff, NMT-2, MS E501
Author file
NiTR file

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: R. E. Wienecke, NMT-2, MS E501

DATE: October 1, 1993

FROM: Dan Taggart, EM-7
Technical Staff Member

MAIL STOP/TELEPHONE: J595/5-6149

SYMBOL: EM-7G-93-536

SUBJECT: **RESPONSE TO NMT-2 NiTR-93-168: "PACKAGING AGREEMENT FOR TRITIUM CONTAMINATED TRANSURANIC WASTE FROM TA-55**

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HEALTH PHYSICS RADIOACTIVE MATERIALS SURVEY TAG

5/01/94 — A 002946

PM _____ Tag Number _____

Item Description TORPEDO

Check categories that apply:

- ☐ Surface Contamination
- ☐ Induced "Volume" Contamination
- ☐ Contaminated Laundry Enclosed (no contamination on exterior of bag at time of survey)
- ☒ Radioactive Material/Source
- ☒ Potential Internal Contamination

Radionuclide(s) _____

Survey of Bare Materials

Contamination Survey Results

Alpha	N/A	dpm/100 cm² direct	N/A	dpm/100 cm² removable
Beta/Gamma	A	dpm/100 cm² direct	A	dpm/100 cm² removable
		tritium		dpm/100 cm² removable

External Radiation Survey Results (measured or estimated)

	At Contact	At 30 cm (1 foot)	At 1 meter
Beta + Gamma	N/A mrem/hr	N/A mrem/hr	N/A mrem/hr
Neutron	mrem/hr	mrem/hr	mrem/hr
Total	N/A mrem/hr	N/A mrem/hr	N/A mrem/hr

Survey of Packaged/Shielded Material

Removable Contamination Survey Results (dpm/100 cm²)

Alpha NDA Beta/gamma NDA Tritium N/A

External Radiation Survey Results

	At Contact	At 30 cm (1 foot)	At 1 meter
Beta - Gamma	0 mrem/hr	0 mrem/hr	0 mrem/hr
Neutron	0.3 mrem/hr	0.2 mrem/hr	0.2 mrem/hr
Total	0.3 mrem/hr	0.2 mrem/hr	0.2 mrem/hr

	Instrument Manufacturer	Model Number	HSE Number (PN)
1.	LUDLUM	139	7604-5-31-94
2.	Eberline	100C	2625-11-15-96
3.	Eberline	PNR-4	5211-2-21-97
4.			
5.			

Comments/Controls: Alpha Swipes (NDA) Neutron Survey NDA

RCT Ronald Chavez (Print name) Ronald Chavez (Signature) Survey Date 09/20/96

Complete below if conditional (controlled) release of contaminated item for use only in a Controlled or Radiological Area:

Individual Authorizing Release _____ (Print name) Group _____ Phone _____

_____ (Signature) Date _____

Note: Signature verifies that exterior and interior surfaces of the item have been monitored according to LANL requirements.

☐ Based on knowledge of process, no interior monitoring is required.

ESH 02-3048

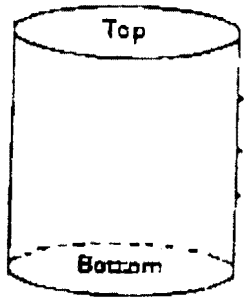
Highest Neutron Dose Rate, one meter from container 0.2 mrem/hr

Total of CONTACT readings: 0.3 mrem/hr

Maximum Alpha Smear HPAL Results NDA dpm/100 cm²

Maximum Beta Smear HPAL Results NDA dpm/100 cm²

Date HPAL results returned 9/12/96



Attachment 1

A FORM
DRUMS

EDO

96

432 Drums

al. Void Date 5-31-94
al. Void Date 11-15-96
al. Void Date 2-21-94

er rough swipe Yes ___ No X

iner 0 mR/hr
iner 0 mR/hr
tainer 0.3 mrem/hr
tainer 0.2 mrem/hr
0.3 mrem/hr

cial Survey Room 401 Drums

96

er rough swipe Yes ___ No X

al. Void Date 5-31-94
al. Void Date 11-15-96
al. Void Date 2-21-94
al. Void Date ___

ner 0 mR/hr
ner 0 mR/hr
ainer 0 mR/hr
ainer 0.3 mrem/hr
ainer 0.2 mrem/hr

)87896	CERTIFIED	8/13/96	0
)93089	CERTIFIED	8/13/96	0
)93089	CERTIFIED	8/13/96	0
)93089	CERTIFIED	8/13/96	0
)93089	CERTIFIED	8/13/96	0
093089	CERTIFIED	8/13/96	-1
)87896	ACCOUNT	9/12/96	0
)87896	CLOSED	9/12/96	0
)87896	CLOSED	9/12/96	0
)87896	CLOSED	9/12/96	0
)87896	CLOSED	9/12/96	0
)87896	CLOSED	9/12/96	0
)87896	CLOSED	9/12/96	0
)87896	CLOSED	9/12/96	-1
)93089	CERTIFIED	9/12/96	0
)93089	CONFIRMED	9/12/96	-1
112026	SURVEYED	10/18/96	0
112026	SURVEYED	10/18/96	0
112026	SURVEYED	10/18/96	0
113319	CONFIRMED	2/10/97	0
087896	TEAM	2/24/97	0
112026	SURVEYED	2/25/97	-1
093089	ACCOUNT	3/25/97	0
093089	TEAM	3/25/97	0
093089	ACCOUNT	4/3/97	0
093089	ACCOUNT	4/3/97	0
093089	TEAM	4/3/97	0
093089	TEAM	4/3/97	0
093089	ACCOUNT	4/17/97	-1
093089	TEAM	4/17/97	-1
099731	GROUP	4/17/97	-1
078418	QA	4/22/97	-1
095222	PRINT	4/24/97 12:46:21 PM	-1
095222	PRINT	4/24/97 12:46:22 PM	-1
095222	PRINT	4/24/97 12:47:00 PM	-1
095222	PRINT	4/24/97 12:47:01 PM	-1

14-MAY-97 TRU WASTE MANIFEST Page 1
56197

*** IN CASE OF EMERGENCY CALL 505-667-6211 ***

SHIP FROM	SHIP TO
TWSR #: 56197 Requestor: MICHAEL E GALLEGOS Z #: 076118 Phone: 70541 TA: 55 Bldg: PF4	EM-SWO Phone: 505-665-6158 Solid Radioactive Waste Management Los Alamos National Laboratory Location TA-54___ Area-L___ Area-G___ TA-50___ Bldg-1___ Bldg-37___ Transporter: LANL

Line Item	HM	DOT Shipping Description	Containers No./Type		Total Quantity / Vo	Uni
1	x	RQ, RADIOACTIVE MATERIAL, N.O.S.,7,UN2982	1	CM	2480	P

56197: Solid,Elemental, AM241, H3, PU238, PU239, PU240, PU241, PU242, ~~1.002e+02TBq(2.707e+03Ci)~~, T.I.=0.2 RADIOACTIVE YELLOW II, Fissile EXCEPTED 2717 / 1005 TI59

RECEIVED
DISCREPANCY
5/15/97
12:2

ADDITIONAL DESCRIPTIONS FOR MATERIALS LISTED ABOVE
ERG#: 163

Road Closure Required

SPECIAL HANDLING INSTRUCTIONS AND ADDITIONAL INFORMATION

THIS IS TO CERTIFY THAT THE ABOVE-NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, LABELED, AND PLACARDED; ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION; AND MEET THE WASTE ACCEPTANCE CRITERIA OF EM-SWO

PRINTED/TYPED NAME	SIGNATURE	DATE
Jackie Bustamante	X Jackie Bustamante	5/07/97

TRANSPORTER ACKNOWLEDGEMENT OF RECEIPT OF MATERIALS

PRINTED/TYPED NAME	SIGNATURE	DATE
T. T. LUTAN	X T. T. Lutan	5/14/97

Appendix G

TRU Waste Storage Information
Container 19 Stored in Shaft 235

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TRU WASTE STORAGE RECORD

19

1. Generator's Pre-Use Visual Inspection

Purchase Order #	Inspected Items		
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
	☑ Lid and Gasket	☑ Gouges	☑ Paint

Printed Name	Signature	Sig. Date	Oper. Date
WCATS APPLICATION (000000)	*WCATS Electronic*	08-14-95	08-14-95

2. Generator's Package Information

Group	Technical Area	Building	Cost Center	Program Code	Cost Account	Work Package
WM-SVS	55	000004				

Additional Information

☐ DP ☐ Non-DP If Non-DP waste, attach DOE approval doc.

Radionuclide Content

Nuclide	Amount	Uncertainty	C= Curie M = Gram
Pu-239	1.500E+000	0.000E+000	C

Container	Liner
☐ Steel Drum (55 gal.)	☑ None
☐ Pipe Overpack Type:	☐ 90 mil liner
☐ Steel Drum (85 gal Overpack)	☐ 125 mil liner
☐ Standard Waste Box	☐ Fiberboard Liner
☐ Standard Waste Box Overpack	**Internal Shielding**
☐ RH Canister	☐ None
☐ Other (Call TWCO)	Type / Thickness

Filter Serial No.			
	01	LEAD	
	02		

Waste Profile Number	20210 (WS ID 485)
Gross Weight (lb.)	2.88E+003
Net Weight (lb.)	1.28E+003
Shipping Category	
LANL Waste Stream ID	TA-03-27
TRUCON Code	LA117C

Hazardous Materials

Name	EPA Code	Qty (g)

Date Closed (MM/DD/YY): 08/16/1995

Accumulation Start Date (MM/DD/YY): 08/14/95

The data in this section were collected, and waste described herein was packaged and labeled according to approved procedures.

Printed Name	Signature	Date:

3. Generator Site Health Physics Information

		Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Gamma Dose Rate (mrem/h) (contact)	0.00E+000				
Neutron Dose Rate (mrem/h) (contact)	0.00E+000				
Total Dose Rate (mrem/h) (contact)	0.00E+000				
Total Dose Rate (mrem/h) (1 meter)					
Alpha Contamination (dpm/100cm2)	0.00E+000				
Beta-Gamma Cont (dpm/100 cm2)	0.00E+000				

The data in this section were collected according to approved procedures.

Printed Name	Date

Signature

TRU WASTE STORAGE RECORD

19

4. TRU Waste Management Review/Authorization

The data package for this waste has been reviewed. Basedon the information provided, this waste meets the WAC requirements for storage at TA-54.	Printed Name	Date:
	Signature	

5. Preload Visual Inspection

This waste package was visually inspected prior to transport according to approved procedures. It meets WAC packaging and labeling requirements and is free from obvious damage and defects.	Printed Name	Date:

6. Receiving Site Health Physics Information

Gamma Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (mrem/h) (contact)	Survey Date	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (mrem/h) (contact)	*The data in this section were collected according to approved procedures.*			
Total Dose Rate (mrem/h) (1 meter)				
Alpha Contamination (dpm/100cm2)	Printed Name			Date
Beta-Gamma Cont (dpm/100 cm2)	Signature			

7. Storage Site Information

Received by (Initials)	Date Received	**Original Storage Data**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (MM/DD/YY)	
Printed Name	Date:	Printed Name	Date:	
Signature		Signature		

8. Waste Acceptance Office

Intials/Date	WE Description

NCR Number	Intials/Date	NCR Description

TRU WASTE STORAGE RECORD

19

9. Continuation Sheet for Radionuclide Content (from Page 1, Section 2)

Radionuclide Content - Continued			
Nuclide	**Amount**	**Uncertainty**	**C= Curie M = Gram**
No Additional Radionuclides			

10. Continuation Sheet for Hazardous Materials (from Page 1, Section 2)

Hazardous Materials		
Name	**EPA Code**	**Qty (g)**
No Additional Hazardous Materials		

CONTAINER PROFILE
19
T-TRU-TEMP

WS ID: 485
C ID: 761845
ACTIVE

GENERAL INFORMATION

Container ID:	761845		
Labeled ID:	19		
Optional ID:		**Status:**	ACTIVE
Chemical Barcode:		**Decommissioned:**	YES
Physical State:	SOLID	**Container Type:**	SC: Shield cask
Waste Stream ID:	485	**Container Subtype:**	Remotely handled canister
Work Path:	T-TRU-TEMP	**Origin Date:**	14-Aug-1995 12:00 am
Quantity (Univ):		**Accum Start Date:**	14-Aug-1995
Compactible:		**Closed Date:**	16-Aug-1995

Discard Matrix:

TID(s):

Gen Contact:

Insert By: WCATS APPLICATION (000000)

Waste Desc: TRUWM-TA55-DP-01 INSPECTION & PACKAGING OF CERTIFIABLE COMBUSTIBLE & NONCOMBUSTIBLE TRU WASTE. WASTE ORIGINATION & DI...

WEIGHTS AND VOLUMES

Container Volume:	0.99 CM	**Gross Weight:**	2880.00 lb
Waste Volume:	NOT SPECIFIED	**Tare Weight:**	1600.00 lb
		Net Weight:	1280.00 lb

LOCATION

Pickup (Origin): LANL: 03-CMR: [NS]

Current: LANL: 54-G-DISP: SHAFT235

CONTAINER PROFILE
19
T-TRU-TEMP

WS ID: 485
C ID: 761845
ACTIVE

PAYLOAD INFORMATION

Container Procurement

P.O. Number: **Year of Manuf:**

Lot No.: **Serial No:** LA019

Solution Package: 55: SP BG Boxes - TRU (RH-17th) Canister

TRUCON Code: LA117C: RH SCRAP METAL

Shipping Category:

CCP AK Report:

WIPP Waste Stream: TA-03-27: COMBINED COMBUSTIBLE AND NONCOMBUSTIBLE

Matrix Code:

Defense Waste: **Equiv. Comb. Matrix:**

Adeq. Ventilation: **Compliant Metal Cont.:** YES

Overpack (1 to 1): NO **Retrievable:** **BIR WS Code:** LA-RM14

Content Code:

COST CODES

Cost Center	Prog Code	Cost Account	Work Package	Percent Allocation	Cost Center Status	Cost Code Status	Recharge Mode
------	KB21	----	----	100.00			*UNCONSTRAINED*

PACKING MATERIAL ADDED

Weight	Material Name	Thickness Inches (if applicable)
0.00 kg	Lead (Pb) Shielding(Thickness = 3.000 in)	3.00E+000

RADIOLOGICAL SURVEY

Survey Type	Instrument Number	Survey Date	At Contact mrem/hr	At 30 cm mrem/hr	At 1 M mrem/hr	Alpha dpm/100cm2	Beta/Gama dpm/100 cm2
Survey ID: 72324, Status: Active							
B/G Survey			= 0.00	=	=	Not Applicable	
Neutron Survey			= 0.00	=	=	Not Applicable	
Smear Results			Not Applicable			= 0.00	= 0.00

RADIONUCLIDES

Nuclide	Amount	Unit	Uncert	MT Derived (Y/N)	Activated (Y/N)	MDA Result (Y/N)	Normal Form (Y/N)	Measurement Code/Comment
Status: Active, Assay Page: 336203, Date: 08/14/1995, Derivation: Generator Entered Results (e.g., Offsite Assay)								
Pu-239	1.50E+000	Ci	0.00E+000	N			Y	

CONTAINER PROFILE
19
T-TRU-TEMP

WS ID: 485
C ID: 761845
ACTIVE

RAD CALCULATIONS

Total Activity (nCi/g):	2.58354E+03	**DOTFissile Mat (g):**	2.41648E+01	
Alpha (nCi/g):	2.58354E+03	**Transport Index:**		
TRU Alpha (nCi/g):	2.58354E+03	**NRC Class:**	GTCC	
Pu-239 FGE:	2.41648E+01	**DOT Type:**	B	
Pu-239 FGE [2U]:	2.41648E+01	**LSA-I Fraction:**	3.18637E+03	N
Pu-239 Eq-Ci:	1.50000E+00	**LSA-II Fraction:**	9.55911E-01	Y
Pu-239 Eq-Ci [2U]:	1.50000E+00	**LSA-III Fraction:**	4.77955E-02	Y
TRU Pu-239 Eq-Ci:	1.50000E+00	**Reportable Quantity:**	1.50000E+02	Y
TRU Pu-239 Eq-Ci [2U]:	1.50000E+00	*** ALC Ratio:**	5.55000E+06	NE
Decay Heat [U] (W):	4.71214E-02	*** ACM Ratio:**	9.55911E+04	NE
Tritium (Ci/m3):	0.00000E+00	**Limited Quantity:**	5.55000E+04	N
TRU ECW PE-Ci:	1.50000E+00			

Weight/Volume Used:

1	Container Net Weight:	5.80598E+02 kg
2	Container Volume:	9.90000E-01 m3

**ALC (Activity Limit for Exempt Consignment)*
**ACM (Activity Concentration for Exempt Material)*
U = 1 Uncertainty, 2U = 2 Uncertainty

TASK HISTORY

Date/ Time	Task ID/ Status	Task Name/ Storage or Disposal Grid Location	Reject
08/14/1995 12:00 AM	1811084 EXECUTED	LANL:03-CMR - DRMPRP-SW	NO
08/22/1995 12:00 AM	569976 EXECUTED	LANL:03-CMR » 54-G-DISP:SHAFT235	NO

Note: Highlighted row indicates container was output or receiving container for the indicated task

COMMENTS

Date Time/ User Name	Comment
08/23/2013 9:37 AM WCATS APPLICATION (000000)	THREE DRUMS - 2 WITH 124A TRUCON CD AND 20210 WPR, AND 1 WITH 116A TRUCON CD AND 20309 WPR. REMOVE CODE D008 FROM THIS CONTAINER. GENERATOR AND WASTE PROFILE DO NOT SUPPORT IT.

EDIT LOG

Date Time/ User Name	Quality Record	Explanation

CONTAINER PROFILE
19
T-TRU-TEMP

WS ID: 485
C ID: 761845
ACTIVE

EDIT LOG

Date Time/ User Name	Quality Record	Explanation
08/23/2013 9:44 PM WCATS APPLICATION (000000)	NO	TRUP.TRUPKG TABLE (WASTEDB): [PKG_ID] = 19, [ALPHA_CONT] = 0, [APPROVE_BY] = 113199, [APPROVE_DATE] = 1995-08-21 00:00:00, [BETA_GAMMA_CONT] = 0, [BLDG_CD] = 03-00029, [BX_SERIAL] = LA019, [CERT_STATUS] = N, [COLOR_CD] = , [COMMENTS] = THREE DRUMS - 2 WITH 124A TRUCON CD AND 20210 WPR, AND 1 WITH 116A TRUCON CD AND 20309 WPR. REMOVE CODE D008 FROM THIS CONTAINER. GENERATOR AND WASTE PROFILE DO NOT SUPPORT IT., [CONTENT_CODE] = , [CONTROL] = CST7, [DATE_CLOSED] = 1995-08-16 00:00:00, [GAMMA_DOSE] = 0, [GROSS_WT] = 2880, [GRP] = MST5, [NEUTRON_DOSE] = 0, [NORMAL] = Y, [OLDDRUMNUM] = , [OLDVOL_UNIT] = , [OLDWT_UNIT] = , [ORG_VOL] = 10, [ORG_WT] = 288, [PKG_CD] = 04, [PKG_CD_DESC] = REMOTELY HANDLED CANISTER, [PKG_DATE] = 1995-08-22 00:00:00, [PKG_FISS_GRAMS] = 23.847376788553259141494435612082670906 2, [PKG_LOT] = , [PKG_PE_ACT] = 1.5, [PKG_TARE_WT] = 1600, [PKG_VOLUME] = .99, [PROC_BTCH_CD] = , [PROG_CODE] = KB21, [ROOM] = , [SAMPLE_ID] = , [THERMAL] = .046502384737678855325914149443561208267, [TOTAL_DOSE] = 0, [TOT_ANCG] = 2583.498677237308211572917 45527039644686, [TRUCON_CD] = LA117C, [WASTE_CD] = , [WPRF_CD] = 20210, [YR_MFG] = , [WASTE_TYPE] = , [INSP_DATE] = 1995-08-14 00:00:00, [AUA_VUA] = , [PROCESS_ID] = , [WGEN_CD] = , [DOT_TYPE] = , [BIR_ID] = LATR05, [RQ] = Y, [LSA_SCO_CD] = , [LSA] = N, [A_START_DATE] = , [BIR_WS] = LA-RM14, [LA_WS] = TA-03-27, [SWBOP] = , [RETRIEVABLE] = , [OFFSITE] = , [LINER_CD] = , [NET_WT] = 1280, [SHIP_CD] = , [WASTE_STREAM] = , [OVERPACK] = N, [REPACKED] = , [INVENTORY_NO] = , [INVENTORY_DT] = , [CHCD_CC_CD] = , [CHCD_CA_CD] = , [CHCD_WP_CD] = , [DOT_DP] = , [WASTE_VERIF] = , [VERIF_COMPLETE] = , [HDL_CD] = S01, [UPD_WHEN] = 2004-07-02 12:08:37, [UPD_WHO] = 114644, [PHY_STATE] = S, [PKG_H3_ACT] = 0, [QTW] = N, [AK_REPORT] = , [STP] = 0
08/23/2013 12:32 PM WCATS APPLICATION (000000)	NO	TRUP.UPD_HISTORY TABLE: [UPD_ID]= 8094, [AUTH_BY]= 113199 -> CHRISTENSEN DAVIS V , [AUTH_NUM]= SR318, [PKG_ID]= 19, [UPD_WHEN]= 03-25-1996, [UPD_WHO]= 088399 -> SANDOVAL LOUELLA J , [WHAT]= TGRAMS, TCURIES, FISS_GRAMS, THERMAL,PKG_PE_ACT, PKG_FISS_GRAMS REMOVED D008. REMOVE CODE D008 FROM THIS CONTAINER. GENERATOR AND WASTE PROFILE DO NOT SUPPORT IT. NEED NEW LABEL PER HEATHER PHILLIIPS 4/20/2009, [WHY] = CORRECT ERRORS UPDATED TWSR PER HEATHER PHILLIPS 4/20/2009
08/23/2013 8:46 AM WCATS APPLICATION (000000)	NO	INITWORKPATH (C_ID=761845/PATH_ID=466): SKIPPED (NO WORKPATH UNITS)

RH AK 4127

Los Alamos
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

[redacted]

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code	N/A	Inspected Items	U127
Year of Manufacture	N/A	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
Drum ID	L-50179	☑ Lid and Gasket	☑ Gouges	☑ Paint

This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.

Printed Name: Larry Field Date: 8-14-95

Signature:

2. GENERATOR'S PACKAGE INFORMATION

Building: SM-39 Program:

Additional Information:

RADIONUCLIDE CONTENT

Material Type: ☐ Yes ☐ No

CODE	CONTAINER	INTERNAL SHIELDING		Nuclide	Amount		Uncertainty		CS Code Mgmt
				Pu239	1.50	E	•	E	
				FGE	•	E	•	E	
01	☐ Steel Drum (55 gal.)	☐ None			•	E	•	E	
02	☐ Standard Waste Box	Type	Thickness (in.)		•	E	•	E	
03	☐ Other (Call TWCO)	Lead	3.0 E+ 0		•	E	•	E	
04	☑ RH Canister		• E+		•	E	•	E	

Waste Profile Request Number: 210210

Carbon Filter ID 01: N/A 02:

Process Batch Code: N/A

Gross Weight (lb.)	2.88E+3
Organic Material Wt. (lb.)	2.88E+2
Organic Material Volume (%)	10%
TRUCON Code	11.7C
Date Closed (MMDDYY)	081695

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
Lead (Shielding)	D008	3.1E+5
		•E+
		•E+
		•E+

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures.

Printed Name: Larry Field Signature: Date: 8-17-95

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (mrem/h)	1.0E+0	Survey Meter Model: RC-3C	Property Number: 2606	Calibration Void Date: 11/2/95
Neutron Dose Rate (mrem/h)	0.0E+0	Survey Meter Model: ESP-1 (NRD)	Property Number: 8006	Calibration Void Date: 11/8/95
Total Dose Rate (mrem/h)	1.0E+0	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (dpm/100cm²)	0.0E+0	Printed Name: James Gallegos		Date: 8/21/95
Beta-Gamma Cont. (dpm/100cm²)	0.0E+0	Signature:		

4. CST-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by CST-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.

Printed Name: Date: 8/25

Signature:

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y				
Date Entered in Database	09	01	95	Printed Name	V.G. Harkleroad	Signature	V.G. Harkleroad
Date Entry Verified	09	05	95	Printed Name	Charlotte Fernandez	Signature	Charlotte Fernandez

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number	Date (*Inspection Valid for 30 Days*)
	N/A 9/1/95 VGH	

9-5-95 VGH 9-5-95 CF

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	•	E	+ -	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (*mrem/h*)		E	+ -	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (*mrem/h*)		E	+ -	N/A 9/1/95 VGH		
Alpha Contamination (*dpm/100cm²*)	•	E	+	*The data in this section were collected according to approved procedures.*		
Beta-Gamma Cont. (*dpm/100cm²*)	•	E	+	Printed Name		Date
				Signature		

8. STORAGE SITE INFORMATION

Received By (*Initials*)	Date Received	ORIGINAL STORAGE DATA		
VGH	8-22-95	Building Number	Layer	Row Number
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		~~Column~~ Number Shaft 235	Date Stacked (*MM,DD,YY*) 08 12 95	
Printed Name V.G. Harkleroad	Date 8-22-95	Printed Name V.G. Harkleroad		Date 9/1/95
Signature V.G. Harkleroad		Signature V.G. Harkleroad		

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name V.G. Harkleroad	Date 9/1/95
	Signature V.G. Harkleroad	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date

11. DATA MANAGEMENT INFORMATION

	M M	D D	Y Y				
Date Entered In Database	09	05	95	Printed Name	Charlotte Fernandez	Signature	Charlotte Fernandez
Date Entry Verified	09	05	95	Printed Name	V.G. Harkleroad	Signature	V.G. Harkleroad

12. DUPLICATE COPY

	M M	D D	Y Y			
Date Duplicate Filed	09	05	95	Printed Name	Charlotte Fernandez	Signature	Charlotte Fernandez

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210 LA000000055637

Status:ACTIVE

Account Info- CC:6407 PC:KB12 CA:5000 WP: VI:

Generator:BALKEY, JAMES J. Z#:087387

WMC:GRUETZMACHER, KATHLEEN Z#:099731

Group:NMT7 Phone:72338 MS:E501 TA:55 BLDG:0004 ROOM:432

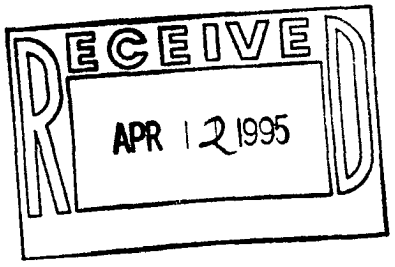
RADIOACTIVE MATERIALS MANAGEMENT AREA (RMMA):55003

Waste Type: PROCESS WASTE/SPENT CHEMICAL

Waste Classes: ON-GOING GENERATION
RADIOACTIVE

Associated Documentation
WM SOP #:DP01
Other SOP #:WODF

Waste Category: NOT APPLICABLE



Waste Sources: RESEARCH AND DEVELOPMENT

Waste Matrix: SOLID

Matrix Type: HETEROGENEOUS

Waste/Process Description:
TRUWM-TA55-DP-01 INSPECTION & PACKAGING OF CERTIFIABLE COMBUSTIBLE & NONCOMBUSTIBLE WASTE. WASTE ORIGINATION & DISPOSITION FORMS(WODF), TRU, TRUCON CODE 124A-SALTS GENERATED FROM PLUTONIUM PROCESSING ACTIVITIES WITH NO KNOWN....

Ignitability: NOT IGNITABLE

Corrosivity: NOT AQUEOUS

Reactivity: NON REACTIVE

Boiling Point: NOT APPLICABLE

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210

Toxicity Characteristic Metals and Organic Compounds

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				
BARIUM	Y				
CADMIUM	Y				
CHROMIUM	Y				
LEAD	Y				
MERCURY	Y				
SELENIUM	Y				
SILVER	Y				

Additional Chemical Constituents and Contaminants

Constituent	CAS NO	MIN	MAX	UOM
ALUMINUM		0	100	%
AMMONIA		0	1	%
CALCIUM		0	100	%
CHLORINE		0	100	%
FLUORINE		0	100	%
HYDROGEN IONS		0	100	%
IRON		0	100	%
MAGNESIUM		0	100	%
NICKEL		0	1	%
NITRATE		0	100	%
OXALATES		0	100	%
POTASIUM		0	100	%
SODIUM		0	100	%
SULFATES		0	100	%
THALLIUM		0	1	%

Radiological Characteristics

Radionuclide	Min	Max	Unit
AM241	0.000E+00	1.100E-01	CIG
NP237	0.000E+00	1.400E-01	CIG
PU238	0.000E+00	2.400E-03	CIG
PU239	0.000E+00	1.800E-03	CIG
PU240	0.000E+00	1.500E-03	CIG
PU241	0.000E+00	9.000E-02	CIG
PU242	0.000E+00	4.720E-05	CIG
PU244	0.000E+00	6.580E-11	CIG
U235	0.000E+00	1.290E-08	CIG
U238	0.000E+00	2.000E-09	CIG

Contamination Type:VOLUME CONTAMINATION

NATIONAL LABORATORY

RM No. 11771	SM No.	Cost Code BNOS	Prog Code \ Cost Acct \ Wk Pkg KB21/1000	Date 8/21/95

GENERAL INSTRUCTIONS: This form is an official shipping document for transporting radioactive material within LANL boundaries. Type or print all entries. Emergency Response Guide information must be attached to this document. Distribution of completed forms is indicated below.

FROM	Name	Telephone	Group	TA	Building	Room
	Orlando Serna	74653	MST-5	3	SM-29	9149

TO	Name	Telephone	Group	TA	Building	Room
	Davis Christensen	5-8686	CST-7	54	22	107

Item A	No. of Pkgs.	Proper Shipping Name	Hazard Class	UN/NA Number	Quantity (Grams)
	3	RQ Radioactive Material, N.O.S.	#7	UN 2982	SEE ATTACHED

Radionuclide (s)	Physical Form	Chemical Form	Activity	Label Category	Transport Index
FGE 239Pu	Solid	Elemental	SEE ATTACHED	SEE ATTACHED	SEE ATTACHED

Fissile Class	DOE or USNRC Identification Number	Additional Description (s)
NA	NA	Road Closure required FGE Pac means NMT-3-FM95-67 Exclusive use

Gross Weight	Rad. Level (Surface)	Required Placards	Packaging Used	Packaged By	Z Number	Date
57.058 lbs	SEE ATTACHED	Radioactive	3ort 17 H 9A Type A	Dennis Cardiff	093089	8/16/95

Item B	No. of Pkgs.	Proper Shipping Name	Hazard Class	UN/NA Number	Quantity (Grams)

Radionuclide (s)	Physical Form	Chemical Form	Activity	Label Category	Transport Index

HMTE REVIEW
APPROVED ☑
DISCREPANCY ☐

Fissile Class	DOE or USNRC Identification Number	Additional Description (s)

Gross Weight	Rad Level (Surface)	Required Placards	Packaging Used	Packaged By	Z Number	Date
			8/22/95 9:00	GM		

Radiation Control Technician (Signature)	Z Number	Date
	096430	8/21/95

Pro-Pers Representative (Signature)	Z Number	Date	Tamper ID
			NONE

EMERGENCY RESPONSE TELEPHONE NUMBER: (505) 667-6211

EMERGENCY CONTACT TELEPHONE NUMBERS FOR ON-SITE TRANSFERS

Name	Z Number	Group	Telephone Number	Emergency Response Guide Number(s)
Orlando Serna	066941	MST-5	74653	Item A 63
Name	Z Number	Group	Telephone Number	Item B
Larry Field	100419	MST-5	5-0919	

SHIPPER'S CERTIFICATION

This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Shipper (Signature)	Z Number	Mail Stop	Date
Orlando Serna	066941	G742	8/21/95

ADDITIONAL TRANSPORTATION INFORMATION

Driver/Transporter	Z Number	Transport Vehicle License Tag Number
	095325	24410

Estimated Date and Time of Arrival	Material Received By	Z Number	Date
8-22-95 0910		097369	8/22/95

Form 1586 (4/94)

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO 87545

RADIOACTIVE MATERIAL SHIPPING CONTINUATION SHEET

RM Number 11771 SM Number _____ Group Shipping MST-5 Date 8/24/95

Container No. (if any)	Isotope	Grams	☐mCi ☐Ci ☐uCi	mRem/hr Contact	mRem/hr 1 meter	Fissile Class	Transport Index Used	Radioactive Type Label I, II, III**
55569	239Pu							
	FGE	.34gm	.0213Ci	36.0	4.0	NA	4.0	Radioactive Yellow III
55637	239Pu							
	FGE	6.28g	.3856Ci	25.0	4.0	NA	4.0	Radioactive Yellow III
55639	239Pu							
	FGE	17.8g	1.095Ci	190.0	35.0	NA	35.0	Radioactive Yellow III

HMTF REVIEW
APPROVED ☑
DISCREPANCY ☐
8/22/95 9:00 GM

** requires Radioactive Placards

Los Alamos
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

LA00000055639

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code	C	Inspected Items	
Year of Manufacture	94	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
Box Serial Number	N/A	☐ Lid and Gasket	☑ Gouges	☑ Paint
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.		Printed Name MICHAEL V GALLEGOS	Date 11-29-94
		Signature Michael V Gallegos	

2. GENERATOR'S PACKAGE INFORMATION

Group CMR-7	Technical Area TA-55	Building PF-4	Program Code RB25000	Normal ☑ Yes ☐ No

Additional Information: Memo NMT-2:FY95-67 Summ; Ouows 12/23/94
TJO # B21977
*Rough Alpha Swipes, N.D.A.
Lid-139 #

RADIONUCLIDE CONTENT

Material Type ☐ Yes ☒ No

Nuclide	Amount	Uncertainty	C=Curie M=Gram
PU239	1.095 E +0	E	C
FGE	E	E	
	E	E	
	E	E	
	E	E	
	E	E	
	E	E	

CODE	CONTAINER	INTERNAL SHIELDING	Type	Thickness (in.)
01	☑ Steel Drum (55 gal.)	☐ None		
02	☐ Standard Waste Box			
03	☐ Other (Call TWCO)		Pb	.3 E +0 1
04	☐ RH Canister			E

Waste Profile Request Number 20210 ~~+6151+6~~ and
Carbon Filter ID 01 33318 02

Process Batch Code N/A

Gross Weight (lb.)	5.22 E +2
Organic Material Wt. (lb.)	1.29 E +1
Organic Material Volume (%)	10
TRUCON Code	124A ~~+124A~~ and
Date Closed (MMDDYY)	120194

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
None		E
		E
		E
		E

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures.

Printed Name Joseph Gutierrez | Signature Joseph Gutierrez | Date 12-3-94

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	1.9 E +2	Survey Meter Model RO3C	Property Number 2664	Calibration Void Date 2/30/95
Neutron Dose Rate (*mrem/h*)	3.0 E +0	Survey Meter Model PNR-4	Property Number 3217	Calibration Void Date 01/25/95
Total Dose Rate (*mrem/h*)	1.9 E +2	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*)	0.0 E +0	Printed Name EDUARDO ESTRADA		Date 01/12/95
Beta-Gamma Cont. (*dpm/100cm²*)	0.0 E +0	Signature Eduardo Estrada		

4. CST-7 REVIEW/AUTHORIZATION

The data package [redacted] been reviewed by CST-7. The generator is authe[redacted]nsportation to TA-54 by AR 10-5.

Printed Name J. Minton-Hughes | Date 5/16/95
Signature Julia Minton-Hughes

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M D D Y Y	Printed Name	Signature
Date Entered in Database			
Date Entry Verified		Printed Name	Signature

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number	Date (*Inspection Valid for 30 Days*)

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*) . E + -	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (*mrem/h*) . E + -	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (*mrem/h*) . E + -	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*) . E +	Printed Name		Date
Beta-Gamma Cont. (*dpm/100cm²*) . E +	Signature		

8. STORAGE SITE INFORMATION

Received By (*Initials*)	Date Received	**ORIGINAL STORAGE DATA**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (*MM,DD,YY*)	
Printed Name	Date	Printed Name		Date
Signature		Signature		

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name	Date
	Signature	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date

11. DATA MANAGEMENT INFORMATION

	M M D D Y Y	Printed Name	Signature
Date Entered In Database			
Date Entry Verified		Printed Name	Signature

12. DUPLICATE COPY

	M M D D Y Y	Printed Name	Signature
Date Duplicate Filed			

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210

To: BALKEY, JAMES J. MS:E501

From: STADELMAIER, AL MS:J579

Please review the waste profile information and the characterization information on the following pages. If there are any questions, please call me at 5-4000. If the information is correct, please sign and date this form in the spaces provided below, make a copy for your files and return the original to MS J579.

Waste Generator Certification: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations

Generator Signature James J Balkey Date: 4/13/95

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210

LA000000055639

Status:ACTIVE

Account Info- CC:6407 PC:KB12 CA:5000 WP: VI:

Generator:BALKEY, JAMES J. Z#:087387

WMC:GRUETZMACHER, KATHLEEN Z#:099731

Group:NMT7 Phone:72338 MS:E501 TA:55 BLDG:0004 ROOM:432

RADIOACTIVE MATERIALS MANAGEMENT AREA (RMMA):55003

Waste Type: PROCESS WASTE/SPENT CHEMICAL

Waste Classes: ON-GOING GENERATION
RADIOACTIVE

Associated Documentation
WM SOP #:DP01
Other SOP #:WODF

Waste Category: NOT APPLICABLE

Waste Sources: RESEARCH AND DEVELOPMENT

Waste Matrix: SOLID

Matrix Type: HETEROGENEOUS

Waste/Process Description:
TRUWM-TA55-DP-01 INSPECTION & PACKAGING OF CERTIFIABLE COMBUSTIBLE & NONCOMBUSTIBLE WASTE. WASTE ORIGINATION & DISPOSITION FORMS(WODF), TRU, TRUCON CODE 124A-SALTS GENERATED FROM PLUTONIUM PROCESSING ACTIVITIES WITH NO KNOWN....

Ignitability: NOT IGNITABLE

Corrosivity: NOT AQUEOUS

Reactivity: NON REACTIVE

Boiling Point: NOT APPLICABLE

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210

Toxicity Characteristic Metals and Organic Compounds

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				
BARIUM	Y				
CADMIUM	Y				
CHROMIUM	Y				
LEAD	Y				
MERCURY	Y				
SELENIUM	Y				
SILVER	Y				

Additional Chemical Constituents and Contaminants

Constituent	CAS NO	MIN	MAX	UOM
ALUMINUM		0	100	%
AMMONIA		0	1	%
CALCIUM		0	100	%
CHLORINE		0	100	%
FLUORINE		0	100	%
HYDROGEN IONS		0	100	%
IRON		0	100	%
MAGNESIUM		0	100	%
NICKEL		0	1	%
NITRATE		0	100	%
OXALATES		0	100	%
POTASIUM		0	100	%
SODIUM		0	100	%
SULFATES		0	100	%
THALLIUM		0	1	%

Radiological Characteristics

Radionuclide	Min	Max	Unit
AM241	0.000E+00	1.100E-01	CIG
NP237	0.000E+00	1.400E-01	CIG
PU238	0.000E+00	2.400E-03	CIG
PU239	0.000E+00	1.800E-03	CIG
PU240	0.000E+00	1.500E-03	CIG
PU241	0.000E+00	9.000E-02	CIG
PU242	0.000E+00	4.720E-05	CIG
PU244	0.000E+00	6.580E-11	CIG
U235	0.000E+00	1.290E-08	CIG
U238	0.000E+00	2.000E-09	CIG

Contamination Type:VOLUME CONTAMINATION

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210

Maximum daily flow when discharge occurs:

Average daily flow when discharge occurs:

Estimated number of days dicharge will occur:

Estimated total volume per year discharged to the RLWC at TA-50:

Wastewater will be discharged through the the following:

Additional Information

HAZARDOUS CONSTITUENTS. PROCESSES INCLUDE SLAG AND CRUCIBLE, PYROCHEMICAL SALTS, AND MOLTEN SALT EXTRACTION, ELECTROREFINING ~~OF~~ OR DIRECT OXIDATION REDUCTION.

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category:TRANSURANIC

Waste Classification:NON-HAZARDOUS CHEMICAL WASTE

Los Alamos
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

LA00000055569

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code	C	Inspected Items	
Year of Manufacture	94	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
Box Serial Number	NA	☑ Lid and Gasket	☑ Gouges	☑ Paint
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.		Printed Name: Joseph Gutierrez	Date: 9-20-94
		Signature	

2. GENERATOR'S PACKAGE INFORMATION

Group: NMT-7	Technical Area: TA-55	Building: PF-4	Program Code: KB12,5000	Normal: ☑ Yes ☐ No

Additional Information: Demo NMT-7: FY 95-67 from Sammy Owens 12/23/94
*Rough Alpha Surveys; N.D.A.
Lic-139 # 7647 expires 5/22/95.
TID # 22124

RADIONUCLIDE CONTENT

Material Type: ☐ Yes ☒ No

Nuclide	Amount	Uncertainty	C=Curie M=Gram
PU239	2.0 E+0	1.3 E+0	C
FGE			

CODE	CONTAINER	INTERNAL SHIELDING	
01	☑ Steel Drum (55 gal.)	☐ None	
02	☐ Standard Waste Box	Type	Thickness (in.)
03	☐ Other (Call TWCO)	Pb	1.3 E+0
04	☐ RH Canister		E+-

Waste Profile Request Number: 203099

Carbon Filter ID: 01 | 02 2812

Process Batch Code: NA

Gross Weight (lb.): 11.16 E+2

Organic Material Wt. (lb.): 3.66 E+1

Organic Material Volume (%): 10

TRUCON Code: 11.6A

Date Closed (MMDDYY): 121494

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
None		

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures.

Printed Name: Dennis Ruiff | Signature: Dennis Ruiff | Date: 1-12-95

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	3.5 E+1	Survey Meter Model: PNR-4	Property Number: 5217	Calibration Void Date: 01/25/95
Neutron Dose Rate (*mrem/h*)	1.0 E+0	Survey Meter Model: RO3C	Property Number: 2643	Calibration Void Date: 02/08/95
Total Dose Rate (*mrem/h*)	3.6 E+1	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*)	0.0 E+0	Printed Name: EDUARDO ESTRADA		Date: 01/09/95
Beta-Gamma Cont. (*dpm/100cm²*)	0.0 E+0	Signature: Eduardo Estrada		

4. CST-7 REVIEW/AUTHORIZATION

The data pac[redacted] has been reviewed by CST-7. The generator is a[redacted] transportation to TA-54 by AR 10-5.

Printed Name: J. Minton-Hughes | Date: 5/10/95

Signature: Julia Minton-Hughes

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M D D Y Y	Printed Name	Signature
Date Entered in Database			
Date Entry Verified			

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number	Date (*Inspection Valid for 30 Days*)

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*) . E + -	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (*mrem/h*) . E + -	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (*mrem/h*) . E + -	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*) . E +	Printed Name		Date
Beta-Gamma Cont. (*dpm/100cm²*) . E +	Signature		

8. STORAGE SITE INFORMATION

Received By (*Initials*)	Date Received	**ORIGINAL STORAGE DATA**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (*MM,DD,YY*)	
Printed Name	Date	Printed Name		Date
Signature		Signature		

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name	Date
	Signature	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date

11. DATA MANAGEMENT INFORMATION

	M M D D Y Y	Printed Name	Signature
Date Entered In Database			
Date Entry Verified			

12. DUPLICATE COPY

	M M D D Y Y	Printed Name	Signature
Date Duplicate Filed			

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20309

To: BALKEY, JAMES J. MS:E501

From: STADELMAIER, AL MS:J579

LA00000055569

Please review the waste profile information and the characterization information on the following pages. If there are any questions, please call me at 5-4000. If the information is correct, please sign and date this form in the spaces provided below, make a copy for your files and return the original to MS J579.

Waste Generator Certification: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations

Generator Signature: James Balkey Date: 4/7/95

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20309

Status:REVCOM

Account Info- CC:6407 PC:KB12 CA:5000 WP: VI:

Generator:BALKEY, JAMES J. Z#:087387

WMC:GRUETZMACHER, KATHLEEN Z#:099731

Group:NMT7 Phone:72338 MS:E501 TA:55 BLDG:0004 ROOM:432

RADIOACTIVE MATERIALS MANAGEMENT AREA (RMMA):55003

Waste Type: PROCESS WASTE/SPENT CHEMICAL

Waste Classes: ON-GOING GENERATION
RADIOACTIVE

Associated Documentation
WM SOP #:DP01
Other SOP #:WODF

Waste Category: NOT APPLICABLE

Waste Sources: DECON/DECOM
MAINTENANCE
MATERIAL PROCESSING
RESEARCH AND DEVELOPMENT

Waste Matrix: SOLID

Matrix Type: HETEROGENEOUS

Waste/Process Description:
TRUWM-TA55-DP-01INSPECTION & PACKAGING OF CERTIFIABLE COMBUSTIBLE & NON-COMBUSTIBLE TRU WASTE. WASTE ORIGINATION & DISPOSITION FORMS(WODF)TRUCON CODE 116A-COMBUSTIBLE SOLID WASTES FROM PLUTONIUM PROCESSING ACTIVITIES WITH NO KNOWN HAZARDOUS...

Ignitability: NOT IGNITABLE

Corrosivity: NOT AQUEOUS

Reactivity: NON REACTIVE

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20309

Boiling Point: NOT APPLICABLE

Additional Chemical Constituents and Contaminants

Constituent	CAS NO	MIN	MAX	UOM
ANTI-C CLOTHING		0	100	%
PAPER		0	100	%
PLASTIC		0	100	%
RAGS(CELLULOSE)		0	100	%
RUBBER		0	100	%
WOOD		0	100	%

Radiological Characteristics

Radionuclide	Min	Max	Unit
AM241	0.000E+00	2.500E-02	CIG
NP237	0.000E+00	1.400E-01	CIG
PU238	0.000E+00	5.390E-04	CIG
PU239	0.000E+00	4.000E-04	CIG
PU240	0.000E+00	3.350E-04	CIG
PU241	0.000E+00	2.045E-02	CIG
PU242	0.000E+00	5.440E-06	CIG
PU244	0.000E+00	7.580E-12	CIG
U235	0.000E+00	2.300E-08	CIG
U238	0.000E+00	1.850E-01	CIG

Contamination Type:VOLUME CONTAMINATION

Maximum daily flow when discharge occurs:

Average daily flow when discharge occurs:

Estimated number of days dicharge will occur:

Estimated total volume per year discharged to the RLWC at TA-50:

Wastewater will be discharged through the the following:

Additional Information

CONSTITUENTS (GLOVES, BAGS, PAPER, PLASTIC, ETC.)

WASTE CHARACTERIZATION INFORMATION

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20309

Radioactivity Category:TRANSURANIC

Waste Classification:NON-HAZARDOUS CHEMICAL WASTE

Los Alamos
NATIONAL LABORATORY

TRU WASTE STORAGE RECORD

LA0000055637

1. GENERATOR'S PRE-USE VISUAL INSPECTION

Drum Lot Code	F	Inspected Items	
Year of Manufacture	94	☑ Ring, Bolt, and Nut	☑ Chime	☑ Dents
Box Serial Number	NA	☑ Lid and Gasket	☑ Gouges	☑ Paint
This container has been visually inspected according to approved procedures and has been found to be free of damage that would make it unsuitable for TRU waste packaging.		Printed Name MICHAEL V BALLEGOS	Date 11-29-94
		Signature Michael V Ballegos	

2. GENERATOR'S PACKAGE INFORMATION

Group NMT-7 per 11-85	Technical Area TA-55	Building PF-4	Program Code KB125000	Normal ☑ Yes ☐ No

Additional Information See Memo # NMT-2: FY95-67 from Sammi Owens ~~12/23/94~~ Also FSS-12 Mark Shanlen TID 12219176 memo FSS-12-94-12

*Rough Alpha Swipes, N.D.A. Lud-139# 7647 expire 5/22/95.

RADIONUCLIDE CONTENT

Material Type ☐ Yes ☒ No

Nuclide	Amount	Uncertainty	C=Curie M=Gram
PU239	3.856 E +01	• E +	C
FGE	• E +	• E +	
	• E +	• E +	
	• E +	• E +	
	• E +	• E +	
	• E +	• E +	
	• E +	• E +	

CODE	CONTAINER	INTERNAL SHIELDING	
01	☑ Steel Drum (55 gal.)	☐ None	
02	☐ Standard Waste Box	Type	Thickness (in.)
03	☐ Other (Call TWCO)	Pb	1.3 E +
04	☐ RH Canister		• E +

Waste Profile Request Number 202110

Carbon Filter ID 01 LA 334 11 02

Process Batch Code NA

Gross Weight (lb.) 5.10 E +2

Organic Material Wt. (lb.) 1.08 E +1

Organic Material Volume (%) 0

TRUCON Code 124A

Date Closed (MMDDYY) 112994

NONRADIOACTIVE HAZARDOUS MATERIALS

Name	EPA Code	Quantity (g)
None		• E +
		• E +
		• E +
		• E +

The data in this section were collected, and the waste described herein was packaged and labeled according to approved procedures.

Printed Name DENNIS R WOLFF Signature Dennis R Wolff Date 12-3-94

3. GENERATOR SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*)	2.3 E + 1	Survey Meter Model PNR-4	Property Number 2914	Calibration Void Date 01/25/95
Neutron Dose Rate (*mrem/h*)	2.0 E + 0	Survey Meter Model B03C	Property Number 3642	Calibration Void Date 02/29/95
Total Dose Rate (*mrem/h*)	2.5 E + 1	*The data in this section were collected according to approved procedures.*		
Alpha Contamination (*dpm/100cm²*)	0.0 E + 0	Printed Name EDUARDO ESTRADA		Date 12/15/94
Beta-Gamma [redacted] (cm^2)	0.0 E + 0	Signature Eduardo Estrada		

4. CST-7 REVIEW/AUTHORIZATION

The data package for this waste has been reviewed by CST-7. The generator is authorized to arrange transportation to TA-54 by AR 10-5.

Printed Name J. Minton-Hughes Date 5/16/95

Signature Julia Minton-Hughes

Form 1562 (2/94)

THIS PAGE FOR CST-7 USE ONLY

5. DATA MANAGEMENT INFORMATION

	M M D D Y Y	Printed Name	Signature
Date Entered in Database			
Date Entry Verified		Printed Name	Signature

6. PRELOAD VISUAL INSPECTION

This waste package was visually inspected prior to pickup according to approved procedures and was found to be free of obvious damage or defects.	Inspector's Stamp Number	Date (*Inspection Valid for 30 Days*)

7. RECEIVING SITE HEALTH PHYSICS INFORMATION

Gamma Dose Rate (*mrem/h*) . E + -	Survey Meter Model	Property Number	Calibration Void Date
Neutron Dose Rate (*mrem/h*) . E + -	Survey Meter Model	Property Number	Calibration Void Date
Total Dose Rate (*mrem/h*) . E + -	*The data in this section were collected according to approved procedures.*		
Alpha Contamination ($dpm/100cm^2$) . E +	Printed Name		Date
Beta-Gamma Cont. ($dpm/100cm^2$) . E +	Signature		

8. STORAGE SITE INFORMATION

Received By (*Initials*)	Date Received	**ORIGINAL STORAGE DATA**		
This waste package was visually inspected and found to be properly labeled and in good condition. It was accepted and inspected according to approved procedures.		Building Number	Layer	Row Number
		Column Number	Date Stacked (*MM,DD,YY*)	
Printed Name	Date	Printed Name		Date
Signature		Signature		

9. REVIEW

The data entered in Sections 6, 7, and 8 have been reviewed according to approved procedures.	Printed Name	Date
	Signature	

10. WASTE ACCEPTANCE OFFICE

NCR Number	Hold Tag Number	Initials/Date	NCR Description	WE Number	Initials/Date

11. DATA MANAGEMENT INFORMATION

	M M D D Y Y	Printed Name	Signature
Date Entered In Database			
Date Entry Verified		Printed Name	Signature

12. DUPLICATE COPY

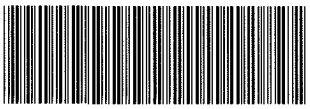
	M M D D Y Y	Printed Name	Signature
Date Duplicate Filed			

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210

To: BALKEY, JAMES J. MS:E501

From: STADELMAIER, AL MS:J579



LA00000055637

Please review the waste profile information and the characterization information on the following pages. If there are any questions, please call me at 5-4000. If the information is correct, please sign and date this form in the spaces provided below, make a copy for your files and return the original to MS J579.

Waste Generator Certification: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations

Generator Signature: James J Balkey Date: 4/13/95

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 20210

Maximum daily flow when discharge occurs:

Average daily flow when discharge occurs:

Estimated number of days dicharge will occur:

Estimated total volume per year discharged to the RLWC at TA-50:

Wastewater will be discharged through the the following:

Additional Information

HAZARDOUS CONSTITUENTS. PROCESSES INCLUDE SLAG AND CRUCIBLE, PYROCHEMICAL SALTS, AND MOLTEN SALT EXTRACTION, ELECTROREFINING ~~OF~~ OR DIRECT OXIDATION REDUCTION.

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category:TRANSURANIC

Waste Classification:NON-HAZARDOUS CHEMICAL WASTE

CANISTER AND DRUM INSPECTION FORM

RH-TRU WASTE

WASTE CANISTER Serial Number

Los Alamos
MST-5, WING 9
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

I. GENERATOR'S PRE-USE VISUAL INSPECTION

	Drum 1	Drum 2	Drum 3
Drum Lot Codes			
Year of Manufacture			
Canister Serial No.	LA019		
Comments			
Canister wt. 1110 lbs			
Lid wt. 430 lbs			

Inspection Items for Drums	Initials
Ring, Bolt, & Nut	
Lid & Gasket	
Chime	
Dents	
Gouges	
Paint	

These containers have been visually inspected and have been found to be free of damage that would make them unsuitable for TRU waste packaging.

Name	Signature	Date
	T. Thomas	8/11/95

II. CANISTER LEAK TEST, CONTAMINATION SMEARS, & RADIATION LEVELS

Helium Leak Test:
Backgroung Reading on Helium Detector 5×10^{-9}
No Helium Leak was observed.

Signature	Date
T. Thomas	8/16/95

Contamination Smears:
Canister smears do not exceed 1000 dpm Beta/Gamma or 20 dpm Alpha.

Signature	Date
Manuel R. López	8/16/95

Contact Radioation Levels: 2 mr/hr Neutrons
Highest Surface Dose Observed 100 mr/hr at Contact

Signature	Date
M.R. López	8/16/95

III. CANISTER VISUAL INSPECTION

Inspection Items	Initials
Filter	
Labels	
Damage	
Closure Lid	

This waste canister was visually inspected at time of pickup as required by approved procedures, and was found to be free of obvious damage or defects

Comments

Name	Signature	Date

IV. EM-7 RECEIVING

Canister Weight (lbs.)
Comments

This waste container was received from MST-5 as RH-TRU Waste.
I certify that all shipping manifests and accompanying documentation are in order.

Name	Signature	Date

PROCEDURES AND INSTRUCTIONS

This form must be used to document packages of RH-TRU waste that have been generated according to the Los Alamos RH-TRU Waste Certification Plan (attachment 7). Accompany all signatures with a typed or printed name. Use black ballpoint or ink.

I. GENERATOR's Pre-Use Inspection

The waste generator shall complete this entire section as explained here, then attach this form to the GWSR form (HS Form Number 10-5A)

Drums: NOTE: Defective lids, bolts, nuts, and closure rings may be replaced in the Hot Cell Area. Make note of replacement in the "Comments section.)

Obtain the drum lot code from the side of the drum, above the top rolling hoop. The year of manufacture is the last two digits in the code stamped in the bottom head of the drum. Example: 16-55-88.

Remove the closure ring and inspect the welds on the lugs for cracks. Verify that the bolt and nut are present and in good condition, and observe the general condition of the ring.

Remove the lid and inspect for deformation that would interfere with proper closure. Look for tears in the gasket. Inspect the threads on the bung hole to insure that a filter can be installed.

Inspect the body for damage to the chime(top curl) that couldcause leakage. look for dents that might permit leakage along the sideseam and the bottom rim seams. Reject drums with gouges that significantly reduce the remaining thickness of the drum wall. Severe corrosion or badly damaged paint is unacceptable.

Defective drums must be clearly marked to ensure that they are not inadvertantly used for RH-TRU Wastye.

II. CANISTER LEAK TEST, CONTAMINATION SMEARS, & RADIATION LEVELS

The Helium Leak Check, Contamination Smear Determinations, and the Surface Radiation Measurements are all performed in accordance with the SOP for "Canister Loading and Welding.

III. Canister Inspection

Verify that the canister contains a filtered vent and that labels are properly applied to the canister and the paperwork.

Visually inspect the canister for handling damage severe enough to bring into question the safety of the canister.

IV. EM-7 Receiving (TA-54 area "G")

Enter the weight in whole pounds.

Los Alamos
NATIONAL LABORATORY

☐ SMALL JOB TICKET
☐ WORK TICKET

ENG File Code 7.23.1.3

Project ID	SJ/WT Number
	66624

All Work Shall Be Done In Accordance With The SSS H&S Manual

Work Order Number	Authorized By
05549	RIK HAGGART

Author	Group	Telephone	Date Written	Date Required	Priority	Requester Name
RIK HAGGART	FSS 9	7-8118	8-17-95		(2)	ORLANDO SERNA

Coord. Area	TA	Bldg.	Room	Equipment Inv. Code	Group	Telephone
65	3	29	ROAD CLOSE	☐ Class A # _____ CFT _____ ☐ Class B As-Builts ☐ Yes ☐ No	MST 5	7-4653

CHECK CRAFTS REQUIRED

☐ Custodial ☐ Electricians ☒ Laborers ☐ Teamsters ☐ Operating Engineers ☐ Painters ☐ Cement Masons
☐ Fitters ☐ Carpenters ☐ Roofers ☐ Insulators ☐ Iron Workers ☐ Sheetmetal ☐ Mechanics
☐ Engineering ☐ Other (Specify) _____

Work Description

SUPPLY LABORERS FOR ROAD CLOSURE (ESCORTED) FROM CMR TA3 SM 29 TO TA-54 AREA-G FOR 8/22/95 AT 9:00

No Kup Req - 8-17-95

CRAFT/EVENT NUMBER	PLANNED HOURS	ACTUAL HOURS	A	B	C	D	E	F	G
TOTAL									

DELAY CODES (Wait For)
A. Instructions
B. Crafts
C. Materials
D. Worksite
E. Tools/Equip.
F. Transp.
G. Other

Planner Number
Date Received
J/S Number
Date Completed
Crew Number

ES&H REVIEW

☐ Y ☒ N **Will this job involve, need, or generate any of the following?**

☐ Lasers ☐ Radiation ☐ Chemicals ☐ Corrosives ☐ Carcinogens ☐ Spec. Vent (Const.) ☐ Hoods Mods./ Shutdowns
☐ X-Rays ☐ Rad. Waste ☐ Beryllium ☐ Microwaves ☐ High Pressure ☐ Electrical > 480V ☐ Underground Storage Tanks
☐ Noise ☐ Asbestos ☐ Explosives ☐ HVAC Mods. ☐ Toxic Materials ☐ Hazardous Waste
☐ PCBs ☐ Solvents ☐ Magnets ☐ Soil Disturbance ☐ Heavy Metals ☐ Structural Mods.
☐ SWMU ☐ Other (Specify) _____

☐ Y ☒ N **Will this job require any of the following?**

☐ ES&H Questionnaire ☐ Entry Into a Radiological Area ☐ Locate Existing Underground Utilities
☐ Entry Into a Security Area ☐ Personnel to be on Respirator List ☐ Pre-job Meeting
☐ Entry Into an Explosives Area ☐ Personnel to be on PU List ☐ Lockout/Tagout

☐ Y ☒ N **Will this job require outages?**

☐ Electrical ☐ Fire Protection ☐ Gas ☐ Communications ☐ Water ☐ Steam ☐ HVAC/Chilled Water/Cooling

☐ Y ☒ N **Will this job require permits or approvals?**

☐ ASR Asbestos-Rad ☐ CWD Chemical Waste Disposal ☐ RCR RCRA ☐ HSC HSWA/CERCLA
☐ ASH Asbestos-Haz ☐ NSC NPDES/Spill Control ☐ AIR Air ☐ Space/Siting
☐ EXC Excavation ☐ RDR Rad-RSWD ☐ Other (Specify) _____

Special Work Permits

☐ RAD Rad. Work Permit ☐ LEC LE/CS ☐ HAZ Haz. Activities ☐ SPF Spark/Flame
☐ CELE Electrical ☐ CUO Cont. Unattended Ops. ☐ Other (Specify) _____

☒ Y ☐ N **Will this job require contacting any of the following groups?**

☒ ESH-1 ☒ ESH-3 ☐ ESH-5/OS ☐ ESH-5/IH ☐ ESH-6/NCS ☐ ESH-15/RAEM
☐ CST-7 ☐ ESH-8/ENV ☐ ESH-8/NEPA ☐ EMER-13/ERWM
☐ FSS-3 ☐ FSS-6 ☒ FSS-9 ☐ FSS-FP
☐ SSS-Safety ☐ SSS-IH ☐ SSS-ENV ☐ SSS-Utilities
☐ Other (Specify) _____

ESH-1 Review Signature (If Required)	ESH-3 Review Signature (Required)	Date
		8-17-95

Comments

Form 1336 (8/94)

NEPTUNIUM SHIPMENT To TA-54

	Gamma Dose Rate mrem/h	Neutron Dose Rate mrem/h	Total Dose Rate mrem/h	Gross Wt LBs	Nuclide	Radionuclide Content Amount	Radionuclide Content Units	Waste Pkg Serial Number
	1.90E+02	3.00E+00	1.90E+02	5.22E+02	PU239 FGE	1.09E+00	Curies	LA00000055637
	2.30E+01	2.00E+00	2.50E+01	5.00E+02	PU239 FGE	3.86E-01	Curies	LA00000055640
	3.50E+01	1.00E+00	3.60E+01	1.16E+02	PU239 FGE	2.01E-02	Curies	LA00000055569
Totals...(scientific notation)->	2.48E+02	6.00E+00	2.51E+02	1.14E+03	PU239 FGE	1.50E+00	Curies	
Totals....(2 decimal points)->	248.00	6.00	251.00	1138.00	PU239 FGE	1.50	Curies	

Los Alamos
NATIONAL LABORATORY

RADIOLOGICAL WORK PERMIT

ESH USE ONLY	
Permit Number	95-3-29-9-283
Effective Date/Time	8/21/95
Expiration Date/Time	12-23-95

GENERAL INFORMATION (to be completed by requester)

Requested by	Group	Telephone Number	Mail Stop
Larry Field	MST-5	50919	G730
Work Location (TA, Building, Room Number)	**SOP Number**	**Small Job Ticket**	**Work Order Number**
3, 29 Wing 9 Hot Cells			

Work to be performed *(Add attachment if necessary)* Load 3 55gal drums into a RH-TRU Canister & weld shut. Load canister into Shield and Shield unto Low Boy trailer. Transport to TA-54-G To deposit canisters into underground silos and return shield to wing 9

Approval required by (date):	Desired start date:	Probable end date:

Describe additional hazards *(Ex: limited egress, confined space, chemicals, criticality, hot particles, etc.)*

Heavy Equipment overhead - Safety Glass, Safety shoes, Hardhats required @ TA-54-G.

PRE-JOB RADIOLOGICAL CONDITIONS

Estimated Radiation Levels < 20 mrem/hr

Surface Contamination < 1000 dpm/100 cm² Airborne Contamination < 0.1 DAC External Dose Equivalent Rate .1 – 10 mrem/hr

Identify nuclides if possible

Measured Radiation Levels*		**Measured Contamination Levels***		
Beta + gamma (mrem/hr)	/	(1)	**DIRECT** (dpm/100 cm²)	**SMEAR** (dpm/100 cm²)
		Alpha	/	/
Neutrons (mrem/hr)	/	Beta + gamma	/	/
		Tritium		/

* Record general area/highest level encountered—see survey report for additional information.

Identify any contamination under paint or on inaccessible surfaces

Airborne Contamination Data DAC	Surveyed by	Z Number	Date
	James Gallegos	096430	8/21/95

RADIATION PROTECTION REQUIREMENTS

Protective Clothing Requirements ☐ None required

(2) ☒ Level 1 *(Coveralls, 2 pairs of surgeon's gloves, booties, and skull cap)* ☐ Taped openings

☐ Level II *(2 Coveralls, 2 pairs of surgeon's gloves, 2 pairs of booties, and hood)* ☐ Other *(See special requirements below)*

Respiratory Requirements ☒ None required

☐ Full-face respirator ☐ Supplied-air mask ☐ Particulate cartridge ☐ Combination cartridge

☐ Chemical cartridge ☐ ESH-5 respirator card ☐ CAM ☐ Ventilation *(Specify)*

☐ SCBA ☐ Supplied-air suit ☐ Special air test ☐ _____

☐ Regular air test

Dosimetry Requirements ☐ None required

☒ WB dosimeter ☒ PNAD packet ☒ Alarming dosimeter ☐ Nose swipes ☐ Urinalysis

☐ Secondary dosimeter ☐ TLD finger rings ☐ NTA badges ☐ Whole-body count ☒ Workers are on Pu access list

RCT Monitoring Requirements ☐ None required

(3) ☒ Intermittent coverage ☐ Personnel before leaving job ☐ Self-frisking ☐ RCT monitor undress

☒ Continuous coverage ☒ Notify RCT at job end ☒ Equipment and tools before removal

☒ Notify RCT before job starts @ Jaime 7-4653

Special Posting Requirements ☒ None required

☐ Required *(Specify)*

Training Requirements

☒ GERT ☐ RadWorker I ☒ RadWorker II ☐ Other

Special Requirements ☐ None required ☒ ~~ALARA review~~/pre-job briefing ☐ Special ALARA controls *(See attachment)*

☐ Heat stress monitoring required (contact ESH-5)

Instructions /Limiting Conditions *(Add attachments if necessary)*

(1) To be done prior to loading drums (2) Various PC requirements at diff stages of procedure

Completed by	Z Number	Date
James Gallegos	096430	8/21/95

APPROVALS

1. Line Manager	Z Number	Group	Date	3.	Z Number	Group	Date
	10049		8/21/95		1004		
2. RCT Supervisor	Z Number	Group	Date	4.	Z Number	Group	Date
	76480	ESH-1	8-21-95	—			

Appendix H

Logbook and Lists of Neptunium Waste Items

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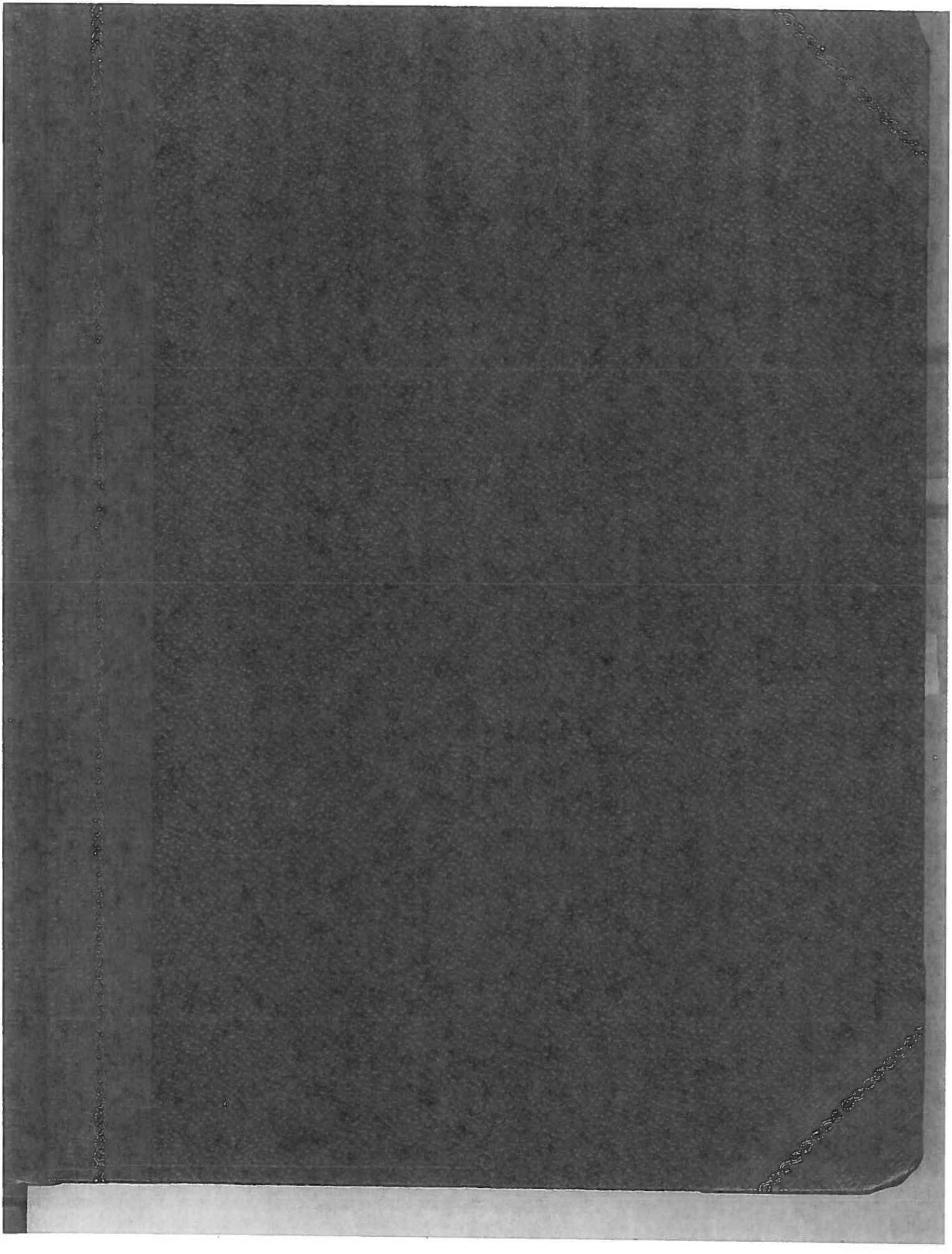

LOS ALAMOS NATIONAL LAB

Sammi Owens NMT-2

ph 5-4017

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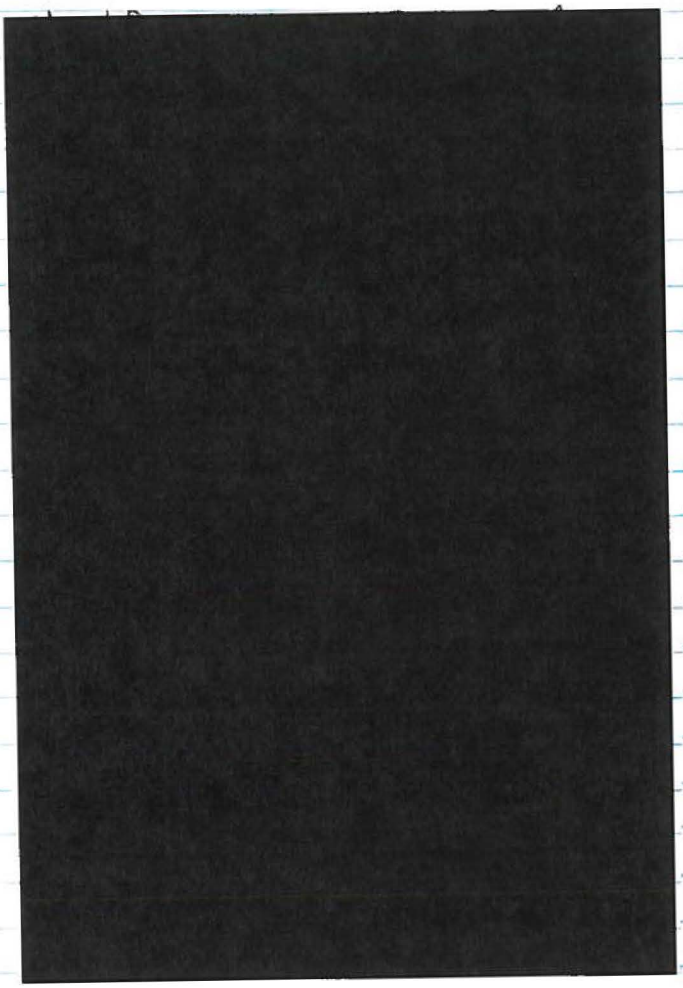
Contents

Page

are okay with the job.

People working Night

NMT-2: Sammie Avers, Greg Bird
NMT-7: Jim Balbey
NMT-2: Esteven Arriaga, Alfonso Vargas, Walter Arriaga, Robert Virgil
NMT-7: Dennis Wulff, Rick Manges, Mike Gallegos, Joe Gutierrez
ESH-1: Mike Jobb, Marcos Martinez, Dan Padilla
NMT-2: Richard Maestas
FSS-12: Diane Otero Bell, Mark Schaefer, Ron Blankenship, Tim Ayers, Lou Williams, Leonard Gonzales



The "Special Work Permit" was issued Nov 16, 94.
Pete Wallace (NMT-DO Safety Office) has file copy.

OT-Tuesday nite Nov 29 Workers were:

Greg Bird doing introductions
Walter Arriaga - packing drum
Sammie Avers - recording
Mike Jobb - monitoring intake
Dennis Wulff, Mark Gallegos, Joe Gutierrez } waste certification, MASS movement + drum paperwork

Esteven Arriaga, Robert Virgil, Alfonso Vargas } getting equip ready + preparing item for intake, sending on MASS
Diane Otero Bell, Mark Schaefer } NP confirmation measurements
Dan Padilla - Backup monitor Paperwork, as needed

The night went incredibly well after a slow start. 20 items were catalyzed, confirmed + packed in one drum. They were all 1 gallon paint cans & no extra lead shielding was introduced. All were SALTS + XBLC's.

Packed Item	Initial (No Shielding) mRem at item
ORS 29	92
ORS 41	90
ORS 5	90
ORS 44	88
ORS 26	86
ORS 35	85
ORS 8	84
ORS 9	84
ORS 19	82
ORS 45	80
ORS 17	78

(very heavy + dense good @ self shielding)

Packed Item	(No Shielding) mRem at item
ORS 21	74
ORS 22	70
ORS 51	69
ORS 15	68
ORS 28	68
ORS 38	68
ORS 30	66
ORS 20	62
ORS 6	62

It took from 5pm until 9pm to pack the drum + dunnage.

[redacted]

The Drum weighed 510 lbs. It moved very easily due to the guy's ingenious plan of putting talcum powder on the floor, placing a plastic (hard) sheet on top of that + then drum on that. The sheet had hand holes cut out + the drum pulled out like a breeze.

[redacted]

The Drum was #1 LA0000000 55637
AND the radiation reading was 23 mRem/hr

Yeah!
Not remote handled so don't have to significantly decrease my forecast for remote handled drums.

SNM Np 405 grams
X .015 FGE Pu^{239}
6 [redacted] FGE Pu^{239}

Memo from FSS-12 documenting double confirmatory measurements ~~as~~ memo # FSS-12-94-1267-U.

Thursday, Dec 1st, 1994

[redacted]

Workers:

Esteban Duenas	Leonard Lovato	Diane Tarbell
Walter Duenas	Joe Williams	Ron Blankenship
Simon Aragon	Rusty Guillen	Tim Ayers
Robert Vigil	Mike Gallegos	
Alfonso Vargas	Dennis Wolff	
	Jay Dettinger	

12/6 NOTE (Item List for Drum on page 7.)

LEAD LINING DRUM 1/8" thick
1/16" outside plastic liner + 1/16" inside plastic liner
(Drum, lead, 5ml Bag, 26LB, 1/8" Polyethylen liner, lead)

ERX6 had to be sieved. 0.33 kg fines created as ERX FINES

Friday Dec 2 1994

1st Drum Drum LA00000055637 weighed ≈520 pounds.

Didn't leave OT last night until 10:15, We had a CAM alarm notification from the Operations Center.

[redacted]

2nd Drum # LA000000 55637 weighed 522.2 lbs
SNM total 1154 Np / Converted X.015 = 17.4 grams

Michael Palmer has processed:
13 solns so far

CMC 97492	0
CMC 95941	0
CMC 96882	0
CMC 96684	1
CMC 97862	1
CMC 97863	1
CMC 5121B	7
SOL CLS 5121-1Y	3
CMC 5121G J	4
SOL CLS 5121-6F	5
SOL CLS 1-5121-3P	2
CMC 203853	9
CMC 44353	4

They are receiving 5 more solutions from CMR's CST on 12/5/94:

RES-5129-3L	4
RES-5129-3H	3
RES-5121-1B	13
RES-5129-4R	0
RES-MSNP-01	4

Tues, Dec 6, 1994

OT to pack salts & metal

Personnel:

Deane Stanfield
Mark Schanfein
Mike Gallegos
Sammy Avers
Richard Maestas (attfish)
(Lalo) Eduardo Estrada
Mike Foffo
Esteban Duran
Robert Vigil
Benjie Martinez
~~Richard~~ Walter Lujan
Dennis Wulff

3rd Drum# CA0000055653 (weighed 508 lbs fully packed)

Items were salts, one HEPA filter, Nonactinide metal (Stirrer rods) and cuvettes

Item#	LOT ID	mRem/hr	Item#	LOT ID	mRem/hr
①	ORS2	100	⑭	GRA840921	21
②	ORS13	100	⑮	STIRRERS	45
③	ORS48	95	⑯	ERC4292GL	60
④	ORS52	93	⑰	GLS840726	34
⑤	ORS43	33	⑱	ORC4240GL	31
⑥	ERS3	30	⑲	FIL860501	30
⑦	ORS39	26	⑳	METAL	27
⑧	ORS42	21	㉑	ORS31	<20
⑨	ORS49	20	㉒	ORS32	<20
⑩	ORS36	18	㉓	ORS4	<20
⑪	ORS37	18	㉔	ORS47	<20
⑫	ORS33	15	㉕	ORS53	<20
⑬	ORS1	12			

All salts from vault are now packed. We put them all in drums w/ FSS-12 confirmation because the salts are too dense to measure in count room.

Due to CAM alarm + problems on Dec 1st here is the packaged list from that night:

Drum #2 LA000000055639 (weighed 522 lbs)

Item #	LOT ID	mRem/hr	Item #	LOT ID	mRem/hr
①	GBS-FGE	2000	(13)	ORS46	150
②	ERX2	600	(14)	ORS16	140
③	ERX5	600	(15)	ORS11	130
④	ORS10	550	(16)	ORS14	110
⑤	ERX7	330	(17)	ORS50	110
⑥	ERX4	320	(18)	ORS7	60
⑦	ERX1	300	(19)	ORS25	52
⑧	ORS23	250	(20)	ORS24	50
⑨	ERX6	250	(21)	ORS18	46
⑩	BCS1	240	(22)	ORS3	45
⑪	ORS34	165	(23)	ORS27	42
⑫	ORS12	150	(24)	ORS28A	38
			(25)	ORS40	38

8
Thurs, Dec 8, 1994

4th OT night

Drum # LA 0000000 55638

packed:

RAG840921
RAGXP1-ERA5
BCP4300RG
RAG 860128 → Rejected by Waste Mgmt MT53 too high send back to vault a find staff to combine so we can ↑ net weight & discard.
RAG860326
ERC4250RG
ORC4240RG
RAG
RAGWE0707
RAG4602M
RAGBC011
RAGIB-1NP
RAGXP1-ERP
RAGXP2-ERP
RAGXP3-ERP
RAGXP4-ERP

The following sweeps were introduced & combined & wastecertified. They will be cemented by Chester Smith along with Mike Palmeis CLS-1 solns.

18651-P
GNF2021
ERP5484SW

[redacted]

6/30/95

Drums generated of NP Waste

LA ~~000000~~	55322	25mR/hr
	638	23mR/hr
	637	23mR/hr
	639	190mR/hr
	569	35mR/hr
	653	15mR/hr
	55907	5mRem/hr (XOPs)

Sorted by date of drum packing

LOTID	PROJ	IDES	COMBINED	DRUM	
18651-P	814	R780		55322	Cemented drum
CLSOH112194	814	R410		55322	
CMC203853	814	L520		55322	
CMC44353	814	L772		55322	
CMC51211B	323	L770		55322	
CMC51216J	323	L770		55322	
CMC95941	323	L190	to CLSOH112194	55322	
CMC96684	814	L19A		55322	
CMC96882	323	L190		55322	
CMC97492	323	L190		55322	
CMC97862	323	L190		55322	
CMC97863	323	L190		55322	
CMF2021	323	R780		55322	
ERP5484SW	814	R780		55322	
PBOH4	814	R412	to SWPFGE01	55322	
RES-5121-1B	814	L000		55322	
RES-5129-3H	814	L000		55322	
RES-5129-3L	814	L000		55322	
RES-5129-YR	814	L000		55322	
RES-MSNP-01	814	L000		55322	
RESXP1-ERA5	814	R26P		55322	
RESXP2-ERP	814	R26P		55322	
SOLCLS1-5121-3P	814	L770		55322	
SOLCLS15119-J6	814	L190	to CLSOH112194	55322	
SOLCLS15121-1Y	814	L770		55322	
SOLCLS15121-6F	814	L770		55322	
SWPFGE01	814	R780		55322	1/26/95 Count= 27 Cemented liquids + powder residues
CMC40993	323	N670		55569	
CMC40994	814	N670		55569	
CMC43048	323	N670		55569	
CMC713459	323	N670		55569	
ERC4250PL	814	N670		55569	
ERP-10PLS	814	N670		55569	
ERP-11PLS	814	N670		55569	
ERP-1PLS	814	N670		55569	
ERP-2PLS	814	N670		55569	
ERP-3PLS	814	N670		55569	
ERP-4PLS	814	N670		55569	
ERP-5PLS	814	N670		55569	
ERP-6PLS	814	N670		55569	
ERP-7PLS	814	N670		55569	
ERP-8PLS	814	N670		55569	
ERP-9PLS	814	N670		55569	
PLAS1	814	N670		55569	
PLAS2	814	N670		55569	
PLAS3	814	N670		55569	
PLAS4	814	N670		55569	
PLAS5	814	N670		55569	
PLS840921	814	N670		55569	
PLSBCO12	814	N670		55569	
PLSXP1-ERA5	814	N670		55569	
PLSXP10-ERA5	814	N670		55569	
PLSXP11-ERA5	814	N670		55569	

Drum 55569

PLSXP12-ERA5	814	N670		55569		
PLSXP2-ERA5	814	N670		55569		
PLSXP3-ERA5	814	N670		55569		
PLSXP4-ERA5	814	N670		55569		
PLSXP5-ERA5	814	N670		55569		
PLSXP6-ERA5	814	N670		55569		
PLSXP7-ERA5	814	N670		55569		
PLSXP8-ERA5	814	N670		55569		
PLSXP9-ERA5	814	N670		55569	12/8/94 Count= 35	plastics
ORS15	814	R712		55637		
ORS17	814	R712		55637		
ORS19	814	R712		55637		
ORS20	814	R712		55637		
ORS21	814	R712		55637		
ORS22	814	R712		55637		
ORS26	814	R712		55637		
ORS28	814	R712		55637		
ORS29	814	R712		55637		
ORS30	814	R712		55637		
ORS35	814	R712		55637		
ORS38	814	R712		55637		
ORS41	814	R712		55637		
ORS44	814	R712		55637		
ORS45	814	R712		55637		
ORS5	814	R712		55637		
ORS51	814	R712		55637		
ORS6	814	R712		55637		
ORS8	814	R712		55637		
ORS9	814	R712		55637	11/29/94 Count= 20	Soft Pesticides
BCP4300RG	814	K150		55638		
ERC4250RG	814	K150		55638		
ORC4240RG	814	K150		55638		
RAG	814	K150		55638		
RAG4602K1	814	K150		55638		
RAG840921	814	K150		55638		
RAG860326	814	K150		55638		
RAGBC011	814	K150		55638		
RAGIB-1NP	814	K150		55638		
RAGWE0787	814	K150		55638		
RAGXP1-ERA5	814	K150		55638		
RAGXP1-ERP	814	K150		55638		
RAGXP2-ERP	814	K150		55638		
RAGXP3-ERP	814	K150		55638		
RAGXP4-ERP	814	K150		55638	12/8/94 Count= 15	Rags
BCS1	814	R712		55639		
ERX1	814	N50X		55639		
ERX2	814	N50X		55639		
ERX4	814	N50X		55639		
ERX5	814	N50X		55639		
ERX6	814	N50X		55639		
ERX7	814	N50X		55639		
GBS-FGE	814	R712		55639		
GBS-NP	814	R712	to GBS-FGE	55639		
ORS10	814	R712		55639		
ORS11	814	R712		55639		
ORS12	814	R712		55639		
ORS14	814	R712		55639		
ORS16	814	R712		55639		

Drum 55637

Drum 55639

ORS18	814	R712		55639			
ORS23	814	R712		55639			
ORS24	814	R712		55639			
ORS25	814	R712		55639			
ORS27	814	R712		55639			
ORS28A	814	R712		55639			
ORS3	814	R712		55639			
ORS34	814	R712		55639			
ORS40	814	R712		55639			
ORS46	814	R712		55639			
ORS50	814	R712		55639			
ORS7	814	R712		55639	12/1/94 Count=	26	Salts + Insolubles
ERC4292GL	814	N290		55653			
ERS3	814	R712		55653			
FIL860501	814	N350		55653			
GLS840726	814	N290		55653			
GRA840921	814	N310		55653			
METAL	814	N550		55653			
ORC4240GL	814	N290		55653			
ORS1	814	R712		55653			
ORS13	814	R712		55653			
ORS2	814	R712		55653			
ORS31	814	R712		55653			
ORS32	814	R712		55653			
ORS33	814	R712		55653			
ORS36	814	R712		55653			
ORS37	814	R712		55653			
ORS39	814	R712		55653			
ORS4	814	R712		55653			
ORS42	814	R712		55653			
ORS43	323	R712		55653			
ORS47	340	R712		55653			
ORS48	814	R712		55653			
ORS49	814	R712		55653			
ORS52	814	R712		55653			
ORS53	814	R712		55653			
STIRRERS	814	N55F		55653	12/6/94 Count=	25	Salts + Nonfetuned Met
XOD-1	814	R71W		55907			
XOD-2	814	R71W		55907			
XOD-2A	814	R71W		55907			
XOD-3	814	R71W		55907			
XOD-3A	814	R71W		55907			
XOD-4	814	R71W		55907			
XOD-4A	814	R71W		55907	6/25/95 Count=	7	Salt
COMBA	814	room trash		56206			
COMBB	814	room trash		56206			
COMBC	814	room trash		56206			
COMB46C	814	room trash		56206			
COMB78	814	room trash		56206			
COMB78A	814	room trash		56206			
COMB82	814	room trash		56206			
COMBFGE1	814	room trash		56206	9/20/96 Count=	8	Combustible Rm trash
COMBFGE2	814	room trash		56216			
NDA RM TRASH1	814	rm trash		56216			
NDA RM TRASH2	814	rm trash		56216			
NDA RM TRASH3	814	rm trash		56216			
NDA RM TRASH4	814	rm trash		56216	9/20/96 Count=	5	Combustible Rm trash
COMBFGE3	814	room trash		56217			

Drum 55639 continued

NDA RM TRASH5	814	rm trash		56217
NDA RM TRASH6	814	rm trash		56217
NDA RM TRASH7	814	rm trash		56217
NDA RM TRASH8	814	rm trash		56217
COMBFGE4	814	room trash		56218
NDA RM TRASH9	814	rm trash		56218
NDA RM TRASH10	814	rm trash		56218
NDA RM TRASH11	814	rm trash		56218
NDA RM TRASH12	814	rm trash		56218
NP-1	323	K600		56218
PLSMM03	345	N670		56219
COMBMM02	814	room trash		56219
COMMM103A	814	room trash		56219
COMMM103B	814	room trash		56219
COMMM103C	814	room trash		56219
COMMM103D	814	room trash		56219
PLSMM02	814	N670		56219
PLSMM04	345	N670		56219
PU/NP-SCP1	814	room tra	to COMM lotid	56219
PU/NP-SCP2	814	room tra	to COMM lotid	56219
PU/NP-SCP3	814	room tra	to COMM lotid	56219
PU/NP-SCP4	814	room tra	to COMM lotid	56219
PU/NP-SCP5	814	room tra	to COMM lotid	56219
PU/NP-SCP6	814	room tra	to COMM lotid	56219
PU/NP-SCP7	814	room tra	to COMM lotid	56219
RAGMM01	814	K15W		56219
DRM10703	814	N000		56221
CAN -28	814	K600		56300
CER840930	814	N50X	to CERFGE01	56300
CER860326	814	N50X	to CERFGE01	56300
CERFGE01	814	N50X		56300
CMC42778	323	N31X	to GRAFGE01	56300
ERC4250GL	814	N290	to GLSFGE01	56300
ERP-1GLS	814	N290	to GLSFGE01	56300
ERP-2GLS	814	N290	to GLSFGE01	56300
ERP-3GLS	814	N290	to GLSFGE01	56300
ERP-4GLS	814	N290	to GLSFGE01	56300
ERP-5GLS	814	N290	to GLSFGE01	56300
ERP-6GLS	814	N290	to GLSFGE01	56300
ERP-7GLS	814	N290	to GLSFGE01	56300
ERP-8GLS	814	N290	to GLSFGE01	56300
FILXP1-ERA5	814	N350		56300
GLS840809	814	N290	to GLSFGE04	56300
GLS860326	814	N290	to GLSFGE01	56300
GLSBC013	814	N290		56300
GLSFGE01	814	N290		56300
GLSFGE02	814	N290		56300
GLSFGE03	814	N290		56300
GLSFGE04	814	N290		56300
GLSFGE05	814	N290		56300
GLSIB-1NP	814	N290	to GLSFGE01	56300
GLSXP1-ERA5	814	N290	to GLSFGE01	56300
GLSXP2-ERA5	814	N290	to GLSFGE01	56300
GLSXP3-ERA5	814	N290	to GLSFGE01	56300
GLSXP4-ERA5	814	N290	to GLSFGE01	56300
GLSXP5-ERA5	814	N290	to GLSFGE01	56300
GLSXP6-ERA5	814	N290	to GLSFGE01	56300
GRA860326	814	N310	to GRAFGE01	56300

9/20/96 Count= 5 Combustable/Rm trash

9/20/96 Count= 6 Combustibles

9/20/96 Count= 16 Combustibles
9/23/96 Count= 1 Non actinide metal + Combustibles, gloss

GRAFGE01	814	N31X		56300		
HNN5111W	814	R26N		56300		
MET840921	814	N550	to METFGE01	56300		
METATLNP-1	814	N290	to METFGE03	56300		
METBC010	814	N550		56300		
METFGE01	814	N550		56300		
METFGE02	814	N550		56300		
METFGE03	814	N550		56300		
METIB-1NP	814	N550	to METFGE01	56300		
METPI1	814	N550		56300		
NPGLSSA	814	N290	to GLSFGE04	56300		
NPMETSCRAP	814	N000	to METFGE01	56300		
NPRES691	814	N000	to GLSFGE04	56300		
NPTR691	814	N000	to GLSFGE04	56300		
SW850731	814	R26N		56300		
SWPFGE02	814	R780		56300		
SWPSA1	814	R780		56300	11/1/96 Count=	48
BCP4300LG	814	N480	to GLVFGE01	56301		
GLVFGE01	814	N480		56301		
GLVXP1-ERA5	814	N480	to GLVFGE01	56301		
GLVXP2-ERA5	814	N480	to GLVFGE01	56301		
PLSFGE03A	814	N670		56301		
PLSFGE03B	814	N670		56301		
PLSFGE04	814	N670		56301		
PLSFGE05	814	N670		56301		
PLSFGE06	814	N670		56301		
PLSFGE07	814	N670		56301		
PLSFGE100	814	N670		56301		
PLSFGE300	814	N670		56301		
PLSIB-1NP	814	N670	to PLSFGE04	56301		
RAG850702	814	K150	to RAG850731	56301		
RAG850731	814	K150		56301		
RAG860128	814	K150		56301		
RAGPI	814	K150		56301		
RAGSA4	814	K150		56301		
RUB840921	814	N700	to GLVFGE01	56301		
RUB842307	814	N700	to GLVFGE01	56301		
RUB860501	814	N700		56301		
RUBFGE01	814	N700		56301		
RUBXP1-ERA5	814	N700	to RUBFGE01	56301	11/1/96 Count=	23
~~CMC03051~~	~~814~~	~~L190~~	~~to CLSOH3995~~	~~none~~		
~~CMC205713~~	~~814~~	~~L520~~	~~to CLSOH3995~~	~~none~~		
GLSCLS12794	345	N290	drum in room 420 for discard in January 97			
NPCON	814	R780	separated into several items			

Ceramics, glass, graphite
Non Combustibles, sweepings combustible

plastics, leaded gloves rags, rubber

Glass

TOTAL Items= ~~271~~ 269

sort by rad

RAD READINGS pre 1996

LOTID	Rad mR/hr	PROJ	IDES	STATUS
ORC4240CO	17000	323	R780	Swpgs,15mr thru heavy lead pig, high R at contact
GBS-NP	2000	814	R712	Slt
ERX2	600	814	N50X	Crucible
ERX5	600	814	N50X	Crucible
ORS10	550	814	R712	salt
ERX7	330	814	N50X	MGO CRUCIBLES
ERX4	320	814	N50X	Crucible
ERX1	300	814	N50X	Crucible
RAG840921	270	814	K150	Rag,35gDRUM
ORS23	250	814	R712	Salt
ERX6	250	814	N50X	Crucible
BCS1	240	814	R712	Salt
ORS34	165	814	R712	Salt,HOLD, Naomi to release due to noncountable
ORS12	150	814	R712	Salt
ORS46	150	814	R712	Salt
ORS16	140	814	R712	Salt
ORS11	130	814	R712	Salt
ORS14	110	814	R712	Salt
ORS50	110	814	R712	Salt
XOD-4	100	814	R71W	Salt,Certified ready for drum
ORS13	100	814	R712	Salt
ORS2	100	814	R712	Salt
ORS48	95	814	R712	Salt
ORS52	93	814	R712	Salt
ORS29	92	814	R712	Salt
XOD-3	90	814	R71W	Salt,Certified ready for drum
ORS41	90	814	R712	Salt
ORS5	90	814	R712	Salt
ORS44	88	814	R712	Salt
ORS26	86	814	R712	Salt
ORS35	85	814	R712	Salt
ORS8	84	814	R712	Salt
ORS9	84	814	R712	Salt
ORS19	82	814	R712	Salt
XOD-4A	80	814	R71W	Salts, certified ready for drum
ORS45	80	814	R712	Salt
ORS17	78	814	R712	Salt
ORS21	74	814	R712	Salt
ORS22	70	814	R712	Salt
RAGXP1-ERA5	70	814	K150	Rag
ORS51	69	814	R712	Salt
ORS15	68	814	R712	Salt
ORS28	68	814	R712	Salt
ORS38	68	814	R712	Salt
ORS30	66	814	R712	Salt
BCP4300RG	65	814	K150	Rag
ORS20	62	814	R712	Salt,Hold Tag (due to TID problem?)
ORS6	62	814	R712	Salt
XOD-2A	60	814	R71W	Salt,Certified ready for drum
ORS7	60	814	R712	Salt
ERC4292GL	60	814	N290	GLASS,high neutron (2)
RAG860128	60	814	K150	Rag
RAG860326	60	814	K150	Rag15"can
ORS25	52	814	R712	Salt

Drum 55639

Drum 55637

XOD-3A	50	814	R71W	Salt,Certified ready for drum		
ORS24	50	814	R712	Salt		
ORS18	46	814	R712	Salt		
ORS3	45	814	R712	Salt		
STIRRERS	45	814	N55F	Nonactinide Metal		
ORS27	42	814	R712	Salt		
ORC4240RG	40	814	K150	Rag		
ORS28A	38	814	R712	Salt		
ORS40	38	814	R712	Salt		
ERC4250RG PL	35	814	K150	Rag,HOLD for OS-2 eval 5/94, in count room 11/14	ITEMS=	64
GLS840726	34	814	N290	Glass		
ORS43	33	323	R712	Salt		
ORC4240GL	31	814	N290	GLASS		
ERS3	30	814	R712	Salt		
FIL860501	30	814	N350	Hepa Filter		
METAL	27	814	N550	Nonactinde metal		
ORS39	26	814	R712	salt		
RAG	22	814	K150	rag		
18651-P	21	814	R780	Sweepings		
ORS42	21	814	R712	salt		
GRA840921	21	814	N310	crucible		
ORS49	20	814	R712	salt	ITEMS=	76
ORS36	18	814	R712	salt		
ORS37	18	814	R712	salt		
ORS33	15	814	R712	salt		
CMF2021	12	323	R780	sweepings,35gDRUM		
ORS1	12	814	R712	salt		
ERP5484SW	10	814	R780	sweepings		
GLS840809	10	814	N290	glass		
GLSXP6-ERA5	10	814	N290	glass,35gDRUM		
RAGWE0787	10	323	K150	high neutron (1.5),Cm, Am243, in count room, 11/14	ITEMS=	85

Drum 55569

[redacted] WASTE CHECK OK = WC

Drum 55639

Drum 55637

Packer Drum #

Items with Net Weights (kg)

Worksheet for RH loading										
sort by rad										
LOTID	Rad mR/hr	PROJ	IDES	STATUS				Chg to OXIDE	IDES	
~~ORC4240CO~~	~~17000~~	~~323~~	~~814~~	~~R780~~	~~Swpgs,15mr thru heavy lead pig, high R at contact~~					
GBS-NP	2000		814	R712	Slt	-WC-	Net 4.07			LF24
ERX2	600		814	N50X	Crucible	-WC-	Net 1.08			Room [redacted]
ERX5	600		814	N50X	Crucible	-WC-	Net 1.50			M16F
ORS10	550		814	R712	salt	-WC-	Net 5.29			M37B
ERX7	330		814	N50X	MGO CRUCIBLES	-WC-	Net 1.47			M13F
ERX4	320		814	N50X	Crucible	-WC-	Net 1.75			M13F
ERX1	300		814	N50X	Crucible	-WC-	Net 1.53			M14A
ORS23	250		814	R712	Salt	33kg -WC-	Net 5.18	[redacted]		H39A
ERX6	250		814	N50X	Crucible FINES	-WC-	Net 1.82		22200	J16B
BCS1	240		814	R712	Salt	-WC-	Net 4.52			M31B
ORS34	165		814	R712	Salt,HOLD, Naomi to release/due to noncountable		Net 5.93			M33C
ORS12	150		814	R712	Salt	-WC-	Net 5.20			M24A
ORS46	150		814	R712	Salt	-WC-	Net 5.15			M39A
ORS16	140		814	R712	Salt	-WC-	Net 5.26			M14C
ORS11	130		814	R712	Salt	-WC-	Net 5.19			M36D
ORS14	110		814	R712	Salt	-WC-	Net 5.21			M15A
ORS50	110		814	R712	Salt	-WC-	Net 5.56			C30A
ORS2	100		814	R712	Salt	-WC-	Net 6.12	[redacted]		M24C
ORS13	100		814	R712	Salt	-WC-	Net 5.20		1395	M24D
ORS48	95		814	R712	Salt	-WC-	Net 5.87			M35A
ORS52	93		814	R712	Salt	-WC-	Net 5.84			M33D
ORS29	92		814	R712	Salt	-WC-	Net 5.68 Kg			M21C
ORS41	90		814	R712	Salt	-WC-	Net 5.01			M19C
ORS5	90		814	R712	Salt	-WC-	Net 5.14			M37D
ORS44	88		814	R712	Salt	-WC-	Net 5.73			M40C
ORS26	86		814	R712	Salt	-WC-	Net 6.36			M31D
ORS35	85		814	R712	Salt	-WC-	Net 5.86			M34C
ORS8	84		814	R712	Salt	-WC-	Net 5.38	[redacted]		M38C
ORS9	84		814	R712	Salt	-WC-	Net 5.31		887	M37F
ORS19	82		814	R712	Salt XBLC, Cu bottom	-WC-	5.23 Kg Tid Cu	-5508.5	-282.7	? Rm [redacted]
ORS45	80		814	R712	Salt XBLC	-WC-	Net [redacted]	5.77 Kg		M36D
ORS17	78		814	R712	Salt (Mg° in all)	-WC-	Net [redacted]	4.97 Kg		M39B
ORS21	74		814	R712	Salt	-WC-	Net	5.28 Kg		M25B
ORS22	70		814	R712	Salt	-WC-	Net	5.24 Kg		M25E
ORS51	69		814	R712	Salt Metal	-WC-	Net	5.78 Kg		M32C
ORS15	68		814	R712	Salt	-WC-	Net	5.39 Kg		M15A
ORS28	68		814	R712	Salt XBLC	-WC-	Net	7.201 Kg		M12A
ORS38	68		814	R712	Salt	-WC-	Net 5.62	[redacted]		M11E
ORS30	66		814	R712	Salt	-WC-	Net 5.47 Kg		723	M21D

Net

Vault movement

Tues Nov 29 Greg BAD Tim McReese

Thurs Dec 1 Jim Bailey Keith Fehr

Tues: SAMMI Robert Voigt

Thurs:

Drum 55639

Drum 55637

[redacted] Rad drums wkshtt

WG RM 3 ORS 31 H01A Net 5,63
WG RM 3 ORS 32 E19B Net 5,61
WG RM 3 ORS 4 H06B Net 5,-
WG RM 3 ORS 47 F14C Net 5,8
WG RM 3 ORS 53 H27B Net 5,7

AV WG 1	ORS20 OS-2	62	814	R712	Salt,Hold Tag (due to TID problem?)	-WC- Net 5,67 Kg		
AV WG 6	ORS6 OS-2	62	814	R712	Salt	-WC- Net 5,20 Kg		
V WG 2	ORS7 OS-2	60	814	R712	Salt	-WC- Net 5,55		
V WG 8	ORS25 OS-2	52	814	R712	Salt	-WC- Net 6,52		
4V WG	ORS24 OS-2	50	814	R712	Salt	-WC- Net 6,65		
4V WG	ORS18 OS-2	46	814	R712	Salt	-WC- Net 5,33		
4V WG	ORS3 OS-2	45	814	R712	Salt	-WC- Net 5,59		
AV WG	ORS27 OS-2	42	814	R712	Salt	-WC- Net 6,55		
4V WG	ORS28A OS-2	38	814	R712	Salt	-WC- Net 6,44 [redacted]		
AV WG	ORS40 OS-2	38	814	R712	Salt	-WC- Net 5,59		495
WG RM 3	ORS43 OS-2	33	323	R712	Salt	-WC- Net 5,05		
NG RM 3	ERS3 OS-2	30	814	R712	Salt	-WC- Net 3,61		
WG RM 3	ORS39 OS-2	26	814	R712	salt	-WC- Net 5,53		
WG RM 3	ORS42 OS-2	21	814	R712	salt	-WC- Net 5,72		
WG RM 3	ORS49 OS-2	20	814	R712	salt	-WC- Net 5,03		
NG RM 3	ORS36 OS-2	18	814	R712	salt	-WC- Net 5,74		
NG RM 3	ORS37 OS-2	18	814	R712	salt	-WC- Net 5,02		
WG RM 3	ORS33 OS-2	15	814	R712	salt	WC- Net 5,40		
WG RM 3	ORS1 OS-2	12	814	R712	salt	-WC- Net 6,23 [redacted]		
WG RM 3	GRA840921 OS-2	21	814	N310	crucible	-WC- Net 0,09		214
WG RM 3	STIRRERS OS-2	45	814	N55F	Nonactinide Metal	-WC- Net 5,1		
WG RM 3	ERC4292GL OS-2	60	814	N290	GLASS,high neutron (2)	-WC- Net 1,1		
WG RM 3	GLS840726 OS-2	34	814	N290	Glass	-WC- Net 0,99		
WG RM 3	ORC4240GL OS-2	31	814	N290	GLASS	-WC- Net 0,88		
WG RM 3	FIL860501 Net 2,26 OS-2	30 OS-2	814	N350	Hepa Filter WC- Not in line Undetermined certify			
WG RM 3	METAL OS-2	27	814	N550	Nonactinde metal	-WC- Net 2,54		
	~~18651-P~~	~~21~~	~~814~~	~~R780~~	~~Sweepings~~ INTRO/CHK			
	~~CMF2021~~	~~12~~	~~323~~	~~R780~~	~~sweepings,35gDRUM~~ INTRO/CHK			260
	~~ERP5484~~ SW 10g							
	~~RAG840921~~ ~~(TROLLEY)~~	~~70~~	814	K150	Rag,35gDRUM ~~(TROLLEY)~~			
WG RM 4	RAGXP1-ERA5 OS-2	70	814	K150	Rag WC- NET 0,12			
NG RM 4	BCP4300RG OS-2	65	814	K150	Rag WC- NET 0,30			
NO	RAG860128 MT52	60	814	K150	Rag NO >MT52 ~~too high~~			
NG RM 4	RAG860326 OS-2	60	814	K150	Rag15"can WC- NET 1,51			
	ERC4250RG	35	814	K150	Rag,HOLD for OS-2 eval 5/94, in count room 11/14			
WG RM 4	ORC4240RG OS-2	40	814	K150	Rag WC- NET 0,70			
WG RM 4	RAG OS-2	22	814	K150	rag WC- NET 0,37	[redacted]		
	~~RAGWE0787~~	10	323	K150	high neutron (1.5),Cm, Am243, in count room, 11/14			632
WG RM 4	~~RAGFGE01 (TROLLEY)~~ OS-2	Net 2,19 -WC-						
	TO BE PACKED IN WASTE MANAGEMENT ROOM							
	XOD-4	100	814	R71W	Salt,Certified ready for drum			
	XOD-3	90	814	R71W	Salt,Certified ready for drum			
	XOD-4A	80	814	R71W	Salts, certified ready for drum			
	XOD-2A	60	814	R71W	Salt,Certified ready for drum			
	XOD-3A	50	814	R71W	Salt,Certified ready for drum			
	XOD-1	5	814	R71W	Salt,Certified ready for drum	[redacted]		
	XOD-2	2	814	R71W	Salt,Certified ready for drum			387
		NUMBER OF ITEMS			84			

m24F
m37D
m38C
m32B
m32A
m39C
m37C
m39E
H27C
m21E

m04E
m40D
m18C
m34B
C27C
m11A
H15B
H13B
E01C
C12A

E29A
E25A
C30B
K32C
KF06
E12A
G495 Compost
KF01
m33F
MF10
I22M
I18F
VLTC
I16P
G495
I17G
I15C
Rm [redacted] G495

WG RM 4 RAG4602K1 I17L OS-2 Net 0,13 WG RM RAGXP3-ERP OS-2 I21A Net 0,30
WG RM 4 RAGBC011 ~~OS-2 Re-WC~~ Net 0,88 WG RM RAGXP4-ERP OS-2 I15J Net 0,23
WG RM 4 RAGIB-INP OS-2 I19C Net 0,12
RM 4 RAGXP1-ERP I20C Net 0,28
RM 4 RAGXP2-ERP I18J Net 0,30

Appendix I

Memorandum
Cans of Np-237 Waste in Drum LA00000055639

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To: Craig Simmons

From: Derek Ott

Date: 10/14/2014

Subject: Cans of Np-237 Waste In Drum LA00000055639

Introduction

Cans of Np-237 bearing waste are currently being stored at LANL within 55-gallon drums. One of the drums, LA00000055639, is of particular concern. This drum has a very high estimate of Np-237 inventory, given at 1154 grams. Some of the cans themselves have very high dose rates, one of them as high as 2000 mR/hr. One possible way of shipping these cans as CH waste is to repack them into Standard Pipe Overpacks (SPO). Dose rate modeling using the particle transport code MCNP was performed to determine if such a packaging configuration would be suitable to ship these cans as CH waste.

Can Only Model

The first step is to determine the activity content of the cans. An MCNP model of a bare can with Np-237 contaminated salt was constructed to find a dose-to-curie (DTC) value for the cans. The DTC value may then be multiplied by the surface dose rate of each can to yield the activity content in the can. The real dimensions of the cans are unknown but assumptions were made based on the height and diameter of standard 1-gallon paint cans and on the metal thickness of steel 55-gallon drums. The dimensions are summarized below.

	in	cm
outer diameter	6.63	16.8402
radius		8.4201
outer height	7.76	19.7104
thickness		0.15

A minimum waste density was calculated from the known gross weight of drum LA00000055639 of 522 lbs. The net waste weight was calculated by subtracting the tare weights of the drum and the cans and the net waste weight was divided by the total volume of the cans to calculate the waste density. Since this assumes that the cans are completely full, this calculated figure represents a minimum density. A maximum density was determined by assuming a solid mass of the salt in the waste. The theoretical densities of most common industrial salts are in the range of 1.8 to 3 g/cm^3, so a median value of 2.4 g/cm^3 was selected to estimate the maximum density of the waste. Finally a nominal value for the waste density of 2.03 g/cm^3 was calculated from the median of the minimum and maximum values. The model

of the can was run at all three of these densities yielding the following DTC values for the cans of Np-237 bearing waste.

Waste Density (g/cm^3)	Model Results (R/hr/Ci)
1.66	9.33E+00
2.03	8.47E+00
2.4	7.68E+00

Actual measured dose rates were reported in a log book for the cans in drum LA00000055639. From the dose rates the Np-237, high, nominal, and low activity estimates in each can were determined as follows.

		Activity (Ci)		
Can	Measured Can Dose R/hr	Minimum Density Model	Nominal Density Model	High Density Model
1	2	2.14E-01	2.36E-01	2.60E-01
2	0.6	6.43E-02	7.09E-02	7.81E-02
3	0.6	6.43E-02	7.09E-02	7.81E-02
4	0.55	5.89E-02	6.50E-02	7.16E-02
5	0.33	3.54E-02	3.90E-02	4.29E-02
6	0.32	3.43E-02	3.78E-02	4.16E-02
7	0.3	3.21E-02	3.54E-02	3.90E-02
8	0.25	2.68E-02	2.95E-02	3.25E-02
9	0.25	2.68E-02	2.95E-02	3.25E-02
10	0.24	2.57E-02	2.83E-02	3.12E-02
11	0.165	1.77E-02	1.95E-02	2.15E-02
12	0.15	1.61E-02	1.77E-02	1.95E-02
13	0.15	1.61E-02	1.77E-02	1.95E-02
14	0.14	1.50E-02	1.65E-02	1.82E-02
15	0.13	1.39E-02	1.54E-02	1.69E-02
16	0.11	1.18E-02	1.30E-02	1.43E-02
17	0.11	1.18E-02	1.30E-02	1.43E-02
18	0.06	6.43E-03	7.09E-03	7.81E-03
19	0.052	5.57E-03	6.14E-03	6.77E-03
20	0.05	5.36E-03	5.91E-03	6.51E-03
21	0.046	4.93E-03	5.43E-03	5.99E-03
22	0.045	4.82E-03	5.31E-03	5.86E-03
23	0.042	4.50E-03	4.96E-03	5.47E-03

24	0.038	4.07E-03	4.49E-03	4.95E-03
25	0.038	4.07E-03	4.49E-03	4.95E-03

SPO With 3-Cans Model

A second model was made, this time of the 12 inch SPO containing 3 cans of Np-237 contaminated material using the assumed can dimensions above. It was assumed that the three cans have the same Np-237 activity. Contact dose points were modeled at the side wall, top and bottom of the SPO drum. As with the bare can model, minimum, nominal and maximum density cases were run for this model. The results of the modeling yielded the following DTC values for this configuration.

Density (g/cm^3)	Side Dose (R/hr/Ci)	Top Dose (R/hr/Ci)	Bottom Dose (R/hr/CI)
1.66	2.94E-01	1.95E-01	5.28E-01
2.03	3.29E-01	2.19E-01	5.87E-01
2.4	2.94E-01	1.95E-01	5.28E-01

To calculate the projected dose rate of loaded SPOs, the can activities (times three for 3 cans) are divided by the highest DTC value of the SPO above.

Can	Minimum Density Dose Rate (R/hr)	Nominal Density Dose Rate (R/hr)	High Density Dose Rate (R/hr)
1	*3.40E-01*	*4.16E-01*	*4.13E-01*
2	1.02E-01	1.25E-01	1.24E-01
3	1.02E-01	1.25E-01	1.24E-01
4	9.34E-02	1.14E-01	1.13E-01
5	5.61E-02	6.86E-02	6.81E-02
6	5.44E-02	6.65E-02	6.60E-02
7	5.10E-02	6.24E-02	6.19E-02
8	4.25E-02	5.20E-02	5.16E-02
9	4.25E-02	5.20E-02	5.16E-02
10	4.08E-02	4.99E-02	4.95E-02
11	2.80E-02	3.43E-02	3.40E-02
12	2.55E-02	3.12E-02	3.09E-02
13	2.55E-02	3.12E-02	3.09E-02
14	2.38E-02	2.91E-02	2.89E-02
15	2.21E-02	2.70E-02	2.68E-02
16	1.87E-02	2.29E-02	2.27E-02

17	1.87E-02	2.29E-02	2.27E-02
18	1.02E-02	1.25E-02	1.24E-02
19	8.83E-03	1.08E-02	1.07E-02
20	8.49E-03	1.04E-02	1.03E-02
21	7.81E-03	9.57E-03	9.49E-03
22	7.64E-03	9.36E-03	9.28E-03
23	7.13E-03	8.73E-03	8.67E-03
24	6.46E-03	7.90E-03	7.84E-03
25	6.46E-03	7.90E-03	7.84E-03

The above results show that the majority of the cans may be loaded into the SPO in a 3-can configuration without breaking the 200 mR/hr limit. However, can number 1 will break the limit if loaded in a 3-can configuration.

SPO with 1-Can Model

A third model was developed to see if can number 1 is able to be shipped by itself. This model assumes that a dunnage can is placed at the bottom of the SPO pipe to raise the waste can away from the bottom of the drum, thereby reducing the dose rate at the bottom surface of the SPO drum. As with the other two models, minimum, nominal and maximum density cases were run for this model. The results of the modeling yielded the following DTC values for this configuration.

Density (g/cm^3)	Side Dose (R/hr/Ci)	Top Dose (R/hr/Ci)	Bottom Dose (R/hr/CI)
1.66	5.39E-01	2.98E-02	4.09E-02
2.03	4.86E-01	2.07E-02	2.18E-02
2.4	4.40E-01	1.42E-02	1.31E-02

To calculate the projected dose rate of loaded SPO, the can activity is divided by the highest DTC value of the SPO above.

Can	Minimum Density Dose Rate (R/hr)	Nominal Density Dose Rate (R/hr)	High Density Dose Rate (R/hr)
1	1.16E-01	1.15E-01	1.15E-01

Summary

The majority of the cans are not expected to break the CH threshold of 200 mR/hr if they placed directly into 12 inch SPO drums loading 3 cans in each SPO drum. The one exception is can number 1 which has a

surface dose rate of 2000 mR/hr as noted in the mentioned logbook. This can may also be shipped as CH in a 12 inch SPO, however, it must be placed singly into the SPO with a dunnage can beneath it.