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ORNL/TM-2003/53

THORIUM NITRATE STOCKPILE DRUM CHARACTERIZATION REPORT

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ORNL/TM-2003/53

Nuclear Science and Technology Division
Environmental Sciences Division

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CONTENTS

LIST OF FIGURES v
LIST OF TABLES vii
ACRONYMS, ABBREVIATIONS, AND INITIALISMS ix
EXECUTIVE SUMMARY xi

1. INTRODUCTION 1

2. REGULATORY REQUIREMENTS 4
   2.1 DOT REGULATIONS AFFECTING THE ThN DISPOSITION 4
   2.2 NTS WAC REQUIREMENTS AFFECTING THE PACKAGING OF THE ThN FOR DISPOSITION 4
   2.3 QUALITY ASSURANCE RECORDS 5

3. BACKGROUND INFORMATION 6
   3.1 OVERVIEW OF STOCKPILE 6
   3.2 OVERVIEW OF CURRENT THORIUM NITRATE PACKAGES SUITABILITY FOR TRANSPORT AND DISPOSAL AT NTS 6
   3.3 OVERVIEW OF STORAGE BUILDINGS 10

4. THORIUM NITRATE SAMPLING PROGRAM DESCRIPTION 17
   4.1 THORIUM NITRATE SAMPLING ACTIVITIES 17
      4.1.1 Drum Handling and Sample Collection at Hammond Depot 19
      4.1.2 Drum Handling and Sample Collection at Curtis Bay Depot 23
      4.1.3 Sample Analyses 28
      4.1.4 Field Sampling Observations 28
      4.1.5 In Situ Gas Analysis 34
   4.2 GAS SAMPLING AND PRESSURE MEASUREMENT 35
   4.3 RADIATION SURVEY REPORTS 36

5. JUSTIFICATION FOR USING ISO CONTAINERS 40
   5.1 ADVANTAGES AND DISADVANTAGES OF ISO CONTAINERS 40
   5.2 ESTIMATED RADIATION DOSE RATES FROM AN ISO CONTAINER FILLED WITH THORIUM NITRATE 41
   5.3 PRESSURE CONSIDERATIONS 43
   5.4 COMMUNICATIONS BETWEEN DOT AND DNSC 44

6. CONCLUSIONS 45

7. REFERENCES 46

CONTENTS (*continued*)

Appendix A.	HAMMOND DEPOT DRUM VISUAL INSPECTIONS	A-1
Appendix B.	HAMMOND DEPOT DRUMS SAMPLED FOR OFFSITE ANALYSES (FIRST SAMPLE SHIPMENT)	B-1
Appendix C.	CURTIS BAY DEPOT DRUMS SAMPLED FOR OFFSITE ANALYSES (SECOND SAMPLE SHIPMENT)	C-1
Appendix D.	CURTIS BAY DEPOT DRUMS SAMPLED FOR OFFSITE ANALYSES (THIRD SAMPLE SHIPMENT)	D-1
Appendix E.	CURTIS BAY DEPOT DRUMS SAMPLED FOR OFFSITE ANALYSES (FOURTH SAMPLE SHIPMENT)	E-1
Appendix F.	CURTIS BAY DEPOT DRUMS SAMPLED FOR OFFSITE ANALYSES (FIFTH SAMPLE SHIPMENT)	F-1
Appendix G.	CURTIS BAY DEPOT DRUMS SAMPLED FOR ONSITE ARCHIVE (FIRST DRUM OF ARCHIVE SAMPLES)	G-1
Appendix H.	CURTIS BAY DEPOT DRUMS SAMPLED FOR ONSITE ARCHIVE (SECOND DRUM OF ARCHIVE SAMPLES)	H-1
Appendix I.	CURTIS BAY DEPOT DRUMS SAMPLED FOR ONSITE ARCHIVE (THIRD DRUM OF ARCHIVE SAMPLES)	I-1
Appendix J.	SAMPLE SHIPPING DOCUMENTATION	J-1
Appendix K.	CHAIN OF CUSTODY AND SAMPLE ANALYSES REQUEST FORMS	K-1
Appendix L.	RADIOLOGICAL DOCUMENTATION	L-1
Appendix M.	POTENTIAL MECHANISMS FOR GENERATION OF HEADSPACE GAS IN THE MD-1 DRUMS	M-1
Appendix N.	DEPARTMENT OF ENERGY'S EXPERIENCE WITH PRESSURIZED DRUMS	N-1
Appendix O.	FOLLOW-UP DRUM PRESSURE TESTING	O-1
Appendix P.	COPIES OF CORRESPONDENCE BETWEEN THE DNSC AND THE DOT	P-1
Appendix Q.	MICROSHIELD DOSE RATE MODELING OF AN ISO CONTAINER LOADED WITH 40,000 lb OF THORIUM NITRATE	Q-1

LIST OF FIGURES

1. Packing configurations for the various types of thorium nitrate drum packages 7
2. MD-1 and MD-3 drums 8
3. MD-2 (red) and MD-5 Indian drums 8
4. MD-2 French drums 8
5. Stack of MD-4 drums 8
6. Closeup view of MD-4 drum 9
7. IN-1 drums at Hammond Depot 9
8. Layout of Building 911 at Curtis Bay Depot 12
9. Layout of Building 912 at Curtis Bay Depot 13
10. Layout of Building 913 at Curtis Bay Depot 14
11. Layout of Building 100W at Hammond Depot 15
12. Thorium nitrate storage area in Building 100W at Hammond Depot 16
13. Sampling trailer 17
14. Sampling tent inside trailer 18
15. Personnel working inside tent 18
16. Reflective tarp over trailer 19
17. Office trailer at Hammond 19
18. Stored drums of thorium nitrate at Hammond 20
19. Core sample of thorium nitrate 21
20. Chunk sample of thorium nitrate 22
21. Samples in secondary containers 22
22. Samples packed in vermiculite 22
23. Drum of samples ready for shipping to analytical laboratory 23
24. Label applied to drum to indicate that it has been sampled 23
25. Office trailer at Curtis Bay 24
26. ThN from Indian origin 27
27. ThN from French origin 27
28. MD-1 drum that lost its lid 29
29. Typical MD-1 drum 30
30. Cut-away schematic of MD-1 drum configuration 31

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LIST OF TABLES

1. Summary of information in the appendices 2
2. Summary of the thorium nitrate inventories 9
3. Summary of drum packing configurations for thorium nitrate 10
4. Thorium nitrate packaging versus selected DOT and NTS WAC requirements 11
5. Drums of thorium nitrate that were inspected or sampled at Hammond Depot 21
6. List of drums that were sampled at Curtis Bay Depot 25
7. Requirements for analysis of thorium nitrate samples 28
8. List of MD-1 drums that were sampled and their characteristic properties 32
9. Measurement of the headspace gas pressure in selected MD-1 drums 36
10. Analysis of the major constituents present in the drum headspace 37
11. Radiation dose estimates from the thorium nitrate sampling activities 39
12. Radiation dose estimates from gas sampling activities at Curtis Bay Depot 39
13. Maximum estimated dose rates from an ISO container loaded with thorium nitrate 42

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ACRONYMS, ABBREVIATIONS, AND INITIALISMS

ACO	Analytical Chemistry Organization (at the Y-12 National Security Complex)
ALARA	As Low As Reasonably Achievable
atm	atmosphere
°C	degrees Celsius
CFR	*Code of Federal Regulations*
cm	centimeter
cm^2	square centimeters
CO_2	carbon dioxide
DNSC	Defense National Stockpile Center
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
dpm	disintegrations per minute
°F	degrees Fahrenheit
ft	foot
gal	gallon
h	hour
HEPA	high efficiency particulate air
IEM	Integrated Environmental Management, Inc.
in.	inch
ISO	accepted abbreviation for International Organization for Standardization
kg	kilogram
L	liter
LANL	Los Alamos National Laboratory
lb	pound
LSA	low specific activity
m	meter
MeV	mega electron volt (million electron volts or 10^6 volts)
mg	milligram
min	minute
mm	millimeter
mR	milliroentgen
mrem	millirem
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NRC	U.S. Nuclear Regulatory Commission
NTRC	National Transportation Research Center
NTS	Nevada Test Site
NucFil	Nuclear Filter Technology
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration

ACRONYMS, ABBREVIATIONS, AND INITIALISMS (*continued*)

pCi	picocurie
ppm	parts per million
psig	pounds per square inch, gage
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RCT	radiation control technician
RWP	radiation work permit
SWRI	Southwest Research Institute
ThN	thorium nitrate
vol %	volume percent
WAC	Waste Acceptance Criteria

EXECUTIVE SUMMARY

The Defense National Stockpile Center (DNSC) has stewardship of ~7 million lb of thorium nitrate (ThN) which is stored at depots in Curtis Bay, Maryland, and in Hammond, Indiana. The ThN has been stored for several decades, and the DNSC has evaluated options for its disposition. In support of the DNSC, Oak Ridge National Laboratory (ORNL) staff directed a characterization campaign for the ThN. The analytical results lead to the following conclusions:

- the ThN could be classified as LSA-1,
- the ThN does not contain hazardous contaminants at concentrations that would cause it to be categorized as a mixed waste if it were declared to be a waste,
- the ThN is not required to be classified as a Division 5.1 oxidizer per the U.S. Department of Transportation (DOT) definition, and
- the disposal of the ThN would not be regulated by the Resource Conservation and Recovery Act (RCRA), and thus it could be accepted for disposal at the Nevada Test Site (NTS).

The DNSC has elected to dispose of the ThN at the NTS.

Transportation and disposal of the ThN by using the existing drums as the shipping and disposal packages is not feasible. First, some drums have external removable contamination, and they would have to be overpacked in clean drums to meet requirements of the DOT and of the NTS Waste Acceptance Criteria (WAC). Second, some drums have poor closures and would require changing of the closure or overpacking of those drums to meet DOT requirements. Third, some drums do not have the required quality assurance documentation and would have to be overpacked to meet the NTS WAC requirements. Lastly, some drums contain pressure that exceeds the NTS WAC requirements, thus the gas pressure would have to be vented prior to transport to NTS. The additional overpacking and the drum venting activities would result in significant radiation doses to the workers involved in the activities which is not in accord with the principle of ALARA (As Low As Reasonably Achievable).

To minimize radiation dose to workers, ORNL staff investigated and recommended that the ThN be shipped in bulk to NTS using ISO containers. Discussions with the DOT and a DOT response to a letter of interpretation requested by the DNSC indicate that ISO containers meet the requirements as a shipping package for the ThN. When in good condition and properly documented, ISO containers also meet all relevant requirements of the NTS WAC. NTS is familiar with accepting waste in ISO containers and burying the entire ISO container. Standard ISO containers would be used; however, high efficiency particulate air (HEPA) filters would be installed in the ISO containers to ensure that the internal pressure would never exceed the NTS WAC limit of 1.5 atm during transport. The HEPA filters further ensure that contamination is not released if a drum were to lose its lid after being placed in the ISO container. The use of ISO containers as the transport package and the disposal package reduces the potential radiation dose to workers at the current storage sites and at the disposal site.

During the characterization campaign for the ThN, pressure in the headspace of the MD-1 drums was determined to be an industrial safety issue. One drum at Curtis Bay Depot had apparently lost its lid to overpressurization and several others had bulged and deformed lids caused by pressure that was either in the drum at the time of inspection, or the pressure was in the drum previously and the

drum had self vented. No drums of other configurations were found to contain headspace pressure; however, all drums shall be handled to meet the requirements of the Occupational Safety and Health Administration.

A headspace gas sampling campaign for MD-1 drums was directed by ORNL staff to characterize the constituents of the gas believed to be causing the drums to deform. The analytical results showed that carbon dioxide was the principal constituent in the headspace gas and primarily resulted from a chemical reaction of nitric acid with slaked lime that has substantial amounts of calcium carbonate. The nitric acid was present in the interstitial pores of the ThN matrix and seeped out of the matrix through the internal packaging until it came in contact with slaked lime, which was placed in the containers to neutralize the acid.

This report discusses the regulatory requirements involved with the packaging, transportation, and disposal of the ThN stockpile at the NTS. It also provides background information about the ThN stockpile, the current packaging configurations, and the current storage arrangements. The reader is also provided a description of the ThN and headspace gas sampling activities that were conducted in 2002 and 2003, respectively. The basis for using ISO containers to transport and dispose of the ThN is discussed.

1. INTRODUCTION

The Defense National Stockpile Center (DNSC) has stewardship of a stockpile of solid thorium nitrate (crystalline hydrate form, abbreviated as ThN) that has been in storage for decades. The stockpile consists of ~7 million lb of ThN crystals (hydrate form) stored in over 21,000 drums in several configurations at two depot locations in the United States: Curtis Bay, Maryland, and Hammond, Indiana. The stockpile is classified as "source material," defined and regulated by the U.S. Nuclear Regulatory Commission (NRC) under 10 CFR 20.1003. The DNSC has historically sold excess ThN to United States and foreign companies, but there is no current demand for this material. The gamma dose at the surface of an isolated drum is in the range of 20–30 mR/h; however, the gamma dose within the storage facilities is in the range of 60–100 mR/h. The DNSC has evaluated various options for the disposition of ThN, and it has decided to dispose of the material at the Nevada Test Site (NTS).

This document provides a brief discussion of the technical and regulatory basis for using ISO containers as the package for transportation and disposal of the ThN stockpile. In addition to discussing these issues and how the use of ISO containers addresses them, the document provides references to the detailed information supporting the discussion provided in this document. Most of the detailed information upon which the discussions in this document are based is provided in the four documents:

- *Thorium Nitrate Material Inventory Definition Report*, ORNL/TM-2000/163,[1]
- *Executive Summary Report for the Thorium Nitrate Stockpile Stewardship and Disposition Project*, ORNL/TM-2001/14,[2]
- *Analytical Characterization of the Thorium Nitrate Stockpile*, ORNL/TM-2003/54,[3] and
- *Potential Radon Emissions from the Thorium Nitrate Stockpile*, ORNL/TM-2003/52.[4]

This report contains 17 appendices that provide the reader with supplemental information. Table 1 provides a summary of the information that can be found in the appendices.

Section 2 describes the regulatory requirements for transportation and disposal of the DNSC's ThN. The U.S. Department of Transportation (DOT) regulates transportation of this material. The NRC regulates transfer of the material from one entity—DNSC—to another—the U.S. Department of Energy (DOE)—and the NTS regulates aspects of the packaging of material destined for disposition at the test site.

Section 3 provides a summary of the ThN inventories, descriptions of the various storage configurations, and descriptions of the storage facilities. This discussion includes physical conditions, external contamination, and, in the case of the MD-1 drum configuration category, gas pressurization.

Section 4 presents a brief description of the sampling campaign conducted in 2002 to characterize the ThN. During that campaign, gas pressurization in the MD-1 drums was identified as a potential industrial safety issue. A description of the headspace gas sampling campaign conducted in 2003 is also provided. A summary of radiation survey data that have been collected during the past 2 years in the storage buildings at Curtis Bay Depot is also presented.

Table 1. Summary of information in the appendices

Appendix	Description of Contents
A	Container inspection checklist and photographs of drums opened and inspected at Hammond Depot.
B	Container inspection checklist and photographs of drums opened, inspected, and sampled at Hammond Depot. These samples were the first shipment to the analytical laboratory.
C	Container inspection checklist and photographs of Indian drums opened, inspected, and sampled at Curtis Bay Depot. These samples were the second shipment to the analytical laboratory.
D	Container inspection checklist and photographs of French drums opened, inspected, and sampled at Curtis Bay Depot. These samples were the third shipment to the analytical laboratory.
E	Container inspection checklist and photographs of domestic drums opened, inspected, and sampled at Curtis Bay Depot. These samples were the fourth shipment to the analytical laboratory.
F	Container inspection checklist and photographs of domestic drums opened, inspected, and sampled at Curtis Bay Depot. These samples were the fifth shipment to the analytical laboratory.
G	Container inspection checklist and photographs of domestic drums opened, inspected, sampled, and archived at Curtis Bay Depot. These samples are the first drum of archive samples.
H	Container inspection checklist and photographs of domestic, French, and Indian drums opened, inspected, sampled, and archived at Curtis Bay Depot. These samples are the second drum of archive samples.
I	Container inspection checklist and photographs of domestic drums opened, inspected, sampled, and archived at Curtis Bay Depot. These samples are the third drum of archive samples.
J	Sample shipping documentation for the ThN samples.
K	Chain of custody documentation for the ThN samples.
L	Copies of radiological documentation used during the sampling of the ThN: includes radiation work permits, radiation and contamination surveys, air sample counts, and drum survey results for individual drums.
M	Potential mechanisms for generation of carbon dioxide and mixed oxides of nitrogen gases in the MD-1 drums.
N	A summary of DOE's experience with pressurized drums.
O	A report that documents pressure testing performed with drums, lids, and locking rings that had been unused and that were identical to those used for the external container of the MD-1 and IN-1 drum configurations.
P	Copies of pertinent correspondence between the DNSC and the DOT.
Q	Copies of the outputs from the radiation dose modeling performed with MicroShield software.

The basis for using ISO containers for transporting and disposing of the ThN drums is provided in Sect. 5. This section discusses the advantages and disadvantage of using ISO containers instead of the individual drums. When radioactive material is shipped, the radiation dose from the transportation package is important; consequently, this section presents the results of an analysis to estimate the radiation dose from the ISO container. During transport, the ISO container is likely to be exposed to temperature and elevation changes which could affect the pressure inside the ISO container. HEPA filters will be essential to allowing the pressure to equilibrate during the changes. HEPA filters would also ensure that radioactive contamination would not be released if a drum was to lose its lid during transport. An estimate of the needed ventilation capacity of the HEPA filters is provided.

2. REGULATORY REQUIREMENTS

Three federal agencies regulate some aspect of the packaging, transportation, and disposal of the ThN stockpile at the NTS. The DNSC is licensed by the NRC to manage and maintain the ThN stockpile as nuclear source material. In the case of the movement of the ThN from the DNSC depots to the NTS, the primary NRC regulations that need to be addressed are those requiring documentation of that amount, ownership, and location of the material. Because the NRC regulations do not bear on packaging they will not be considered in this document. The DOT regulates the classification, packaging, and documentation of hazardous materials that are being transported. These regulations are provided in 49 CFR. Finally, the DOE has developed the NTS WAC that regulate the type of waste that the NTS can accept and store as well as the packaging of that waste.

2.1 DOT REGULATIONS AFFECTING THE ThN DISPOSITION

DOT provides the regulations for transport of hazardous materials in 49 CFR Parts 171–173. In addition, if requested in specific cases, the DOT will provide written interpretation of these regulations for the specific case. Both 49 CFR and written interpretations were used to guide the decisions on classifying and packaging the ThN in the DNSC stockpile.

The first step in successfully applying the DOT regulations is to properly classify the material to be shipped. In the case of ThN, there is an entry in the *Hazardous Materials Table* (49 CFR 172.101). This entry specifies that ThN is a radioactive oxidizer and requires the material be packaged in a container inside a Type A package; however, DOT also requires that material be classified in the condition that it will be offered for transport. In the case of the ThN stockpile, experience indicated that the material was not dry enough to be classified as an oxidizer. In March 2001, the DNSC obtained a letter of interpretation from the DOT stating that if the ThN in the stockpile did not meet the test for oxidizer then it could be properly classified as a Low Specific Activity (LSA) material. The letter from the DNSC requesting this interpretation and the DOT reply are shown in Appendix P.

Once a material is properly classified, the correct hazard communications and the package can be selected. The requirements for transportation of radioactive materials, including packaging, are provided in 49 CFR 173 Subpart I (173.401- 476). From the package selection and packaging perspective, this subpart provides regulations or requirements of package performance, surface contamination limits, and dose limits. The specifics of the packaging regulations and requirements are governed by the type and amount of radioactive material that is to be transported.

2.2 NTS WAC REQUIREMENTS AFFECTING THE PACKAGING OF THE ThN FOR DISPOSITION

The NTS WAC provide a variety of requirements for packages destined for disposal at the NTS. While Sect. 3.1 *General Waste Form Criteria* provides requirements for the waste being offered, Sects. 3.1.5 *Free Liquids* and 3.1.7 *Gases* state some requirements in terms of how much liquids or gases are acceptable in a package. The requirement for free liquid is < 1% of the volume of the waste package. For gases, the waste package cannot be pressurized to more than 1.5 atm.

Section 3.2 *Waste Package Criteria* of the NTS WAC provides technical details about the waste package. This section begins by citing DOT, DOE, and NRC regulations for packages. The specific portions of this section that are most germane to the current discussion are 3.2.4 *Strength*, 3.2.5 *Handling*, 3.2.6 *Size*, and 3.2.7 *Weight*. Section 3.2.4 provides crush strength requirements for non-bulk and non-drum packages. Drums and bulk packages are exempted from meeting the crush strength requirements. Section 3.2.5 provides that the package must have appropriate handling fixtures (e.g., forklift pockets, lifting eyes, non-attached rigging, etc.) and those handling fixtures must not interfere with stacking packages, and they must meet certain strength requirements. Section 3.2.6 states that 55-gal drums are acceptable and there is no size restriction on bulk packages; however, this section also notes that all bulk packages must comply with DOT package requirements. Section 3.2.7 provides that drums must not weigh more than 544 kg (1,200 lb) and bulk packages do not have weight limits.

In addition to the specific technical criteria set forth in Sect. 3 of the WAC, there are quality assurance (QA) requirements for the design, procurement, and use of packages provided in Sect. 5 *Quality Assurance Requirements for Waste Certification Program*. Specific portions of this section, 5.6 *Design*, 5.7 *Procurement*, and 5.8 *Inspection and Acceptance Testing*, call out the waste package as examples of items requiring attention. In all these sections, the specific process (e.g., design, procurement or acceptance inspection and testing) must document that the waste package is suitable and meets the technical requirements stated in the WAC.

2.3 QUALITY ASSURANCE RECORDS

The NTS WAC require that packages accepted for disposition at the NTS have documented design, procurement, and receiving inspection records. The DNSC and its predecessors developed and maintained QA records for several of the domestic packages. The MD-1 and MD-3 drums have records that completely meet the NTS WAC QA criteria. However, because of the pressurization in the MD-1 drums, many of these drums no longer conform to the procurement specifications. The IN-1 and MD-4 drums have limited design documentation, no procurement documentation, and no remaining incoming inspection documentation. The MD-2 (French and Indian) and MD-5 (salvage) drums have no QA records. Thus, the QA records for most of the types of drums in the ThN stockpile are insufficient to meet the NTS WAC requirements; and of the MD-1 drums with acceptable records, many of the individual drums no longer conform to the documented design.

3. BACKGROUND INFORMATION

As discussed in Sect. 2, regulatory requirements must be met for the transportation and disposal of the ThN stored by the DNSC. This section begins by providing a description of the ThN stockpile, including a summary of the various configurations in which the ThN is packaged and the amount of ThN being stored. Brief descriptions of the various drum configurations and the current storage arrangements are provided.

3.1 OVERVIEW OF STOCKPILE

The ThN stockpile exists in six major drum configurations. Over the years, a significant portion of the drums have corroded and have required periodic repackaging. Figure 1 is a schematic that illustrates the current packaging of each configuration. The Curtis Bay Depot stores the drums with the five "MD" designations, and Hammond Depot stores the drum with the IN-1 designation. The predominant drum type is the MD-1, which comprises ~15,700 drums. The IN-1 type includes ~2300 drums. Photographs of the various drum configurations are shown in Figs. 2–7. Current plans are to repackage the drums containing the ThN into ISO containers and ship those containers to the DOE's NTS for burial. This action is planned to be accomplished in calendar years 2004–2005.

The ThN currently held by the DNSC was originally procured in the late 1950's and early 1960's from a domestic supplier and suppliers from France and India. The domestic material is stored at Hammond Depot and at Curtis Bay Depot. The ThN received from France and India is stored only at Curtis Bay Depot. The thorium (^{232}Th) nitrate is ~74% (by weight) of domestic origin; the remainder originated in France (~19%) and India (~7%). A summary of the ThN inventories is provided in Table 2.

Table 3 provides a summary of the number of drums of ThN in each drum configuration. It also shows the typical weight of ThN per container, the typical weight of a container, the estimated total weight of ThN per drum configuration, and the estimated total weight per drum configuration. Approximately 20 drums that contain characterization and pilot-scale demonstration thorium products (e.g., oxide and hydroxide) are stored in Building 913. The characterization of those drums is completed and documented in other references.[5,6,7] There are also three drums stored in Building 913 that contain archive samples collected during the ThN characterization campaign. These drums are also planned for shipment to NTS.

3.2 OVERVIEW OF CURRENT ThN PACKAGES SUITABILITY FOR TRANSPORT AND DISPOSAL AT NTS

This section examines the extent to which the current ThN packages meet the DOT regulatory requirements for transportation and the NTS WAC requirements for disposal. All current packages will require proper DOT and NTS WAC labels and markings. For all other regulations and requirements, one or more packaging configurations meet the requirement and one or more configurations are marginal or will fail to meet the requirement. For those packages that are marginal or fail to meet a requirement, the preferred course of action is, at a minimum, to overpack the existing package. Sometimes additional remediation (e.g., drum depressurization) may be required.

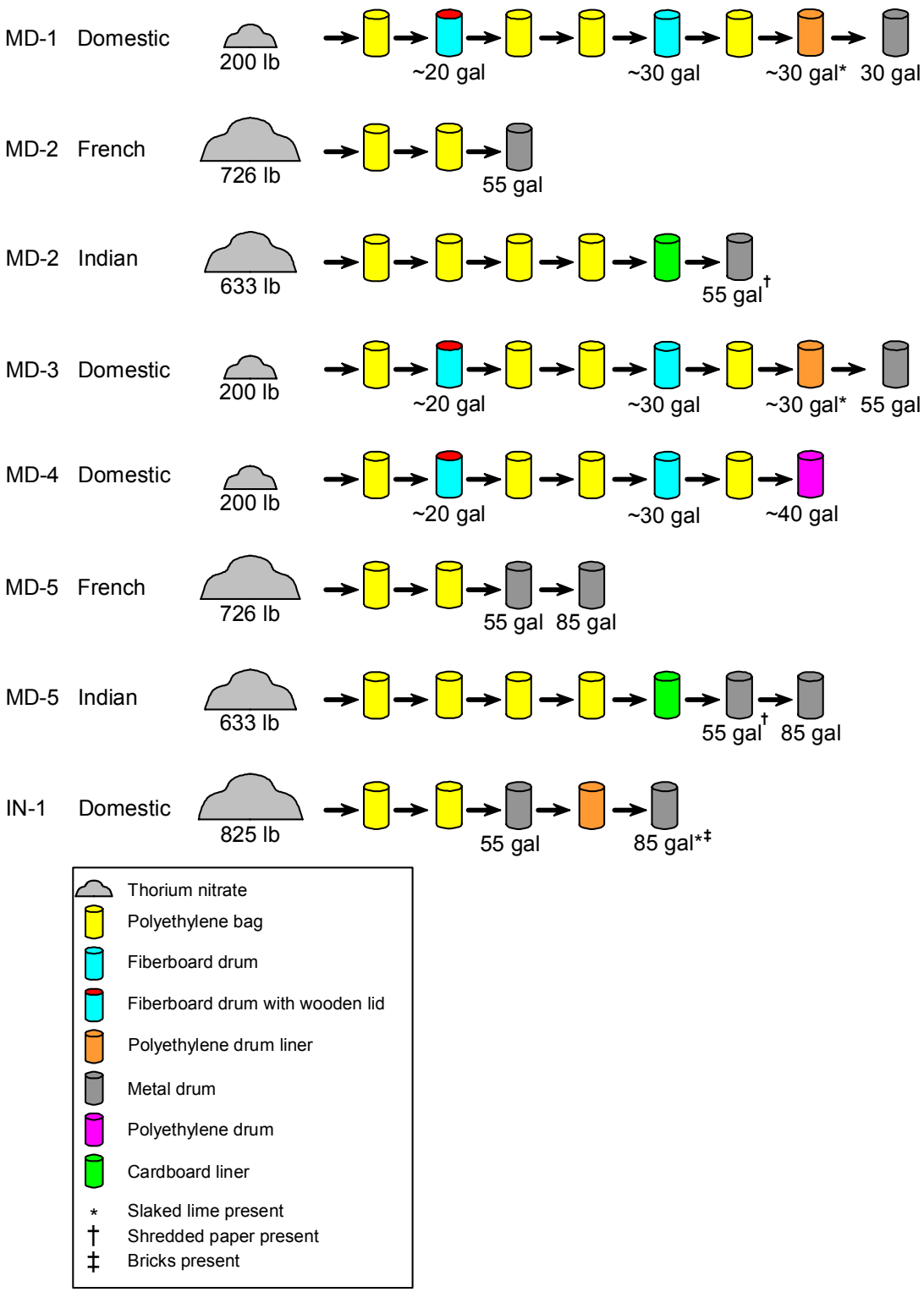


Fig. 1. Packing configurations for the various types of thorium nitrate drum packages.

Fig. 2. MD-1 and MD-3 drums.

Fig. 3. MD-2 (red) and MD-5 Indian drums.

Fig. 4. MD-2 French drums.

Fig. 5. Stack of MD-4 drums.

Fig. 6. Closeup view of MD-4 drum.

Fig. 7. IN-1 drums at Hammond Depot.

Table 2. Summary of the ThN inventories

Site	Country of origin	Weight of ThN (lb)	Weight of ThN (kg)	Number of drums
Curtis Bay[a]	USA	3,323,314	1,507,430	16,617
	France	1,382,658	627,163	1,903
	India	481,834	218,556	760
Curtis Bay total		5,187,806	2,353,149	19,280
Hammond[b]	USA	1,904,085	863,678	2,308
	France	0	0	0
	India	0	0	0
Hammond total		1,904,085	863,678	2,308
Total	USA	5,227,399	2,371,108	18,925
	France	1,382,658	627,163	1,903
	India	481,834	218,556	760
Total		7,091,891	3,216,828	21,588

[a]Weight values are based on data provided in the site's radiological license (STC-133). The number of drums is based on the average weight of ThN per drum configuration.

[b]Weight values and the number of drums are based on the site's inventory records.

Table 3. Summary of drum packing configurations for thorium nitrate

Drum designation	Number of drums	Typical ThN weight per container (lb)	Typical container weight (lb)	Estimated total ThN weight (lb)[a]	Estimated total container weight (lb)[a]
MD-1	15,682	200	272	3,136,000	4,266,000
MD-2 French[b]	1,868	726	791	1,356,000	1,478,000
MD-2 Indian[b]	727	633	672	460,000	489,000
MD-3	184	200	312	37,000	57,000
MD-4	753	200	212	151,000	160,000
MD-5 French[b]	33	726	941	24,000	31,000
MD-5 Indian[b]	33	633	721	21,000	24,000
IN-1	2,308	825	1008	1,904,000	2,326,000
TOTAL	21,588			7,089,000[c]	8,831,000

[a]Values are rounded to the nearest thousand.
[b]The total number of MD-2 and MD-5 drums is 2595 and 66, respectively. The values shown for the ThN of French and Indian origin are best estimates based on available information.
[c]This value differs slightly from Table 2 because of round-off.

Table 4 summarizes the current ThN package configurations and whether each configuration is compliant with several different transportation regulations and aspects of the NTS WAC, and it shows that each current packaging configuration in the inventory would require some level of remediation to meet requirements for either DOT, NTS WAC, or in some cases both.

3.3 OVERVIEW OF STORAGE BUILDINGS

At Curtis Bay Depot, the ThN is stored in three buildings (911, 912, and 913). These buildings are similar in construction and are approximately 220 ft long × 50 ft wide. The ThN at Hammond Depot is inside of Building 100W. Building 100W is approximately 400 ft long × 125 ft wide; however, it is used to store other commodities (nonradioactive) besides the ThN.

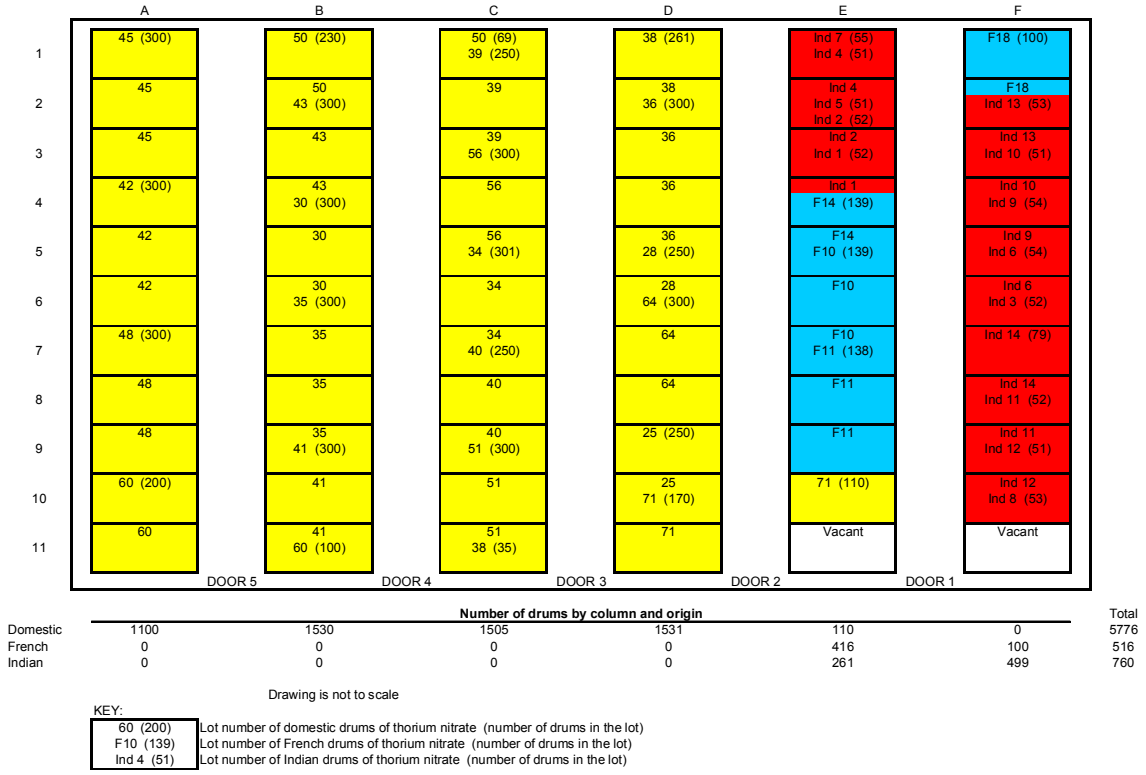
Layouts of Curtis Bay Depot Buildings 911, 912, and 913 are shown in Figs. 8–10, respectively. The layouts are color-coded to show the approximate locations of the various drum configurations within the buildings. The lot numbers and the number of drums in the lots are also shown on the schematics.

A layout of Hammond Building 100W is shown in Fig. 11. The approximate storage locations for the ThN is shown in the diagram; however, there are other commodities that are stored in the building that are not shown in the diagram. The schematic in Fig. 12 shows the area within Building 100W where the ThN is stored. The ThN is surrounded by drums that provide shielding from radiation exposure to personnel that work on the site, but these drums are not shown in either Fig. 11 or Fig. 12. The lot numbers and the number of drums per lot are identified in Fig. 12.

Table 4. ThN packaging versus selected DOT and NTS WAC requirements

	DOT Regulations			NTS WAC Requirements		
Package configuration designation	Strong tight?	Any labels or marks requiring obliteration?	External contamination?	Package QA quality documentation	Strong enough?	Meet internal pressure requirement?
IN-1	Y	Y[a]	N	Poor	Y	Y
MD-1	N[b]	N	N	Good	Y	N
MD-2[c]	Probably[d]	N	Y[e]	None	Y	Y
MD-3	Unknown[f]	N	N	Good	Y	Unknown[f]
MD-4	N	N	N	Fair	N	Y
MD-5	Y	Y[g]	N	None	Y	Y

[a]Requires obliteration of both marking and labeling.
[b]Many packages breached due to gas pressure.
[c]Includes packages containing ThN from French and Indian origins.
[d]Some surface rust but drums seen during the 2002 sampling campaign were in good shape.
[e]Requires overpacking for contamination control.
[f]None of these packages were sampled during the 2002 sampling campaign, but the MD-3 package could be reasonably expected to be the same as the MD-1 package since the only packaging difference is the size of the exterior container.
[g]Requires obliterating "Thorium Nitrate" marking.



Number of drums by column and origin

							Total
Domestic	1100	1530	1505	1531	110	0	5776
French	0	0	0	0	416	100	516
Indian	0	0	0	0	261	499	760

Drawing is not to scale

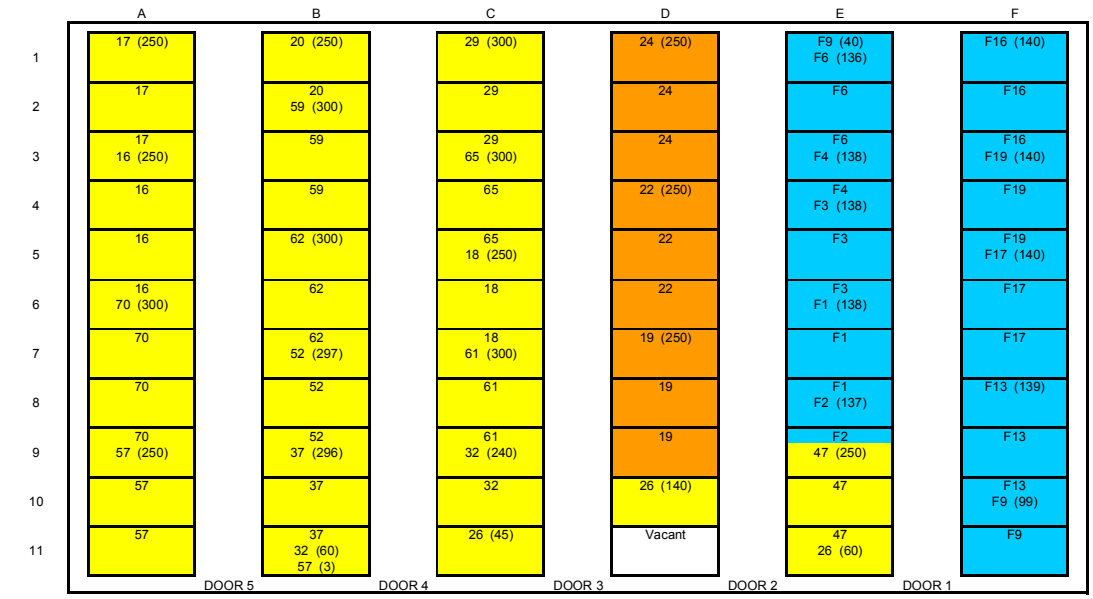
KEY:

60 (200)	Lot number of domestic drums of thorium nitrate (number of drums in the lot)
F10 (139)	Lot number of French drums of thorium nitrate (number of drums in the lot)
Ind 4 (51)	Lot number of Indian drums of thorium nitrate (number of drums in the lot)

Drum type	Nom. Weight (lb)	Nom. Height (in.)	Nom. Diam. (in.)	Origin	Color code
MD-1	272	30	20	Domestic	
MD-2	791	35	24	French	
MD-2	672	35	24	Indian	
MD-3	312	35	24	Domestic	
MD-5	941	39	27.5	French	
MD-5	721	39	27.5	Indian	

The exact number and locations of MD-3 and MD-5 drums in a particular building is unknown; therefore, these drums are mapped with the MD-1 and MD-2 drums, respectively.

Fig. 8. Layout of Building 911 at Curtis Bay Depot.



Number of drums by column and origin

	A	B	C	D	E	F	Total
Domestic	1097	1506	1435	890	310	0	5238
French	0	0	0	0	727	658	1385
Indian	0	0	0	0	0	0	0

KEY:

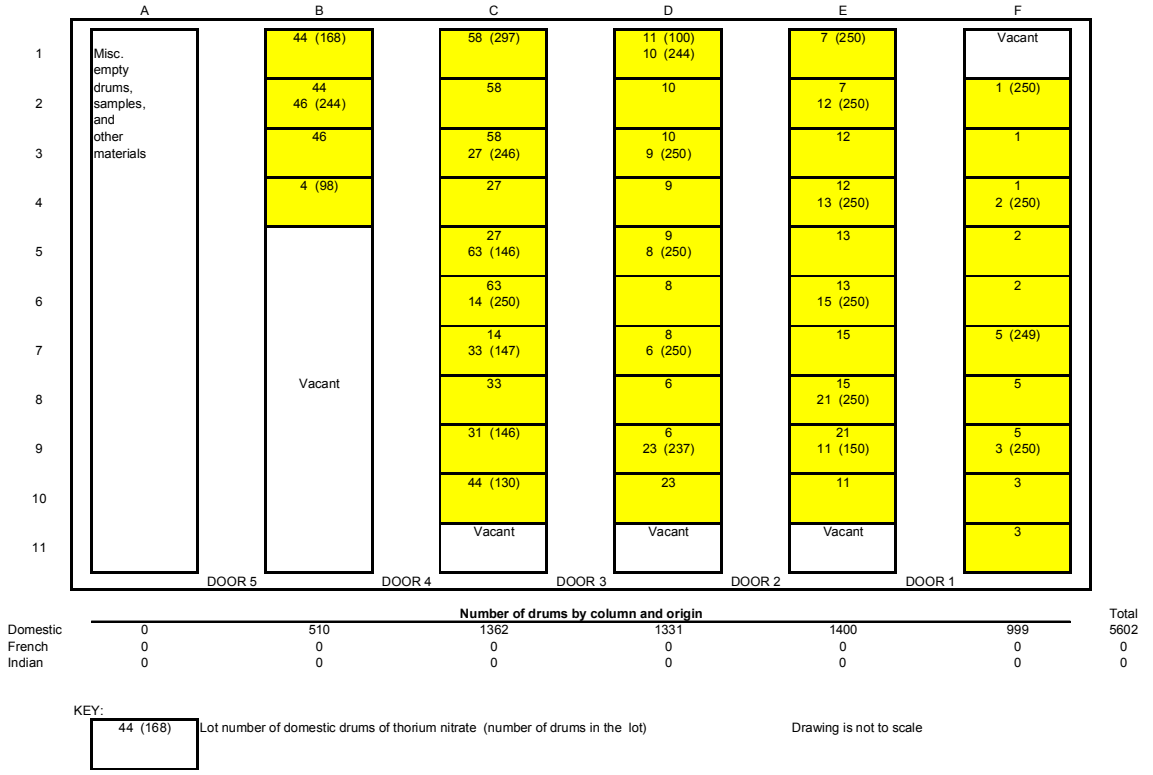
60 (200) — Lot number of domestic drums of thorium nitrate (number of drums in the lot)
F10 (139) — Lot number of French drums of thorium nitrate (number of drums in the lot)

Drawing is not to scale

Drum type	Nom. Weight (lb)	Nom. Height (in.)	Nom. Diam. (in.)	Origin	Color code
MD-1	272	30	20	Domestic	
MD-2	791	35	24	French	
MD-3	312	35	24	Domestic	
MD-4	212	28.5	20.5	Domestic	
MD-5	941	39	27.5	French	

The exact number and locations of MD-3 and MD-5 drums in a particular building is unknown; therefore, these drums are mapped with the MD-1 and MD-2 drums, respectively.

Fig. 9. Layout of Building 912 at Curtis Bay Depot.



	Number of drums by column and origin						Total
Domestic	0	510	1362	1331	1400	999	5602
French	0	0	0	0	0	0	0
Indian	0	0	0	0	0	0	0

KEY:

44 (168) Lot number of domestic drums of thorium nitrate (number of drums in the lot)

Drawing is not to scale

Drum type	Nom. Weight (lb)	Nom. Height (in.)	Nom. Diam. (in.)	Origin	Color code
MD-1	272	30	20	Domestic	
MD-3	312	35	24	Domestic	

All of the drums in Building 913 are believed to be MD-1 drums, except for the miscellaneous drums noted in Column A which are not to be included. There are two overpacked MD-1 drums stored near Lot 44.

Fig. 10. Layout of Building 913 at Curtis Bay Depot.

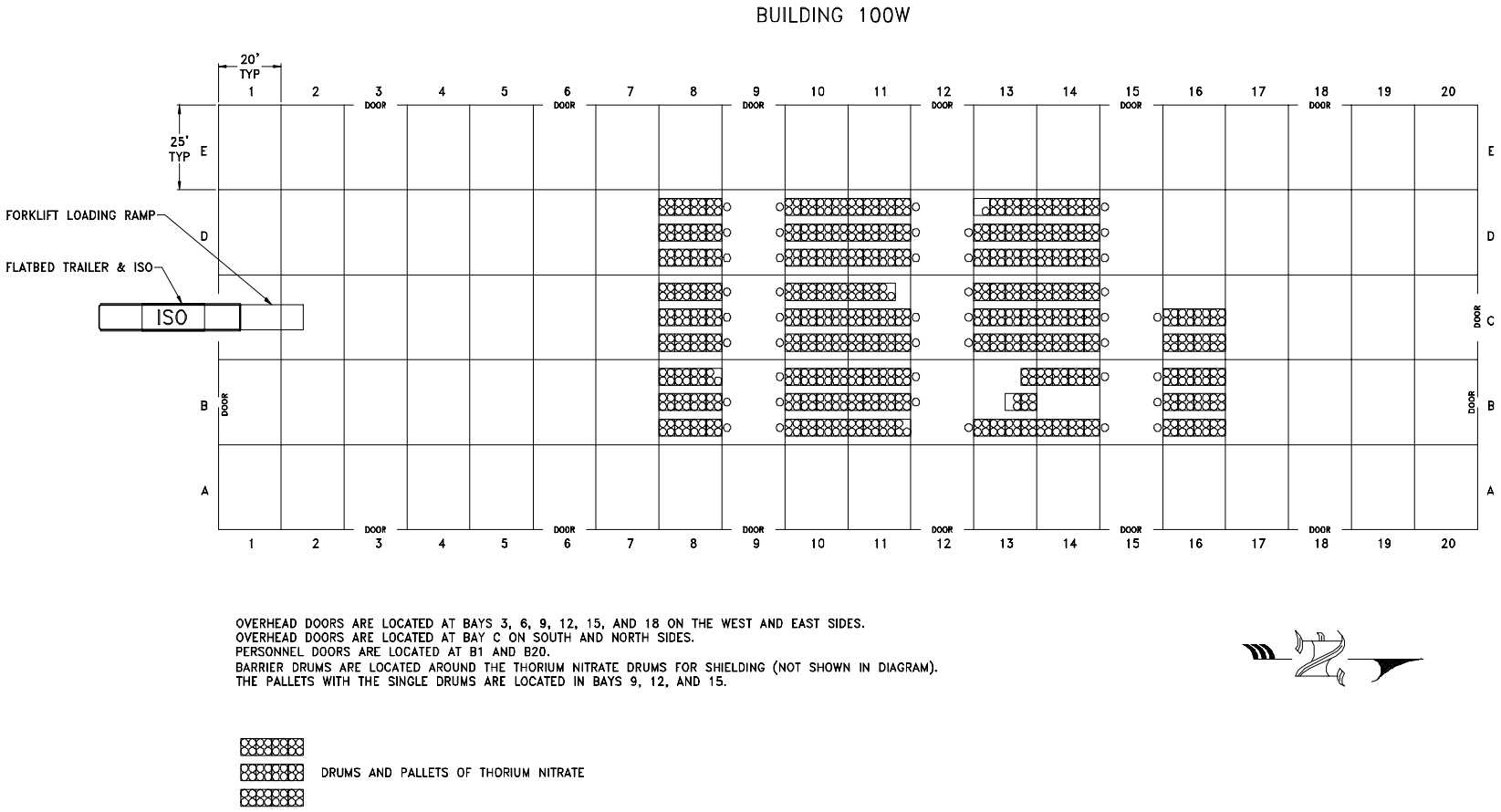


Fig. 11. Layout of building 100W at the Hammond depot.

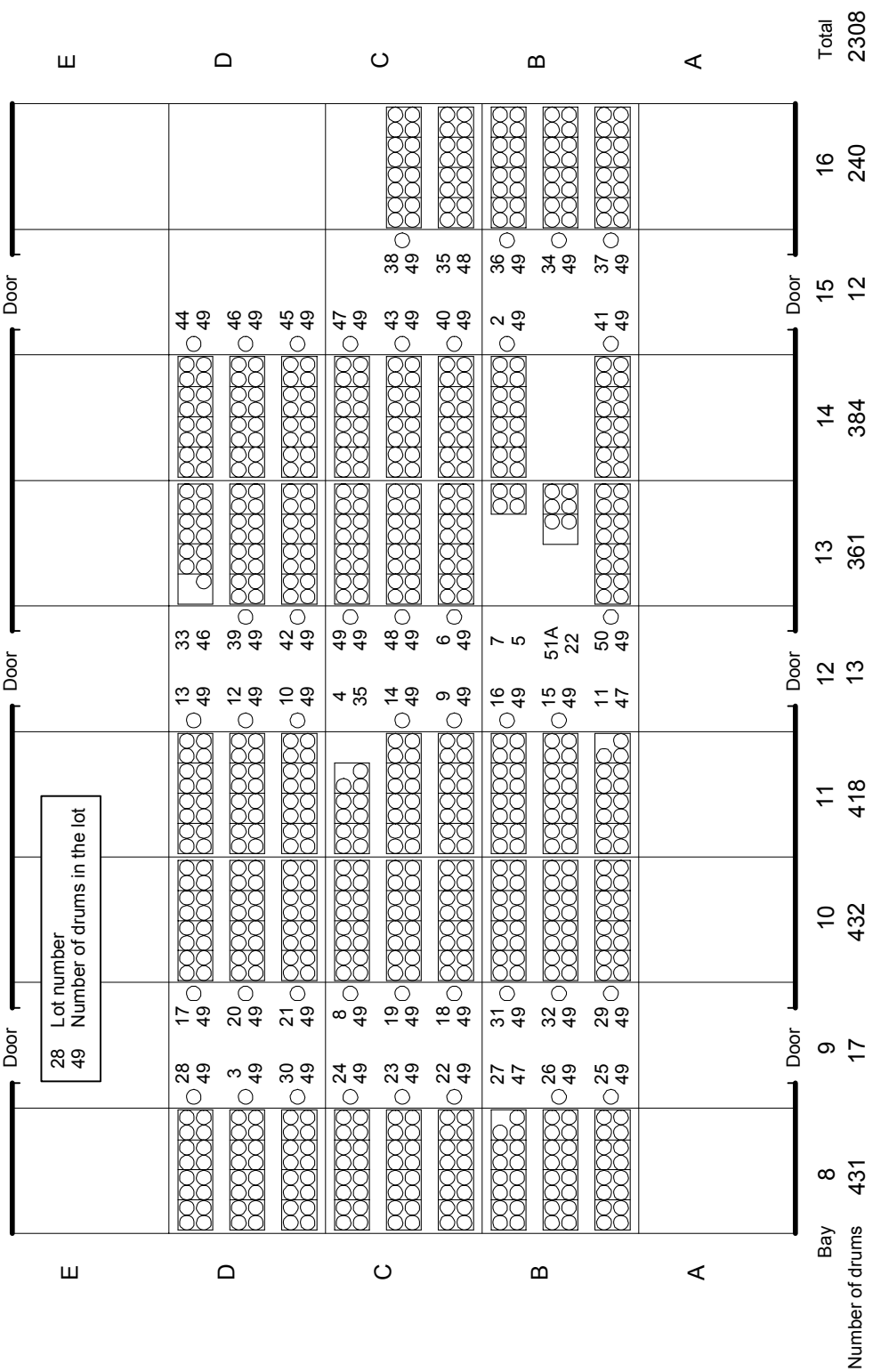


Fig. 12. Thorium nitrate storage area in building 100W at the Hammond depot. The top number represents the lot number and the bottom number represents the number of drums in that particular lot.

4. THORIUM NITRATE SAMPLING PROGRAM DESCRIPTION

This section describes the sampling activities that were conducted to characterize the ThN inventory and the headspace gas in the MD-1 drums. Radiation dose estimates are also provided for the activities. Detailed information regarding the characterization requirements, the sampling basis, and the analytical results from the sampling activities are reported by Mattus.[3]

4.1 THORIUM NITRATE SAMPLING ACTIVITIES

Through a competitive solicitation, ORNL selected RWE NUKEM Corp. to perform the sampling and inspection of the drums of ThN. RWE NUKEM lead a team of companies that included Integrated Environmental Management (IEM), Inc. (provided radiation control technician and forklift operator) and WESKEM, LLC (provided sampling experience and sample coordination).

A 40-ft ISO container was secured to a flat bed trailer and converted into a sampling trailer (see Fig. 13). A two-chamber sampling tent, manufactured by Lancs Industries, was positioned inside the ISO container (see Fig. 14). The first chamber was for donning and doffing personal protection equipment. The second chamber was for opening, inspecting, and sampling the drums. The samples were weighed in the second chamber. The tent was ventilated by an external exhaust fan that removed air from the sampling side of the tent. The exhaust air passed through a HEPA filter prior to being discharged to the atmosphere. Sampling personnel wore powered air purifying respirators, protective clothing, and gloves (see Fig. 15).

Fig. 13. Sampling trailer.

Fig. 14. Sampling tent inside trailer.

Fig. 15. Personnel working inside tent.

Two radiation work permits (RWPs) were issued at each site. One RWP covered the drum retrieval activities from the warehouse, and the other covered the drum inspection and sampling activities. Personnel that entered the radiation areas were required to sign the appropriate RWP and carry a self-reading dosimeter. In addition, personnel entering the areas wore thermoluminescent dosimeters for official record of radiation dose. Air samples were collected on a daily basis from inside the sampling tent and from inside the warehouse to ensure that the concentration of thorium was below the allowable limit. Copies of the RWPs and air sampling data are shown in Appendix L.

The sampling team was fortunate that the weather was cool when they were at Hammond Depot; thus, heat stress was not a factor at that site. It was also beneficial that the sampling trailer was inside Building 100W, which reduced the heat stress even more.

The weather conditions at Curtis Bay Depot were not as favorable and the sampling personnel were forced to contend with heat stress. Because the sampling trailer was parked outside, it received direct radiant heat from the sun. The team implemented engineering control measures to reduce the heat load in the sampling trailer. A reflective tarp was placed over the trailer, and cooled air was directed into the trailer (see Fig. 16). The reflective tarp was generally acceptable, but it did experience some damage from strong winds from a storm that passed over the depot one night.

Fig. 16. Reflective tarp over trailer.

4.1.1 Drum Handling and Sample Collection at Hammond Depot

A description of Building 100W and the drums stored there is provided in Sect. 3. The sampling trailer was parked in bays C1, C2, and C3 (see Fig. 11). A support trailer for the sampling personnel was parked outside the south end of Building 100W. One end of the trailer served as the office area, and the other end was used for counting radiological smear samples. Electrical power for the office trailer and the sampling trailer was provided by a generator (see Fig. 17).

Fig. 17. Office trailer at Hammond.

The drums containing ThN are stored on 60 × 60 in. pallets which are stacked three pallets high. Each pallet typically contains four drums. As shown in Fig. 12, most of the lots have 49 drums. Because of the stacking arrangement, most of the lots have one drum placed on a pallet in front of the other drums (see Figs. 12 and 18). Since the ThN in a particular lot is homogenous, the single drums were selected for sampling rather than a drum from the top tier to reduce the radiation dose to personnel and to reduce the potential for accidents.

Fig. 18. Stored drums of thorium nitrate at Hammond.

The drums were retrieved and transported to the sampling trailer by a forklift truck and drum gripper attachment. The drums at Hammond Depot were not externally contaminated, so overpacking was not required. The selected drum was moved into the sampling tent on a roller conveyor. Sampling personnel documented the opening of each drum by recording information on an inspection checklist as the drum was opened. In addition, photographs were taken of the drum prior to opening the drum and each time that a layer of packaging was removed. Copies of the inspection checklists and photographs for the drums opened at Hammond are shown in Appendices A and B. Some drums were designated for collecting ThN samples and some drums were designated for a visual inspection only. A list of the drums that were opened at Hammond Depot is shown in Table 5. This table shows whether the drum was only inspected or inspected and sampled for analysis. No samples were collected from the Hammond drums for on-site storage (archival).

When the lid was removed from the 85-gal drum, the 55-gal drum was accessible; however, the sampling personnel had some difficulty in getting their wrenches on the bolt to remove the drum ring. A pneumatic wrench facilitated removal of the bolt. After the lid was removed, the sampling personnel then cut through two polyethylene bags to access the ThN material.

As expected, the ThN at Hammond Depot has solidified into monoliths. The oxidizer test requires that the sample to be analyzed is representative of the material to be shipped; therefore, large chunks of ThN were needed, rather than fine particles that are not representative of the monolith. A coring saw was used to obtain samples that were nominally 8-in. long × 2-in. diam. from the monoliths (see Fig. 19). A local off-gas system was provided around the coring saw to collect fine particles

Table 5. Drums of ThN that were inspected or sampled at Hammond Depot[a]

			Task Performed	
Lot number	Drum number	Drum type	Inspected only	Sampled and analyzed
2	49	IN-1	●	
8	18	IN-1		●
10	46	IN-1		●
20	39	IN-1	●	
23	42	IN-1		●
28	30	IN-1	●	
29	4	IN-1		●
30	6	IN-1		●
32	45	IN-1	●	
38	25	IN-1		●
43	44	IN-1	●	
45	22	IN-1	●	
47	6	IN-1		●
48	40	IN-1		●
49	2	IN-1	●	

[a]All drums at Hammond Depot are of domestic origin.

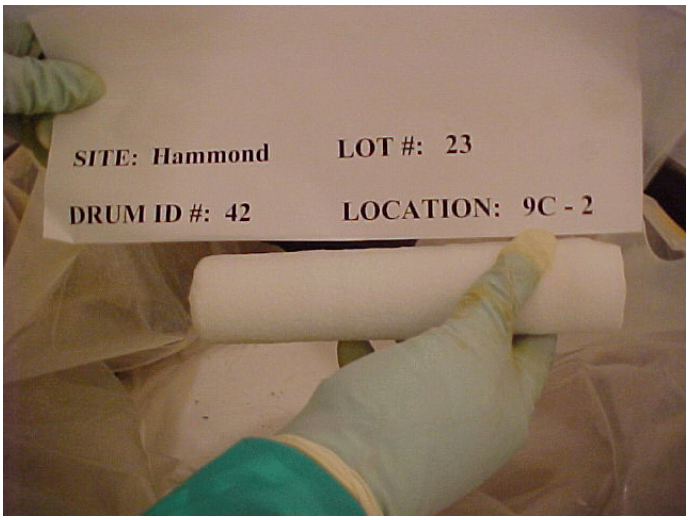


Fig. 19. Core sample of ThN.

that were generated during the coring process. The sampling personnel found that some of the monoliths (lots 8, 10, 38, and 47) were too brittle to core; therefore, large chunks were obtained using a hammer and chisel (see Fig. 20). The samples were placed in plastic bags, and the net weight of the cores were determined for accountability purposes. Chain-of-custody sheets were completed upon collection of the samples and accompanied the samples to the laboratory (see Appendix K).

Fig. 20. Chunk sample of thorium nitrate.

The sample bottles were placed in secondary containers (two bottles per container). The secondary containers were sealed with duct tape (see Fig. 21) and stacked in drums and packed with vermiculite (see Fig. 22). Figure 23 shows a photograph of a drum of samples that was shipped to Southwest Research Institute (SWRI) for analysis. Copies of shipping documentation are shown in Appendix J.

After the sampling of a drum was completed, the sampling personnel closed the drum similar to the manner in which they were originally closed. One change that was made was the drum ring on the 55-gal drum was turned over, so that if the drum was opened again, the bolt would be accessed easier. There was enough free space between the lid of the 55-gal drum and the lid of the 85-gal drum that the bolt did not interfere with reinstalling lid on the 85-gal drum.

After the 85-gal drums were reclosed, tags were attached to the drums to show that the drums had been sampled (see Fig. 24), and radiation protection personnel smeared them to check for contamination. When they were shown to be uncontaminated, the drums were returned to the ThN inventory and restacked in their original positions.

Fig. 21. Samples in secondary containers.

Fig. 22. Samples packed in vermiculite.

Fig. 23. Drum of samples ready for shipping to analytical laboratory.

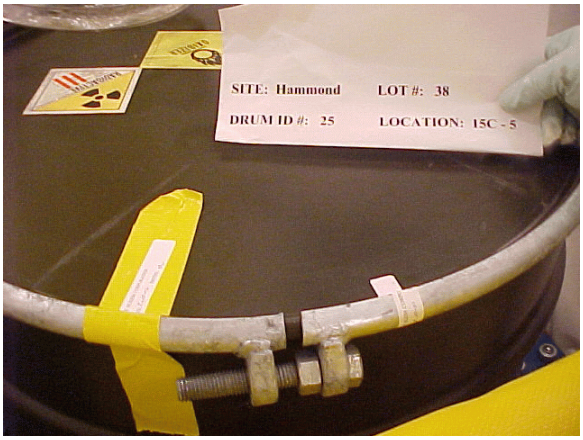


Fig. 24. Label applied to drum to indicate that it has been sampled.

A question arose regarding whether the core sampling method would adversely affect the moisture content of the samples by drying the material (due to frictional heat and air flow) and thus make the samples appear to be friable (a key characteristic of the oxidizer test). A technical decision was made to collect samples at Curtis Bay Depot from monoliths by breaking the monoliths into chunks.

4.1.2 Drum Handling and Sample Collection at Curtis Bay Depot

A description of Buildings 911, 912, and 913, and the storage of the drums of ThN in these buildings was provided in Sect. 3. Access to the buildings is through five overhead rollup doors. The depot's standard procedure is to open all of the doors at least 30 min prior to personnel entering the buildings to allow the dispersal of any radon gas (from the radioactive decay of the ThN) that might be present in the building.

As done at Hammond, a support trailer was set up on the site to serve as an office trailer and as a counting station for smear samples (see Fig. 25). Because of the high radiation background (in relation to counting smear samples), the office trailer was positioned next to the perimeter fence (near the entry gate to the B-Line). Even after positioning the trailer at such a distance from the building, the alpha counter detector (for the smear samples) had to be shielded with lead shot to achieve a radiation background that was low enough to count samples in a reasonable time. Electrical power for the office trailer was provided by a generator.

Fig. 25. Office trailer at Curtis Bay.

Radiation protection personnel performed a radiological survey of the buildings (see Appendix L). The survey confirmed that removable contamination was present in Buildings 911 and 912. Polymeric Barrier System, a non-toxic, single component material that provides interim control over the migration of hazardous materials, was obtained and applied to the aisleways that the forklift needed to enter to retrieve drums.

The sampling trailer, which was previously used at Hammond Depot, was initially parked in front of Building 911. A generator positioned next to the sampling trailer provided the electricity needed to support the sampling operations (see Fig. 13).

Since the ThN within a given lot is homogenous, drums were selected based on their accessibility to reduce radiation dose to personnel and to reduce the potential for accidents. Drums at Curtis Bay were removed from the top tier since there were not any lone drums. When a drum was retrieved from the stack, the drum was checked for contamination and then transported out to the dock. The forklift set the drum onto a roller conveyor, and the drum was moved into the sampling tent. If contamination was found on a drum, which was the case for the French and Indian drums, it was placed in a bag prior to taking it out to the dock. The domestic drums were not externally contaminated. A sample was collected from each lot. Some samples were shipped off-site for analysis and some were stored on-site in case additional analyses might be needed. Table 6 lists the drums that were opened and sampled and shows whether the sample was analyzed or archived (i.e., stored on-site).

Only the ThN of domestic origin was monolithic. The ThN of Indian origin was shaped like gravel (see Fig. 26), and the ThN of French origin was either a powder or lumps that easily broke into a powder (see Fig. 27). The sampling team obtained samples from a ThN monolith by breaking the monolith into chunks by pounding with the end of a pipe. The large chunks were placed in plastic bags and then placed in a 2-L bottle. Samples from the French and Indian drums were obtained with a scoop and were also placed in plastic bags and 2-L bottles.

After the sampling of a drum was completed, the drum was resealed, tagged to indicate that it had been sampled, and then returned to the building and placed back in its original position. After the sampling was completed in Building 911, the sampling trailer was moved to Building 912. The drums in Buildings 912 and 913 were sampled similarly.

Table 6. List of drums that were sampled at Curtis Bay Depot

Lot number	Drum number	Drum type	Task performed: Sampled and analyzed	Task performed: Sampled and archived
		Domestic Origin		
1	111	MD-1		●
2	78	MD-1	●	
3	57	MD-1	●	
4	142	MD-1		●
5	111	MD-1		●
6	175	MD-1		●
7	59	MD-1		●
8	127	MD-1		●
9[a]	24	MD-1		●
10	135	MD-1		●
11	248	MD-1	●	
12	136	MD-1	●	
13	124	MD-1		●
14	123	MD-1	●	
15	239	MD-1	●	
16	230	MD-1		●
17	108	MD-1	●	
18	212	MD-1	●	
19	52	MD-4		●
20	11	MD-1	●	
21	83	MD-1		●
22	8	MD-4	●	
23	200	MD-1		●
24	102	MD-4		●
25	25	MD-1		●
26	202	MD-1		●
27	159	MD-1		●
28	240	MD-1	●	
29	30	MD-1	●	
30	171	MD-1	●	
31	00	MD-1		●
32	152	MD-1		●
33	149	MD-1		●
34	80	MD-1		●
35	203	MD-1		●
36	267	MD-1	●	
37	19	MD-1	●	
38	75	MD-1		●
39	6	MD-1		●

Table 6. (*continued*)

Lot number	Drum number	Drum type	Task performed: Sampled and analyzed	Task performed: Sampled and archived
40	35	MD-1		●
41	142	MD-1		●
42	154	MD-1		●
43	179	MD-1		●
44	182	MD-1	●	
45	105	MD-1	●	
46	24	MD-1		●
47	204	MD-1		●
48	119	MD-1	●	
50	3	MD-1		●
51	155	MD-1		●
52	194	MD-1	●	
56	48	MD-1		●
57	110	MD-1		●
58	97	MD-1	●	
59	241	MD-1		●
60	285	MD-1		●
61	86	MD-1	●	
62	159	MD-1		●
63	5	MD-1		●
64	00	MD-1		●
65	107	MD-1	●	
70	3	MD-1		●
71	192	MD-1		●
		French origin		
1	52	MD-2	●	
2	49	MD-2	●	
3	95	MD-2	●	
4	29	MD-2	●	
6	100	MD-2	●	
9	51	MD-2	●	
10	94	MD-2	●	
11	42	MD-2	●	
13	137	MD-2	●	
14	78	MD-5	●	
16	37	MD-2	●	
17	6	MD-2	●	
18	35	MD-2		●
19	58	MD-5	●	

Table 6. (*continued*)

Lot number	Drum number	Drum type	Task performed: Sampled and analyzed	Task performed: Sampled and archived
		Indian origin		
1	14	MD-2		●
2	99	MD-2		●
3	149	MD-2	●	
4	206	MD-5	●	
5	251	MD-5	●	
6	300	MD-5	●	
7	358	MD-5	●	
8	371	MD-2		●
9	780	MD-5	●	
10	484	MD-2		●
11	537	MD-2	●	
12	589	MD-5	●	
13	637	MD-2	●	
14	78	MD-2	●	

[a]The sample from domestic Lot 9 was originally designated to be analyzed; however, the sample was inadvertently placed with the "archive" samples and was not sent to the laboratory.

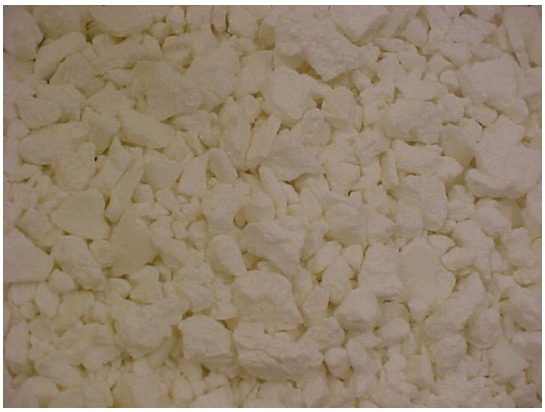


Fig. 26. Thorium nitrate of Indian origin.

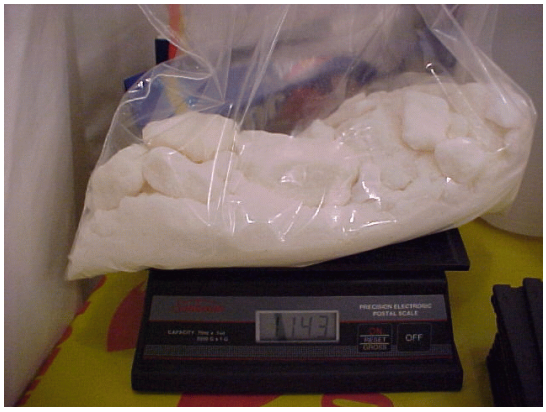


Fig. 27. Thorium nitrate of French origin.

The samples that were selected for analysis were packaged for shipment similarly as done at Hammond. Two 2-L bottles were placed in a secondary container with a resealable lid. Duct tape was wrapped around the secondary container. The secondary container was sealed in a plastic bag and then

stacked in a drum that was approved for transporting samples. The sample containers were packed in vermiculite to prevent them from shifting during transport; however, the shipping conditions for the samples were at least as abusive as the drums would encounter during shipment. The drums that contained the samples were shipped to SWRI with the appropriate documentation (e.g., chain-of-custody sheets) for analysis (see Appendices J and K).

Detailed records were collected during package disassembly, sample collection, and package closure. The sampling personnel documented the opening and sampling of the drum contents with a checksheet and digital photographs. Photographs were taken of the drum to identify the lot and drum numbers, and then each time a packaging layer was removed. After the sample was collected, the sampling personnel closed the drum and placed a label on the lid to indicate that this particular drum had been sampled. Copies of the records for the Curtis Bay site are shown in Appendices C – I.

4.1.3 Sample Analyses

At SWRI, consistent procedures were followed to ensure data quality. Upon receipt of the samples at SWRI, the drums were opened and the contents checked against the chain-of-custody sheets. The samples were weighed to determine the percentage of powder in the sample (i.e., the amount of material that had separated from the large chunks during shipping and handling). The samples for the oxidizer test were prepared from the large sample chunks, except samples that were all powder (e.g., the French ThN). The smaller pieces were used in the other analyses. Leftover sample material was returned to its original container, and the sample bottle was placed back into the drum for storage. The analyses that were performed on the ThN material are listed in Table 7 along with the analytical methods used. This topic is discussed in more detail in the analytical characterization report by Mattus.[3]

Table 7. Requirements for analysis of thorium nitrate samples

Analytical parameter	Analytical methods
Metals/inorganics	SW846-6020, -7471, -6010B
Oxidizer test	UN ST/SG/AC.10/11.Rev.3
Radionuclides	
Thorium	Gamma spectroscopy (method consistent
Uranium	with EPA 901.1 method)

4.1.4 Field Sampling Observations

During the opening of the drums, the sampling team encountered gas pressure in some drums of the MD-1 configuration. This pressure was similar to that experienced during a pilot demonstration completed in 1997 with MD-1 drums from domestic lot 71. The sampling team did not encounter gas pressure in the other drum configurations; however, none of the MD-3 drum configurations were opened. The MD-3 configuration is similar to the MD-1 configuration, but it differs in that a 55-gal drum was used as the exterior container instead of a 30-gal drum. The drum handling steps that will be implemented for safely handling the MD-1 drums (e.g., place a drum into a cage and tighten the ring bolt) will also be used with the MD-3 drums, so it is not important that none of the MD-3 drums were

opened during the sampling campaign. When gas pressure was present in the MD-1 drums, it was quickly and easily detected as the bolt in the locking ring was loosened to permit removal of the drum lid, because gas could be heard escaping from the headspace. In some cases, the drum lid and bottom were visibly domed and sometimes kinked, indicating that the drum was at one time pressurized to the point where this deformation could occur. Some drums did not exhibit significant deformation, but the sampling personnel could detect the presence of gas pressure based on tone (from tapping on the drum) and physically pressing down on the lid with their thumb and observing whether the drum lid returned to its as-found position. In some cases, the internal polyethylene bags contained gas pressure, and the bags would rise above the top of the drum when the drum lid was removed. Samples of gas in the headspace of selected MD-1 drums were collected. The sampling procedure is discussed in Sect. 4.2. The analytical results, which are reported by Mattus,[3] indicated that carbon dioxide is the main constituent. Potential mechanisms for the generation of carbon dioxide in the drums are discussed in Appendix M.

During the retrieval of drums in Building 913 for the 2002 sampling campaign, a drum in lot 21 was discovered that had lost its lid, apparently from overpressurization of the drum (see Figs. 10 and 28). The drum was in the middle of a stack of drums, which prevented a detailed inspection from being performed at that time. This drum and another nearby drum that was significantly bulging were retrieved and inspected in detail during the April 2003 headspace gas sampling campaign which is discussed in further detail in Sect. 4.2.

Fig. 28. MD-1 drum that lost its lid.

Consideration was given to the experience with pressurized drums throughout the DOE facilities. Drum incidents at DOE facilities with effects, postulated causes, and preventative measures were compiled. Also, the work of drum researchers at Los Alamos National Laboratory (LANL) were considered. The LANL researchers had prepared documentation on drum pressurization and a video presentation on pressurized drum handling and destruction. Most of their numerical analyses were for 55-gal drums. A copy of the information obtained for the pressurized drums experience in the DOE may be found in Appendix N.

The sampling team did not find free liquids inside any of the drums. There was a small amount of condensation on the internal plastic bag surfaces; however, the quantity of condensate was too small to collect a sample. When the condensate was checked with litmus paper, it was shown to be acidic which was expected since the ThN had been crystallized from a nitric acid matrix.

4.1.4.1 MD-1 Drums

The exterior container for an MD-1 drum configuration is a 30-gal drum that was manufactured by Greif Bros. Corporation. A photograph of a typical MD-1 drums is shown in Fig. 29. Figure 30 shows a cut-away schematic of the MD-1 drum configuration. When the drum was opened to obtain a sample of the ThN, the sampling personnel first removed the drum's metal ring clamp and the metal lid. A polyethylene liner with lid was inside the drum. The plastic lid was set aside. A sealed polyethylene bag was then encountered. According to historical records, slaked lime (ranging from 2.2 quarts to 7.5 gal) was supposed to be in the void space between the polyethylene liner and the polyethylene bag. Sampling personnel reported that the polyethylene liner fit tightly inside the 30-gal drum, and they could not see into the void space; however, they reported seeing some white dust on the lid of the polyethylene liner and on the outside of the first polyethylene bag. The sampling personnel cut through the polyethylene bag, and then encountered a fiberboard drum with a fiberboard lid. Then they cut through the fiberboard lid and encountered a second sealed polyethylene bag. They cut through this bag and encountered a third polyethylene bag. The sampling personnel cut through this bag and encountered a fiberboard with a wooden lid. After the wooden lid was removed, a fourth sealed polyethylene bag was found. The ThN material was accessible after cutting through this bag.

Fig. 29. Typical MD-1 drum.

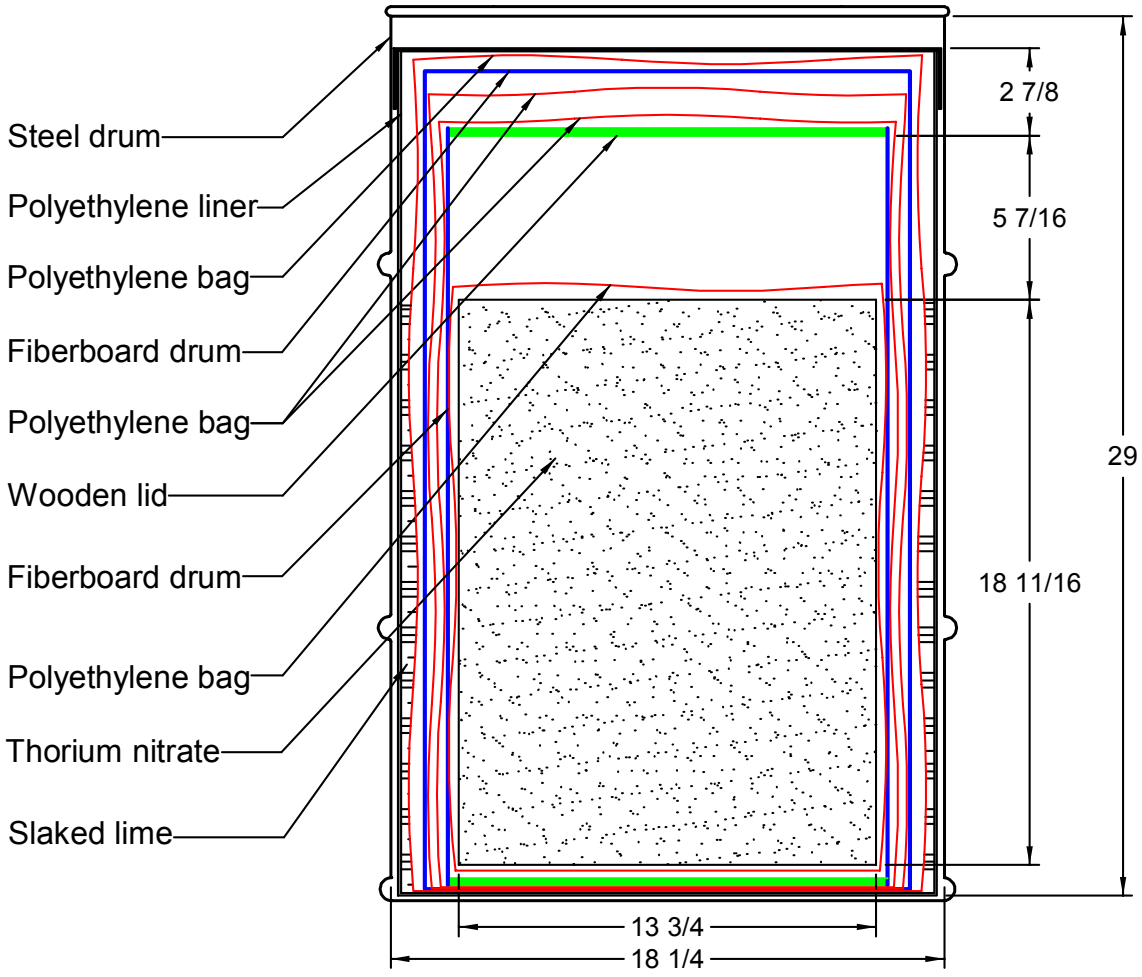


Fig. 30. Cut-away schematic of MD-1 drum configuration.

Table 8 provides a summary of all the MD-1 drums that were opened during the sampling campaign and identifies whether the drum lids were deformed, gas pressure was present in the headspace, the lid was pushed through the drum ring, and the internal pressure in the polyethylene bags lifted the fiberboard lid above the top of the drum. Because of packing similarities, the MD-4 drums that were sampled are also included in the table for comparison with the MD-1 drums. The MD-4 drums differ from the MD-1 drums in the type of outer container and there is some uncertainty as to whether slaked lime was placed in the MD-4 drums. The MD-4 drums were used to repackage

Table 8. List of MD-1 drums that were sampled and their characteristic properties[a]

Lot number	Drum number	Was the lid dented?	Was headspace pressure present?	Did the poly bag push the metal lid up through locking ring?	Did the tape separate with the fiberboard lid rising above the top of the drum?
Drums for which the samples were analyzed					
17	108	No	Yes	Yes	Yes
18	212	No	Yes	Yes	Yes
28	240	No	Yes	No	Yes
29	30	No	Yes	Yes	Yes
30	171	No	No	No	No
36	267	No	No	No	No
37	19	Yes	No	No	No
45	105	No	Yes	Yes	Yes
48	119	No	Yes	Yes	Yes
61	86	No	No	No	No
65	107	Yes	No	No	No
2	78	No	Yes	Yes	Yes
3	57	No	No	No	No
11	248	No	No	No	No
12	136	No	Yes	No	Yes
14	123	No	Yes	No	Yes
15	239	No	No	No	No
20	11	No	Yes	No	Yes
44	182	No	Yes	No	Yes
52	194	No	Yes	No	Yes
58	97	No	Yes	No	Yes
22[b]	8	No	No	NA	No
Drums for which the samples were archived					
34	80	No	Yes	Yes	Yes
35	203	No	Yes	No	No
38	75	No	No	No	No
39	6	No	Yes	No	Yes
40	35	No	No	No	No
41	142	No	No	No	Yes
42	154	No	Yes	No	No
43	179	No	Yes	No	Yes
50	3	No	No	No	No
51	155	No	Yes	No	Yes
56	48	No	No	No	No
60	285	No	Yes	No	No
64	00	No	Yes	No	Yes
71	192	No	Yes	No	Yes
16	230	No	Yes	Yes	Yes

Table 8. (*continued*)[a]

Lot number	Drum number	Was the lid dented?	Was headspace pressure present?	Did the poly bag push the metal lid up through locking ring?	Did the tape separate with the fiberboard lid rising above the top of the drum?
19[b]	52	No	No	NA	No
24[b]	102	No	No	NA	No
25	25	No	Yes	No	Yes
26	202	No	Yes	No	Yes
32	152	Yes	Yes	No	No
47	204	No	Yes	No	Yes
57	110	No	No	No	No
59	241	No	Yes	No	Yes
62	159	No	Yes	No	Yes
70	3	No	Yes	No	Yes
1	111	No	Yes	No	Yes
4	142	No	No	No	No
5	111	No	Yes	No	No
6	175	No	No	No	No
7	59	No	Yes	No	No
8	127	No	No	No	Yes
9	24	No	No	No	Yes
10	135	No	No	No	No
13	124	No	No	No	Yes
21	83	No	No	No	Yes
23	200	No	No	No	Yes
27	159	No	No	No	No
31[d]	00	No	No	No	No
33	149	No	No	No	Yes
46	24	No	No	No	No
63	5	No	No	No	No

[a]The values in this table are based on the information that the sampling personnel provided on their drum inspection sheets and from the photographs taken of the drums during the sampling activities.

[b]This drum is an MD-4 type drum instead of an MD-1 type drum and is shown for comparison purposes. The difference between the MD-1 and the MD-4 drum is the outer container. It is believed that the seal on the MD-4 drums is not as tight as the seal on the MD-1. NA = not applicable.

[c]This drum did not contain a wooden lid on the internal fiberboard drum.

[d]The 2nd polyethylene bag was taped closed where it had been heat sealed in other drums. Also, there was not an internal fiber drum or 4th polyethylene liner.

the fiberboard drums after a sprinkler accident. Historical documentation indicates that slaked lime was to have been placed in the drum; however, personnel that were present when the MD-4 repackaging was conducted indicated that this was more of an emergency operation and that slaked lime was not placed in the drums. In any event, no gas pressure was observed either in the drum headspace or in the polyethylene bags in the MD-4 drums.

The data in Table 8 indicate that headspace pressure was identified in 33 of 60 (55%) MD-1 drums. There were 8 cases (13%) where the metal lid was pushed through the locking ring by the polyethylene bag. There were 7 cases (12%) where headspace gas pressure was not identified, but gas pressure was present in the internal bags. There are at least three scenarios that could explain the latter event: (1) the headspace pressure bled off in the past, but not far enough in the past for diffusion to have significantly reduced the pressure in the bag, (2) the headspace pressure bled off during the sampling activities, but the gases exited around enough of the gasket such that the noise was not noticeable, and (3) headspace pressure was present and noticeable, but the sampling personnel failed to record the event.

Since the mass transfer rate of nitric acid to the slaked lime is likely to vary within each drum, the pressure also varies from drum to drum. Some of the MD-1 drums have not exhibited any internal gas pressure. These drums are likely to have kept the nitric acid separated from the slaked lime, to be self venting, or perhaps to be without slaked lime.

The tightness of the drum ring is also likely to vary from drum to drum. The drum ring on the drum that lost its lid may have not had the drum ring properly tightened. Thus far, only one drum has been found without its lid, but there may be drums beneath the top tier of drums with inadequately tightened drum rings. When the top tier of drums are removed from the stack, the potential exists for drums in the lower tier to lose their lids, so care must be exercised when removing pallets from the stacks.

Following the ThN sampling campaign, a study was conducted at the National Transportation Research Center (NTRC) with unused drums that were identical to the MD-1 and IN-1 drums to determine (1) how much pressure was required to produce the observed drum deformations in the MD-1 drum, (2) how much pressure was required to produce the drumhead excursions observed during sampling, (3) whether the MD-1 drum would reliably self-vent before reaching ~7 psig, and (4) why no gas buildup was observed in the IN-1 drums despite the presence of slaked lime in that drum. The NTRC testing indicated that the MD-1 drum began to deform at approximately 7 psig and permanent deformation began occurring at approximately 12 psig. Only about 3 psig was required to "pop" a MD-1 drumhead through a loosened locking ring. If the MD-1 gasket and drum curl were free of contaminants, like paint chips or rust, the MD-1 drum held pressure up to at least 15 psig and so cannot be relied on to self-vent at 7 psig. No pressure was observed in the IN-1 drums because the sealing force provided by the lever locking-ring used on this drum is insufficient to prevent gas from escaping the drum at pressures below 1 psig. The details of the drum pressurization studies are in Appendix O.

4.1.5 In Situ Gas Analysis

A Dräger Mini-Warn instrument was used to obtain in-situ measurements of gas composition while opening the drums. The Dräger instrument was limited to measuring combustible gas (measured in percent lower explosive limit – methane equivalent), NO (up to 50 ppm), NO_2 (up to 50 ppm), and O_2 (vol %). From the majority of the measurements made with the Dräger Mini-Warn instrument during sampling, NO and NO_2 were present in both the drum's headspace and in the headspace of the 3rd polyethylene bag. In some cases during inspection of the drum, the innermost polyethylene bag (referred to as the 4th polyethylene bag) was slightly pressurized. There is one case where an in-situ measurement of the headspace gas in the 4th bag was taken, and its composition was very similar to the headspace gas in the 3rd polyethylene bag. From inspection of this data, there exists a gas generation mechanism from the actual ThN material and acid films to form NO, NO_2, and other NO_x compounds. The Dräger instrument was limited to measuring the concentration of NO and NO_2 when the

concentration was ≤50 ppm. When a direct measurement was made of the gases in the drum, the concentration of NO and NO_2 exceeded 50 ppm. Because of the engineering controls used for sampling and the location of the HEPA blower exhaust, the concentrations of these compounds in the breathing zones were actually zero (as measured by the Dräger instrument). The HEPA blower quickly evacuated the gases in the headspace (i.e., within seconds). The actual gas composition data is best described using the analytical data from the internal gas samples that were reported by Mattus.[3]

According to the Dräger instrument's literature, it was subject to drift up to 10 to 15% over a 6-month period, which was an acceptable range for the project. The Dräger instrument remained on at all times to monitor the breathing zone air for the sampling personnel.

4.2 GAS SAMPLING AND PRESSURE MEASUREMENT

During the 2002 ThN sampling campaign, a drum in lot 21 in Building 913 was discovered to have lost its lid (see Fig. 28), apparently due to overpressurization. At that time, the drum was not accessible. In addition, several of the MD-1 drums that had been opened for sampling had shown evidence of internal gas pressure, and several MD-1 drums have bulged lids which would indicate that the drum either is pressurized or has been pressurized at some time and has self vented. A drum with a bulged lid can be seen in Fig. 28 near the drum that lost its lid.

The MD-1 drum configuration is not designed to permit the collection of untainted headspace gas samples (i.e., without dilution with atmospheric air) without the employment of specialized sampling equipment. Nuclear Filter Technology (NucFil) has developed the technology to obtain undiluted headspace gas samples from drums. NucFil's technology involves using a pneumatic driver to instantaneously punch a specially-designed dart through the metal lid. The dart has an o-ring which compresses against the surface of the lid and seals. The sharp-pointed tip of the dart falls off after the dart has penetrated the lid. After the tip falls off, a septum seal in the dart permits the insertion of a needle into the drum's headspace. The pressure of the headspace gas can then be measured by connecting a needle to a calibrated pressure gauge, and then inserting the needle through the septum. Similarly, gas samples can be collected by attaching a needle to an evacuated sample canister, inserting the needle through the septum, and opening a valve to permit the gas to flow into the cylinder.

In April 2003, an ORNL team inspected the top layer of drums and selected MD-1 drums for headspace gas sampling from those that appeared to have internal pressure (limited to the aisle-ways access). This methodology was followed to maximize the chances to bound pressure conditions and ensure a better chance of collecting gas samples from the headspace for analysis. Two drums from lot 21 were also retrieved: the drum that had lost its lid (drum number 205) and the drum with a bulged lid that can be seen in Fig. 28 (drum number 176). The NucFil technology was employed for the selected drums for measuring the pressure of the headspace gas and collecting gas samples for analysis. The two drums from Lot 21 (numbers 176 and 205) were inspected for the presence of free liquids in the drums. The drums were inverted and the outer drum was removed and inspected for the presence of liquids. The internal surfaces of the drums were dry and uncorroded, indicating that there had not been any free liquids. Also, the internal polyethylene liners were inspected for free liquids while they were inverted, but none was observed. The polyethylene liners and their contents were then repackaged in 55-gal drums (like the MD-3 configuration) and stored separately in Building 913. A videotape was made to document the storage arrangement of drums at Curtis Bay Depot, the retrieval of the drums from Lot 21, the retrieval of drums selected for headspace gas sampling, collection of gas samples from the selected drums, and the internal inspection of the drums from Lot 21. Highlights of these activities have been recorded on a digital video disc (DVD).

The gas samples were shipped to the off-site laboratories for analysis of the constituents. The results of gas sample analyses are discussed in detail by Mattus[3], but the overall result was that carbon dioxide and nitrogen oxide were the major constituents contributing to the buildup of gas pressure in the drums.

Since ThN is hygroscopic, the two drums from Lot 21 were expected to be the worst cases for whether any of the drums contained free liquids. The storage buildings are located near a large area of water; therefore, the drum without the lid had the potential for absorbing water from the humid atmosphere. The drum with the bulged lid was probably the most deformed lid that was observed during the inspection, thus it too had some potential for free liquid (in this case, excess acid). For the drum that had lost its lid, the inner bag was still intact and had some gas pressure in it. The gas pressure was not measured, but a gas sample was collected and analyzed. Mattus reports that the sample results indicated that the gas was regular air.[3] It is reasonable to believe that the gas in the polyethylene bag had equilibrated with atmospheric air (through diffusion). As indicated above, neither of these drums had any free liquids; therefore, none of the other drums are expected to have free liquids either.

Table 9 provides the pressure data obtained on the selected drums, and Table 10 shows the analytical results obtained from the headspace gas analyses by the two laboratories. It should be emphasized that when the ThN will be transported for disposal at the NTS site, the drums will be packed in ISO containers, and the ISO containers will be vented with HEPA filter systems. Therefore, the data are presented here for information only. The data in Table 10 show that carbon dioxide is the major constituent contributing to the headspace gas pressure.

Table 9. Measurement of the headspace gas pressure in selected MD-1 drums

Lot number	Drum number	Headspace pressure (psig)
4	55	12
6	83	0.5
6	84	5
8	18	9
14	244	2
21	176	16
27	79	4
31	34	7.5
33	117	7.5
44	262	9
63	60	3

4.3 RADIATION SURVEY REPORTS

Appendix L contains copies of radiological surveys, air sampling records, and RWPs used during the sampling of the ThN. General descriptions of radiological surveys conducted at Curtis Bay Depot (within the past 2 years) are provided below. Inaccessible areas are present in Buildings 911, 912, and 913; thus, there are some areas that were not surveyed.

Table 10. Analysis of the major constituents present in the drum headspace[a,b]

Sample number	CO_2 (vol %)	NO_x (vol %)	N_2 (vol %)	O_2 (vol %)	CO (mg/L)	H_2 (mg/L)	CH_4 (mg/L)	ethane (mg/L)	ethene (mg/L)
ACO[c] - Lot 4 Drum 55	35.98	18.79	44.09	0.02	6500	180	30	—	—
SWRI[c] - Lot 4 Drum 55	39.5 (38.6)	0.1578	45.8 (43.0)	11.2 (10.2)	1051	21.5	28.7	1.45	6.05
SWRI[c] - Lot 6 Drum 83	40.9 (40.8)	0.0929	44.7 (45.2)	ND[d] (ND)	886	ND[d]	25.8	1.39	4.99
SWRI[c] - Lot 6 Drum 84	42.2 (42.4)	0.1383	47.1 (45.4)	9.81 (9.3)	1030	ND[d]	27	1.5	6.2
ACO[c] - Lot 8 Drum 18	34.05	16.13	47.88	0.16	11800	200	40	—	—
SWRI[c] - Lot 14 Drum 244	41.4 (41.3)	0.1035	61.9 (50.6)	ND[d] (ND)	986	ND[d]	42.7	ND[d]	5.54
SWRI[c] - Lot 21 Drum 176	44.6 (45.4)	0.2867	36.5 (35.2)	12.2 (11.9)	1360	18.2	16.4	0.99	5.38
SWRI[c] - Lot 21 Drum 176	42.8	0.2540	31.5	9.75	1270	20.4	16.6	1.02	5.91
ACO[c] - Lot 27 Drum 79	39.96	18.95	39.11	0.24	12500	170	30	—	—
SWRI[c] - Lot 27 Drum 79	42.2 (43.9)	0.1446	41.6 (44)	ND[d] (ND)	1170	ND[d]	35.9	1.5	6.28
SWRI[c] - Lot 31 Drum 34	44.3 (43)	0.1225	38.9 (46.9)	9.85 (12.2)	1220	18	32	1.48	6.33
ACO[c] - Lot 33 Drum 117	45.25	16.89	36.38	0.06	9600	200	20	—	—
SWRI[c] - Lot 33 Drum 117	31.9 (30.5)	0.0974	48.2 (45.5)	12.9 (11.9)	831	ND[d]	28.1	ND[d]	5.42
SWRI[c] - Lot 44 Drum 262	35.5 (36)	0.0979	51.8 (49.6)	11.2 (10.4)	1210	18.6	31.1	1.06	6.21
Gaseous composition of dry air	0.035	Tr[d]	78.084	20.947	0.25	0.53	1.7	Tr[d]	Tr[d]

[a]Refer to Mattus' report (ORNL/TM-2003/54) for details.

[b]Results in parentheses are those of duplicate analyses made by the laboratory.

[c]ACO = Analytical Chemistry Organization at the Y-12 National Security Complex; SWRI = Southwest Research Institute.

[d]ND = not detected, Tr = traces.

Gas sampling project of April 2003

- The highest general area dose rate in the aisle way was 45 mR/h in Building 911.
- The highest loose contamination reading on the building floor was 51 dpm/100 cm^2 alpha located in Building 911.
- No loose contamination was found on exterior parts of drums that were sampled.
- The highest interior loose contamination on sample drums was 87 dpm/100 cm^2 alpha and 600 dpm/100 cm^2 beta/gamma
- No loose contamination was found in Buildings 912 and 913, but all areas were not surveyed.
- Air samples taken during movement of drums and gas sampling of drums showed no airborne contamination.

The loose floor contamination had been drastically reduced due to the use of a fixative covering used during the drum sampling project of June 2002 (see Sect. 4.1.2).

ThN sampling project of June 2002

- The highest loose contamination in Building 911 was 205 dpm/100 cm^2 alpha.
- No loose contamination was found in Building 912 (after fixative floor covering was applied).
- The highest loose contamination in Building 913 was 47 dpm/100 cm^2 alpha.
- The highest contact dose rate in Building 911 was 110 mR/h and highest general area dose rate was 80 mR/h.
- The highest contact dose rate in Building 912 was 120 mR/h and highest general area dose rate was 80 mR/h.
- The highest contact dose rate in Building 913 was 80 mR/h and highest general area dose rate was 50 mR/h.

Radiological survey conducted in October 2001

- The highest loose contamination on the floor of Building 911 was 666 dpm/100 cm^2 alpha and 1157 dpm/100 cm^2 beta/gamma.
- The highest direct alpha contamination on the floor of Building 911 was 100,870 dpm/100 cm^2.
- The highest loose contamination on drums located in Building 911 was 5,112 dpm/100 cm^2 alpha and 11,997 dpm/100 cm^2 beta/gamma.
- The highest loose contamination on the floor of Building 912 was 209 dpm/100 cm^2 beta/gamma.
- The highest direct contamination found on drums was 53,256 dpm/100 cm^2 in Building 911.
- The highest loose contamination on drums located in Building 912 was 480 dpm/100 cm^2 alpha and 1,079 dpm/100 cm^2 beta/gamma.
- The highest center bay general area dose rate was 44 mR/h in Building 911.
- The highest general area dose rate at ~2 ft from the drums was 65 mR/h in Building 911.
- The highest center bay general area dose rate was 45 mR/h in Building 912.
- The highest general area dose rate at ~2 ft from the drums was 36 mR/h in Building 912.
- No survey was completed in Building 913.

A radon sample survey was performed at Hammond Depot in January 2000, and the results were documented by the U.S. Department of Health and Human Services. The radon levels measured in Building 100W ranged from 1.1 – 2.2 pCi/L.

Radiation exposure data from the ThN sampling activities and the headspace gas sampling activities are provided in Tables 11 and 12, respectively. These data should be helpful in performing radiation dose estimates for future drum handling activities.

Table 11. Radiation dose estimates from the ThN sampling activities

Depot	Total effect dose equivalent (rem)	Dates	Comments
Hammond	0.493	5/29/2002 through 6/13/2002	Five-person RWE NUKEM staff performed drum movement, ThN sampling, and radiological monitoring.
Curtis Bay	1.696	6/18/2002 through 7/18/2002	Dose results included a "control dose" biased by dosimeters being stored in high radiation background areas of the depot.
Total	2.189		

Table 12. Radiation dose estimates from gas sampling activities at Curtis Bay Depot

		Dose[a] (mR)	Work date	Comments
Drums inspection and staging	Drum inspection, project planning, video, and surveys	125 174 299	4/2/2003 4/1/2003 Subtotal	Drum inspectors received 137 mR. Video recorders received 61 mR. Radiation Control Technicians (RCTs) received 68 mR.
	Drum staging, video recording, and project planning	282 102 384	4/3/2003 4/4/2003 Subtotal	Forklift driver received 110 mR (2 days). Spotter received 130 mR (2 days). Video recorder received 28 mR. RCTs received 72 mR.
Gas sampling	Gas sampling of 10 drums, video, and oversight	87	4/7-8/2003	Samplers (2) received 10 mR each. Drum stagers received 27 mR. RCTs received 15 mR.
Special drum inspection and oversight	Package inspection, video, and project wrap-up.	28	4/7-8/2003	
Total		798		

[a]Estimated from direct reading dosimeters.

5. JUSTIFICATION FOR USING ISO CONTAINERS

As discussed in Sect. 2.3, the drums as currently packaged will not meet the regulatory requirements of DOT and/or the NTS WAC. The issue of pressure in the MD-1 drums (and possibly the MD-3 drums) introduces an engineering problem with regard to using these drums as waste packages for disposal. As previously discussed, the NTS WAC requires that the pressure in the waste package not exceed 1.5 atm (~7.5 psig); therefore, if the MD-1 and MD-3 drums were to be used as waste packages, each drum would need to either (1) be vented and have a HEPA filter installed to prevent future recurrence of pressurization, or (2) be overpacked. In the case of the latter option, the overpack container would need to have a HEPA filter installed to prevent that container from ever exceeding the NTS WAC pressure limit. When one considers that ~15,900 MD-1 and MD-3 drums are involved, either option would be laborious and would subject the personnel to radiation doses that do not meet the principle of ALARA. Inspecting and certifying every drum to meet the NTS WAC would also be a labor-intensive task that would also subject the personnel to significant radiation doses.

In order to minimize the radiation dose to personnel, ORNL staff recommend using ISO containers as the transport package for the ThN drums to NTS. Upon arrival at the NTS, the entire ISO container will buried. Section 5.1 presents the advantages and disadvantages of using ISO containers for these purposes. The estimated radiation dose rates from an ISO container loaded with ThN is discussed in Sect. 5.2. The potential issue of pressure inside the ISO container is addressed in Sect. 5.3. Section 5.4 discusses the approval for ISO containers as the package for transporting the ThN by DOT.

5.1 ADVANTAGES AND DISADVANTAGES OF ISO CONTAINERS

ISO containers are being proposed as the transport and disposal packages for the ThN drums in order to resolve the issues associated with using the individual drums for those purposes. A typical ISO container that would be used for this project is approximately 20 ft × 8 ft × 8 ft and has a payload up to ~40,000 lb, including the weight of the ISO container, and the bracing and blocking materials (this assumes the truck will weigh 40,000 lb). It is estimated that approximately 127 MD-1 drums could be placed in one ISO container, and ~267 ISO containers would be required to dispose of all of the ThN material.

The advantages of using an ISO container include the following:

- Minimizes material handling, once the container is filled with drums,
- Minimizes the potential for material spills during transport and disposal,
- Reduces radiation exposure for workers at the Hammond and Curtis Bay depots and at NTS (i.e., meets ALARA principle),
- Minimizes the potential for cross contamination and release of contaminants,
- Minimizes contaminated equipment remaining after disposal operations are complete,
- ISO containers support disposal in Area 3 at NTS,
- Minimizes time spent loading and off loading trucks,
- ISO containers are DOT approved LSA-1 shipping containers,
- Material processing, shipping, and disposal records are easily maintained,
- ISO containers are easily acquired,
- Empty return trips from NTS are minimized,

- May remove the need for overpacking French and Indian drums,
- Personal protective equipment associated with contaminated operations, filters, contaminated drums, and pallets can be disposed with ThN in ST-90 boxes,
- Only ~267 ISO containers require certification instead of ~21,000 drums,
- The basis for complying with NTS WAC requirements of no free water and internal pressure being less than 1.5 atm is improved,
- No need for installing new locking rings on Hammond drums,
- No need for testing ~750 plastic drums, and
- ISO containers have been used for similar activities. DOE's Fernald Environmental Management Project used a similar configuration to ship low-level wastes to NTS.

The disadvantage of using ISO containers include the following:

- The disposal volume and associated disposal costs increase by a factor of approximately two.

The increase in costs from added disposal volume would be more than offset by the cost reductions achieved by the many advantages of using ISO containers.

5.2 ESTIMATED RADIATION DOSE RATES FROM AN ISO CONTAINER FILLED WITH THORIUM NITRATE

The dose rates from packages containing radioactive materials must be determined prior to transport. Radiation dose rate estimates have been prepared to determine whether an ISO container could be feasibly used for the ThN.

To prepare dose rate estimates, the quantity of ThN being transported must be known. It was determined that the largest quantity of ThN being shipped in a single 20-ft long ISO container would be 54 drums of ThN of French origin. The French drums have the highest radiation dose because of the concentration of ^{230}Th in its matrix. Each of these 55-gal drums contains about 330 kg (728 lb) of ThN. The loaded package would contain approximately 17,820 kg (39,286 lb) of ThN.

An overestimate of the ThN loading was made to ensure that the computed dose rates are conservative. Thus, for computational purposes, the maximum quantity of ThN that would be transported in a single 20-ft long ISO container is assumed to be 18,144 kg (40,000 lb).

The dose rates were computed using MicroShield Version 5.05 software from Grove Engineering. For modeling purposes, the ThN was assumed to be uniformly distributed throughout the inside of the 20-ft long ISO container. Nominal internal dimensions of the ISO container are 19 ft 4.2 in. long by 7 ft 8.5 in. wide by 7 ft 9.9 in. tall. These dimensions produce an internal volume of approximately 1167 ft^3. Copies of the results obtained from the analysis (i.e., MicroShield 5.05 outputs) are provided in Appendix Q.

Th-232 emits only weak gamma rays [fraction of decays: 0.00042 (0.1250 MeV), 0.00190 (0.0590 MeV), and 0.08390 (0.0123 MeV)], but about 50% of the gamma rays emitted by its progeny have energies between 0.5 and 3 MeV.

The steel walls of the drums are thin: 0.049 in. for 30-gal drums and 0.063 in. for 55- and 85-gal drums. Because the drum walls are thin, the drums provide limited shielding for energetic gamma rays [one half-value layer for gamma rays in steel is about 15 mm (0.59 in.) for 1 MeV photons, 20 mm (0.79 in.) for 2 MeV photons, and 24 mm (0.94 in.) for 3 MeV photons].

For each centimeter along the line of sight, the ThN provides much less shielding than the drum walls. A one-half value layer for gamma rays in ThN is about 52 mm (2.1 in.) for 1 MeV photons, 78 mm (3.1 in.) for 2 MeV photons, and 92 mm (3.6 in.) for 3 MeV photons.

A typical gamma ray, that originates in the center of an ISO container loaded with fifty-four 55-gal drums containing ThN produced in France, would pass through about 67.5 times more ThN than steel while moving in a direct path to the end of the ISO container. Although ThN is about 3.5 times less effective than steel at stopping a 1MeV photon, most photons would encounter many times more ThN than steel while they are within the ISO container. Therefore, the drums were ignored for the purpose of computing the doses from an ISO container filled with ThN.

The dose rates were computed along lines extending through the center and a corner of each representative face of the rectangular parallelepiped used to model the ISO container. The dose rates were modeled at 1 cm from the surface of the ISO container [MicroShield documentation cautions against making calculations at less than 1 cm (0.39 in.) from the modeled radiation source] and at 1 m (3.28 ft) from the surface of the ISO container. The calculated dose rates are given in Table 13.

Table 13. Maximum estimated dose rates from an ISO container loaded with thorium nitrate[a,b]

	Dose rate (mrem/h) at distance of	
Location	1 cm	1 m
Center of an end	89.4	32.4
Center of a side	93.2	46.8
Center of the top or bottom	93.1	46.4
Corner[c]	23.5	17.2

[a]Estimates are based on the French ThN which would have the highest dose rate of any of the drum configurations.

[b]Dose rates were estimated with MicroShield version 5.05. See Appendix Q for copies of the outputs.

[c]MicroShield was used to evaluate the radiation dose at a corner using three geometries: the corner of an end, corner of a side, and the corner of the top or bottom. In actuality, these are the same point, but MicroShield calculated slightly different values for each geometry. There is no reason to believe that one value is better than the others, so the average of the three points (for each distance) is shown. See Appendix Q for the outputs for the three geometries.

The centerline dose rates for the 20-ft long ISO container were consistently larger than the dose rates at the edges of the container. The centerline dose rates at 1 cm were computed to be approximately 93 mrem/h at the top, bottom, and sides and approximately 89 mrem/h at the ends. The centerline dose rates at 1 m were computed to be approximately 46 mrem/h at the top and bottom, 47 mrem/h at the sides, and 32 mrem/h at the ends.

The dose rate at 2 m from the ISO container is limited by 49 CFR 173.441(c) to 10 mrem/h for exclusive use shipments. The computed dose rates at 1 m given in the previous paragraph suggest strongly that there may be combinations of ThN drums that would produce dose rates exceeding 10 mrem/h at 2 m from the sides and/or ends of the ISO containers. Updated calculations will be performed and the results will be documented in a revision to this document or in a separate white paper.

The maximum expected dose rates in the cab of a tractor-trailer rig were also computed. The 20-ft-long ISO container was assumed to be sitting in the center of a 40-ft-long trailer. Also, the total distance from the container to the occupied portion of the cab was estimated to be 16 to 18 ft. The shorter distance was used for conservatism. No radiation shielding credit was taken for any materials between the ISO container and the occupied portion of the cab. The dose rates in the cab were calculated to be 3.3 mrem/h along the centerline of the ISO container and 2.9 mrem/h along a line extending from any of the four corners of the ISO container that are facing the cab. These dose rates are conservative estimates for the shipments with the highest radiation field: fifty-four 55-gal drums of ThN processed in France. All other shipments would produce lower dose rates in the cab. The modeled maximum expected dose rates in the cab could be reduced from 3.3 to 1.4 mrem/h and from 2.9 to 1.3 mrem/h by moving the ISO container to the end of the trailer furthest from the cab. The MicroShield outputs for this model are shown in Appendix Q.

5.3 PRESSURE CONSIDERATIONS

The NTS WAC pressure limitation of 1.5 atm on internal pressure is for the package. If an ISO container is used as the disposal package, the pressure restriction is met because the ISO container is loaded at atmospheric pressure. An uncertainty that was considered is what happens to the internal pressure if one or more of the MD-1 drums should lose their lids. The ISO container is likely to experience pressure changes due to changes in barometric pressure and temperature. If a drum did happen to lose a lid during transport, there is a possibility that radioactive material could become airborne inside the ISO container. ISO containers normally come with vents that are open to the atmosphere. The ISO containers that would be used for disposing of the ThN would be modified to close those vents and install HEPA filters to allow the ISO container to breathe during transport and to further ensure that the radioactive material would not escape from the ISO container if a drum was to lose its lid and release material during the transport.

The approach to mitigate the potential for any excess pressure in ISO containers is to use the concept of double contingency. The first contingency is to tighten the locking ring on each MD-1 drum prior to loading in the ISO container. This procedure reduces the potential for any drum to vent. The second contingency is the installation of two HEPA filters to vent pressurized gas from any drum which might vent after the locking ring is tightened. As a result, any pressure within the ISO container from the unlikely venting of a pressurized drum would be transient and easily contained by the structure of the ISO container. Therefore, any pressure buildup in the ISO container and the release of any contamination is extremely unlikely.

A conservative scenario was developed to determine the minimum ventilation rate capacity for the HEPA filters to be installed in the ISO containers. The following assumptions were made for this scenario:

- ISO container is loaded with 147 MD-1 drums (49 drums per layer) plus 10% dunnage,
- each drum contains headspace gas with a pressure of 16 psig measured at 40˚F (4.4˚C),
- the temperature of the ISO container and drums reach 140˚F (60˚C),
- the internal pressure of the ISO container is 1.0 atm,
- a drum loses its lid every hour, and
- the ISO container is outfitted with HEPA filter(s).

These assumptions are considered conservative because only one drum has lost its lid in the many years that the drums have been stored. Also, the plans for loading the drums into an ISO container require that the locking ring of each MD-1 and MD-3 drum to be tightened prior to loading it on the ISO. Tightening of the locking ring will make it much less likely that a drum lid could escape from the drum.

Based on the void volume in the drum and the associated volume expansion of the gas at 140°F, it is estimated that a drum that lost its lid would release ~120 L (~4.4 g-moles) of gas into the ISO container. It should be noted that the 147 MD-1 drums is the maximum number of drums that can physically be loaded into the nominal 20-ft ISO container. In reality, there will likely be less drums loaded into an ISO container because of weight restrictions; but for the purpose of this scenario, the maximum number of drums was assumed to reduce the void volume in the ISO container, and thus make the pressure higher if a drum was to lose its lid.

The release of the 120 L of gas from the drum into the ISO container is estimated to increase the pressure inside the ISO container to 1.009 atm (~4 in. of water). In order to prevent the internal pressure in the ISO container from increasing with subsequent drum lid releases, the HEPA filter(s) should be sized so that the gas volume from one drum is fully vented before another drum potentially loses its lid; thus, to be consistent with the scenario defined above, the 120 L of gas needs to be vented within 60 min – a minimum ventilation rate capacity of 2 L/min is needed. HEPA filters are commercially available that have the needed ventilation capacity and that are adaptable to installation in an ISO container.

5.4 COMMUNICATIONS BETWEEN DOT AND DNSC

The DNSC approached the DOT with the proposal of using ISO containers as shipment containers for the ThN drums, and DOT has approved their use as strong-tight containers. Copies of the correspondence between the DNSC and the DOE are shown in Appendix P.

6. CONCLUSIONS

The DNSC has stewardship of ~7 million lb of ThN which is stored at depots in Curtis Bay, Maryland, and in Hammond, Indiana. The ThN has been stored for several decades, and the DNSC has evaluated options for its disposition. In support of the DNSC, ORNL directed a characterization campaign for the ThN. The analytical results from the samples are documented by Mattus.[3] The following conclusions were made from the analytical results:

- The ThN could be classified as LSA-1,
- The ThN does not contain hazardous contaminants at concentrations that would cause it to be categorized as a mixed waste if it were declared to be a waste,
- The ThN is not required to be classified as a Division 5.1 oxidizer per the DOT definition, and
- The disposal of the ThN would not be regulated by RCRA, and thus it could be accepted for disposal at the NTS.

The DNSC has decided to dispose of the ThN at the NTS.

During the sampling of the ThN, it was determined that pressure in the headspace of the MD-1 drums was a significant industrial safety issue. One drum at Curtis Bay Depot had apparently lost its lid to overpressurization and several others had bulged and deformed lids due to pressure that was either in the drum or at one time was in the drum and had since self vented. No drums of other configurations were found to contain headspace pressure. A headspace gas sampling campaign was conducted, and it was determined that carbon dioxide was the primary constituent contributing to the gas pressure. Carbon dioxide is believed to have resulted when nitric acid seeped from the interstitial pores of the ThN matrix, penetrated the internal packaging, and came in contact with slaked lime which was placed in the drums to neutralize any leaking acid. It is believed that the slaked lime contained some calcium carbonate which released carbon dioxide when it reacted with the nitric acid. As a result, when retrieving drums of domestic origin ThN stored in metal drums should be handled with special attention to minimize the risk of another drum losing its lid.

Transportation and disposal of the ThN by using the existing drums as the shipping and disposal packages is not feasible. Firstly, some of the drums (French and Indian origin) have external removable contamination, and they would have to be overpacked in clean drums to meet requirements of the DOT and of the NTS WAC. Secondly, some of the drums have poor closures and would require changing of the closure or overpacking of those drums to meet DOT requirements. Thirdly, some drums do not have the required quality assurance documentation and would have to be overpacked to meet the NTS WAC requirements. Lastly, some of the drums contain pressure that exceeds the NTS WAC requirements, thus the gas pressure would have to be vented prior to transport to NTS. The additional overpacking and the drum venting activities would result in significant radiation doses to the workers involved in the activities which is not in accord with the principle of ALARA.

To minimize radiation dose to workers, ORNL staff investigated and recommended the ThN to be shipped in bulk to NTS using ISO containers. The use of ISO containers as the transport package meets the requirements of the DOT. The use of ISO containers as the disposal package also meets the WAC of the NTS. Using ISO containers reduces the potential radiation dose to workers at the current storage sites and at the disposal site.

7. REFERENCES

1. Hermes, W. H., et al., *Thorium Nitrate Material Inventory Definition Report*, ORNL/TM-2000/163, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 2001.

2. Hermes, W. H., et al., *Executive Summary Report for the Thorium Nitrate Stockpile Stewardship and Disposition Project*, ORNL/TM-2001/14, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 2001.

3. Mattus, C. H., et al., *Analytical Characterization of the Thorium Nitrate Stockpile*, ORNL/TM-2003/54, Oak Ridge National Laboratory, Oak Ridge, Tennessee, August 2003.

4. Terry, J. W., et al., *Potential Radon Emissions from the Thorium Nitrate Stockpile*, ORNL/TM-2003/52, Oak Ridge National Laboratory, Oak Ridge, Tennessee, August 2003.

5. Clinton, S. D., et al., *Thorium Nitrate Pilot-Scale Demonstration and Stockpile Processing Option Results Report*, ORNL/M-6625, Oak Ridge National Laboratory, Oak Ridge, Tennessee, December 1998.

6. PES (Perma-Fix Environmental Services, Inc.), MEC (East Tennessee Materials and Energy Corporation), and TBE (Teledyne Brown Engineering), *Demonstration Results Report: Thorium De-nitration Pilot Project*, Rev. 1, prepared for the U.S. Army Defense Logistics Agency, Arlington, Virginia, September 1998.

7. RDC (Recovery Dynamics Corporation), *Pilot Demonstration Results Report for Conversion of Thorium Nitrate to Thorium Oxide*, R-108-03, prepared for Lockheed Martin Energy Systems, Inc., Oak Ridge, Tennessee, September 1998.

APPENDIX A

HAMMOND DEPOT
DRUM VISUAL INSPECTIONS

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The following table provides a list of drum lots and drum identification numbers that were inspected at the Hammond Depot as part of the Thorium Nitrate Drum Sampling Project. These drums were only subjected to a visual inspection per the contract terms and not sampled for off-site analyses or on-site archive. The drum inspection data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

Also included with the table is the page number of the starting page in this appendix for the visual inspection data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	2	49	A-5
2	20	39	A-15
3	28	30	A-25
4	32	45	A-35
5	43	44	A-45
6	45	22	A-55
7	49	2	A-65

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Hammond Depot
Lot #2 - Drum #49
Visual Inspection

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 2 Drum ID #: 49 Location: Warehouse 100W - 15B-3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): Good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3.2mR/hr Dpm/300cm^2 <20α & <200 βγ
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container # 2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): NA
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): NA
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): NA
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

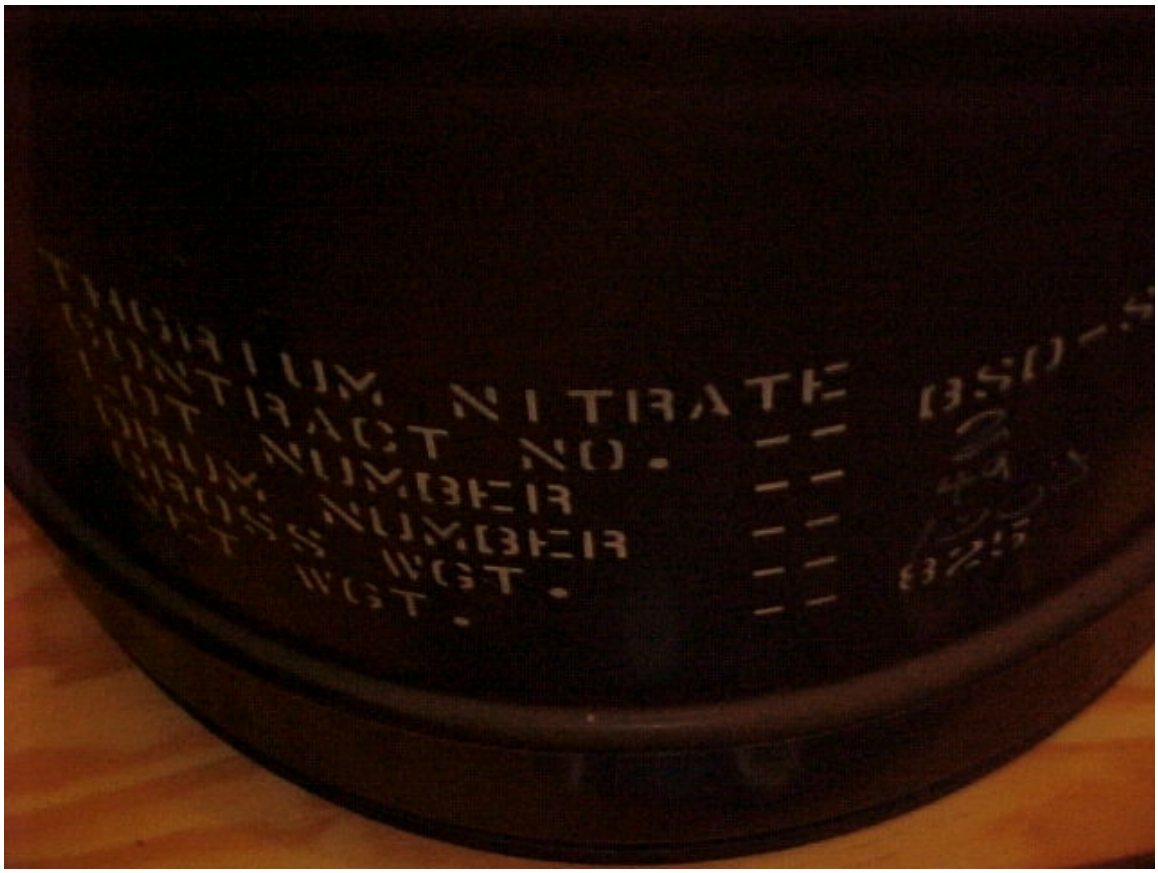
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: none
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: Tony Cunningham (signature on file) Date: 6-6-02

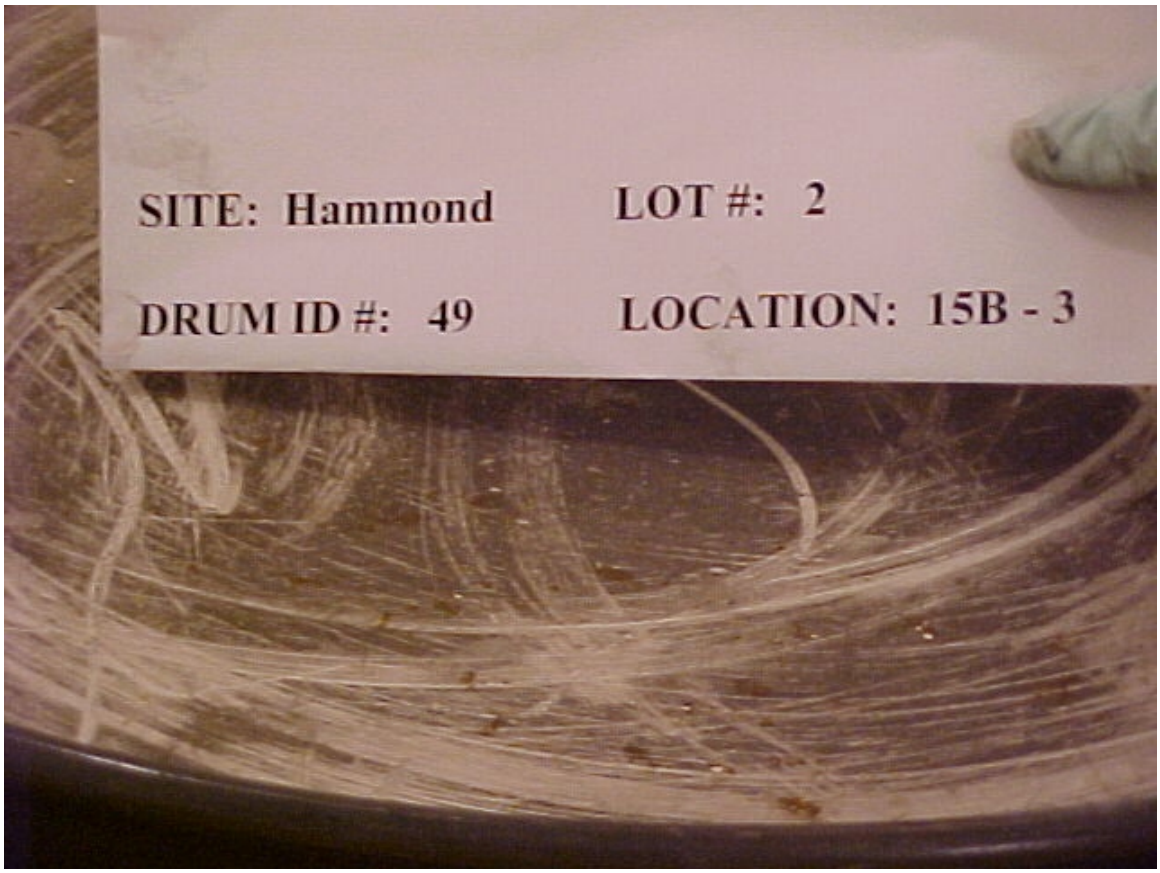
Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	1 of 8
Site	Hammond		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface 32 mR/hr		
	1 meter 3.2 mR/hr		



Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	2 of 8
Site	Hammond		
Container	85-gallon steel drum	Container Condition	Good – drum ring also in good condition

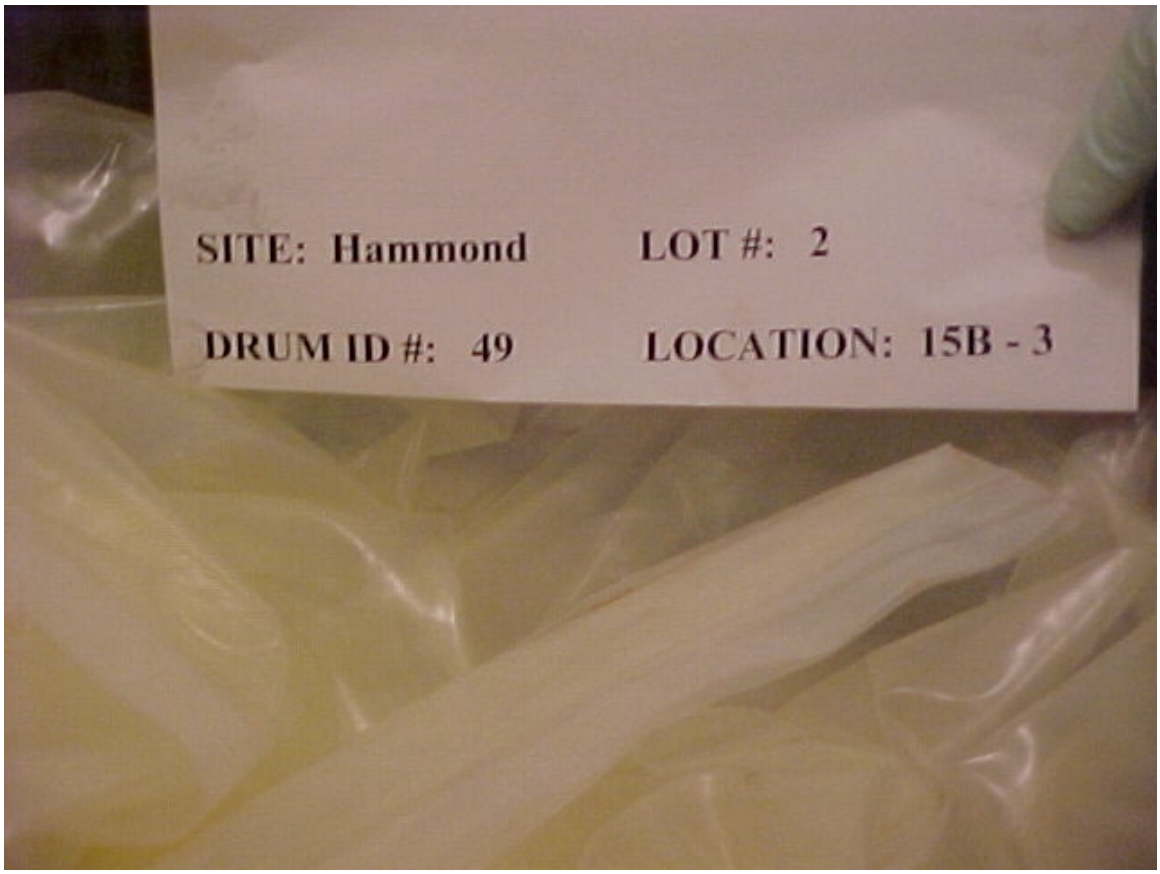
Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	3 of 8
Site	Hammond		

55 gal drum lid – Good Condition
Ring is in good condition with 3/8 x 3 ½ bolt/nut
Ring and lid are tight
55-gal drum is packaged in an 85-gal drum with vermiculite
No gasses present



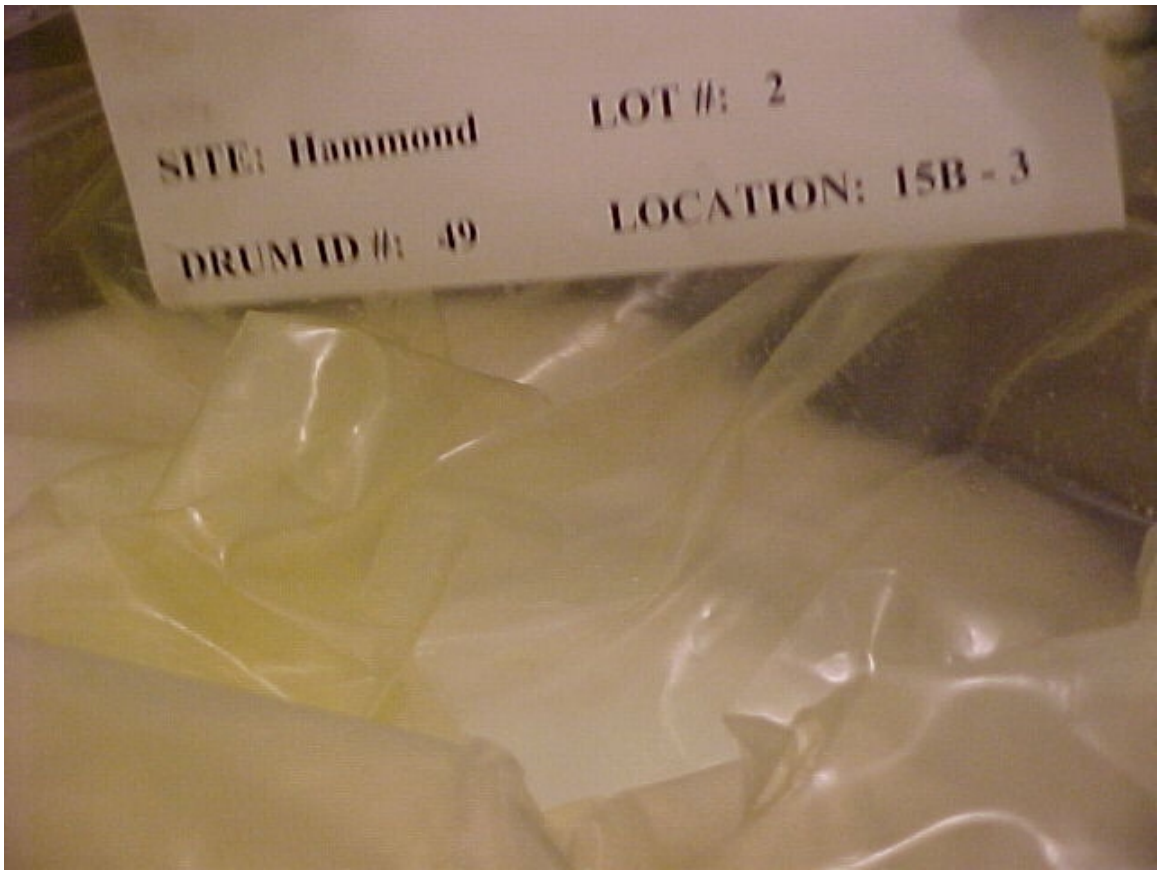
Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	4 of 8
Site	Hammond		

1st Poly liner/bag
Sealed - Poly liner/bag - Good Condition
No gasses present



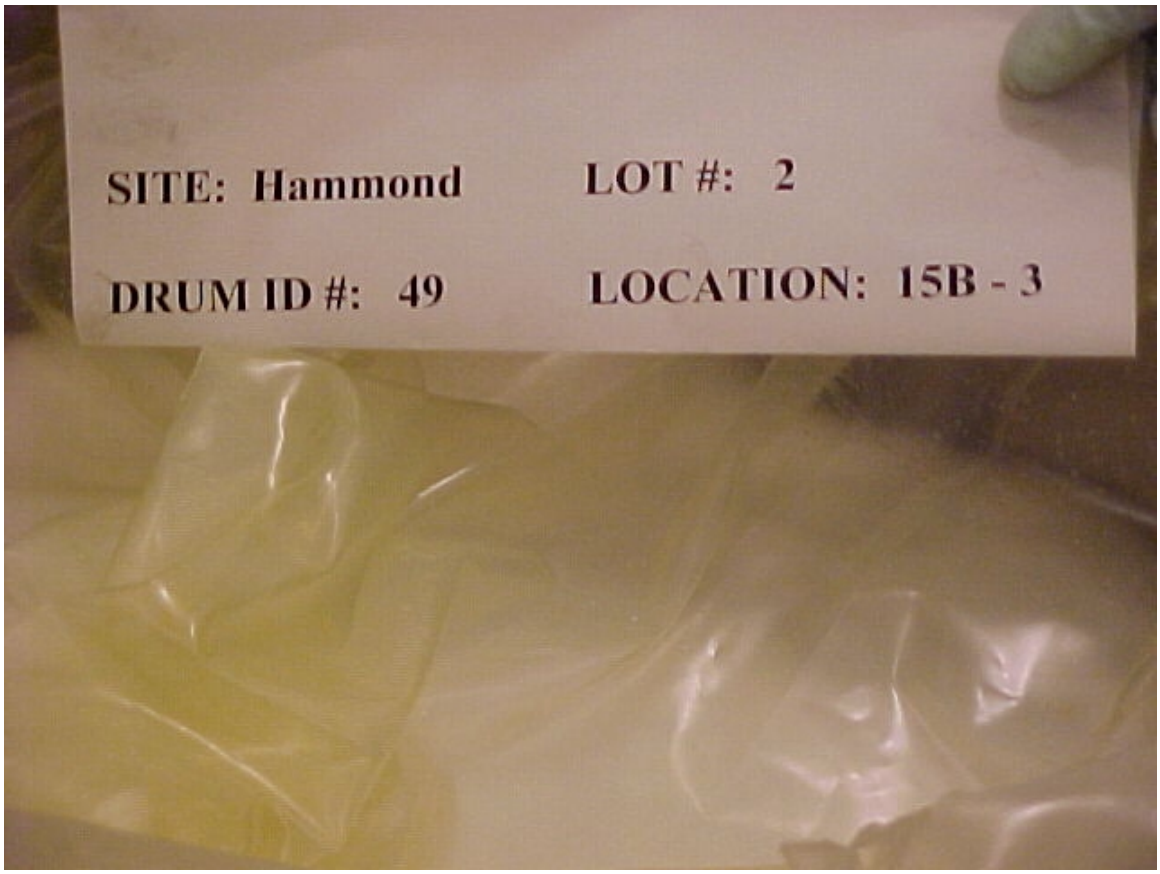
Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	5 of 8
Site	Hammond		

2nd Poly liner/bag – Good Condition
No moisture present
No measurement of gasses present



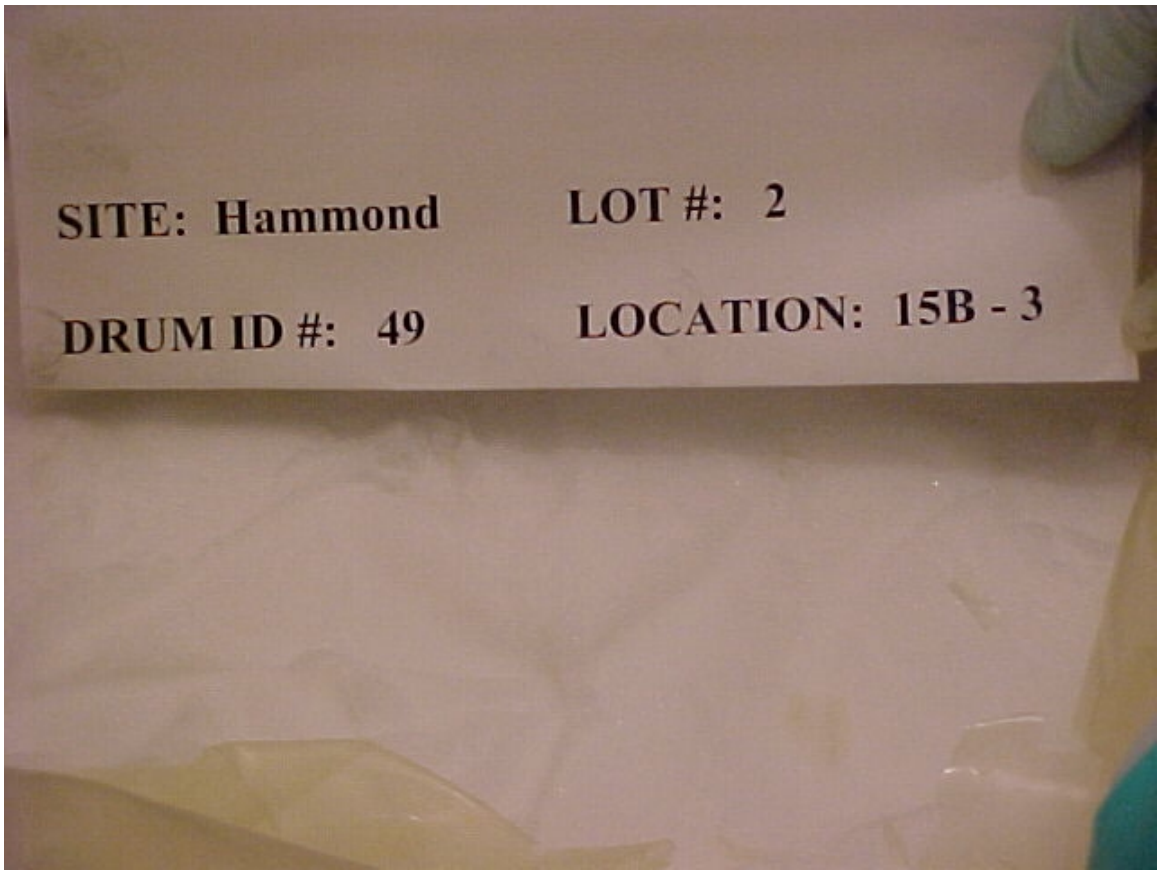
Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	6 of 8
Site	Hammond		

Another photo of the 2nd poly liner/bag
No holes or tears in liner/bag
No gasses present



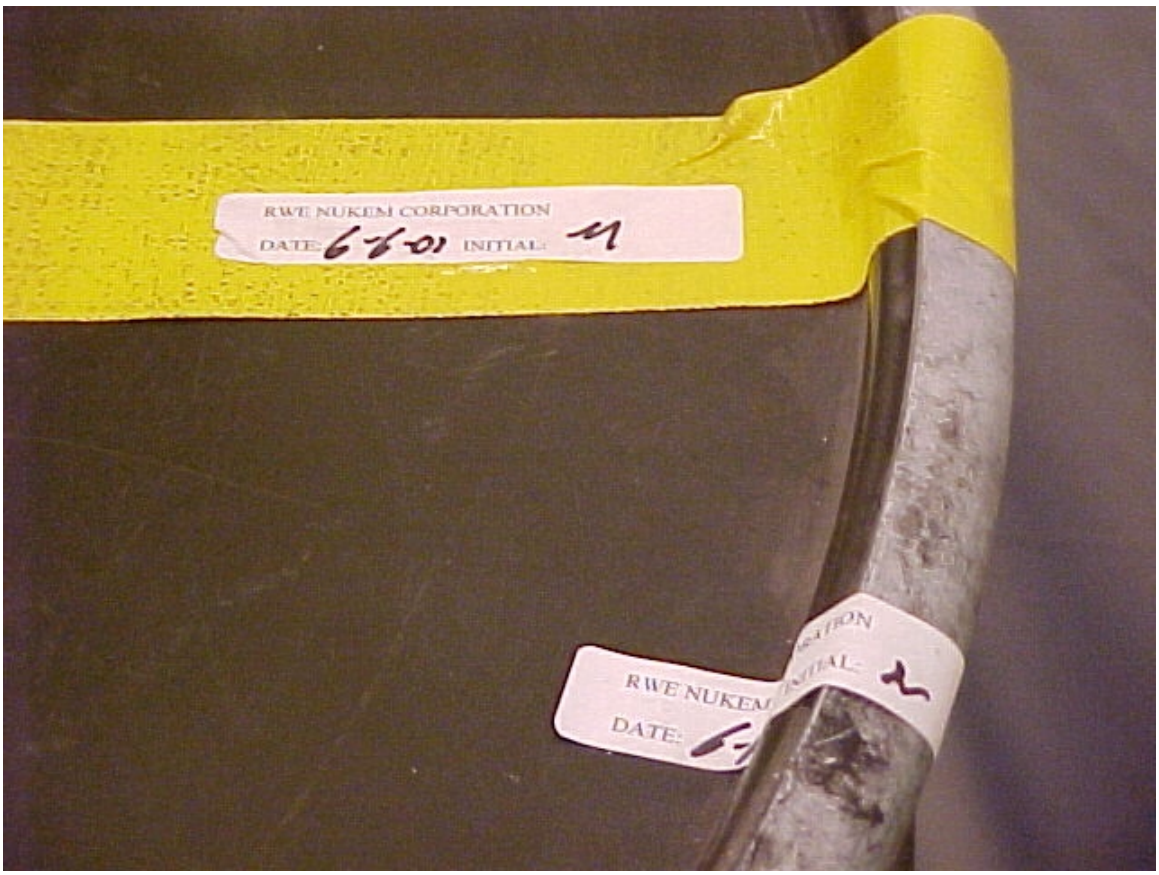
Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	7 of 8
Site	Hammond		

Monolith - White in color
Solid and very dry
No measurement of gasses present



Lot No.	2	Inspection/Sample	Visual Inspection
Drum ID No.	49	Date	6-6-2002
Location	15B-3	Photo No.	8 of 8
Site	Hammond		

85-gal container – Good Condition
Sealed/dated - Completed



Hammond Depot
Lot #20 - Drum #39
Visual Inspection

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 20 Drum ID #: 39 Location: Warehouse 100W - 9D – 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 3mR/hr dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag (a sample of the rust/powder particles on poly liner/bags were sampled for analysis and provided to UT Battelle personnel)
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container # 2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

CONTENTS INFORMATION

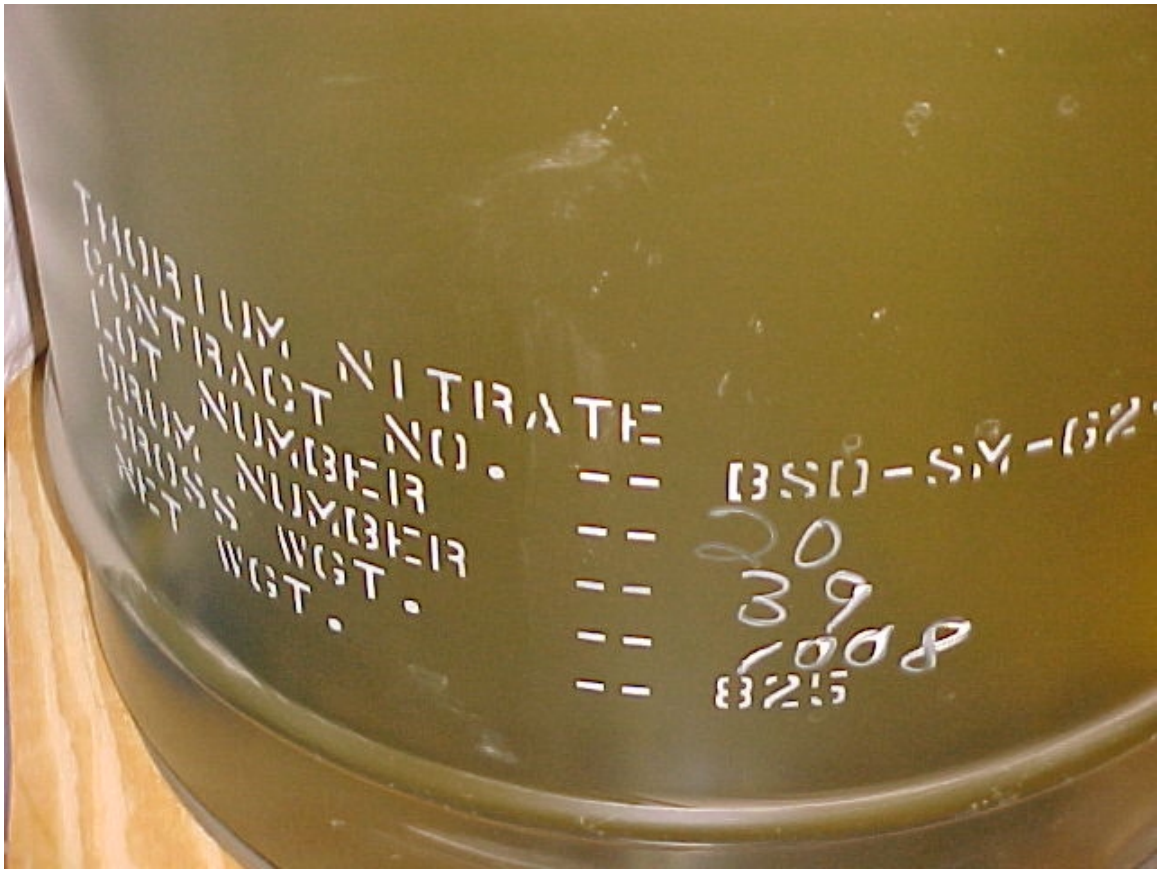
Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: small amount of moisture on inside 2nd poly liner/bag – pH sample was taken – Red/0 results

Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label seal with date & initials

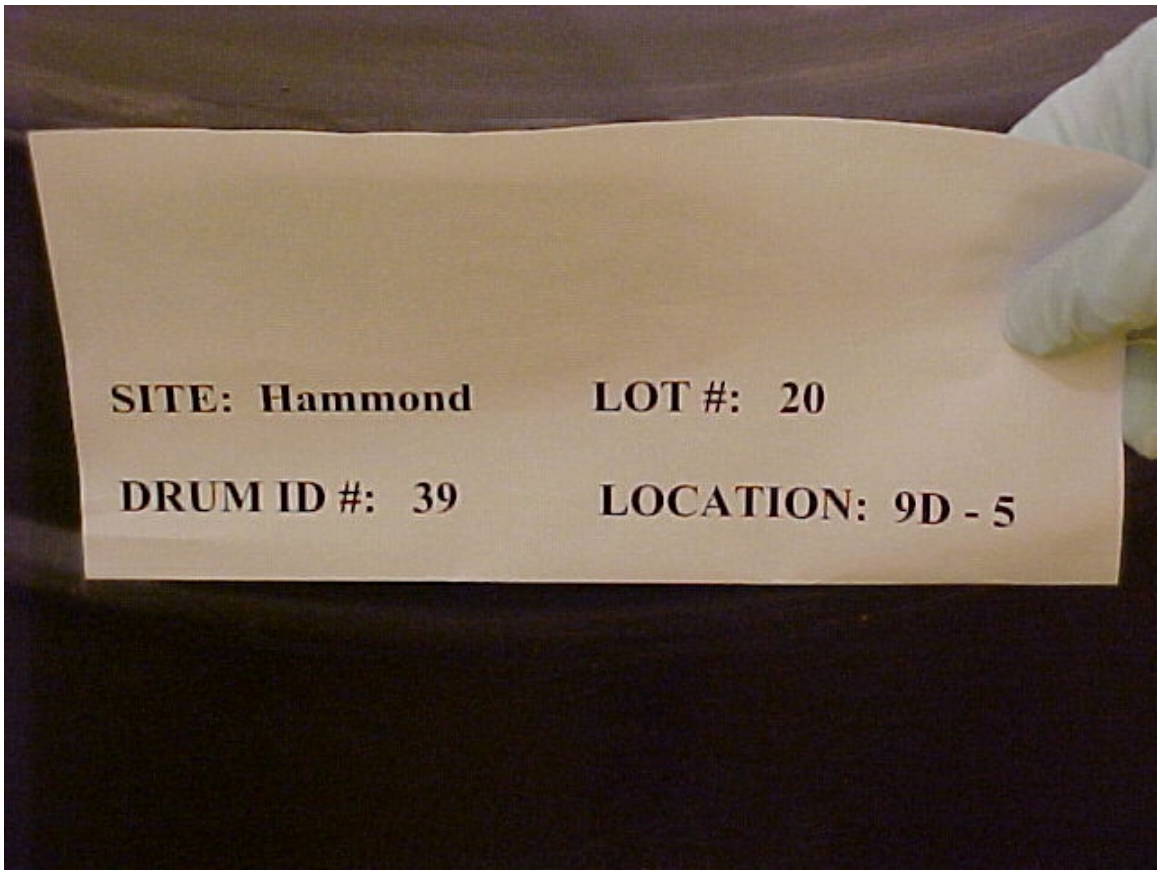
Checklist completed by: Tony Cunningham (signature on file) Date: 6-6-02

Lot No.	20	Inspection/Sample	Visual Inspection
Drum ID No.	39	Date	6-6-2002
Location	9D-5	Photo No.	1 of 7
Site	Hammond		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface 32 mR/hr		
	1 meter 3 mR/hr		



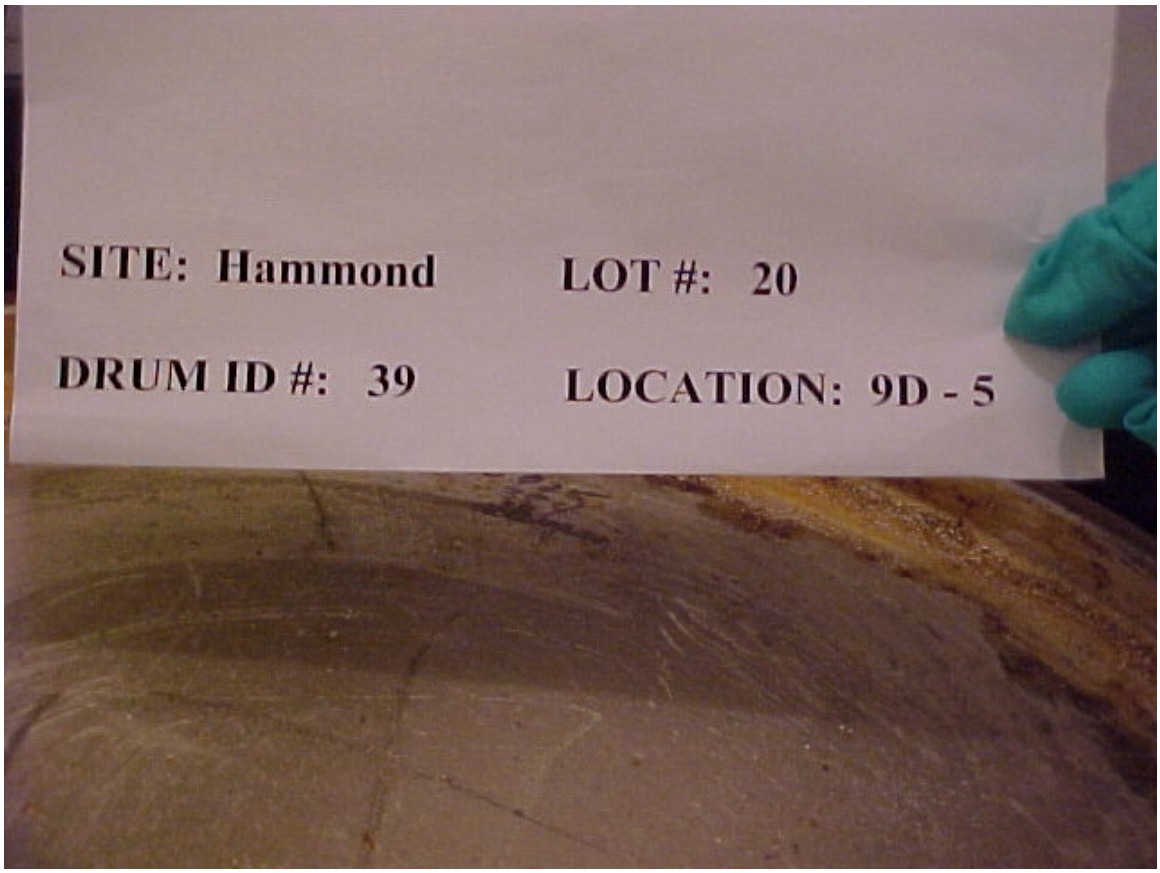
Lot No.	20	Inspection/Sample	Visual Inspection
Drum ID No.	39	Date	6-6-2002
Location	9D-5	Photo No.	2 of 7
Site	Hammond		

85 gal drum lid – Good Condition
Ring is also in good condition



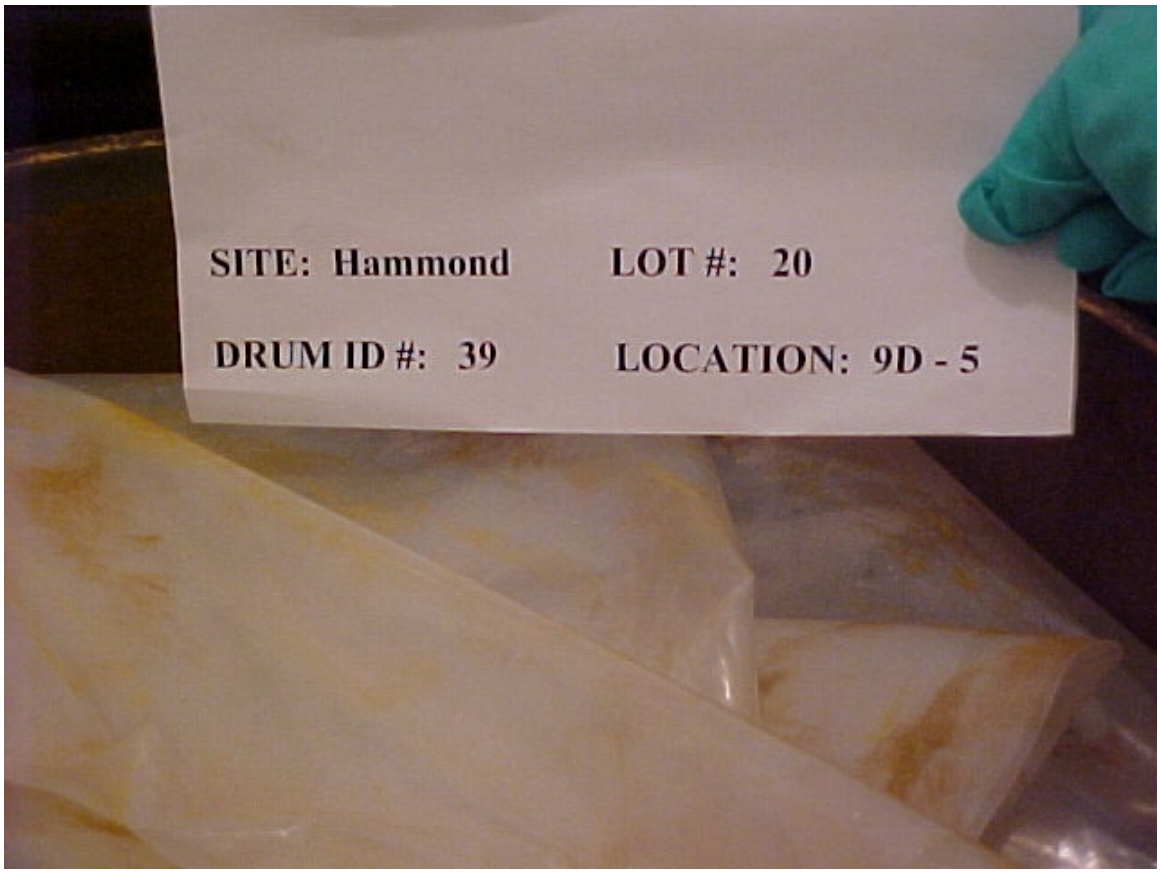
Lot No.	20	Inspection/Sample	Visual Inspection
Drum ID No.	39	Date	6-6-2002
Location	9D-5	Photo No.	3 of 7
Site	Hammond		

55 gal lid – Good Condition
Ring bolted by a 3/8 x 3 ½ bolt/nut
Observing the ring we noticed that the ring was extremely loose
55 gal drum is package in a 85 gal overpack with vermiculite
No measurement of gasses present



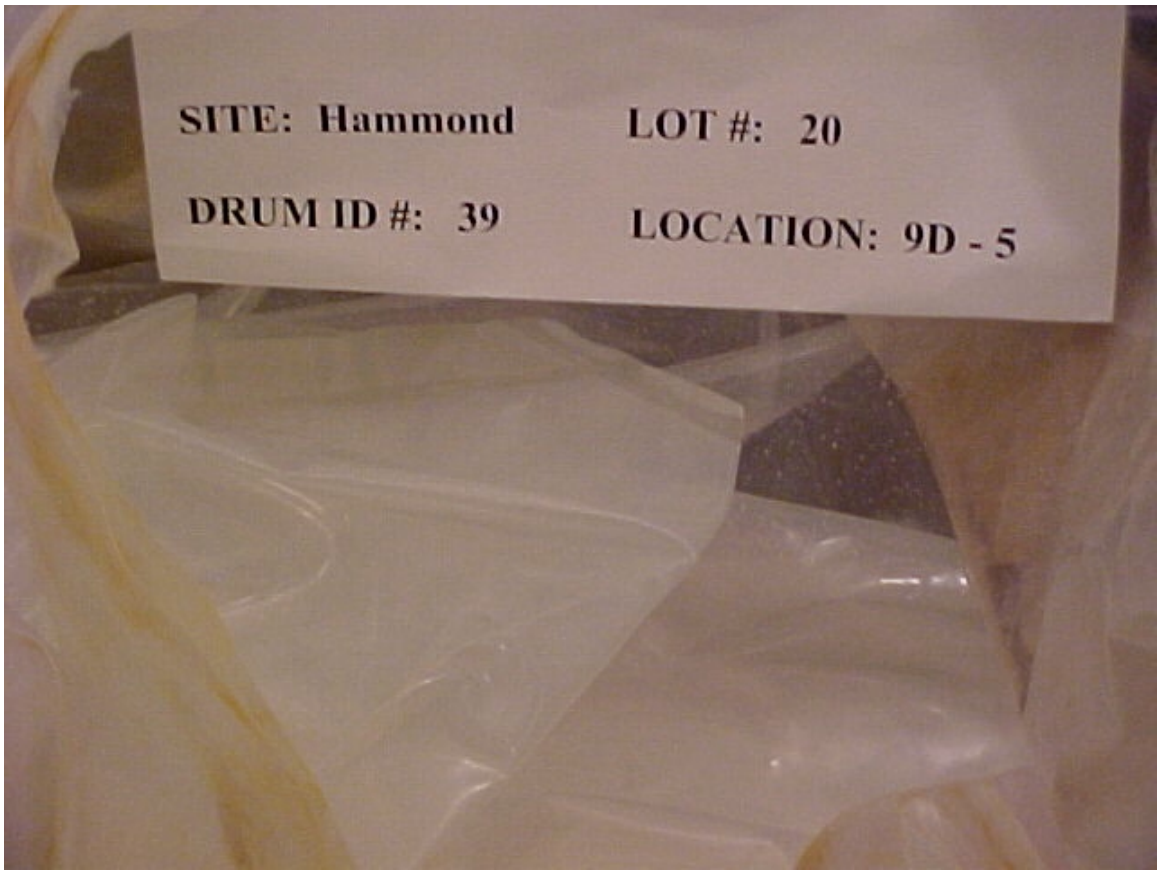
Lot No.	20	Inspection/Sample	Visual Inspection
Drum ID No.	39	Date	6-6-2002
Location	9D-5	Photo No.	4 of 7
Site	Hammond		

1st poly liner/bag – Good Condition
Liner is sealed and in good condition
No measurement of gasses present
Notice of rusty powder on top of liner
A sample was taken of the rusty powder for analysis



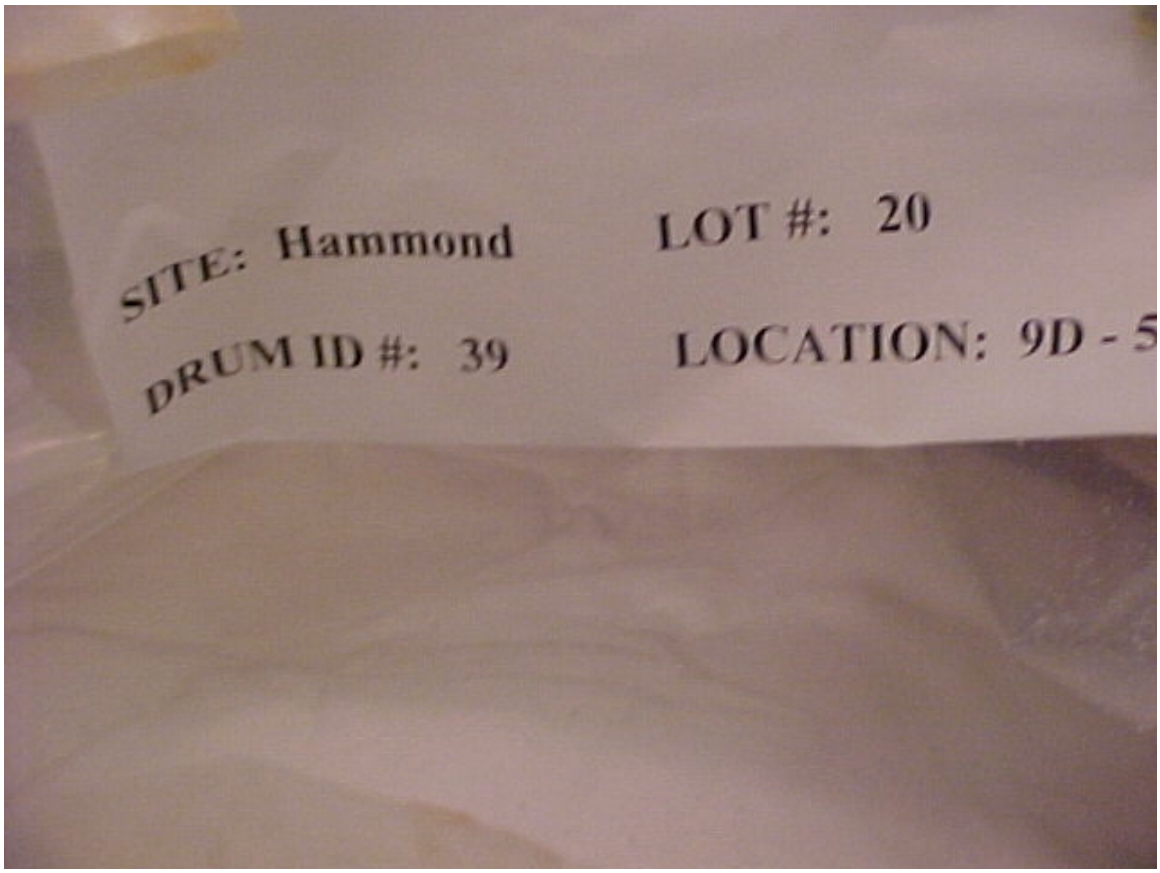
Lot No.	20	Inspection/Sample	Visual Inspection
Drum ID No.	39	Date	6-6-2002
Location	9D-5	Photo No.	5 of 7
Site	Hammond		

2nd poly liner/bag – good condition
Small amounts of crystal/moisture inside liner/bag
No gasses present



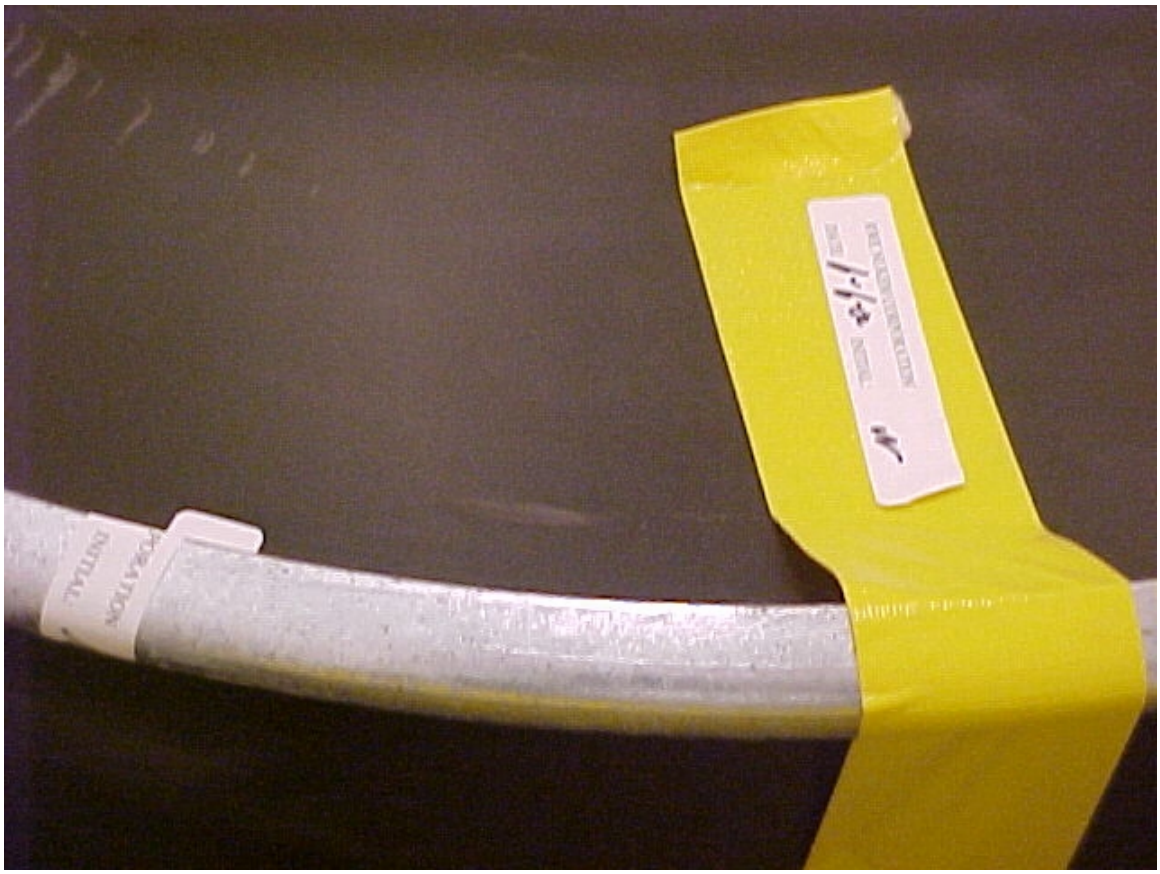
Lot No.	20	Inspection/Sample	Visual Inspection
Drum ID No.	39	Date	6-6-2002
Location	9D-5	Photo No.	6 of 7
Site	Hammond		

Monolith – white in color
Solid – dry
Moisture/crystal on inside of liner/bag
pH sample was taken – red/high – 0 results
No gasses present



Lot No.	20	Inspection/Sample	Visual Inspection
Drum ID No.	39	Date	6-6-2002
Location	9D-5	Photo No.	7 of 7
Site	Hammond		

85 gal drum – Good Condition
Sealed/dated - Completed



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Hammond Depot
Lot #28 - Drum #30
Visual Inspection

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 28 Drum ID #: 30 Location: Warehouse 100W - 9D – 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:

Rad Measurements at the time of opening: Dose Rate at Surface 32mR/hr Dose at 1 meter 3.6mR/hr Dpm/300cm^2 <20α & <200 βγ
Headspace Gas Measurements: Hydrocarbons 5.7% LEL NOx 7.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good rusty/powder on inside drum
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): seal was good - but there were several hole in bag
Photo Taken of Inner Container # 2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 4Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 5Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 6Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

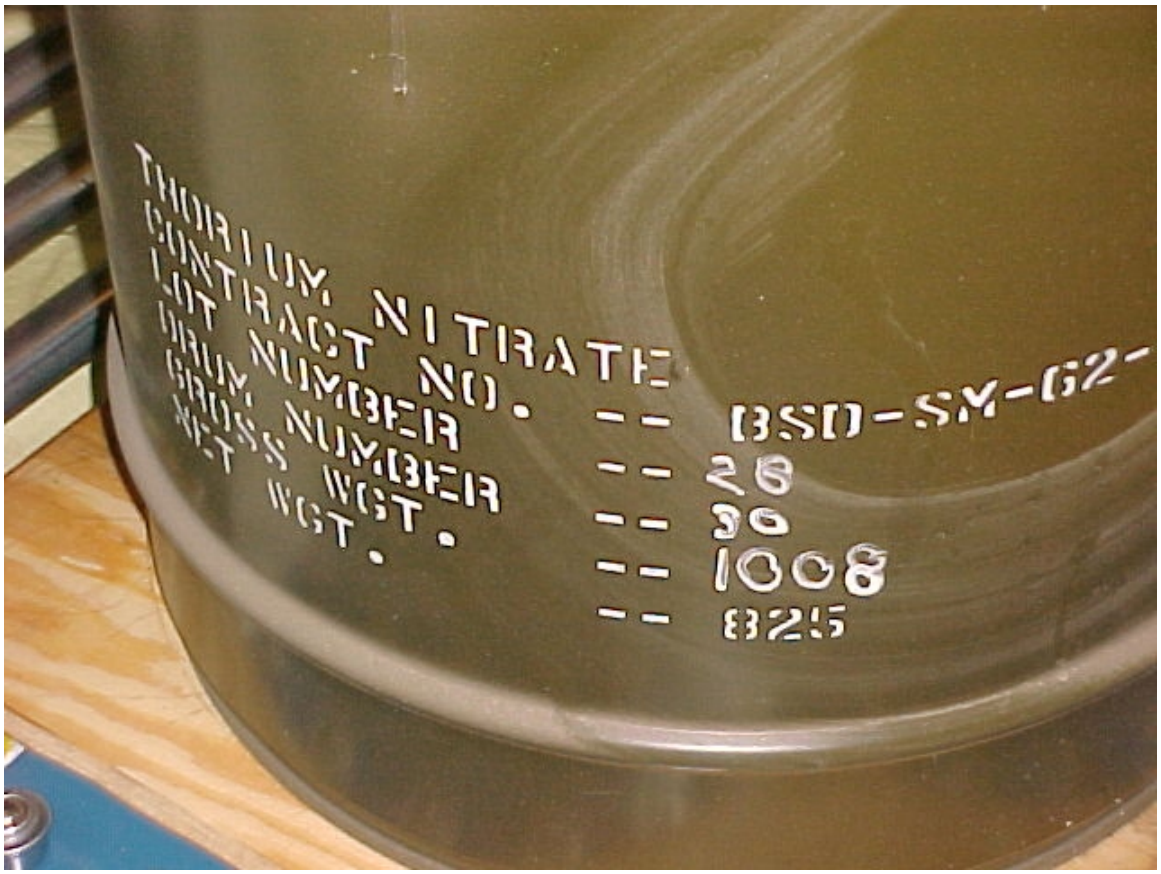
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: small amount of moisture inside 2nd poly liner/bag
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label seal with date & initials

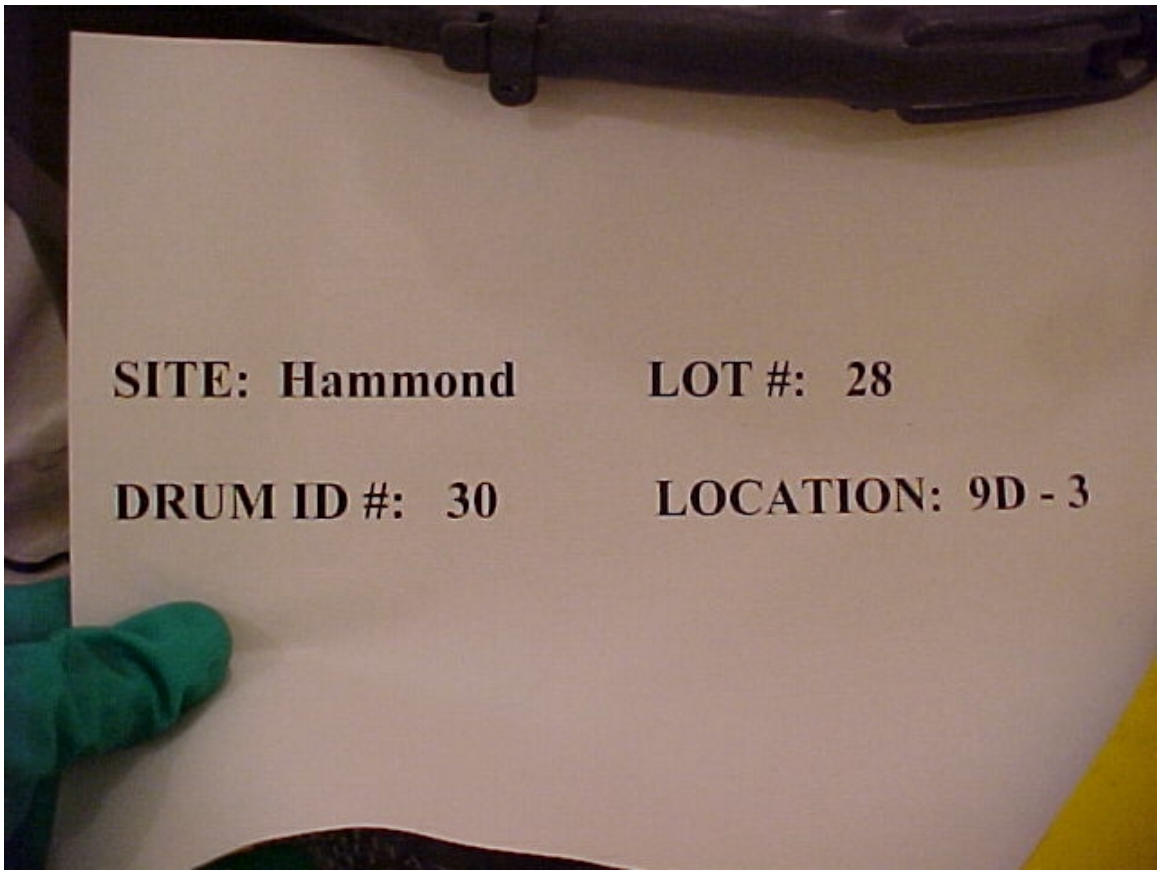
Checklist completed by: Tony Cunningham (signature on file) Date: 6-5-02

Lot No.	30		Inspection/Sample	Visual Inspection
Drum ID No.	28		Date	6-5-2002
Location	9D-3		Photo No.	1 of 7
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	32 mR/hr		
	1 meter	3.6 mR/hr		



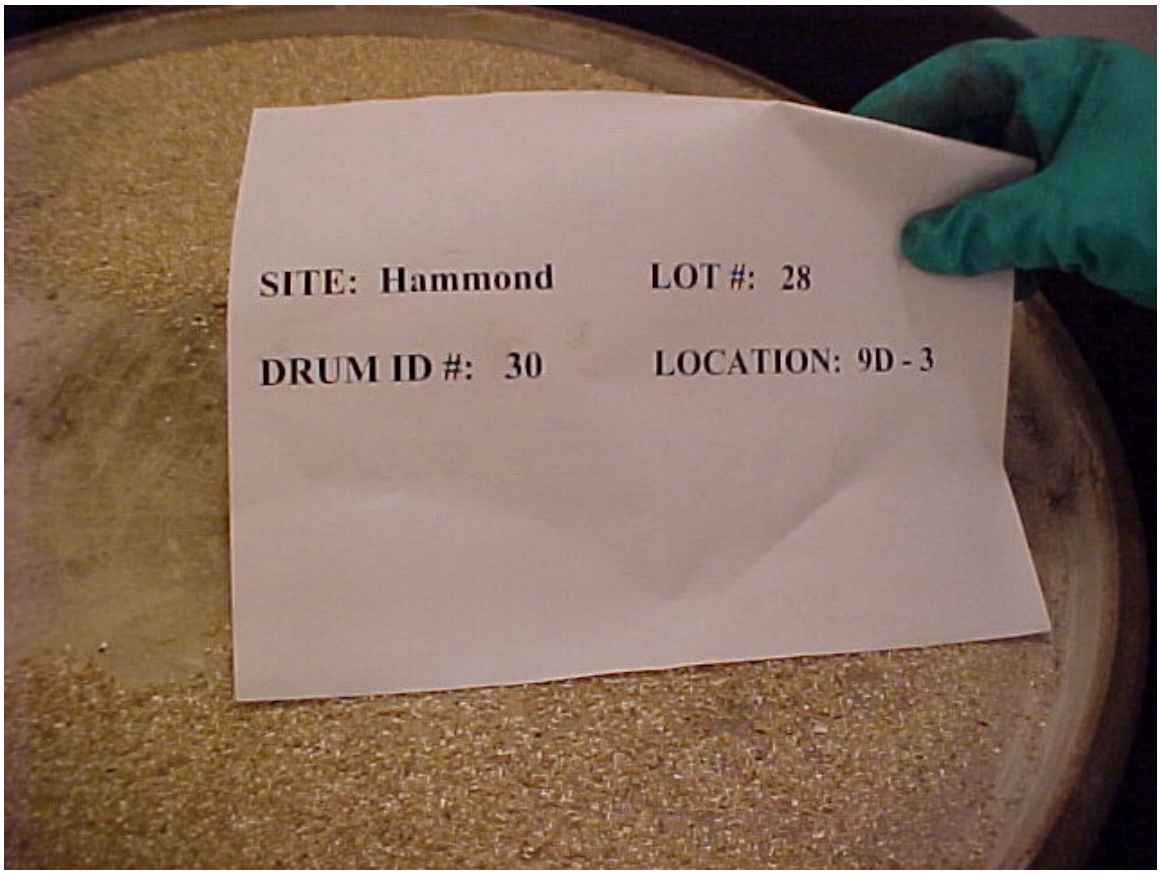
Lot No.	30	Inspection/Sample	Visual Inspection
Drum ID No.	28	Date	6-5-2002
Location	9D-3	Photo No.	2 of 7
Site	Hammond		

85-gal lid – Good Condition
Ring around lid is also in good condition



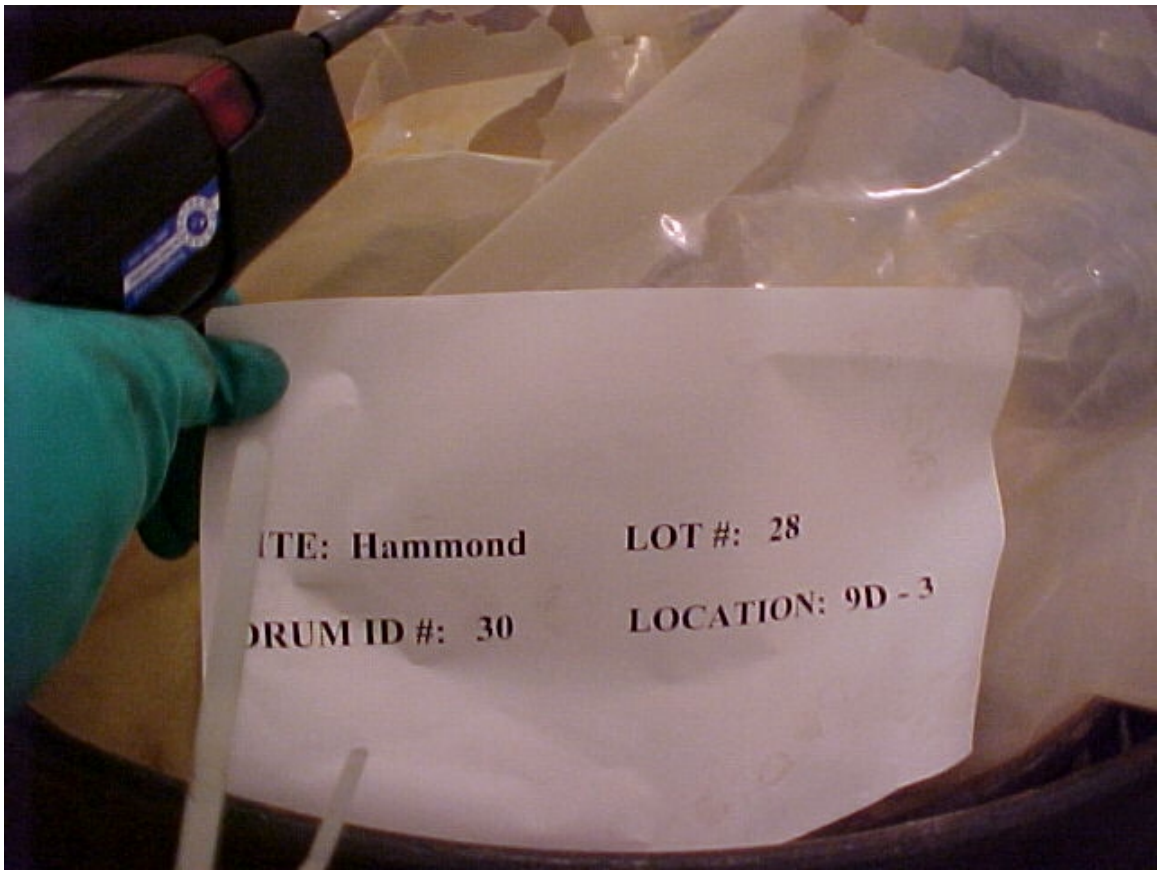
Lot No.	30	Inspection/Sample	Visual Inspection
Drum ID No.	28	Date	6-5-2002
Location	9D-3	Photo No.	3 of 7
Site	Hammond		

55-gal lid – Good Condition
Lid is covered with vermiculite
Ring on 55 gal lid is tight
55 gal is packaged in a 85 gal overpack drum with vermiculite
Lid was cleaned off with a vacuum
No measurement of gasses present



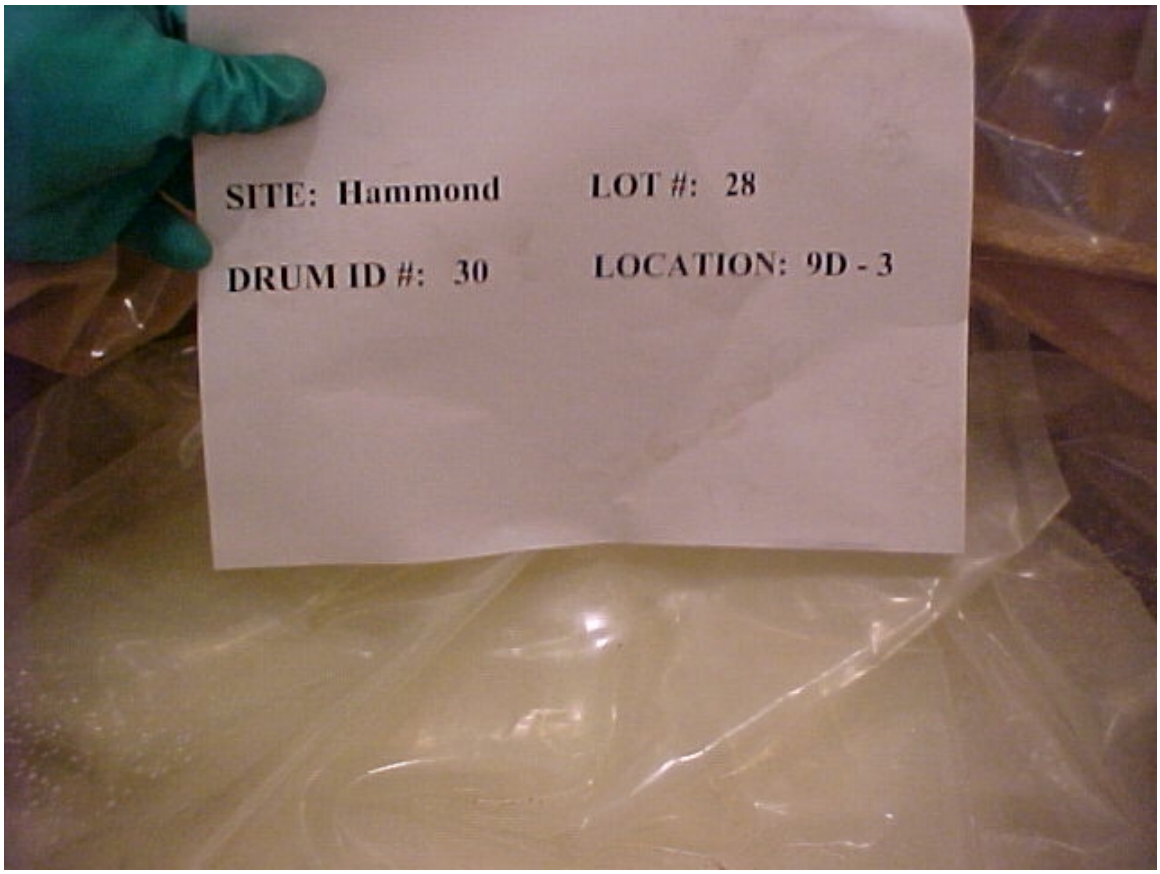
Lot No.	30	Inspection/Sample	Visual Inspection
Drum ID No.	28	Date	6-5-2002
Location	9D-3	Photo No.	4 of 7
Site	Hammond		

1st poly liner/bag - Bad Condition
There are holes all in the liner/bag
No gasses are present



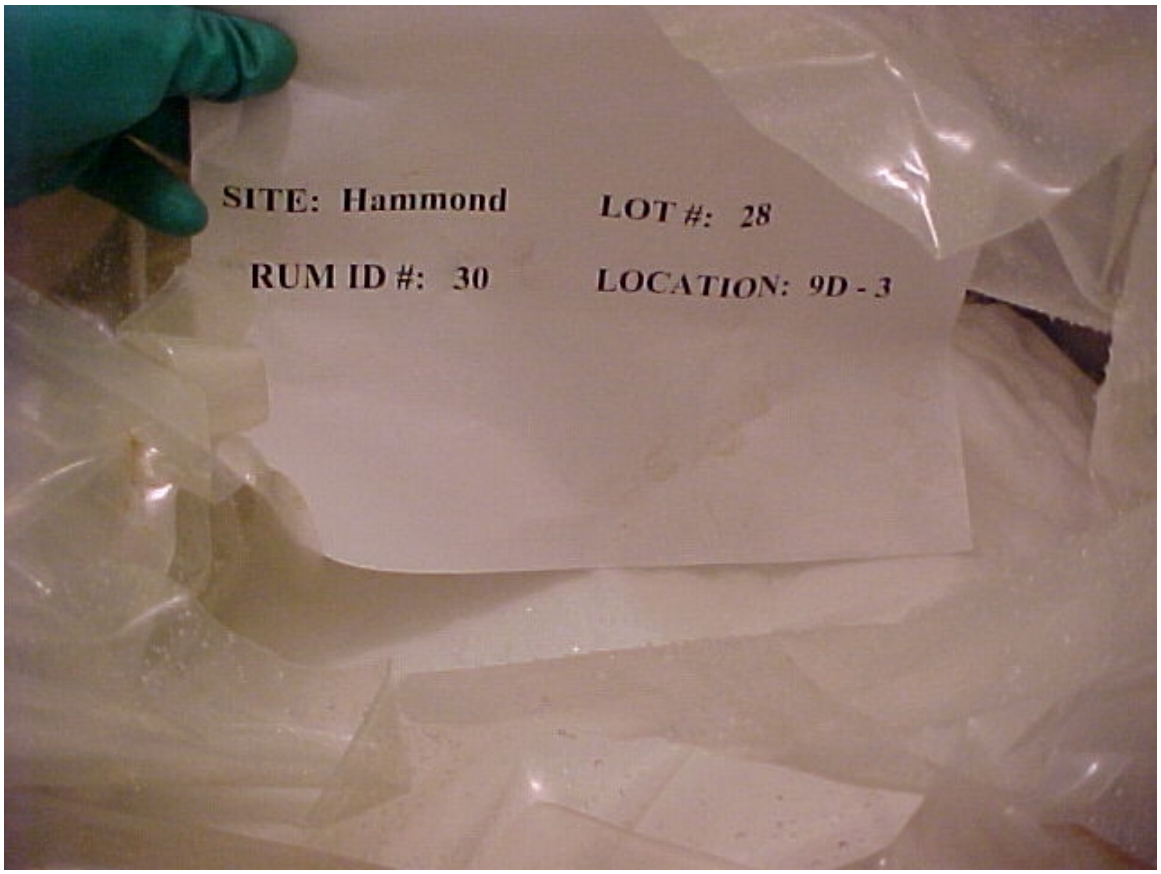
Lot No.	30	Inspection/Sample	Visual Inspection
Drum ID No.	28	Date	6-5-2002
Location	9D-3	Photo No.	5 of 7
Site	Hammond		

2nd poly liner/bag – Good Condition
Moisture is present
No measurement of gasses found



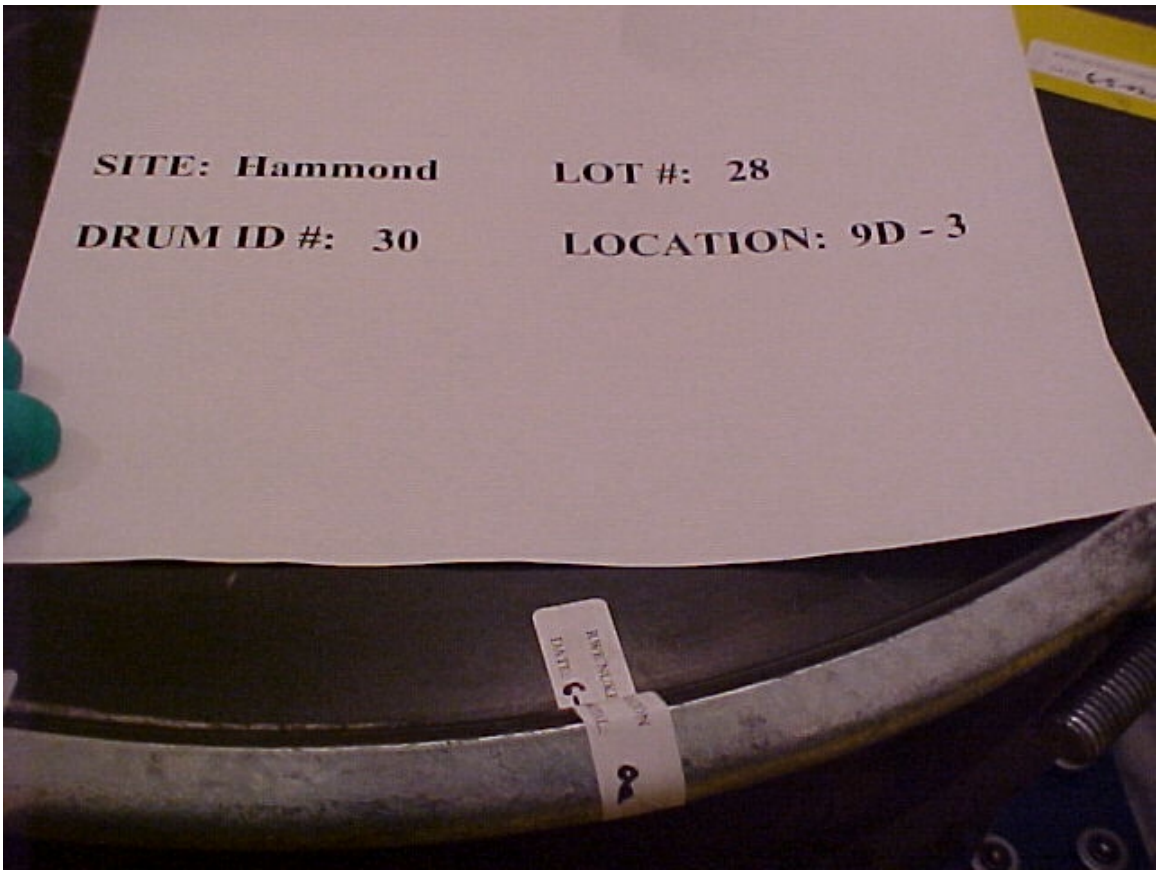
Lot No.	30	Inspection/Sample	Visual Inspection
Drum ID No.	28	Date	6-5-2002
Location	9D-3	Photo No.	6 of 7
Site	Hammond		

Monolith – white in color
Very dry
Gasses were present while monitoring
Hydrocarbons – 5.7% LEL
NOx – 7.0ppm
Continuous monitoring for gasses until gasses dissipated to 0.0ppm



Lot No.	30	Inspection/Sample	Visual Inspection
Drum ID No.	28	Date	6-5-2002
Location	9D-3	Photo No.	6 of 7
Site	Hammond		

85-gal container – Good Condition
Sealed/dated – Completed



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Hammond Depot
Lot #32 - Drum #45
Visual Inspection

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 32 Drum ID #: 45 Location: Warehouse 100W - 9B – 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:

Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 3.2mR/hr dpm/300cm^2 <20α & <200 βγ
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container # 2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 4Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 5Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 6Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

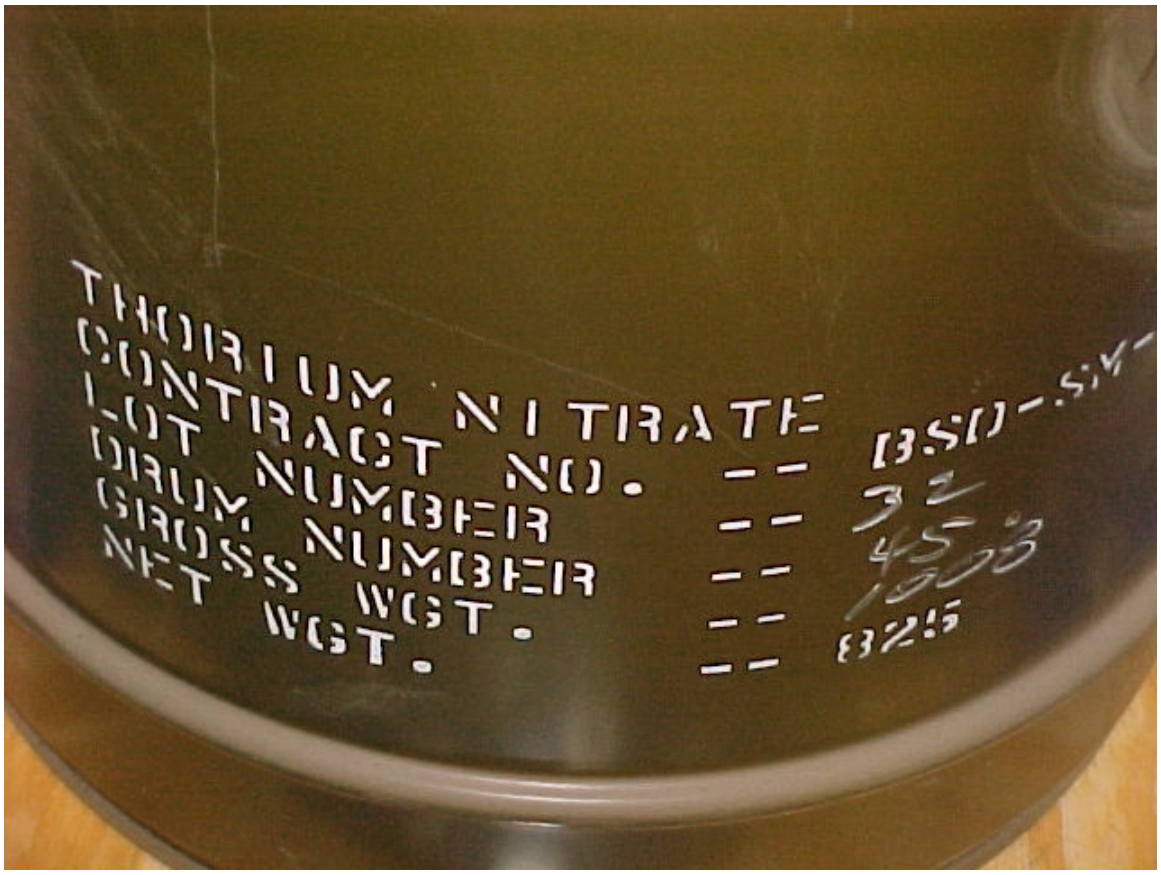
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label seal with date & initials

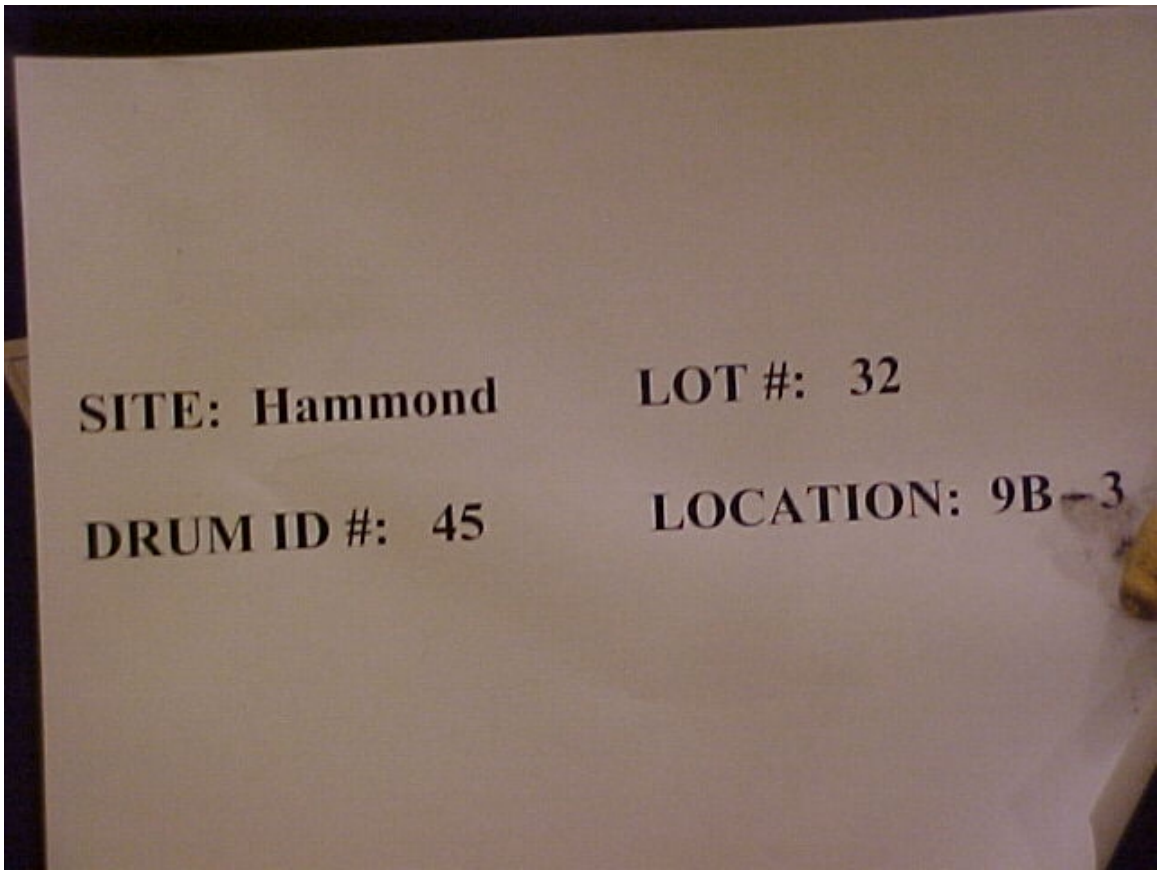
Checklist completed by: Tony Cunningham (signature on file) Date: 6-5-02

Lot No.	45		Inspection/Sample	Visual Inspection
Drum ID No.	32		Date	6-5-2002
Location	9B-3		Photo No.	1 of 7
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	30 mR/hr		
	1 meter	3.2 mR/hr		



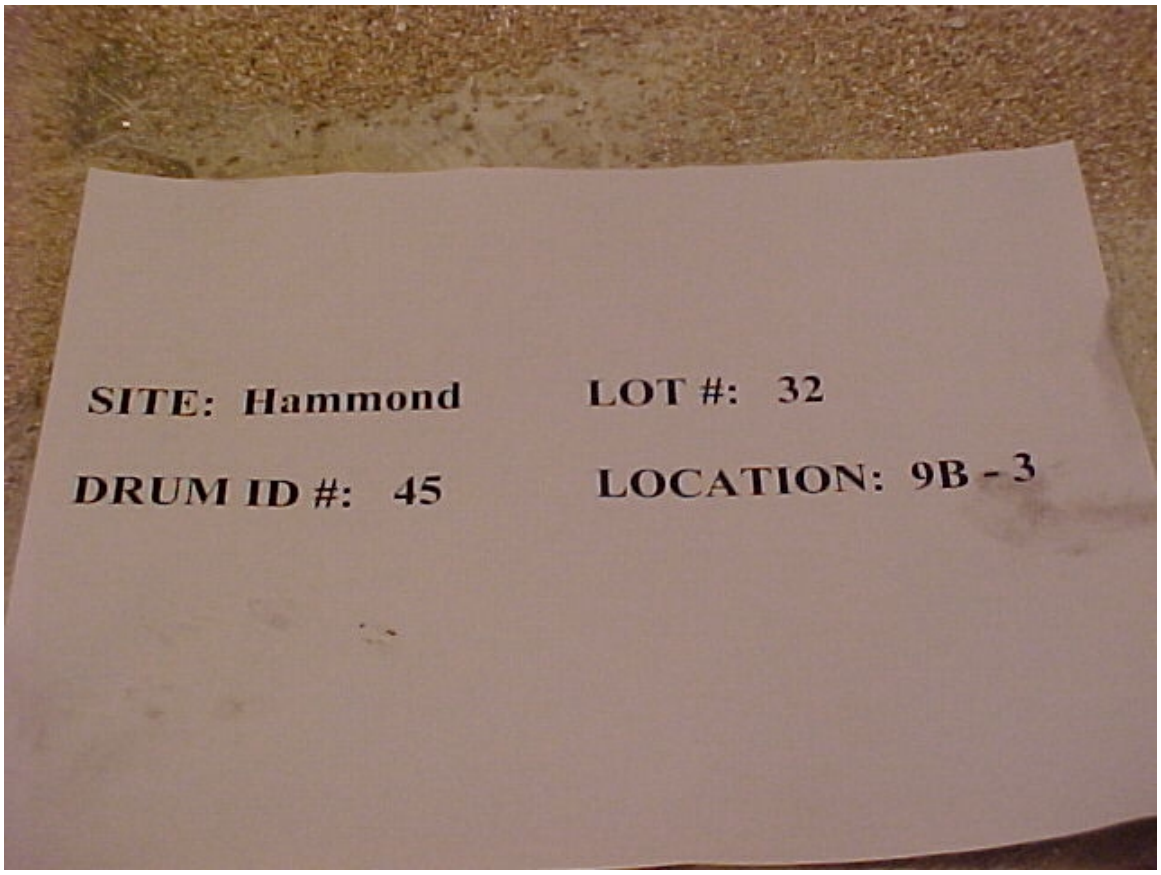
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	32	Date	6-5-2002
Location	9B-3	Photo No.	2 of 7
Site	Hammond		

85 gal lid – Good Condition
Ring is tight and in good condition



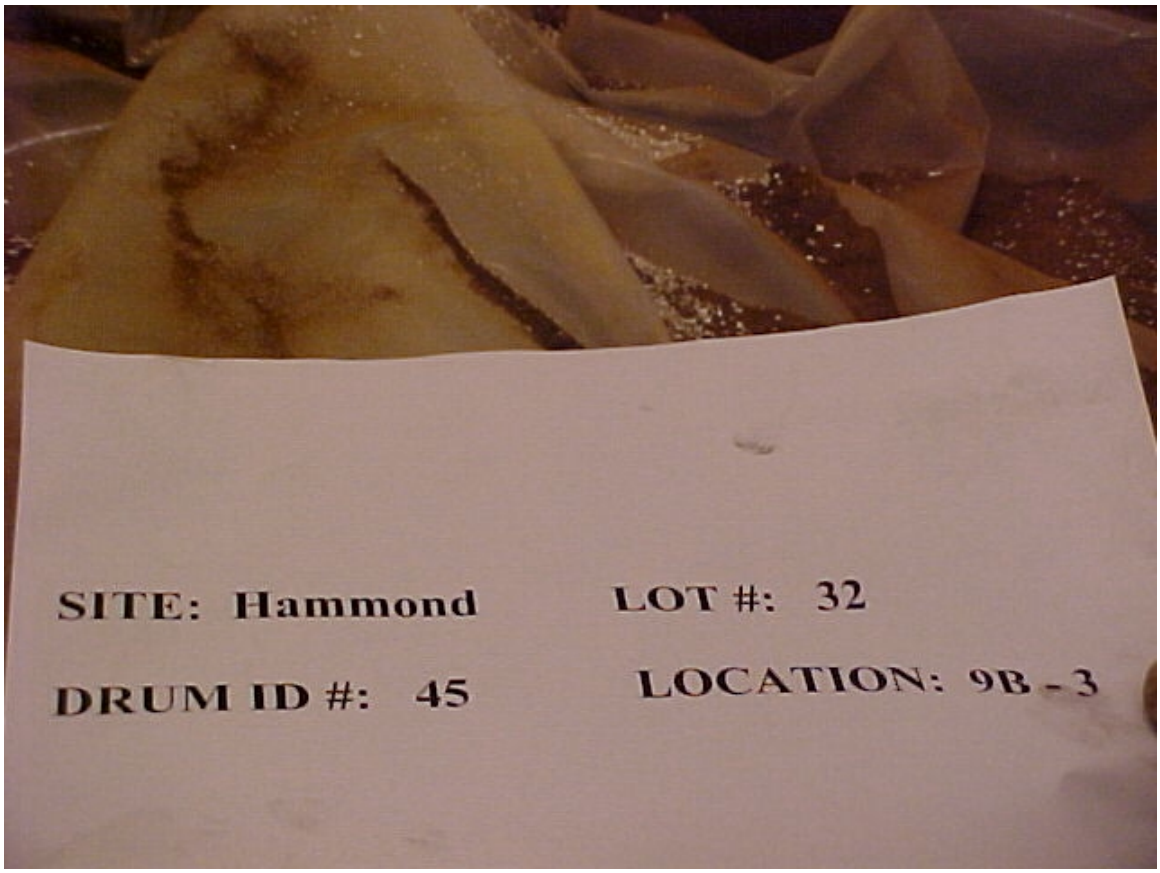
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	32	Date	6-5-2002
Location	9B-3	Photo No.	3 of 7
Site	Hammond		

55 gal lid – Good Condition
Lid is cover with vermiculite
Lid was vacuum and cleaned
Ring has a 3/8 x 3 ½ bolt/nut
Ring is tightly on the drum
55 gal drum is pack inside a 85 gal overpack
No gasses present



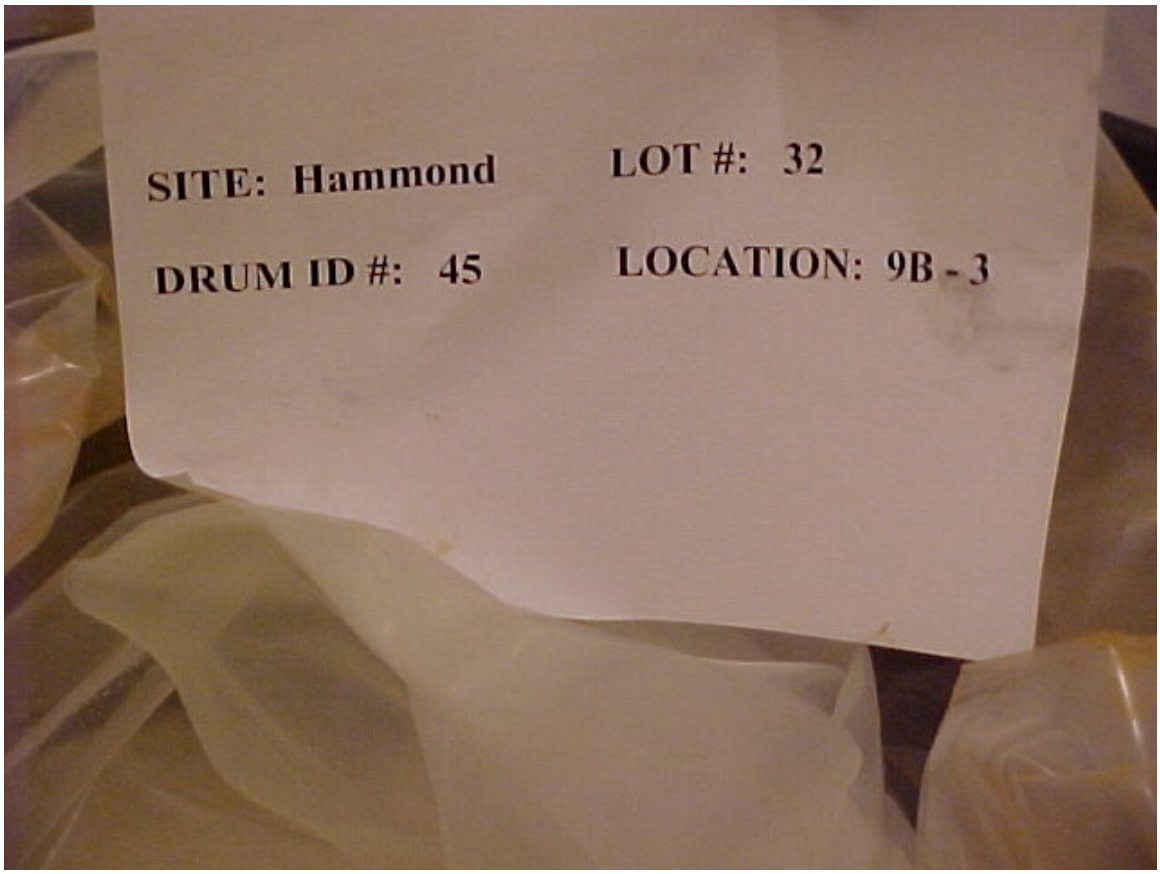
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	32	Date	6-5-2002
Location	9B-3	Photo No.	4 of 7
Site	Hammond		

1st poly liner/bag – Good Condition
Poly liner/bag was sealed and in gook condition
Vermiculite and rusty/power covered liner/bag
The debris was vacuumed from the liner/bag
No gasses were present



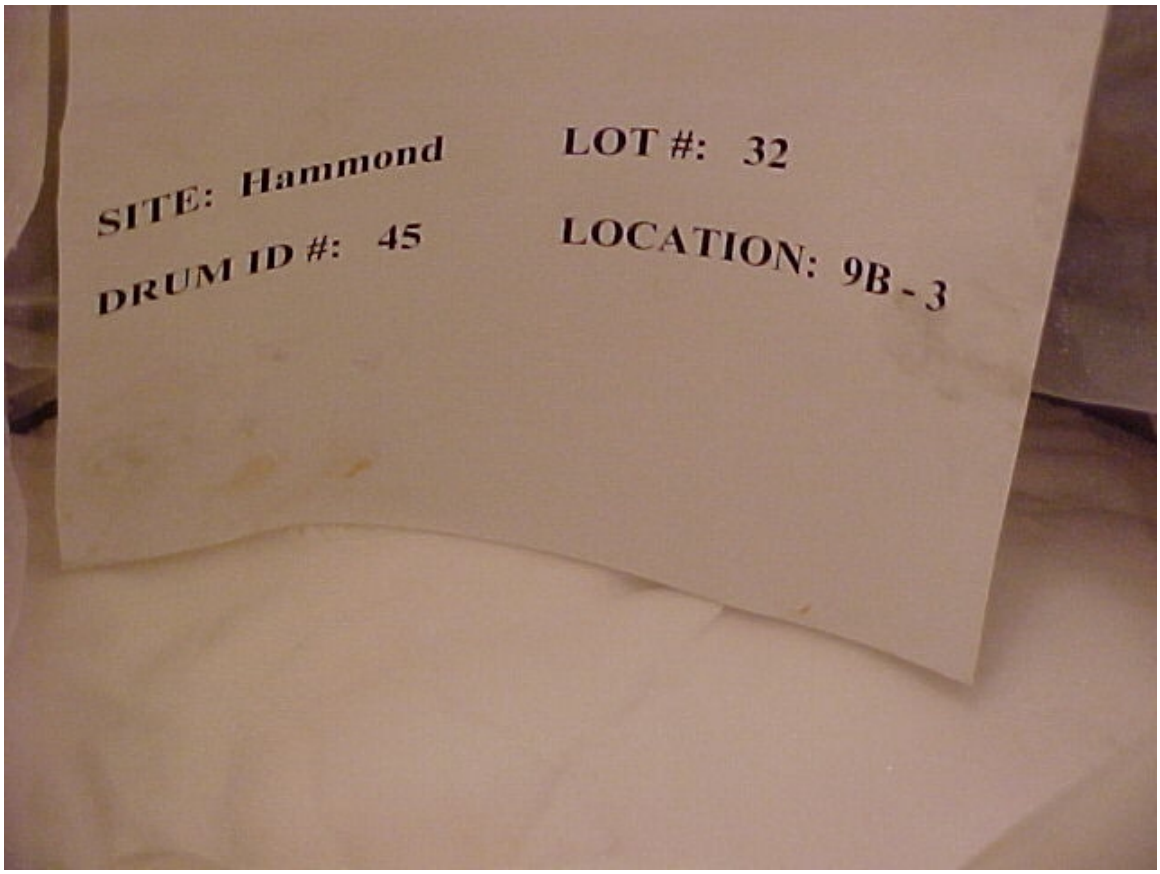
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	32	Date	6-5-2002
Location	9B-3	Photo No.	5 of 7
Site	Hammond		

2nd poly liner/bag – Good Condition
No moisture present
No measurements of gasses present



Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	32	Date	6-5-2002
Location	9B-3	Photo No.	6 of 7
Site	Hammond		

Monolith – white in color
Solid - Very dry
No moisture present
No measurement of gasses present



Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	32	Date	6-5-2002
Location	9B-3	Photo No.	7 of 7
Site	Hammond		

85-gal container – Good Condition
Sealed/dated – Completed
Picture did not properly focus (somewhat blurry image)

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Hammond Depot
Lot #43 - Drum #44
Visual Inspection

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or Curtis Bay *(circle one)*

Lot #: 43 Drum ID #: 44 Location: Warehouse 100W - 15C – 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:

Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 3mR/hr dpm/300cm^2 <20α & <200 βγ
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 4Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 5Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 6Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: none
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label seal with date & initials

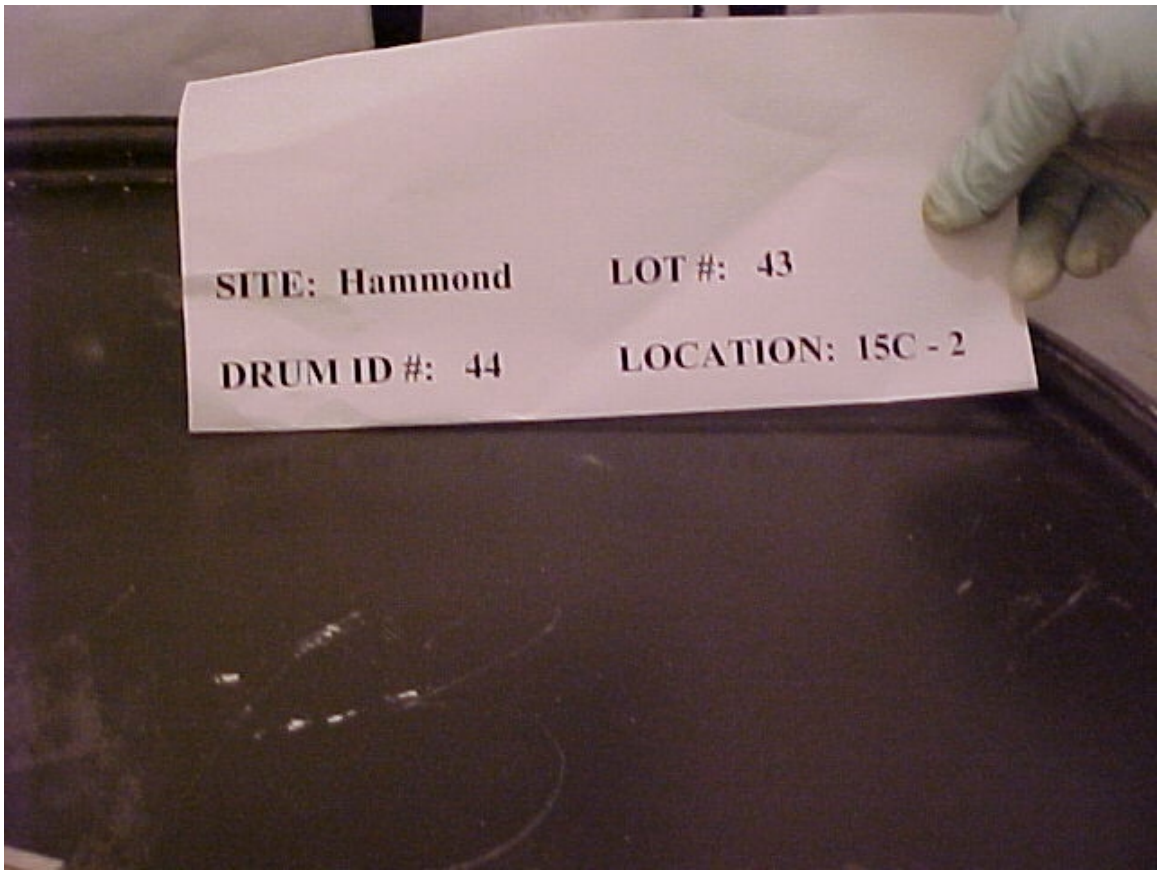
Checklist completed by: Tony Cunningham (signature on file) Date: 6-6-02

Lot No.	43	Inspection/Sample	Visual Inspection
Drum ID No.	44	Date	6-6-2002
Location	15C-2	Photo No.	1 of 7
Site	Hammond		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface 30 mR/hr		
	1 meter 3 mR/hr		

Picture did not properly develop – apparently flash did not function while taking picture

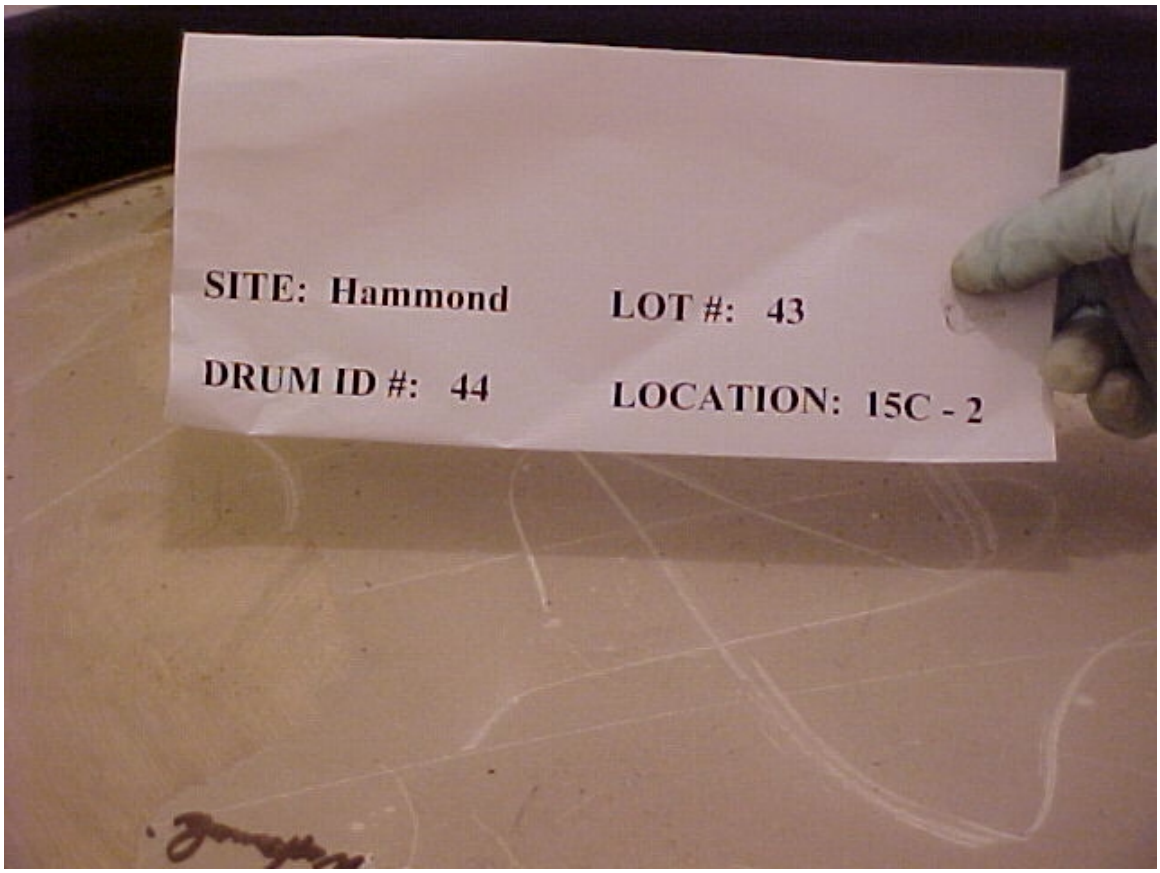
Lot No.	43	Inspection/Sample	Visual Inspection
Drum ID No.	44	Date	6-6-2002
Location	15C-2	Photo No.	2 of 7
Site	Hammond		

55 gal drum lid – Good Condition
Ring is also in good condition
No measurement of gasses present



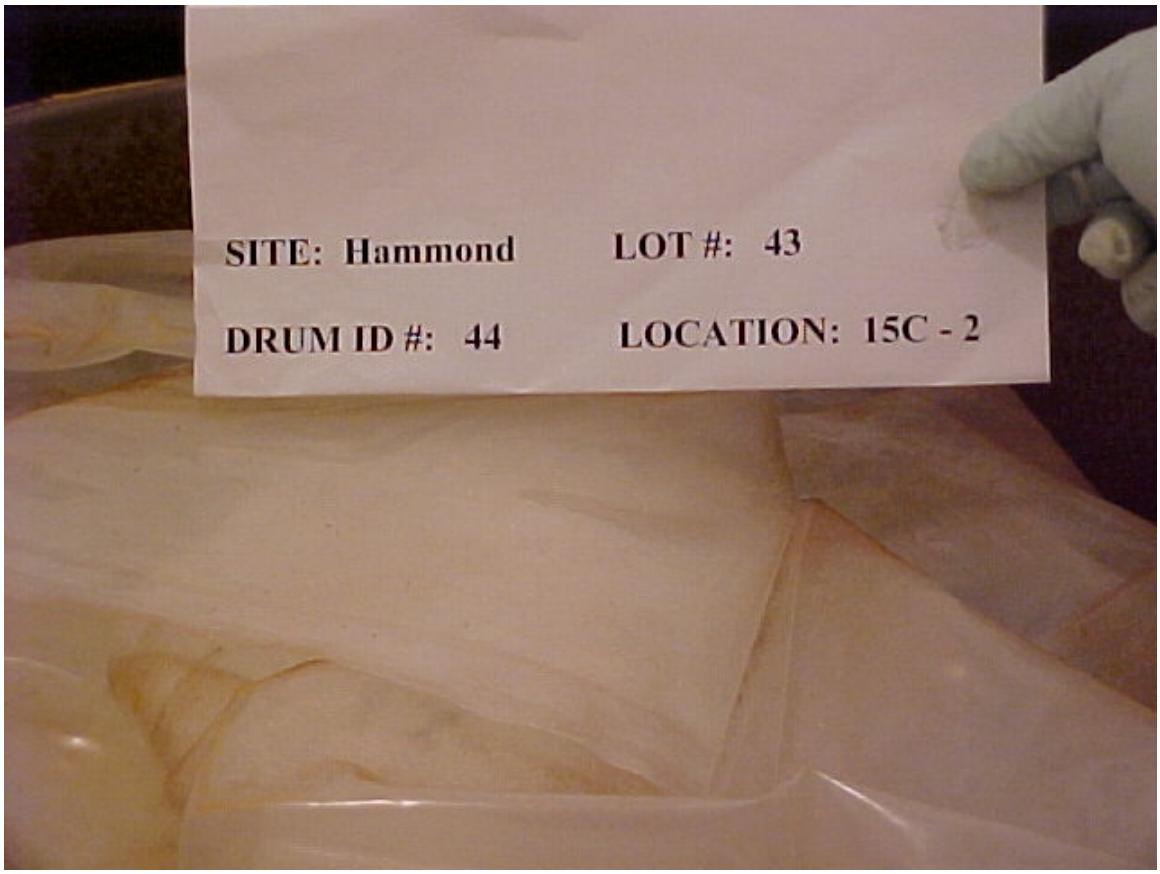
Lot No.	43	Inspection/Sample	Visual Inspection
Drum ID No.	44	Date	6-6-2002
Location	15C-2	Photo No.	3 of 7
Site	Hammond		

55 gal inter lid – Good Condition
Ring has a 3/8 x 3 ½ bolt/nut holding it on
Ring and lid are on tight
55-gal drum is packaged with vermiculite about 2/3 of 55-gal height
No gasses present



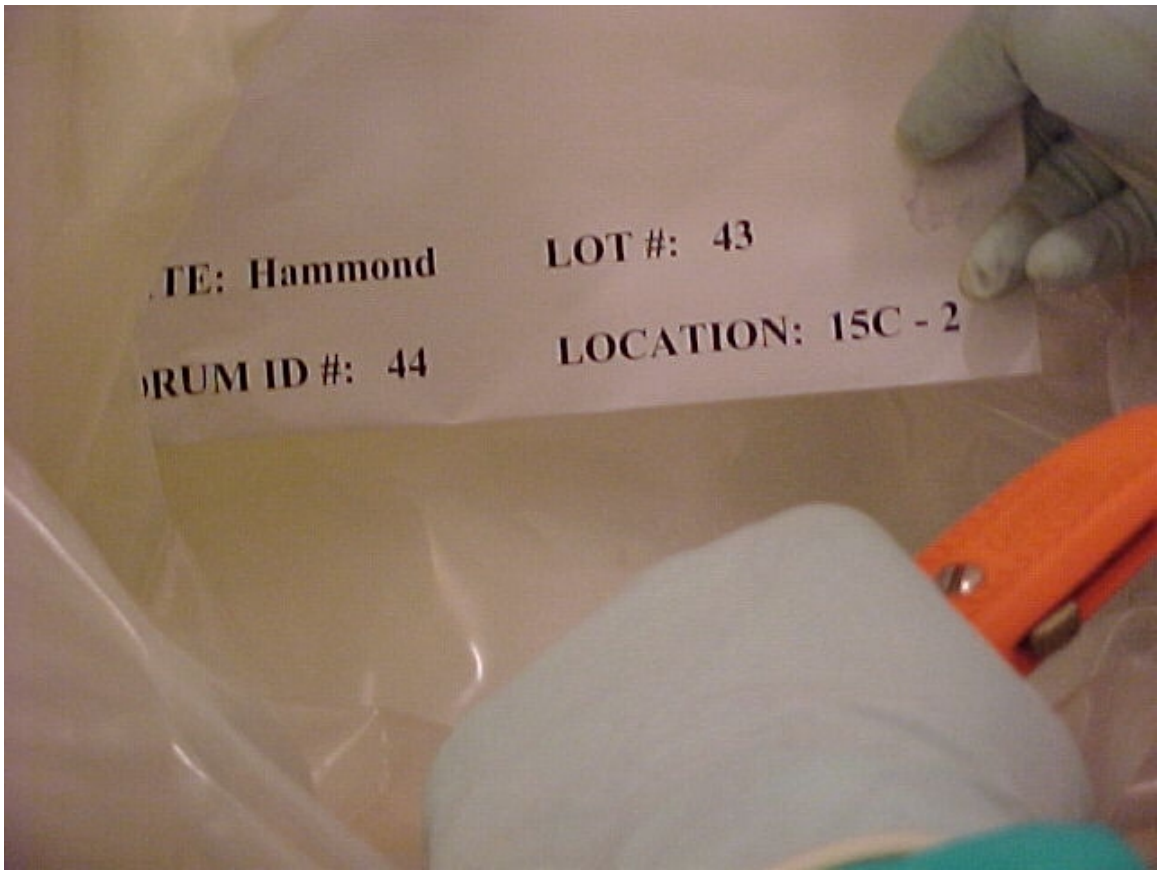
Lot No.	43	Inspection/Sample	Visual Inspection
Drum ID No.	44	Date	6-6-2002
Location	15C-2	Photo No.	4 of 7
Site	Hammond		

1st poly liner/bag - Fair Condition
No gas measurements present



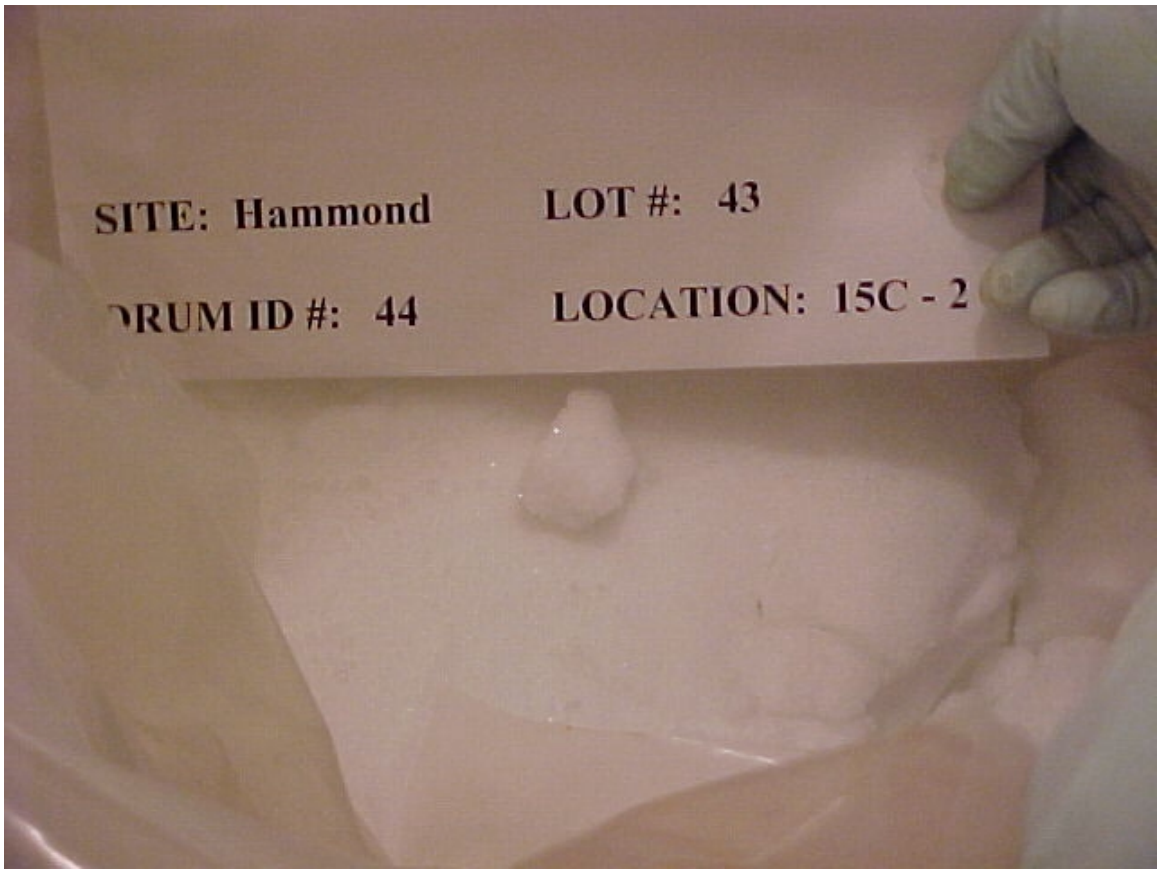
Lot No.	43	Inspection/Sample	Visual Inspection
Drum ID No.	44	Date	6-6-2002
Location	15C-2	Photo No.	5 of 7
Site	Hammond		

2nd poly liner/bag - Good Condition
No moisture present
No gasses present



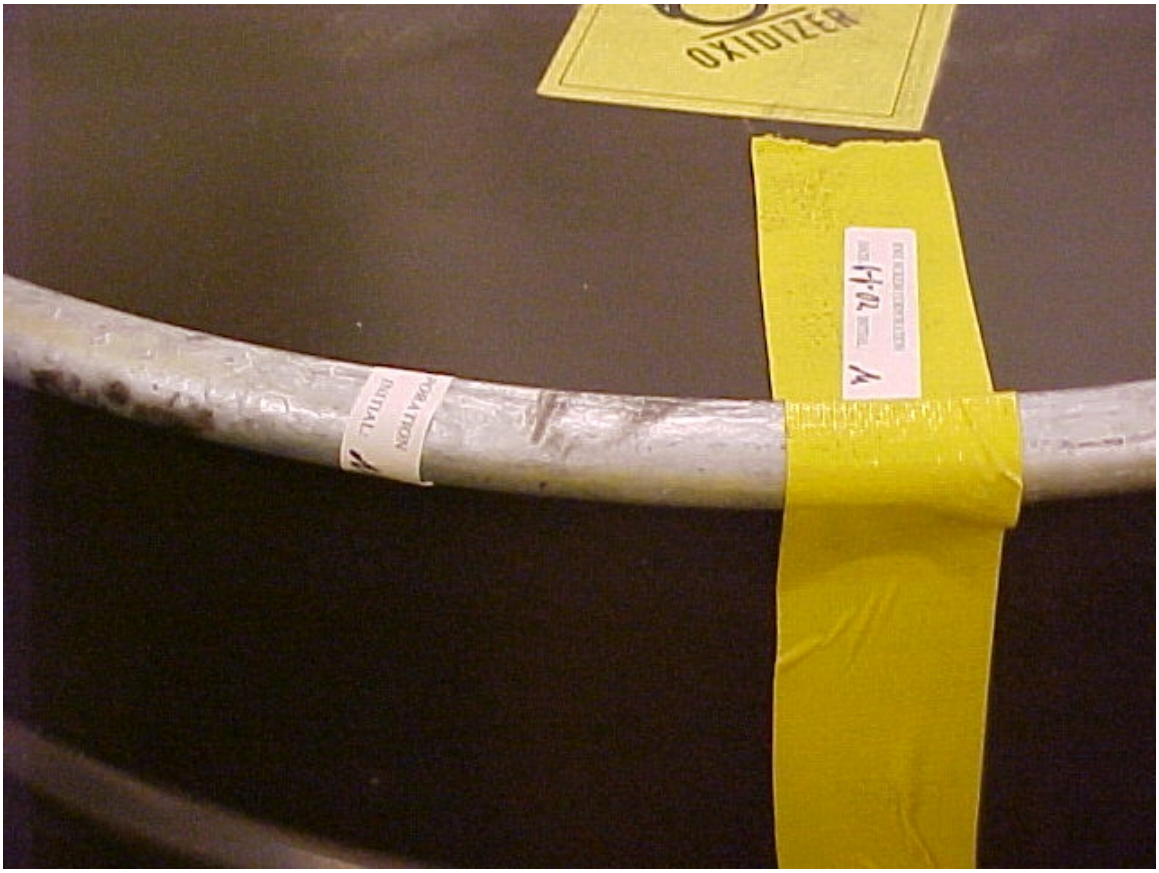
Lot No.	43	Inspection/Sample	Visual Inspection
Drum ID No.	44	Date	6-6-2002
Location	15C-2	Photo No.	6 of 7
Site	Hammond		

Monolith – white in color
Broken/cracked in several places
Very dry
No moisture present
No gasses present



Lot No.	43	Inspection/Sample	Visual Inspection
Drum ID No.	44	Date	6-6-2002
Location	15C-2	Photo No.	7 of 7
Site	Hammond		

85-gal container – Good Condition
Sealed/dated - Completed



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Hammond Depot
Lot #45 - Drum #22
Visual Inspection

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 45 Drum ID #: 22 Location: Warehouse 100W - 15D – 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 3mR/hr dpm/300cm^2 <20α & <200 βγ
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good rusty/powder on inside lid
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

CONTENTS INFORMATION

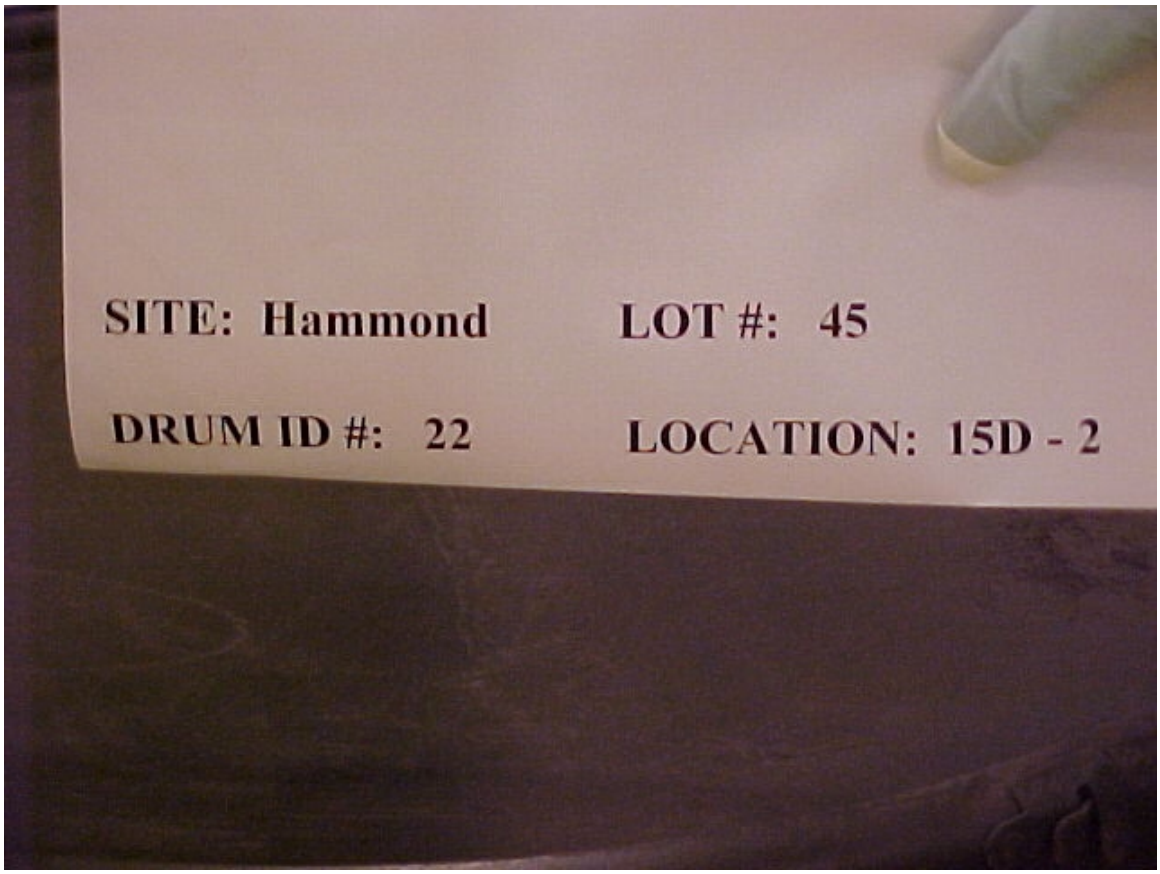
Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: moisture inside poly liner/bag -- pH take - red/0 - results
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label seal with date & initials

Checklist completed by: Tony Cunningham (signature on file) Date: 6-6-02

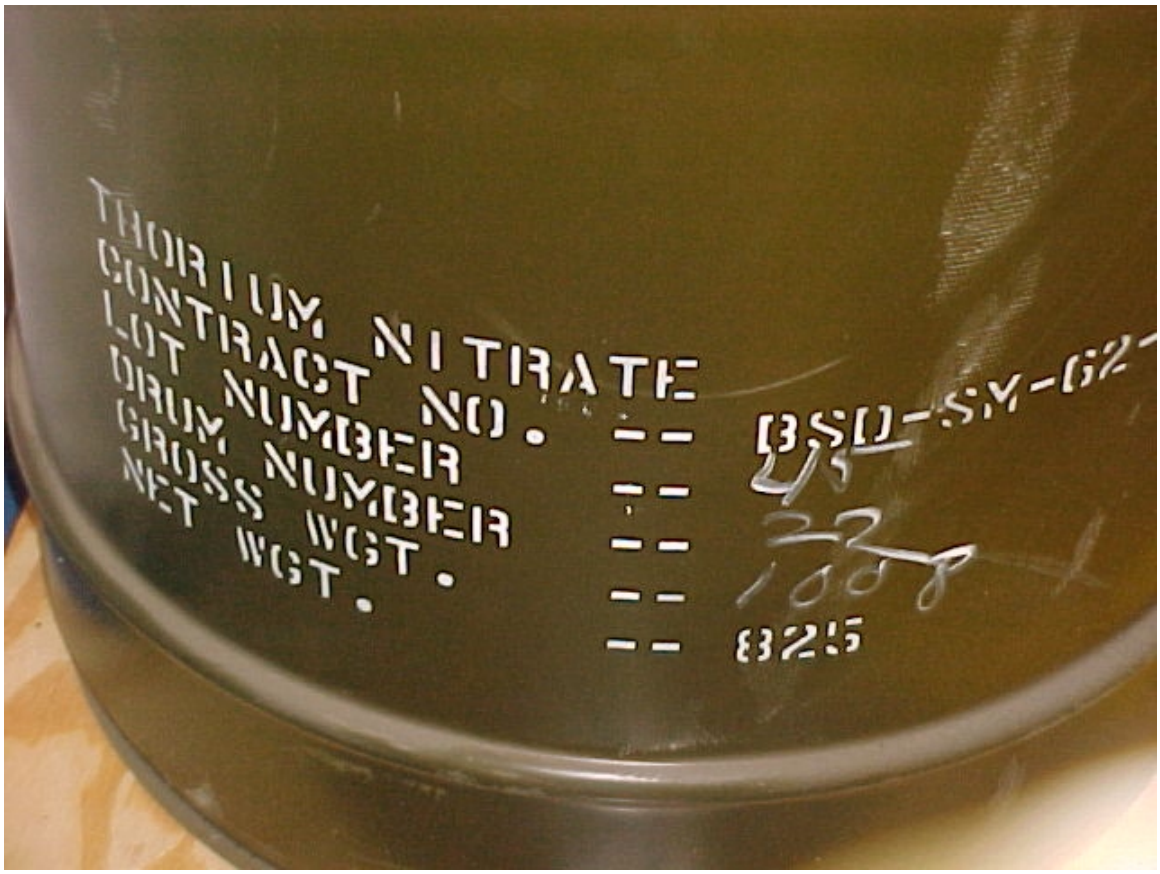
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	22	Date	6-6-2002
Location	15D-2	Photo No.	1 of 8
Site	Hammond		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface 30 mR/hr		
	1 meter 3 mR/hr		

Ring in good condition



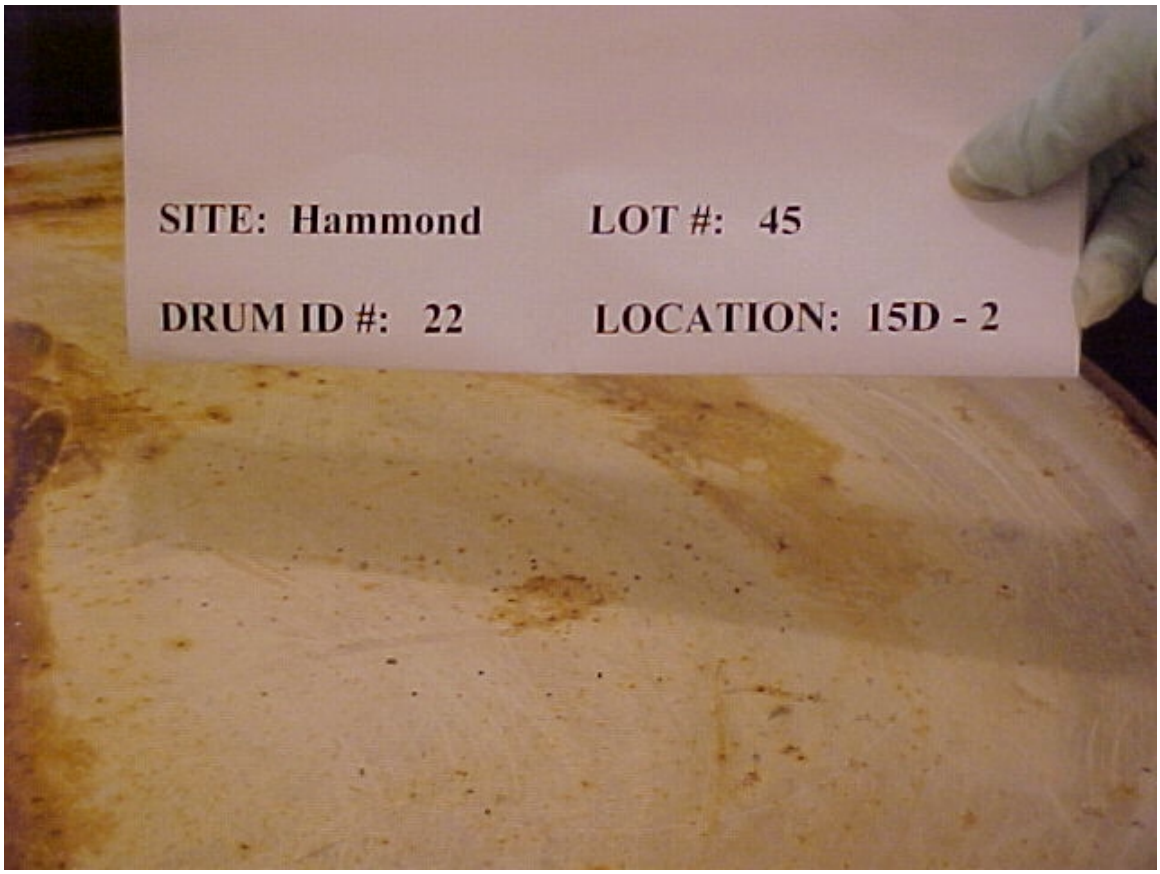
Lot No. 45
Drum ID No. 22
Location 15D-2
Site Hammond
85 gal container – Good Condition
Dose – surface – 30mR
1m - 3mR

Inspection/Sample Visual Inspection
Date 6-6-2002
Photo No. 2 of 8



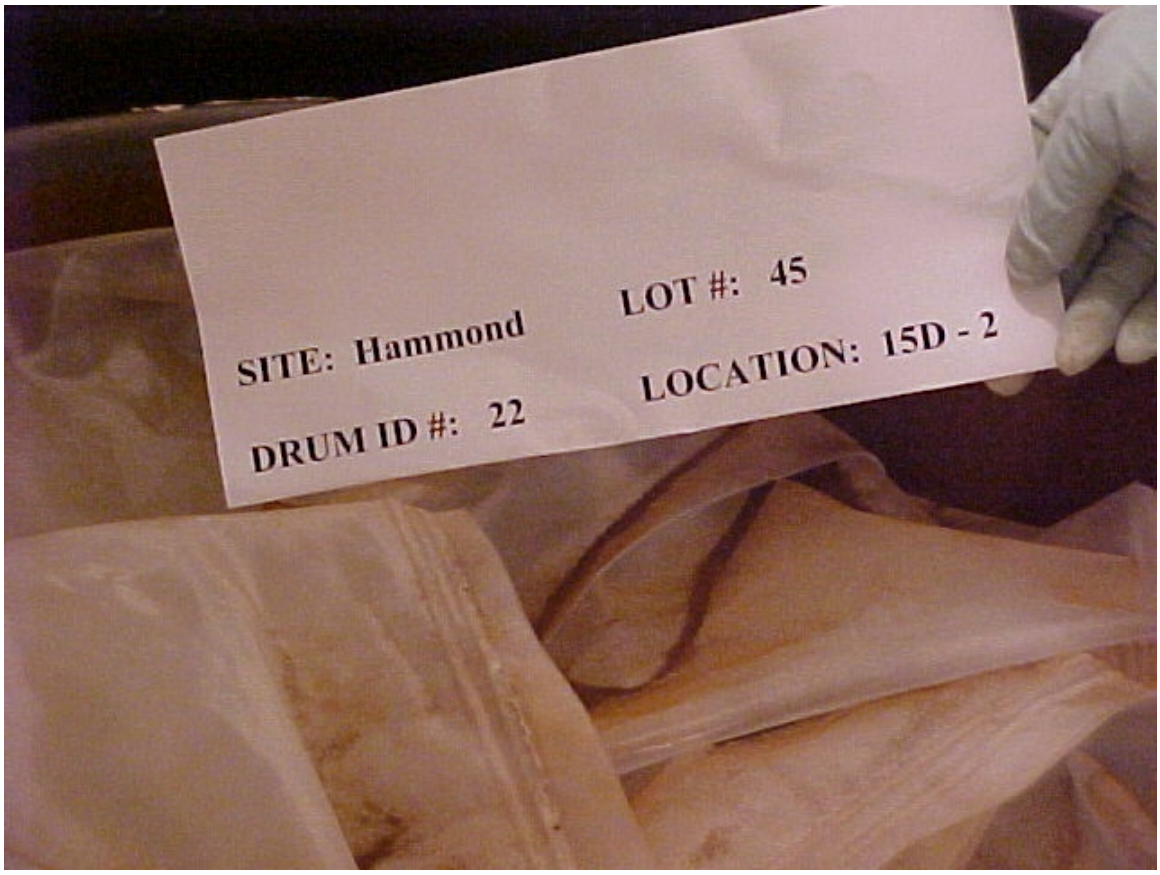
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	22	Date	6-6-2002
Location	15D-2	Photo No.	3 of 8
Site	Hammond		

55 gal drum lid – Good Condition
Ring in good condition
Rings are secured by 3/8 x 3-½ bolt/nut
Ring and lid on tight
55-gal drum is packaged with vermiculite
No measurement of gasses present



Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	22	Date	6-6-2002
Location	15D-2	Photo No.	4 of 8
Site	Hammond		

1st poly liner/bag – bad Condition
Although the liner/bag seal was in tack
The liner/bag had several holes in it
No gasses present

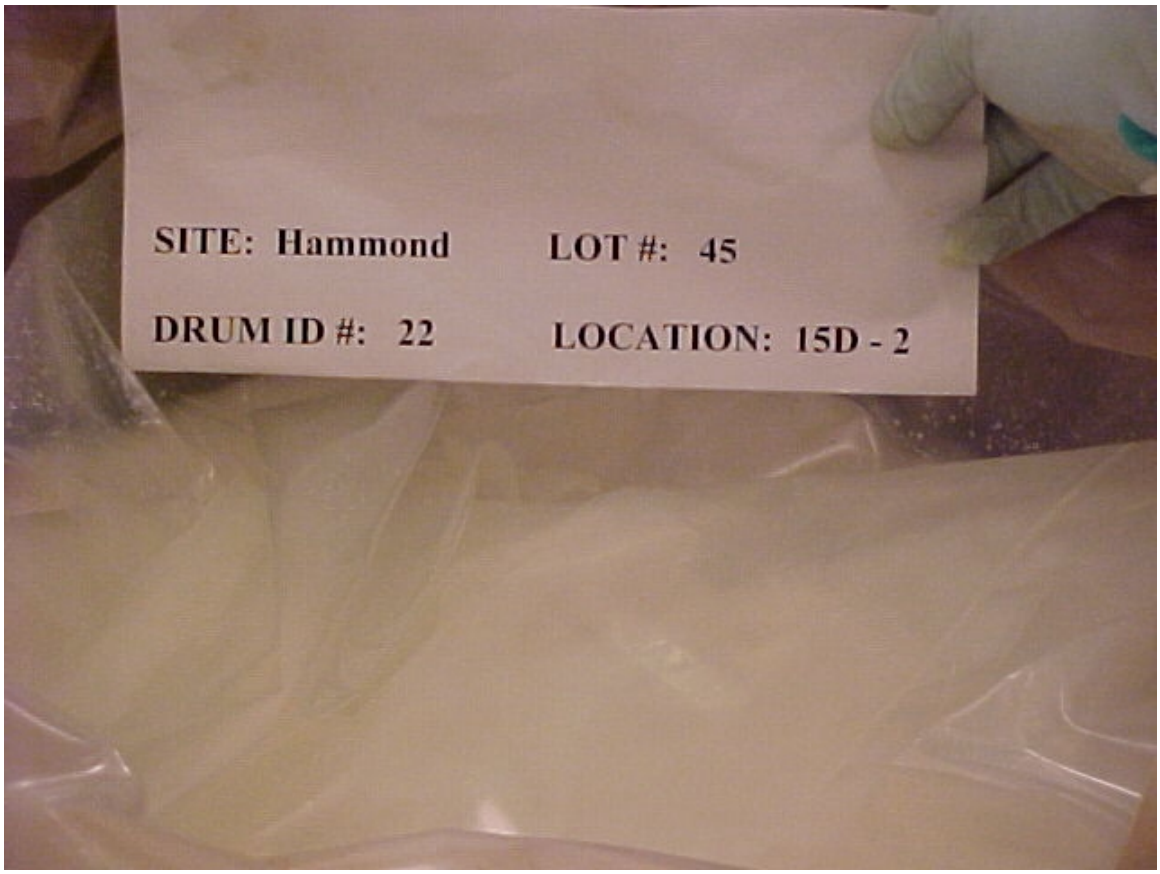


Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	22	Date	6-6-2002
Location	15D-2	Photo No.	5 of 8
Site	Hammond		

This is a picture of the inside lid of the 55-gal container
It shows rust/powder on it

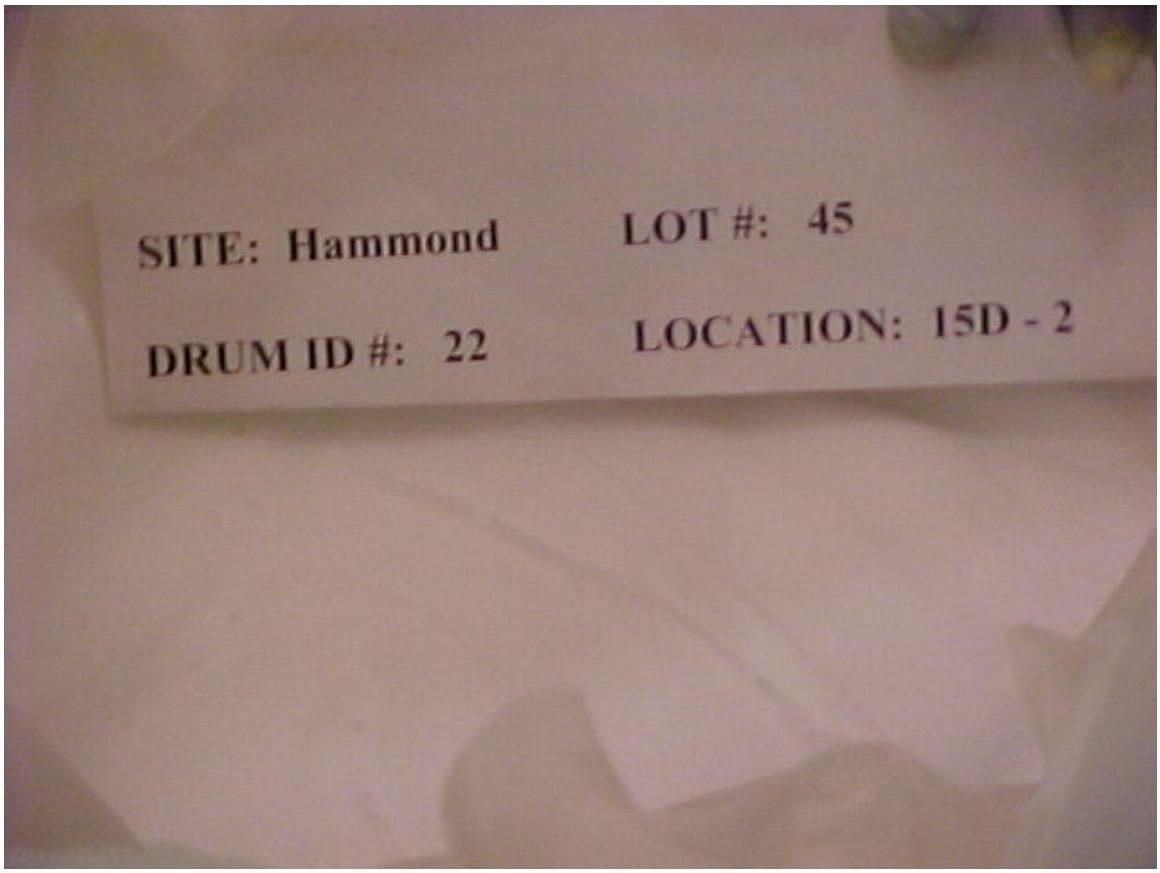
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	22	Date	6-6-2002
Location	15D-2	Photo No.	6 of 8
Site	Hammond		

2nd poly liner/bag – Good Condition
Moisture was in side the liner/bag
No measurement of gasses present



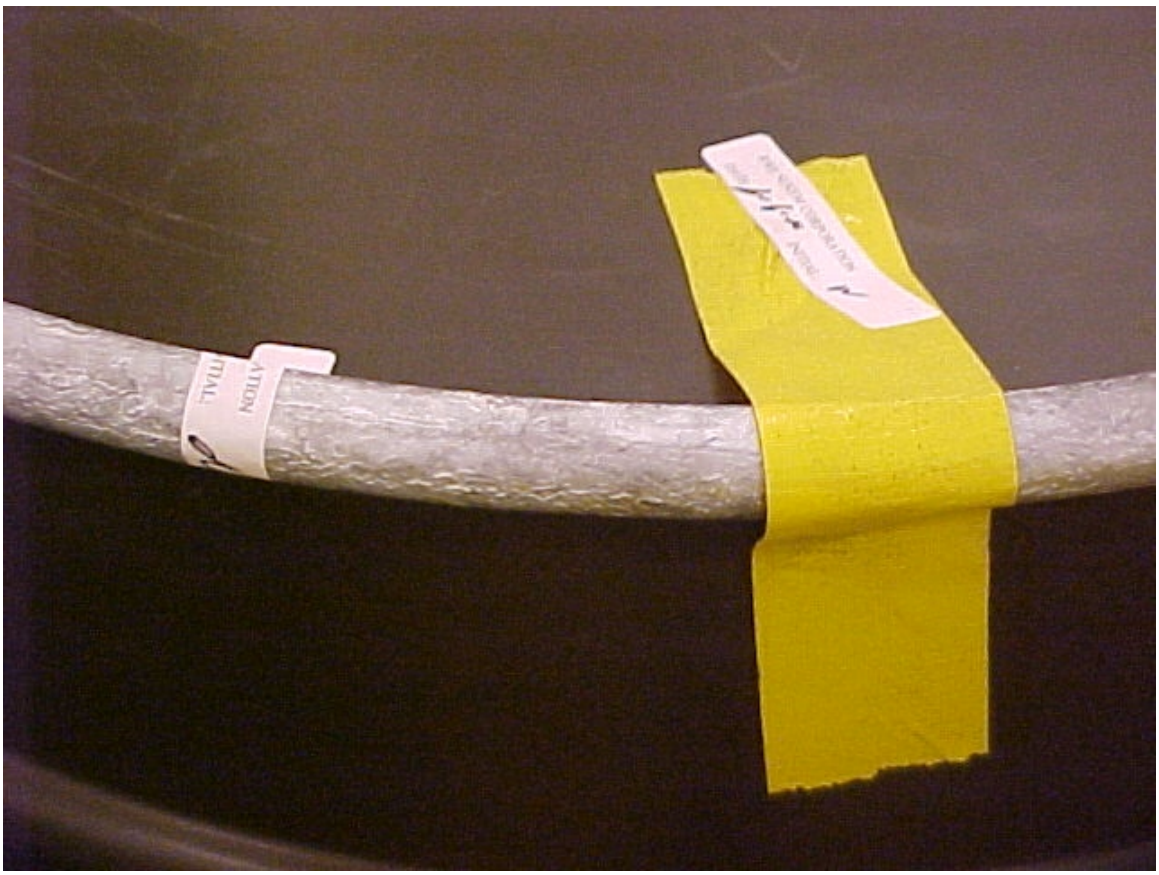
Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	22	Date	6-6-2002
Location	15D-2	Photo No.	7 of 8
Site	Hammond		

Monolith - white in color
Solid – very dry
No gas measurements present
Crystal/moisture on inside liner/bag
pH was taken - red indicator - 0 - results/high



Lot No.	45	Inspection/Sample	Visual Inspection
Drum ID No.	22	Date	6-6-2002
Location	15D-2	Photo No.	8 of 8
Site	Hammond		

85-gal container – Good Condition
Sealed/dated – Completed



Hammond Depot
Lot #49 - Drum #2
Visual Inspection

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 49 Drum ID #: 2 Location: Warehouse 100W - 12C – 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:

Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 3mR/hr dpm/300cm^2 <20α & <200 βγ
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

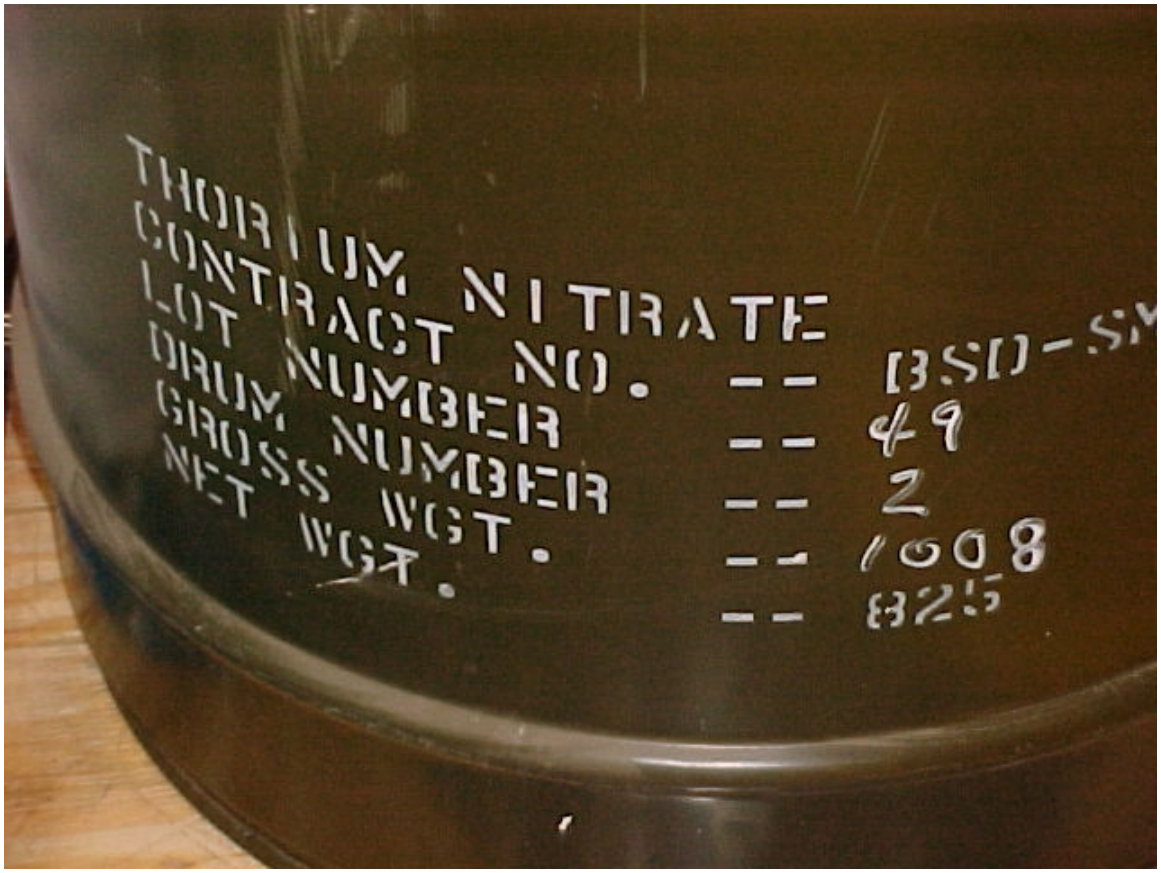
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: small amount of moisture inside 2nd poly liner/bag
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label seal with date & initials

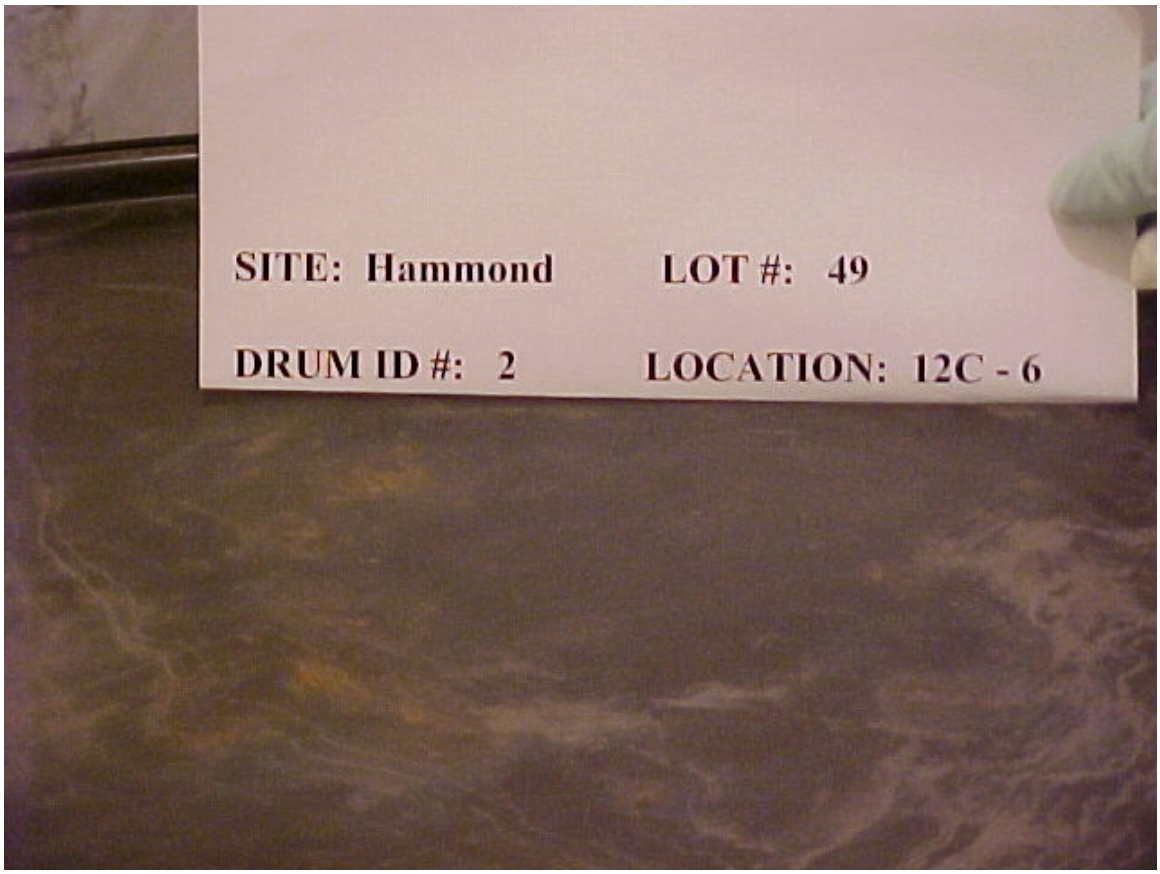
Checklist completed by: Tony Cunningham (signature on file) Date: 6-6-02

Lot No.	49	Inspection/Sample	Visual Inspection
Drum ID No.	2	Date	6-6-2002
Location	12C-6	Photo No.	1 of 7
Site	Hammond		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface 30 mR/hr		
	1 meter 3 mR/hr		



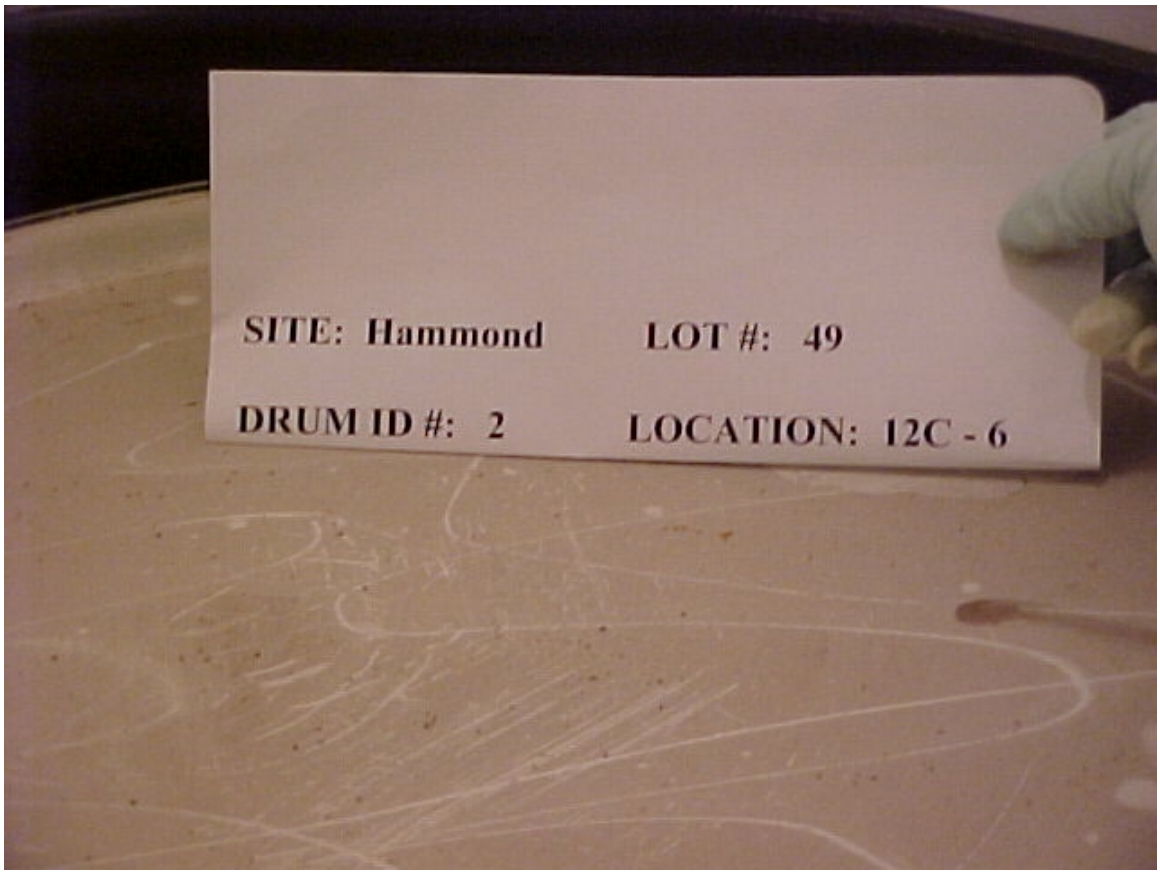
Lot No.	49	Inspection/Sample	Visual Inspection
Drum ID No.	2	Date	6-6-2002
Location	12C-6	Photo No.	2 of 7
Site	Hammond		

85 gal lid – Good Condition
Ring is also in good condition



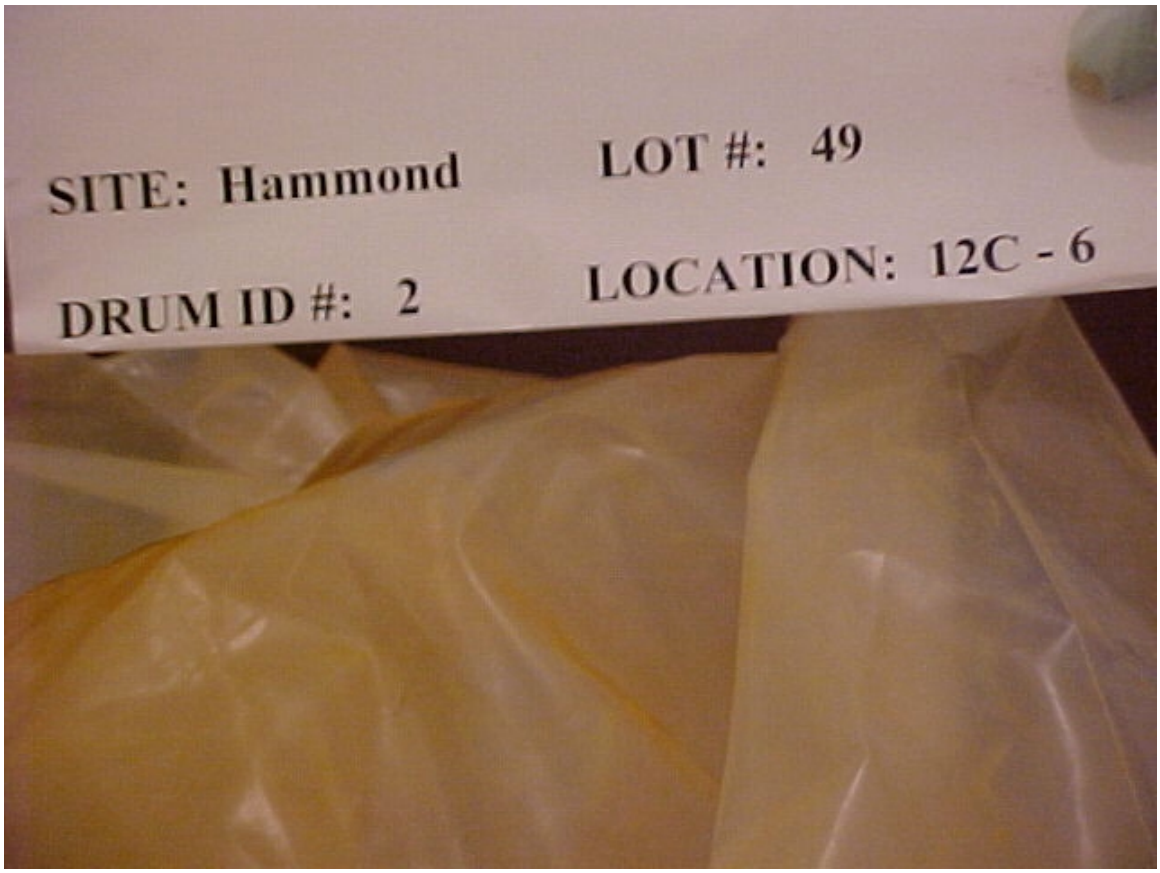
Lot No.	49	Inspection/Sample	Visual Inspection
Drum ID No.	2	Date	6-6-2002
Location	12C-6	Photo No.	3 of 7
Site	Hammond		

55 gal lid – Good Condition
Ring is also in good condition
There is a 3/8 x 3 ½ bolt/nut holding the ring in place
These bolt/nut combinations are difficult to reach and open
55 gal drums are packaged with vermiculite inside a 85-gal overpack
No gasses present



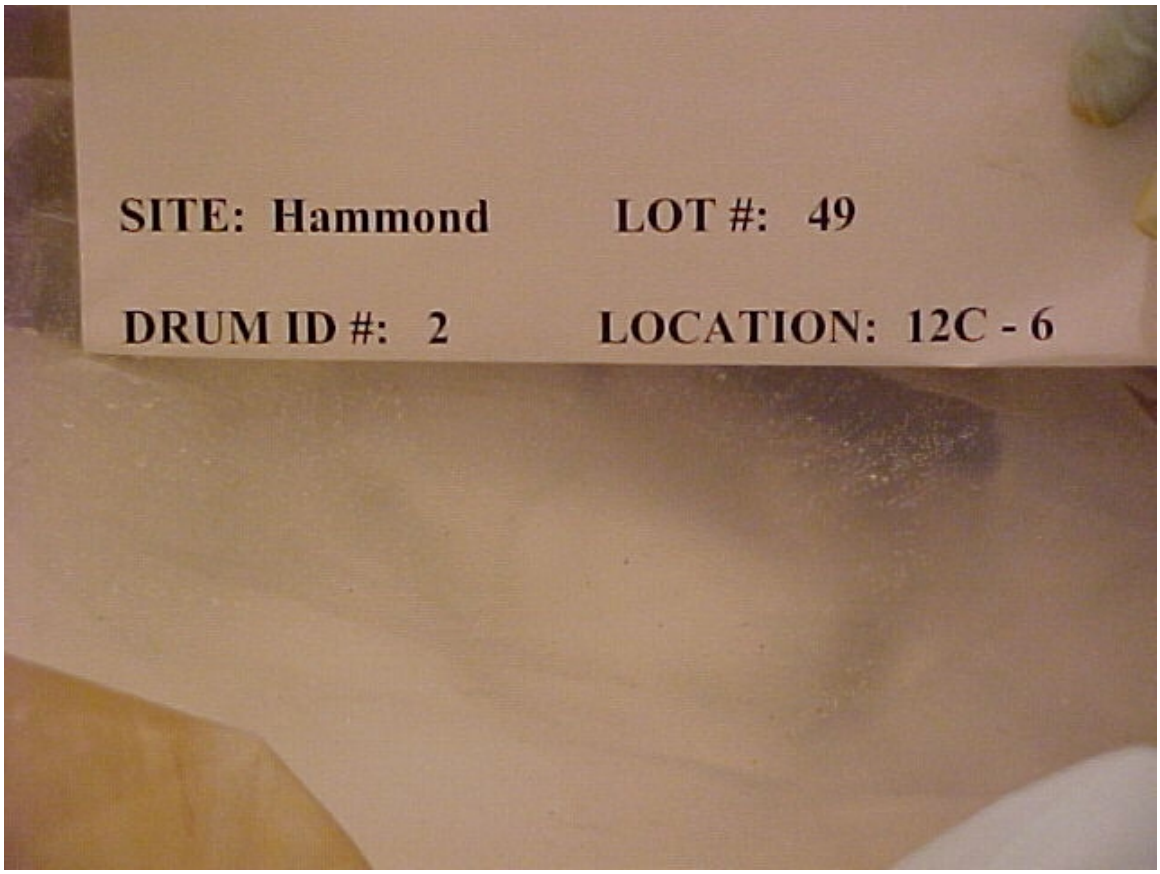
Lot No.	49	Inspection/Sample	Visual Inspection
Drum ID No.	2	Date	6-6-2002
Location	12C-6	Photo No.	4 of 7
Site	Hammond		

1st poly liner/bag – Good Condition
No gas measurement present
Small amounts of rust apparent on top of inside drum
Lid and poly liner/bag – good condition
Took sample of rust/powder



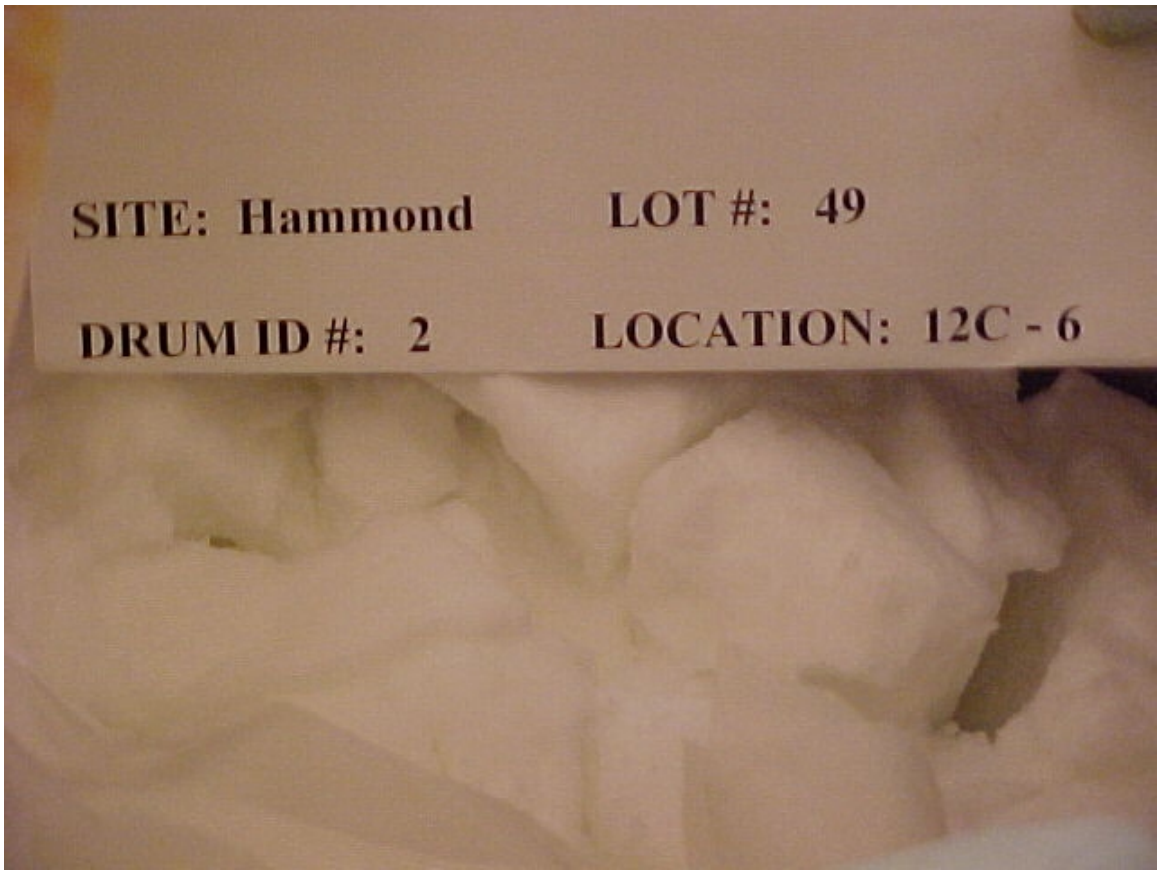
Lot No.	49	Inspection/Sample	Visual Inspection
Drum ID No.	2	Date	6-6-2002
Location	12C-6	Photo No.	5 of 7
Site	Hammond		

2nd poly liner/bag – Good Condition
Little moisture inside bag
No gasses present



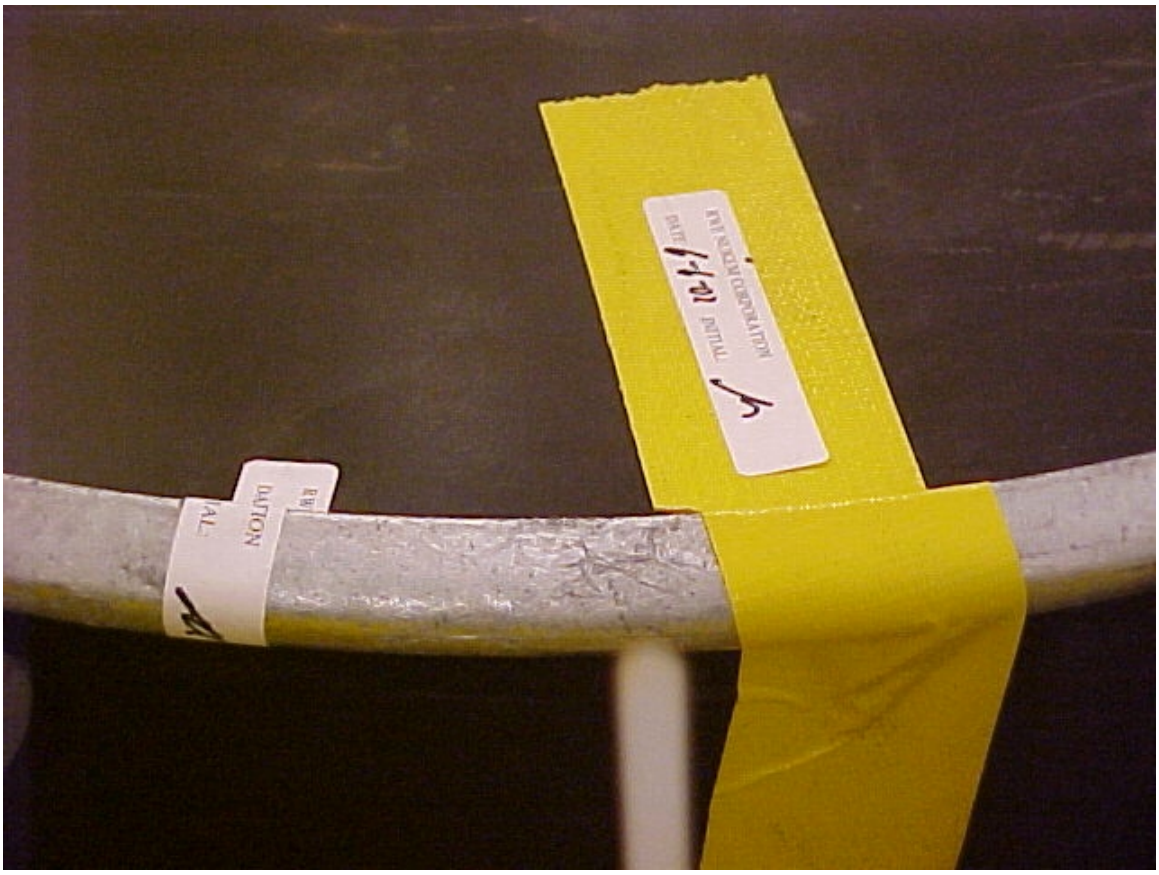
Lot No.	49	Inspection/Sample	Visual Inspection
Drum ID No.	2	Date	6-6-2002
Location	12C-6	Photo No.	6 of 7
Site	Hammond		

Monolith – white in color
Broken/cracked in several places
No gasses present
Very dry



Lot No.	49	Inspection/Sample	Visual Inspection
Drum ID No.	2	Date	6-6-2002
Location	12C-6	Photo No.	7 of 7
Site	Hammond		

85-gal container – Good Condition
Sealed/dated - Completed



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APPENDIX B

HAMMOND DEPOT
DRUMS SAMPLED FOR OFF-SITE ANALYSES
(FIRST SAMPLE SHIPMENT)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Hammond Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were sampled and shipped off-site for analyses per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were shipped to UT Battelle's contracted off-site laboratory per Shipment No. 6990-001-001 (i.e. the first shipment of samples to the laboratory for this project).

Also included with the table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	8	18	B-5
2	10	46	B-21
3	23	42	B-35
4	29	4	B-55
5	30	6	B-69
6	38	25	B-87
7	47	6	B-99
8	48	40	B-113

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Hammond Depot
Lot #8 – Drum #18
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 8 Drum ID #: 18 Location: Warehouse 100W - 9C – 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 34mR/hr DR at 1 meter 3.4mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 4Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 5Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):

Inner Container # 6Condition/Description (rusty, leaking, good, etc):

Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

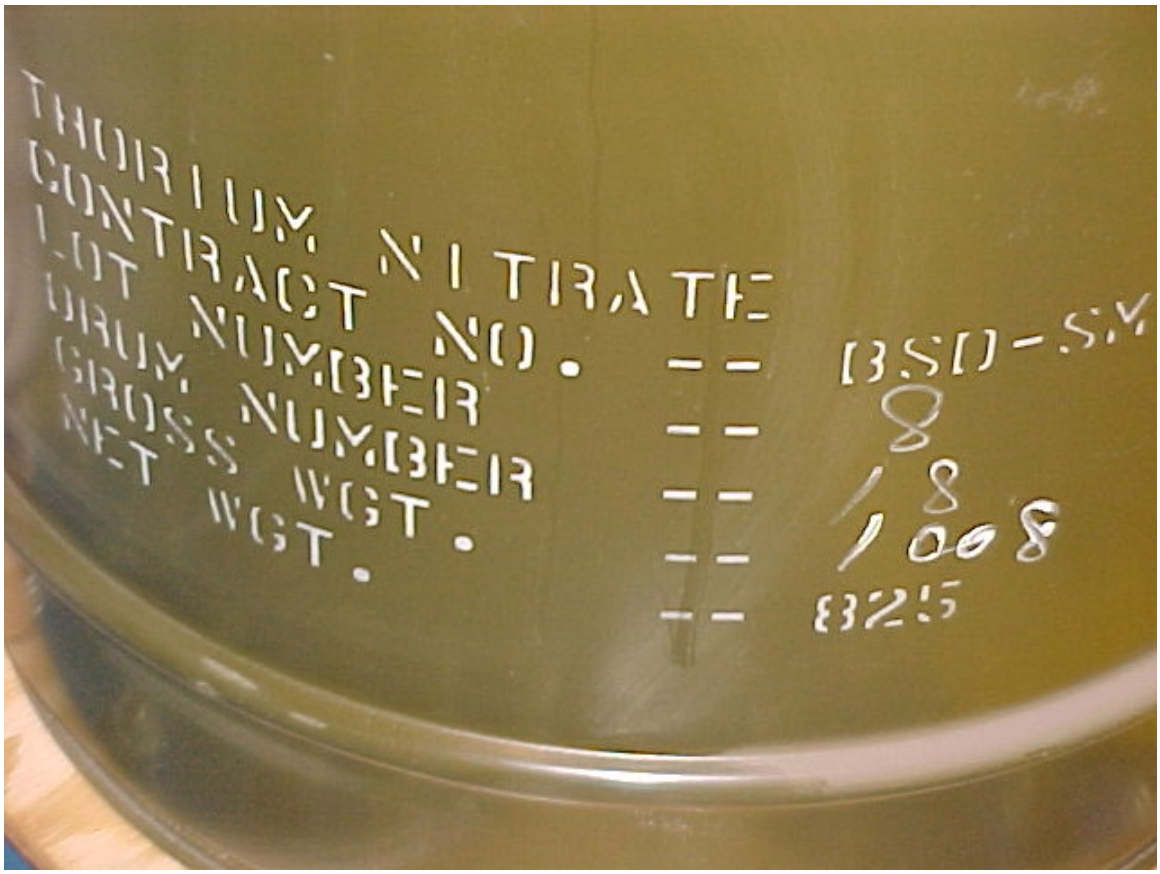
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

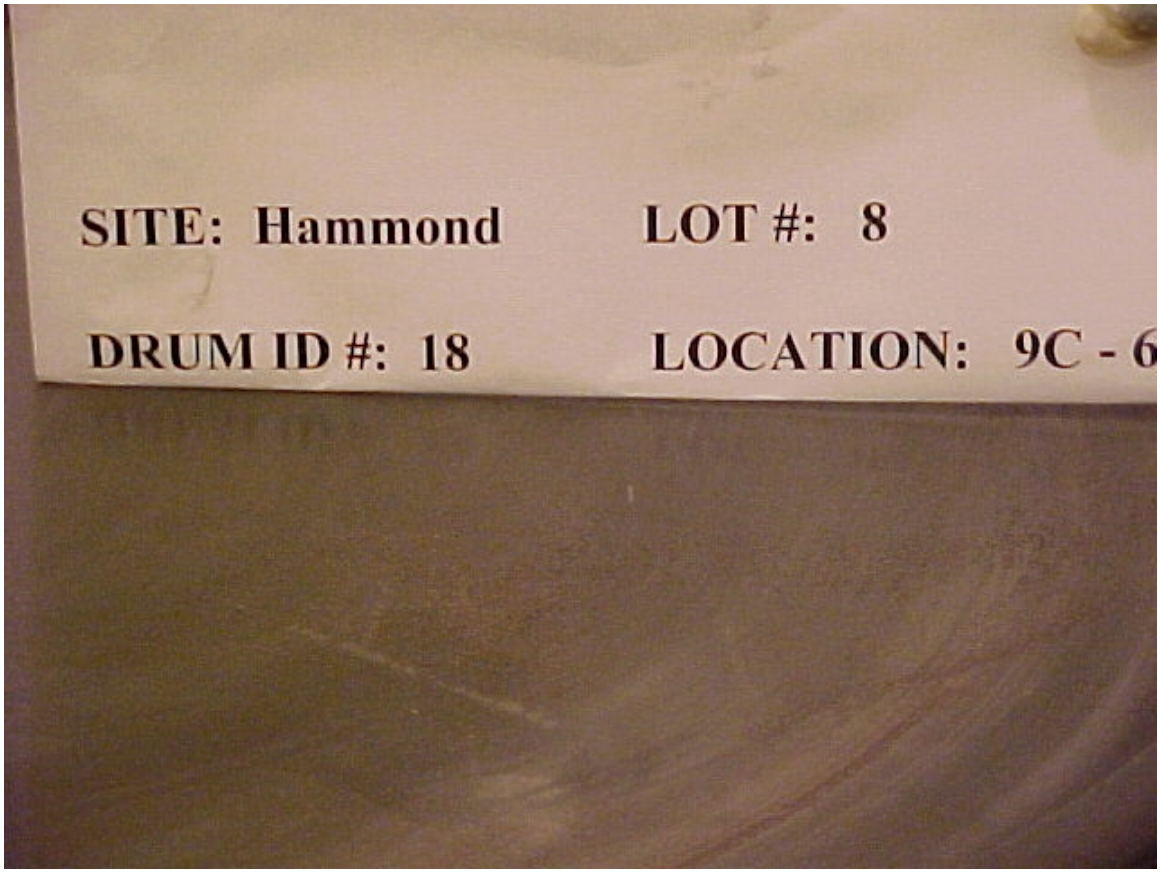
Checklist completed by: Tony Cunningham (signature on file) Date: 6-7-02

Lot No.	8		Inspection/Sample Date	Visual Inspection & Sampling 6-7-2002
Drum ID No.	18			
Location	9C-6		Photo No.	1 of 14
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	34 mR/hr		
	1 meter	3.4 mR/hr		



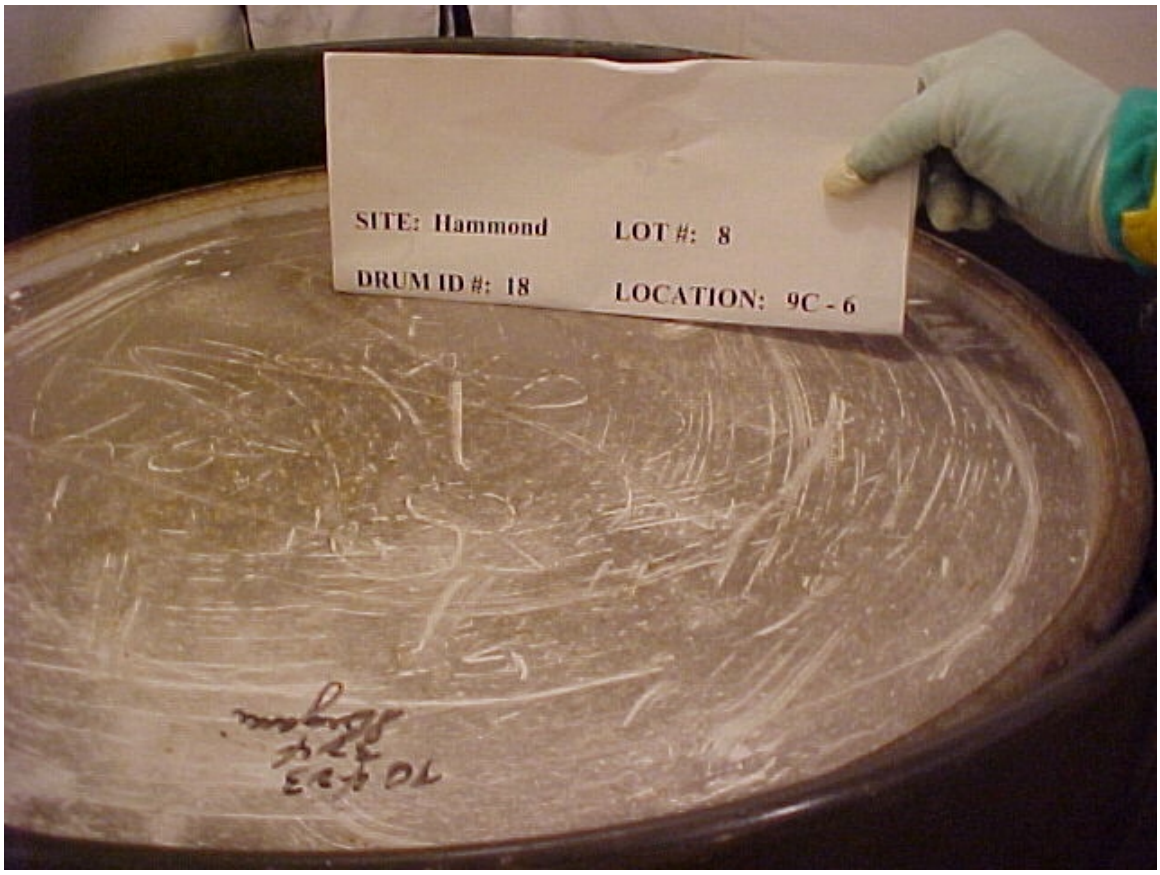
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	2 of 14
Site	Hammond		

85 gal drum – Good Condition
Ring – Good Condition



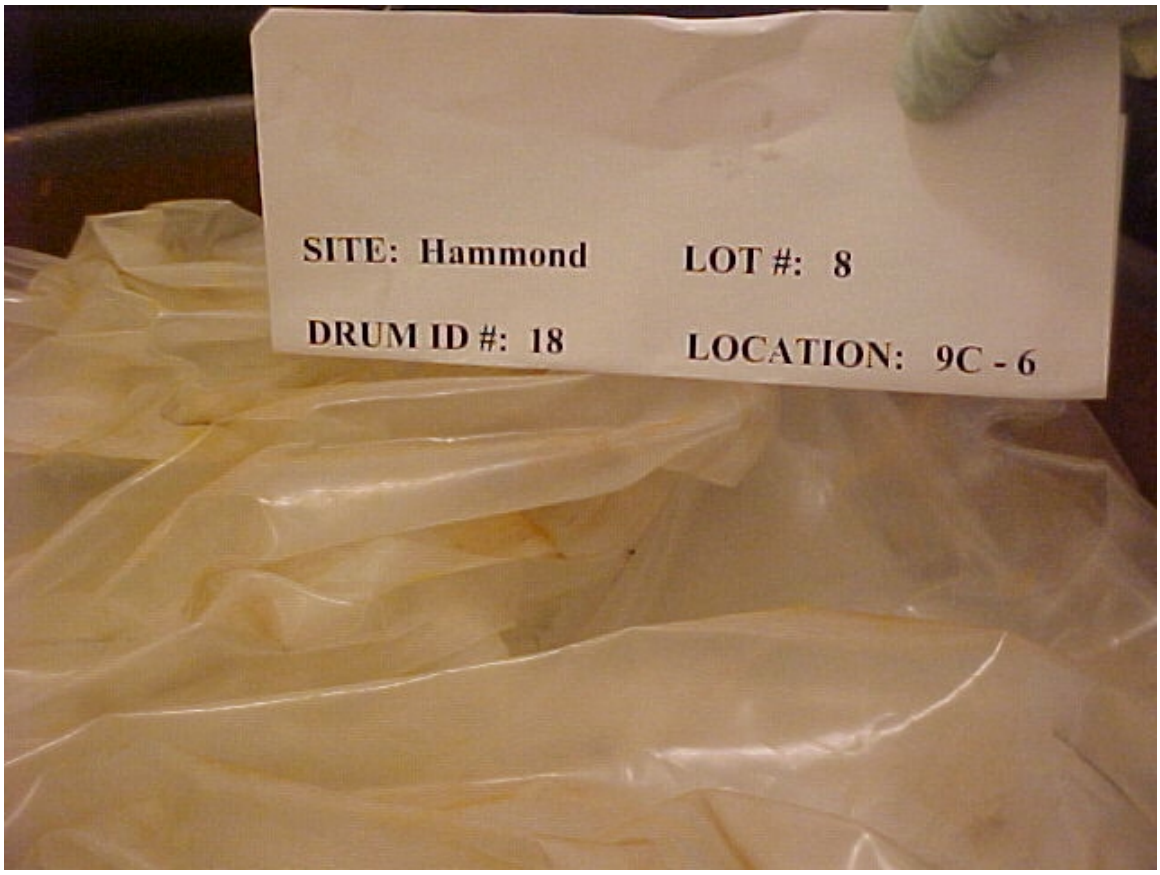
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	3 of 14
Site	Hammond		

55 gal drum lid– Good Condition
Ring 3/8 x 31/2 bolt – Good Condition/tight
55 gal container is package in a 85 overpack with vermiculite
No Gasses present



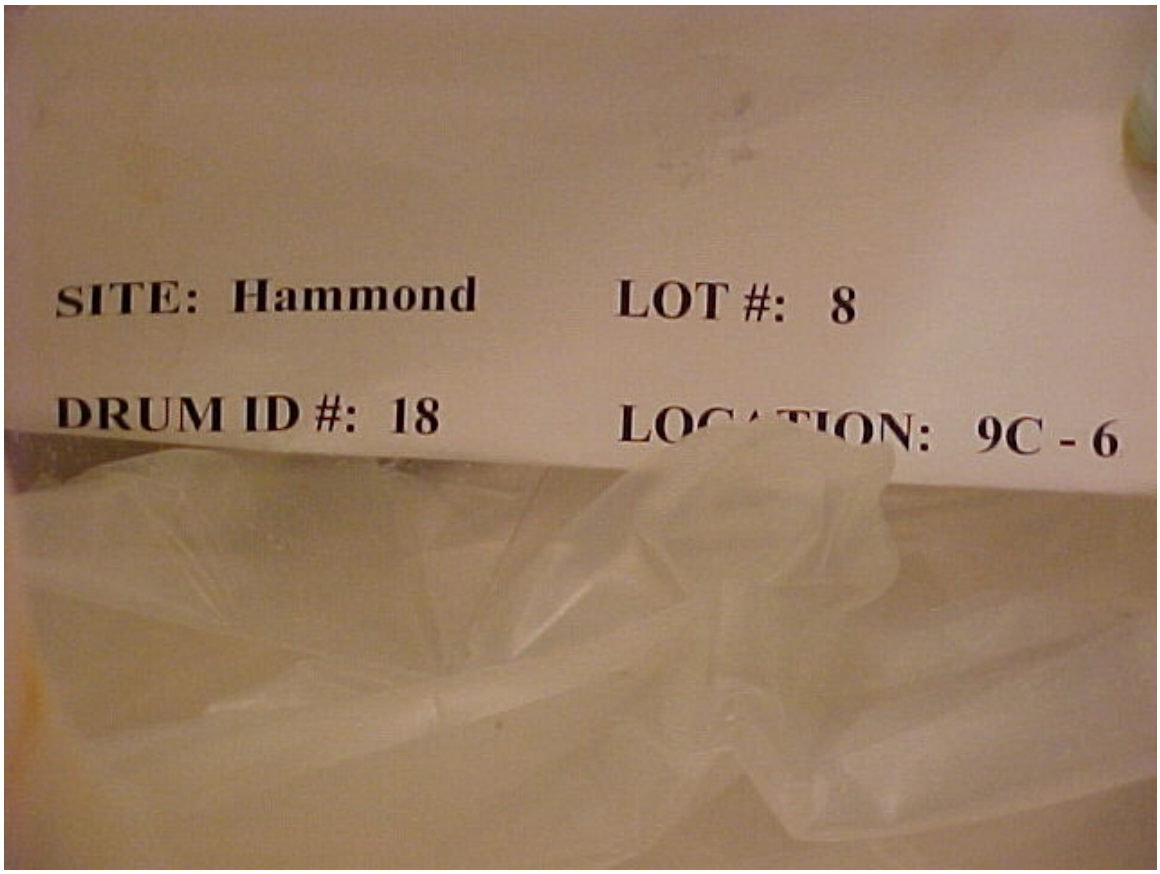
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	4 of 14
Site	Hammond		

1st Poly liner/bag - Good Condition
Seal in good condition
No holes in liner/bag
No Gasses present



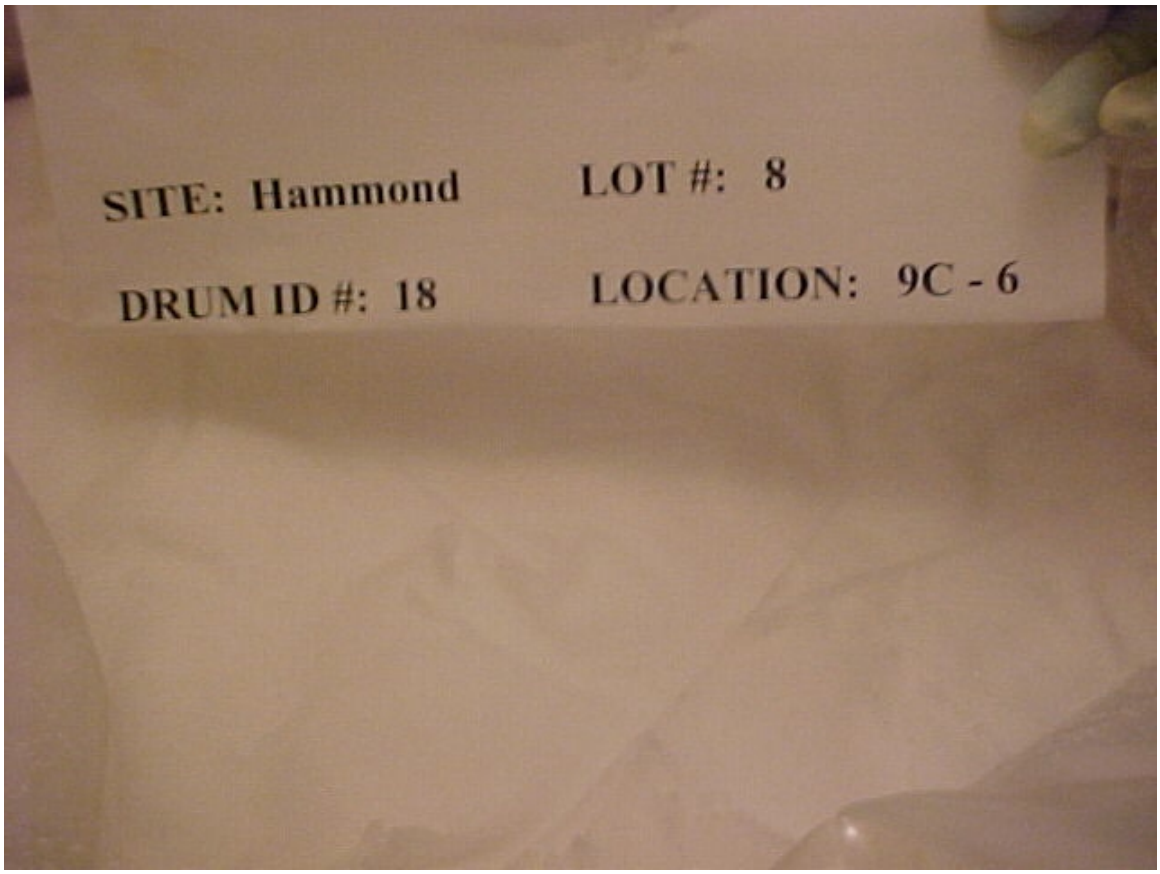
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	5 of 14
Site	Hammond		

2nd Poly liner/bag - Good Condition
Seal in good condition
No holes in liner/bag
No Moisture
No Gasses present



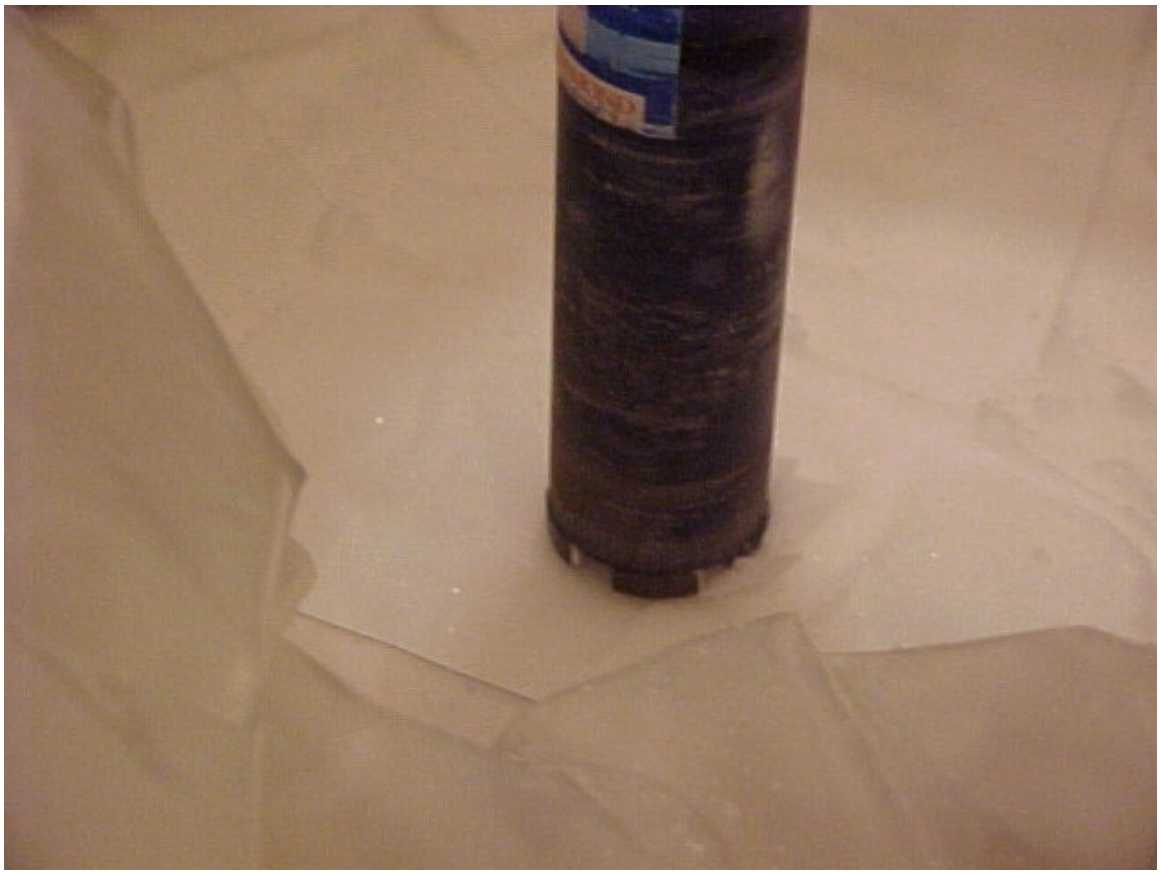
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	6 of 14
Site	Hammond		

Monolith – White in Color
Solid – very dry
No Gasses present



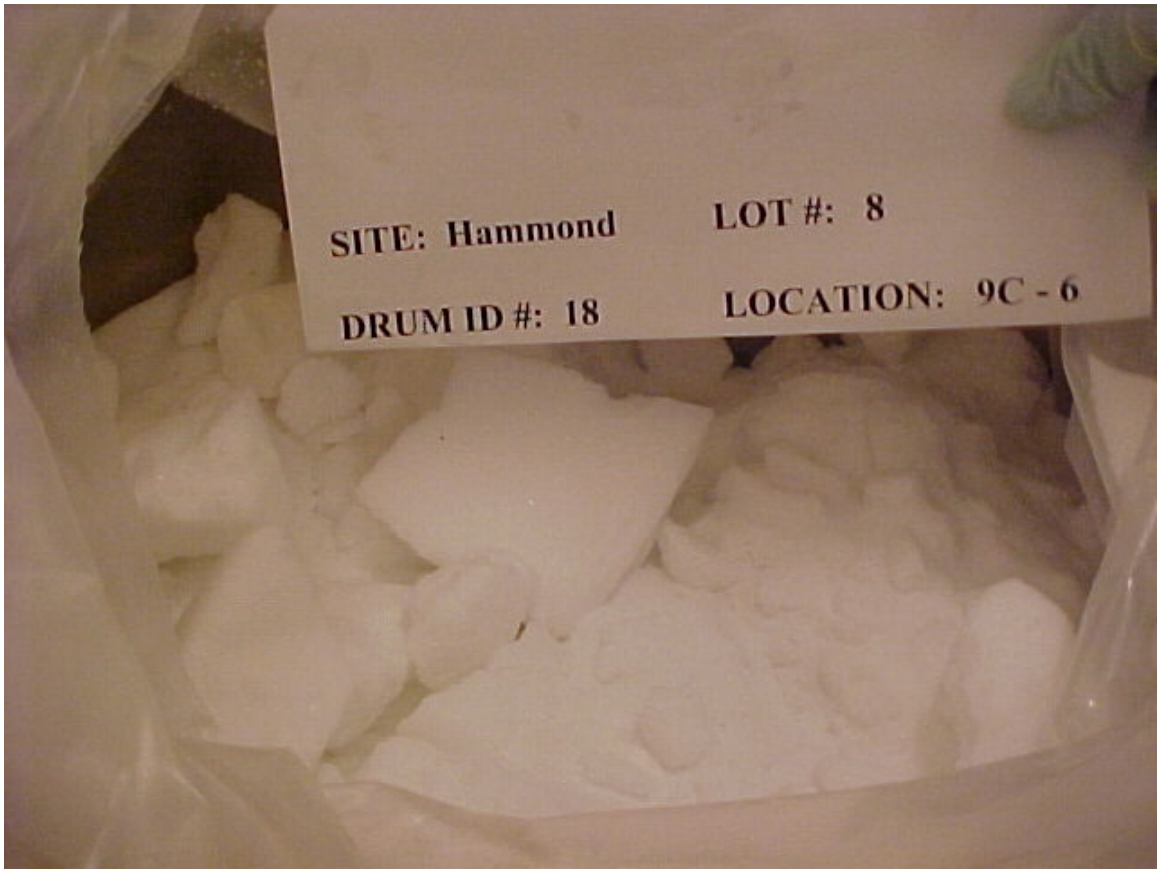
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	7 of 14
Site	Hammond		

Beginning to drill cores with core bit
No Gasses present



Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	8 of 14
Site	Hammond		

Coring was to brittle and fine…had to use chisel and hammer
to break up into large peace's to fit 2-liter container
No Gasses present



Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	9 of 14
Site	Hammond		

Closing 2nd and 1st Poly liner/bag for final closure
No holes in liner/bag
No Gasses present

Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	10 of 14
Site	Hammond		

55 gal container
Placed ring upside down on lid for tightening
This makes it easier and reachable for securing ring to lid
No Gasses present

Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	11 of 14
Site	Hammond		

Shows each large sample to be placed into 2-liter container for shipment
Each sample is sealed in a plastic liner and then placed into the 2-liter container
No Gasses present

Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	12 of 14
Site	Hammond		

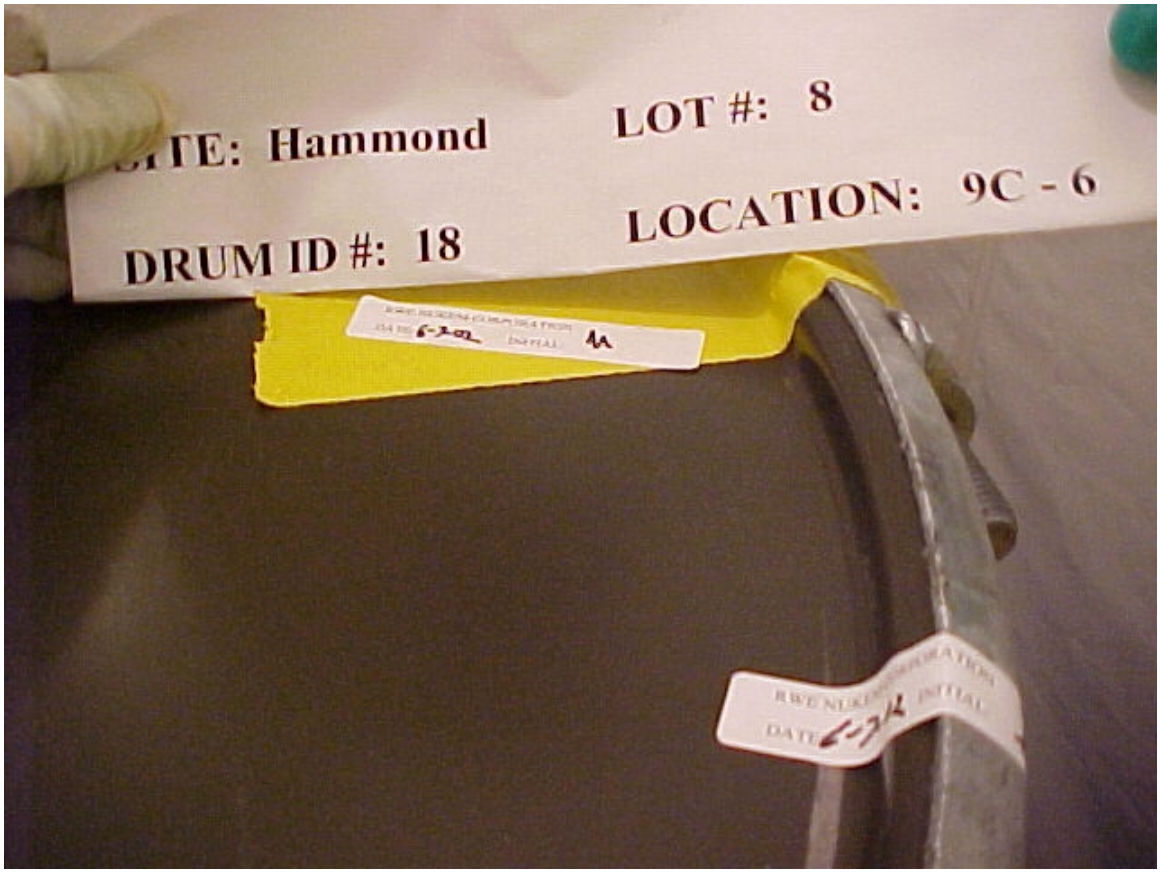
This photograph shows the larger of the 2 samples
Core sample is 900gm
No holes in liner/bag
No Gasses present

Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	13 of 14
Site	Hammond		

This photograph shows the smaller of the 2 samples
527 gm sealed in a plastic liner/bag
No Gasses present

Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	18	Date	6-7-2002
Location	9C-6	Photo No.	14 of 14
Site	Hammond		

85 gal container – Good Condition
Sealed/Dated – completed



Hammond Depot
Lot #10 - Drum #46
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 10 Drum ID #: 46 Location: Warehouse 100W - 12D – 1

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 30mR/hr DR at 1 meter 2.8mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good -- damp inside
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

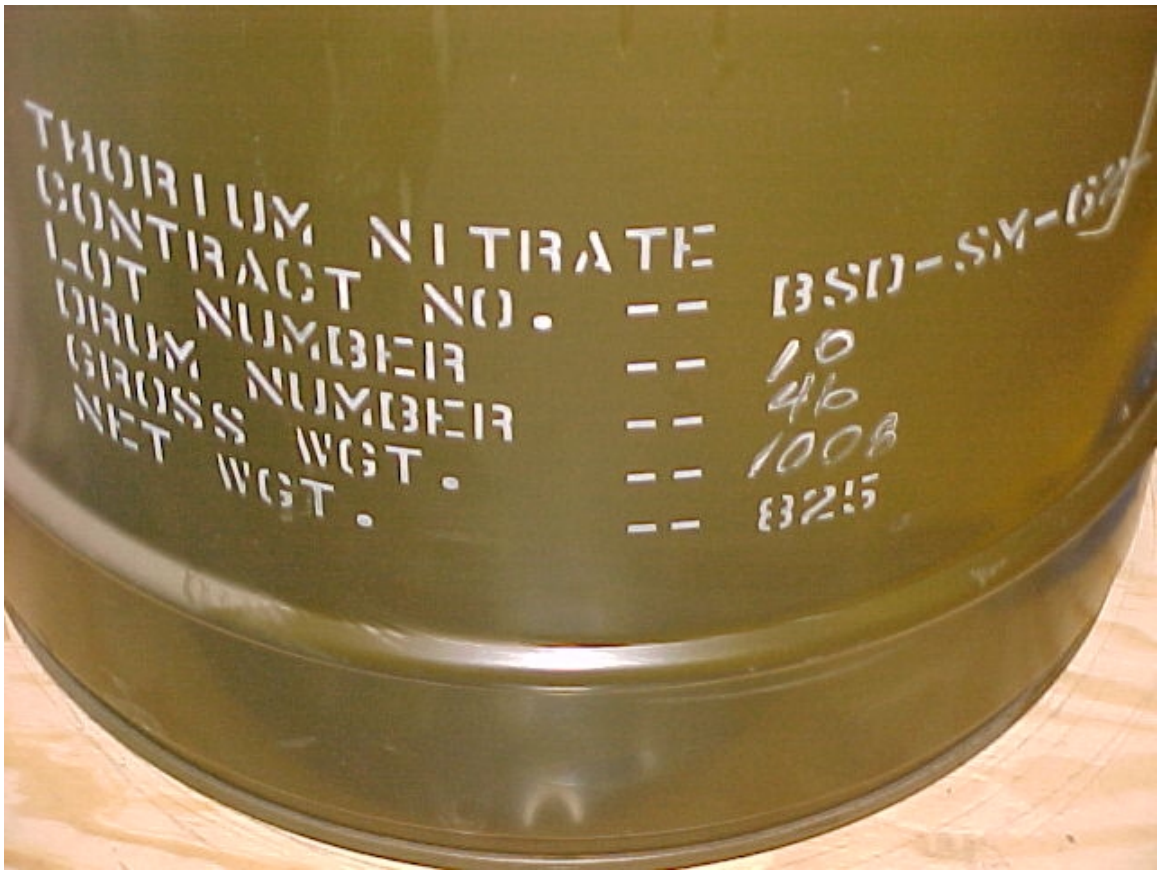
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: No
Moisture or Liquids Present: Moisture present inside 2nd Polyliner/bag
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

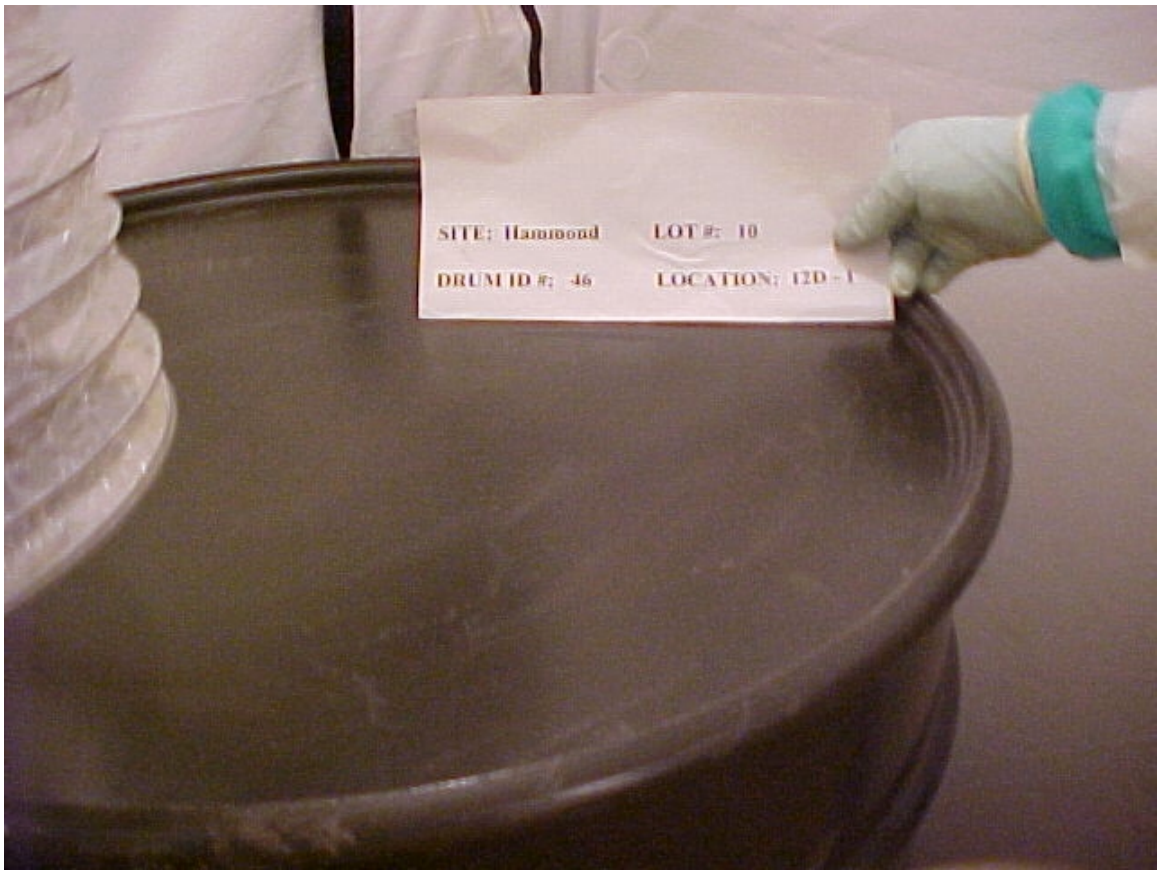
Checklist completed by: Tony Cunningham (signature on file) Date: 6-10-02

Lot No.	10		Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46		Date	6-10-2002
Location	12D-1		Photo No.	1 of 11
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	30 mR/hr		
	1 meter	2.8 mR/hr		



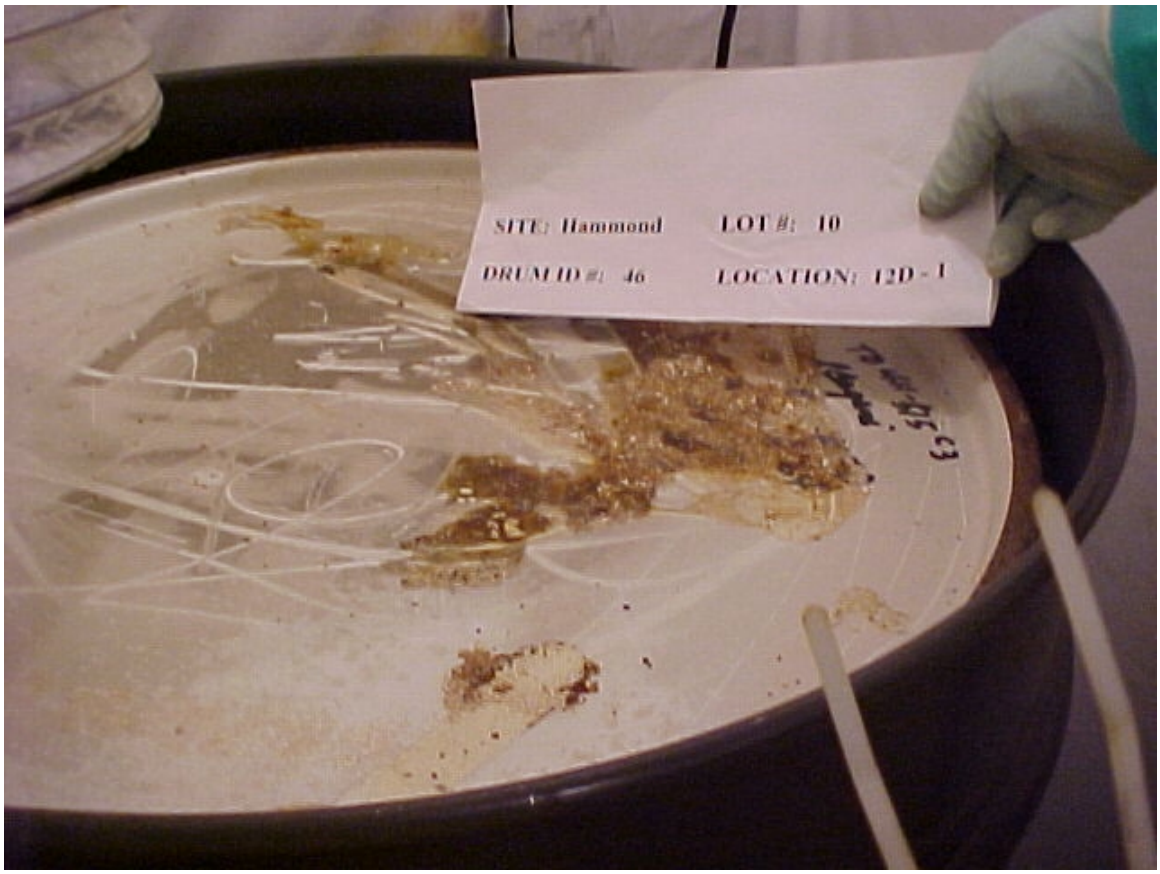
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	2 of 11
Site	Hammond		

Lid of 85-gal drum - Good Condition



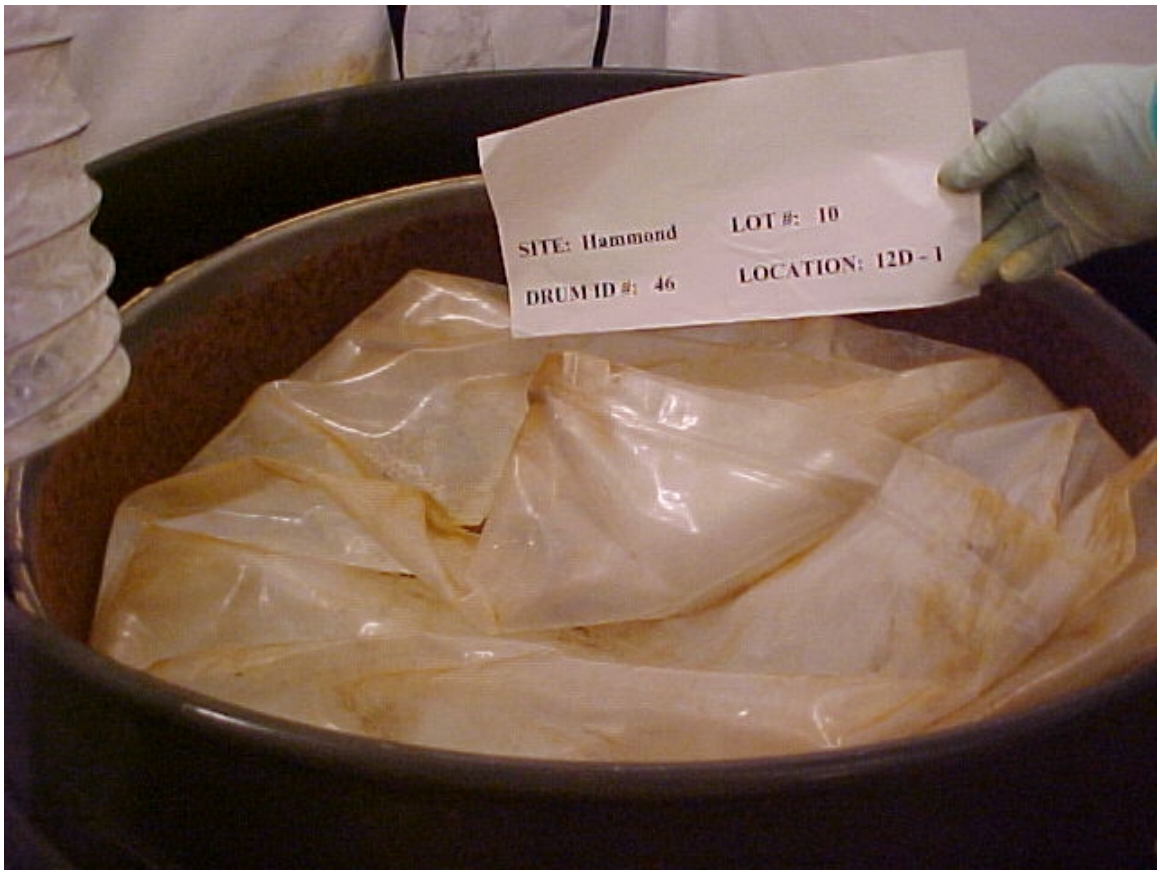
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	3 of 11
Site	Hammond		

55gal drum-good condition
no gases present
ring - good condition



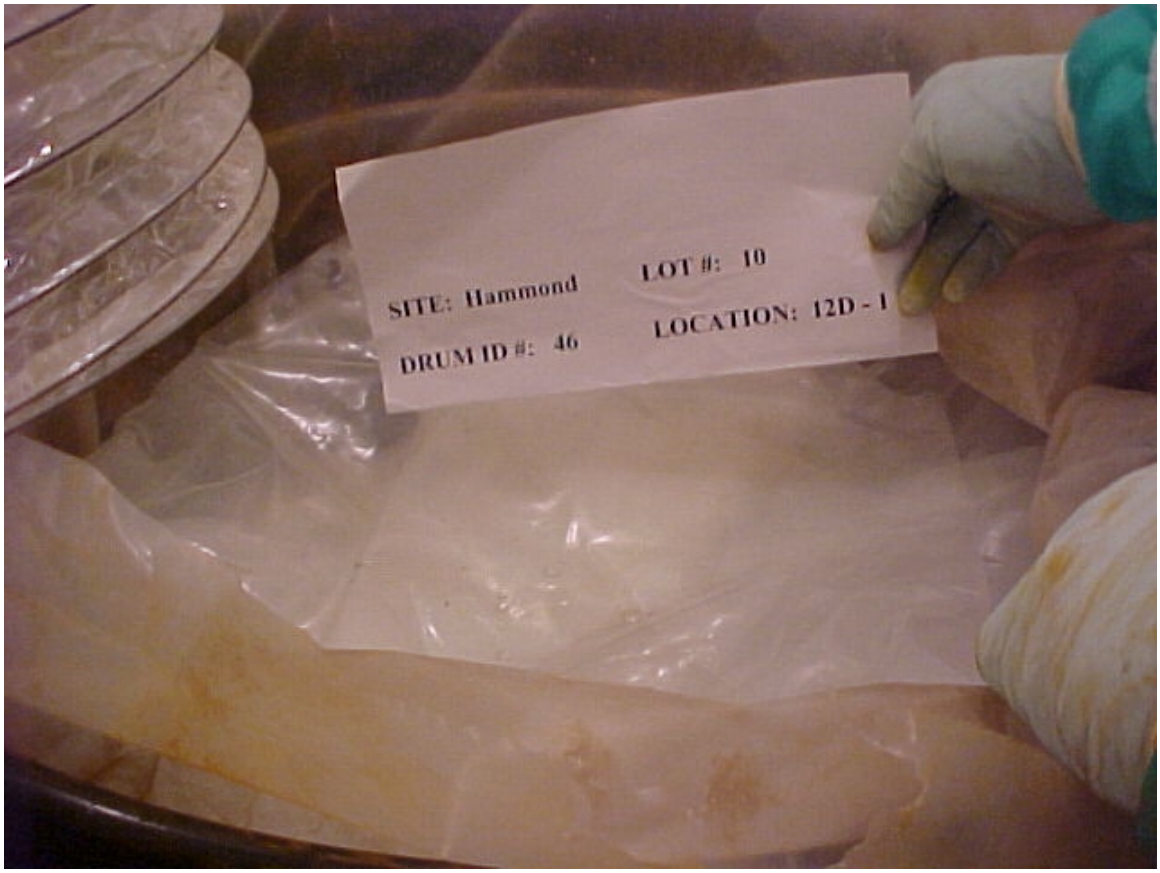
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	4 of 11
Site	Hammond		

1st poly-liner/bag- Good Condition
No gasses present



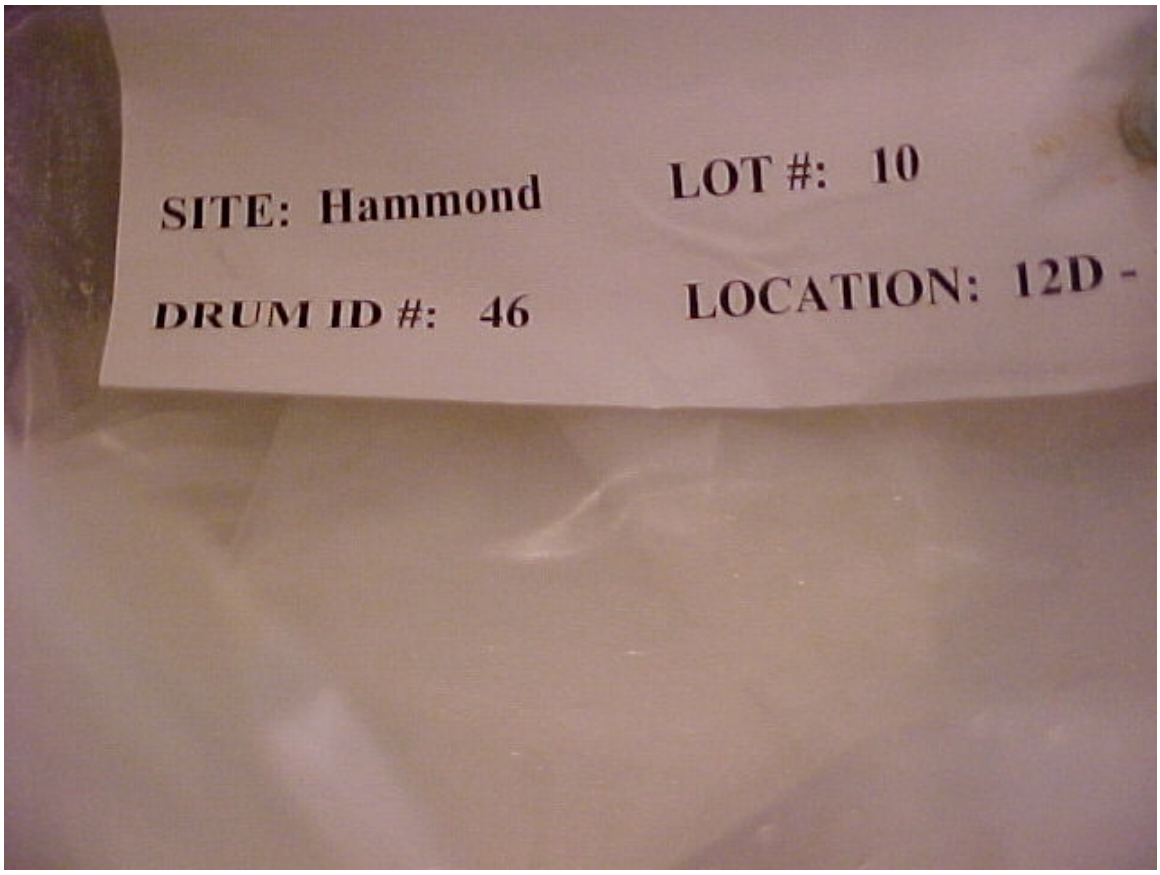
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	5 of 11
Site	Hammond		

2nd Poly-liner/bag- Good Condition
No gasses present



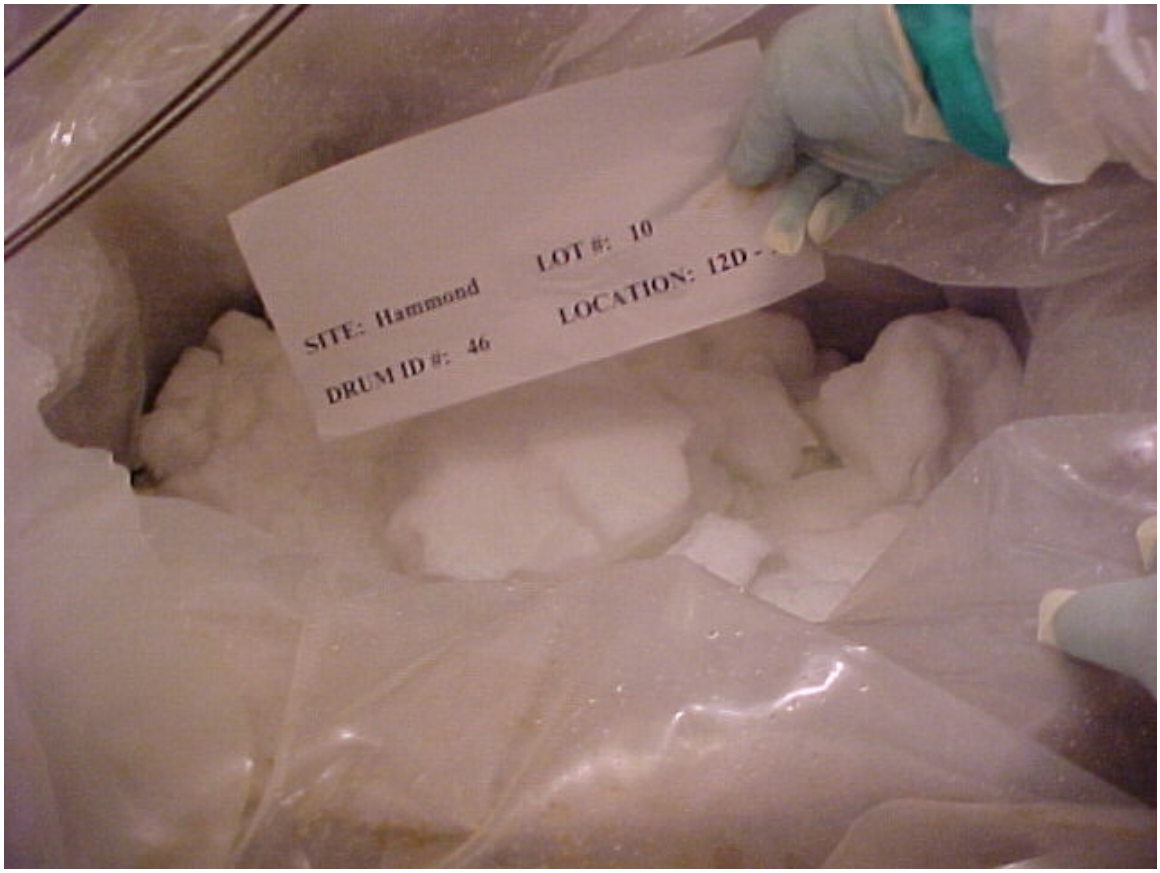
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	6 of 11
Site	Hammond		

3rd Poly-liner/bag- Good Condition
No gasses present
You can see water crystals/wet damp inside of liner



Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	7 of 11
Site	Hammond		

Monolith-white in color
Chunks/ broken
Damp/wet inside
Took pH reading color Red-0 scale
No gasses present



Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	8 of 11
Site	Hammond		

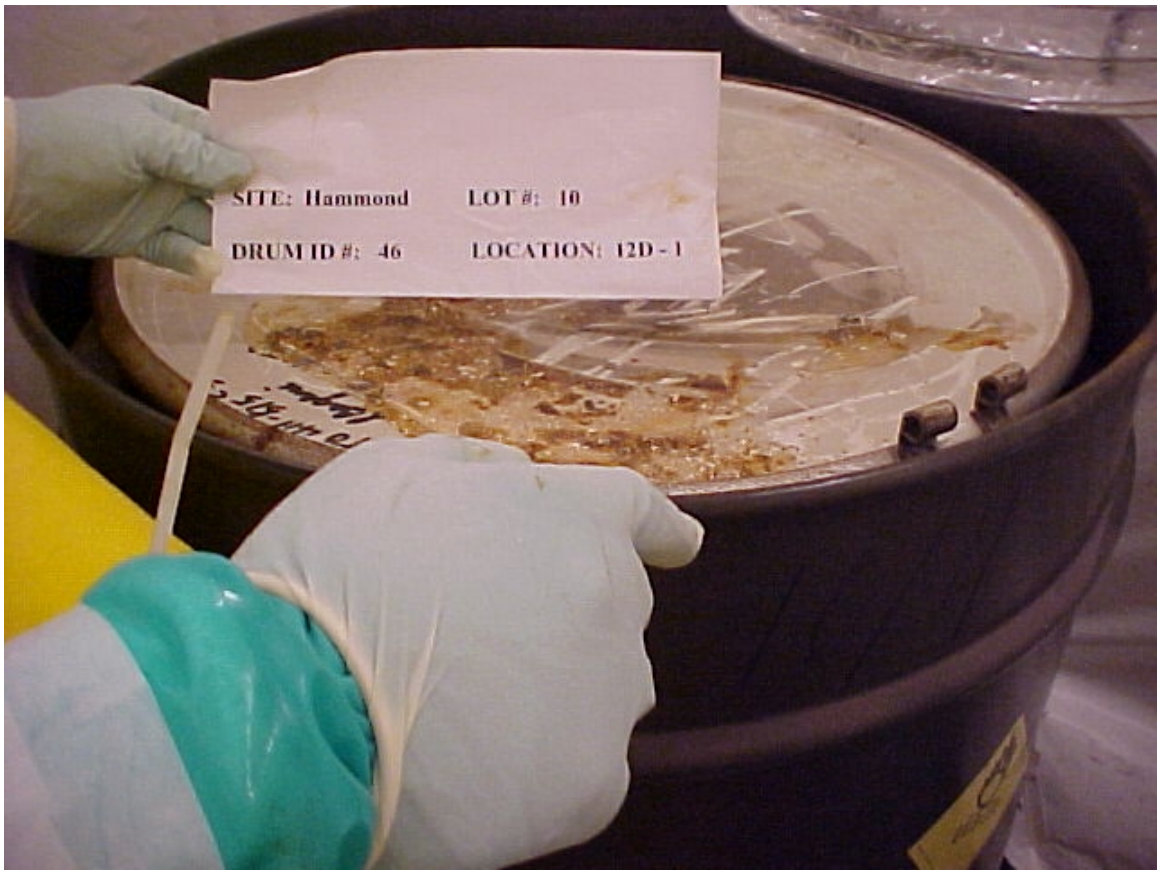
Pictures indicates drilling for core samples
No gasses present

Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	9 of 11
Site	Hammond		

No gasses present
Drilling for core samples did not work had to use chisel to get sample

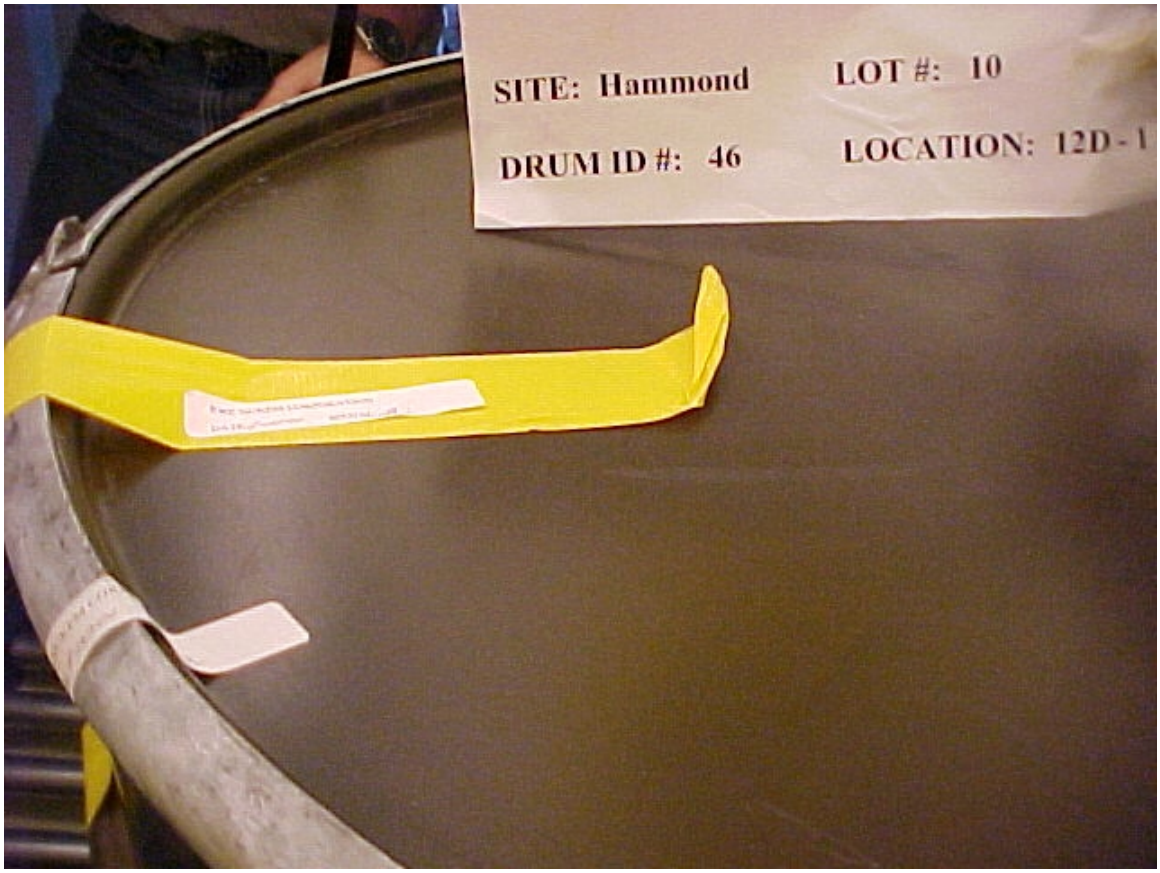
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	10 of 11
Site	Hammond		

No gasses present
Replaced ring and lid on 55gal drum



Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	46	Date	6-10-2002
Location	12D-1	Photo No.	11 of 11
Site	Hammond		

85 gal drum lid and ring secured
Drum sealed/dated/completed



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Hammond Depot
Lot #23 - Drum #42
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 23 Drum ID #: 42 Location: Warehouse 100W - 9C – 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Polyliner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

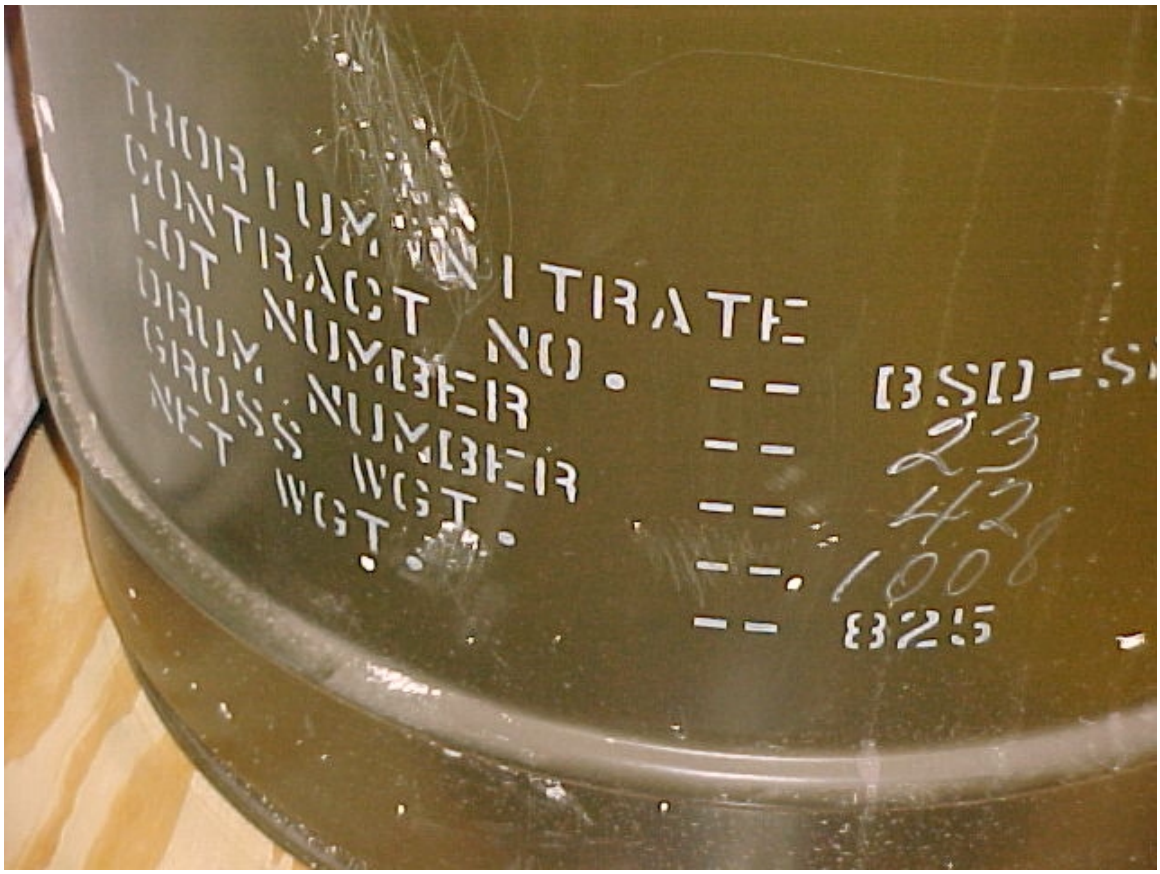
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

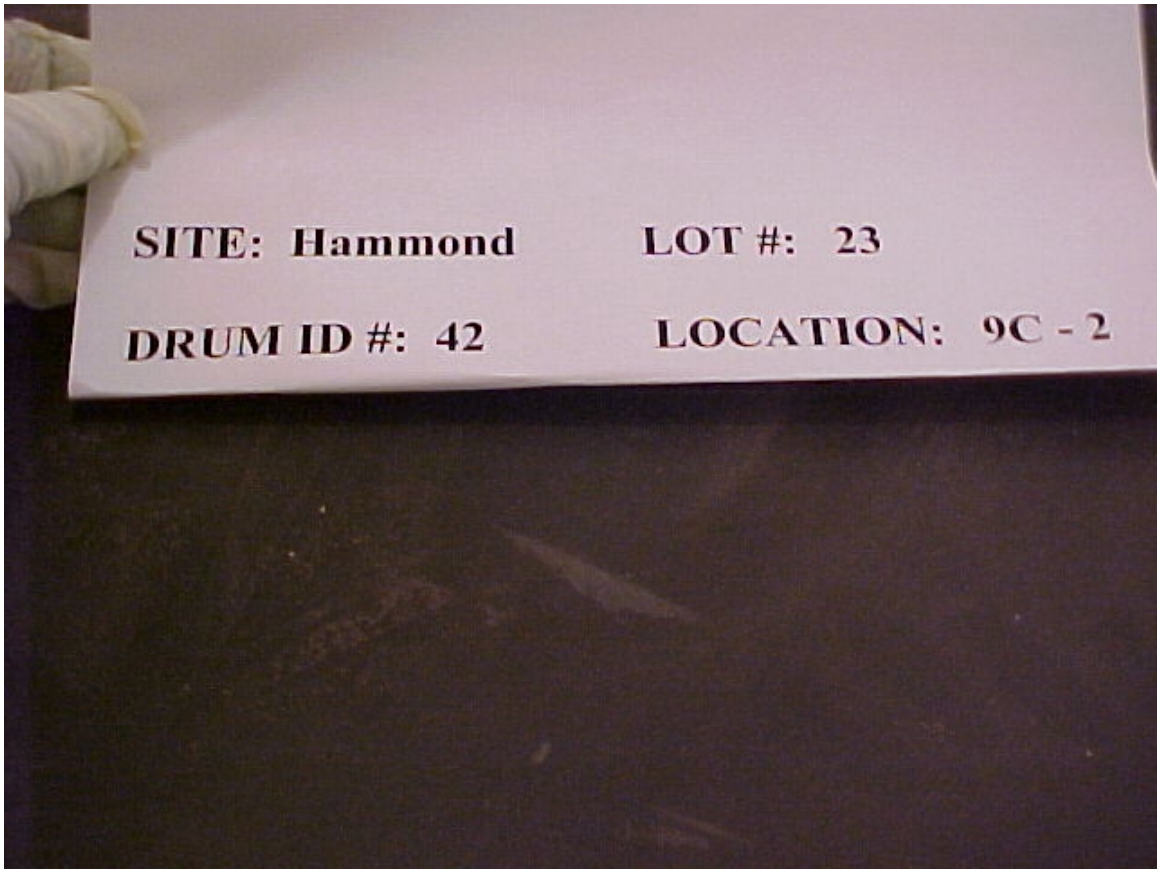
Checklist completed by: Tony Cunningham (signature on file) Date: 6-7-02

Lot No.	23		Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42		Date	6-07-2002
Location	9C-2		Photo No.	1 of 17
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	32 mR/hr		
	1 meter	3 mR/hr		



Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	2 of 17
Site	Hammond		

85 gal drum lid – Good Condition
Ring is also in good condition

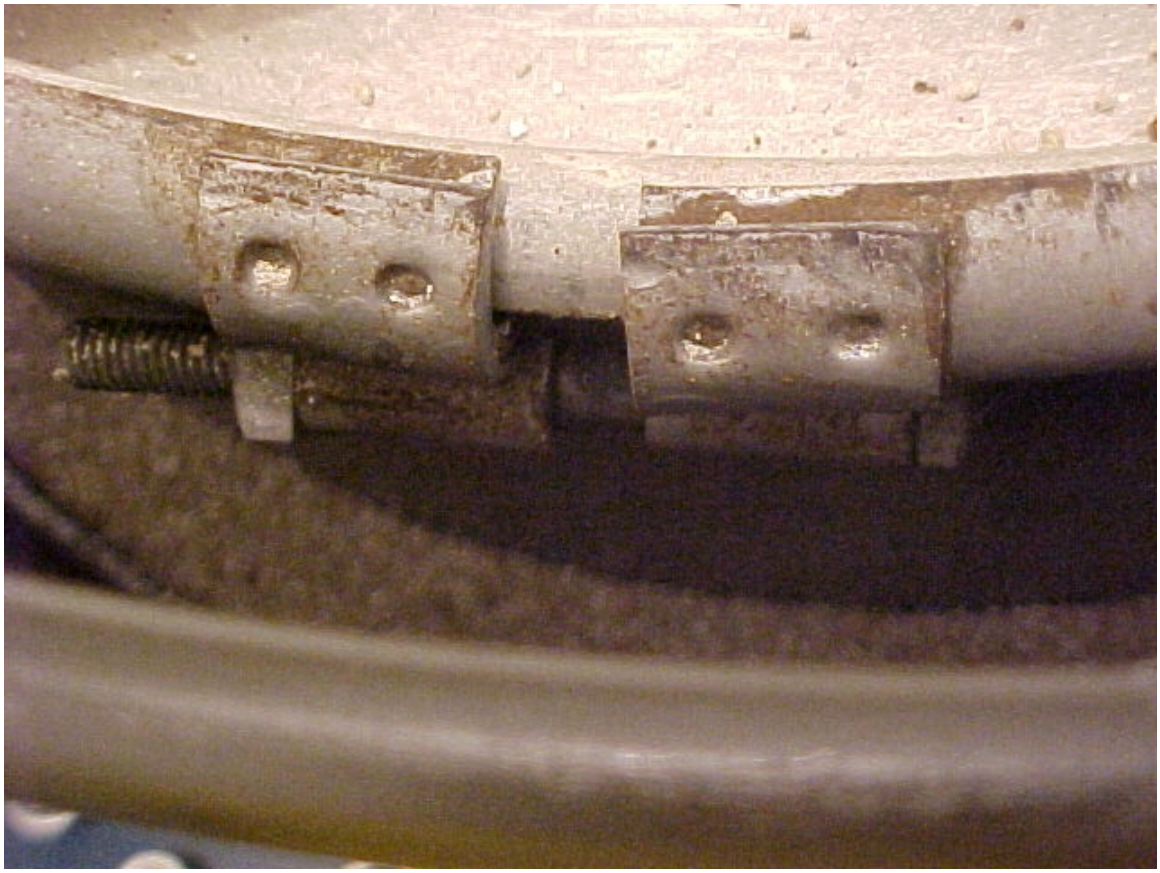


Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	3 of 17
Site	Hammond		

55 gal lid – Good Condition
Ring 3/8 x 3 ½ bolt/nut is in good condition/tight
55 gal drum is in a 85 gal overpack with vermiculite
No gasses present

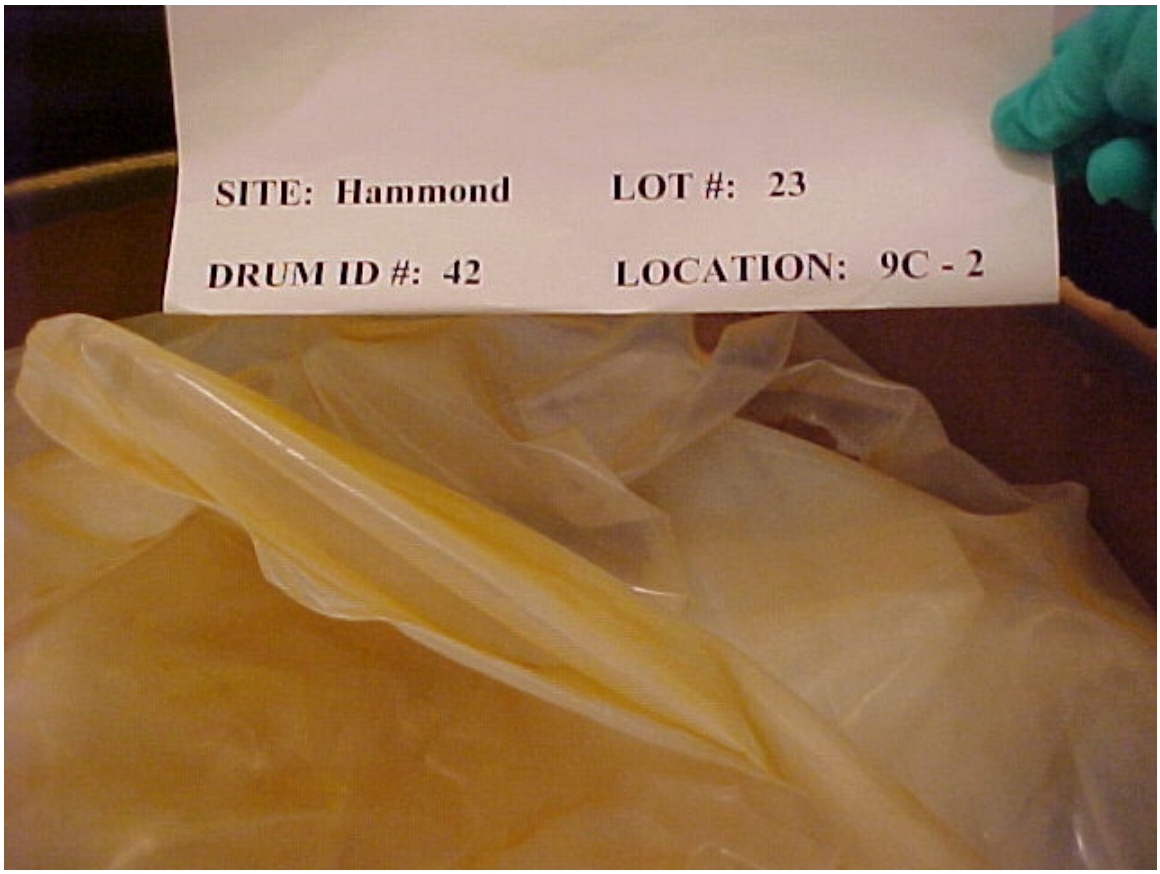
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	4 of 17
Site	Hammond		

This shows the integrity of the lid on the 55-gal container – Good Condition
Notice the 3/8 x 3 ½ bolt and nut combination – difficult to reach bolt/nut combination



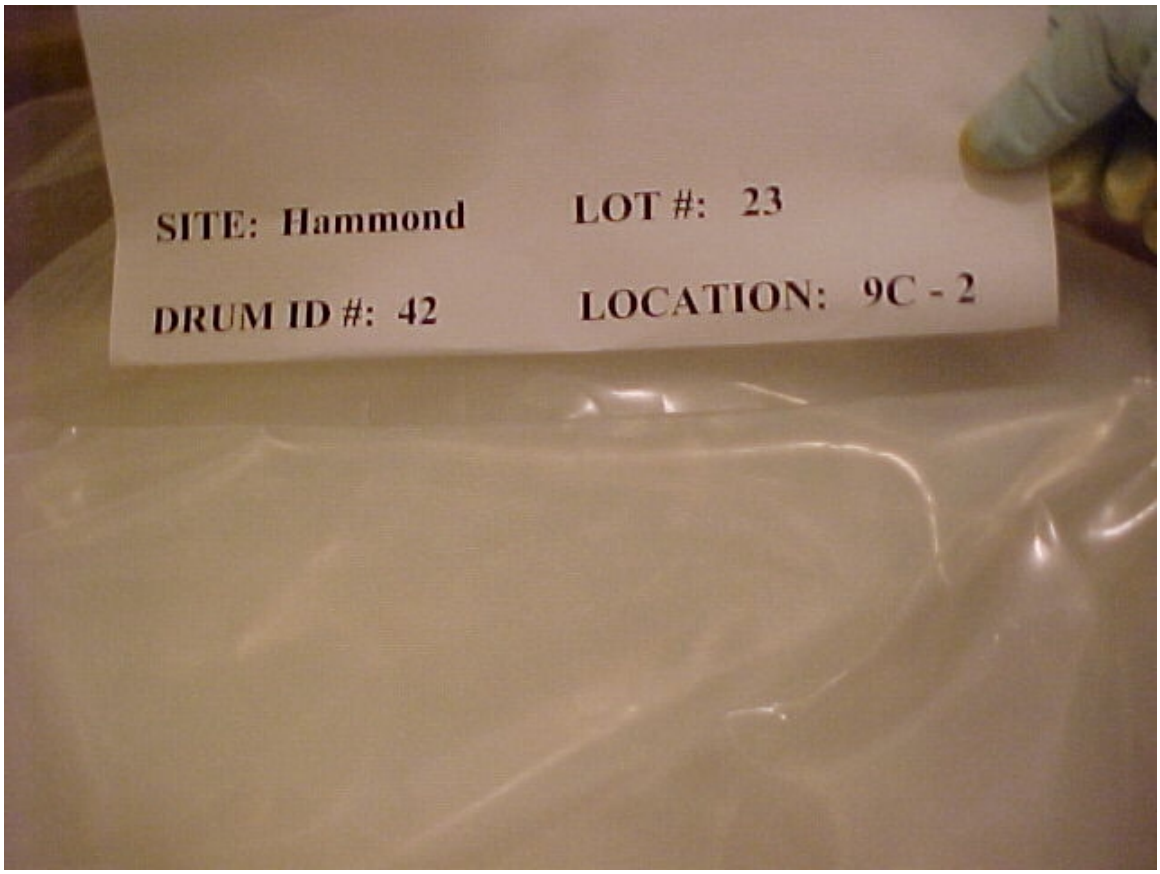
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	5 of 17
Site	Hammond		

1st Poly liner/bag – Good Condition
Liner is sealed and in good condition
No measurement of gasses present



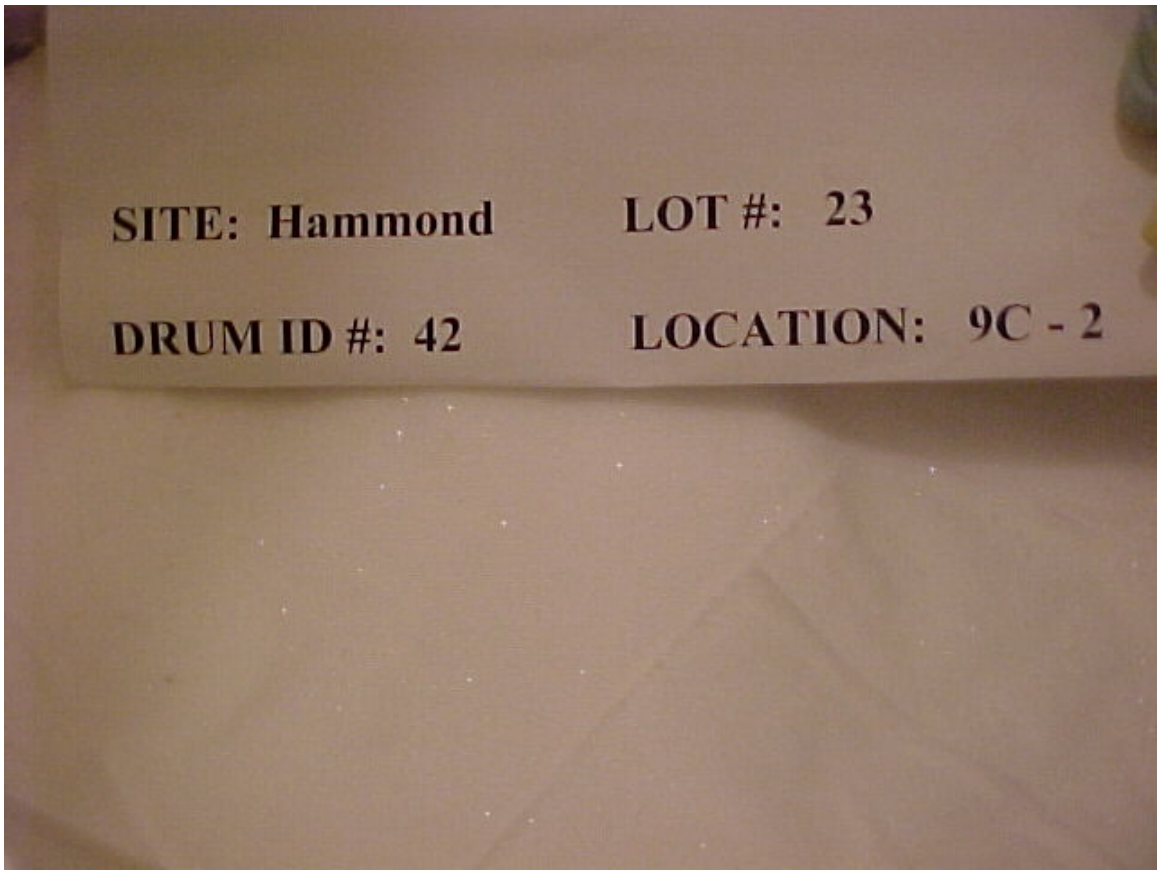
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	6 of 17
Site	Hammond		

2nd Poly liner/bag – Good Condition
No moisture
No gasses present



Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	7 of 17
Site	Hammond		

Monolith - White in color
Solid - dry
No gasses present

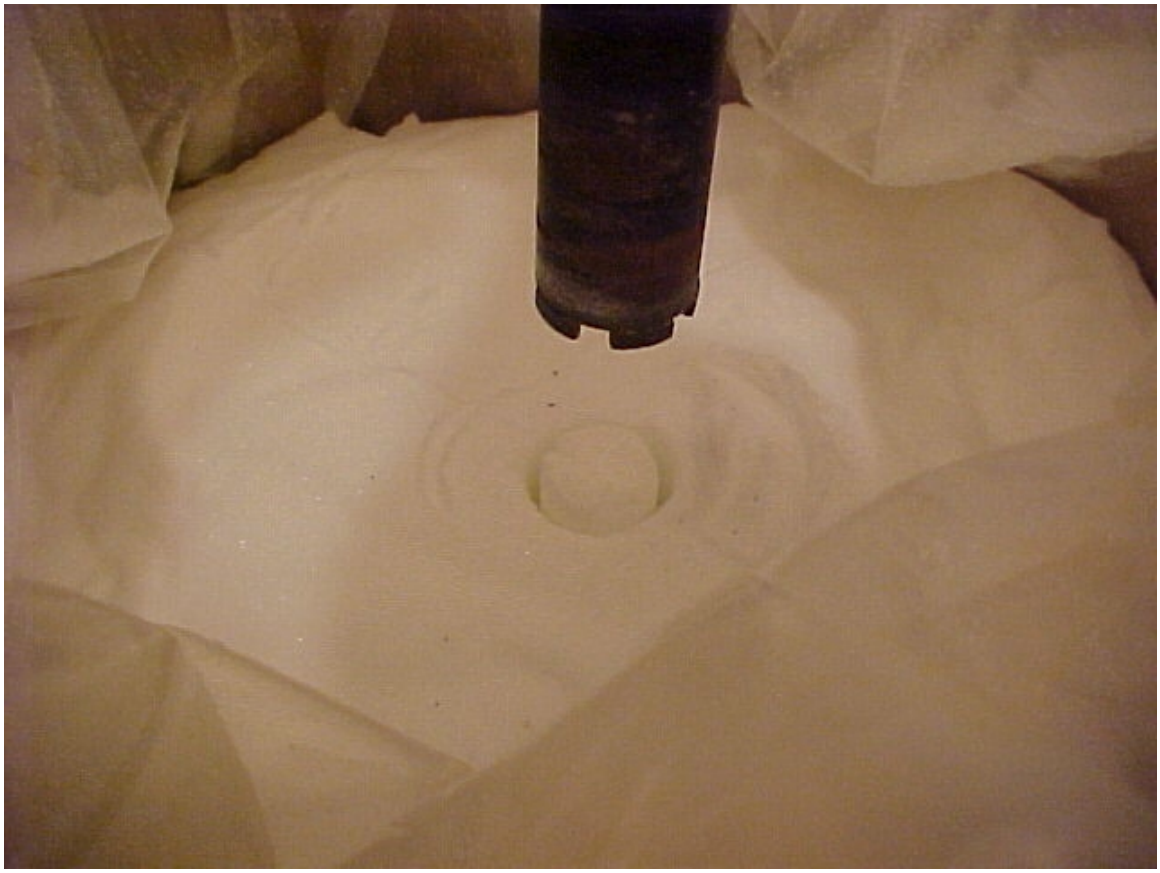


Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	8 of 17
Site	Hammond		

This shows the drill bit with the vaccum adapter in place
No gasses present

Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	9 of 17
Site	Hammond		

Here is the 1st core sample taken
No gasses present

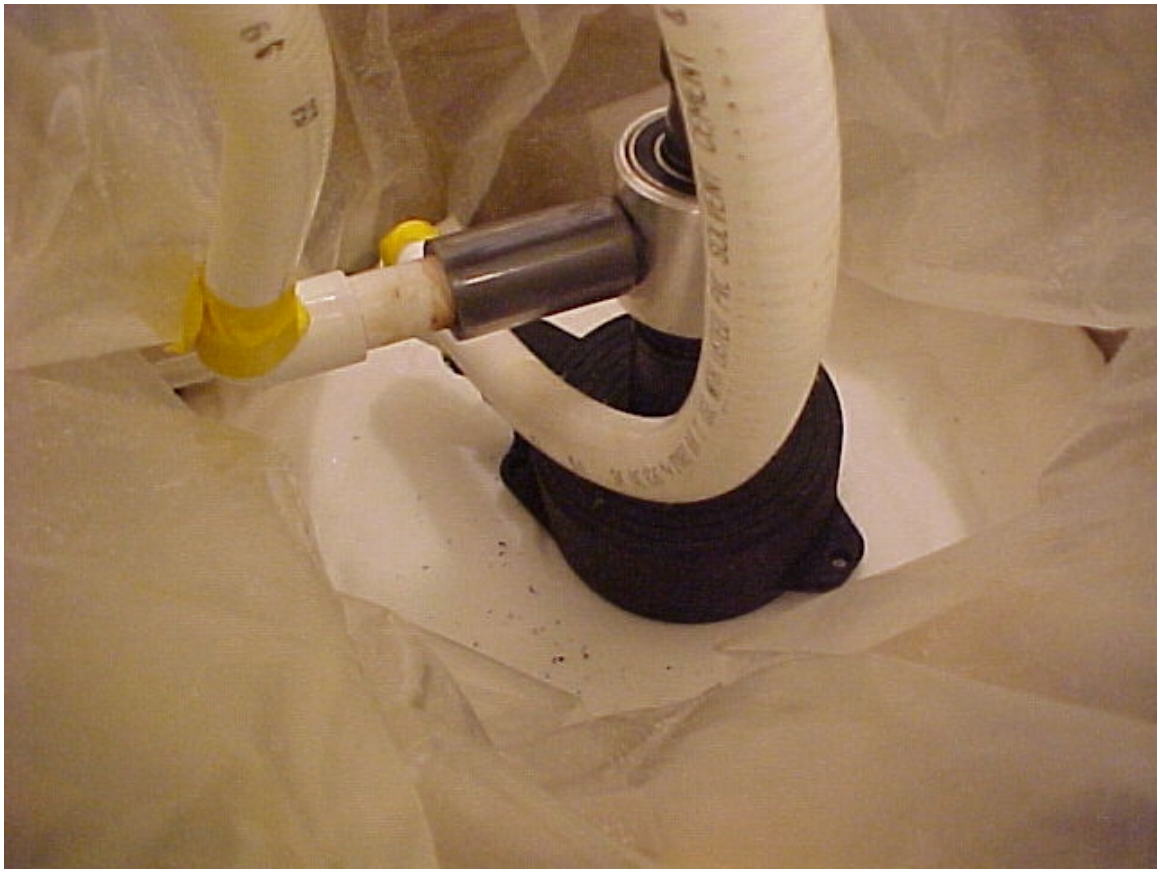


Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	10 of 17
Site	Hammond		

This picture shows how the vacuum system works
We are drilling for the 2nd core sample
No gasses are present

Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	11 of 17
Site	Hammond		

Another picture of the drill and vacuum system operating
No gasses present

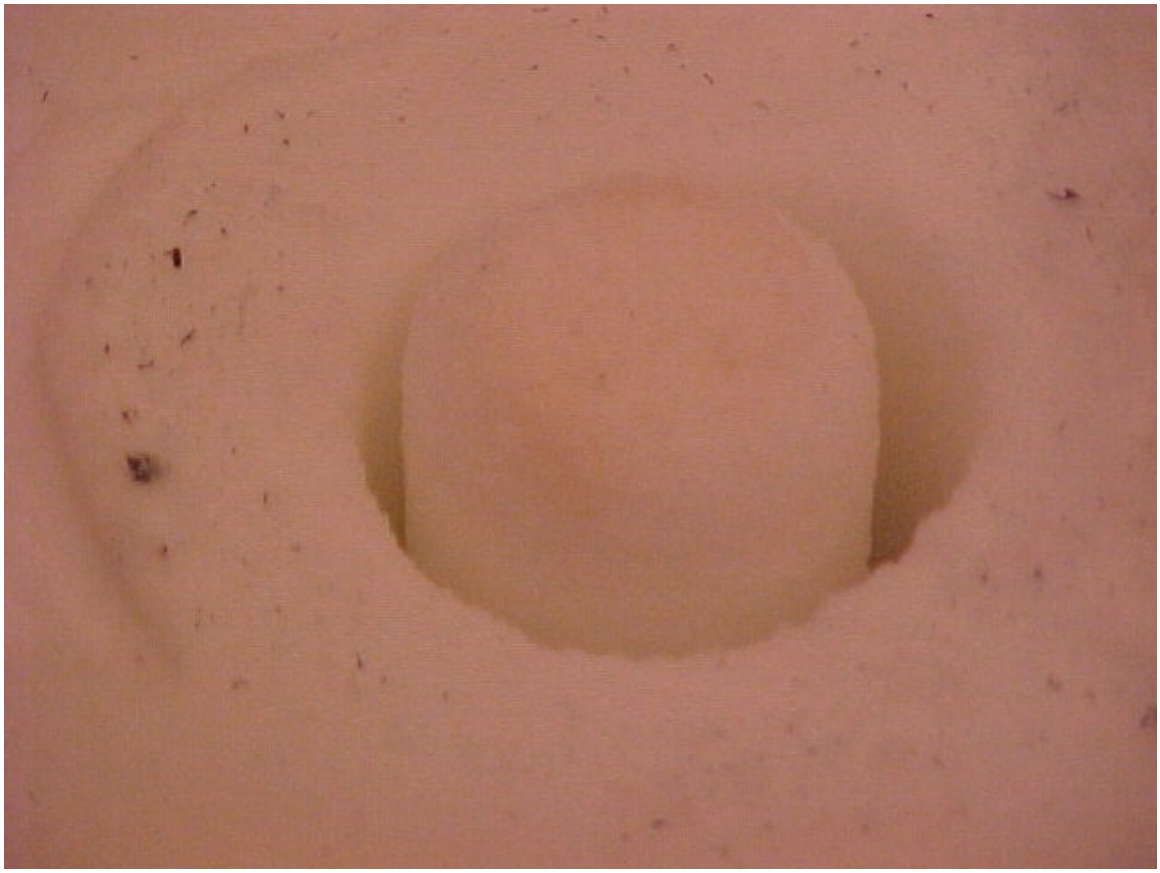


Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	12 of 17
Site	Hammond		

Lifting the drill and vacuum cover shows a piece of the core sample
No gasses present

Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	13 of 17
Site	Hammond		

A closes-up picture of the 2nd core sample still in the core block
No gasses present



Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	14 of 17
Site	Hammond		

Here is a picture of the 1st core sample
Notice that the paper is 8 ½ x 11 landscape
This shows the core sample is about 8'' long and in good condition
This core sample weight is 572gm
There are no gasses present

Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	15 of 17
Site	Hammond		

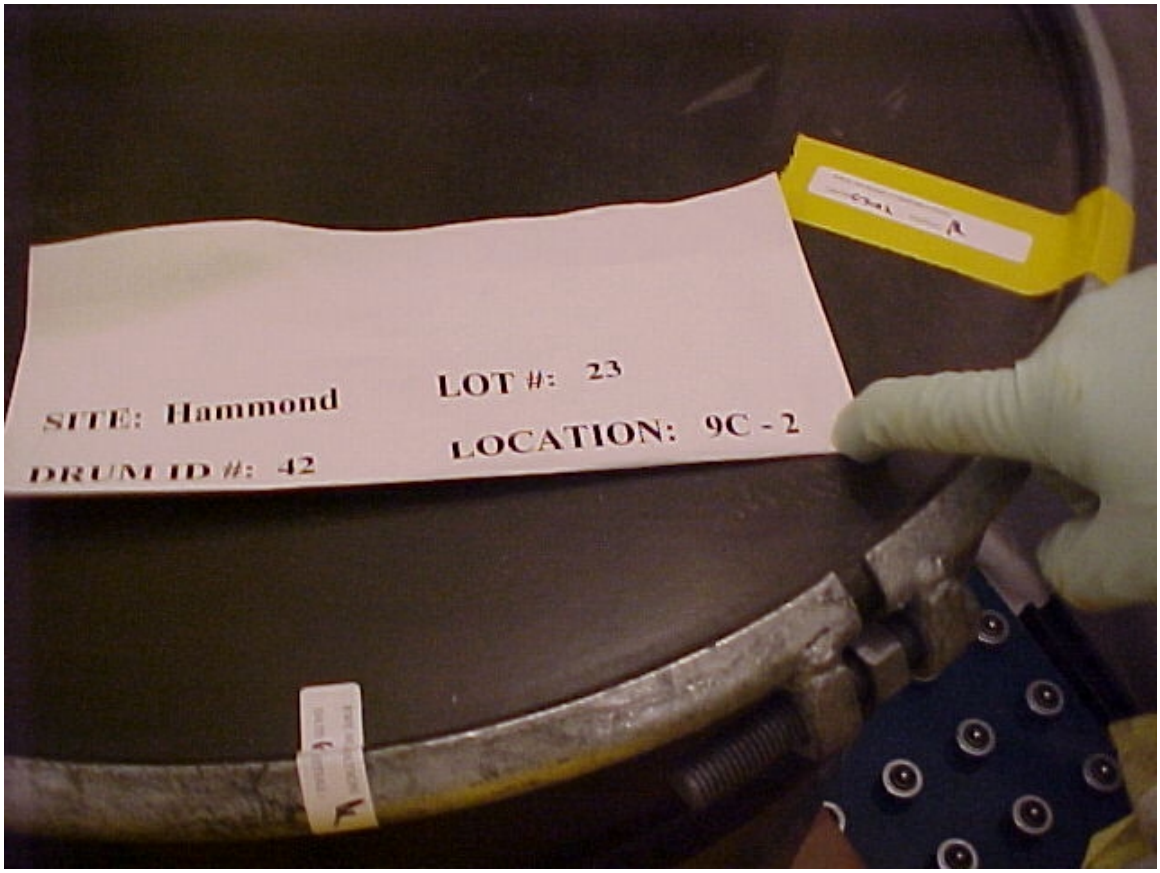
Both core holes drilled with one core sample already taken out
This picture shows a clean cut with the drill
No gasses present

Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	16 of 17
Site	Hammond		

55-gal drum ring placement – Good Condition
Ring is installed upside down for easy access
No gasses present

Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Date	6-07-2002
Location	9C-2	Photo No.	17 of 17
Site	Hammond		

85-gal container – Good Condition
Sealed/dated - Completed



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Hammond Depot
Lot #29 – Drum #4
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 29 Drum ID #: 4 Location: Warehouse 100W - 9B – 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 30mR/hr DR at 1 meter 3mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container # 2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

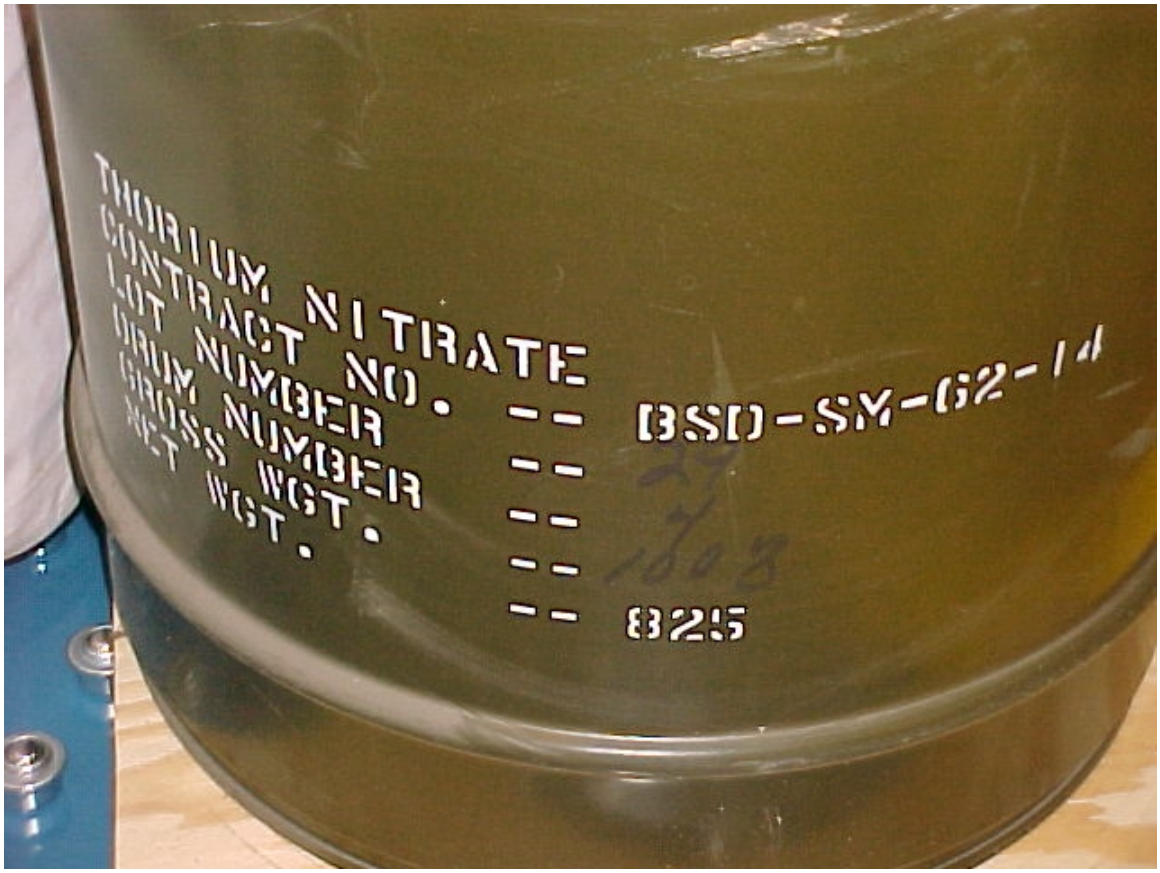
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

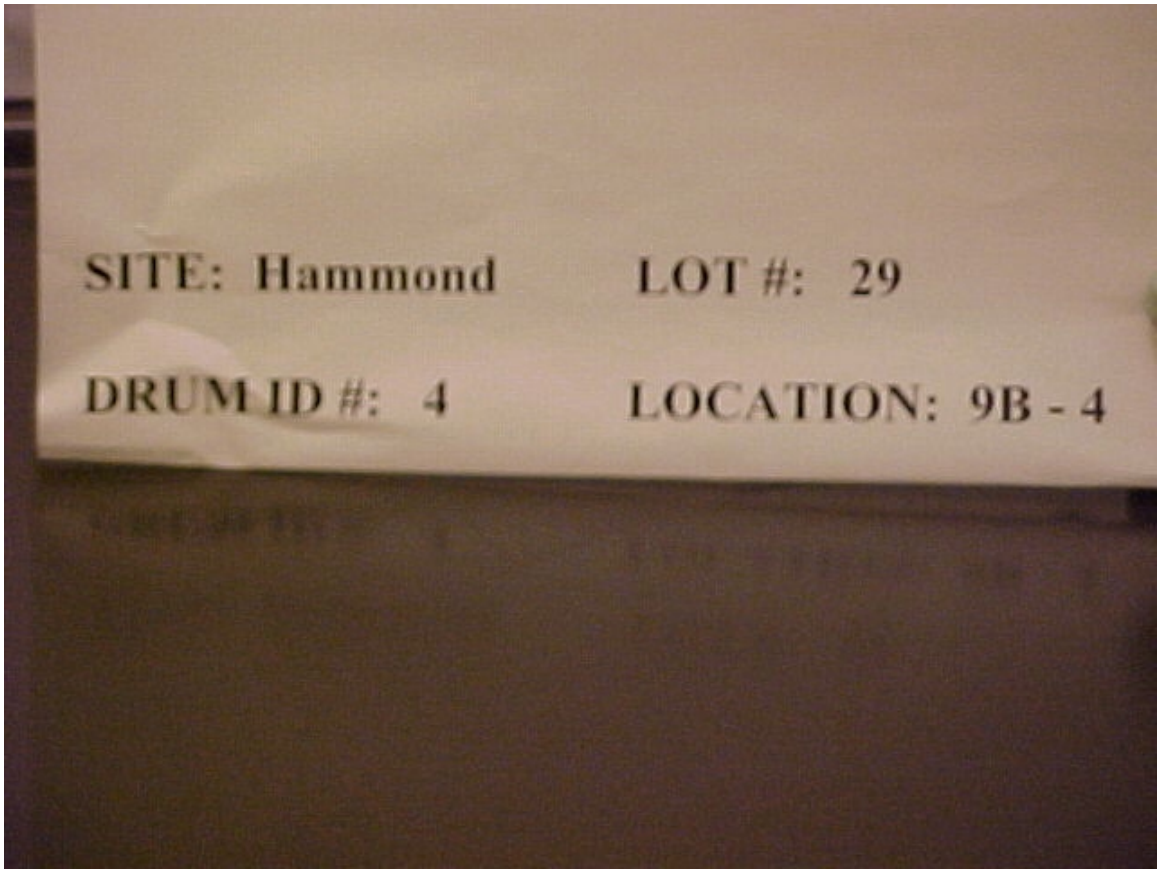
Checklist completed by: Tony Cunningham (signature on file) Date: 6-10-02

Lot No.	29		Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4		Date	6-07-2002
Location	9B-4		Photo No.	1 of 12
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	30 mR/hr		
	1 meter	3 mR/hr		



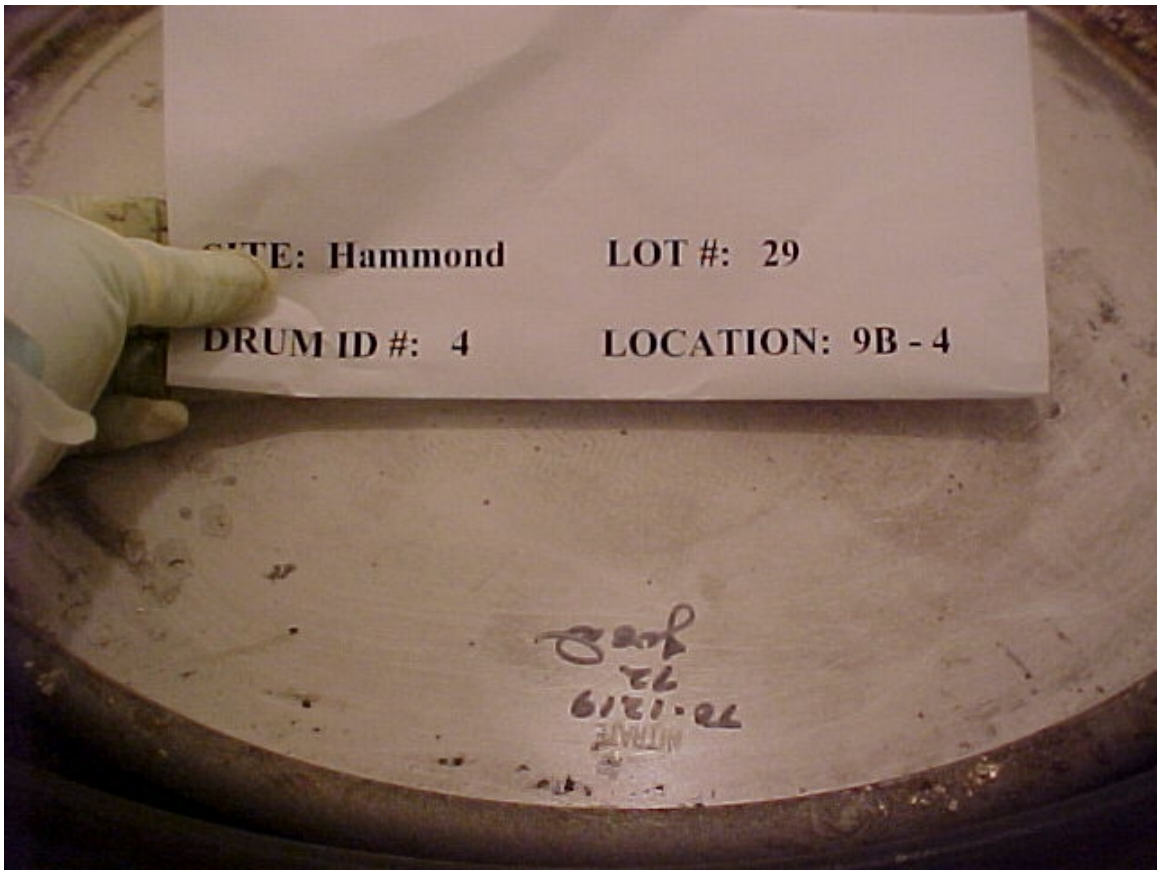
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	2 of 12
Site	Hammond		

85 gal drum lid – Good Condition
Ring is also in good condition



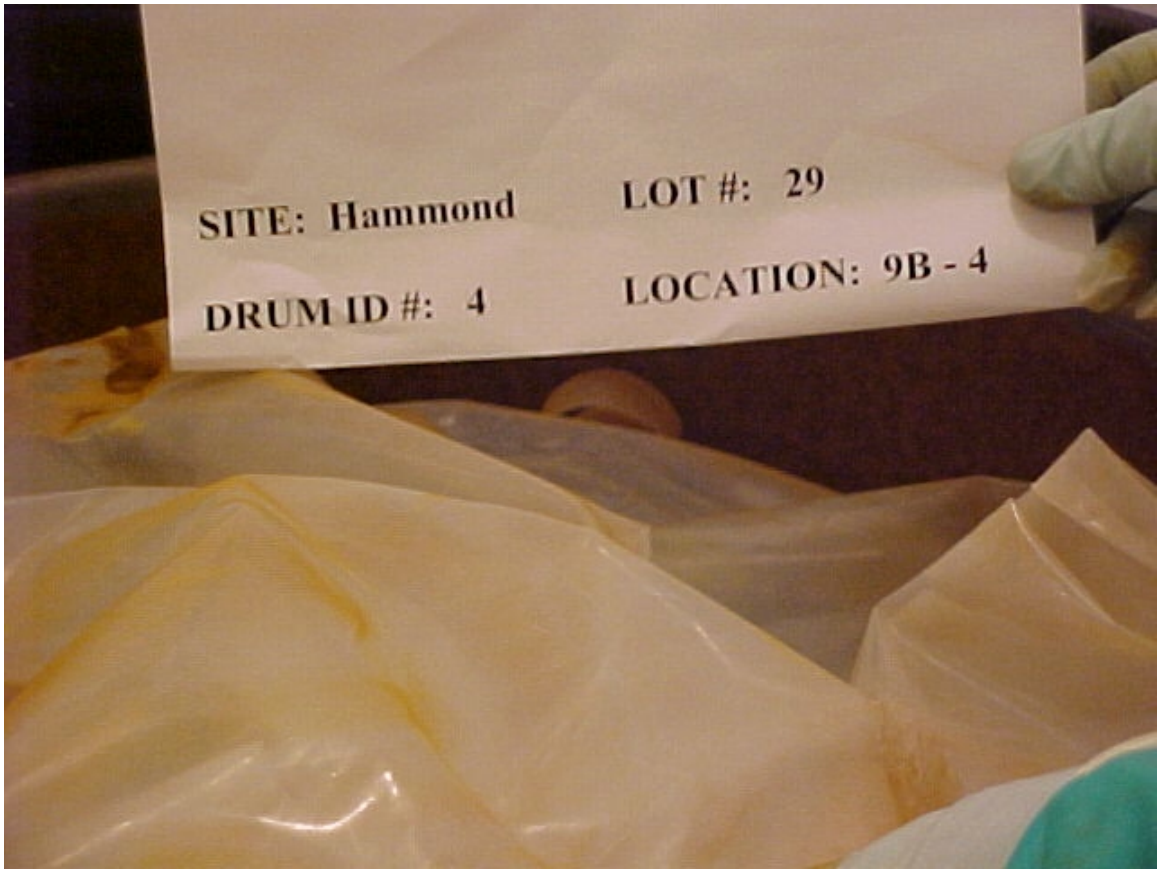
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	3 of 12
Site	Hammond		

55 gal containers lid – Good Condition
Ring is bolted with a 3/8 x 3-1/2 bolt
55 gal drum is placed in a 85 overpack with vermiculite
No gasses present



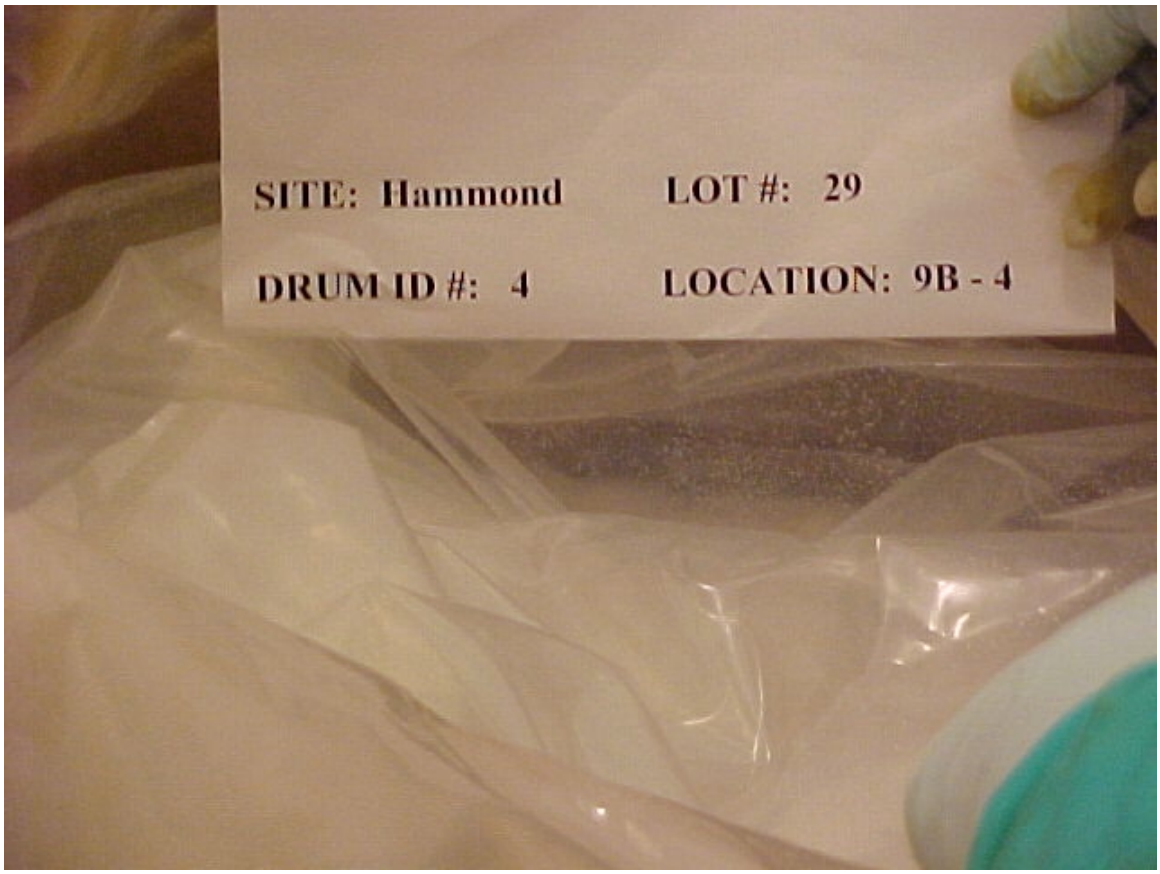
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	4 of 12
Site	Hammond		

1st poly liner/bag – Good Condition
Seal is in good condition
No gassed present



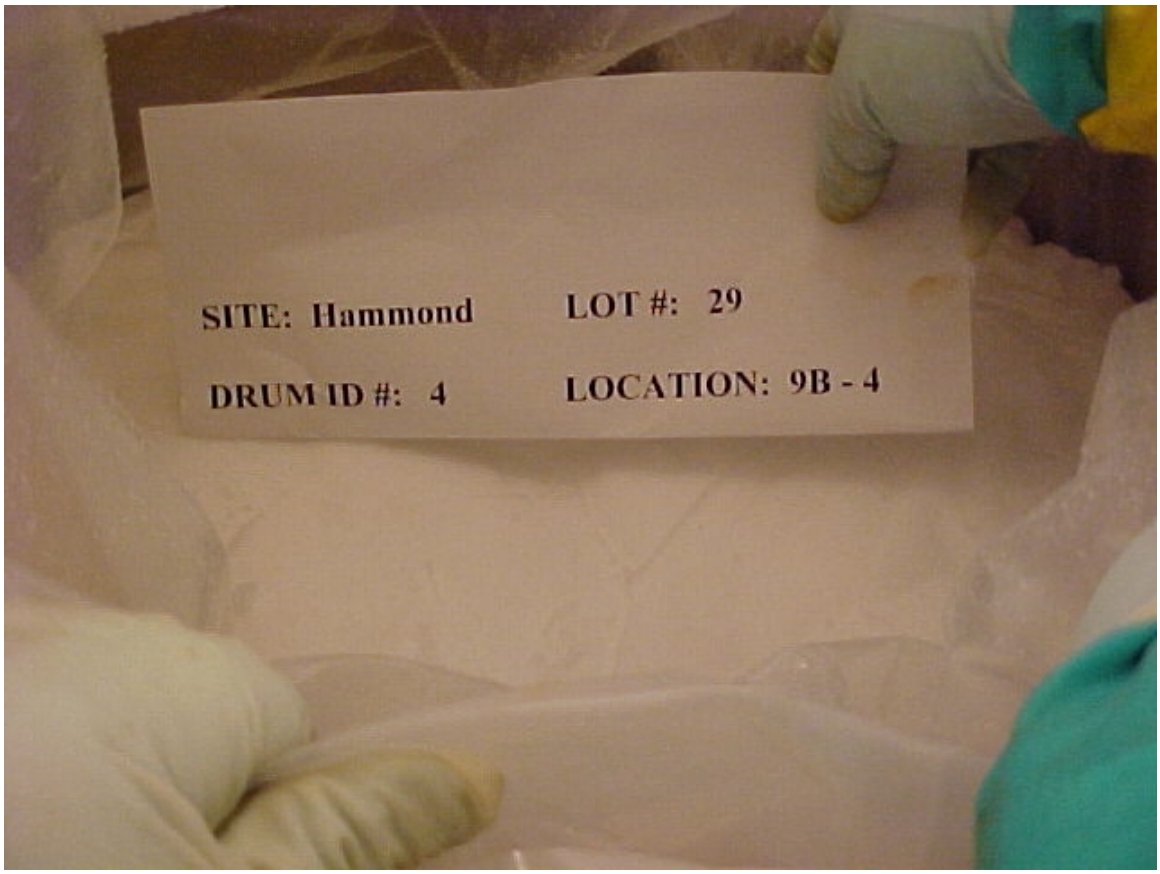
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	5 of 12
Site	Hammond		

2nd poly liner/bag – Good Condition
Moisture crystals present inside bag
No gasses present



Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	6 of 12
Site	Hammond		

Monolith – white in color
Solid – very dry
No gasses present while monitoring



Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	7 of 12
Site	Hammond		

This shows (1) one core already drilled and another core sample is being drilled
No gasses are present

Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	8 of 12
Site	Hammond		

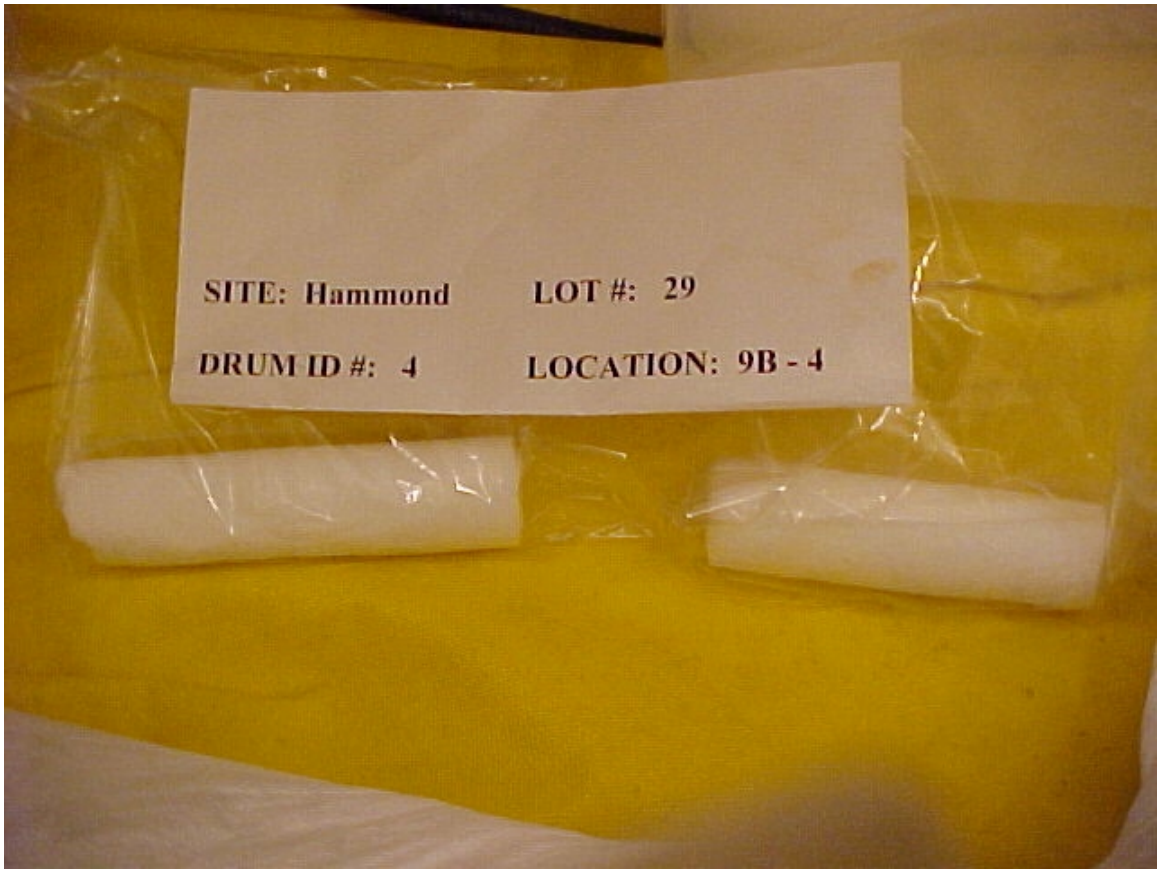
The drill bit is lifted from the core sample
Some particles fall over core
Both core samples are in view
No gasses present

Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	9 of 12
Site	Hammond		

Both core samples lying on top of core block – both are in good condition
No gasses present

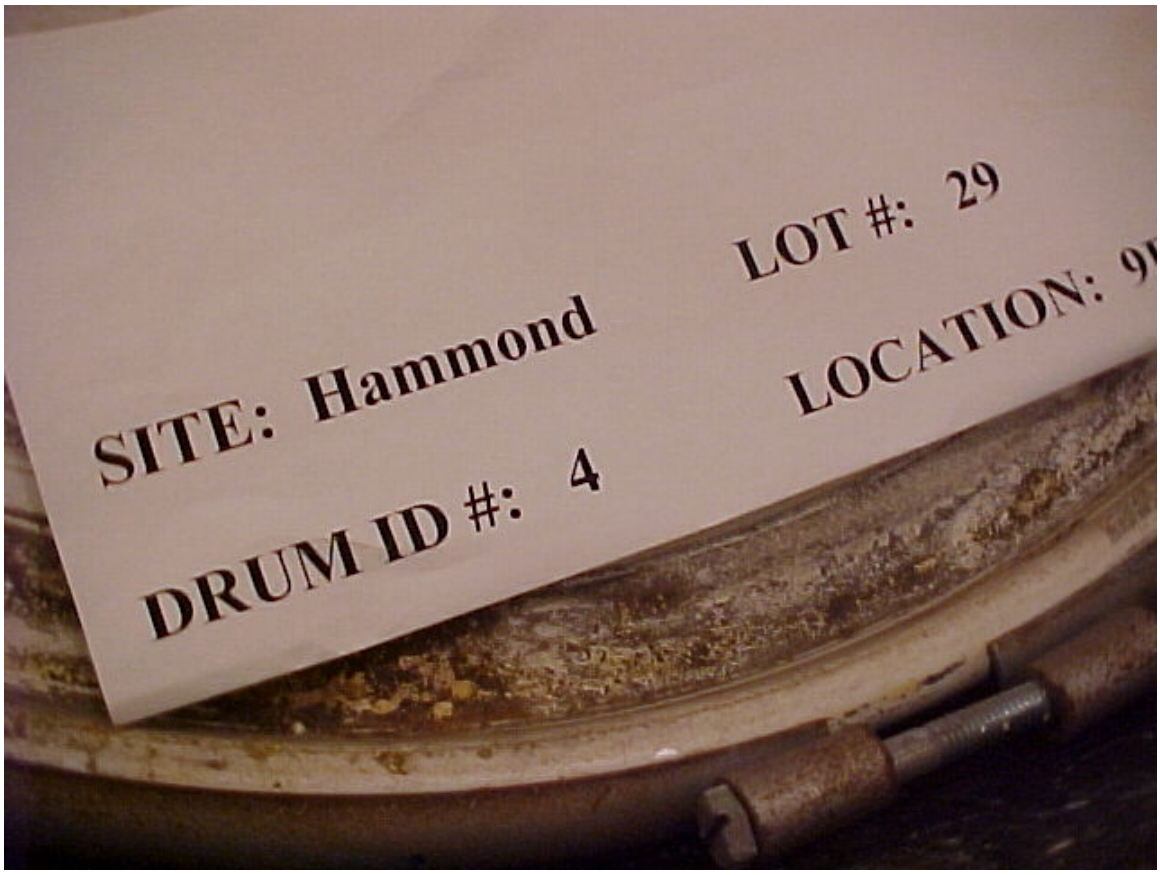
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	10 of 12
Site	Hammond		

Here both core samples are sealed in individual plastic bags
Weight of the core on the left – 629 gm
Weight of the core on the right – 518 gm



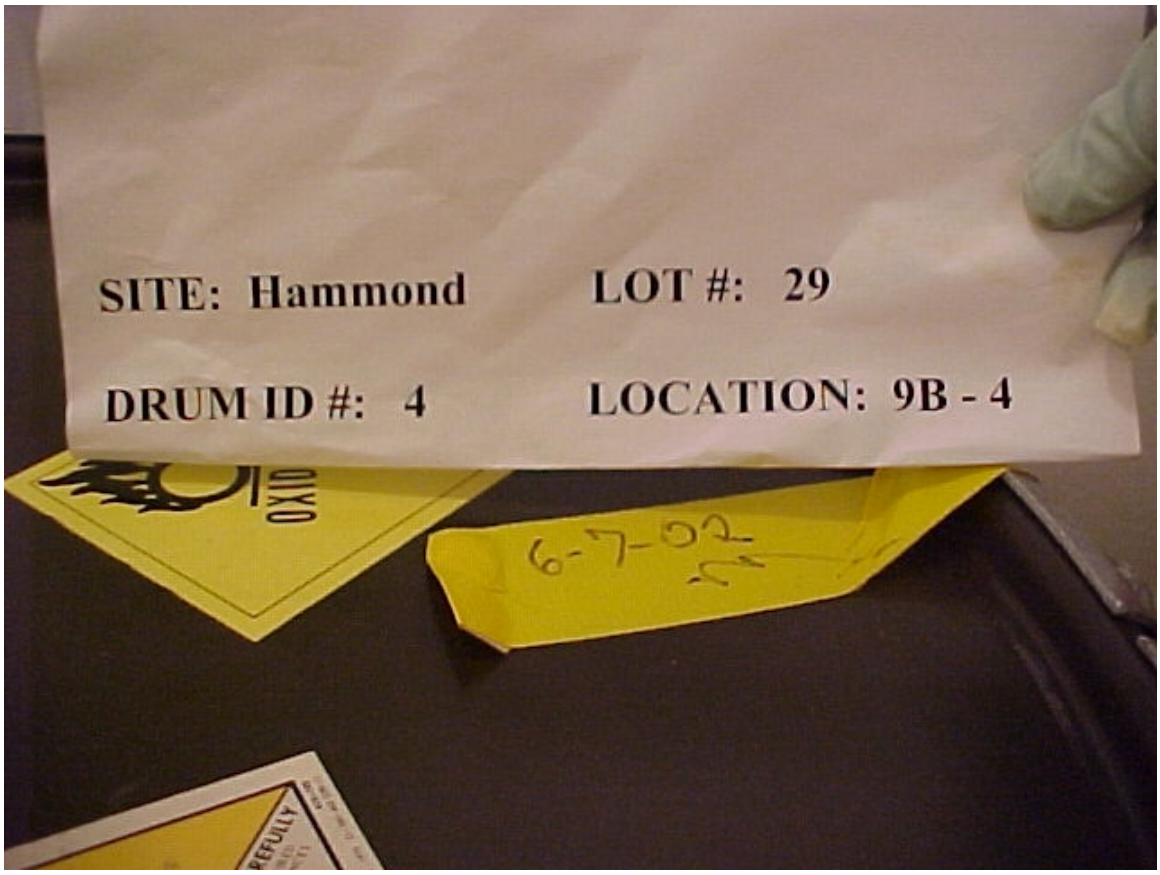
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	11 of 12
Site	Hammond		

55 gal drum lid secured and in good condition
Ring on upside down to tighten bolts
No gasses are present



Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	4	Date	6-07-2002
Location	9B-4	Photo No.	12 of 12
Site	Hammond		

85-gal container – Good Condition
Sealed/Dated – Completed



Hammond Depot
Lot #30 – Drum #6
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 30 Drum ID #: 6 Location: Warehouse 100W - 9D – 1

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

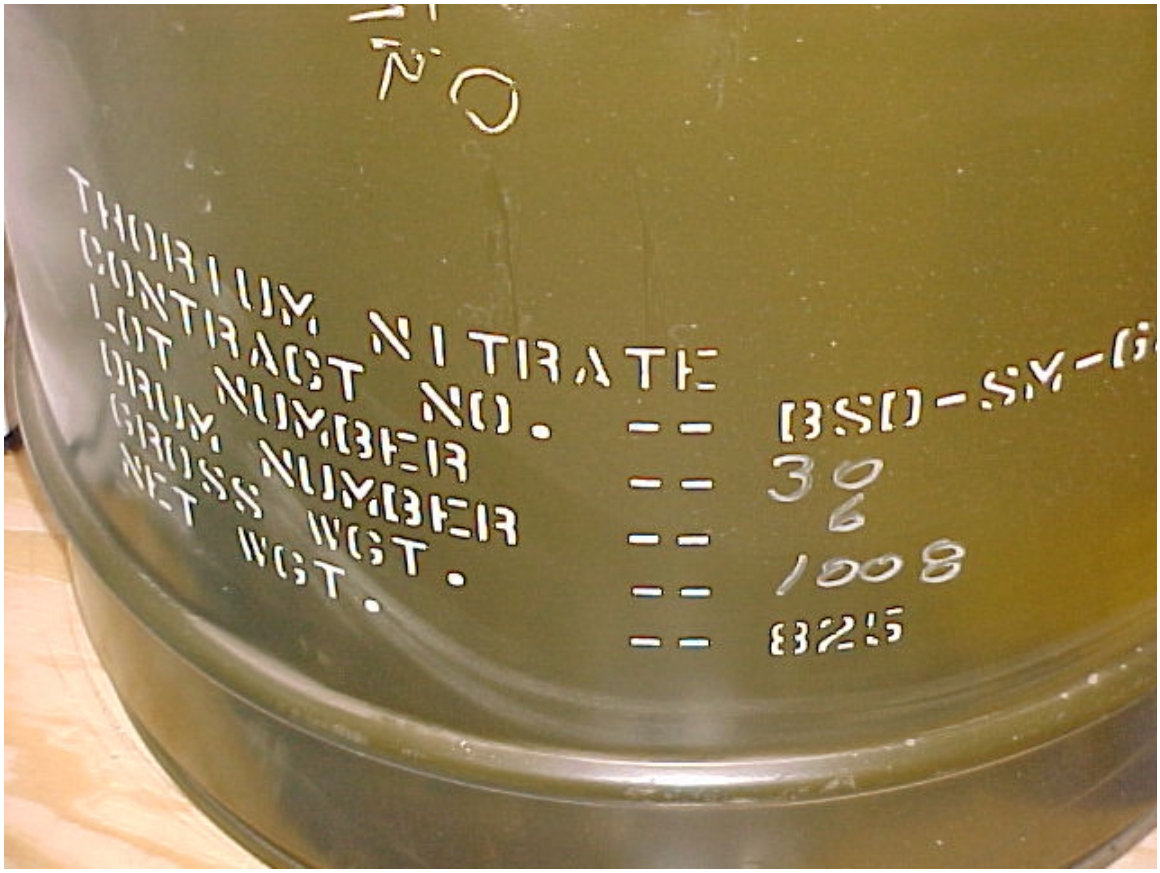
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: very dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

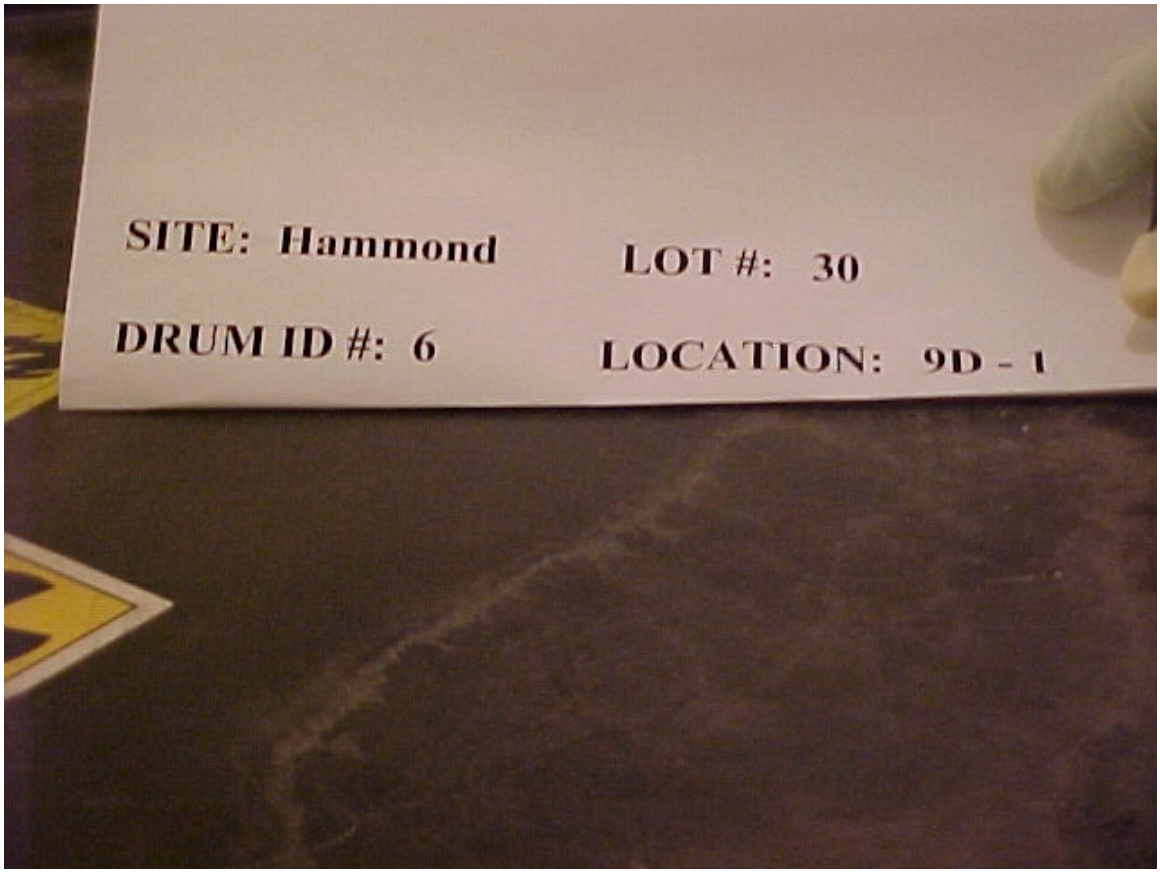
Checklist completed by: Tony Cunningham (signature on file) Date: 6-07-02

Lot No.	30		Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6		Date	6-07-2002
Location	9D-1		Photo No.	1 of 16
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	32 mR/hr		
	1 meter	3 mR/hr		



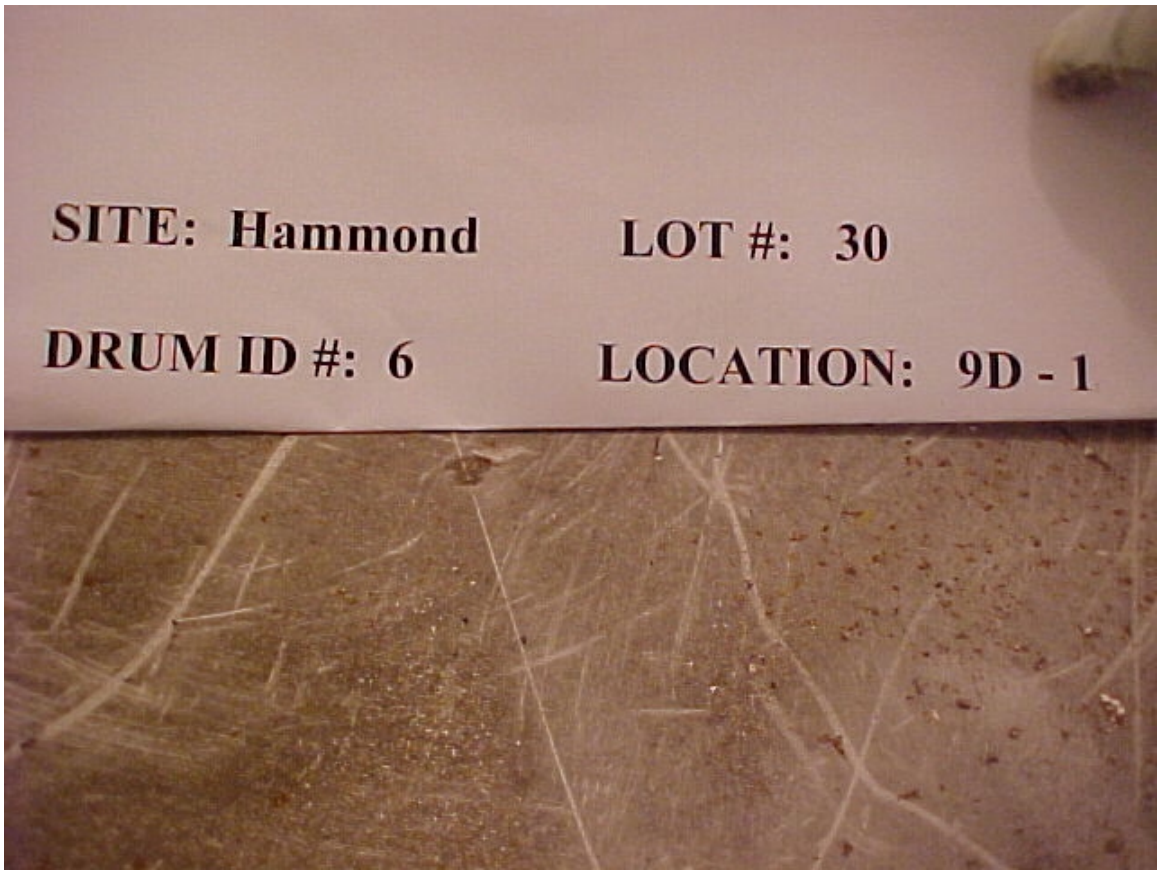
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	2 of 16
Site	Hammond		

85 gal drum lid – Good Condition
Ring on drum lid is in good condition



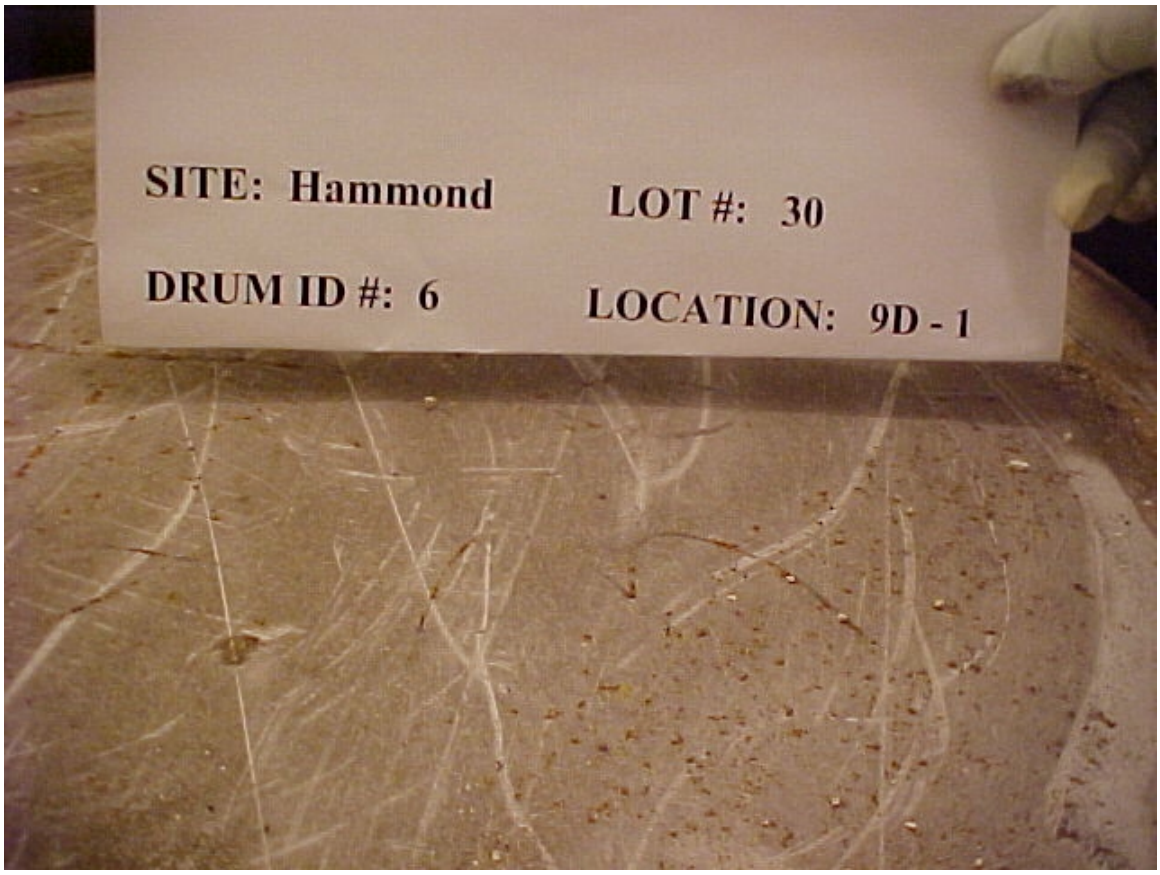
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	3 of 16
Site	Hammond		

55-gal container – Good Condition
Ring on 55 gal drum is also in good condition
Ring has a 3/8 x 3 ½ bolt – rusty and tight
55 gal drum is package in a 85 gal overpack with vermiculite



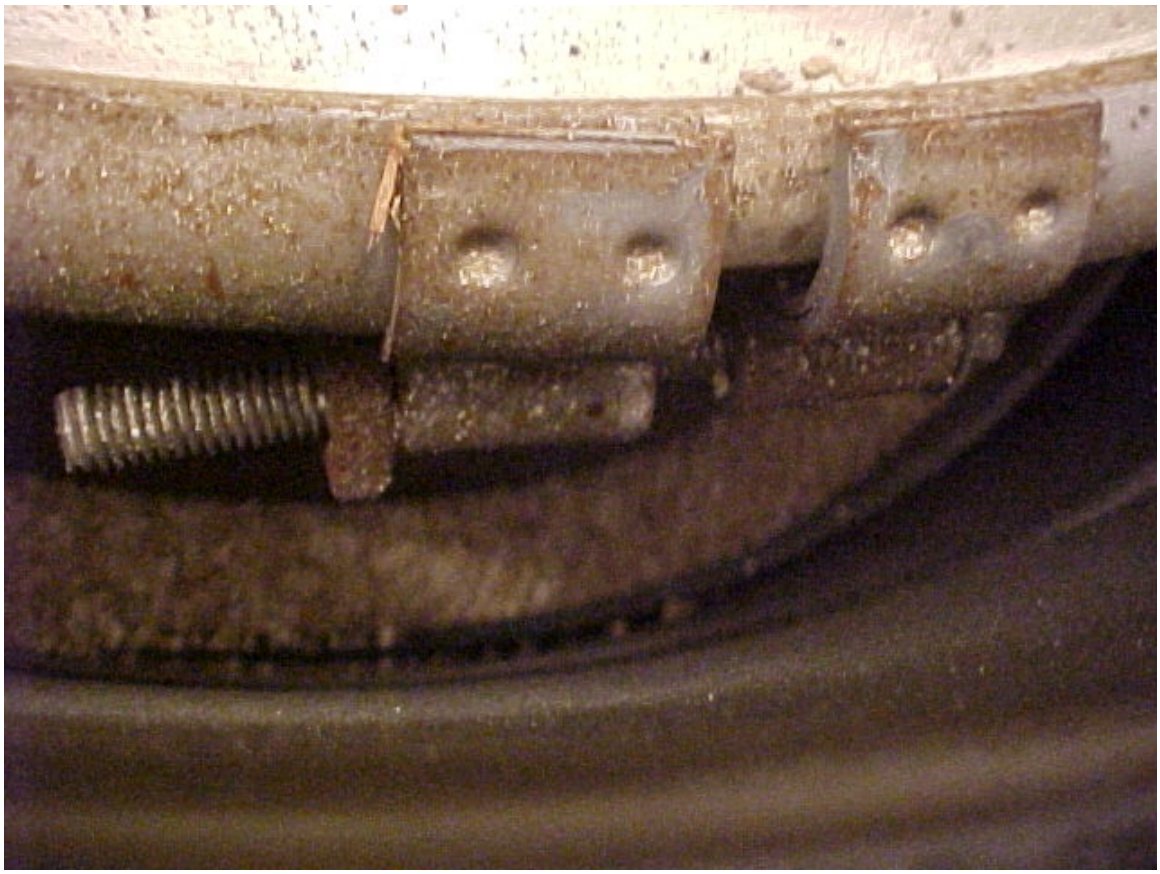
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	4 of 16
Site	Hammond		

Another picture of the 55 gal drum lid



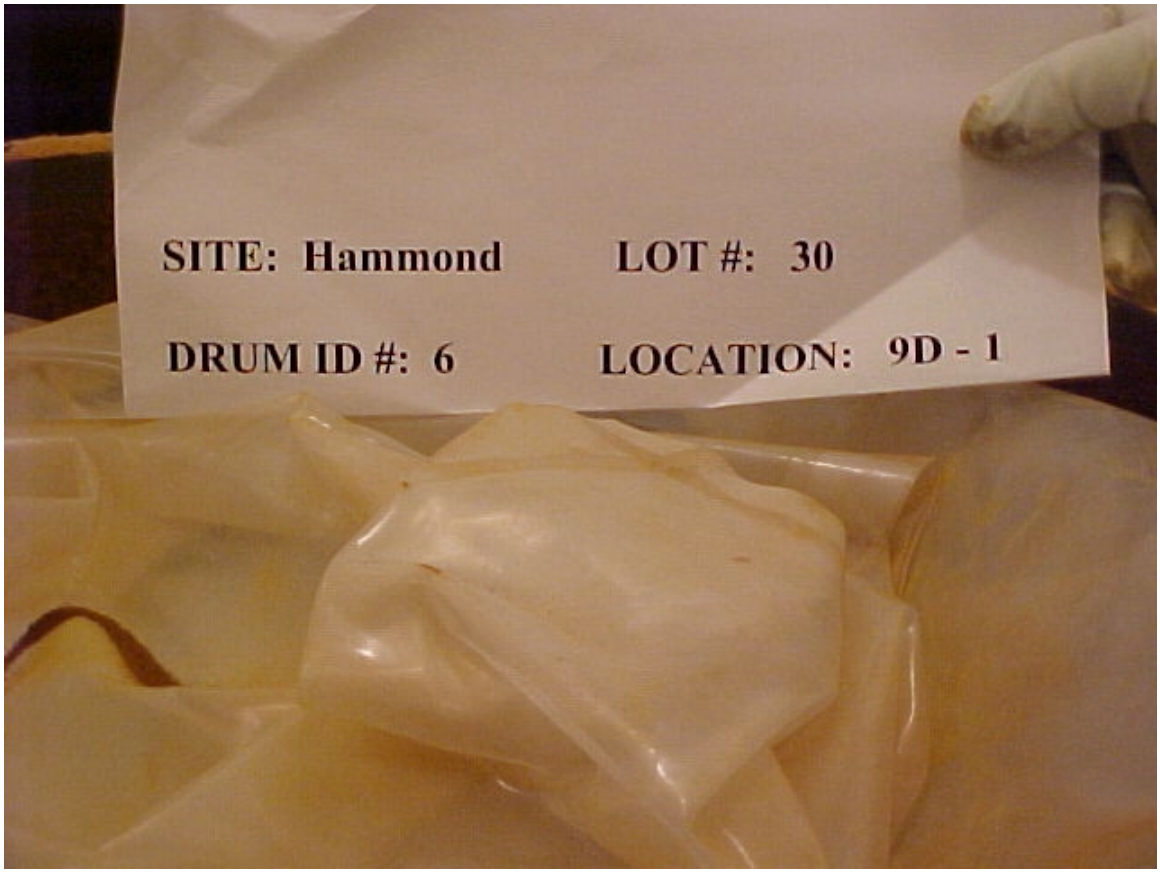
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	5 of 16
Site	Hammond		

This shows the difficulty at getting to some of the 3/8 bolts
Underneath and bent
No gasses present



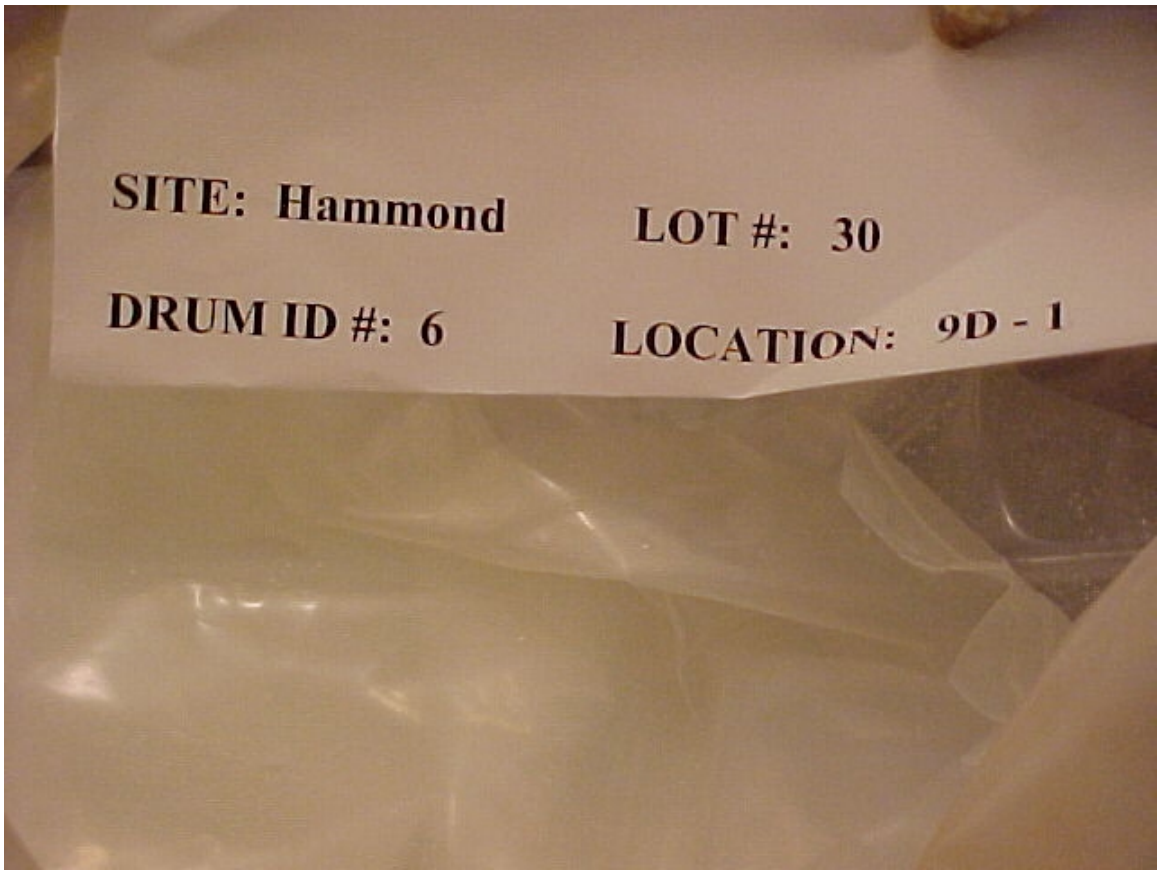
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	6 of 16
Site	Hammond		

1st Poly liner/bag – Good Condition
No gasses present



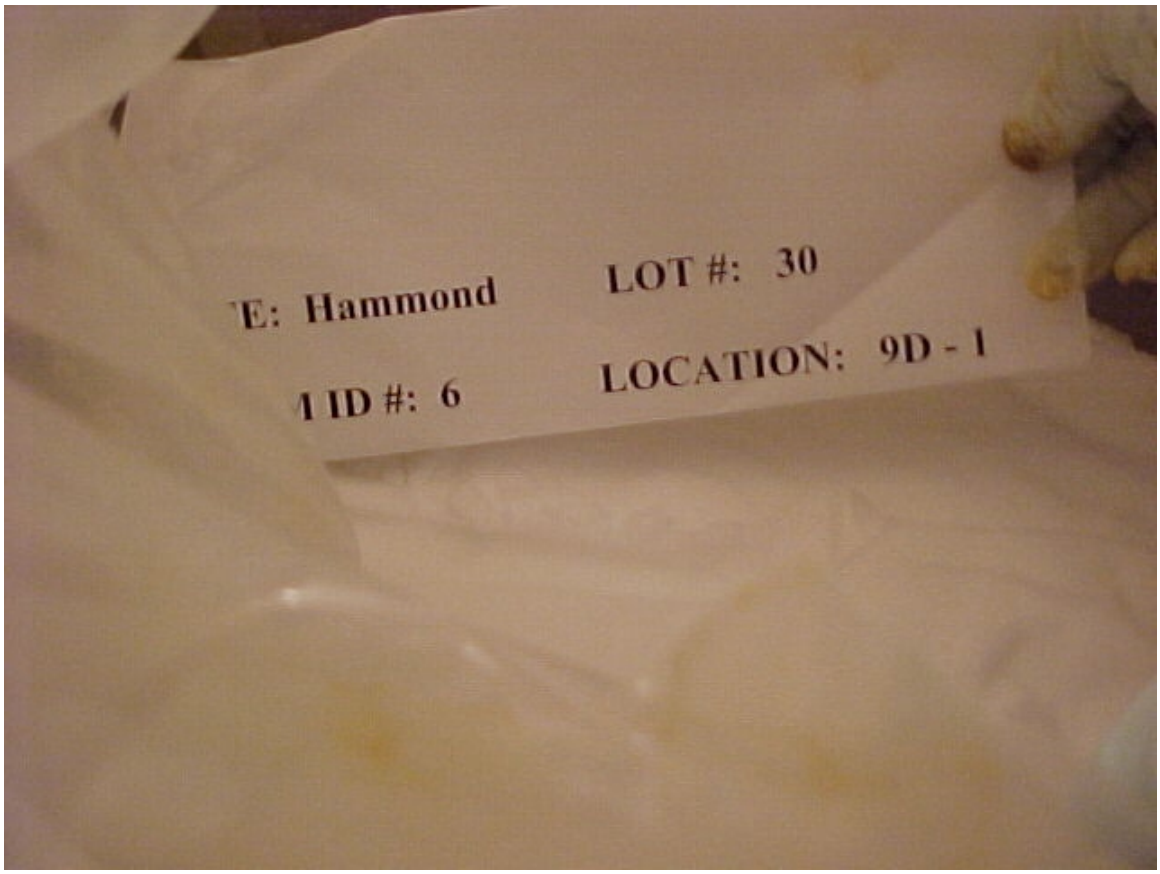
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	7 of 16
Site	Hammond		

2nd poly liner/bag – Good Condition
No moisture
No gasses present



Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	8 of 16
Site	Hammond		

Monolith - white in color
Solid - very dry
No gasses present



Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	9 of 16
Site	Hammond		

Close-up of drill right before drilling of a core sample
No gasses present

Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	10 of 16
Site	Hammond		

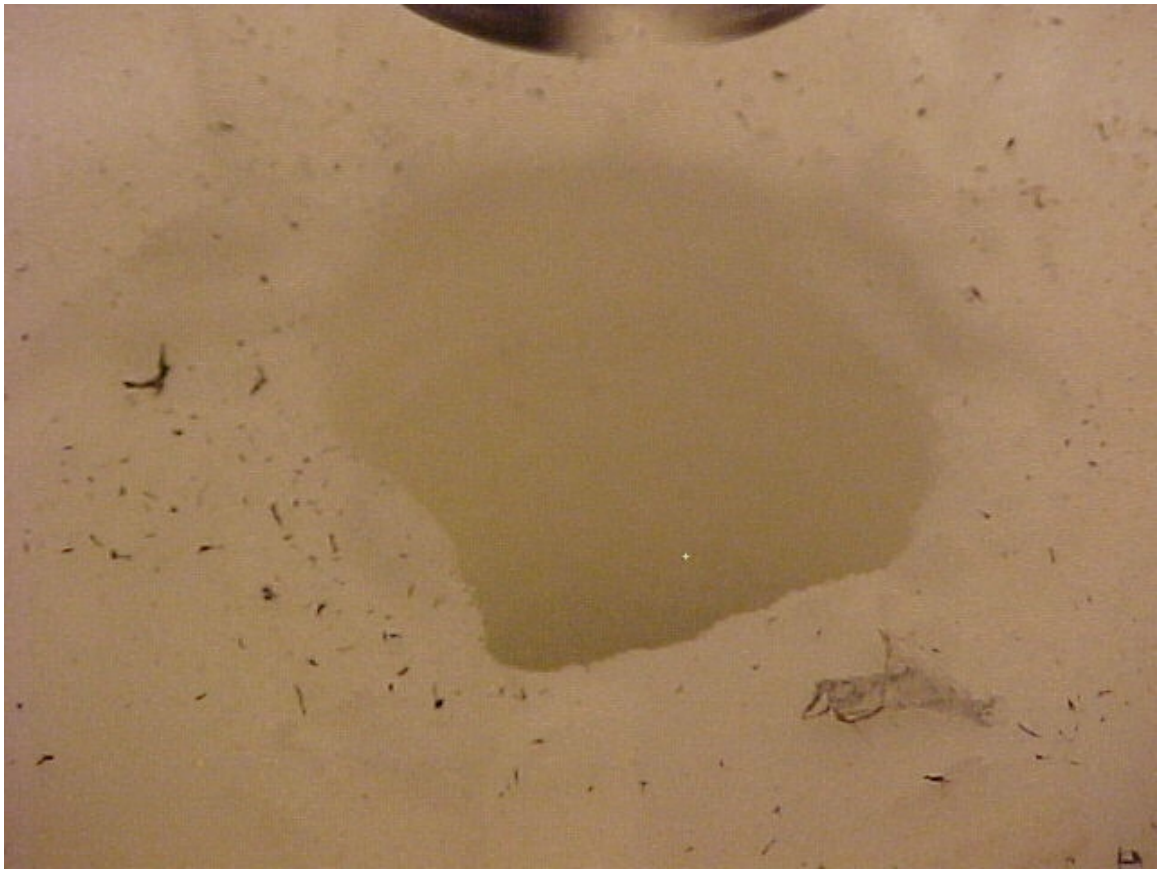
Close-up of drill, drilling through monolith block
No gasses present

Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	11 of 16
Site	Hammond		

A look at the vacuum system for the drill
No gasses present

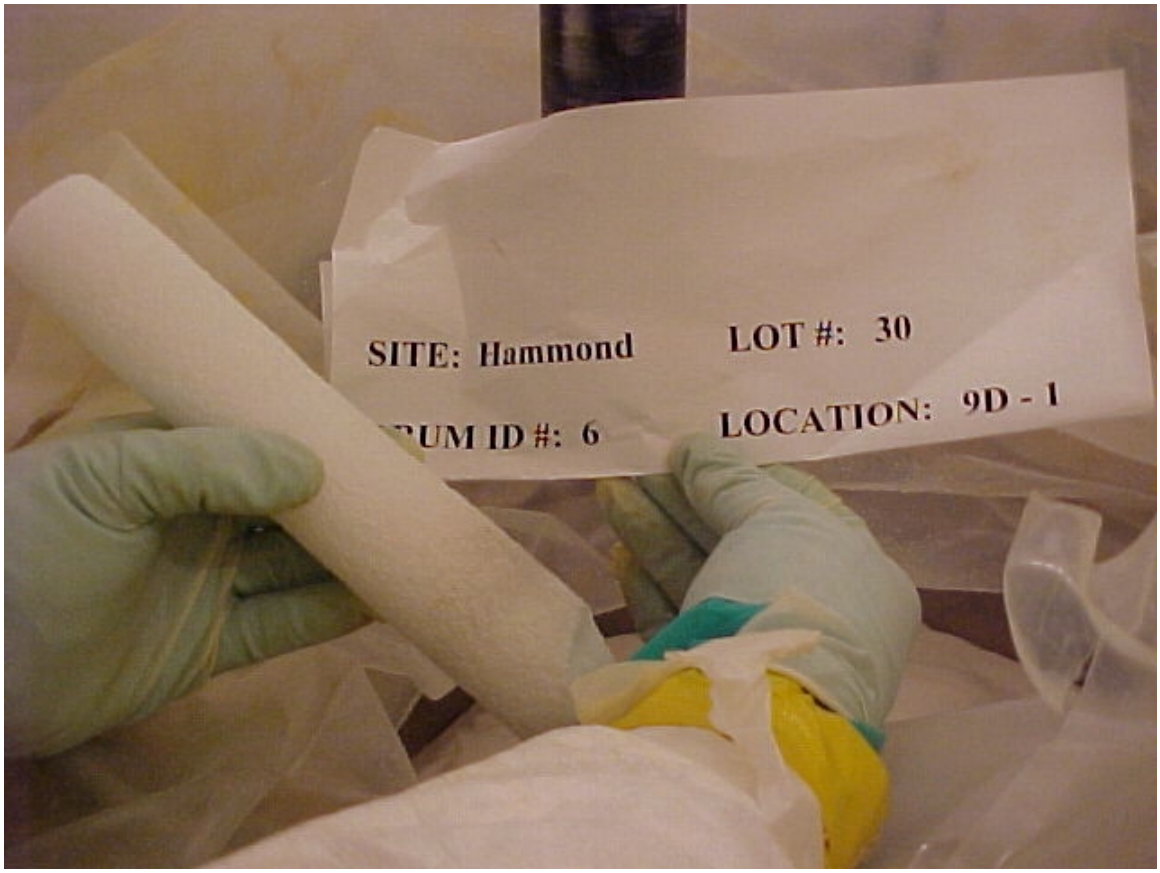
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	12 of 16
Site	Hammond		

A hole were the drill left after core sample was taken out
The black dots are the plastic housing on the vacuum cover



Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	13 of 16
Site	Hammond		

Here is a picture of the core that was taken
No gasses present



Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	14 of 16
Site	Hammond		

55 gal container lid– Good Condition
Ring is tight and secure
No gasses present

Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	15 of 16
Site	Hammond		

This is a picture of underneath the 85 gal lid; although difficult to make out from the photograph, the underside of the lid has no rust or discoloration

Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-07-2002
Location	9D-1	Photo No.	16 of 16
Site	Hammond		

85-gal container – Good Condition
Sealed/dated - Completed

Hammond Depot
Lot #38 – Drum #25
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 38 Drum ID #: 25 Location: Warehouse 100W - 15C – 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good -- damp inside
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith broken pieces
Dryness: dry
Moisture or Liquids Present: Moisture present inside 2nd Polyliner/bag
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: Tony Cunningham (signature on file) Date: 6-10-02

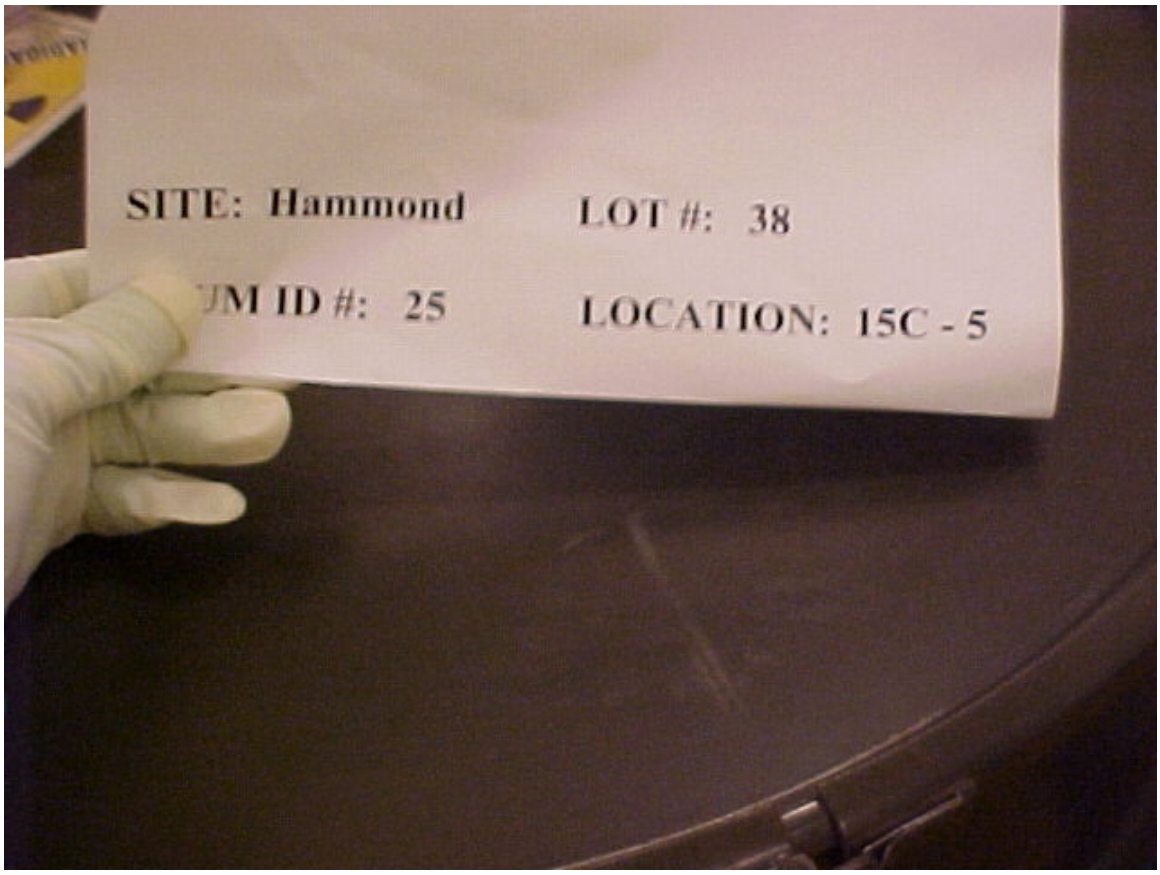
Lot No.	38		Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25		Date	6-10-2002
Location	15C-5		Photo No.	1 of 10
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	32 mR/hr		
	1 meter	3 mR/hr		

Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	2 of 10
Site	Hammond		

85-gal drum – Good Condition
Another picture of outer 85-gal drum in case prior picture was too dark

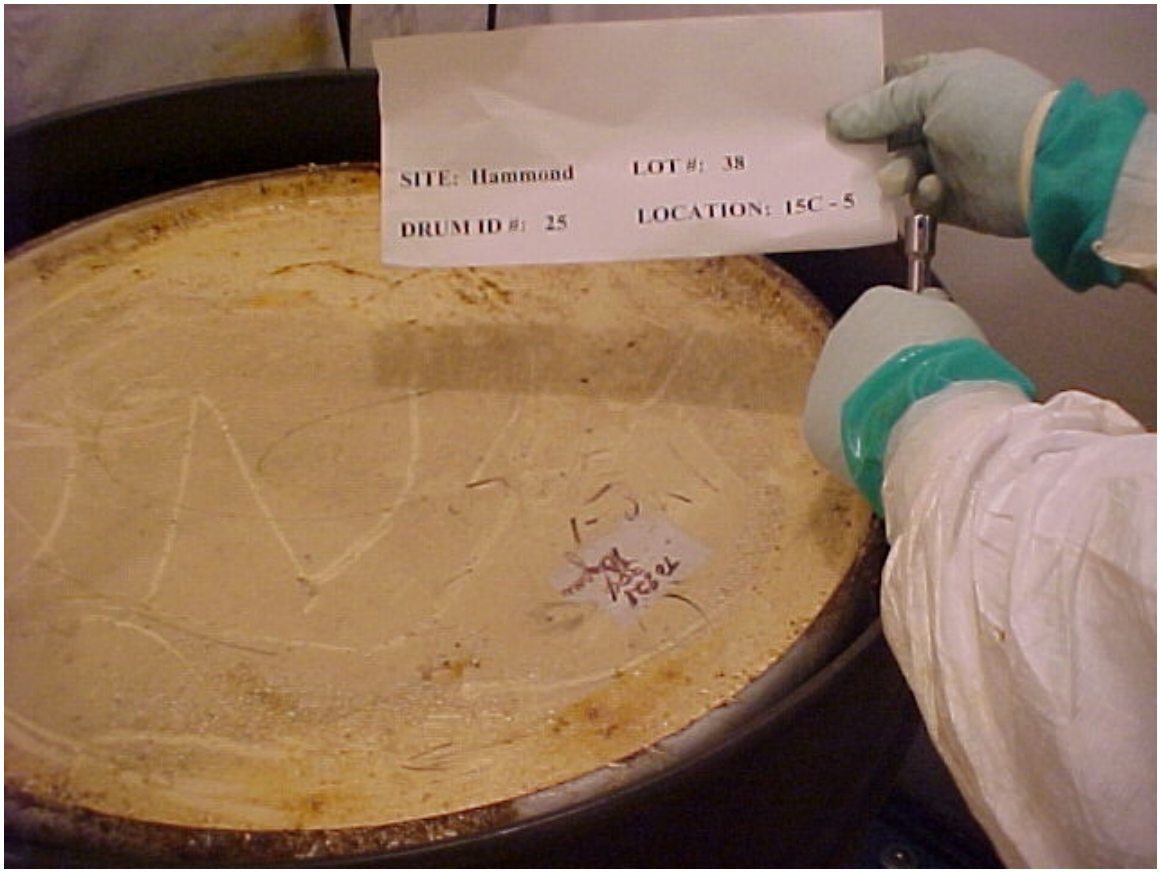
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	3 of 10
Site	Hammond		

Lid and ring of 85-gal drum – Good Condition



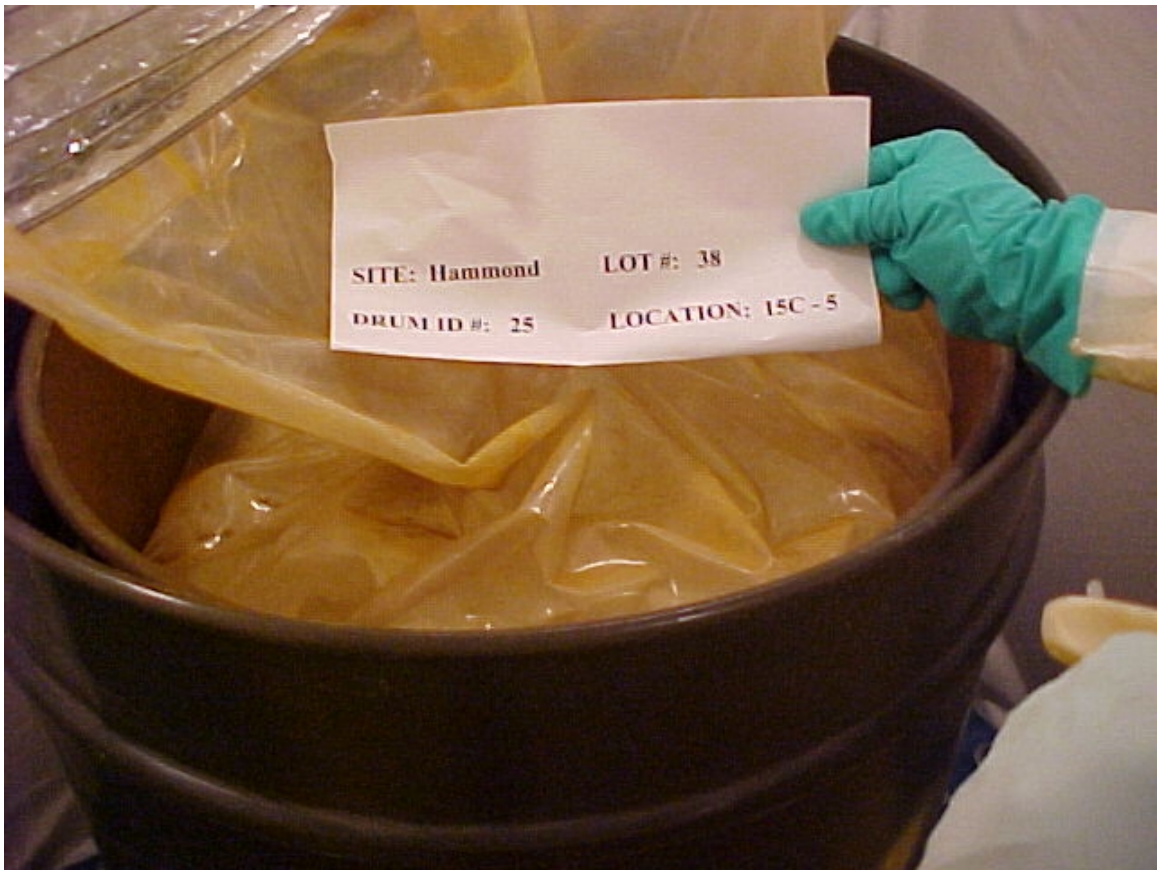
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	4 of 10
Site	Hammond		

55gal drum-good condition
No gases present
Ring-good condition



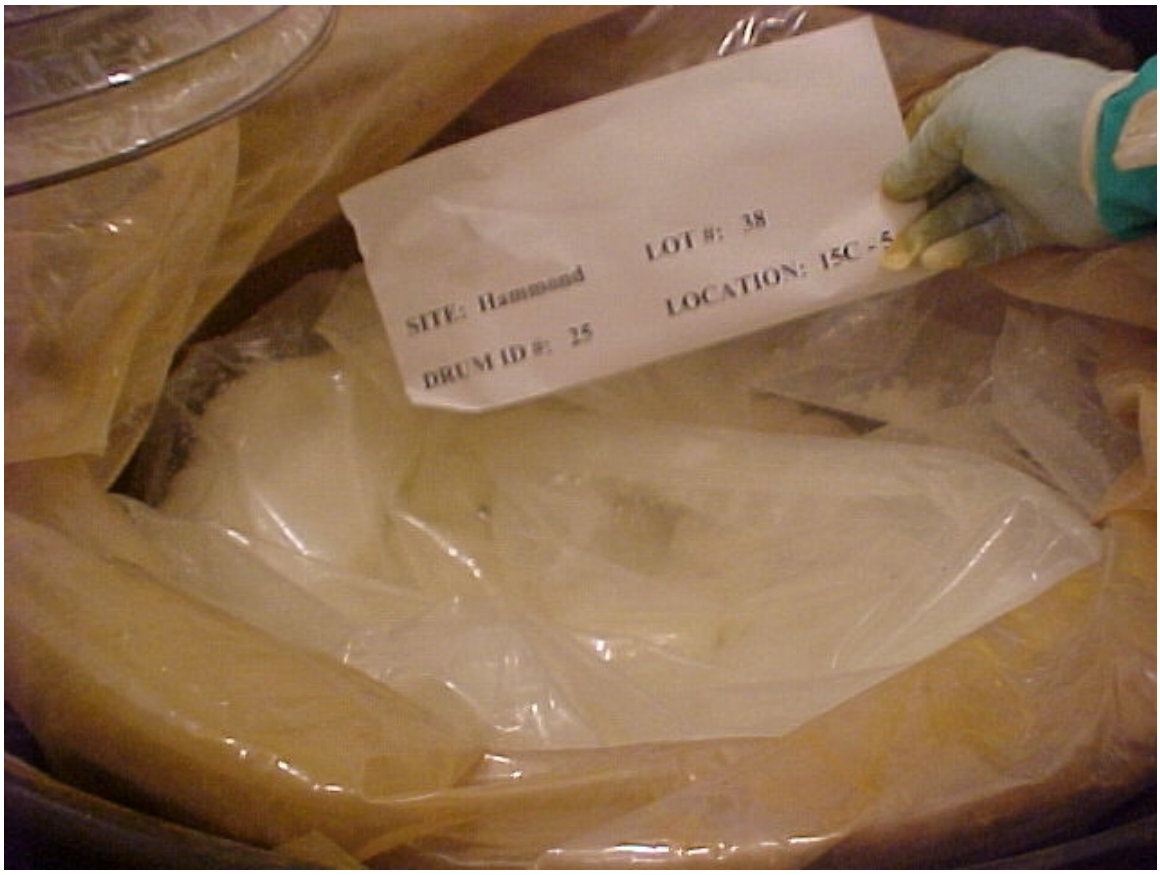
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	5 of 10
Site	Hammond		

1st poly-liner/bag- Good Condition
No gasses present



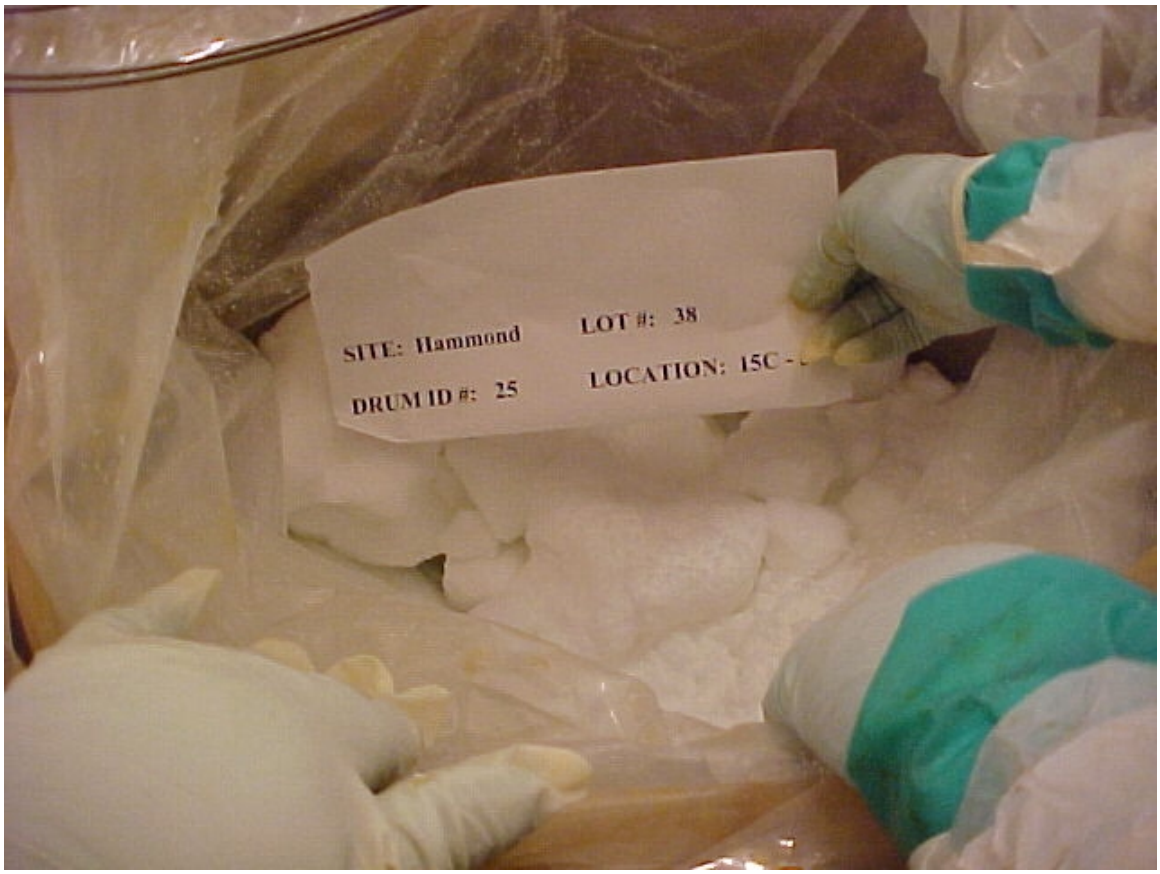
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	6 of 10
Site	Hammond		

2nd Poly-liner/bag- Good Condition
No gasses present



Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	7 of 10
Site	Hammond		

Monolith-white in color
Chunks / broken
Damp/wet inside
Took pH reading color Red-0 scale
No gasses present

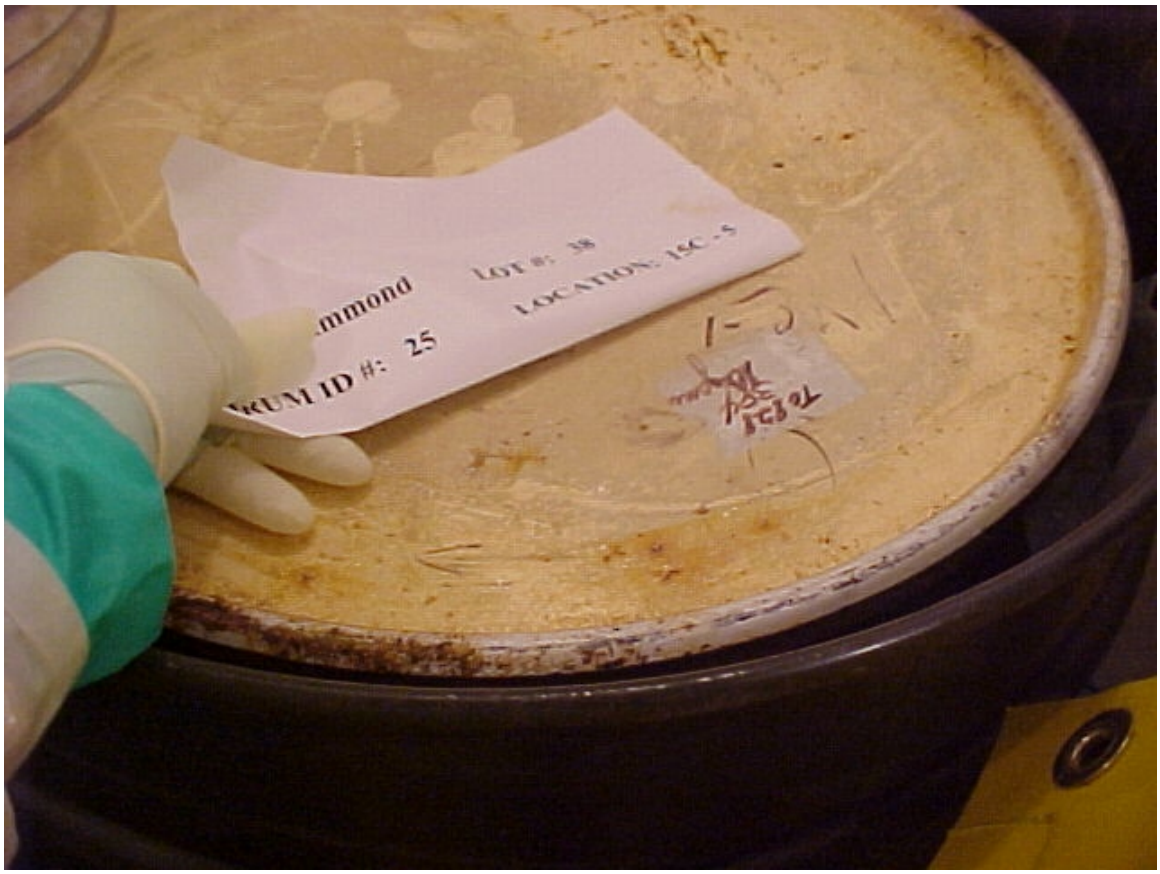


Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	8 of 10
Site	Hammond		

Another view of using chisel and hammer to make samples fit container
No gasses present

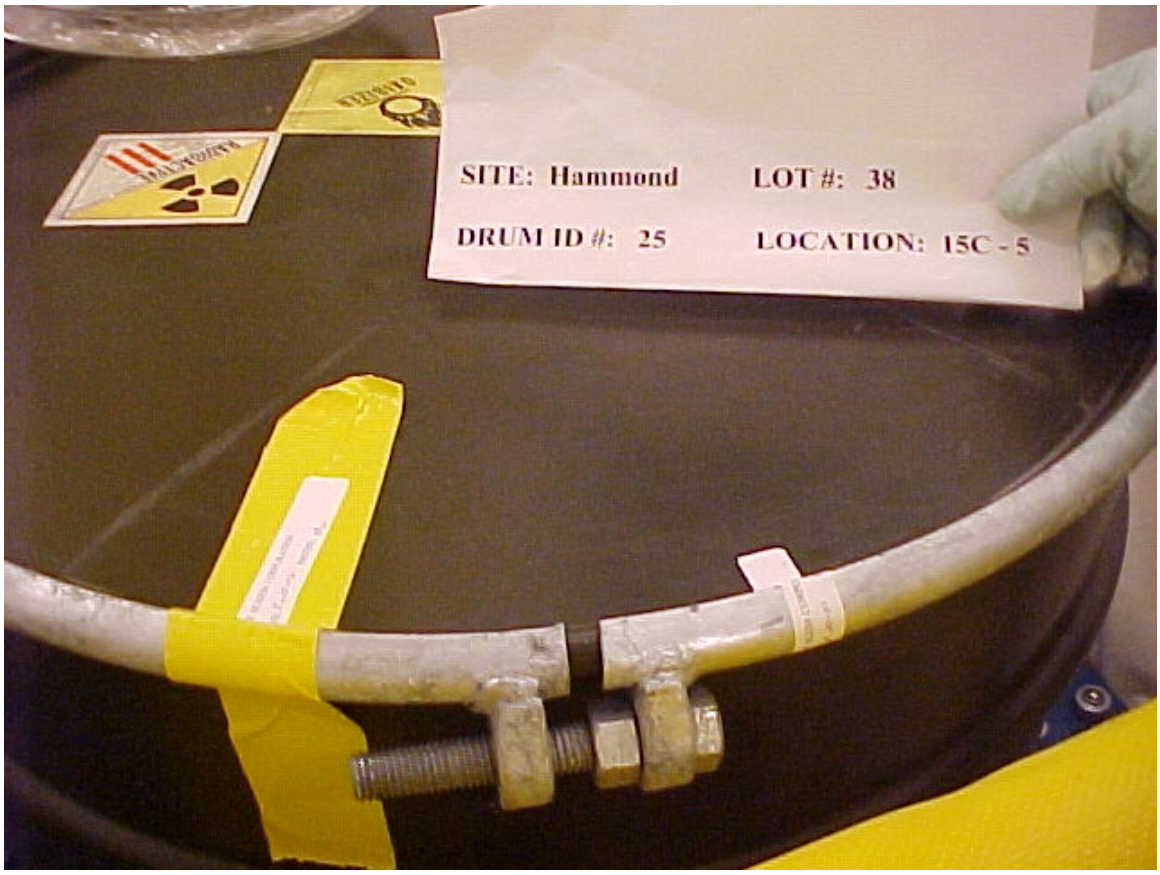
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	9 of 10
Site	Hammond		

No gasses present
Replaced ring and lid on 55gal drum
No gasses present



Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Date	6-10-2002
Location	15C-5	Photo No.	10 of 10
Site	Hammond		

85 gal drum lid and ring secured
Drum sealed/dated/completed



Hammond Depot
Lot #47 – Drum #6
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 47 Drum ID #: 6 Location: Warehouse 100W - 15C – 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Polyliner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good -- damp inside
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith broken pieces
Dryness: No
Moisture or Liquids Present: Moisture present inside 2nd Poly liner/bag
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

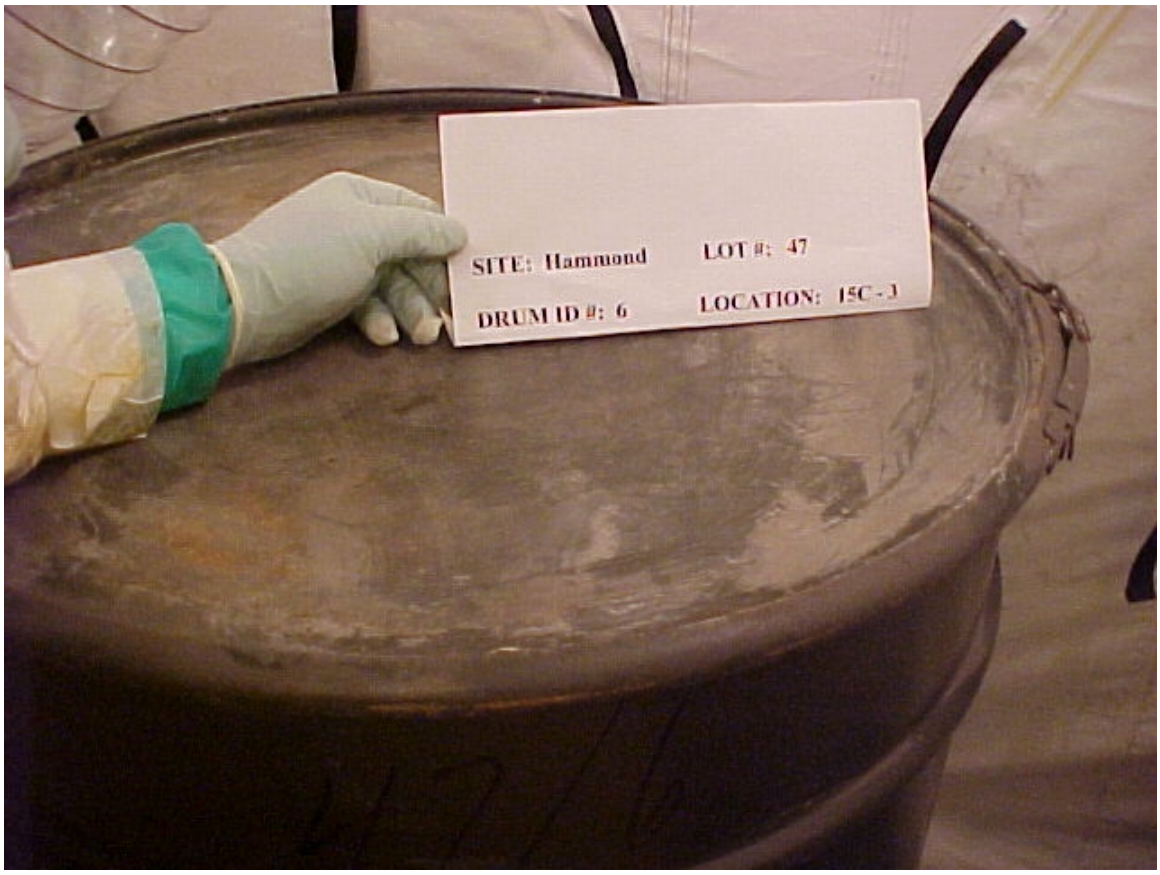
TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: Tony Cunningham (signature on file) Date: 6-10-02

Lot No.	47		Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6		Date	6-10-2002
Location	12D-1		Photo No.	1 of 11
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	32 mR/hr		
	1 meter	3 mR/hr		

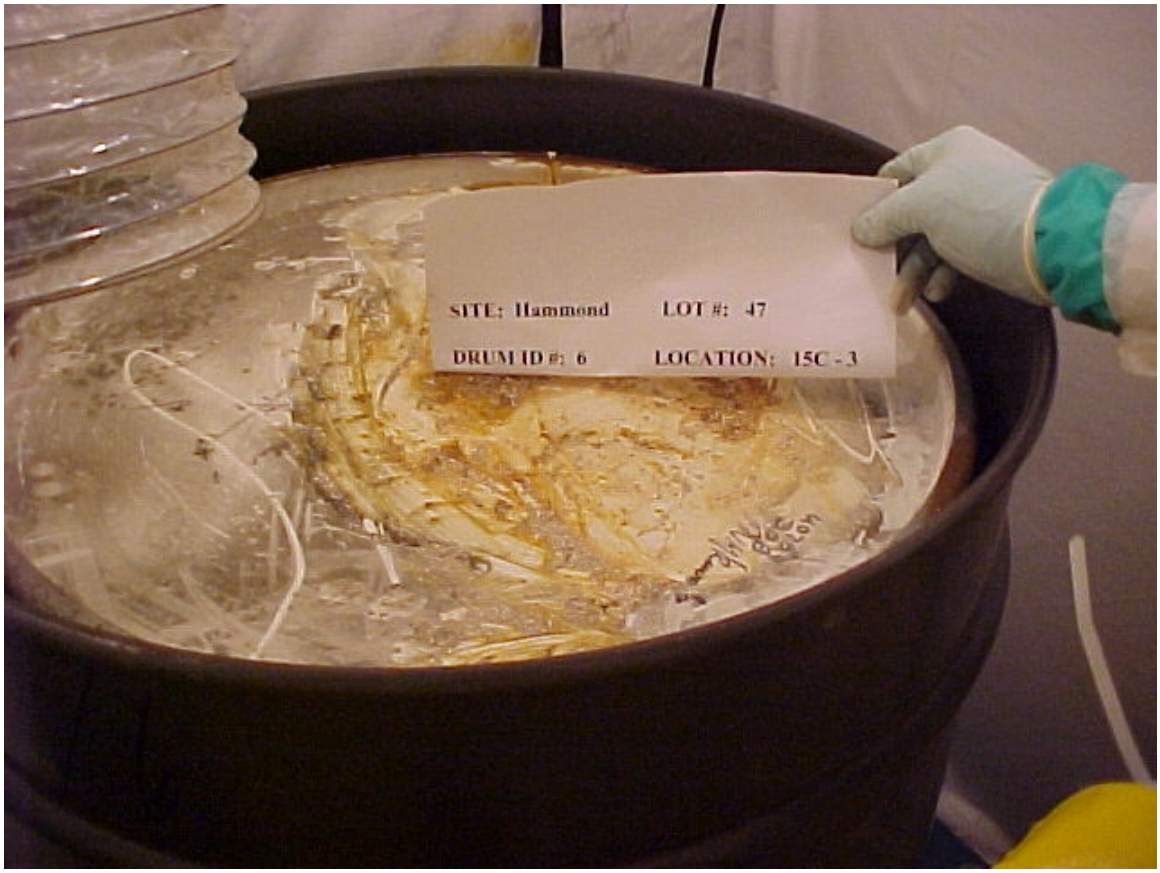
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	2 of 11
Site	Hammond		

Lid of 85 gal drum - Good Condition



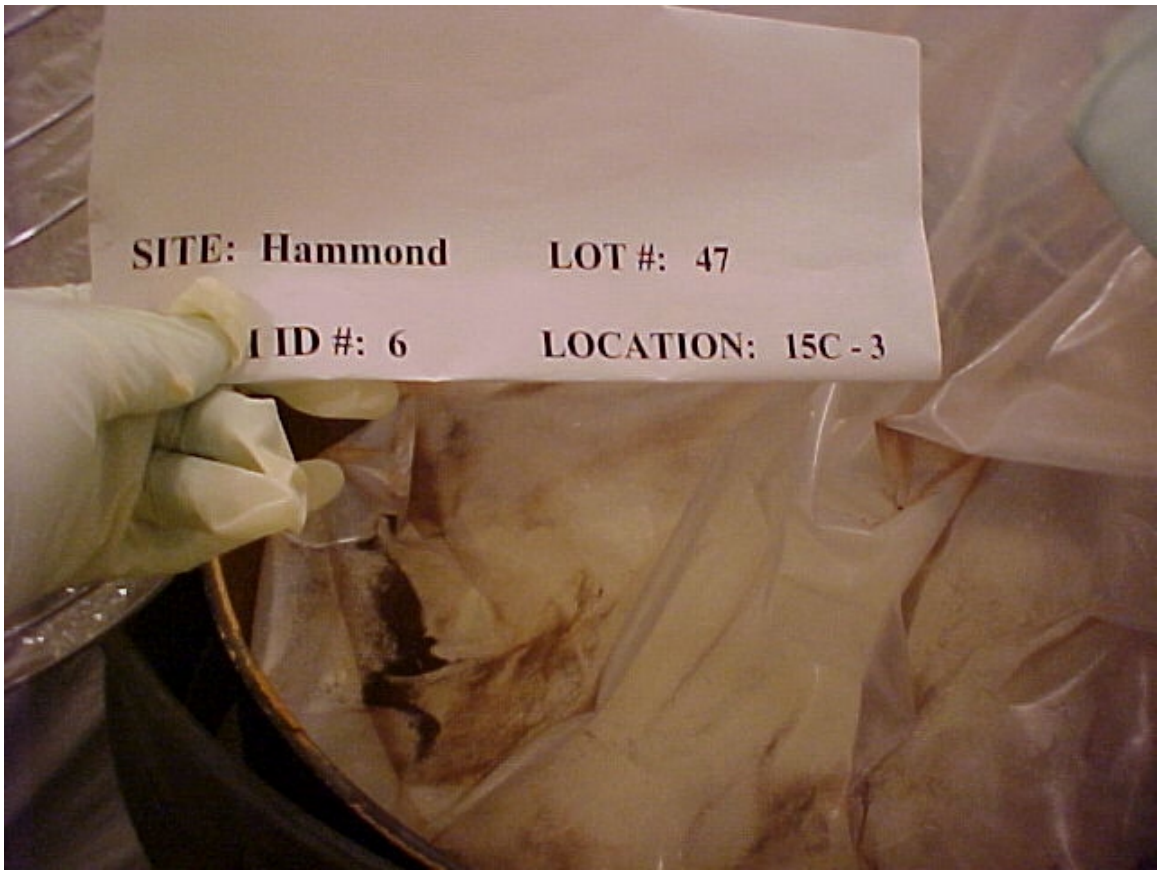
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	3 of 11
Site	Hammond		

55-gal drum-good condition
No gases present
Ring-good condition



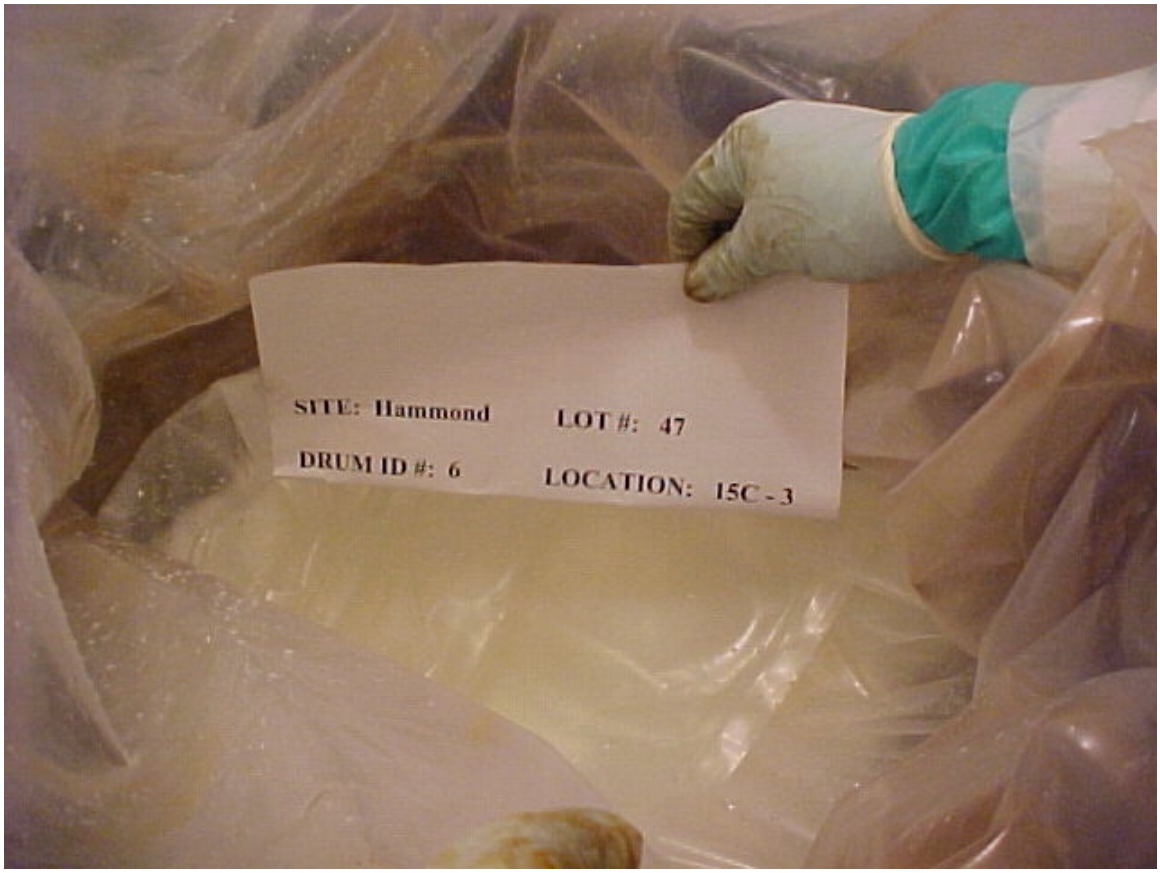
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	4 of 11
Site	Hammond		

1st poly-liner/bag- Good Condition
No gasses present



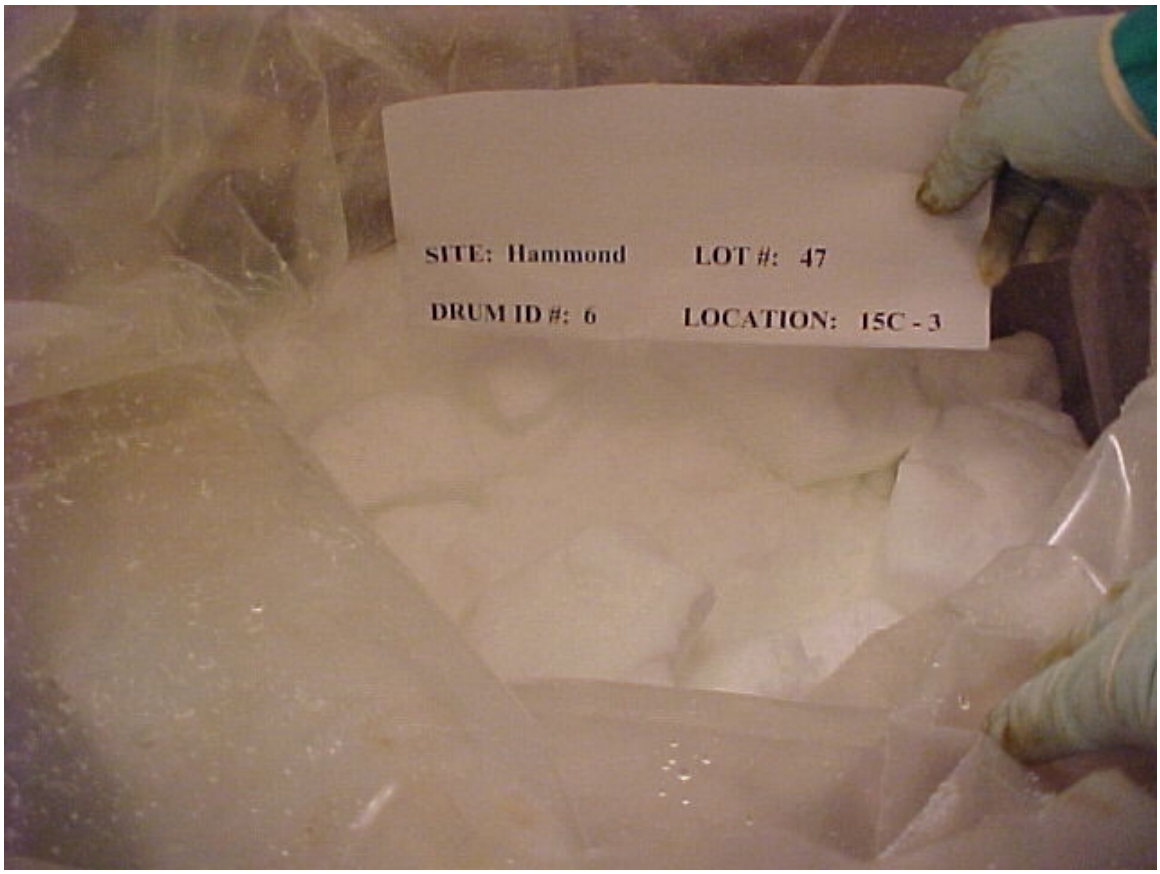
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	5 of 11
Site	Hammond		

2nd Poly-liner/bag- Good Condition
No gasses present
Wet crystals formed in the bag/ chunky pieces visible



Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	6 of 11
Site	Hammond		

Monolith-white in color
Chunks/ broken
Damp/wet inside
Took pH reading color Red-0 scale
No gasses present



Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	7 of 11
Site	Hammond		

No gasses present
Picture indicates chisel and hammer used to break up chunk pieces to fit inside 2ltr bottles.

Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	8 of 11
Site	Hammond		

No gasses present
Chunks were molded to fit container
1st sample 830grms
2nd sample 655grms

Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	9 of 11
Site	Hammond		

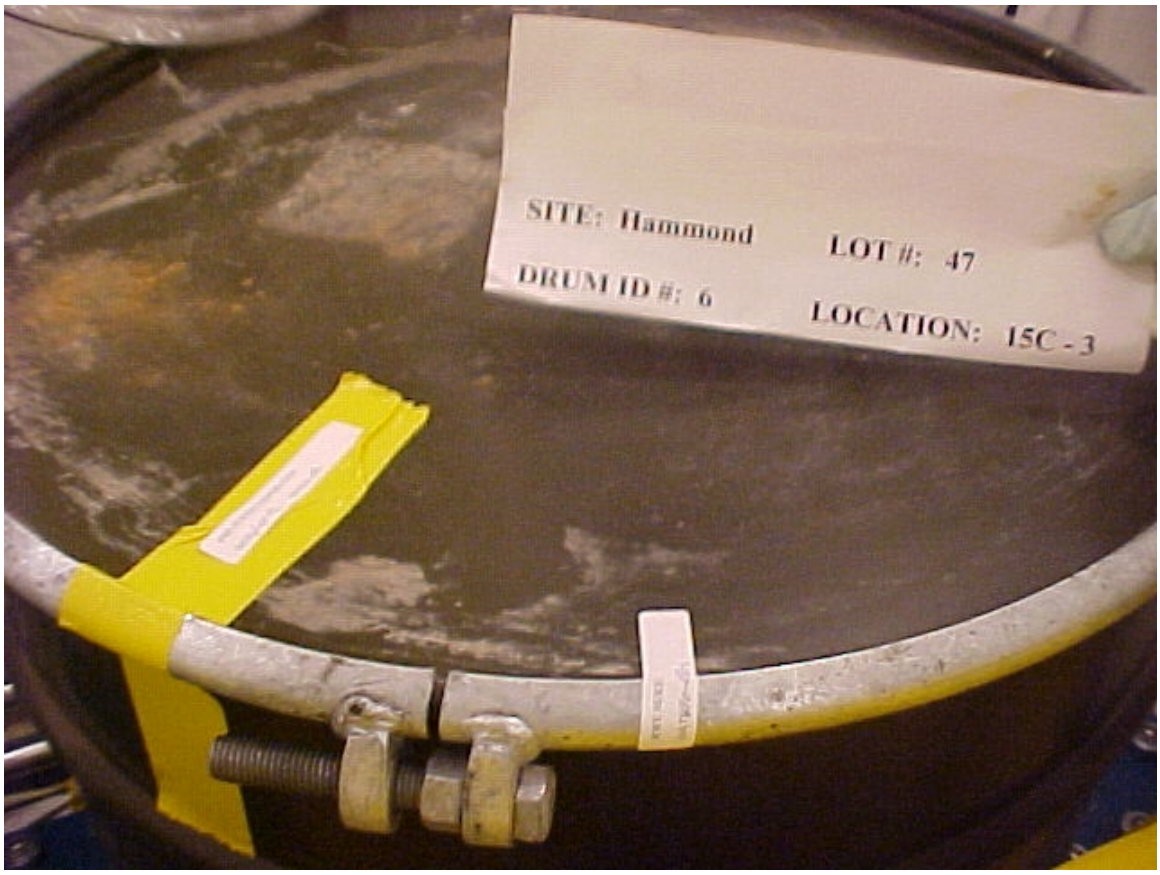
Replacing ring and lid on 55-gal drum
No gasses present

Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	10 of 11
Site	Hammond		

No gasses present
Replaced ring and lid on 55gal drum

Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Date	6-10-2002
Location	12D-1	Photo No.	11 of 11
Site	Hammond		

85 gal drum lid and ring secured
Drum sealed/dated/completed



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Hammond Depot
Lot #48 – Drum #40
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or ~~Curtis Bay~~ *(circle one)*

Lot #: 48 Drum ID #: 40 Location: Warehouse 100W - 12C – 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3.2mR/hr Dpm/300cm^2 <20α & <200 $\beta\gamma$
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55 gal drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 4: Yes (include Drum ID in photo) No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 5: Yes (include Drum ID in photo) No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 6: Yes (include Drum ID in photo) No

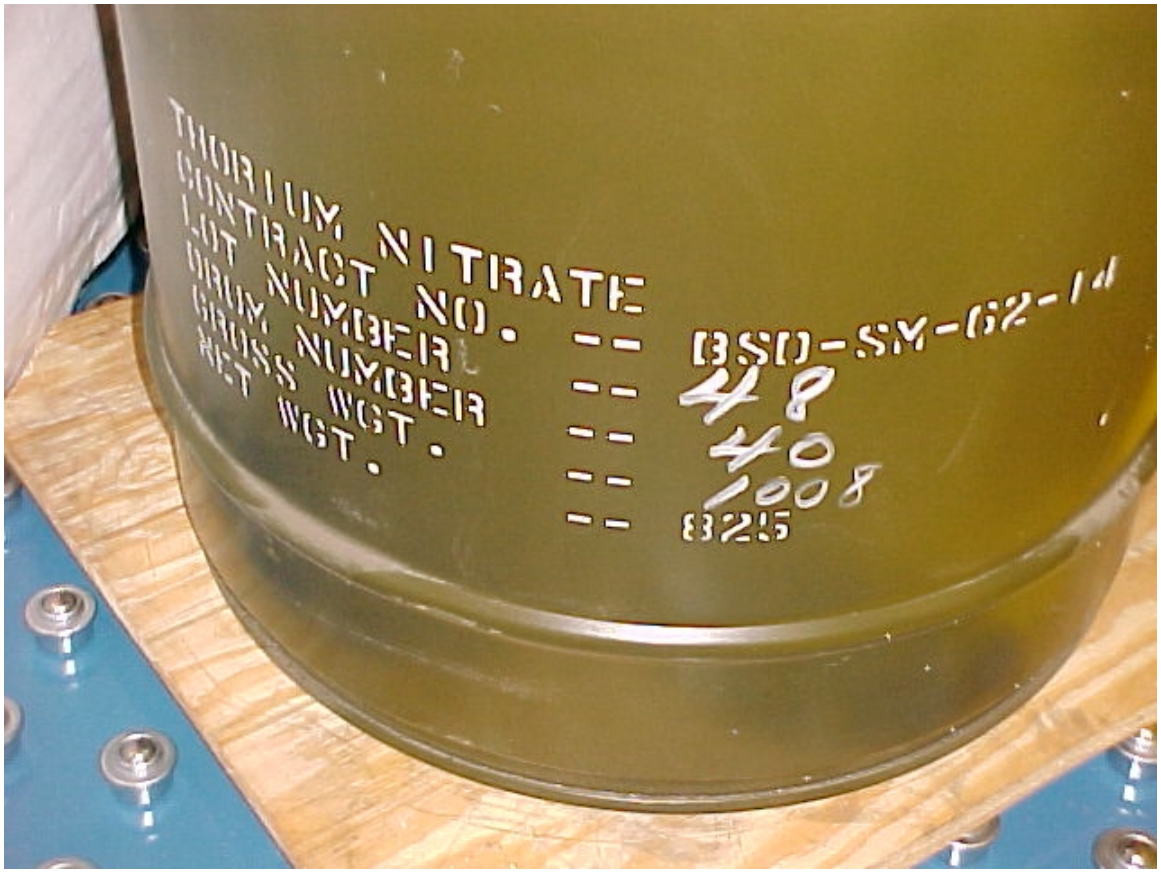
CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: No
Moisture or Liquids Present: Moisture present inside 2nd Poly liner/bag
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

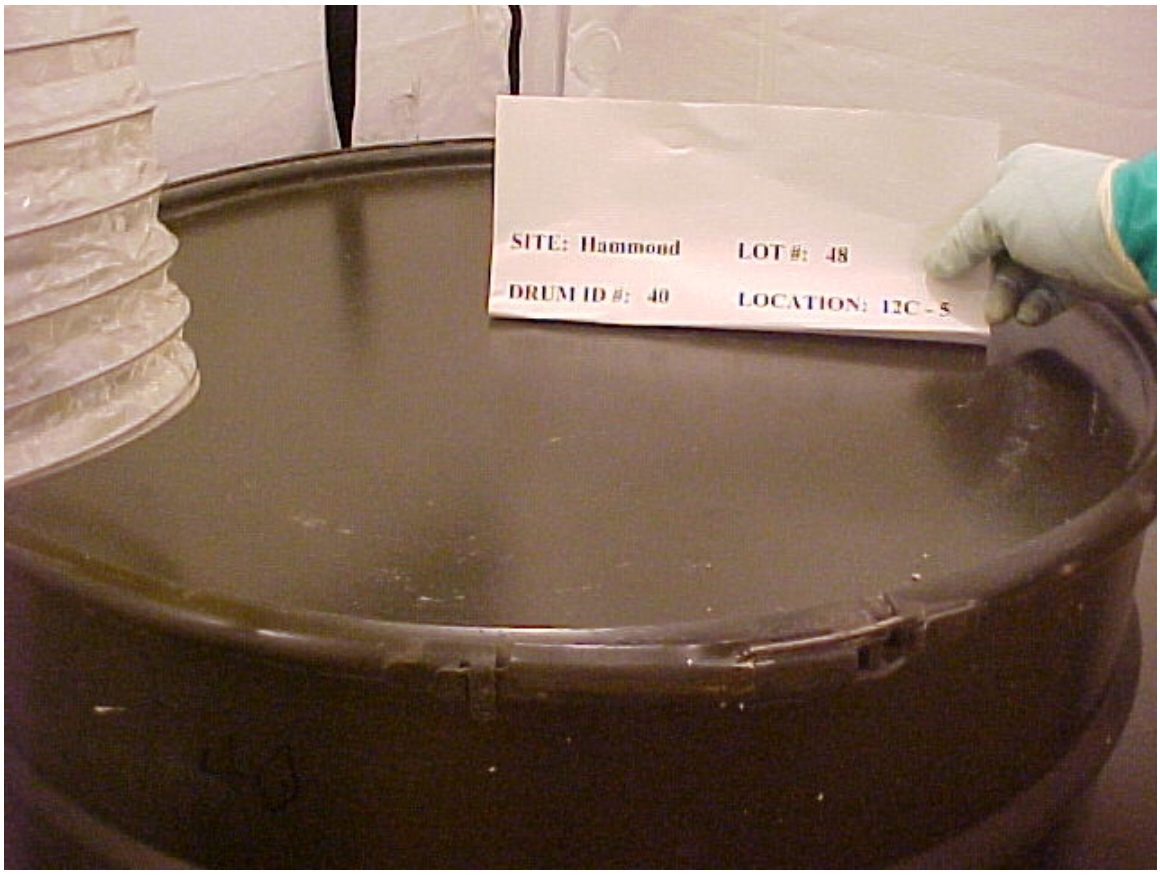
Checklist completed by: Tony Cunningham (signature on file) Date: 6-10-02

Lot No.	48		Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40		Date	6-10-2002
Location	12C-5		Photo No.	1 of 14
Site	Hammond			
Container	85-gallon steel drum		Container Condition	Good
Dose Rate	Surface	32 mR/hr		
	1 meter	3.2 mR/hr		



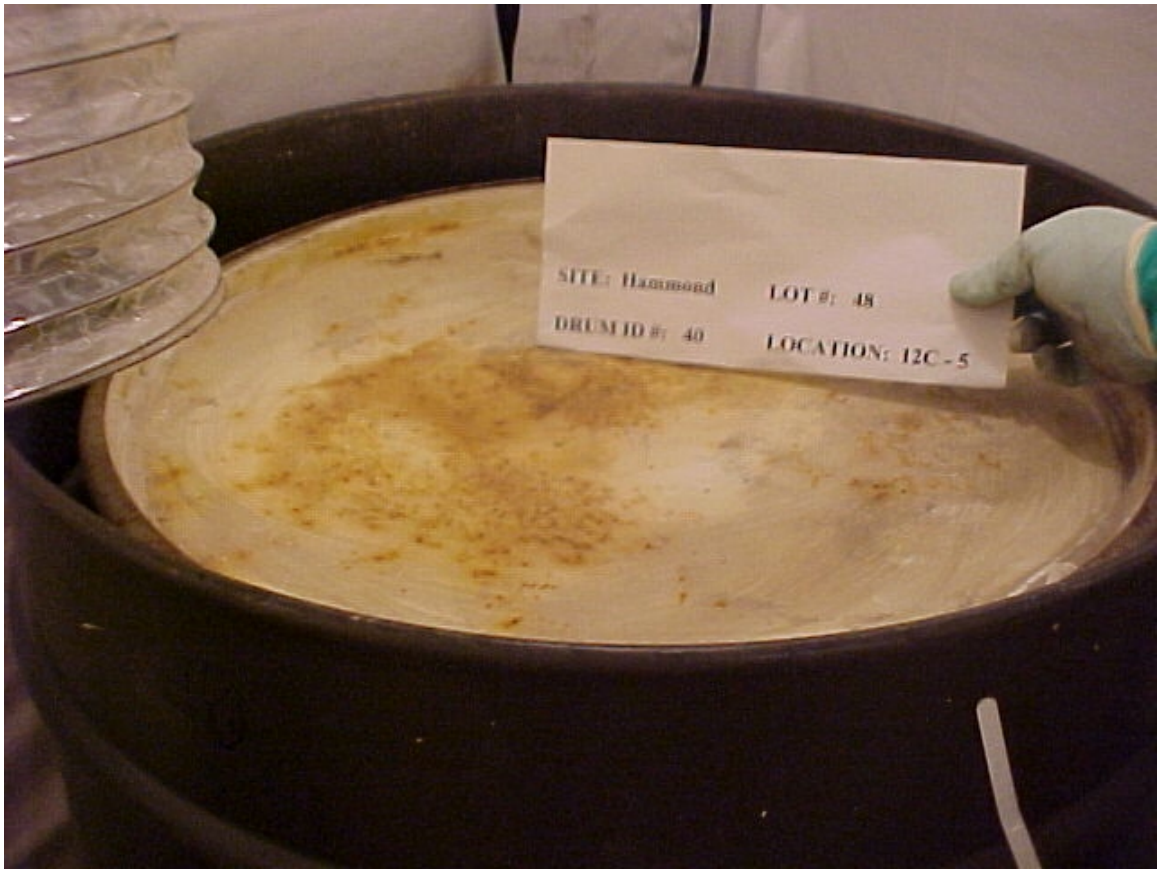
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	2 of 14
Site	Hammond		

Lid of 85 gal drum - Good Condition



Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	3 of 14
Site	Hammond		

55-gal drum-good condition
no gases present
ring-good condition

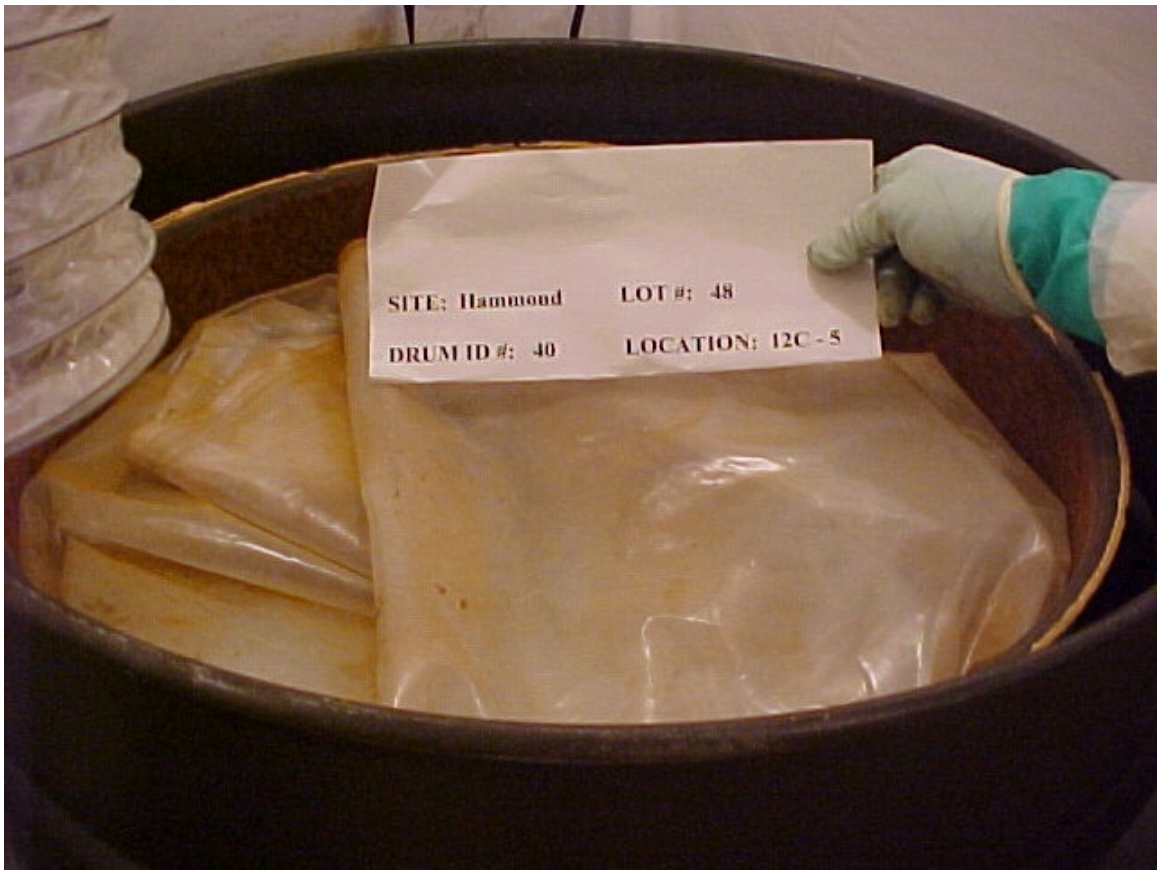


Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	4 of 14
Site	Hammond		

No gasses present
This picture shows the position/ difficulty of removing bolt from ring

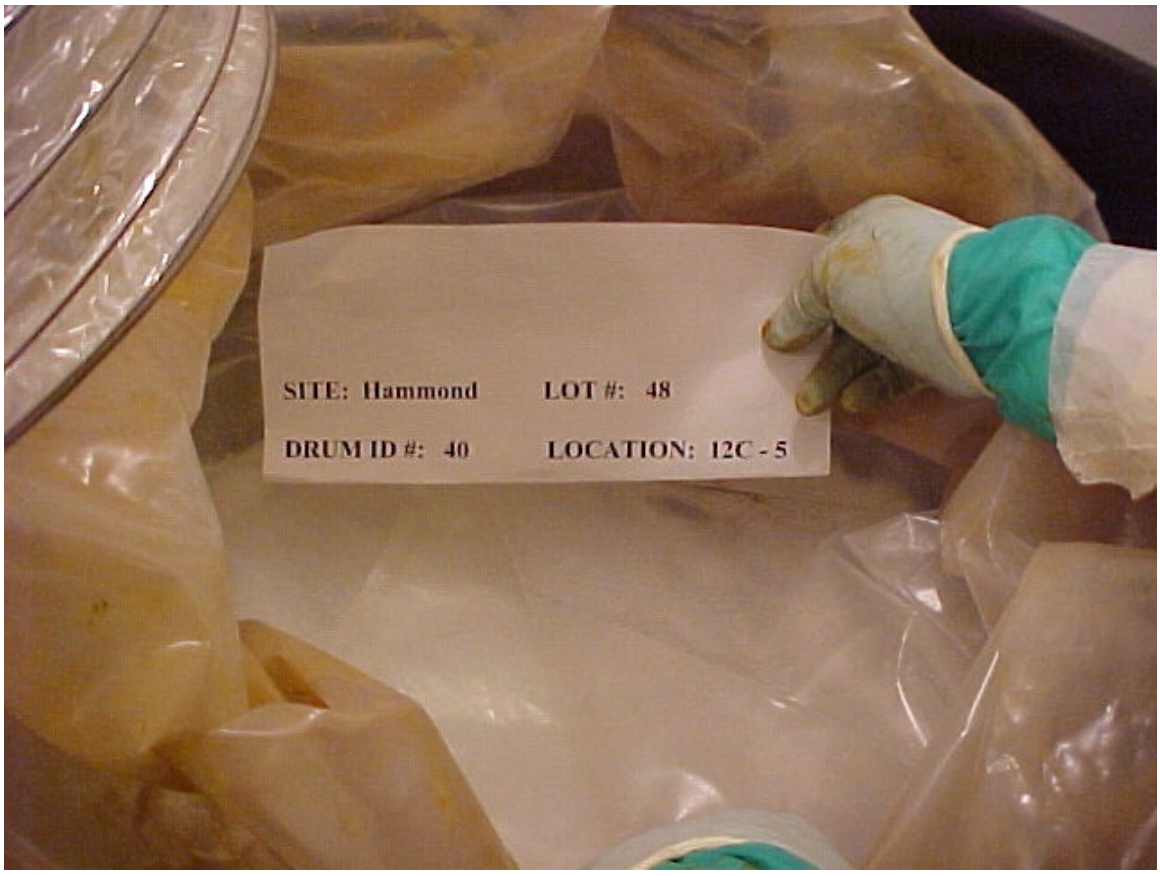
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	5 of 14
Site	Hammond		

1st poly-liner/bag- Good Condition
No gasses present



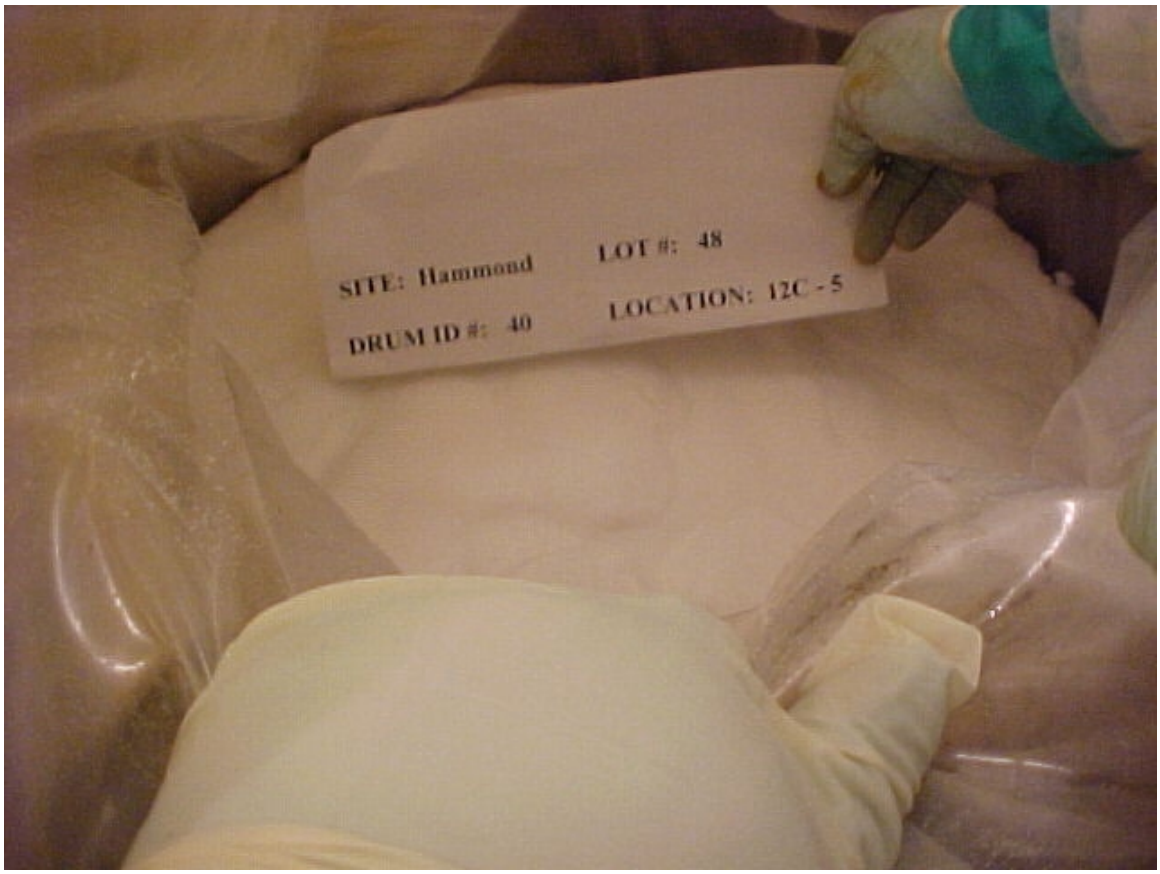
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	6 of 14
Site	Hammond		

2nd Poly-liner/bag- Good Condition
No gasses present



Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	7 of 14
Site	Hammond		

Monolith-white in color
Solid
No gasses present
Light moisture

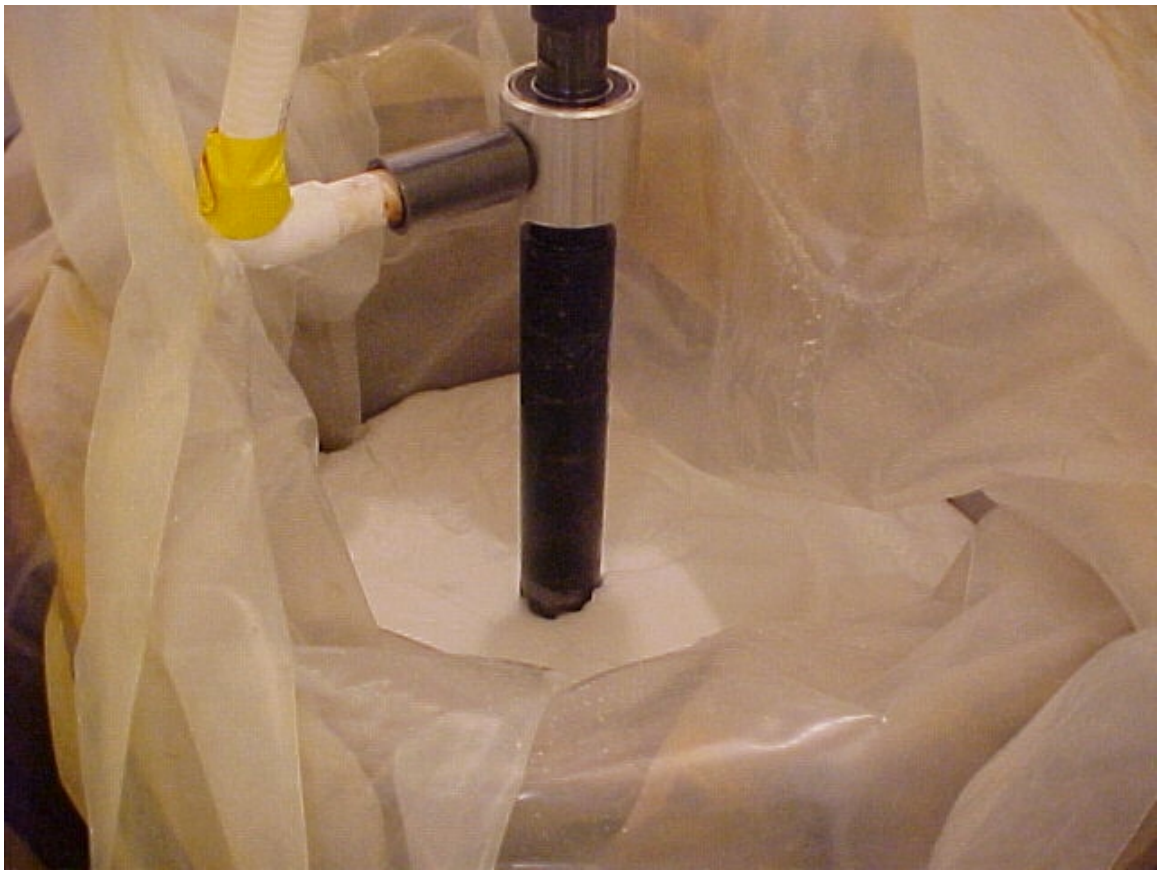


Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	8 of 14
Site	Hammond		

Pictures shows drilling for core samples
No gasses present

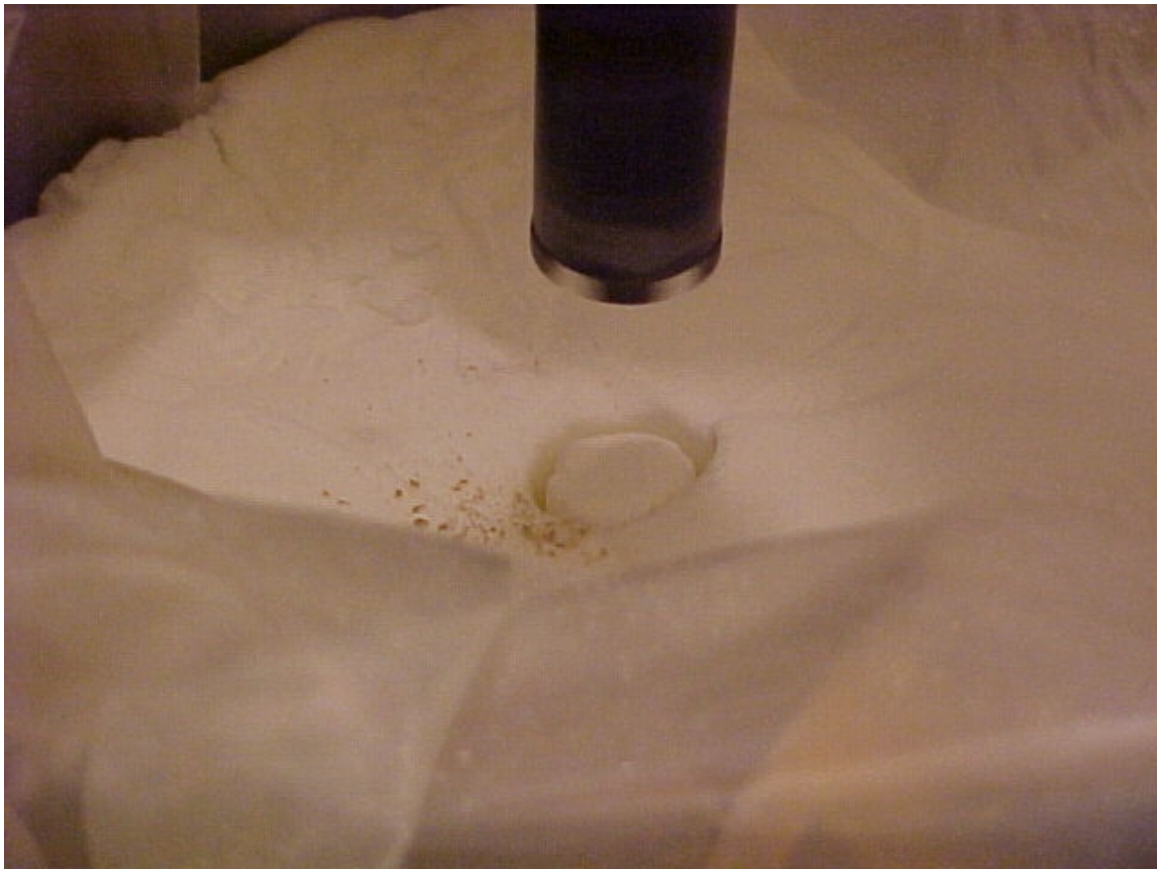
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	9 of 14
Site	Hammond		

Picture shows drilling for core samples
No gasses present



Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	10 of 14
Site	Hammond		

Picture of core after drilling for sample
Shows core still inside of block
No gasses present



Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	11 of 14
Site	Hammond		

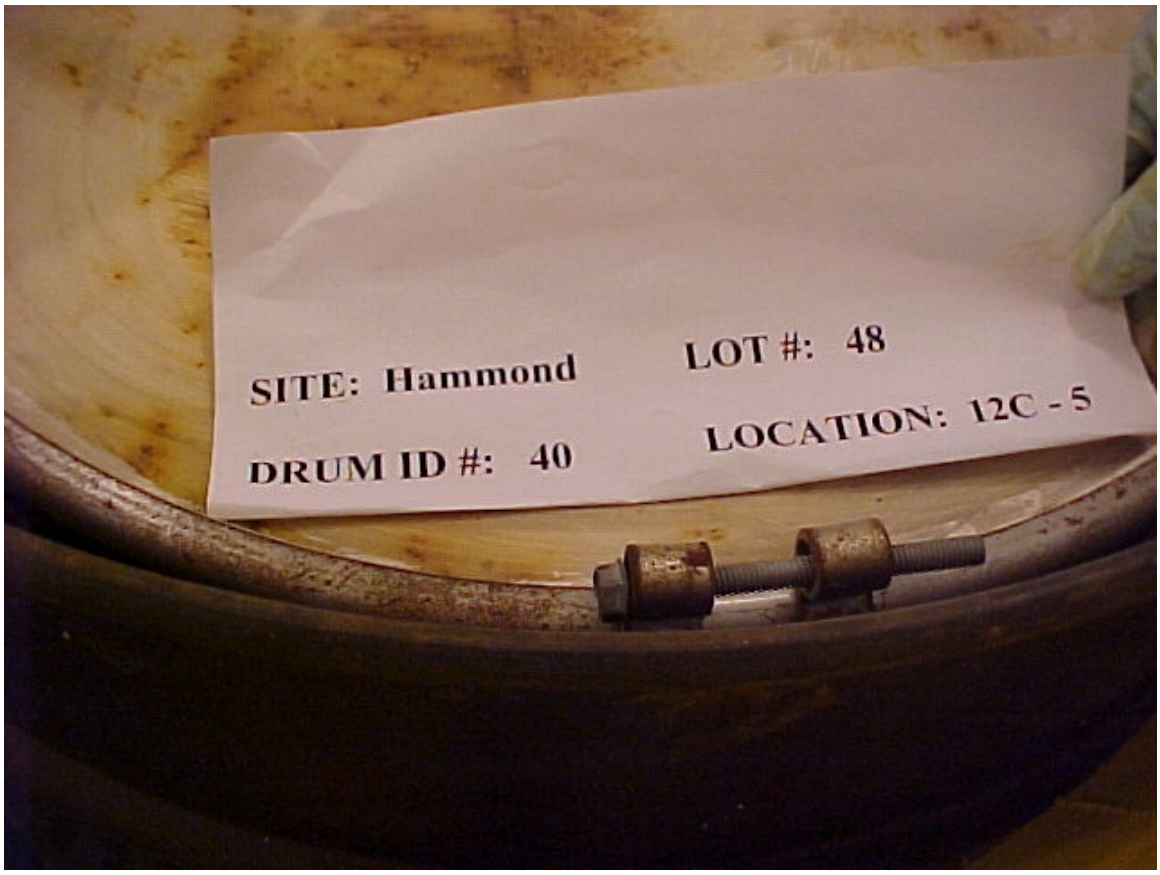
Picture of 2 cores after drilling for sample
Shows 2 cores still inside of block
No gasses present

Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	12 of 14
Site	Hammond		

Bad (blurry) picture of 2 core samples
1^{sst} weights 491grams
2nd weights 536grams
No gasses present

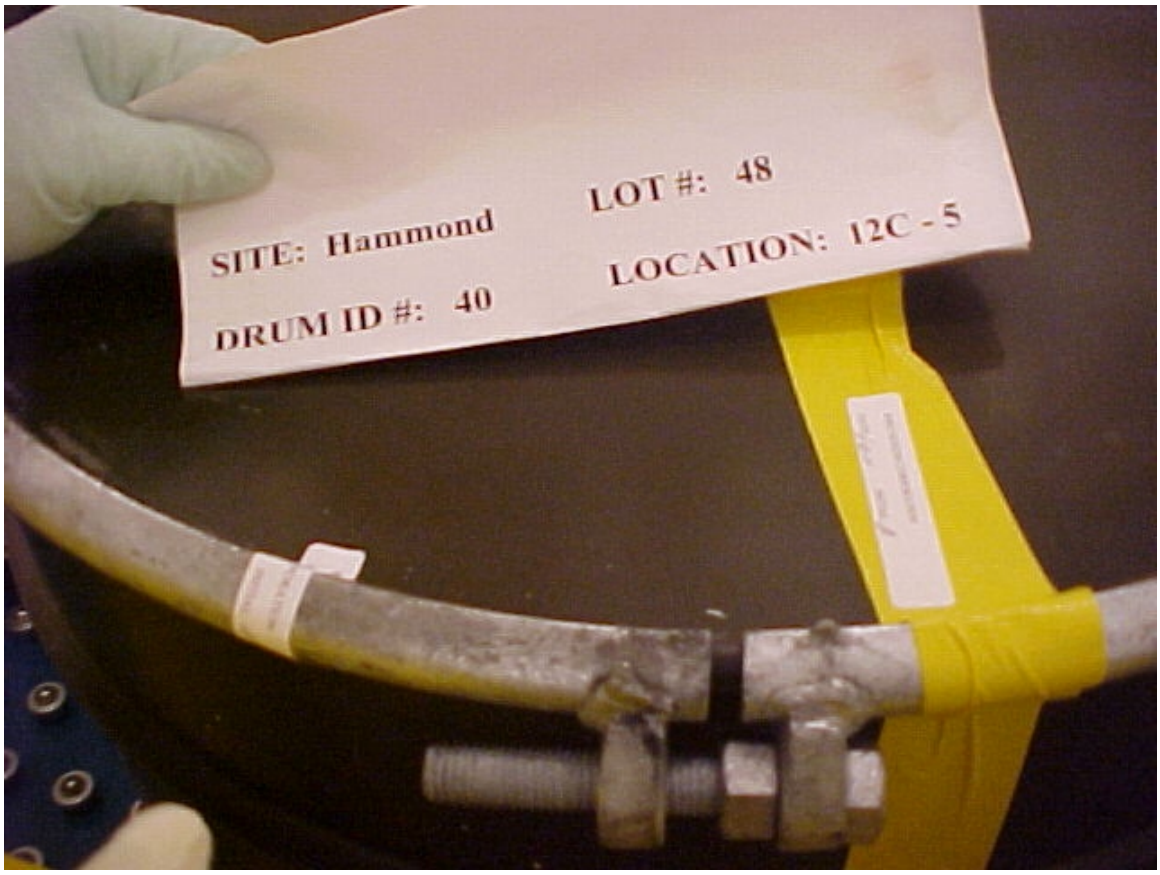
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	13 of 14
Site	Hammond		

No gasses present
Replacing lid on 55gal drum



Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	40	Date	6-10-2002
Location	12C-5	Photo No.	14 of 14
Site	Hammond		

85 gal drum lid and ring secured
Drum sealed/dated/completed



APPENDIX C

CURTIS BAY DEPOT
DRUMS SAMPLED FOR OFF-SITE ANALYSES
(SECOND SAMPLE SHIPMENT)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Curtis Bay Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were sampled and shipped off-site for analyses per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were shipped to UT Battelle's contracted off-site laboratory per Shipment No. 6990-001-003 (i.e. the second shipment of samples to the laboratory for this project). All lots/drums included in this appendix came from Thorium Nitrate materials originating in India; therefore, the lot numbers delineated below are preceded with "I" to designate that the lot has originated from India.

Also included with this table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	I-3	149	C-5
2	I-4	206	C-17
3	I-5	251	C-27
4	I-6	300	C-39
5	I-7	358	C-51
6	I-9	780	C-63
7	I-11	537	C-75
8	I-12	589	C-85
9	I-13	637	C-97
10	I-14	714	C-107

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Curtis Bay Depot
Lot #I-3 – Drum 149
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-3 Drum ID #: 149 Location: Warehouse 911 – Column F – Row 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 42mR/hr DR at 1 meter 4.5mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard & Shredded paper for packaging
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th poly liner/bag
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 6Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #6: ☐ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

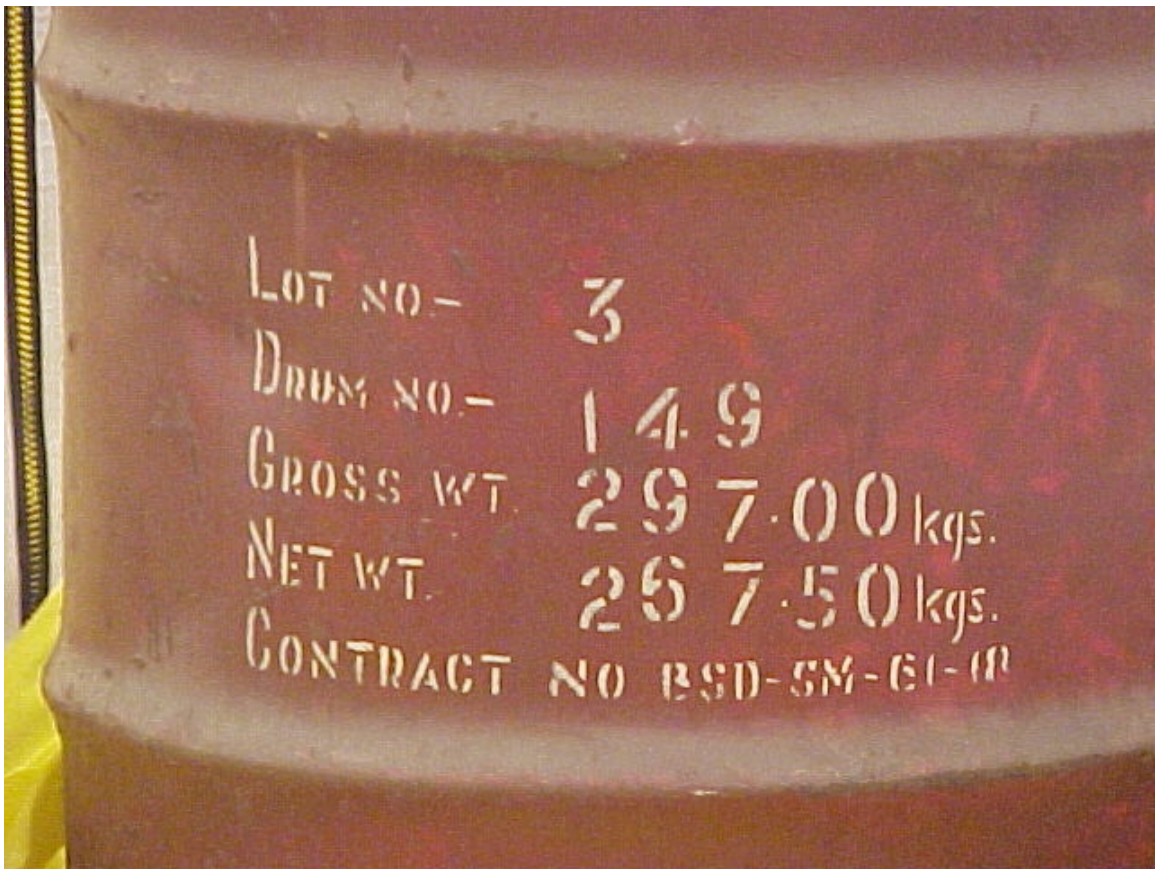
Warehouse	911	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No.	1 of 9		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	42 mR/hr	
	1 meter	4.5 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

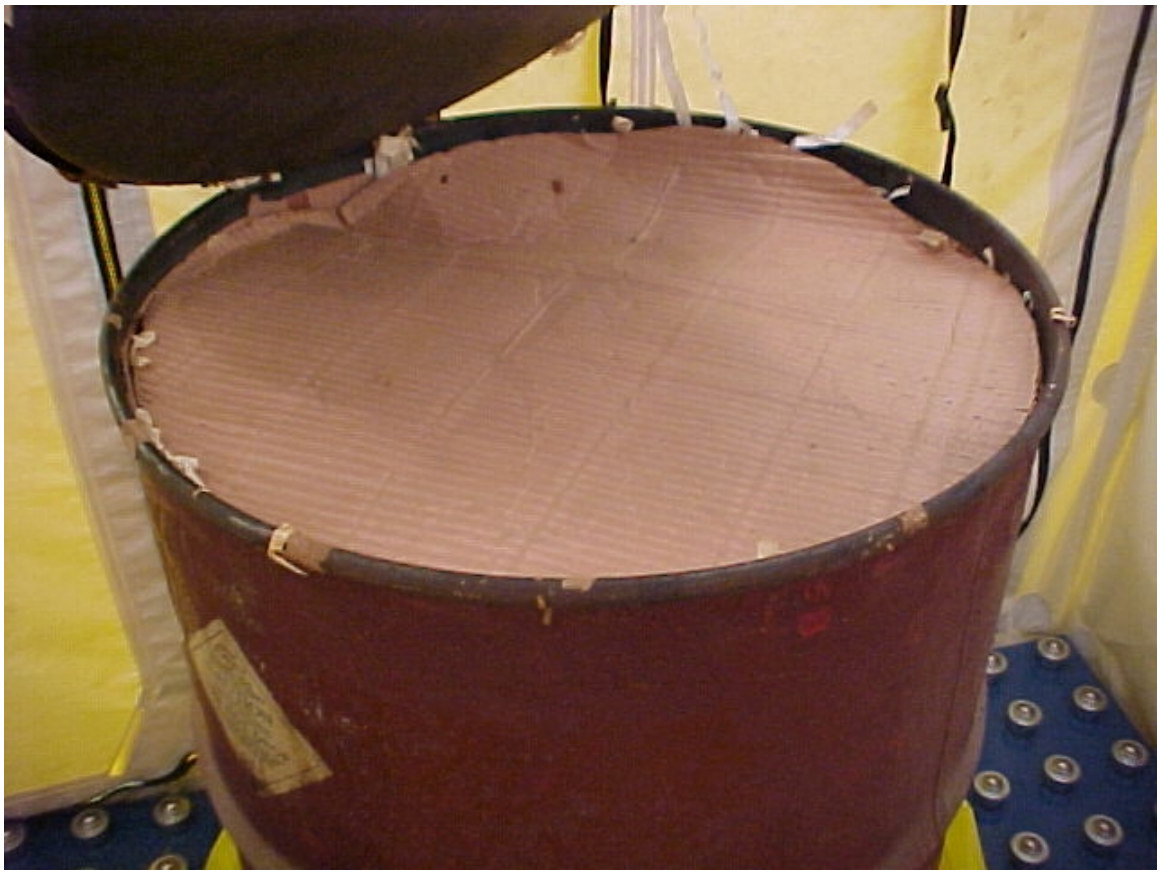
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 2 of 9

Round cardboard lid covering the shredded paper – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

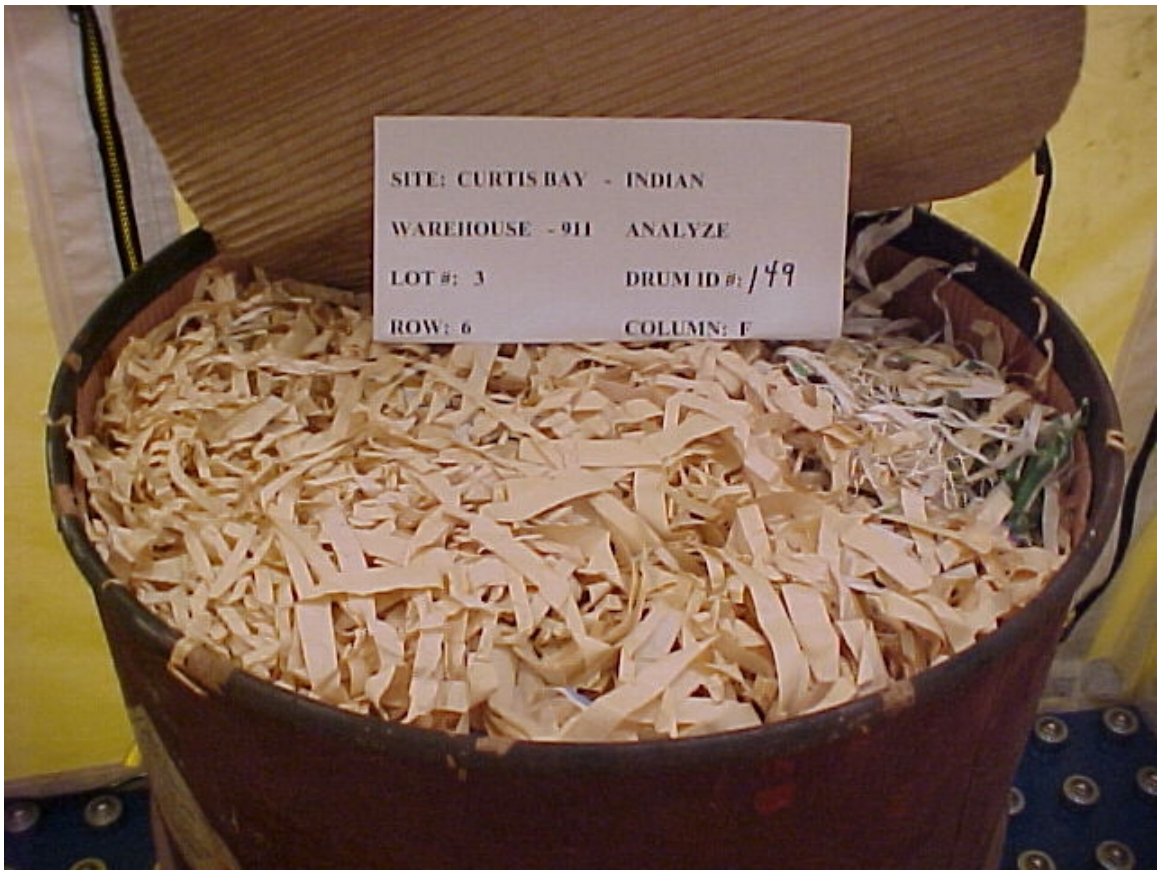
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 3 of 9

Colorful shredded paper
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

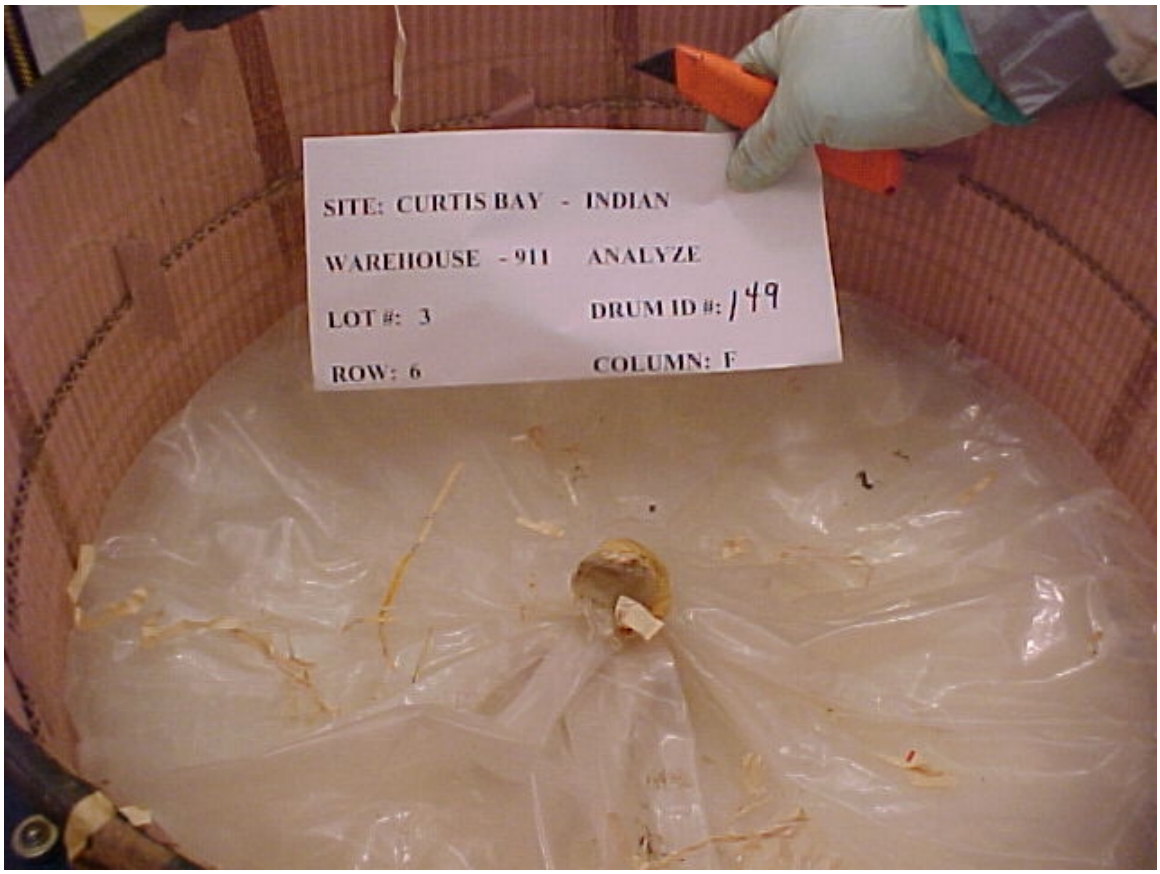
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 4 of 9

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

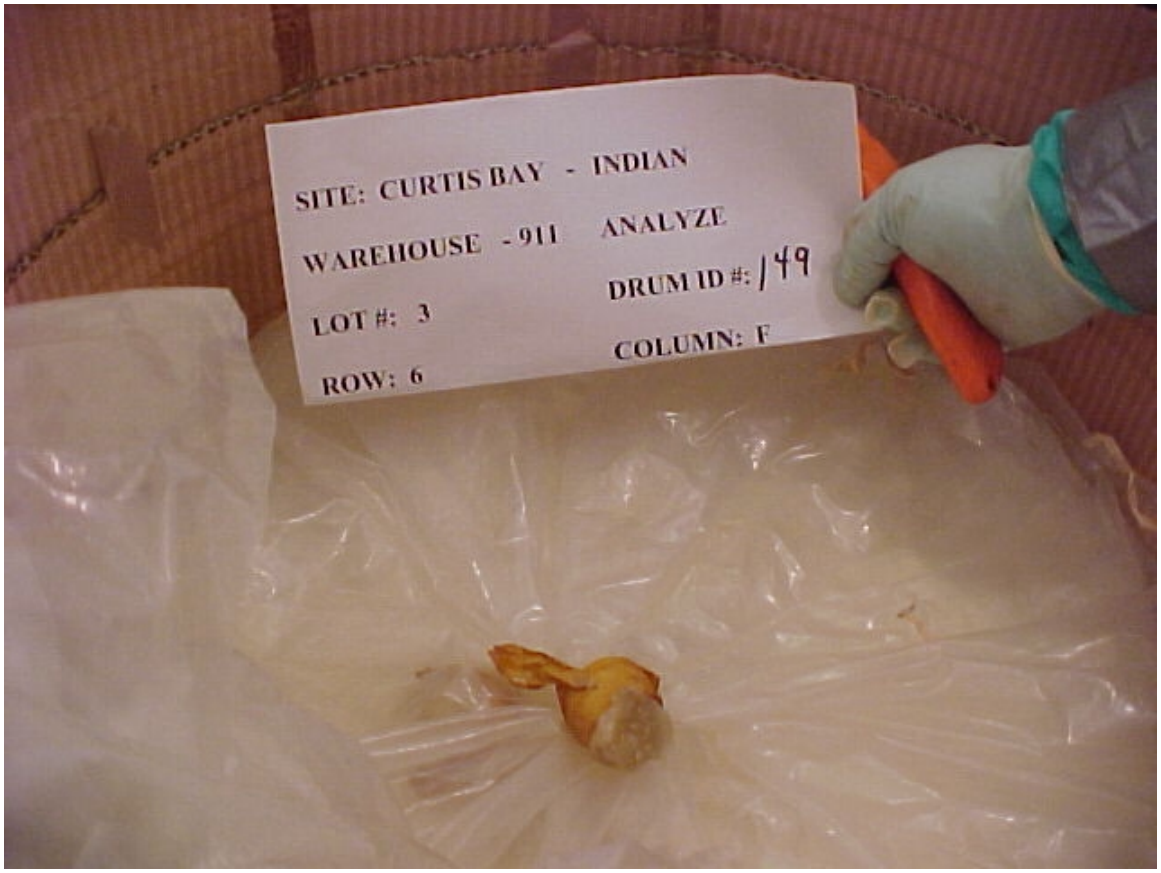
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 5 of 9

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

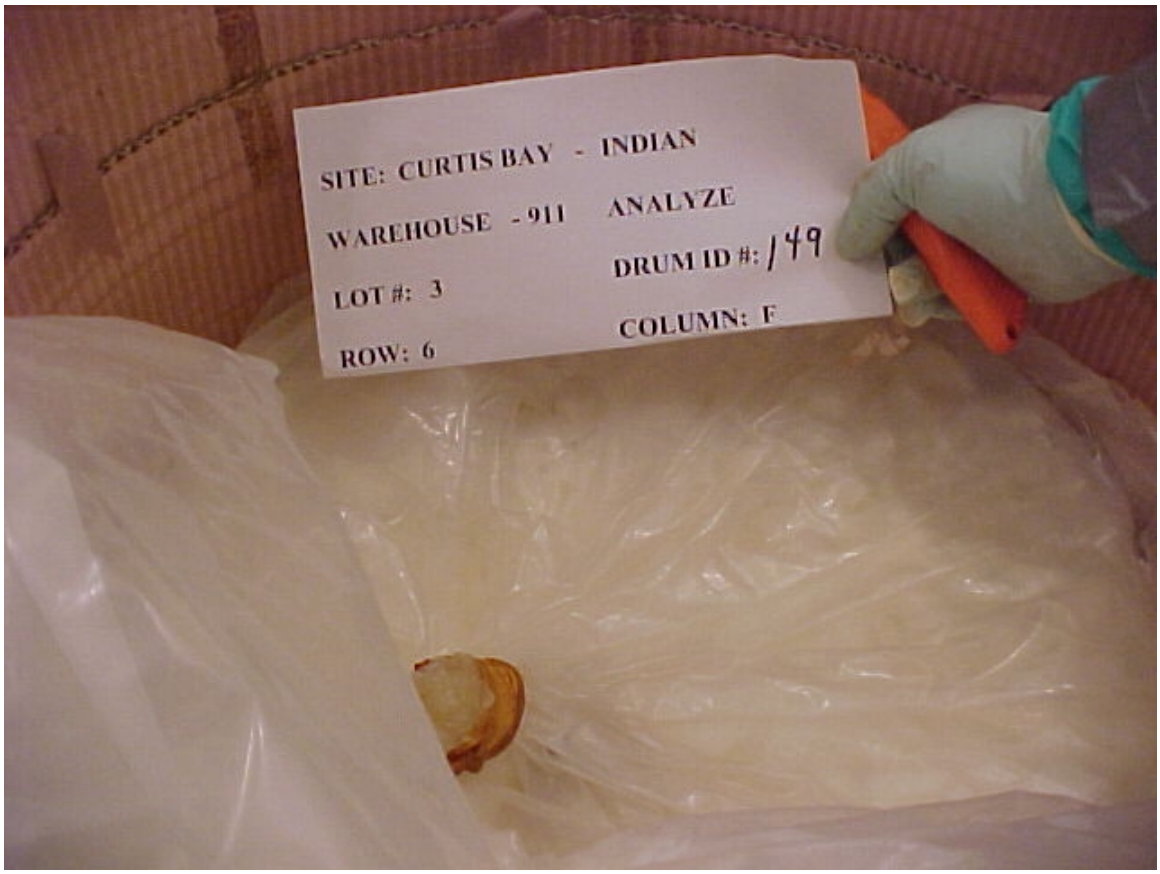
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 6 of 9

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

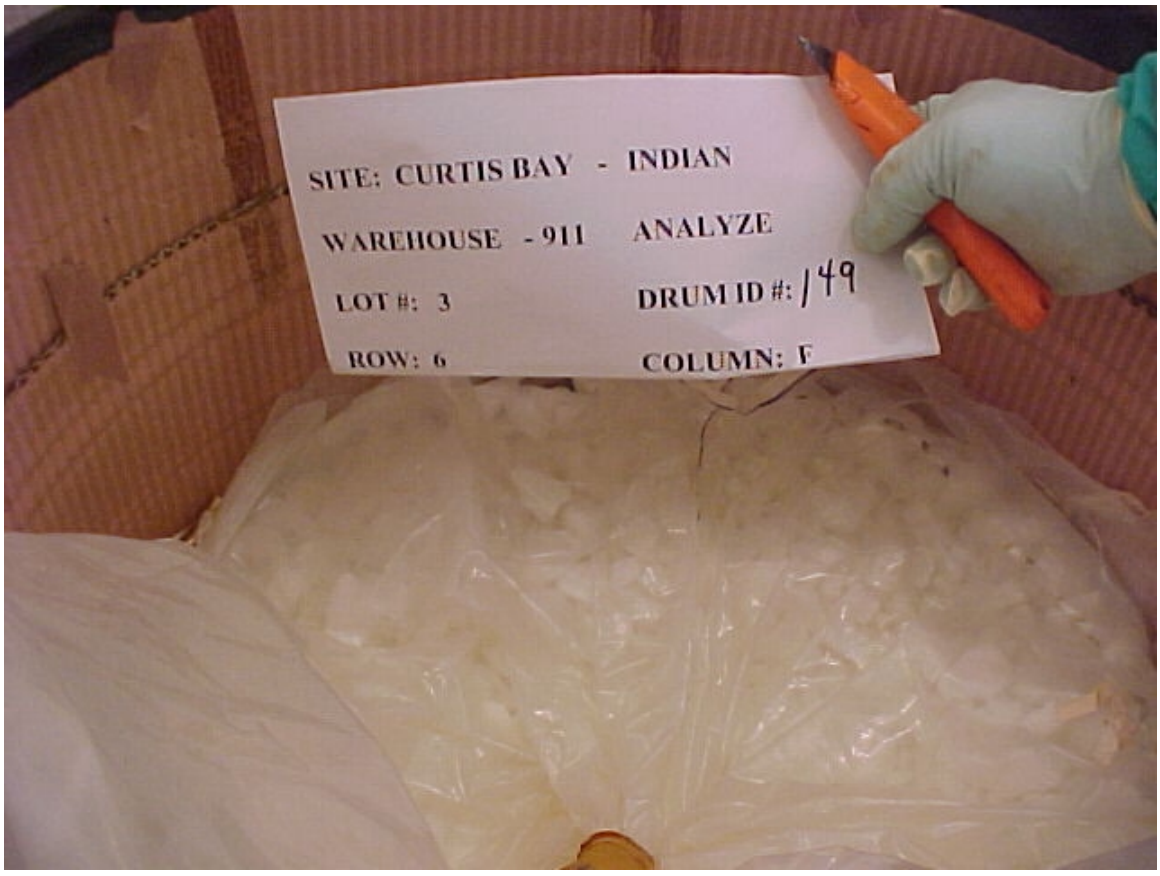
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 7 of 9

4th poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

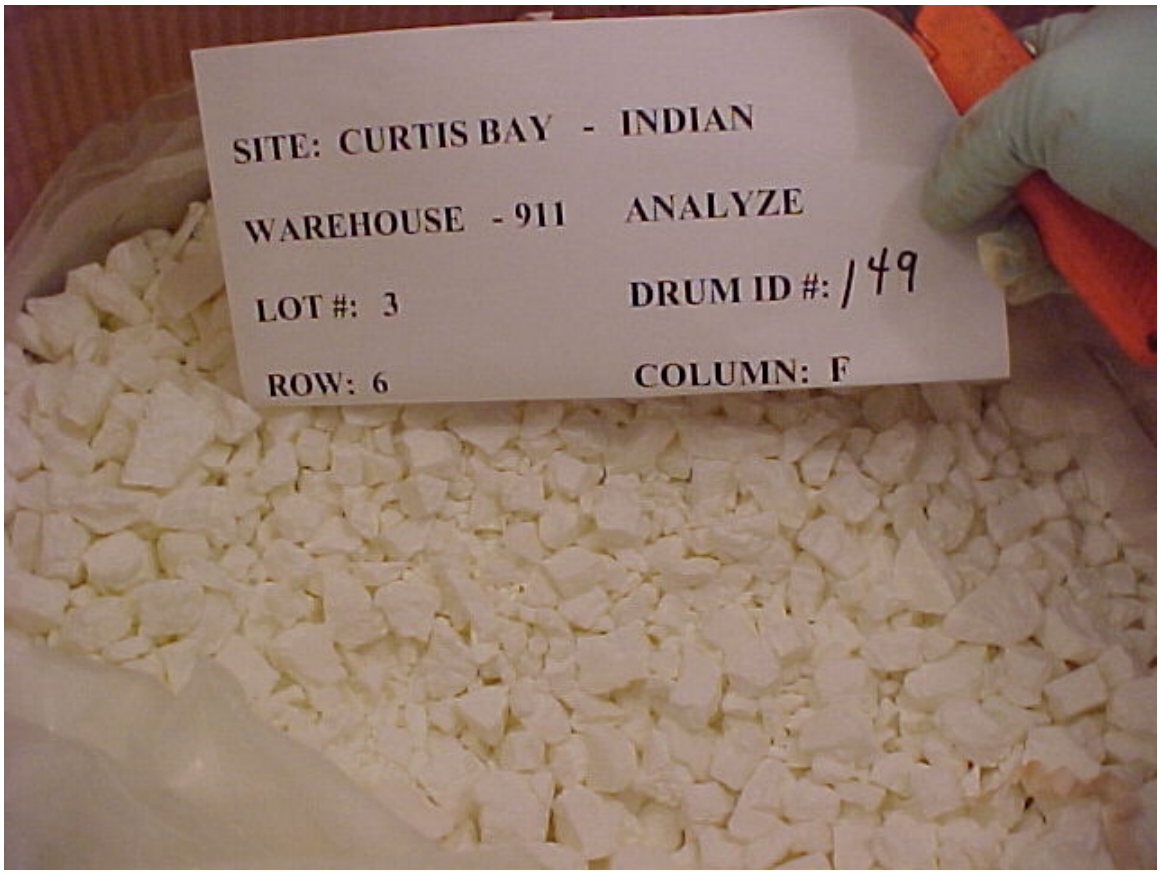
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 8 of 9

Thorium Nitrate looks like white gravel – solid – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	F

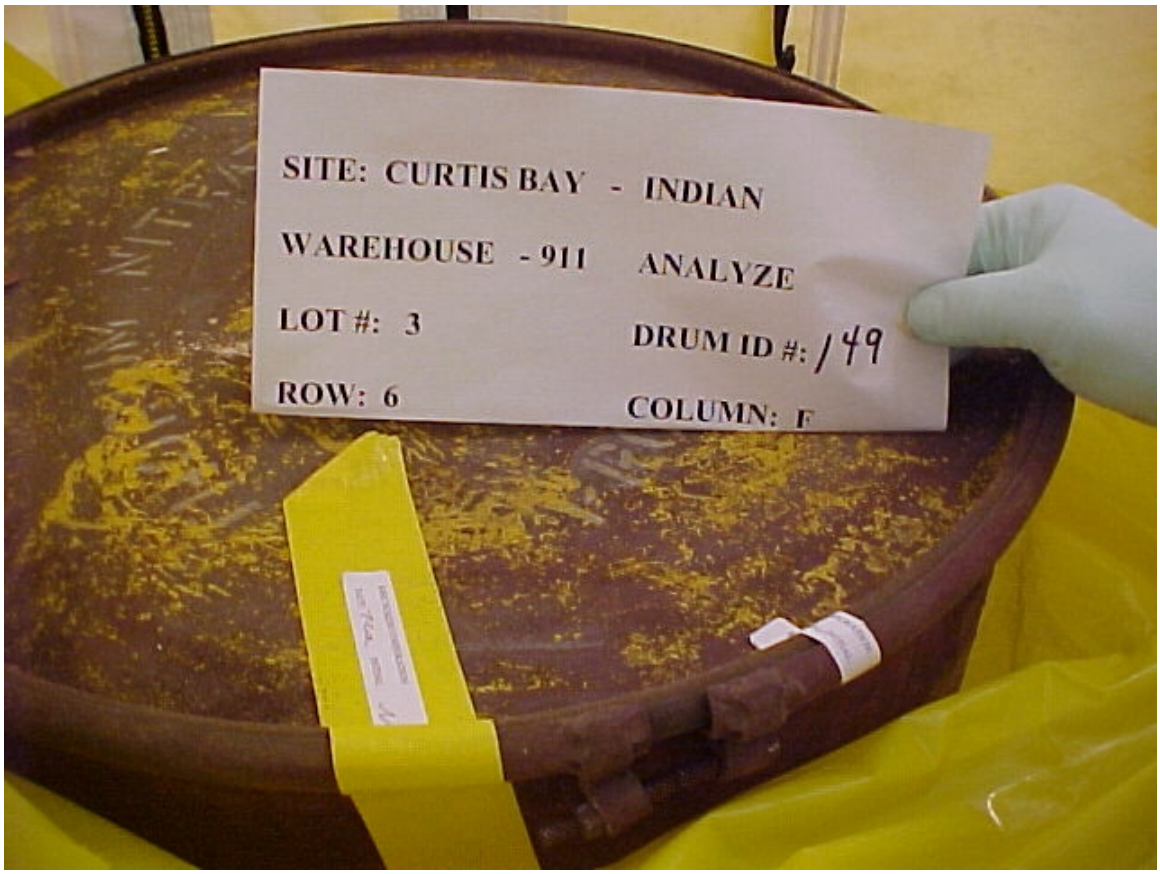
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:30

Other Information

Photo No. 9 of 9

Sealed & dated - complete



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Curtis Bay Depot
Lot #I-4 – Drum #206
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-4 Drum ID #: 206 Location: Warehouse 911 – Column E - Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* NA (85-gal drum) Units: in
Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 4.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Container (w/ cardboard lining)
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes

Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

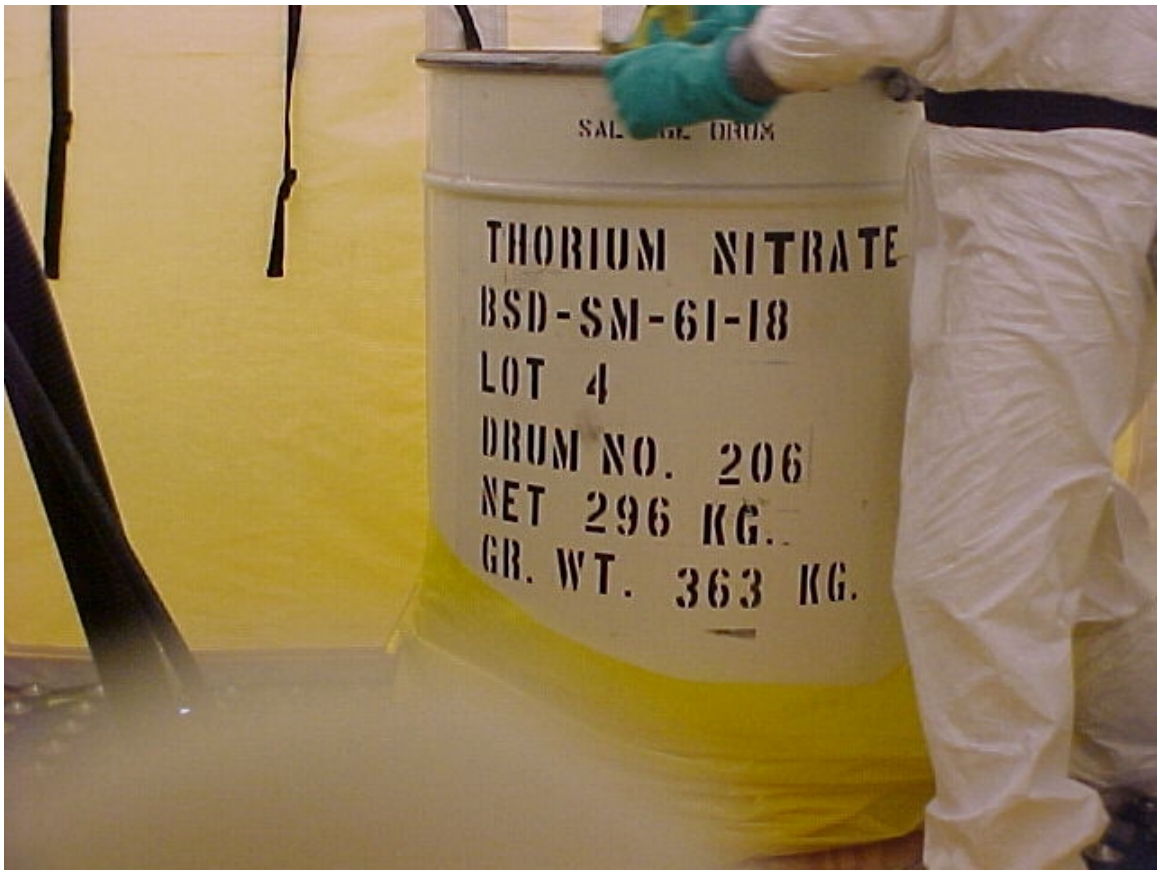
Warehouse	911	Row	2
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No.	1 of 8		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	30 mR/hr	
	1 meter	4.0 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

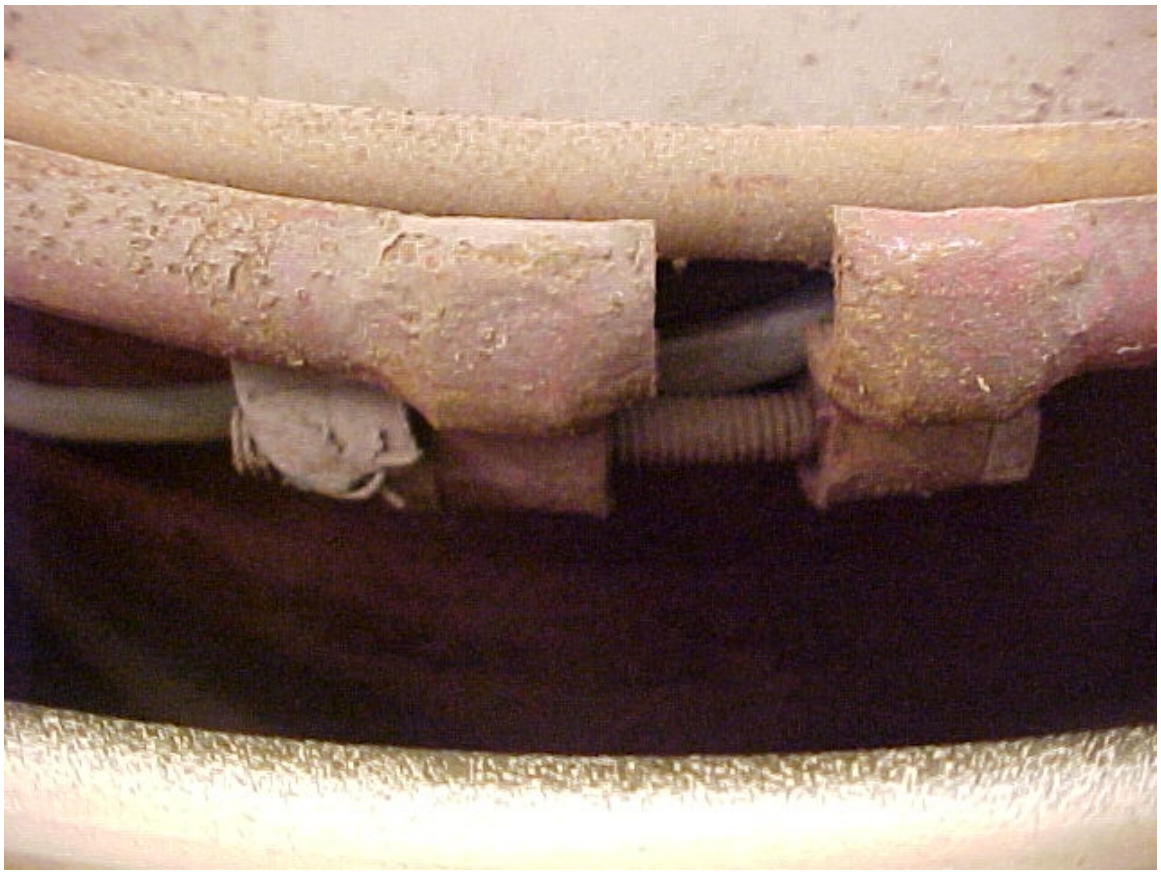
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No. 2 of 8

55-gal drum ring of inner 55-gallon drum is rusted & bent and hard to reach with tools to open
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

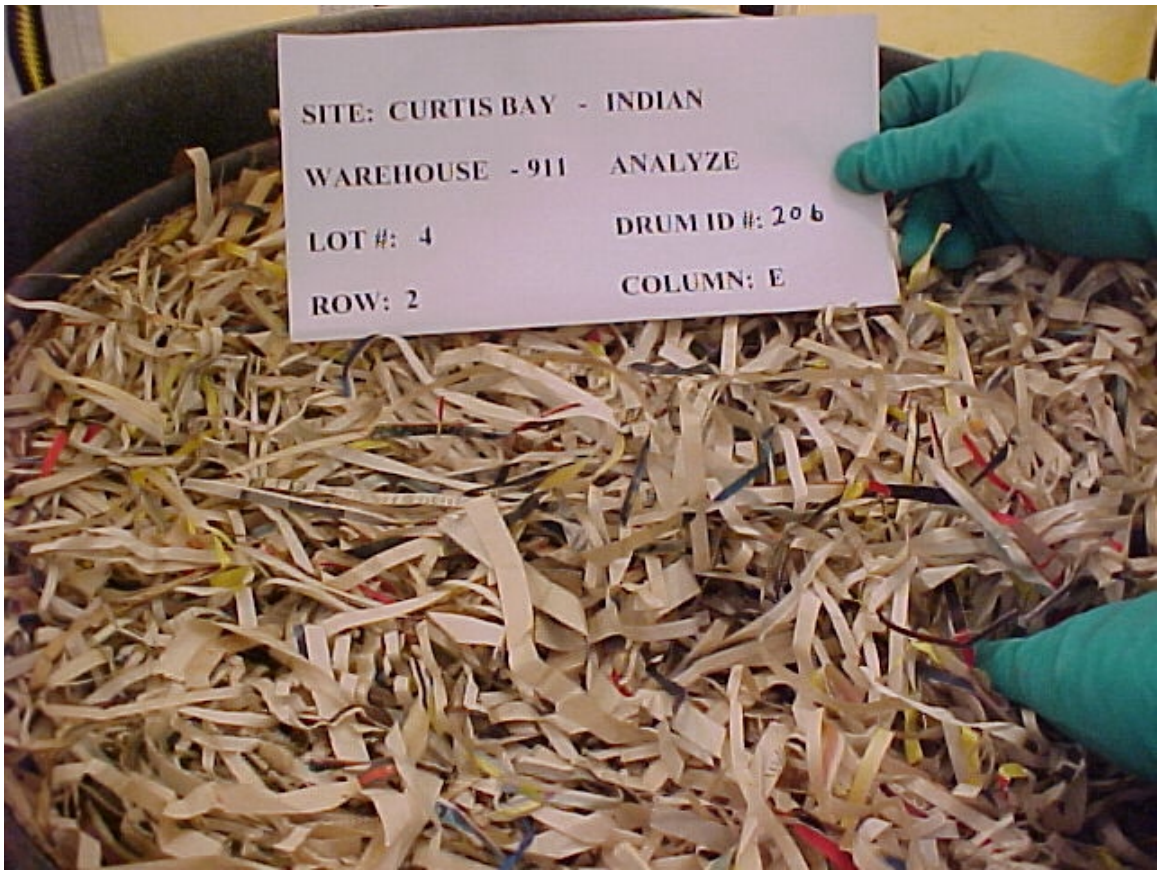
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No. 3 of 8

The shredded paper – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

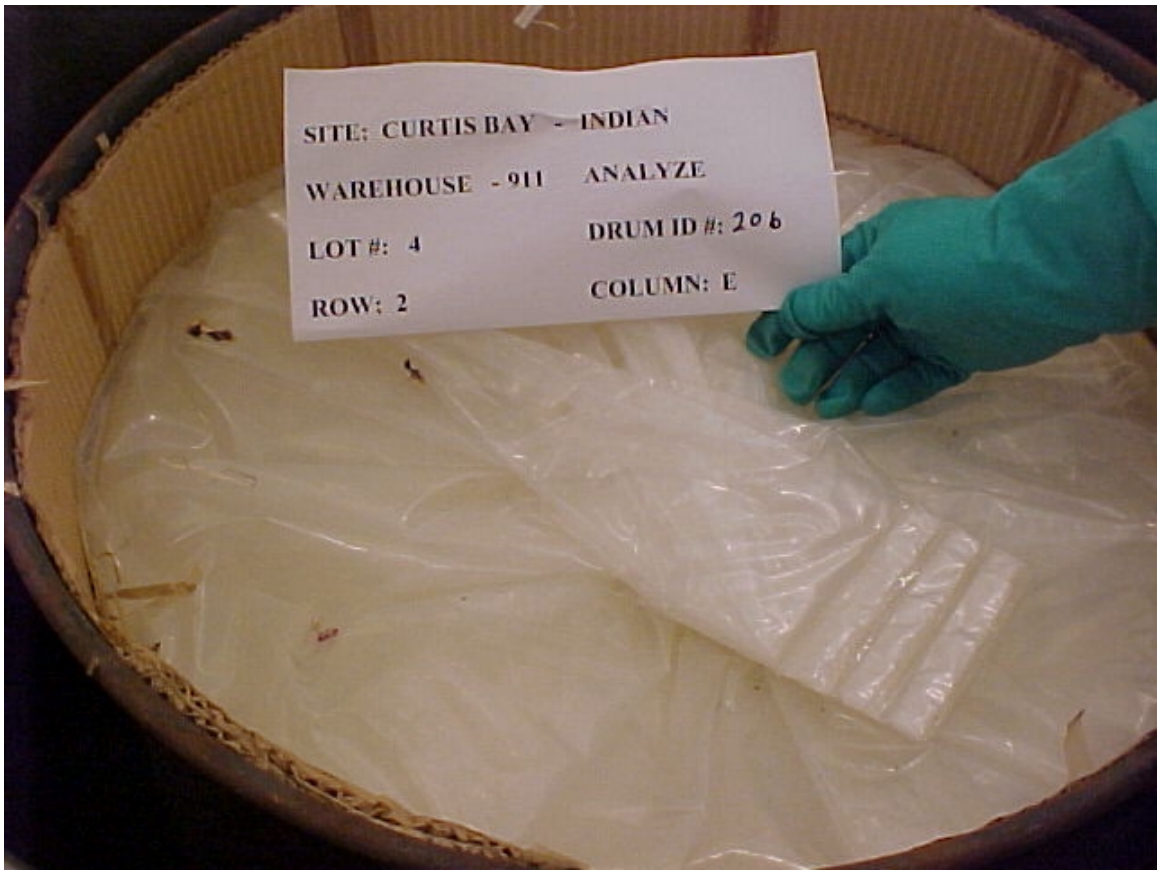
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No. 4 of 8

1st polyliner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

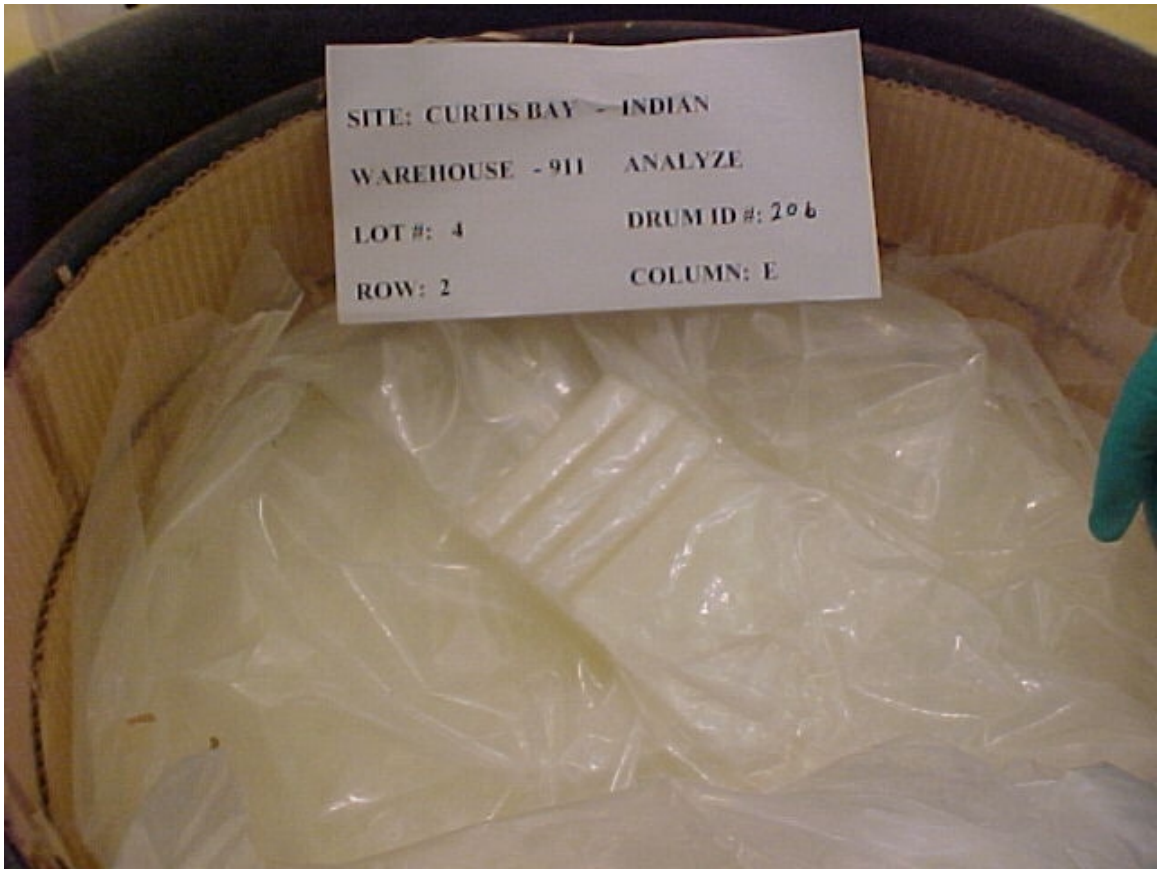
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No. 5 of 8

2nd polyliner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No. 6 of 8

3rd polyliner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

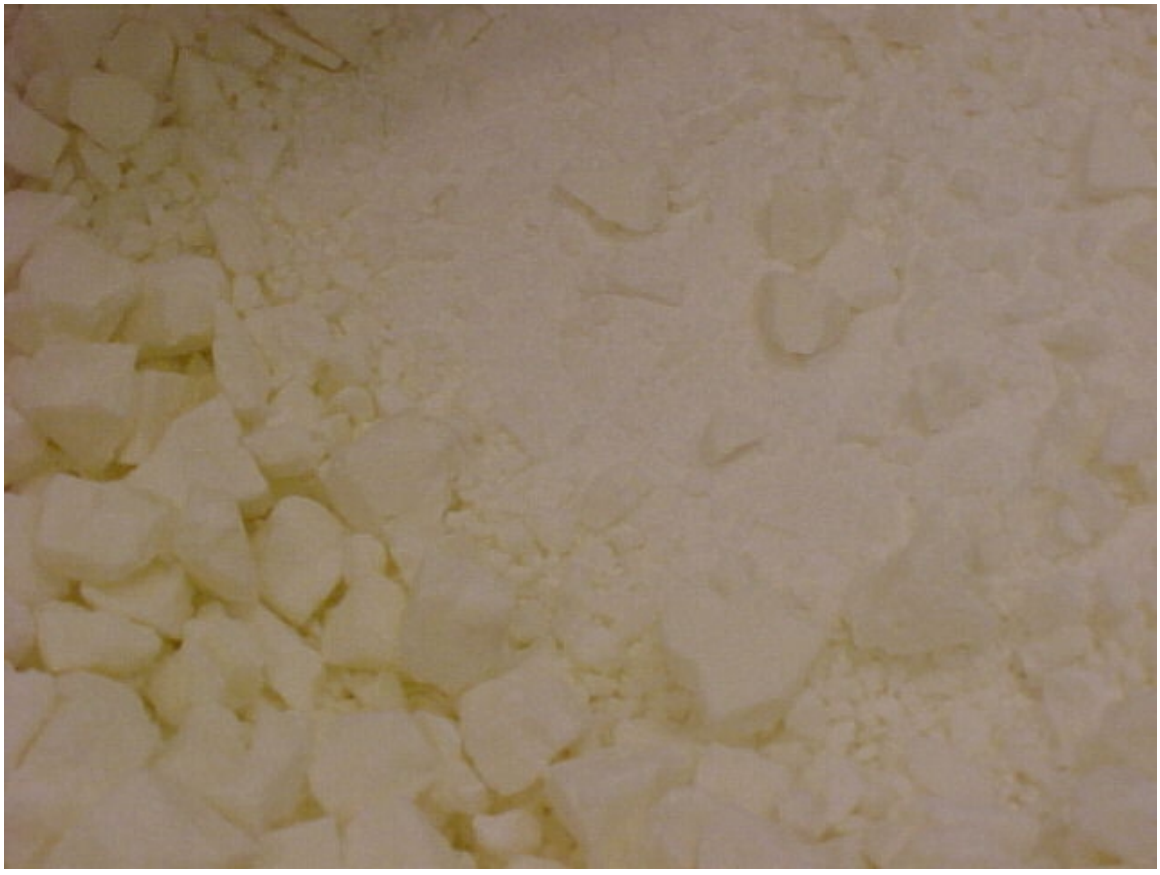
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No. 7 of 8

Thorium Nitrate looks like white gravel – solid – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	206	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

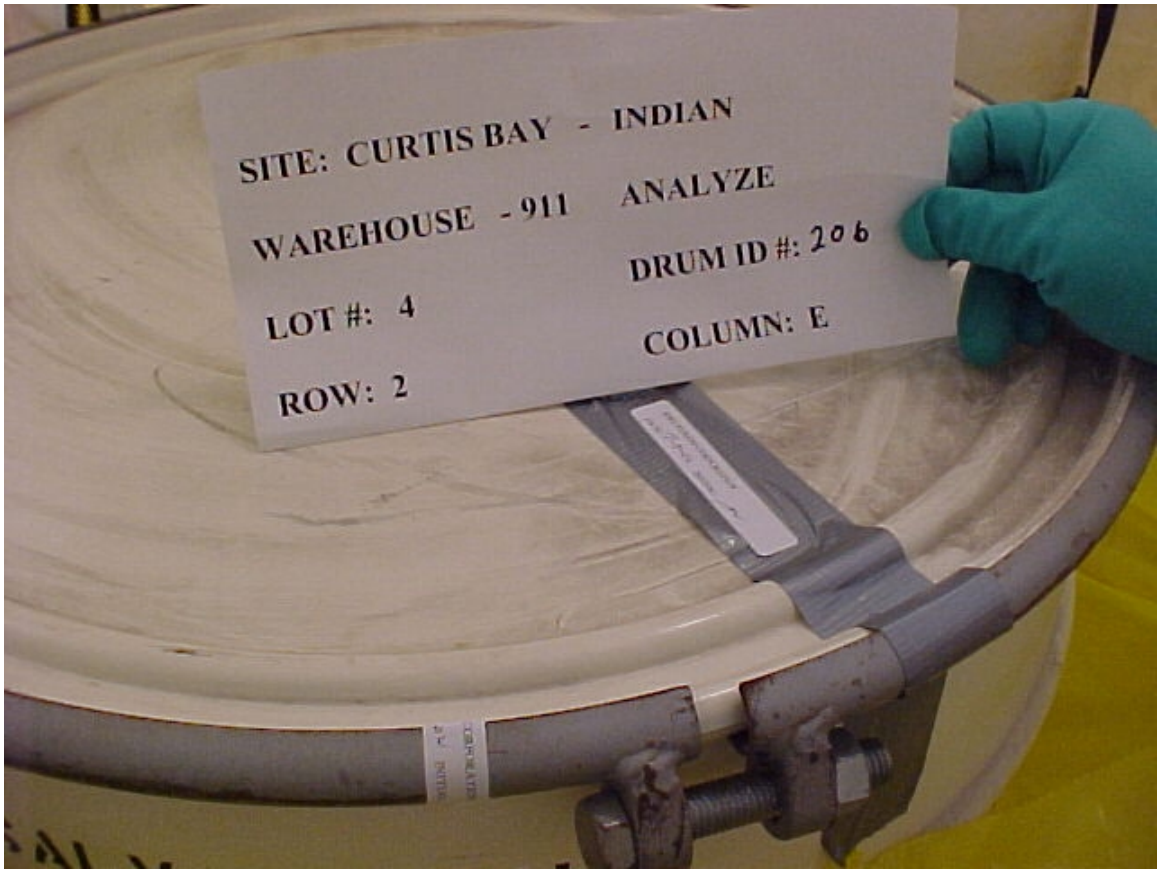
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:15

Other Information

Photo No. 8 of 8

Sealed & dated - complete



Curtis Bay Depot
Lot #I-5 – Drum #251
Inspect, Sample & Analyze

Container Inspection Checklist

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-5 Drum ID #: 251 Location: Warehouse 911 – Column E - Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* NA (85-gal drum) Units: in
Rad Measurements at the time of opening: DR at Surface 34mR/hr DR at 1 meter 4.5mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Container (w/ cardboard lining)
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes

Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

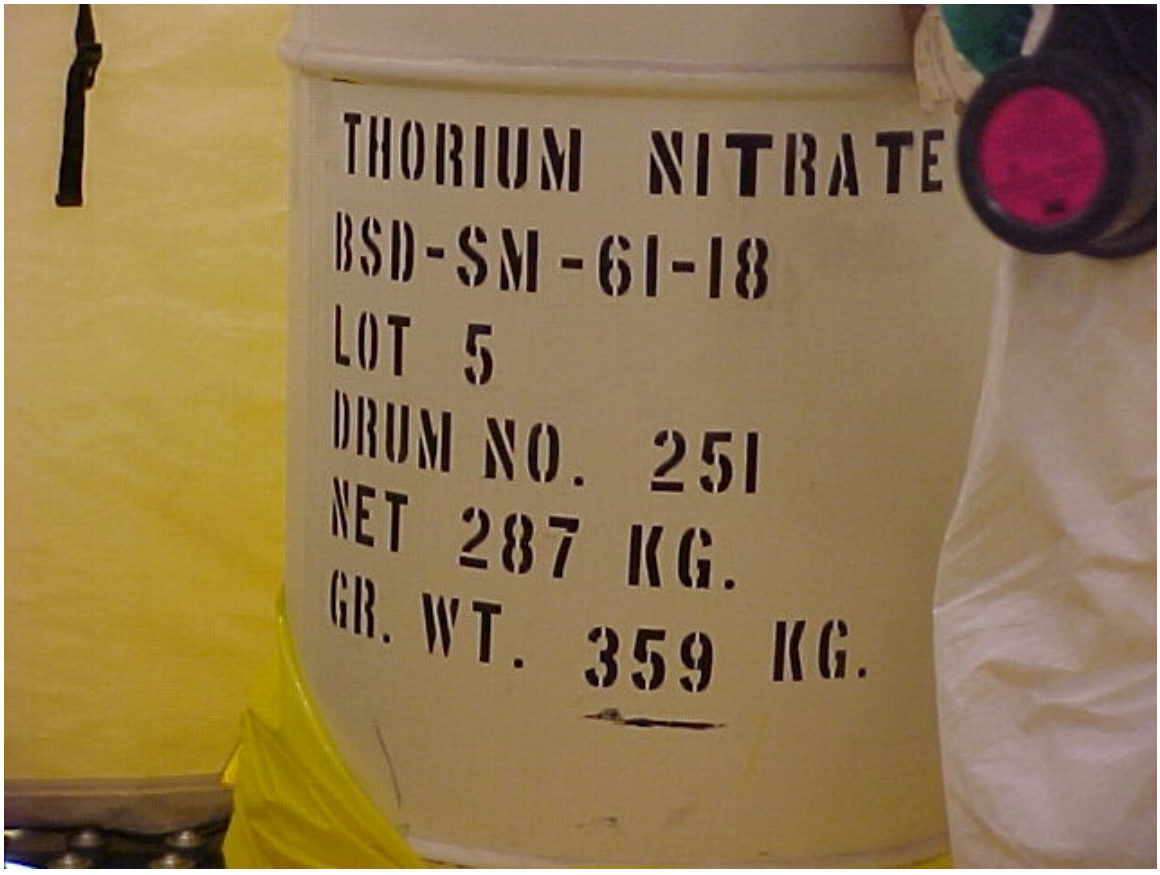
Warehouse	911	Row	2
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No.	1 of 9		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	34 mR/hr	
	1 meter	4.5 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

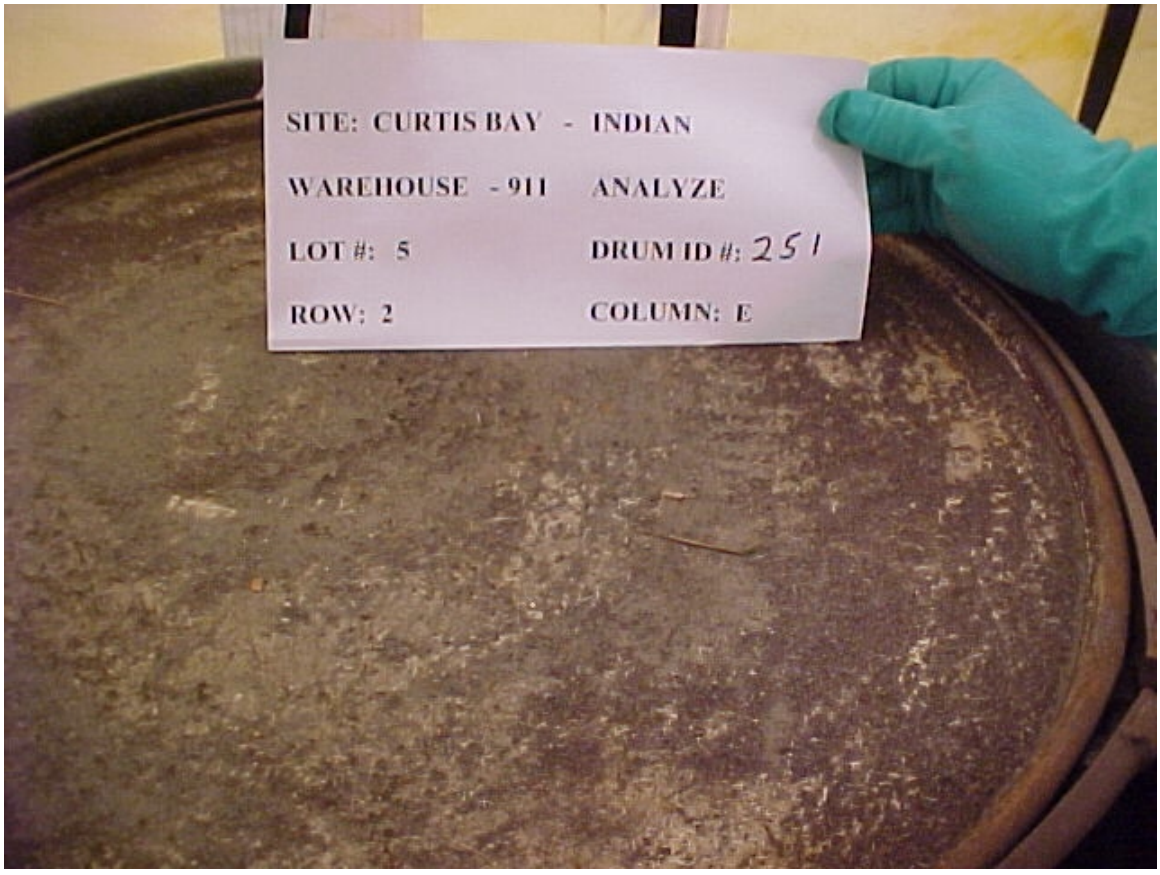
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 2 of 9

55-gal container and ring – Fair condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

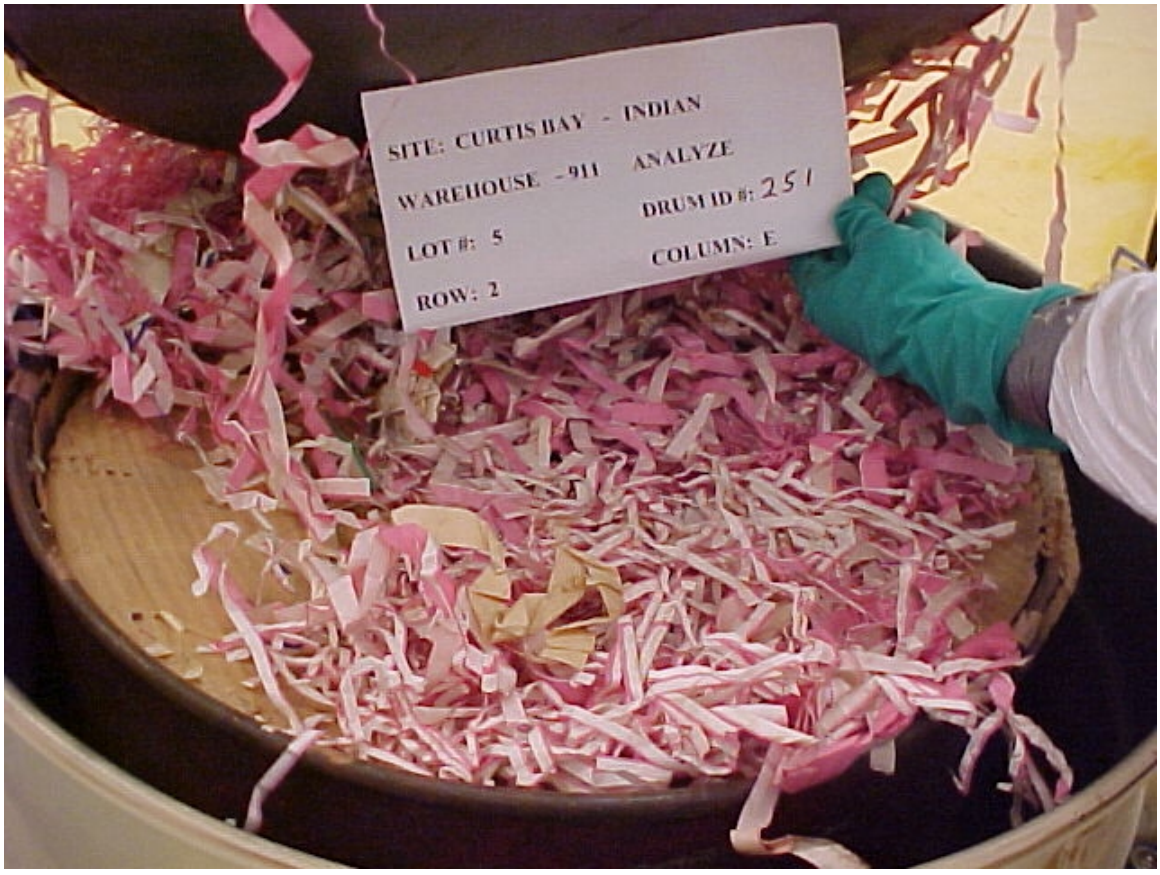
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 3 of 9

The shredded paper under the 55 gal lid
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

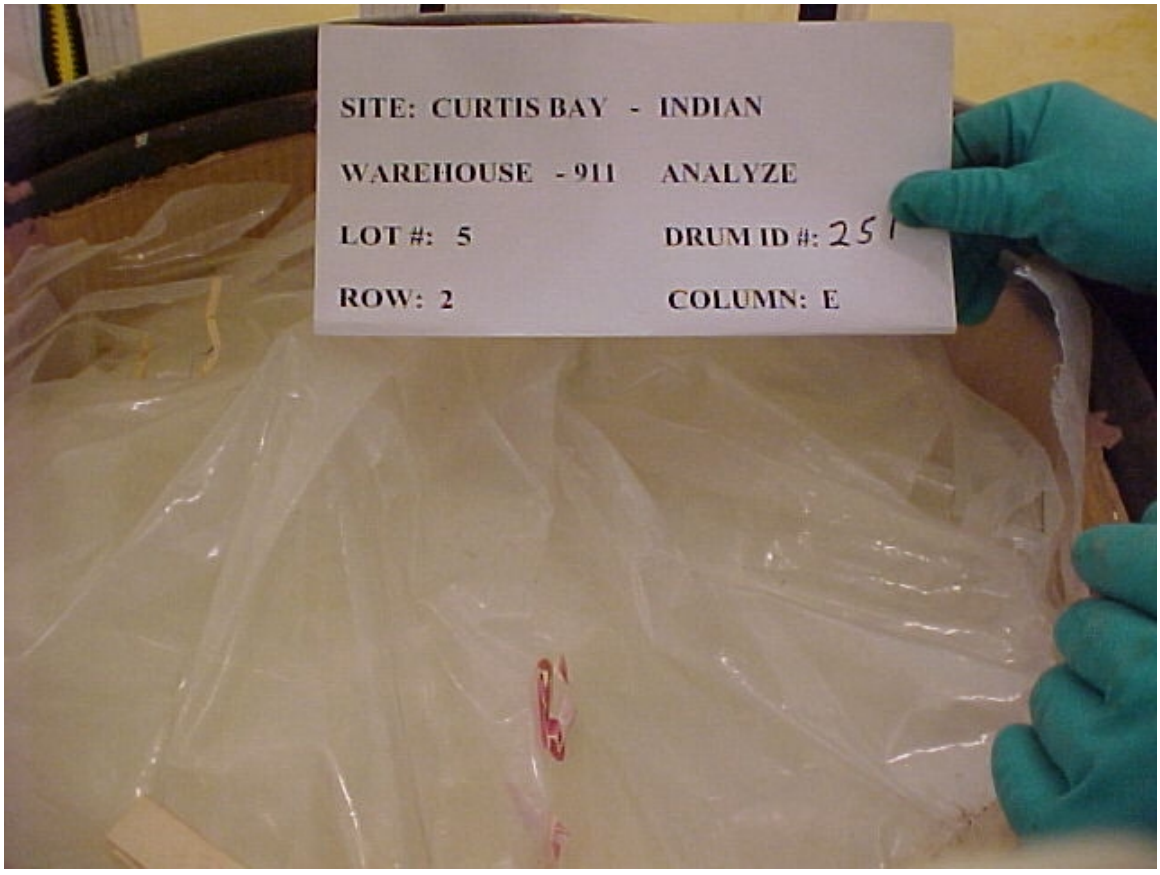
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 4 of 9

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

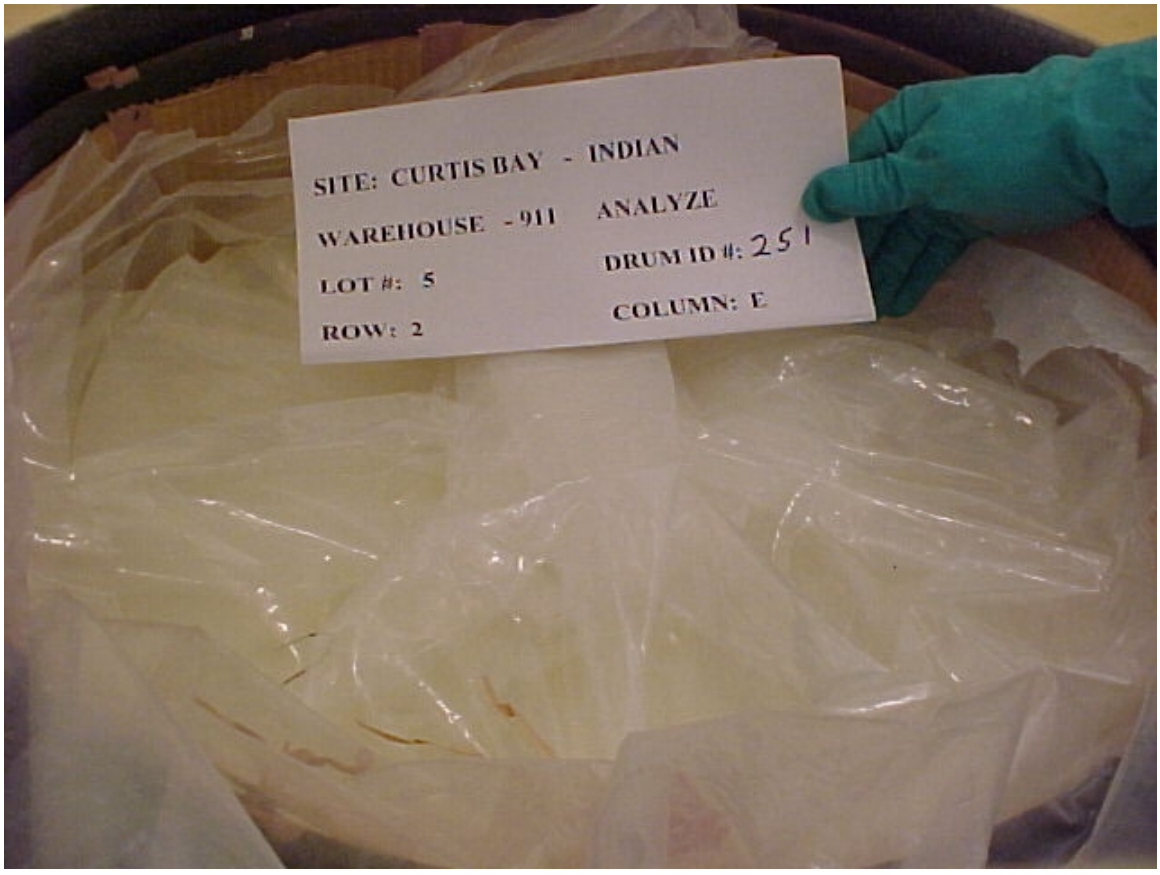
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 5 of 9

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

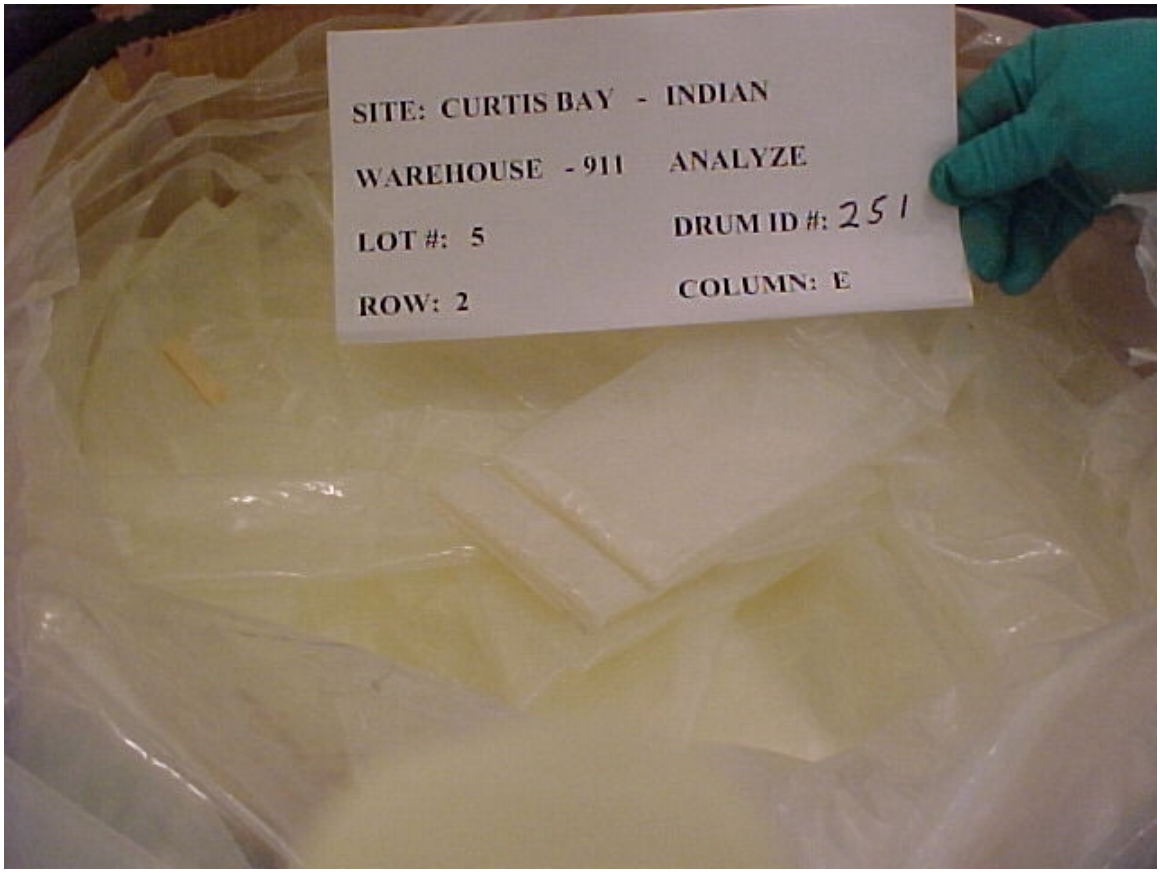
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 6 of 9

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

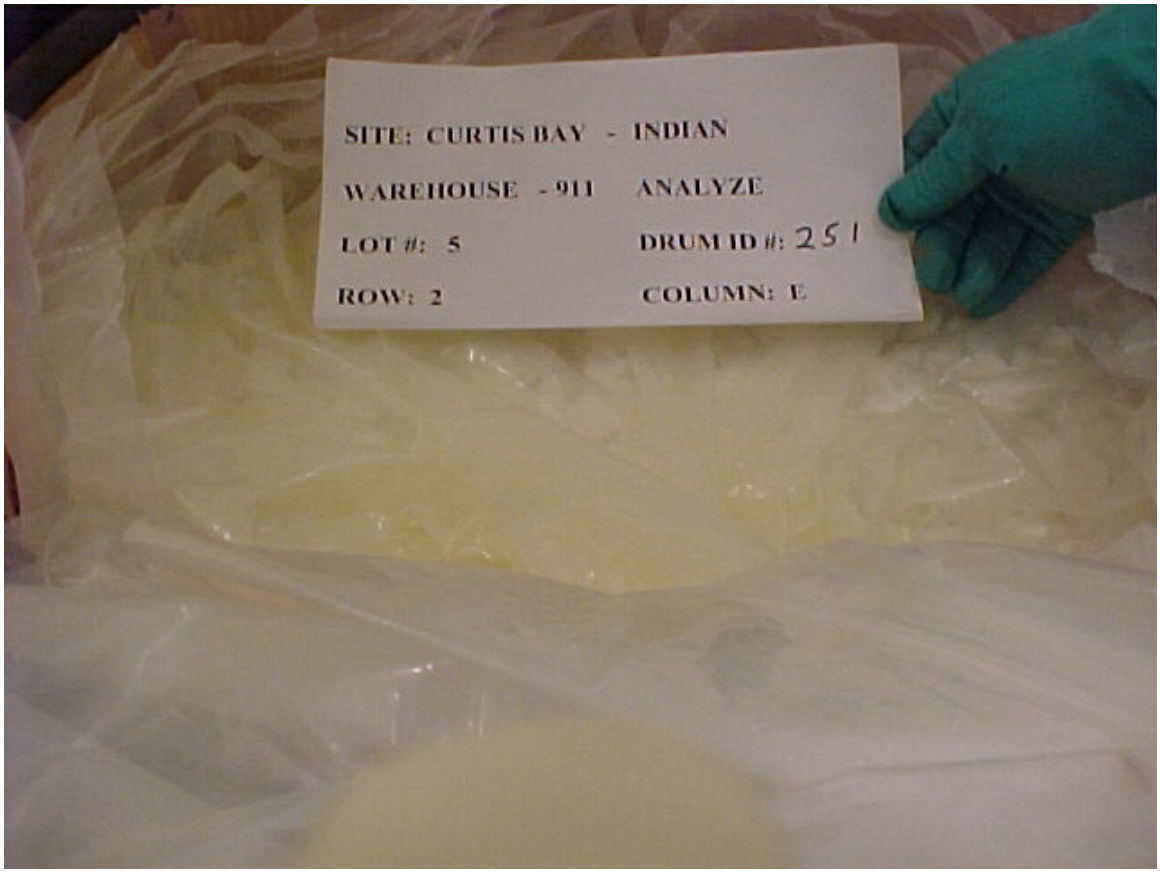
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 7 of 9

4th poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 8 of 9

Indian – Thorium Nitrate – white – gravel/rock looking – dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	251	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	E

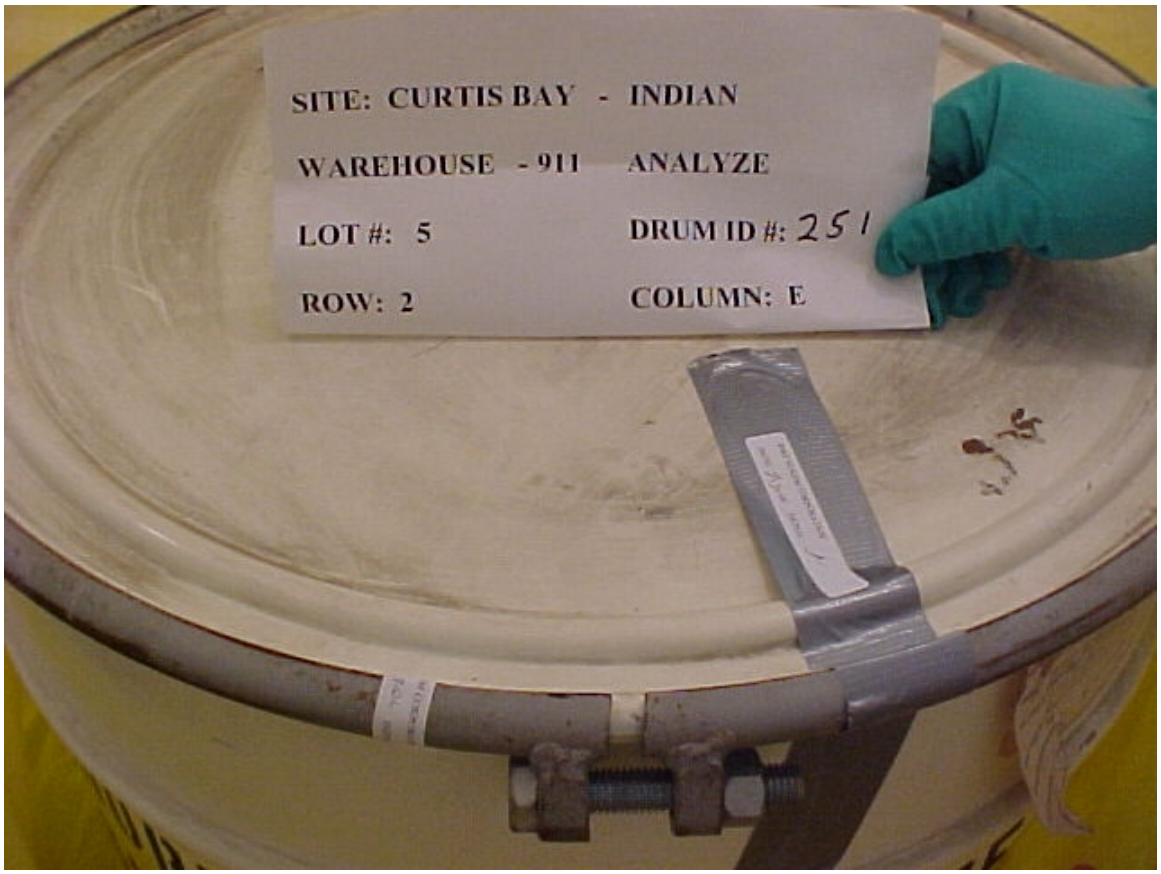
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:25

Other Information

Photo No. 9 of 9

Sealed/Dated – Completed



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Curtis Bay Depot
Lot #I-6 – Drum #300
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-6 Drum ID #: 300 Location: Warehouse 911 – Column F - Row 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* NA (85-gal drum) Units:
Rad Measurements at the time of opening: DR at Surface 32mR/hr DR at 1 meter 4.5mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Container (w/ cardboard lining)
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes

Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

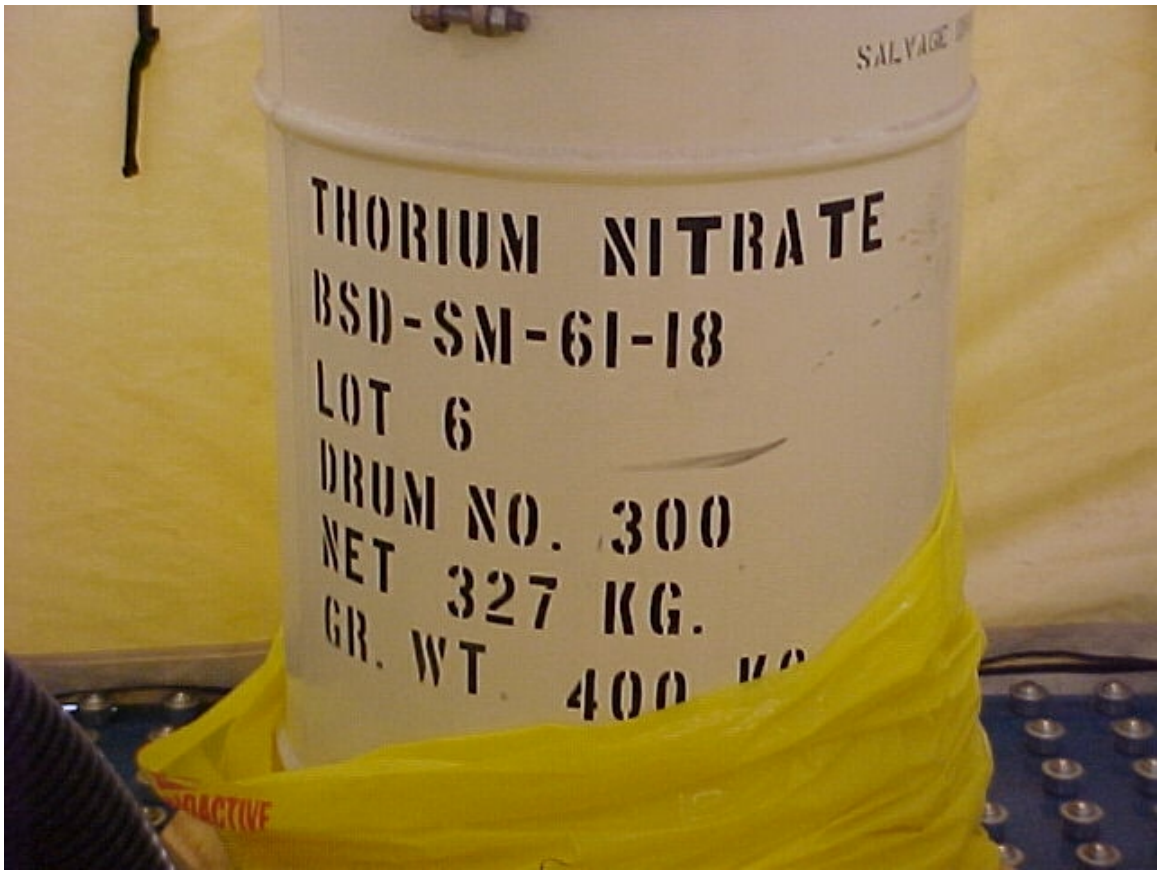
Warehouse	911	Row	5
		Column	F

Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No.	1 of 10		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	32 mR/hr	
	1 meter	4.5 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 2 of 10

Picture of the 55 gal container – fair condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

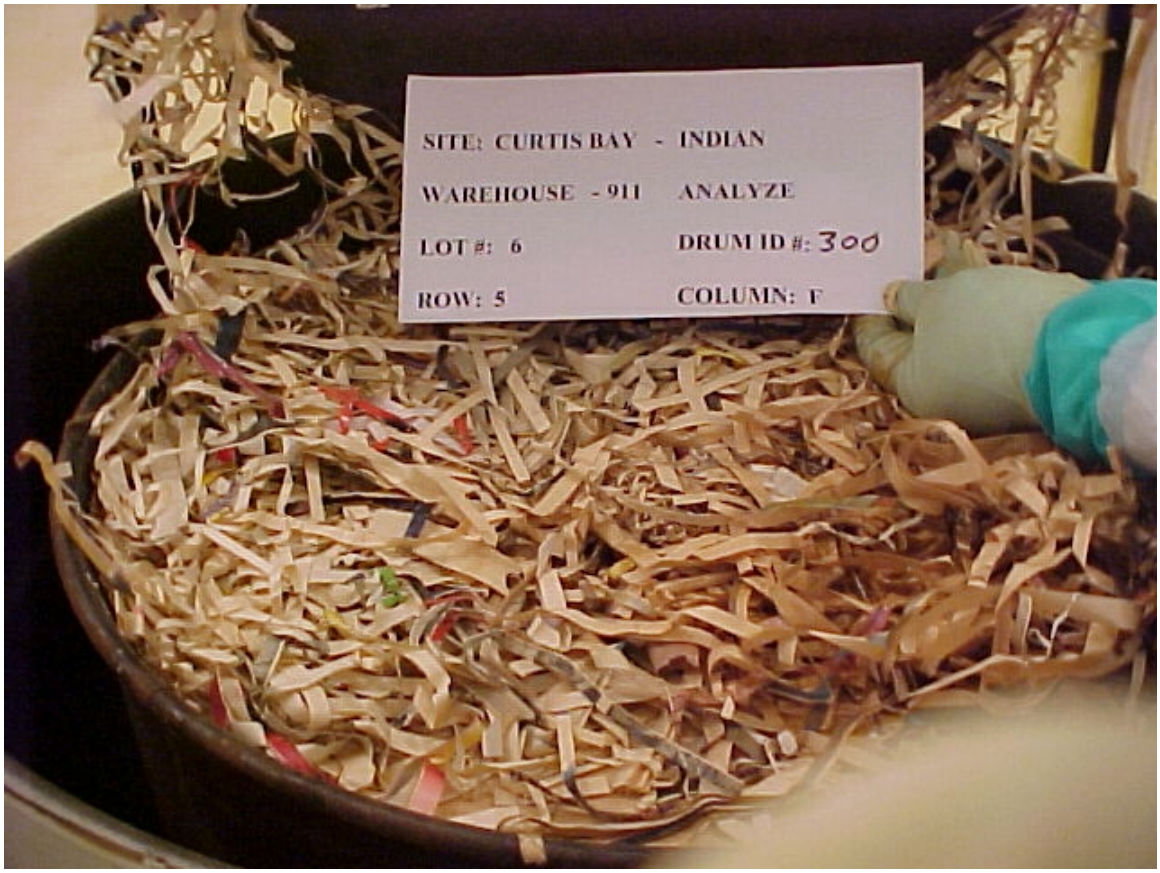
Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 3 of 10

Shredded paper for packaging
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

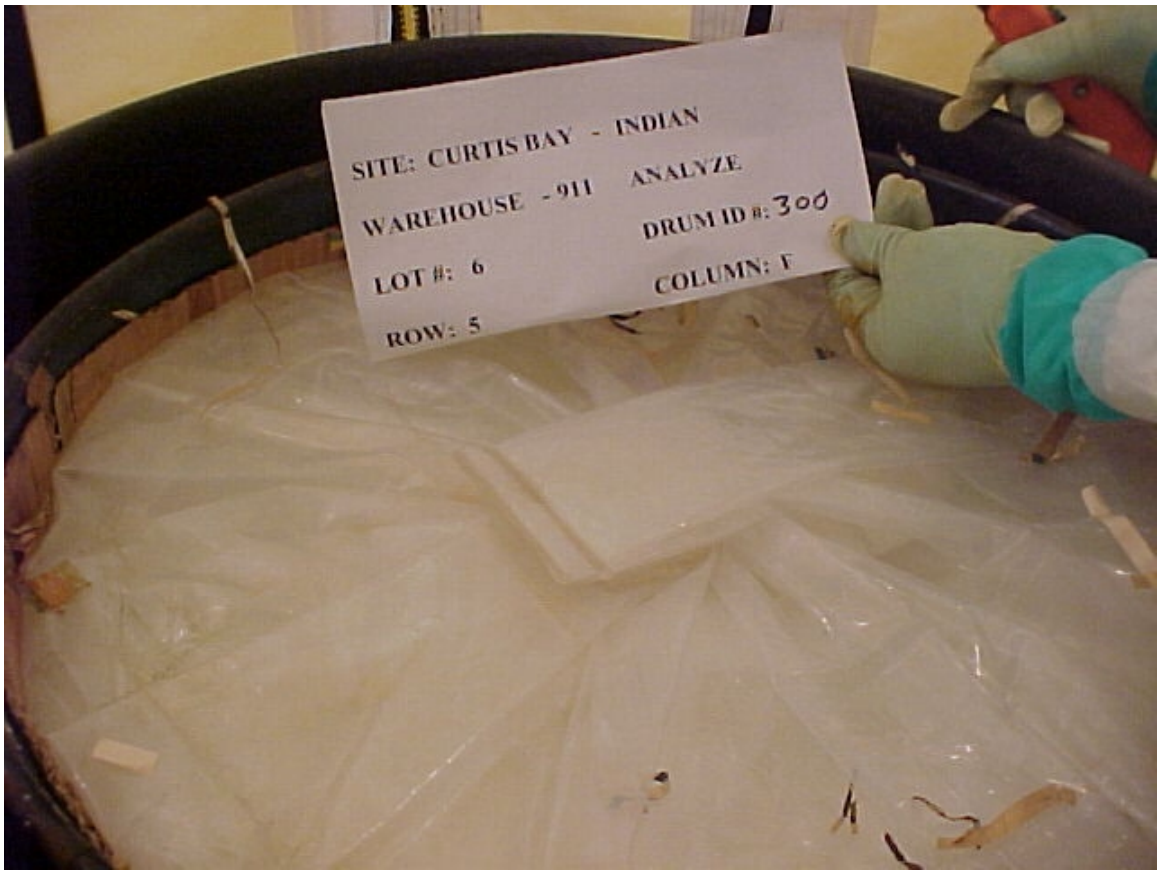
Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 4 of 10

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

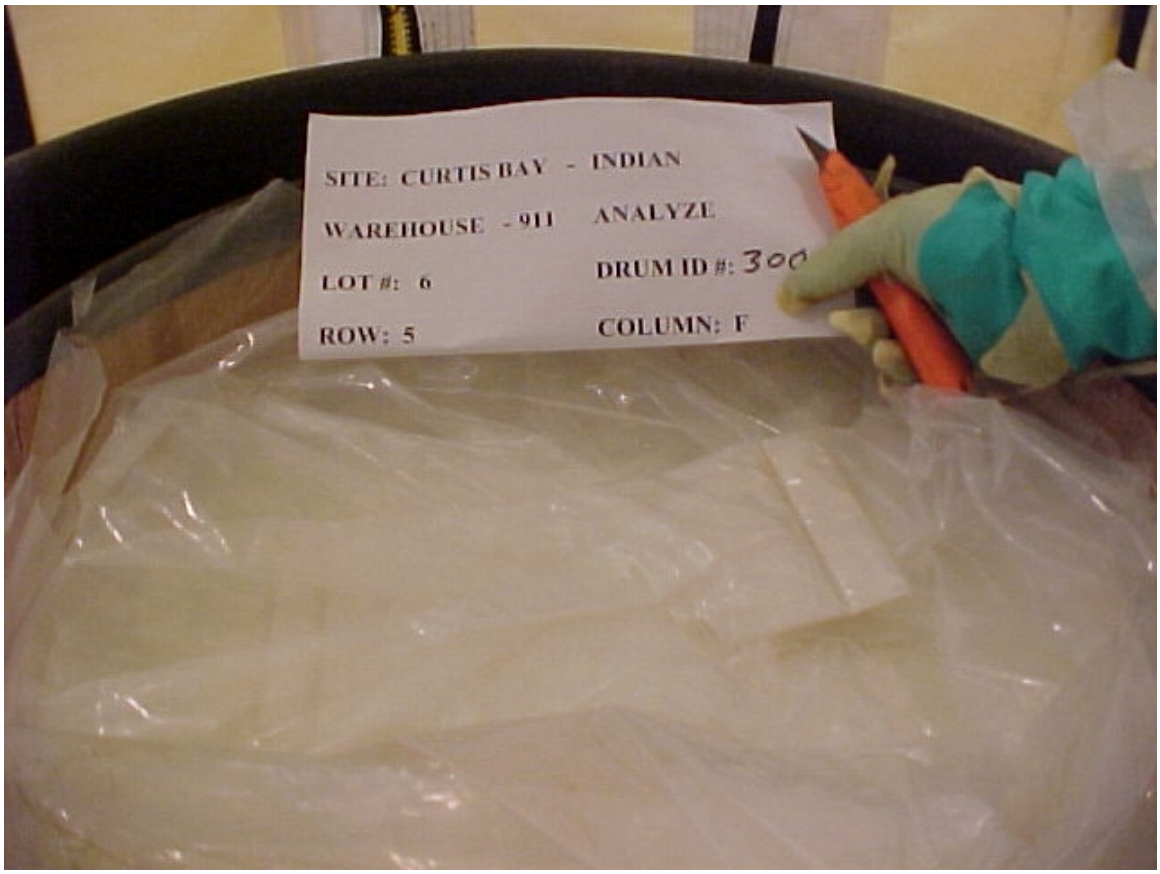
Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 5 of 10

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

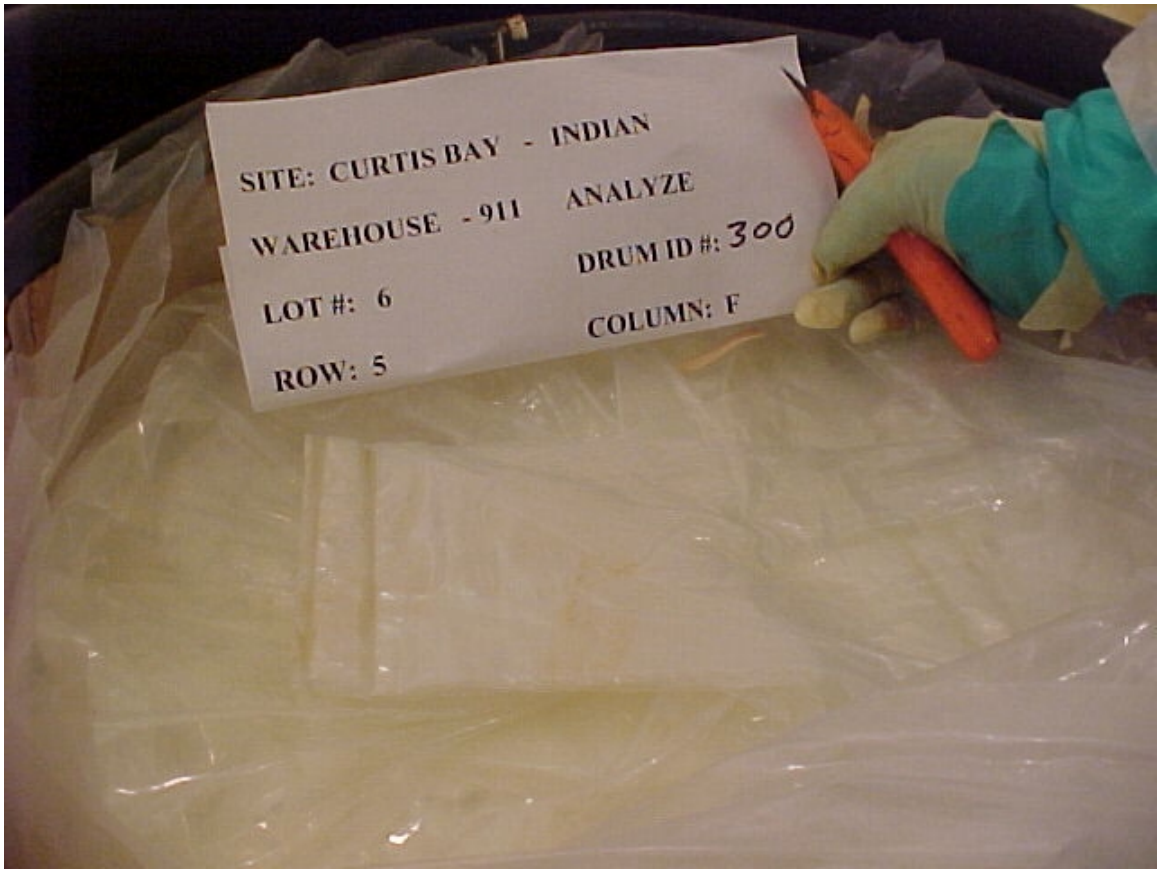
Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 6 of 10

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

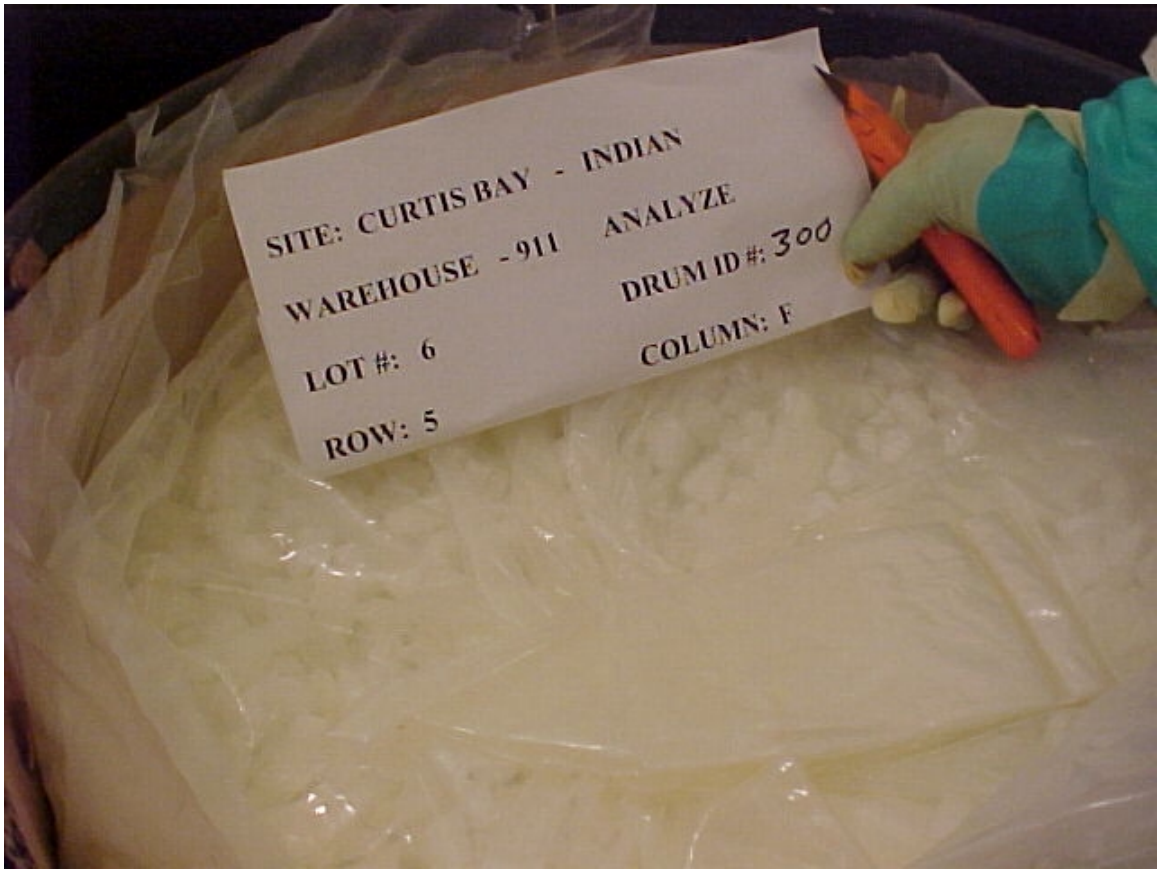
Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 7 of 10

4th poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

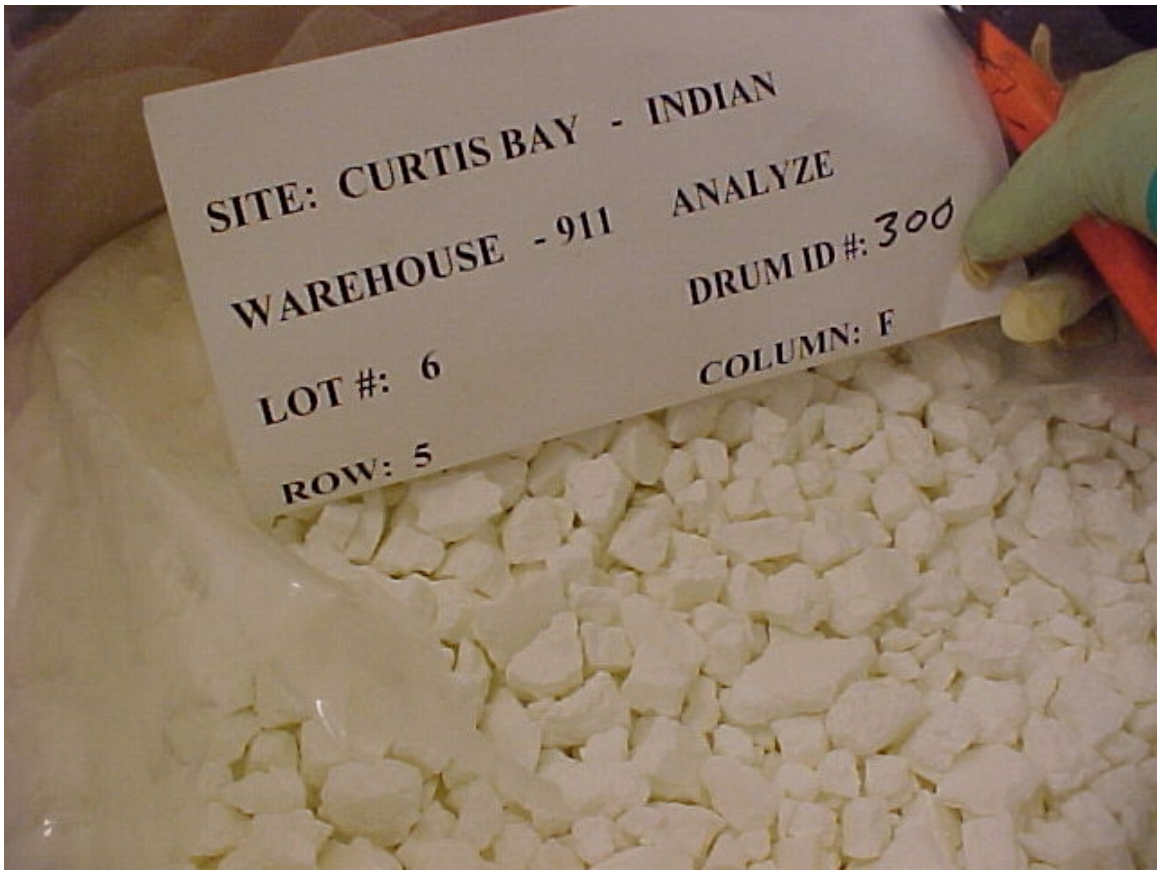
Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 8 of 10

Thorium Nitrate – solid – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 9 of 10

Close-up of Thorium Nitrate particles
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	300	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	F

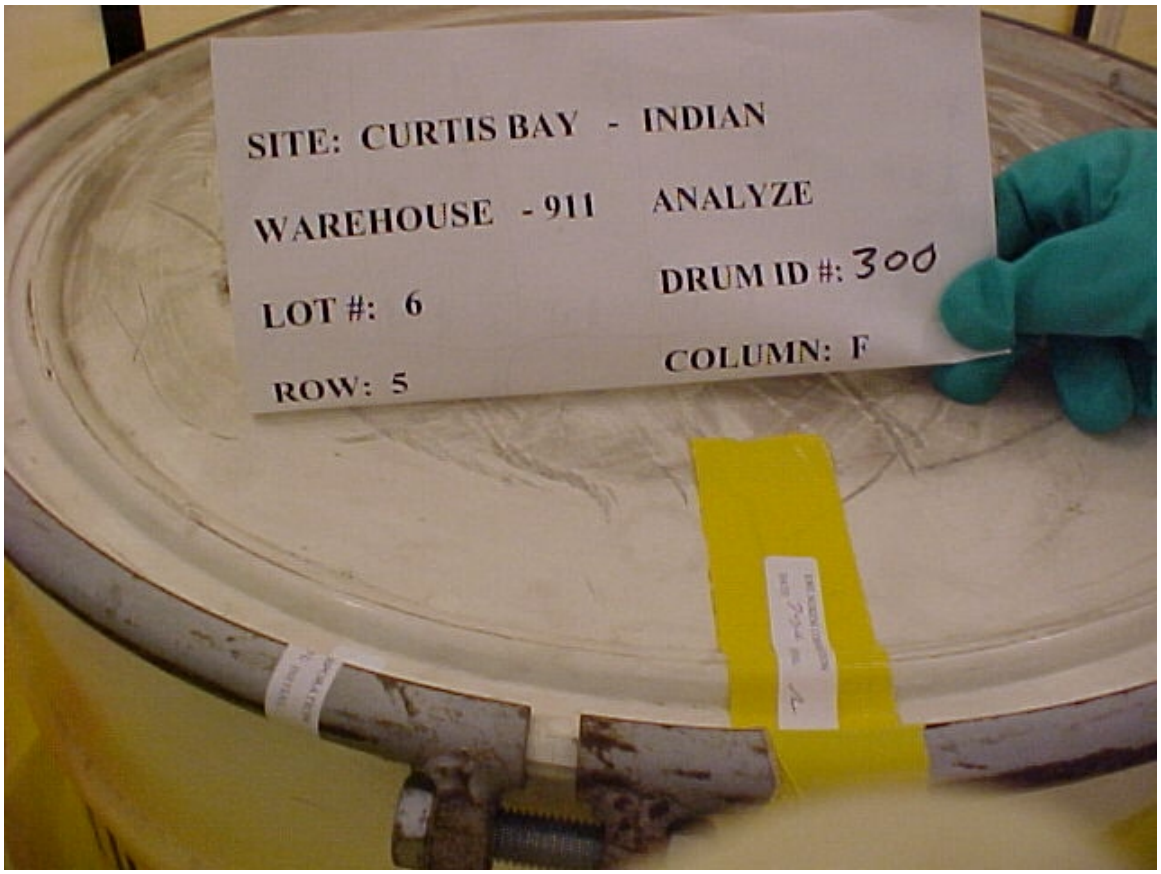
Inspection/Sample Date & Time

Date	7-3-2002	Time	08:45

Other Information

Photo No. 10 of 10

Sealed & dated - complete



Curtis Bay Depot
Lot #I-7 – Drum #358
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-7 Drum ID #: 358 Location: Warehouse 911 – Column E – Row 1

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* NA (85-gal drum) Units:
Rad Measurements at the time of opening: DR at Surface 32mR/hr DR at 1 meter 4.4mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Container (w/ cardboard lining)
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bag
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

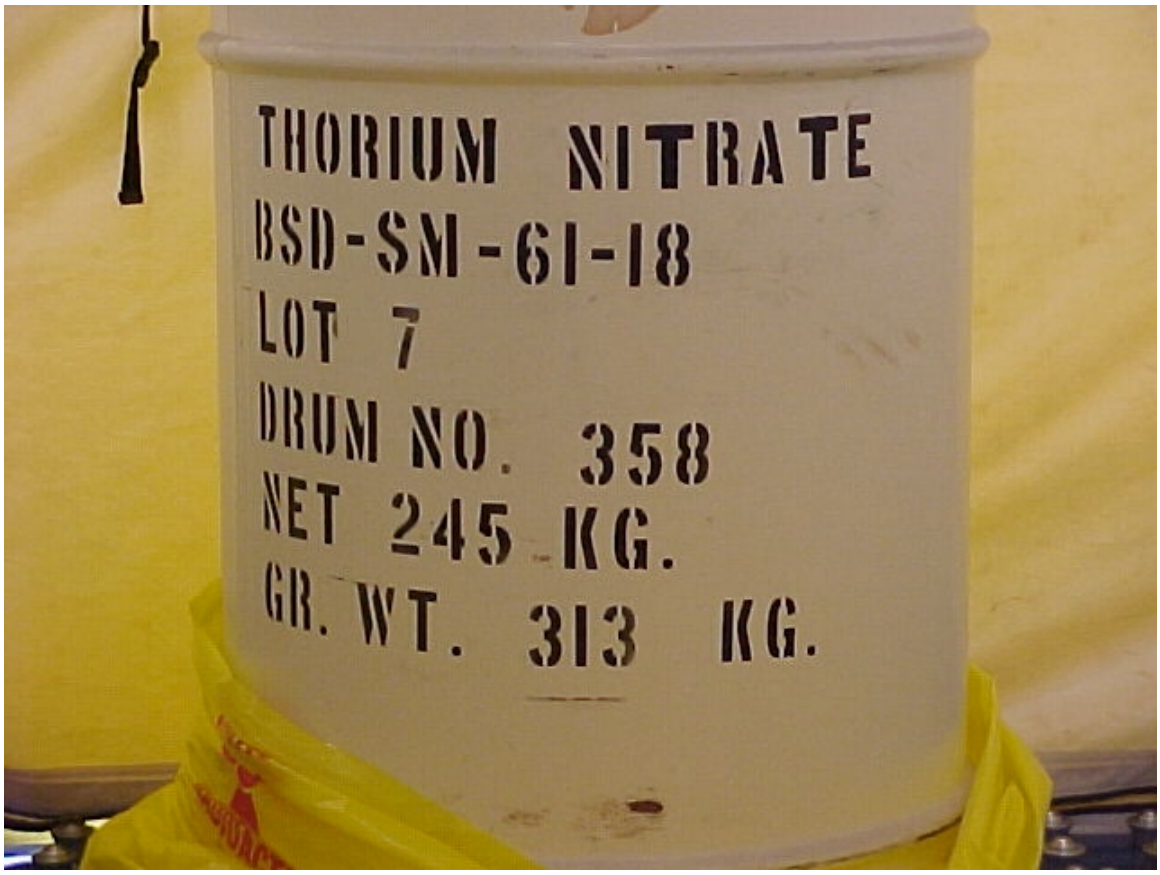
Warehouse	911	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No.	1 of 9		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	32.0 mR/hr	
	1 meter	4.4 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 2 of 9

55-gal container – shows the ring already off the drum
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

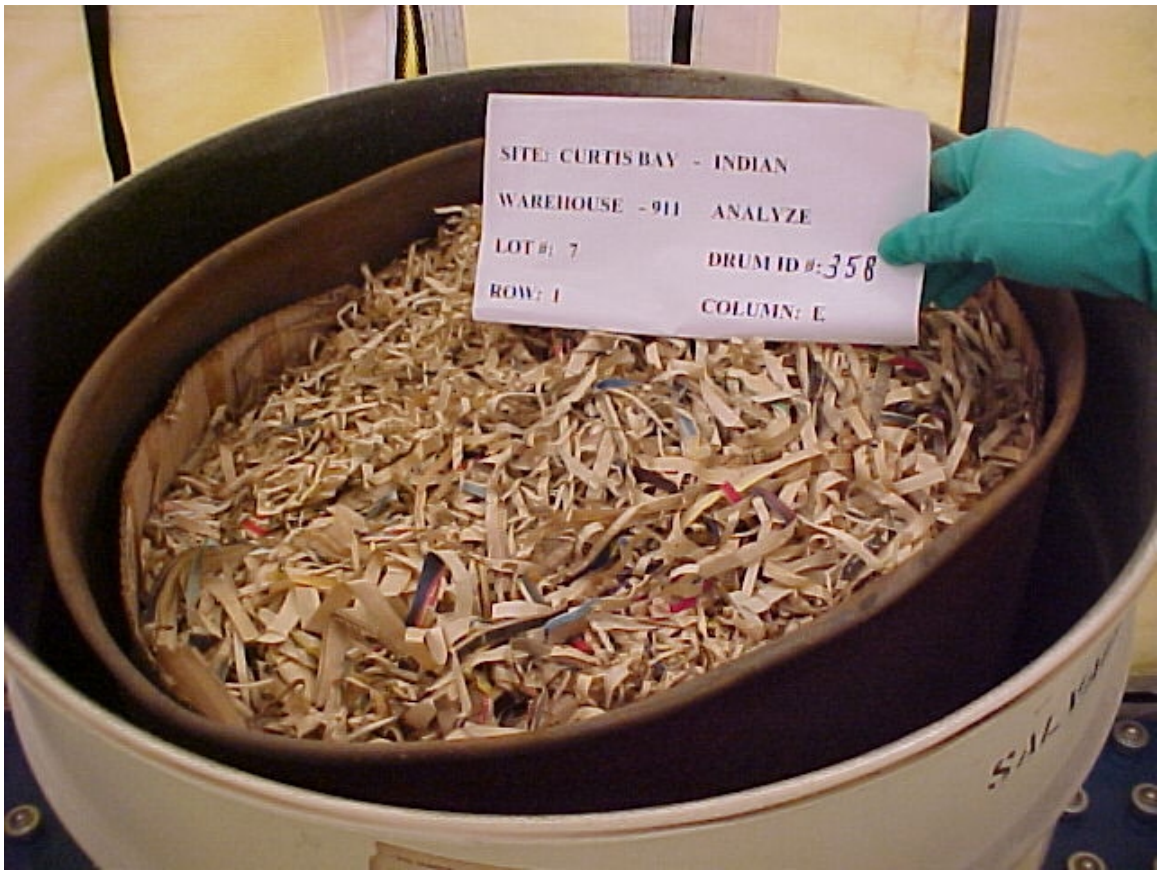
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 3 of 9

1st layer – shredded paper
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 4 of 9

1st poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 5 of 9

2nd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 6 of 9

3rd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 7 of 9

4th poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 8 of 9

Thorium Nitrate – gravel looking – solid – dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	358	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	1
		Column	E

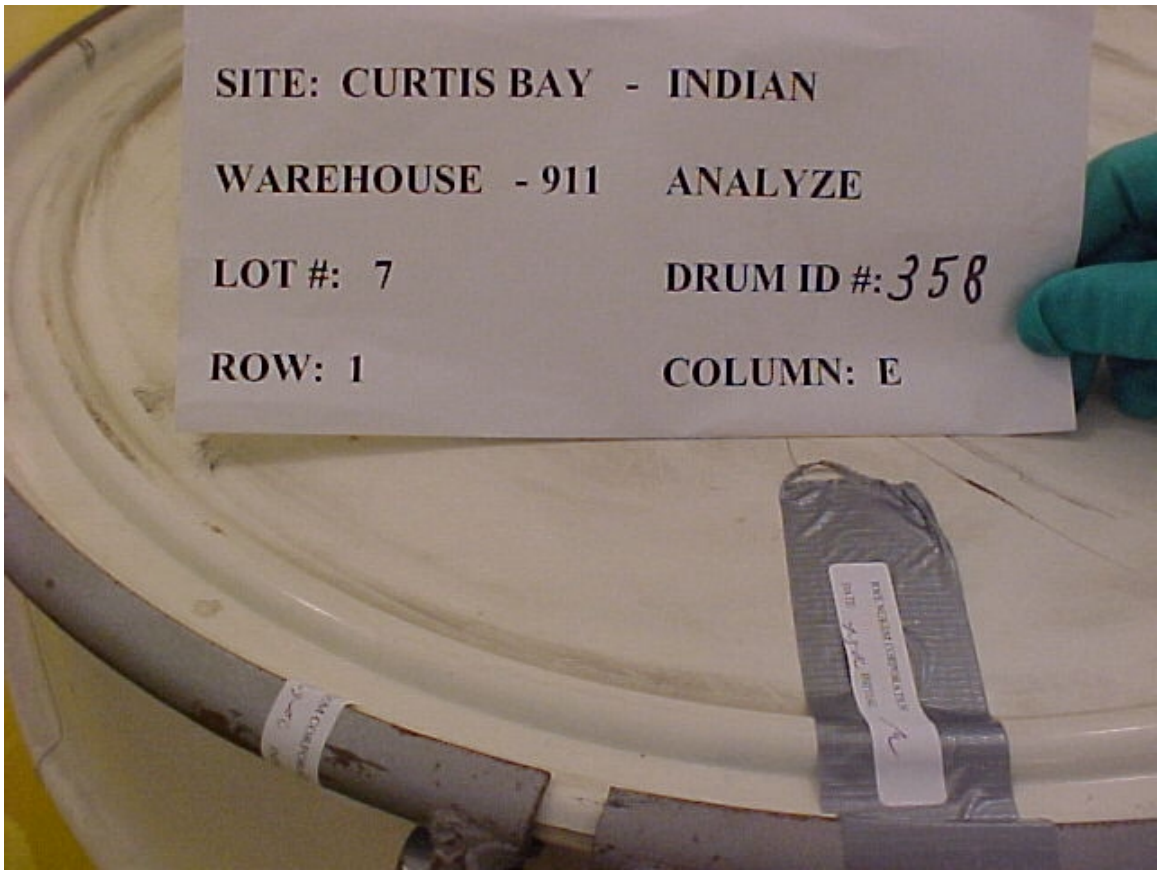
Inspection/Sample Date & Time

Date	7-3-2002	Time	10:00

Other Information

Photo No. 9 of 9

Sealed & dated - complete



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Curtis Bay Depot
Lot #I-9 – Drum #780
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-9 Drum ID #: 780 Location: Warehouse 911 – Column F – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 4.5mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Container (w/ cardboard lining)
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

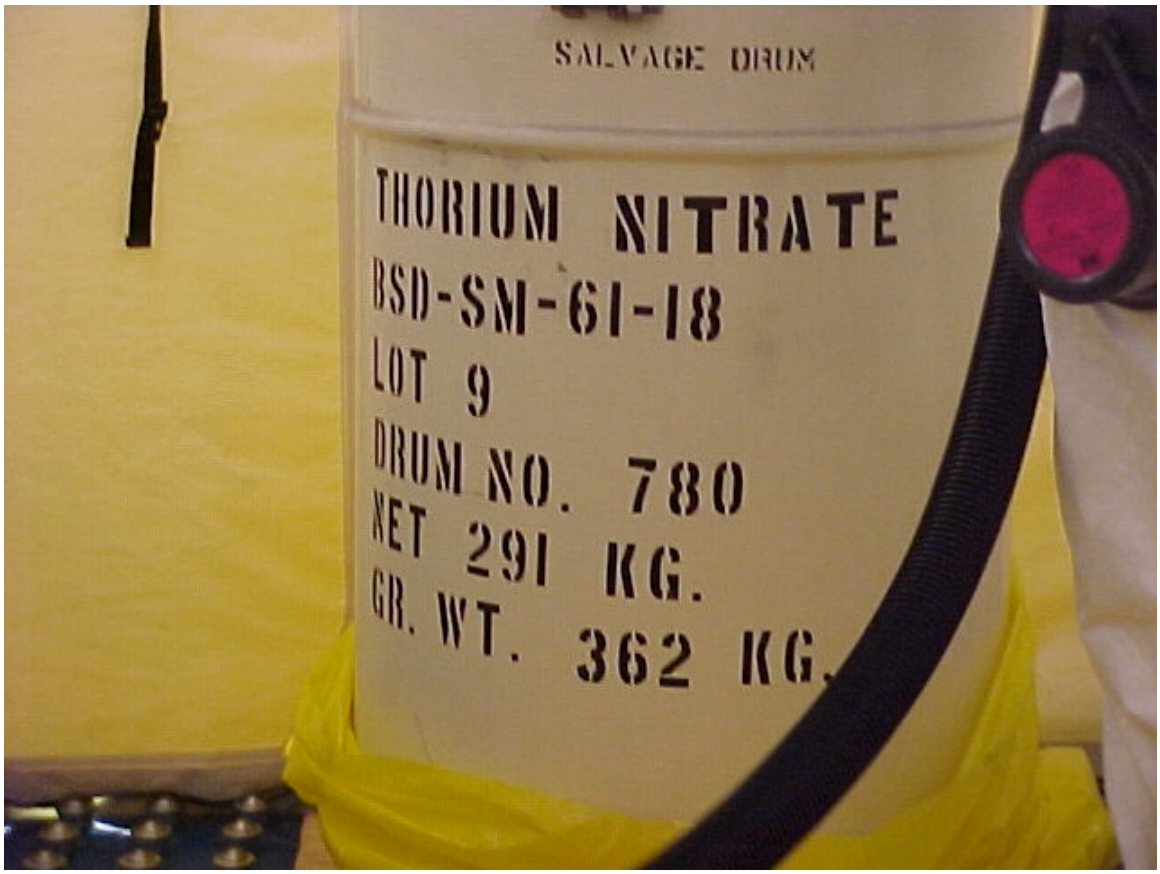
Warehouse	911	Row	4
		Column	F

Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No.	1 of 9		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	30.0 mR/hr	
	1 meter	4.5 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

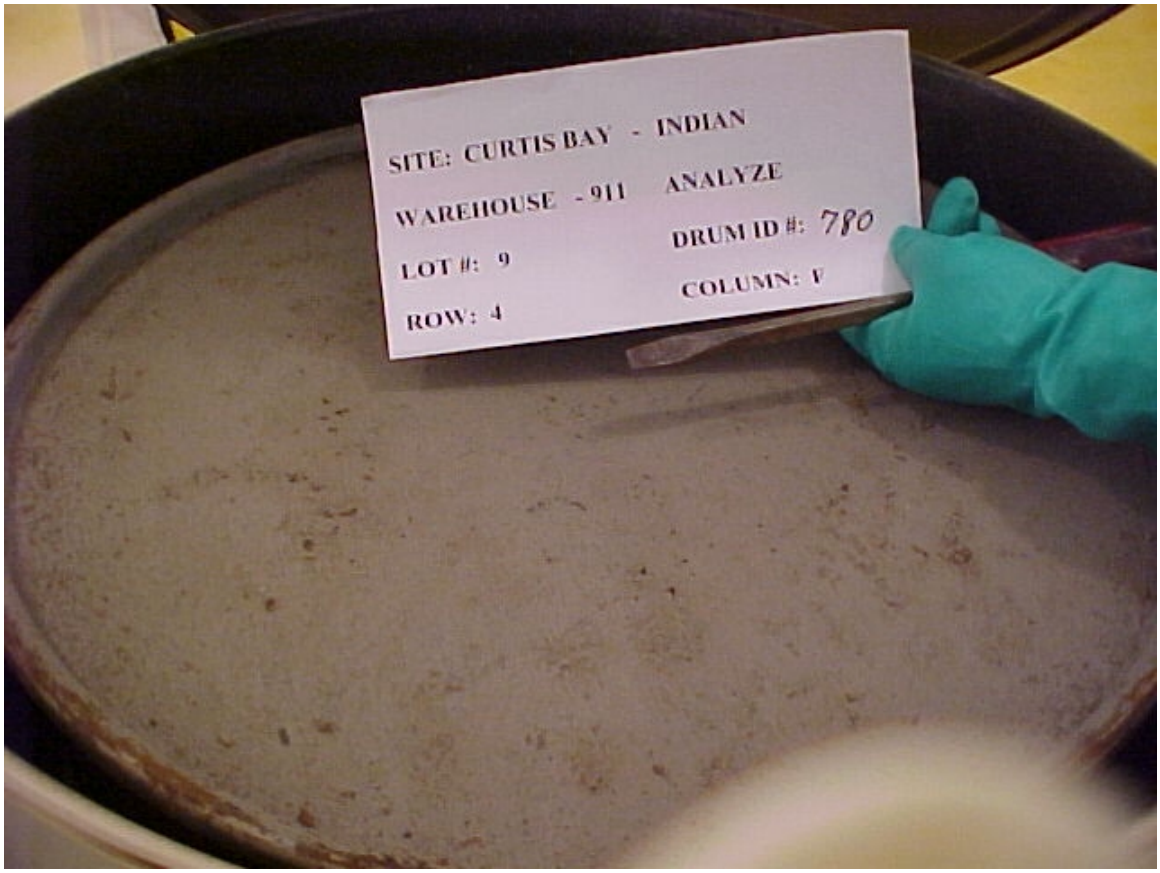
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 2 of 9

55-gal container – there was no ring on the 55-gal drum
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 3 of 9

Shredded paper in container
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

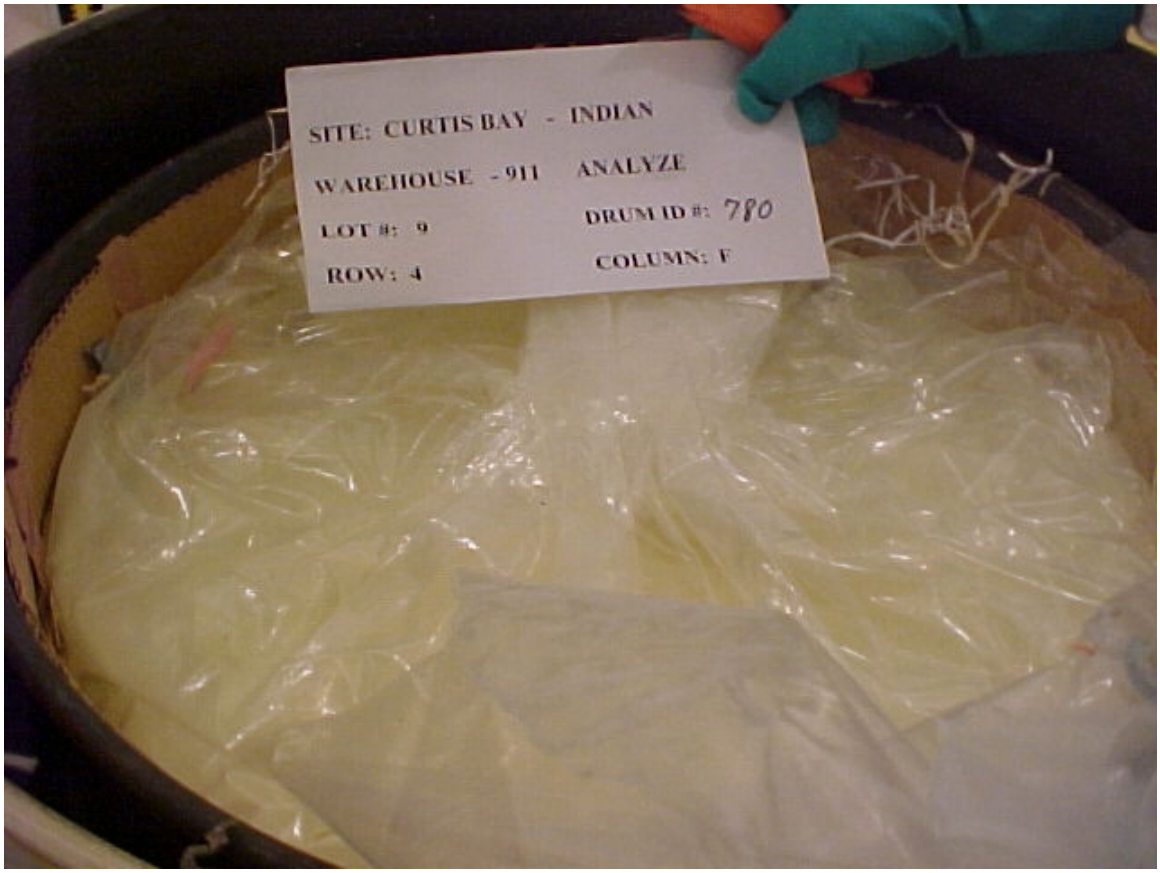
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 4 of 9

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

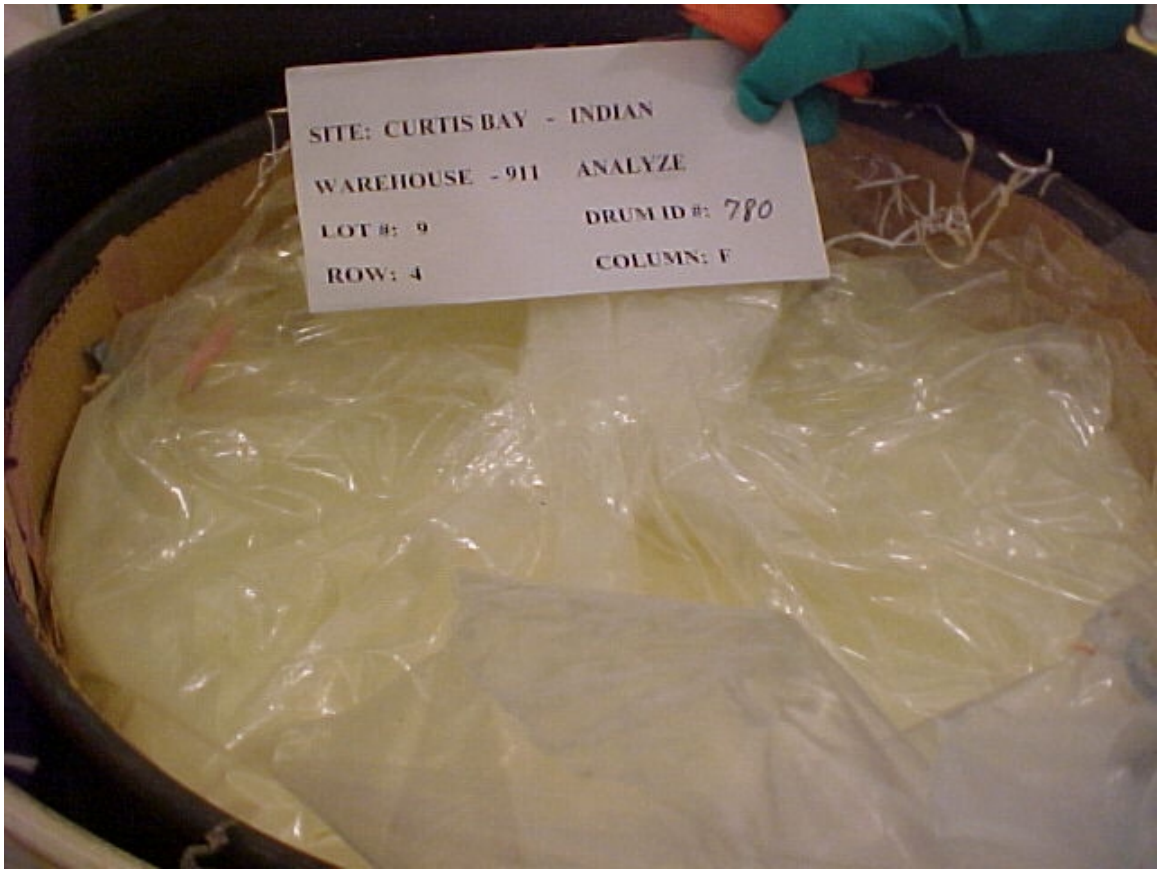
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 5 of 9

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

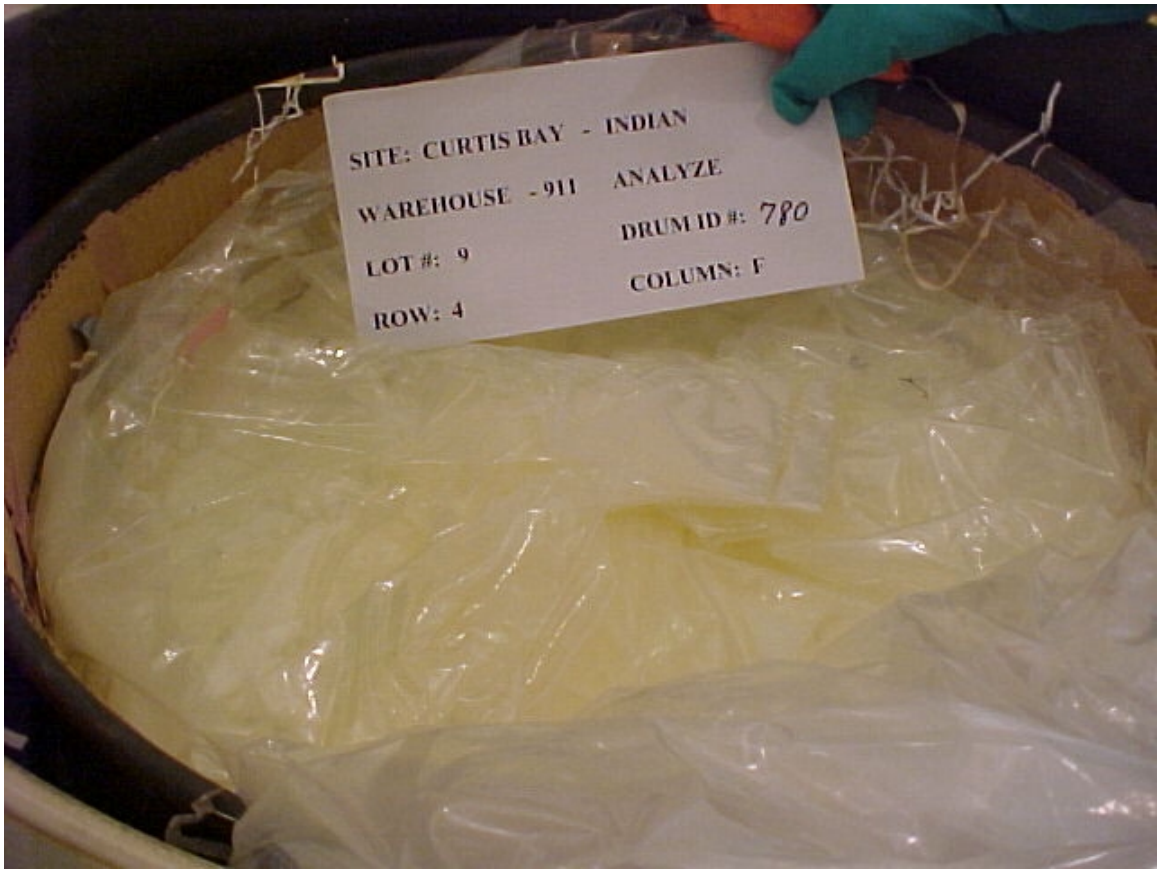
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 6 of 9

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

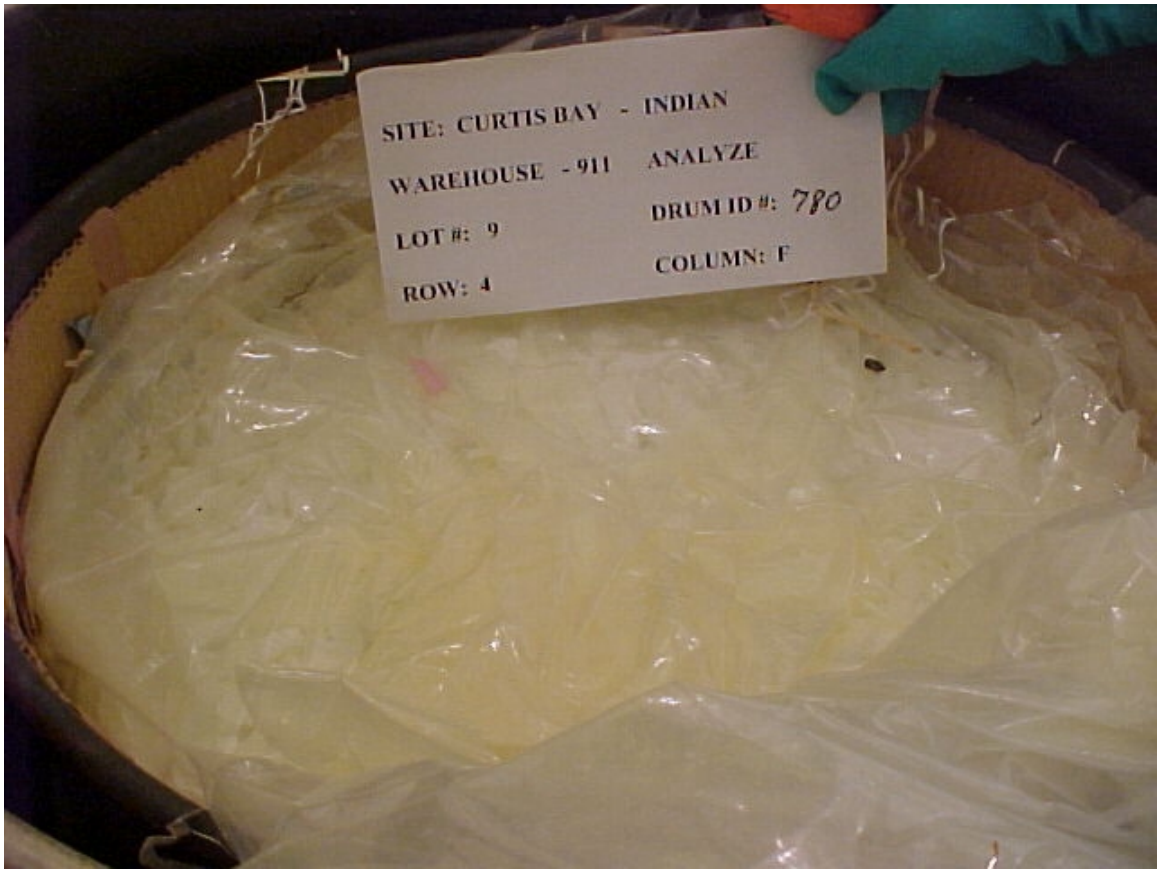
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 7 of 9

4th poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

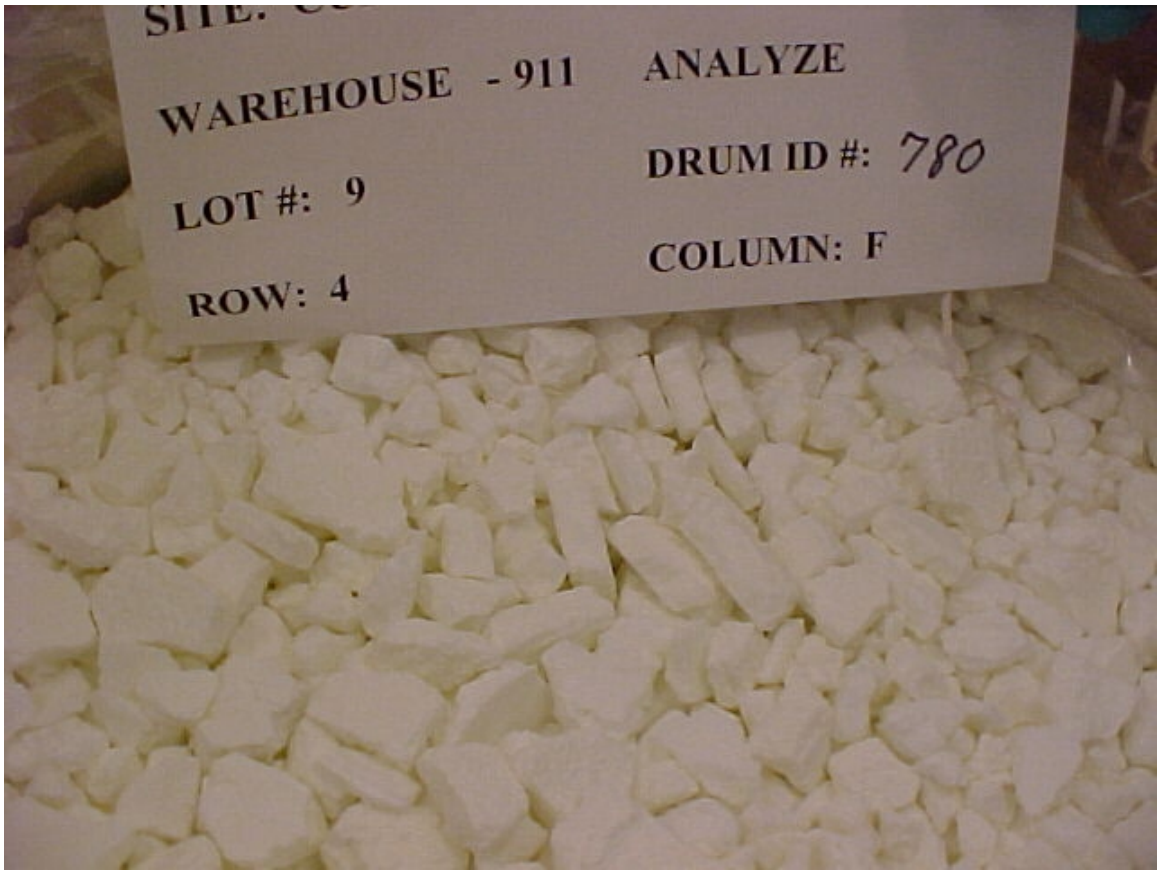
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 8 of 9

Indian – Thorium Nitrate – gravel looking – solid – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	780	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	F

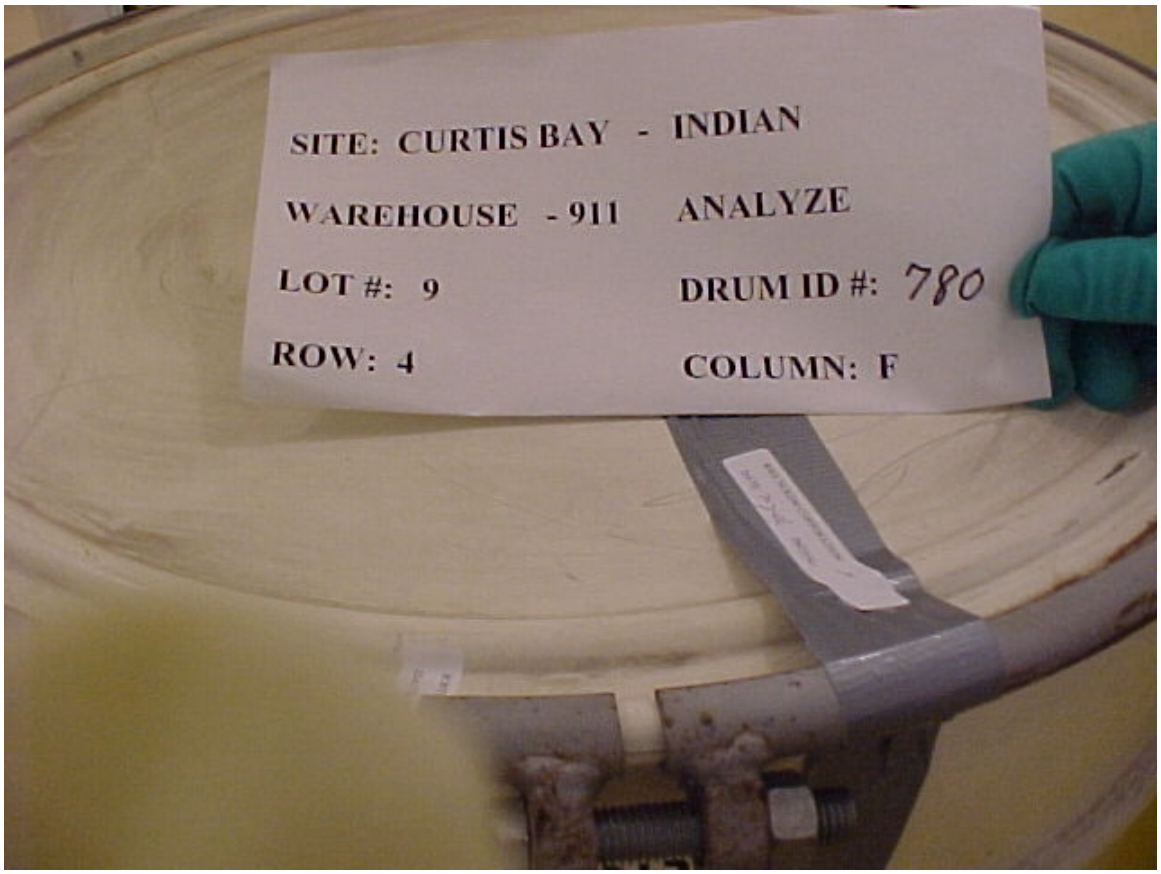
Inspection/Sample Date & Time

Date	7-3-2002	Time	09:15

Other Information

Photo No. 9 of 9

Sealed & dated - complete



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Curtis Bay Depot
Lot #I-11 – Drum #537
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-11 Drum ID #: 537 Location: Warehouse 911 – Column F - Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair – external rust
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 4.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Cardboard Lining
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

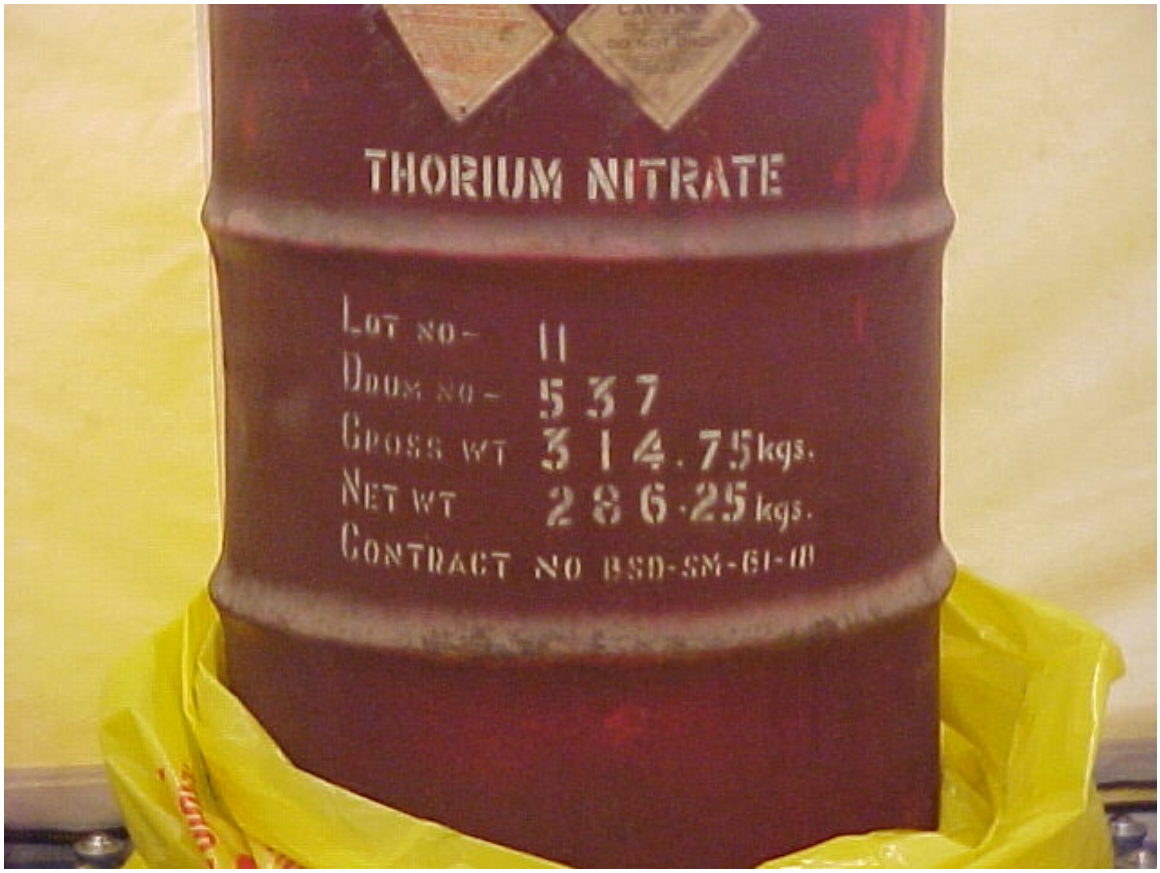
Warehouse	911	Row	8
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No.	1 of 8		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	44.0 mR/hr	
	1 meter	4.0 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	F

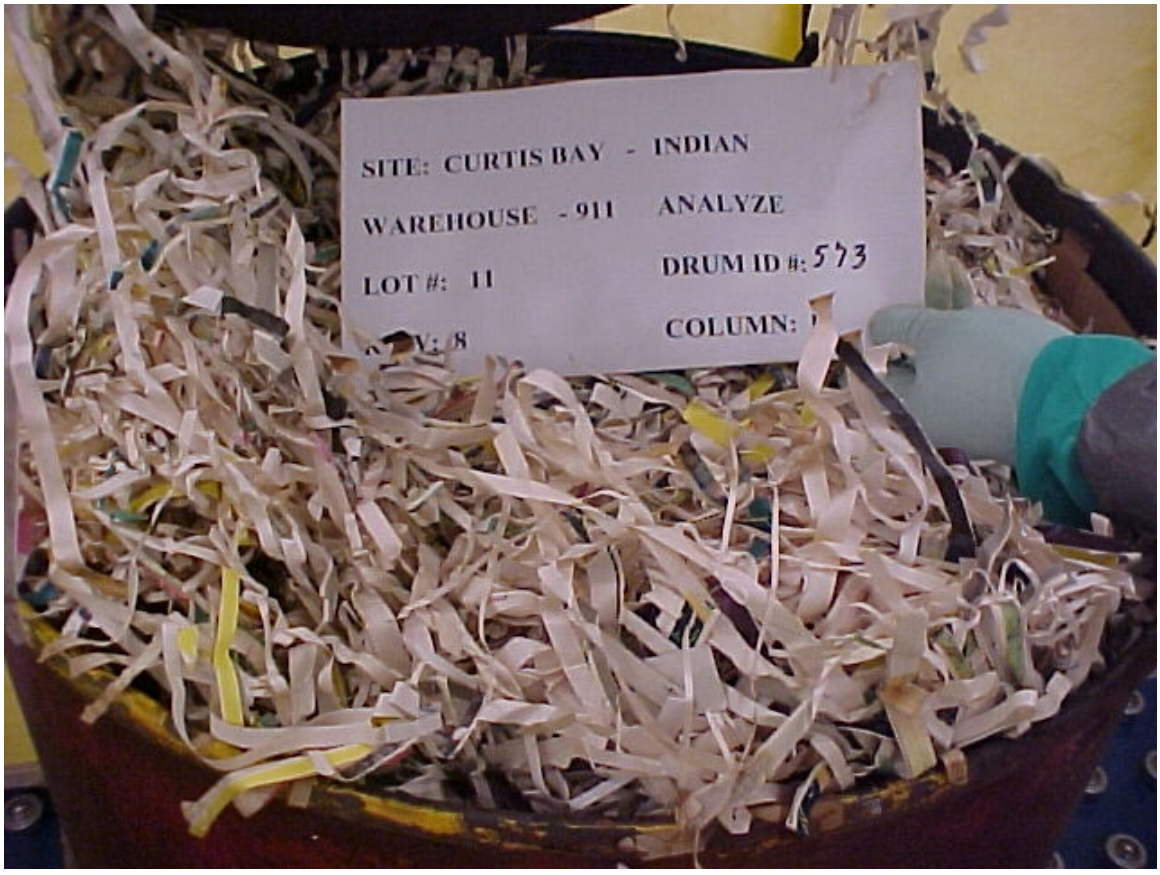
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No. 2 of 8

Shredded paper for packaging
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	F

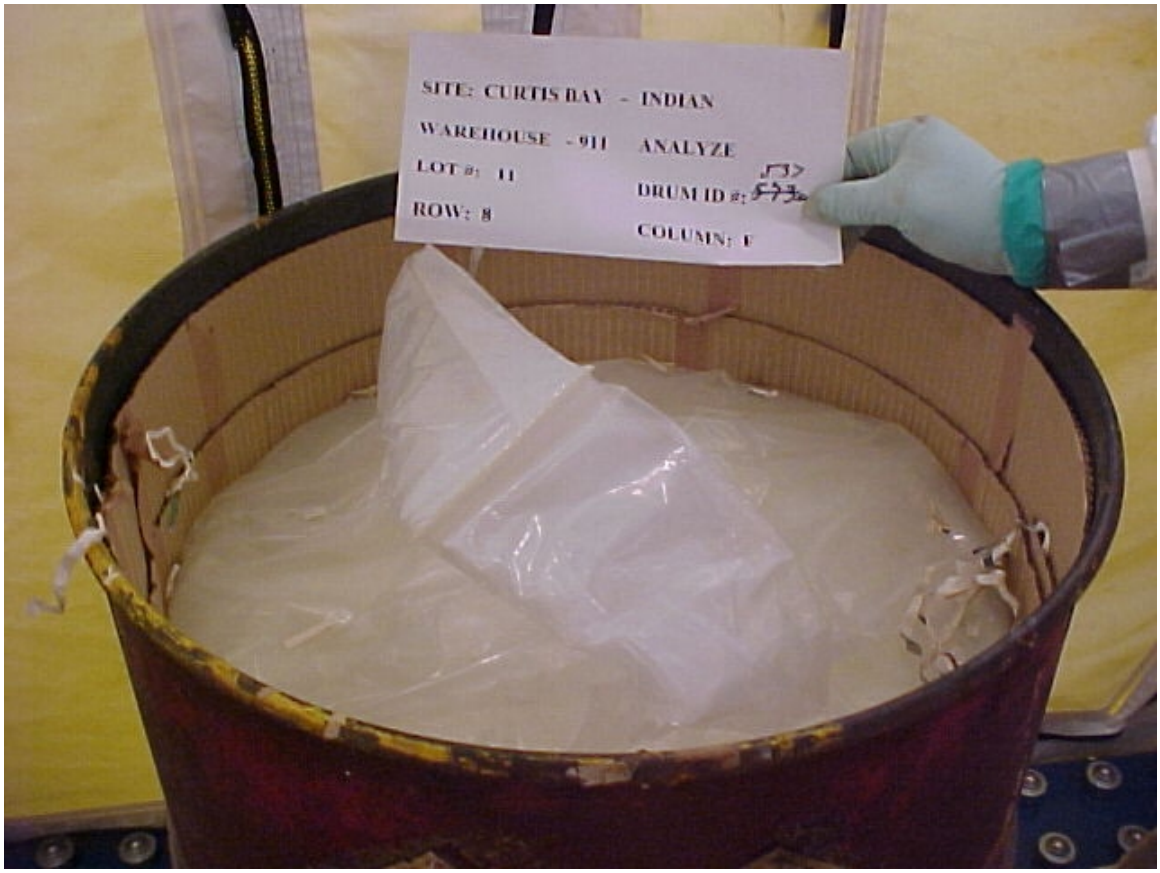
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No. 3 of 8

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	F

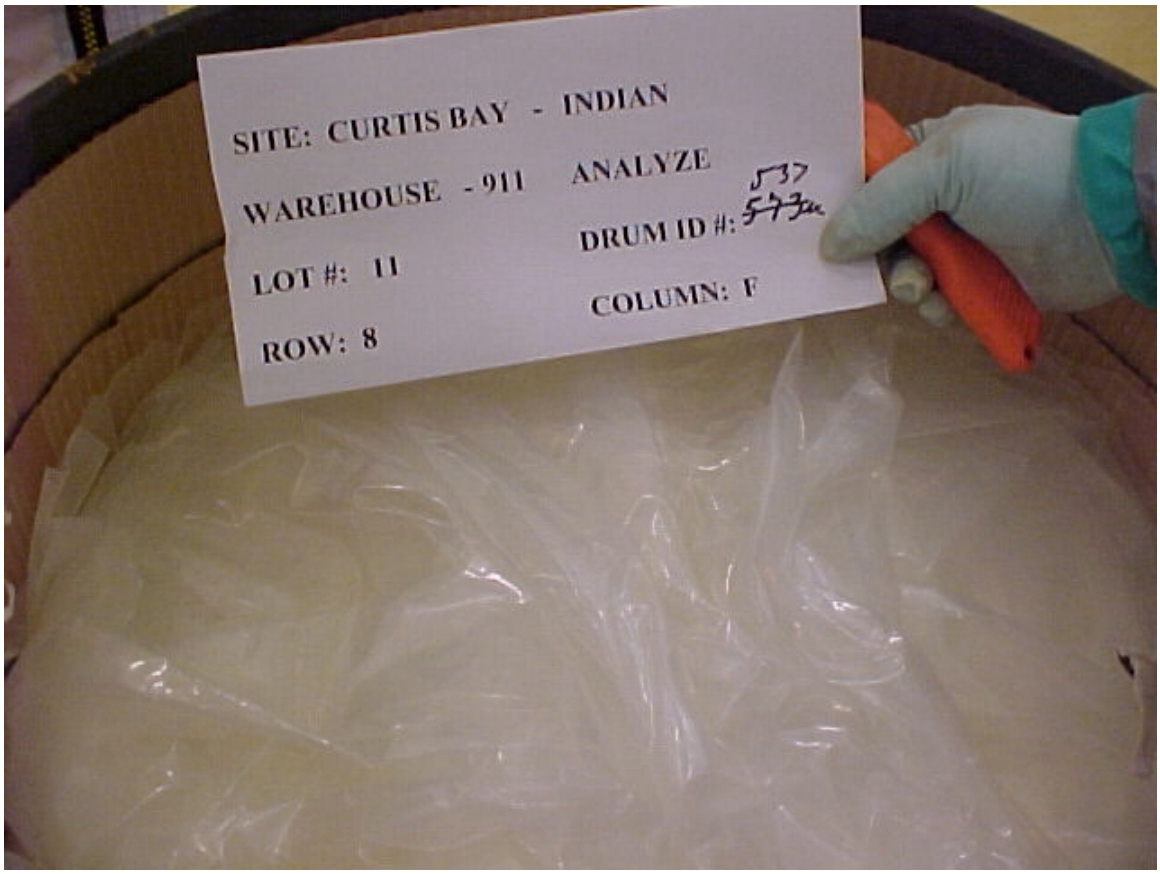
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No. 4 of 8

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	F

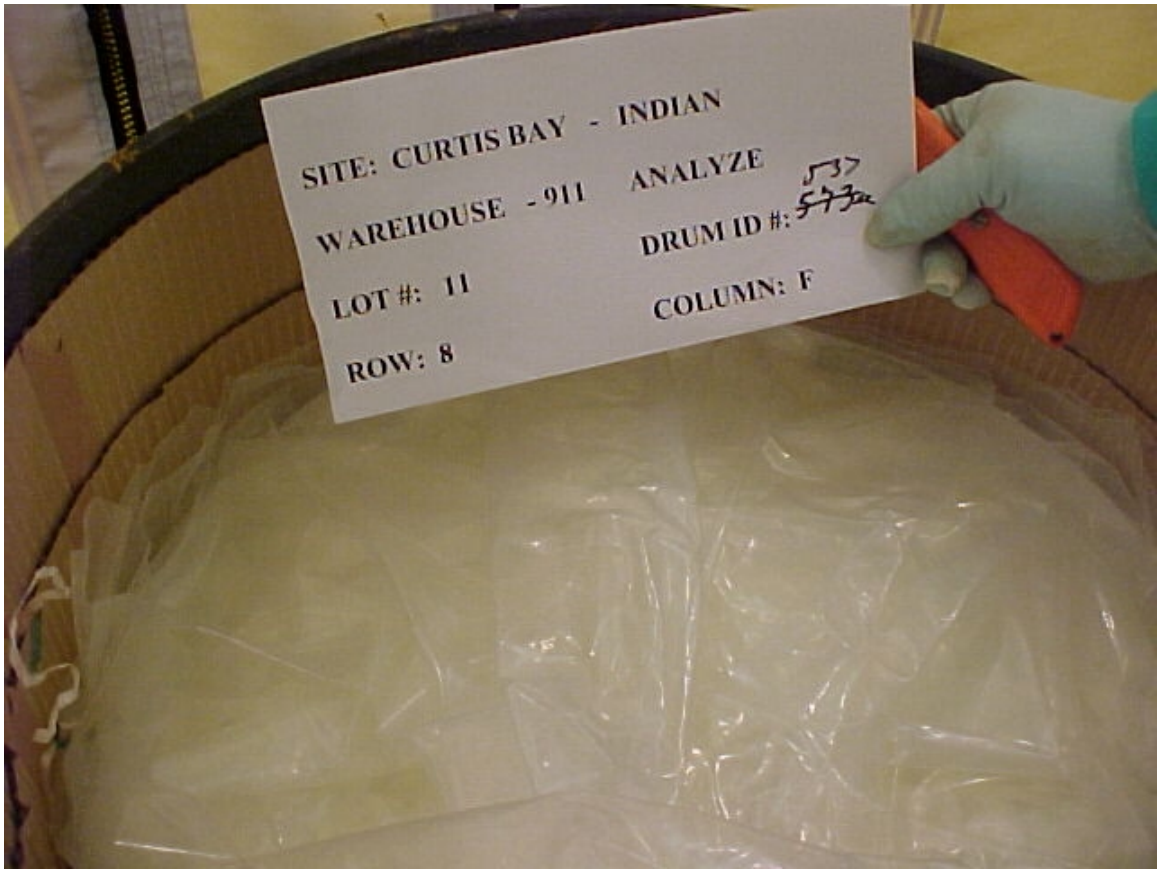
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No. 5 of 8

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	F

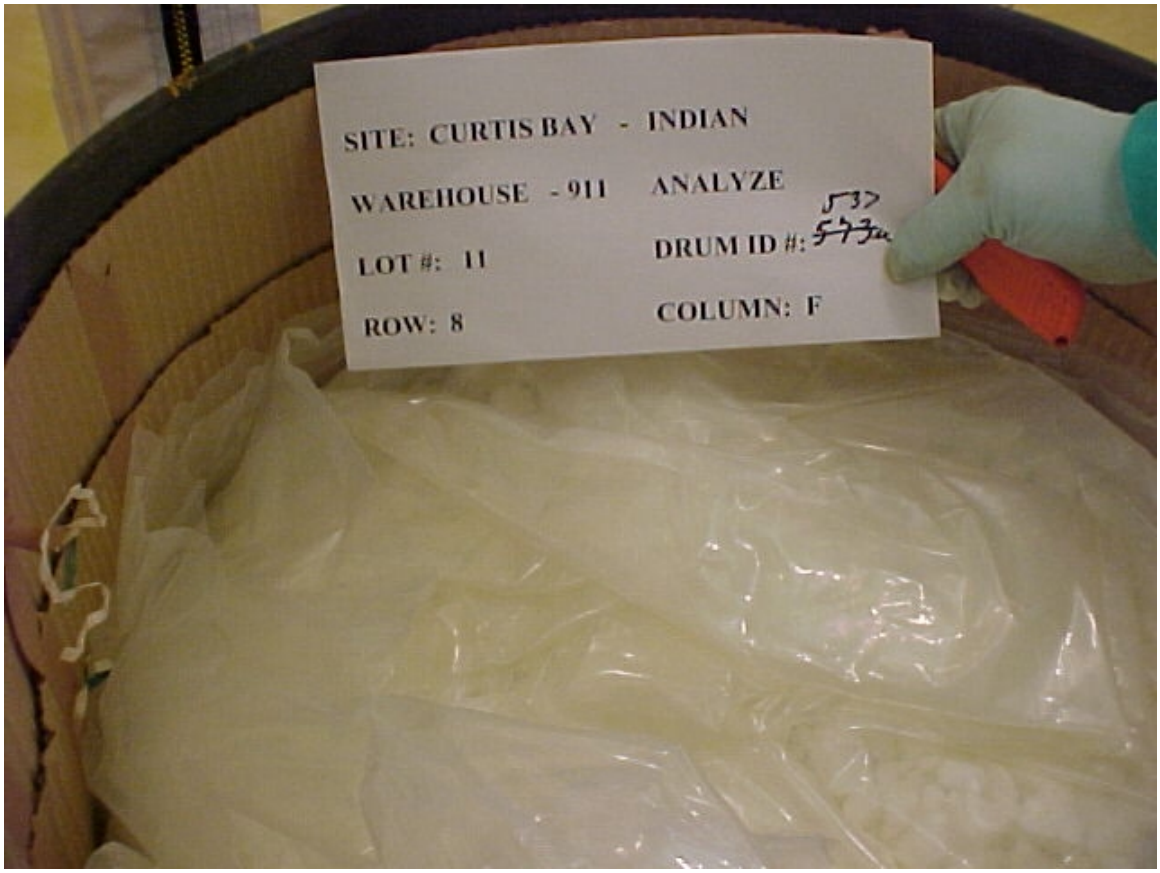
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No. 6 of 8

4th poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No. 7 of 8

Thorium Nitrate – white gravel looking – solid – dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	537	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	F

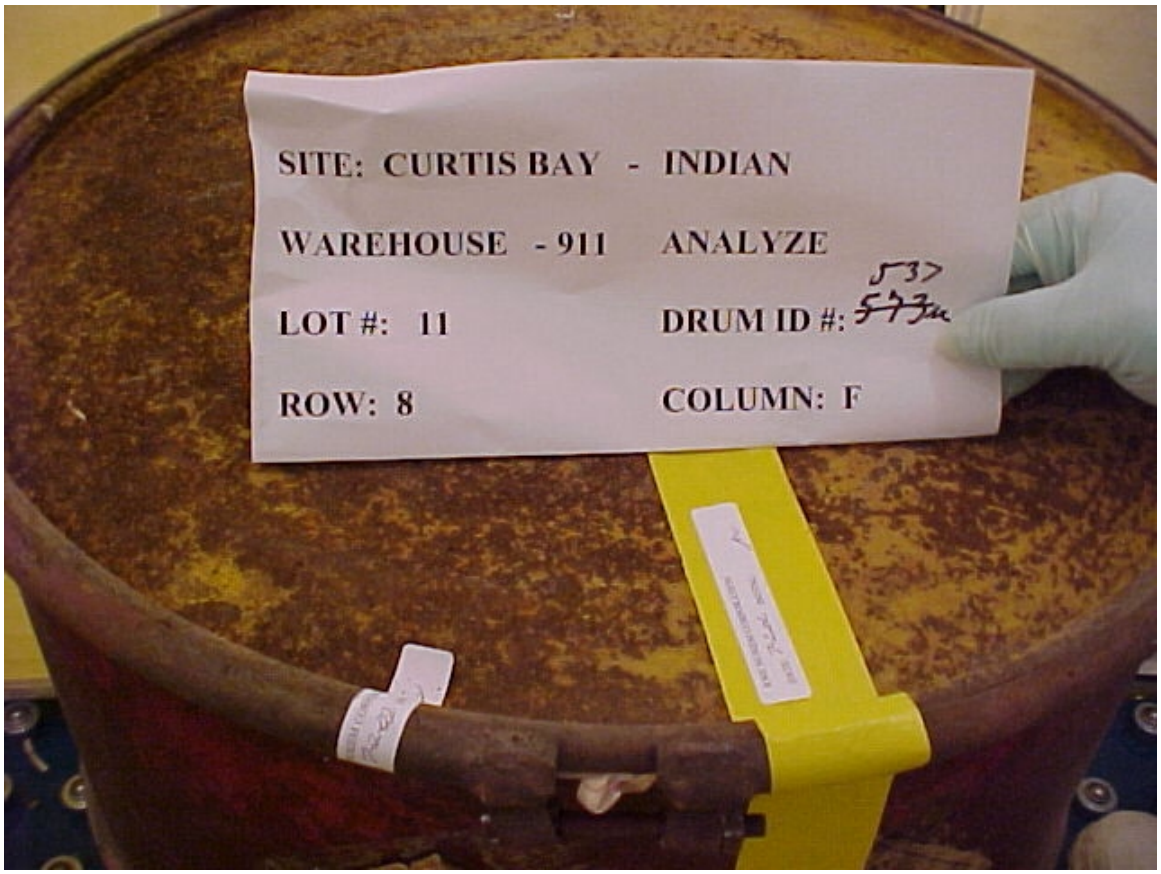
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:50

Other Information

Photo No. 8 of 8

Sealed & dated - complete



Curtis Bay Depot
Lot #I-12 – Drum #589
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-12 Drum ID #: 589 Location: Warehouse 911 – Column F – Row 9

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* NA (85-gal drum) Units:
Rad Measurements at the time of opening: DR at Surface 35mR/hr DR at 1 meter 4.2mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Container
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging (cardboard lines 55-gal inner drum wall)
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container # 7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

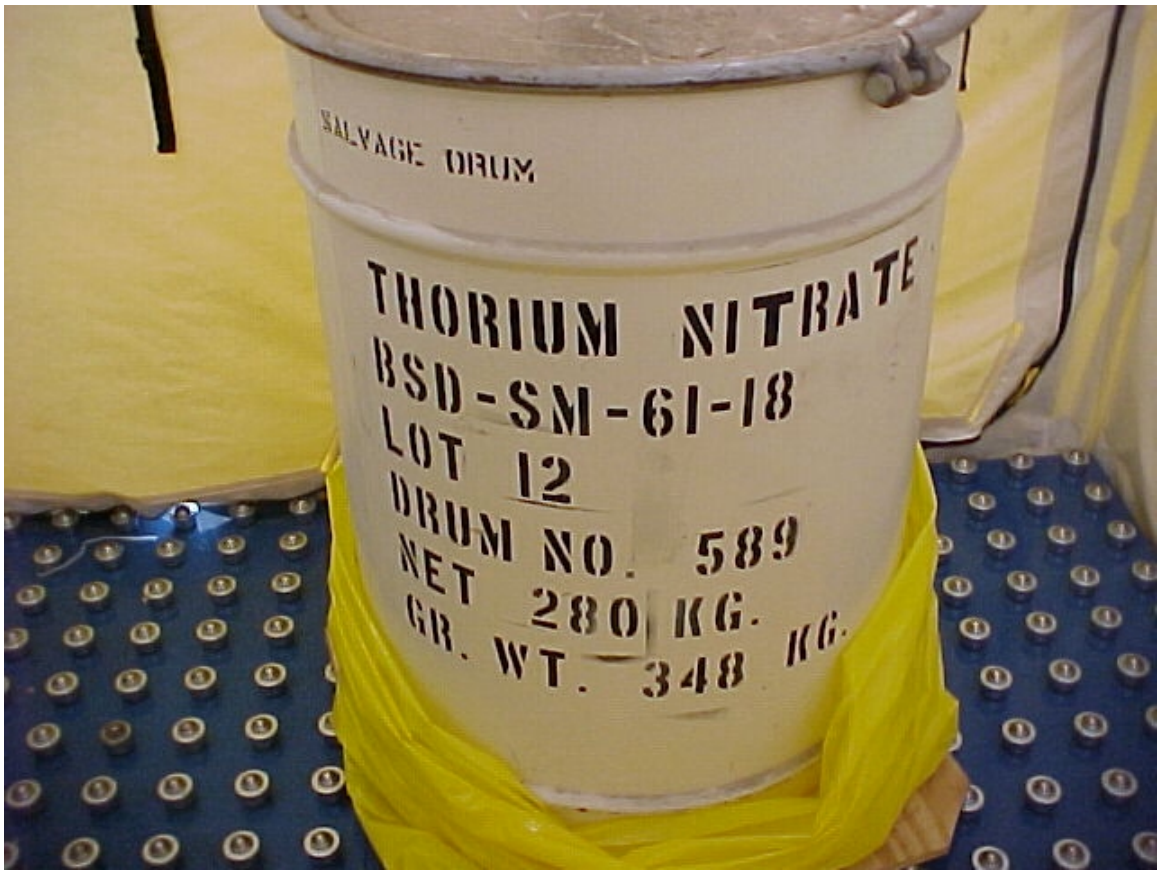
Warehouse	911	Row	9
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No.	1 of 9		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	35.0 mR/hr	
	1 meter	4.2 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 2 of 9

55 gal drum – ring was not on – lid in poor/fair condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

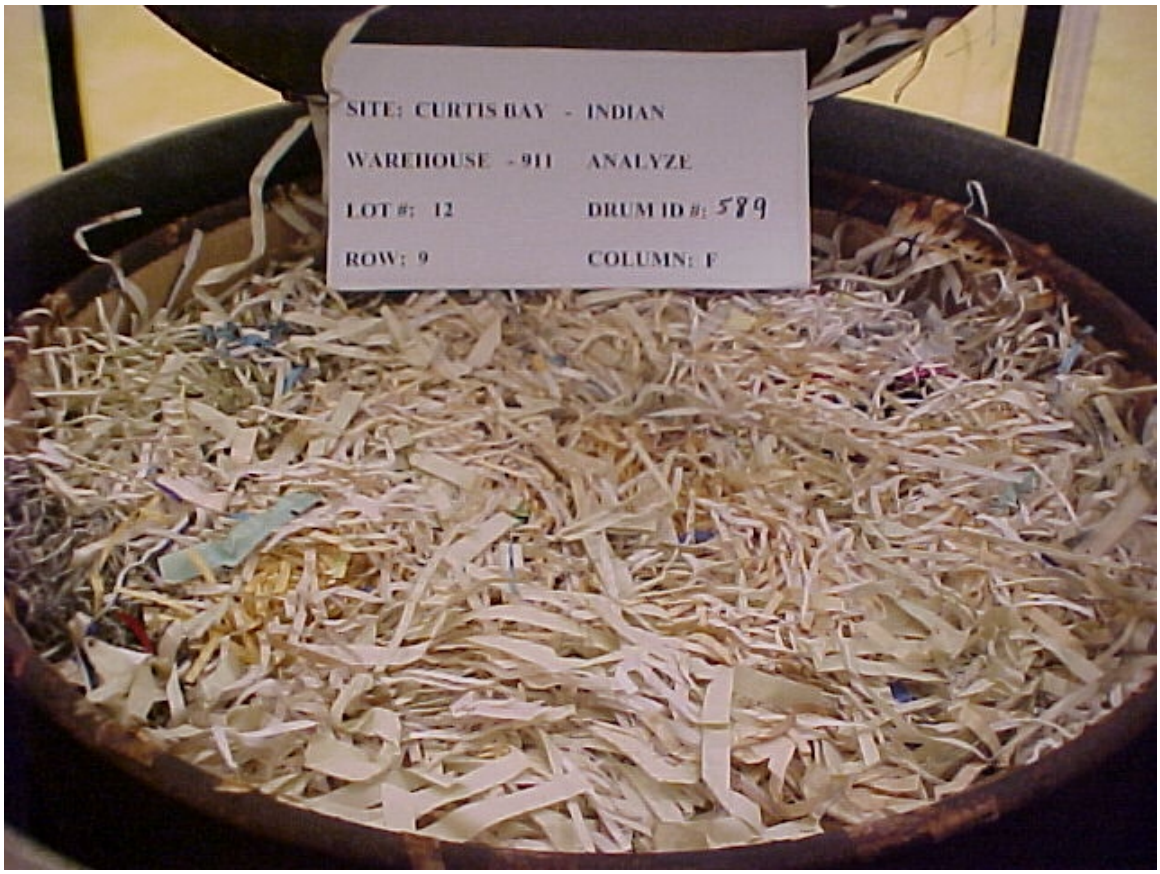
Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 3 of 9

Shredded paper for packaging
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

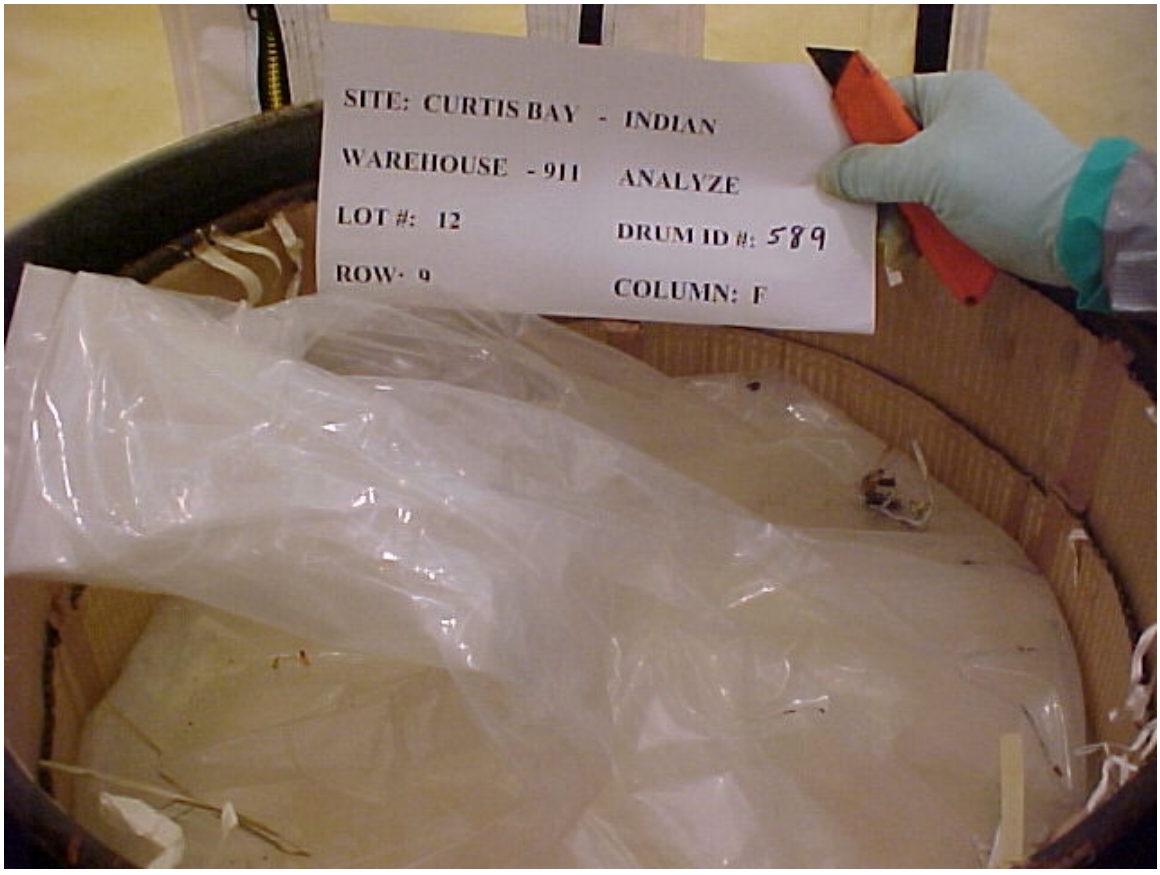
Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 4 of 9

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

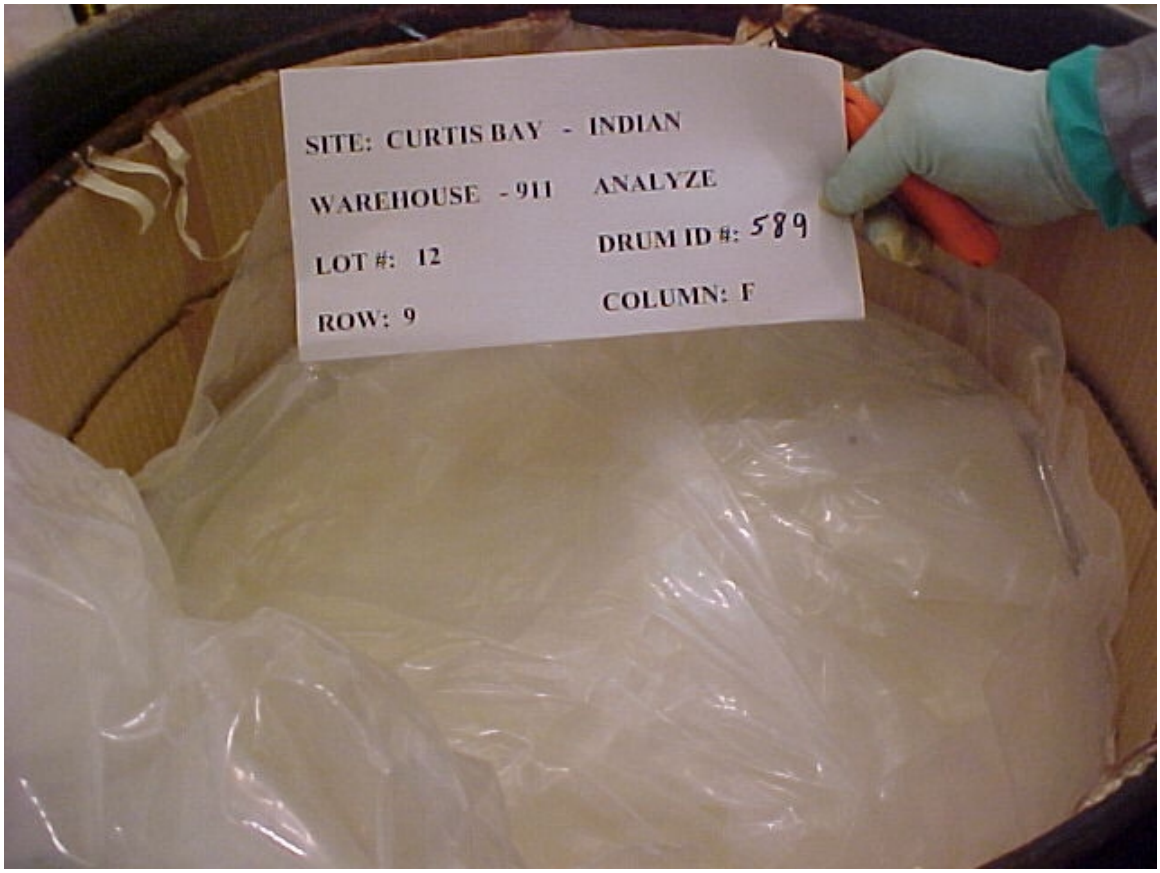
Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 5 of 9

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

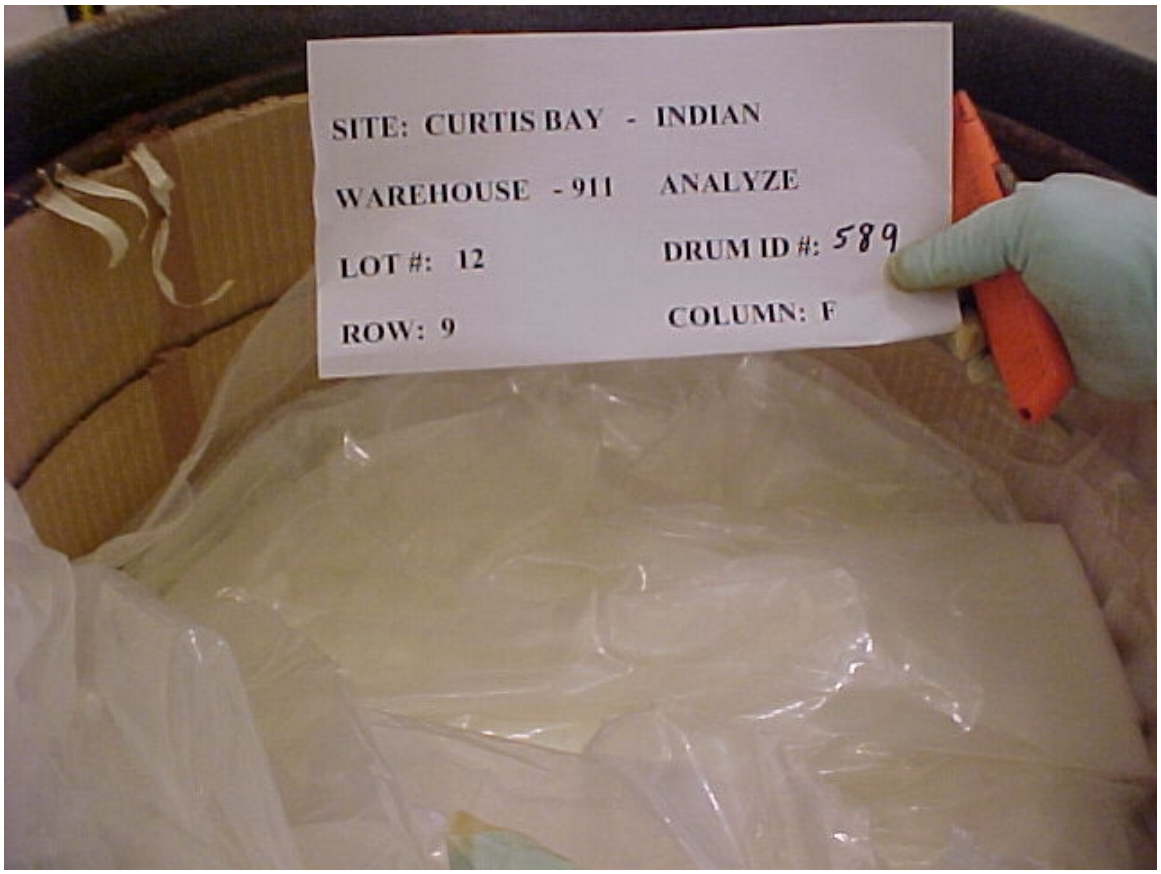
Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 6 of 9

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

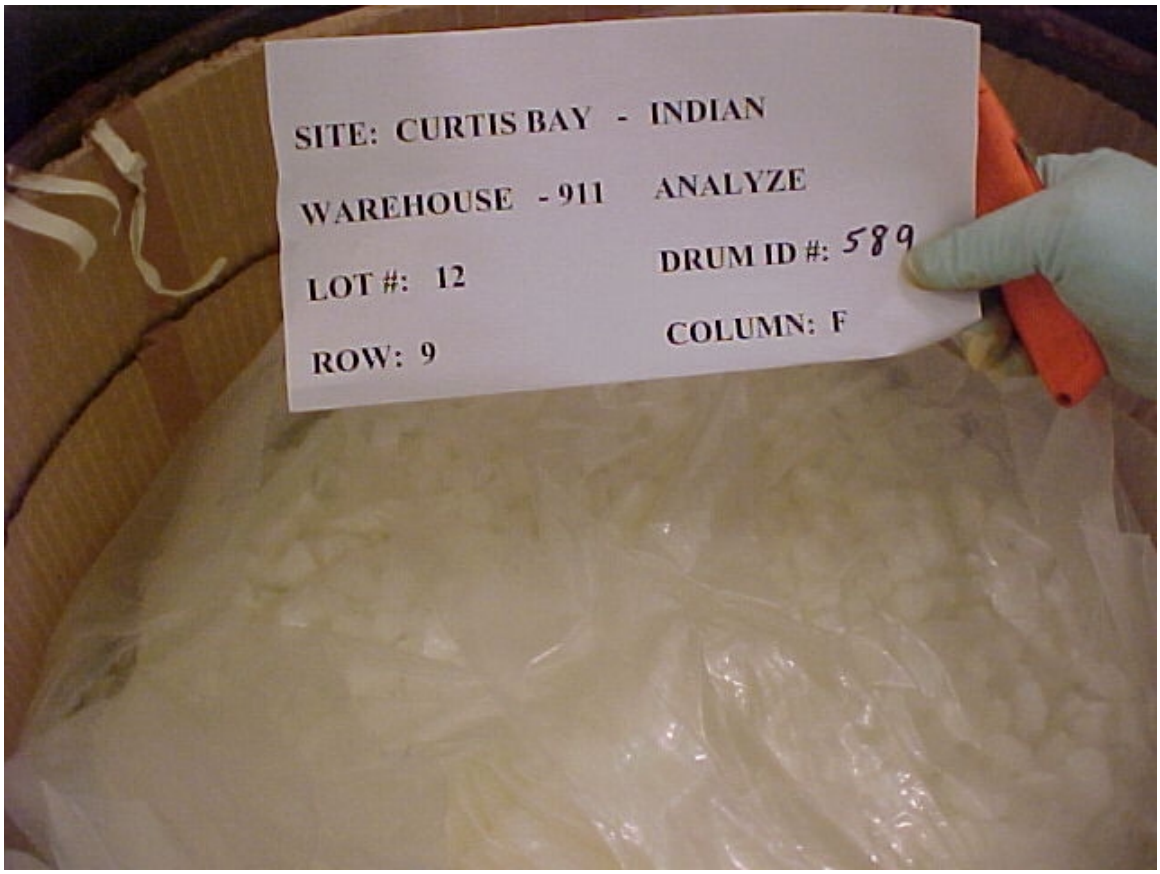
Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 7 of 9

4th poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

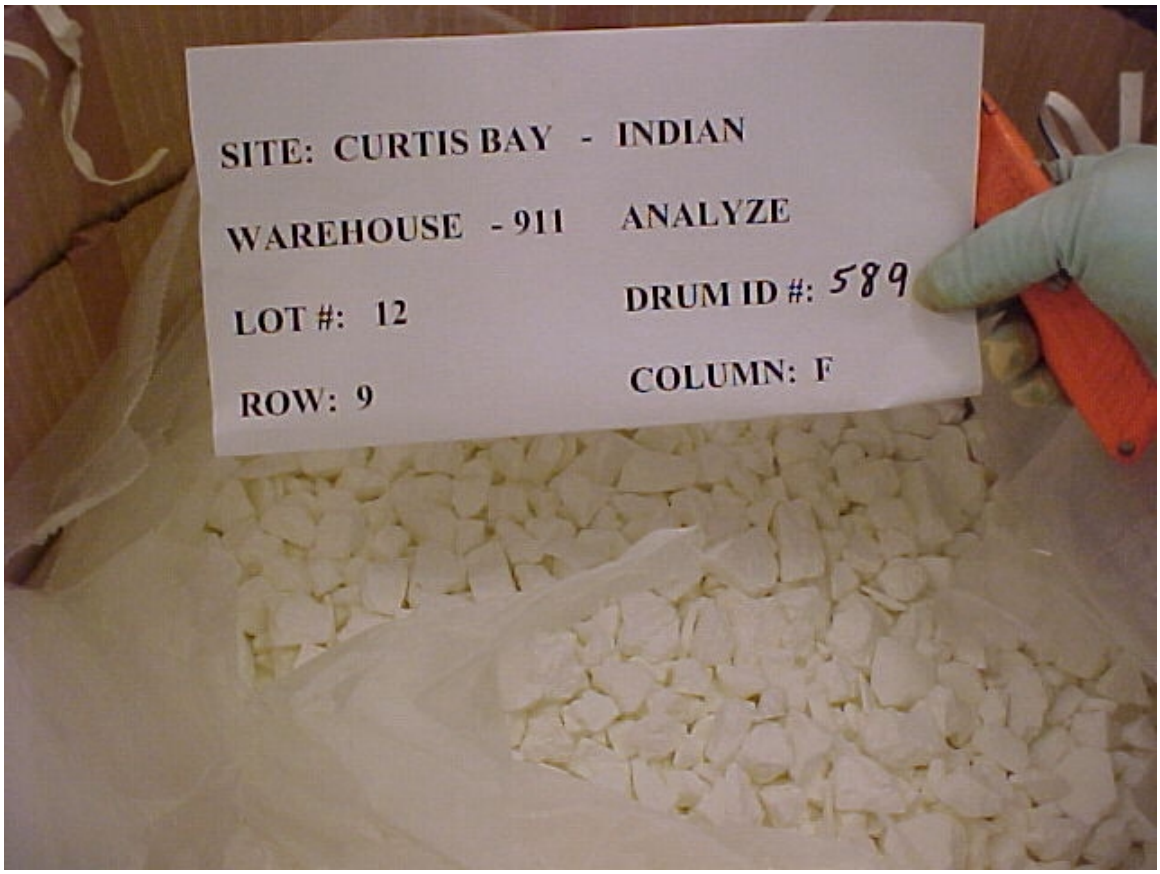
Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 8 of 9

Thorium Nitrate – solid – white – gravel shape - dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	589	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	9
		Column	F

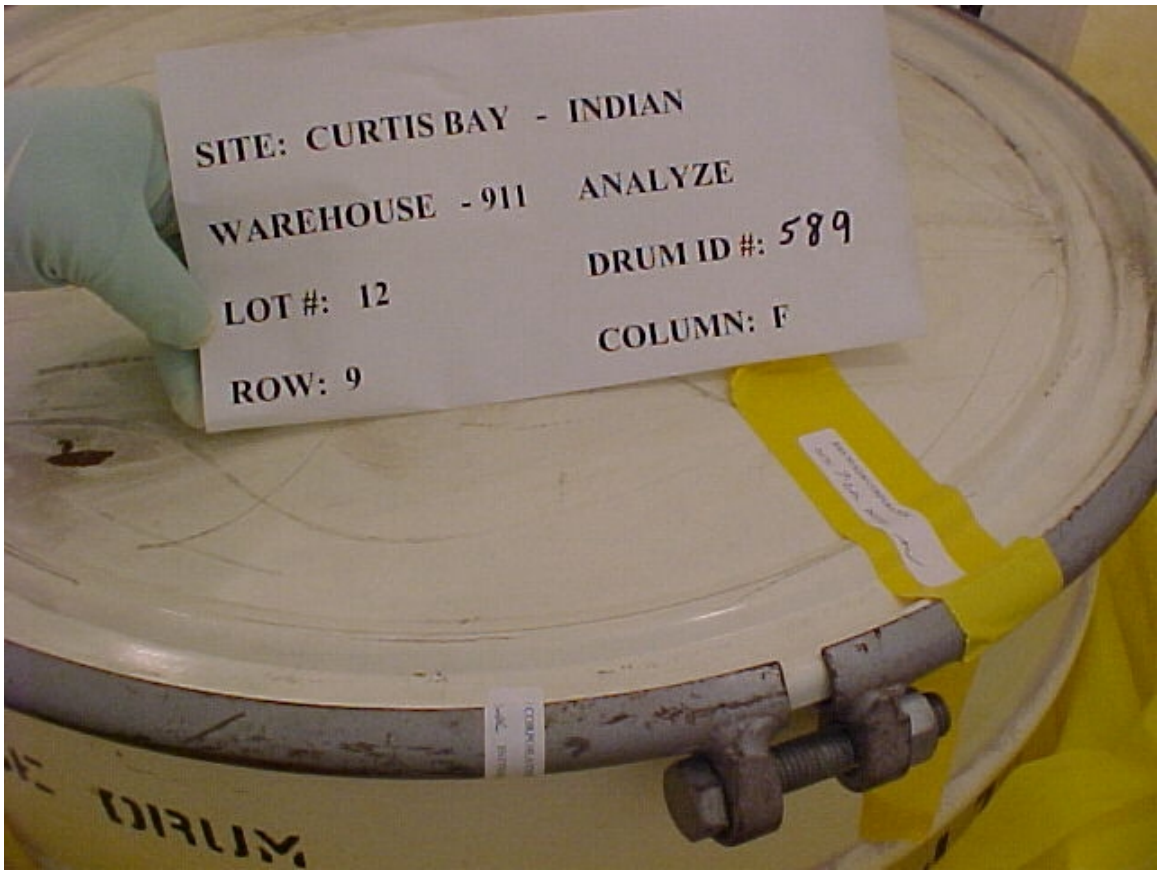
Inspection/Sample Date & Time

Date	7-2-2002	Time	9:50

Other Information

Photo No. 9 of 9

Sealed & dated - completed



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Curtis Bay Depot
Lot #I-13 – Drum #637
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-13 Drum ID #: 637 Location: Warehouse 911 – Column F – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 35mR/hr DR at 1 meter 4.2mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Cardboard
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

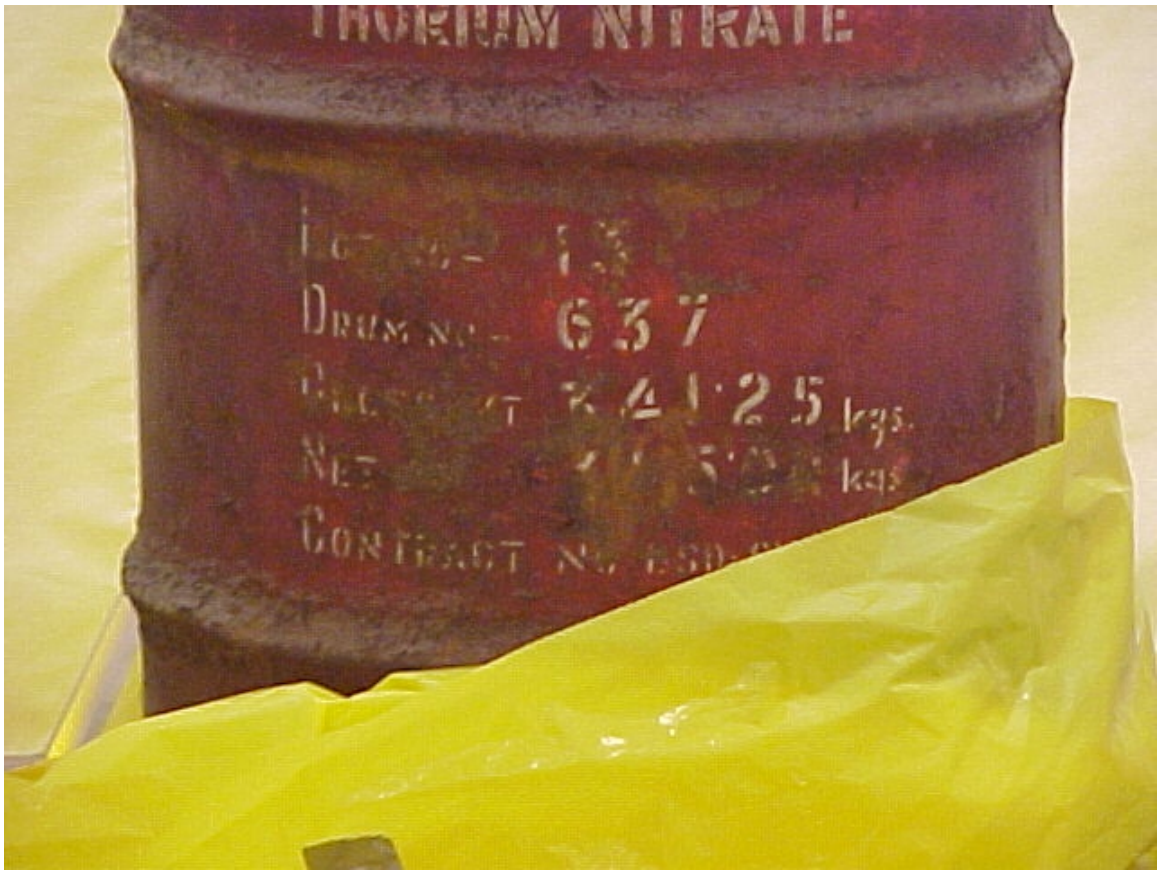
Warehouse	911	Row	2
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No.	1 of 8		
Container	55-gallon steel drum	Container Condition	Fair
Dose Rate	Surface	35.0 mR/hr	
	1 meter	4.2 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No. 2 of 8

The packaging under the 55-gal drum lid is shredded paper
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

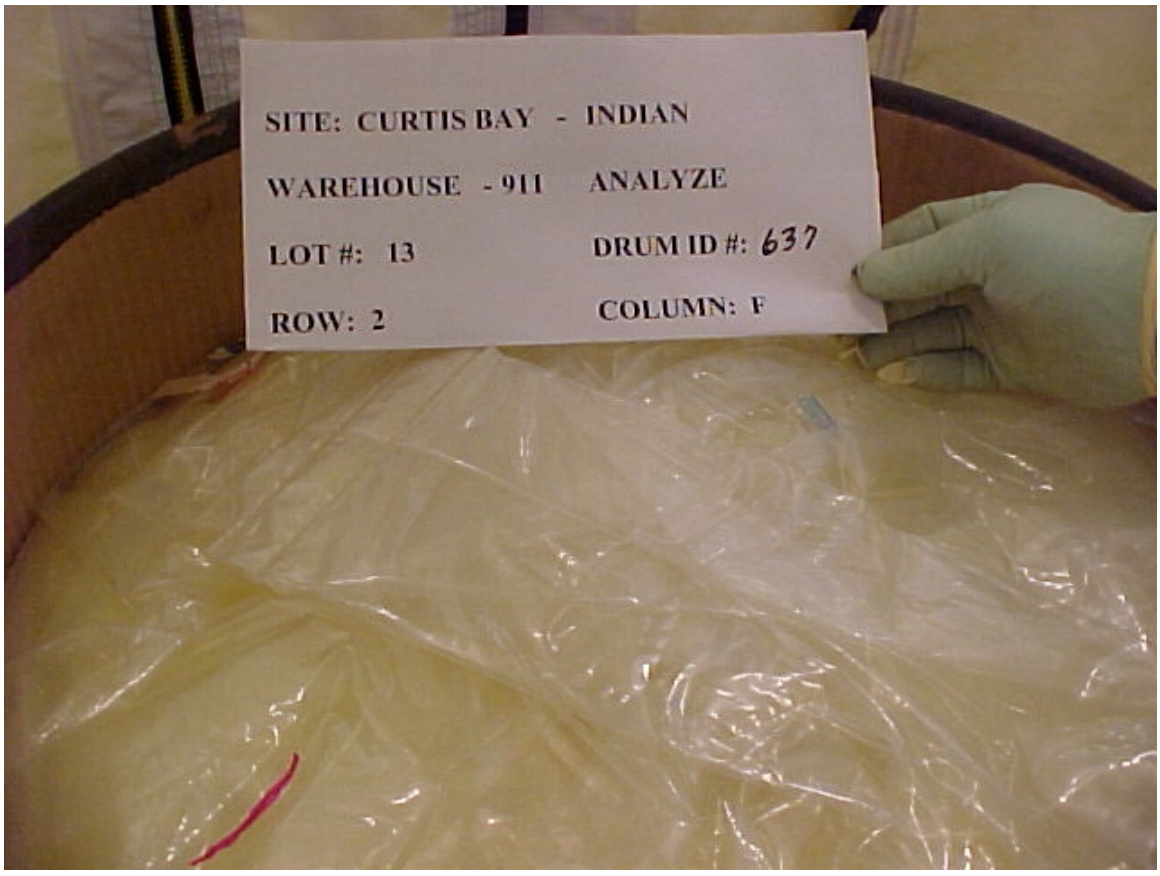
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No. 3 of 8

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

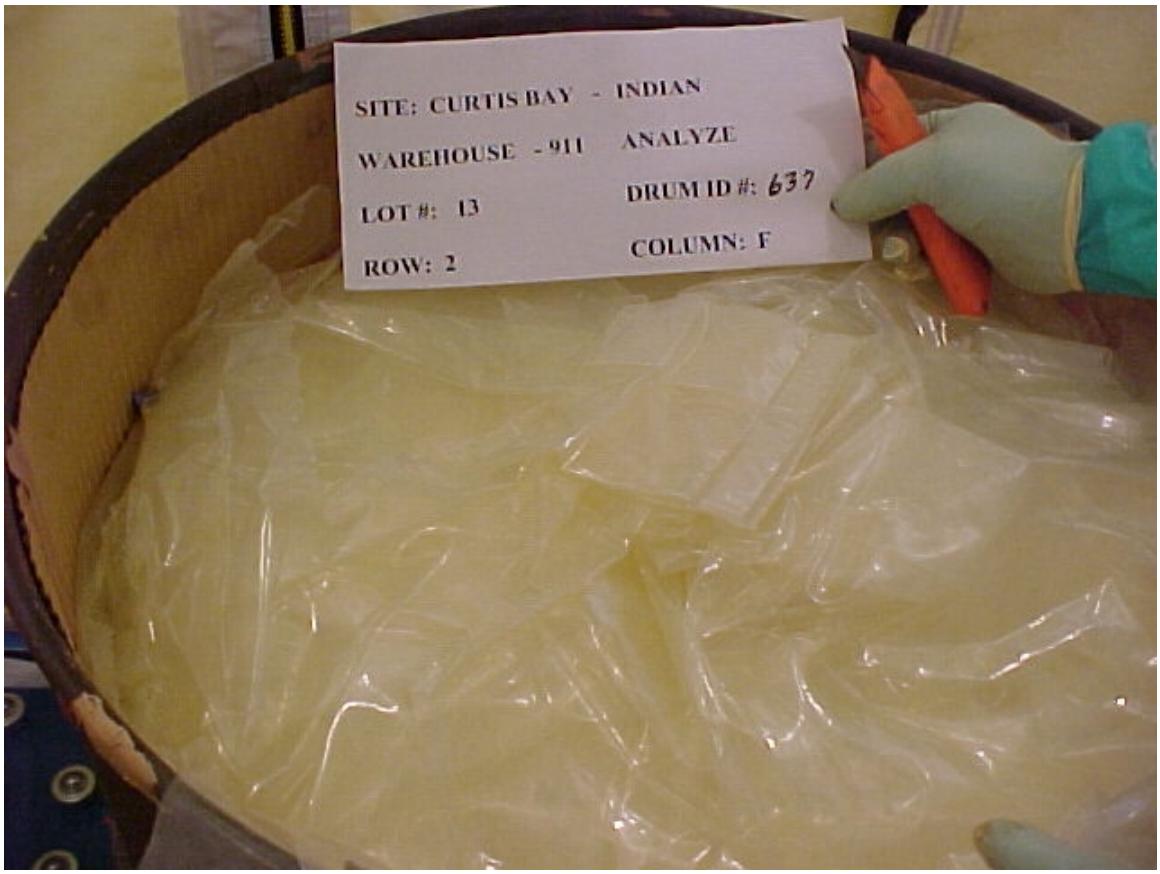
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No. 4 of 8

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

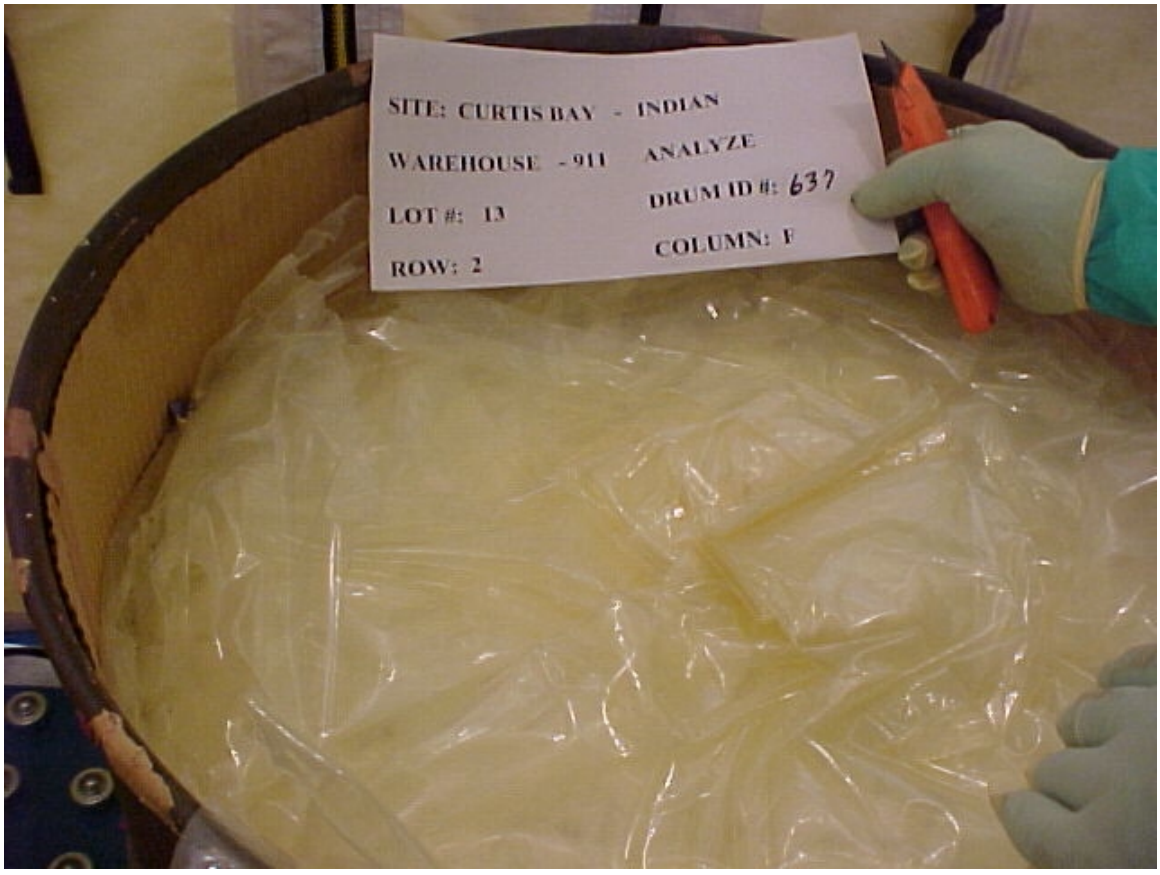
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No. 5 of 8

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

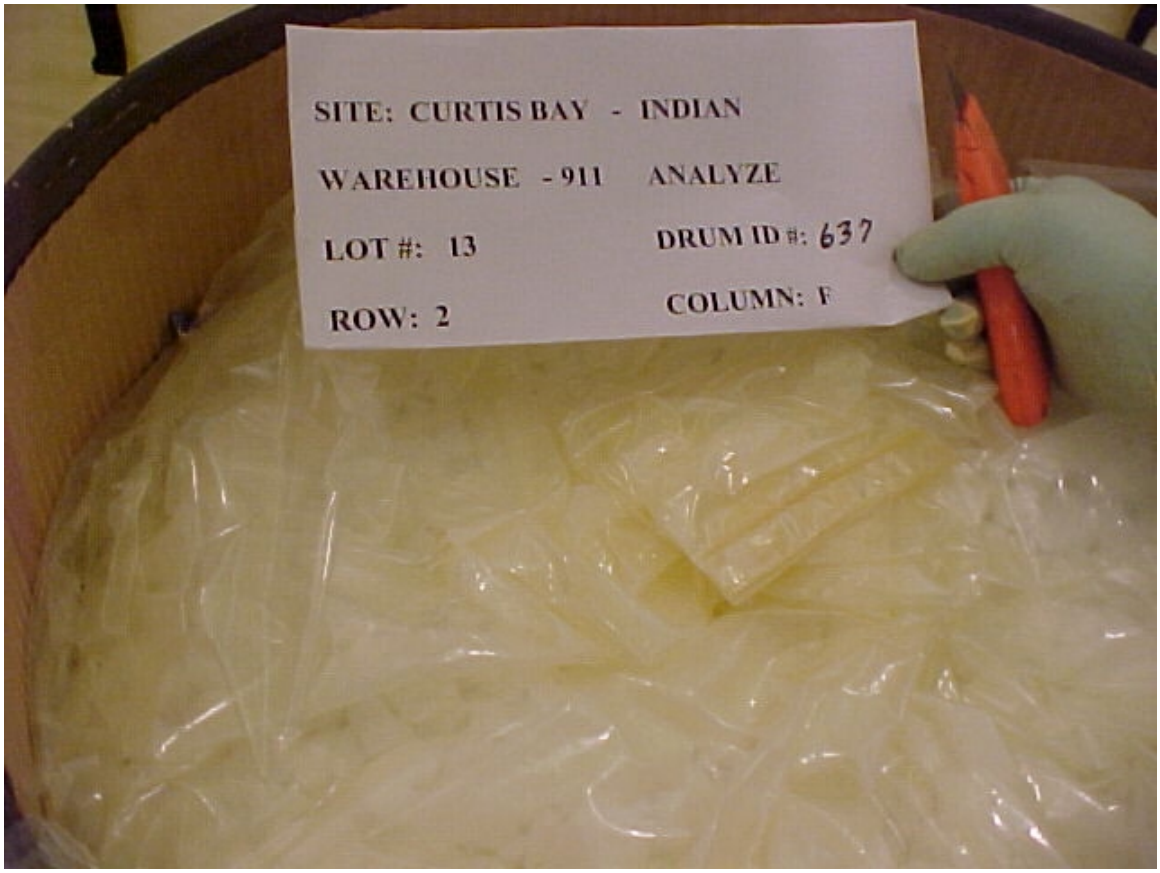
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No. 6 of 8

4th poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

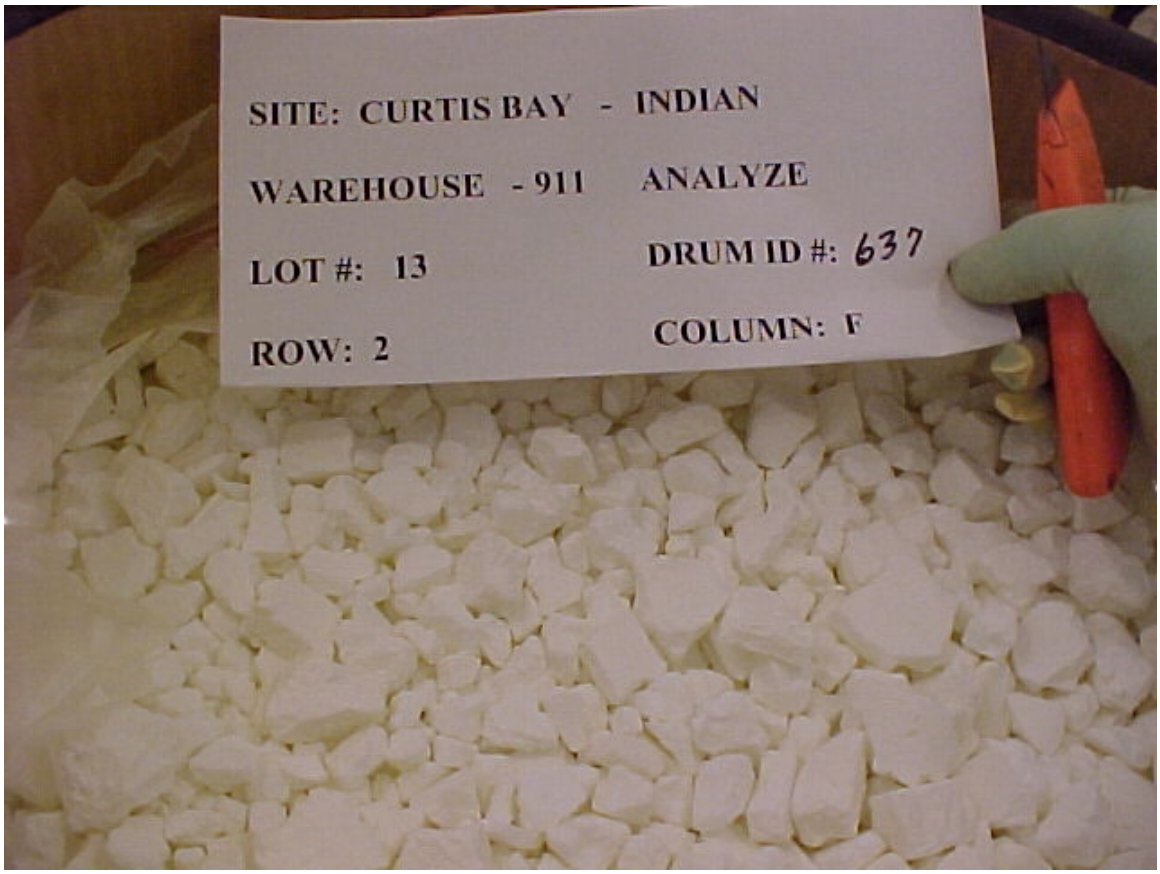
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No. 7 of 8

Thorium Nitrate – dry – solid – white – shape of gravel
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	637	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

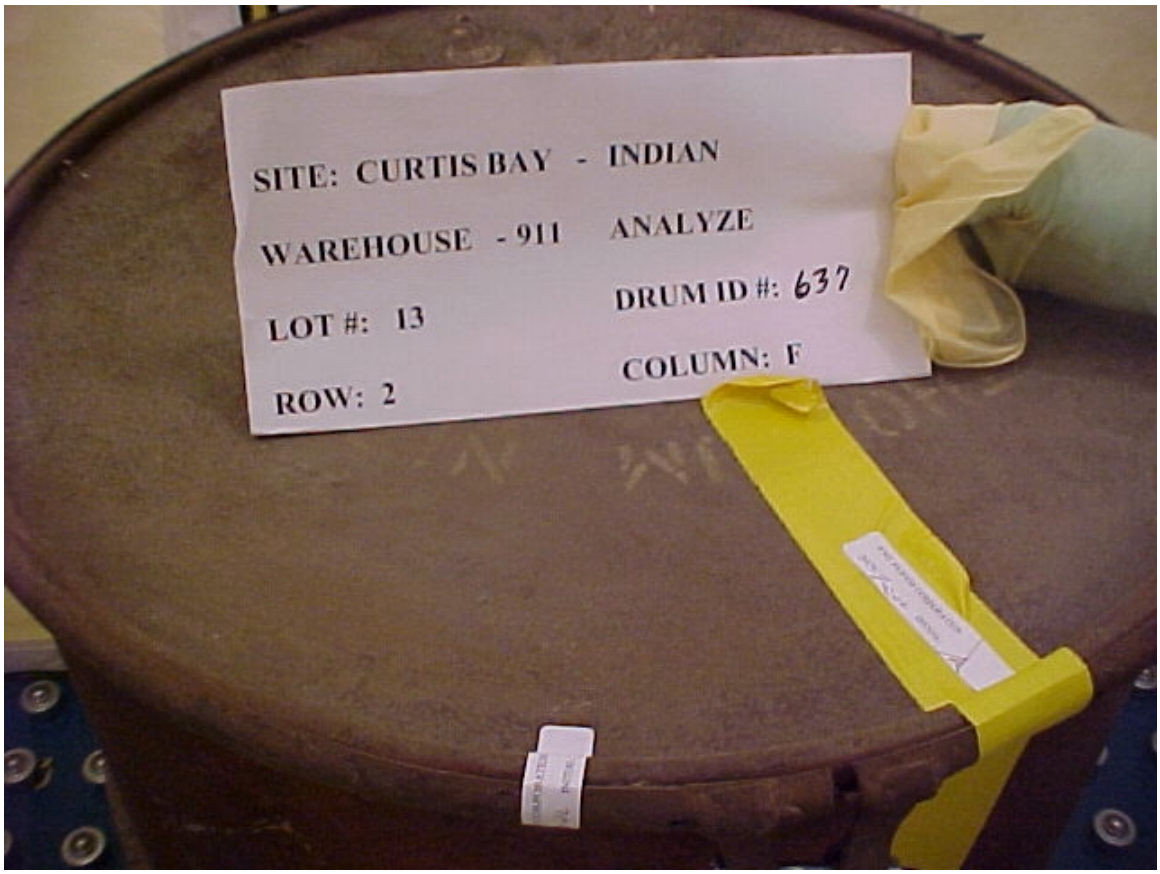
Inspection/Sample Date & Time

Date	7-2-2002	Time	10:05

Other Information

Photo No. 8 of 8

Sealed & dated - completed



Curtis Bay Depot
Lot #I-14 – Drum #714
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-14 Drum ID #: 714 Location: Warehouse 911 – Column F – Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☐ Yes (include Drum ID in photo) ☒ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 35mR/hr DR at 1 meter 4.2mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Cardboard
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Shredded paper for packaging

Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1at poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag
Inner Container # 6Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 7Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #7: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	714	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	7
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	11:15

Other Information

Photo No.	1 of 7		
Container	55-gallon steel drum	Container Condition	Fair
Dose Rate	Surface	38.0 mR/hr	
	1 meter	4.5 mR/hr	

Picture of exterior of drum did not take

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	714	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	7
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	11:15

Other Information

Photo No.	2 of 7		
Container	55-gallon steel drum	Container Condition	Fair
Dose Rate	Surface	38.0 mR/hr	
	1 meter	4.5 mR/hr	

Packaging under 55-gal drum lid is shredded paper
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	714	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	7
		Column	F

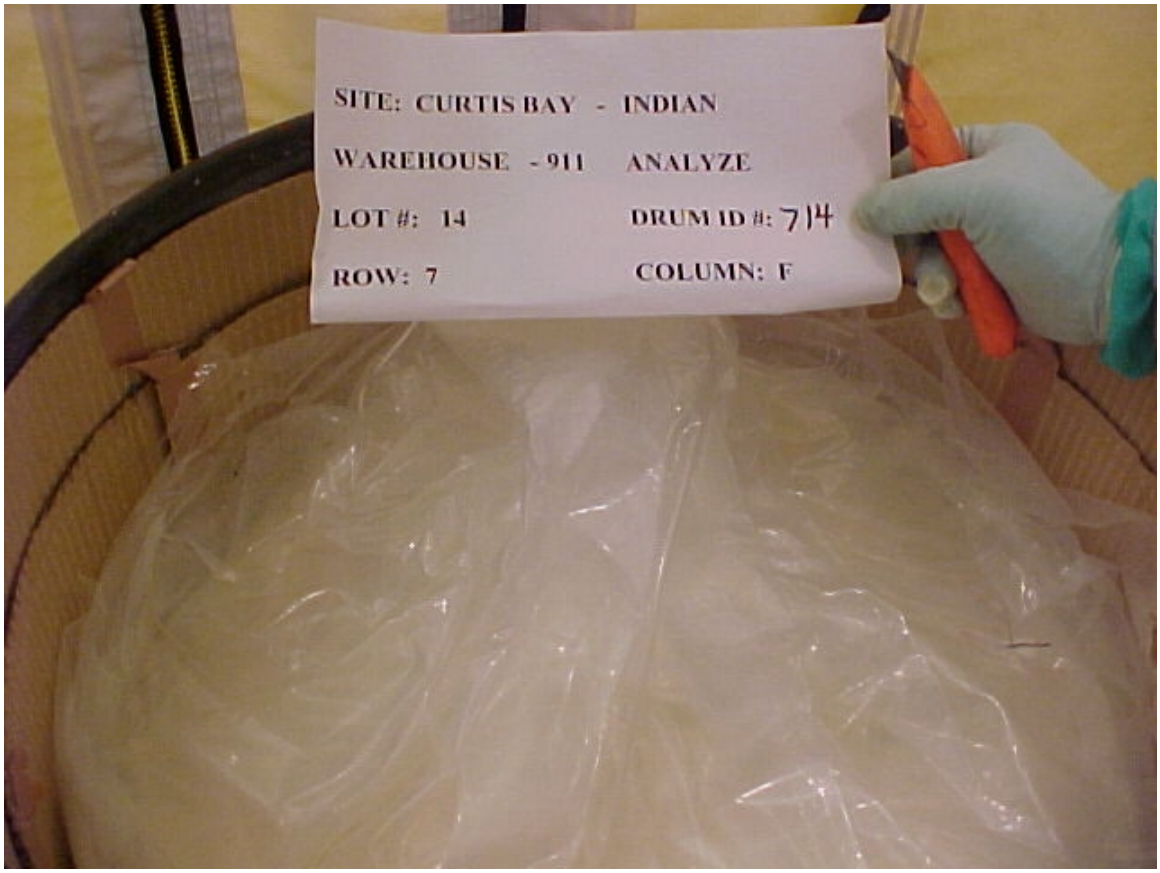
Inspection/Sample Date & Time

Date	7-2-2002	Time	11:15

Other Information

Photo No. 3 of 7

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	714	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	7
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	11:15

Other Information

Photo No. 4 of 7

2nd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	714	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	7
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	11:15

Other Information

Photo No. 5 of 7

3rd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	714	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	7
		Column	F

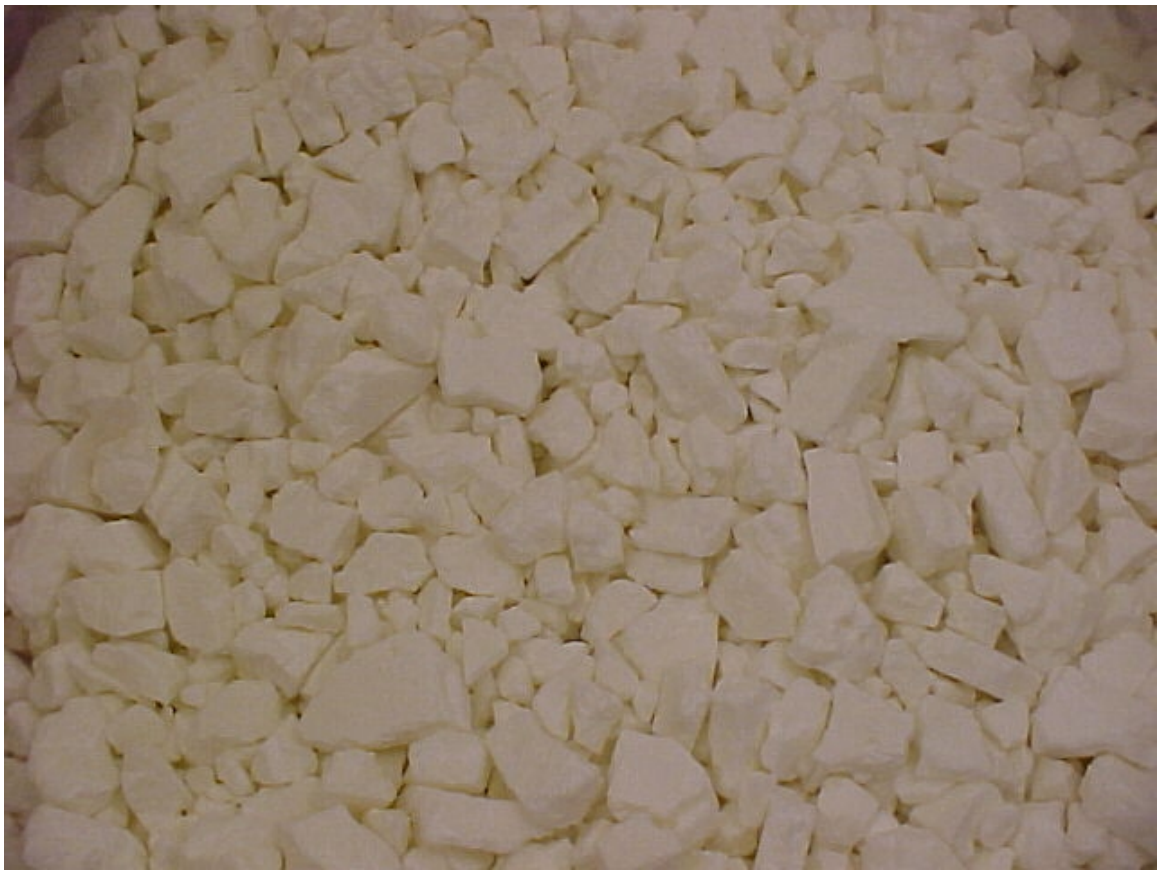
Inspection/Sample Date & Time

Date	7-2-2002	Time	11:15

Other Information

Photo No. 6 of 7

Thorium Nitrate – dry – solid – white – gravel shape
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Indian		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	714	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	7
		Column	F

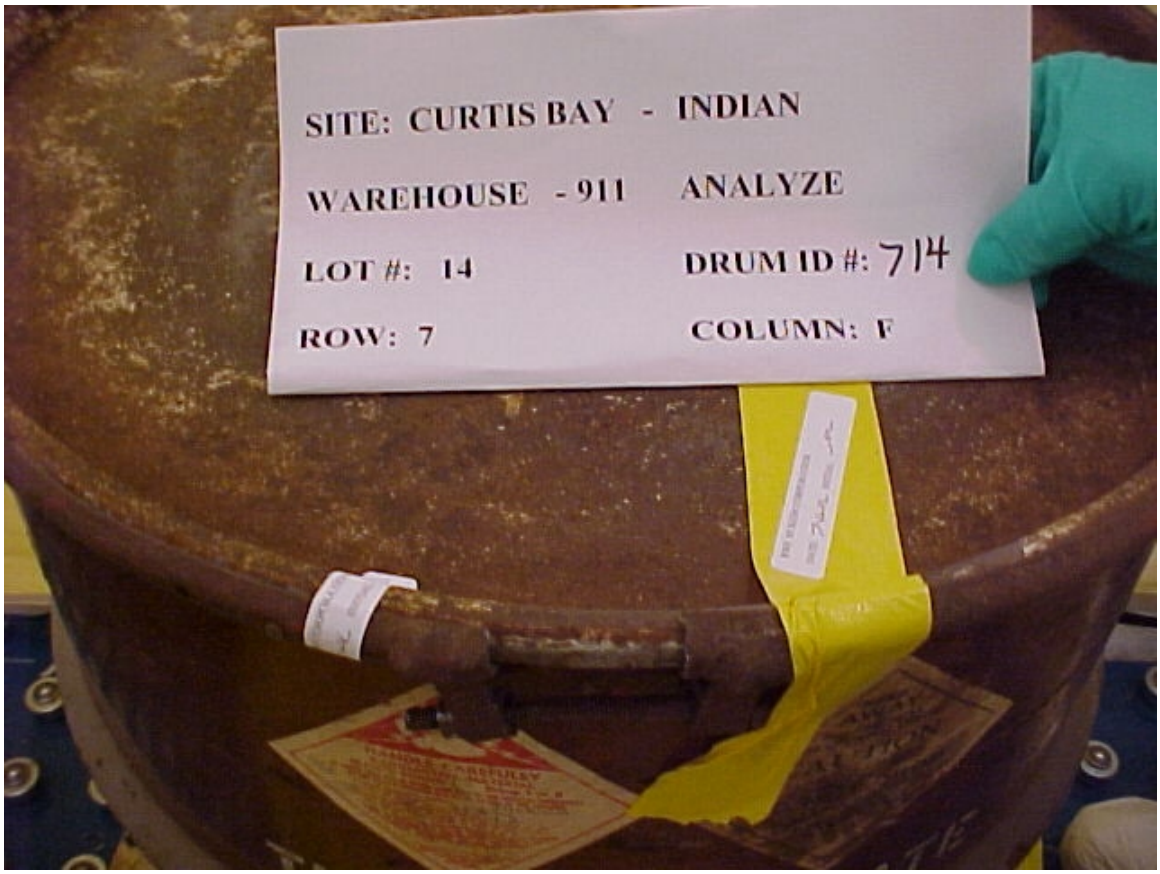
Inspection/Sample Date & Time

Date	7-2-2002	Time	11:15

Other Information

Photo No. 7 of 7

Sealed & dated - complete



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APPENDIX D

CURTIS BAY DEPOT
DRUMS SAMPLED FOR OFF-SITE ANALYSES
(THIRD SAMPLE SHIPMENT)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Curtis Bay Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were sampled and shipped off-site for analyses per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were shipped to UT Battelle's contracted off-site laboratory per Shipment No. 6990-001-004 (i.e. the third shipment of samples to the laboratory for this project). All lots/drums included in this appendix came from Thorium Nitrate materials originating in France; therefore, the lot numbers delineated below are preceded with "F" to designate that the lot has originated from France.

Also included with this table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	F-1	52	D-5
2	F-2	49	D-13
3	F-3	95	D-21
4	F-4	29	D-29
5	F-6	100	D-37
6	F-9	51	D-45
7	F-10	94	D-53
8	F-11	42	D-61
9	F-13	137	D-71
10	F-14	78	D-79
11	F-16	57	D-87
12	F-17	6	D-95
13	F-19	58	D-103

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Curtis Bay Depot
Lot #F-1 – Drum #52
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-1 Drum ID #: 52 Location: Warehouse 912 - Column E - Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 4.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Analyze

Physical Location of Drum

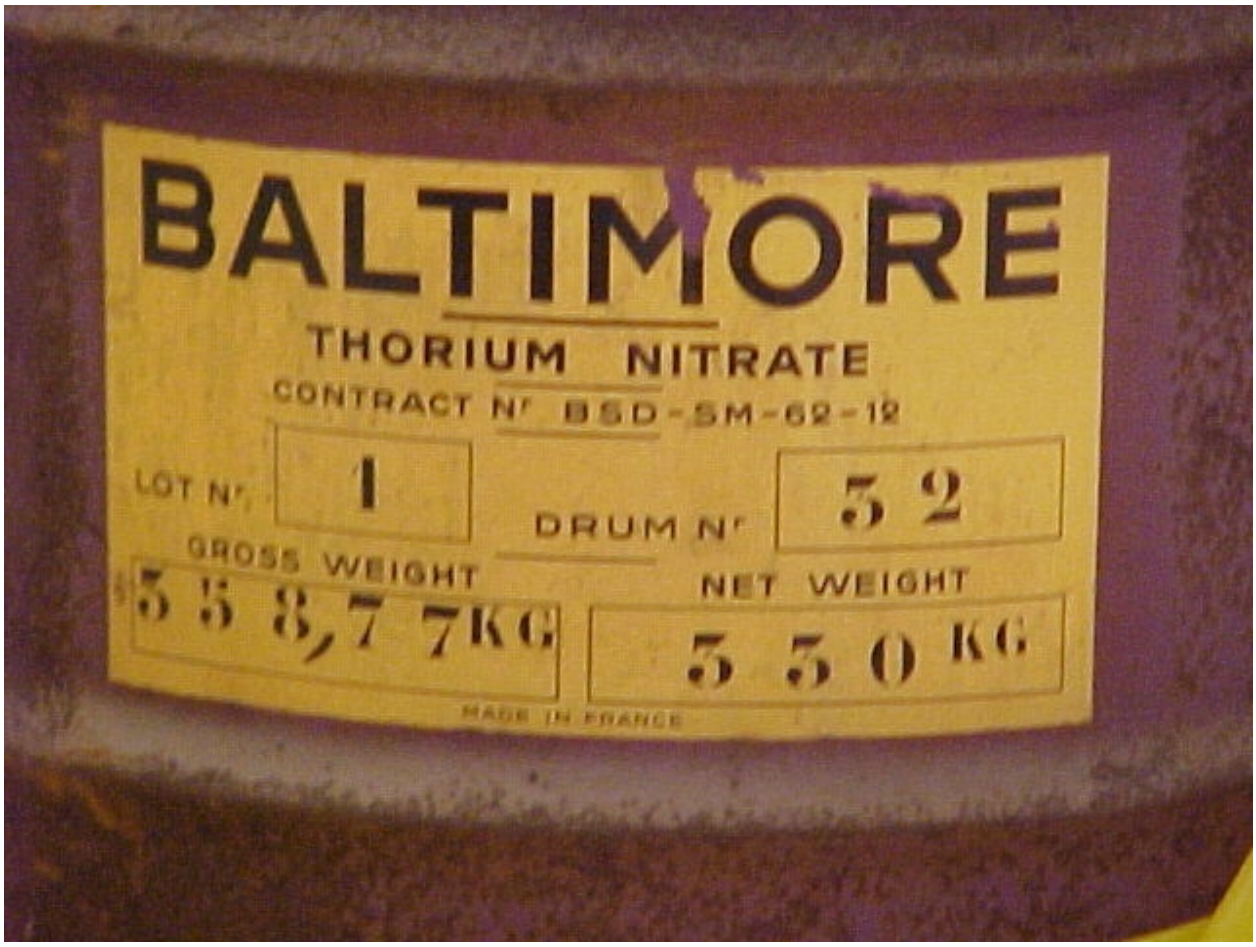
Warehouse	912	Row	7
		Column	E

Inspection/Sample Date & Time

Date	7-8-2002	Time	13:45

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	44 mR/hr	
	1 meter	4.0 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	E

Inspection/Sample Date & Time

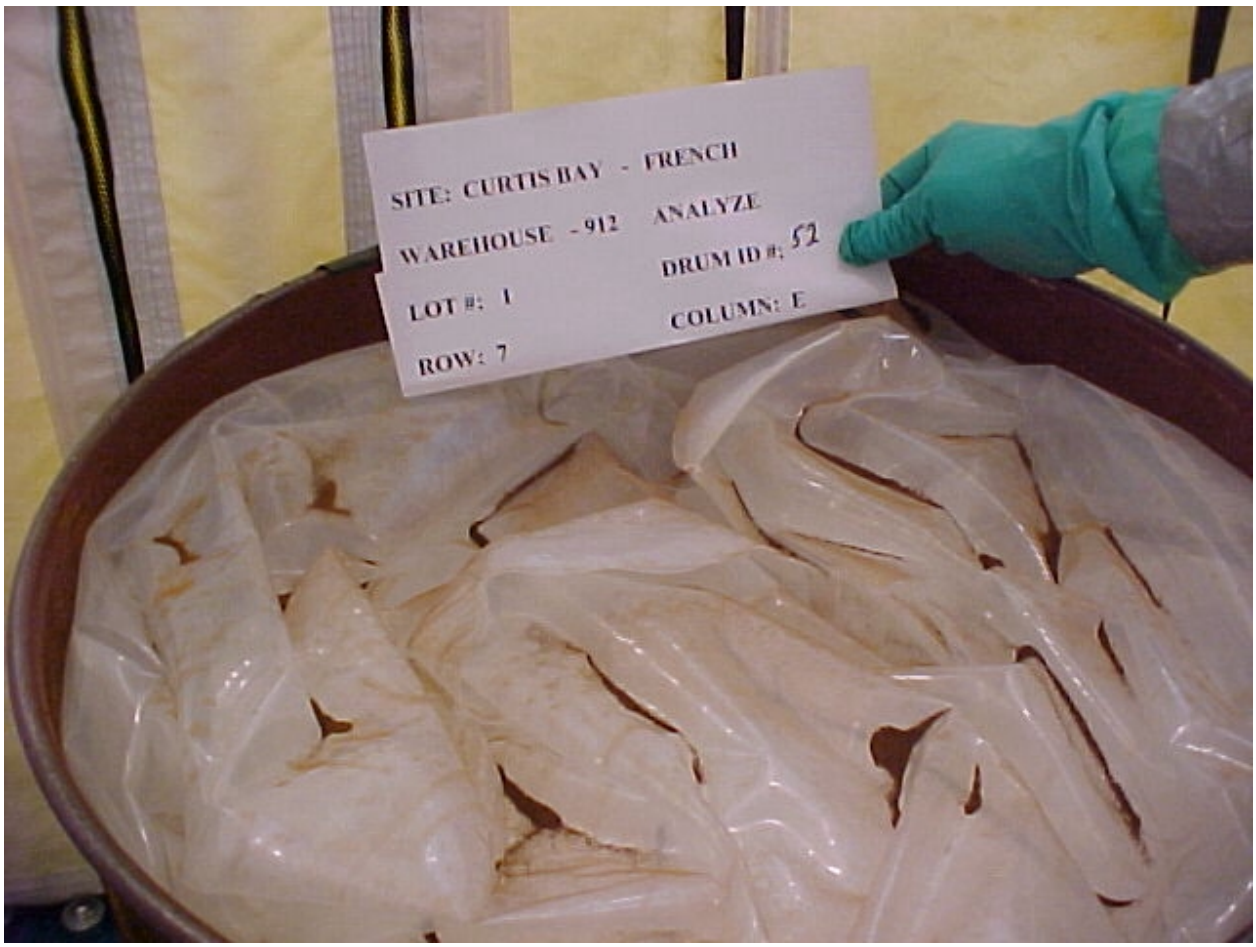
Date	7-8-2002	Time	13:45

Other Information

Photo No. 2 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	E

Inspection/Sample Date & Time

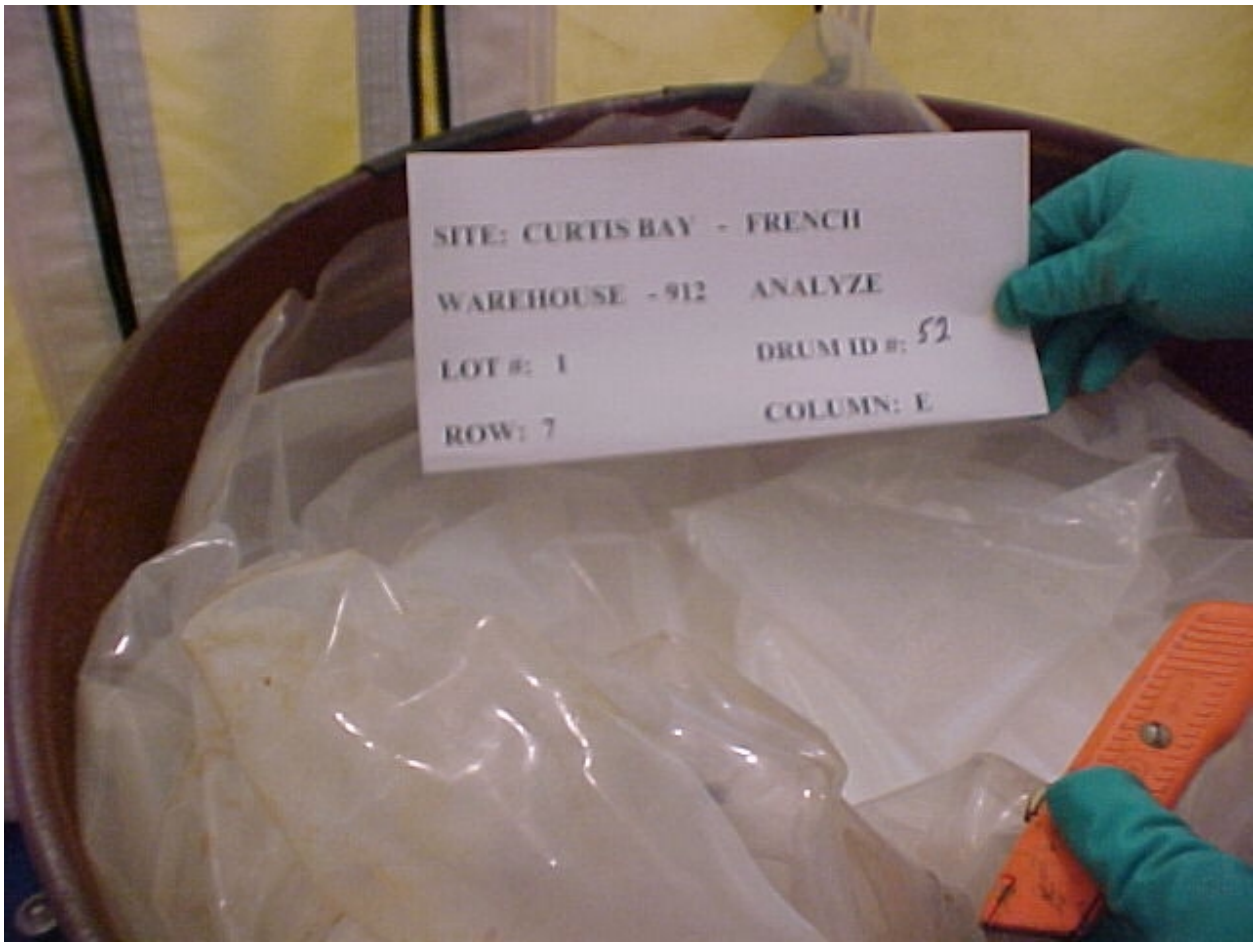
Date	7-8-2002	Time	13:45

Other Information

Photo No. 3 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	E

Inspection/Sample Date & Time

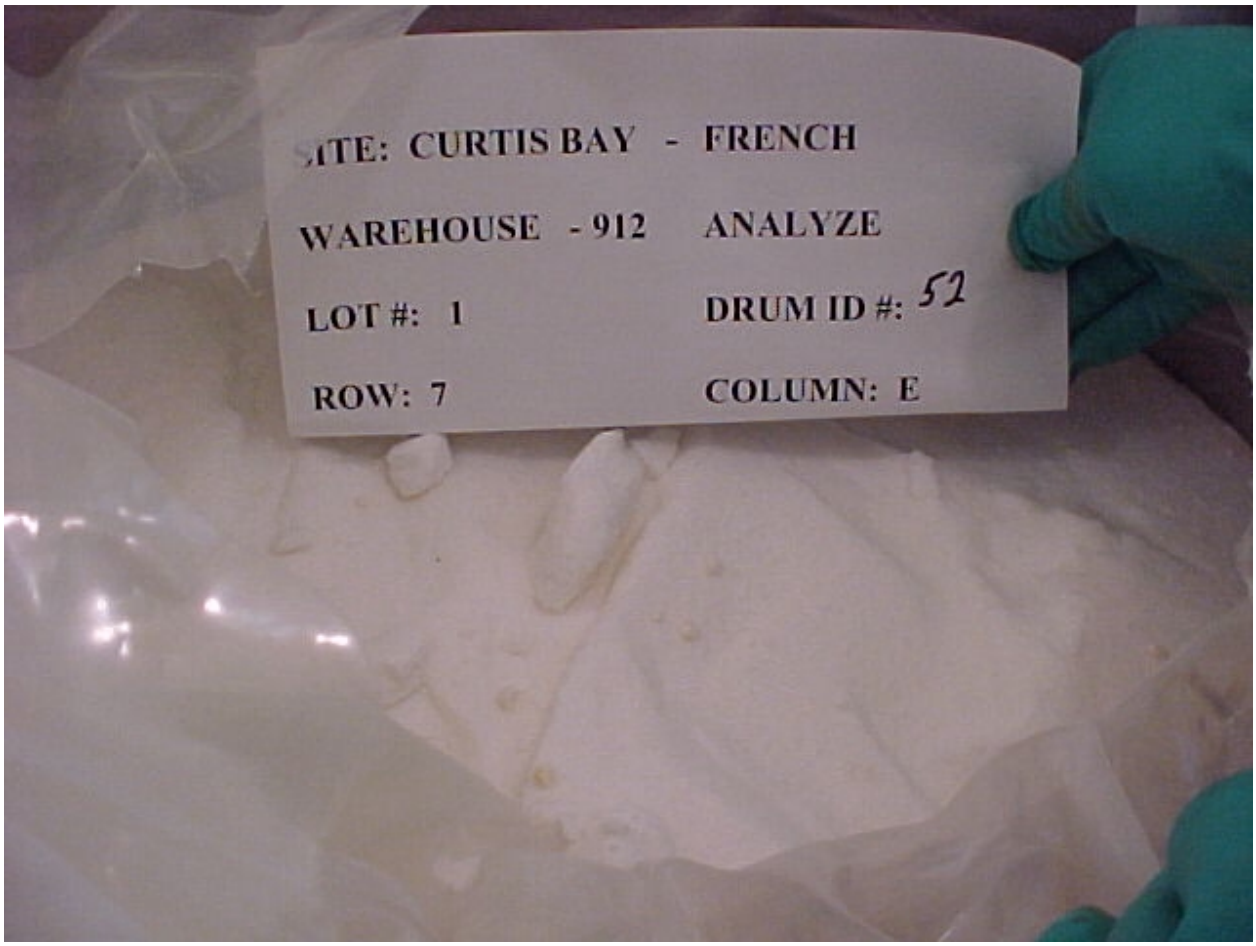
Date	7-8-2002	Time	13:45

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	E

Inspection/Sample Date & Time

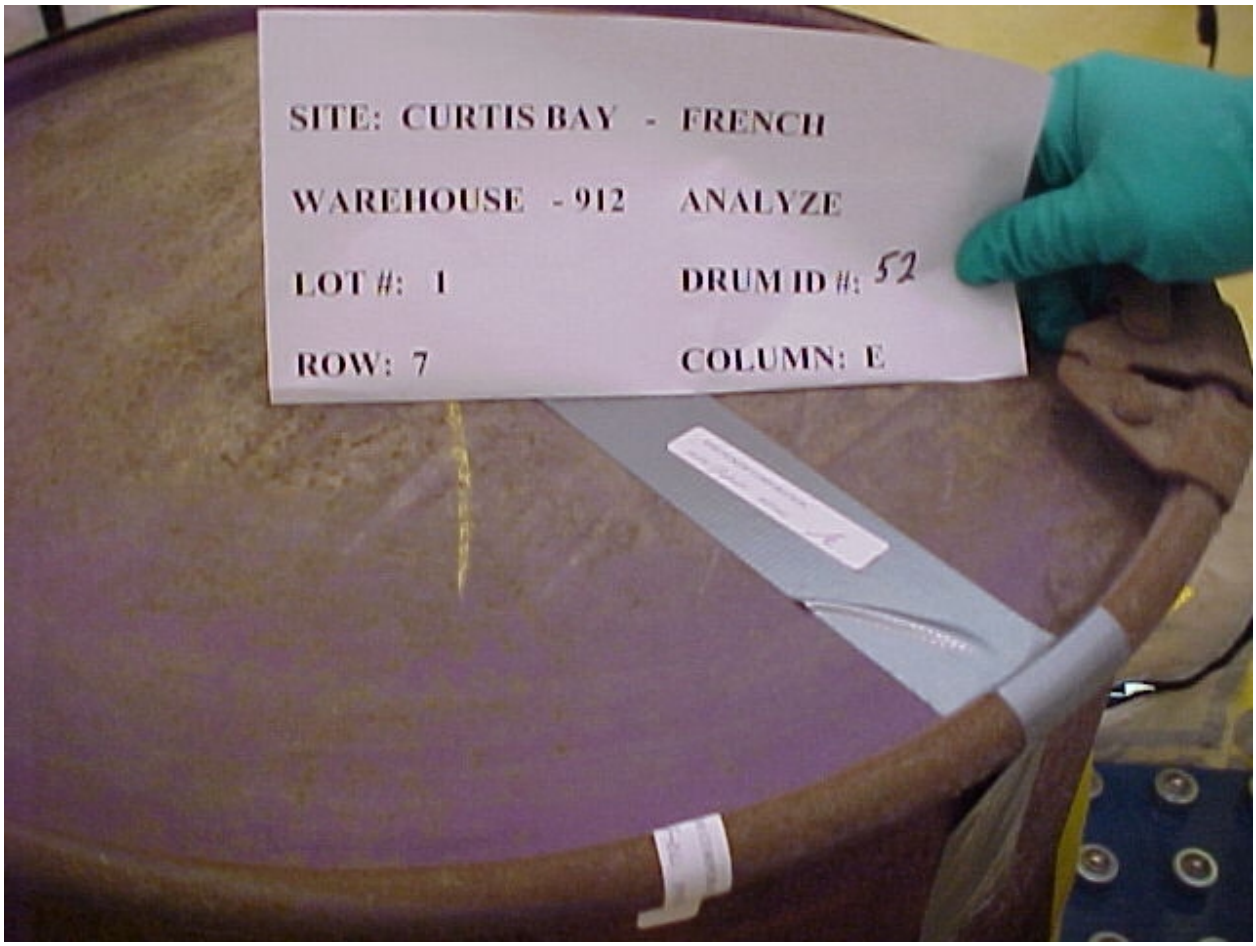
Date	7-8-2002	Time	13:45

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #F-2 – Drum #49
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-2 Drum ID #: 49 Location: Warehouse 912 – Column E – Row 9

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 42mR/hr DR at 1 meter 3.8mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	49	Disposition	Analyze

Physical Location of Drum

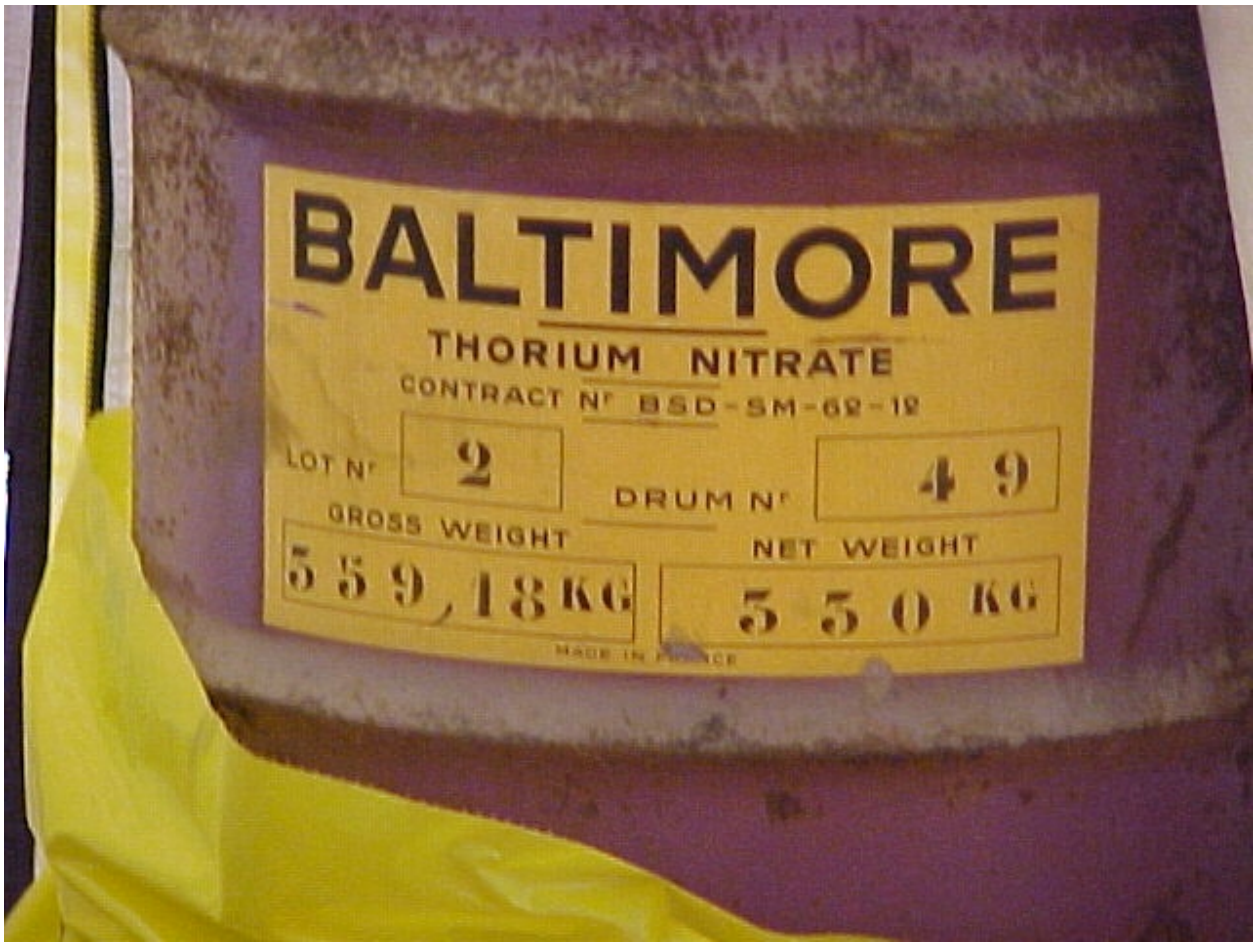
Warehouse	912	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-8-2002	Time	13:30

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	42 mR/hr	
	1 meter	3.8 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	49	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	E

Inspection/Sample Date & Time

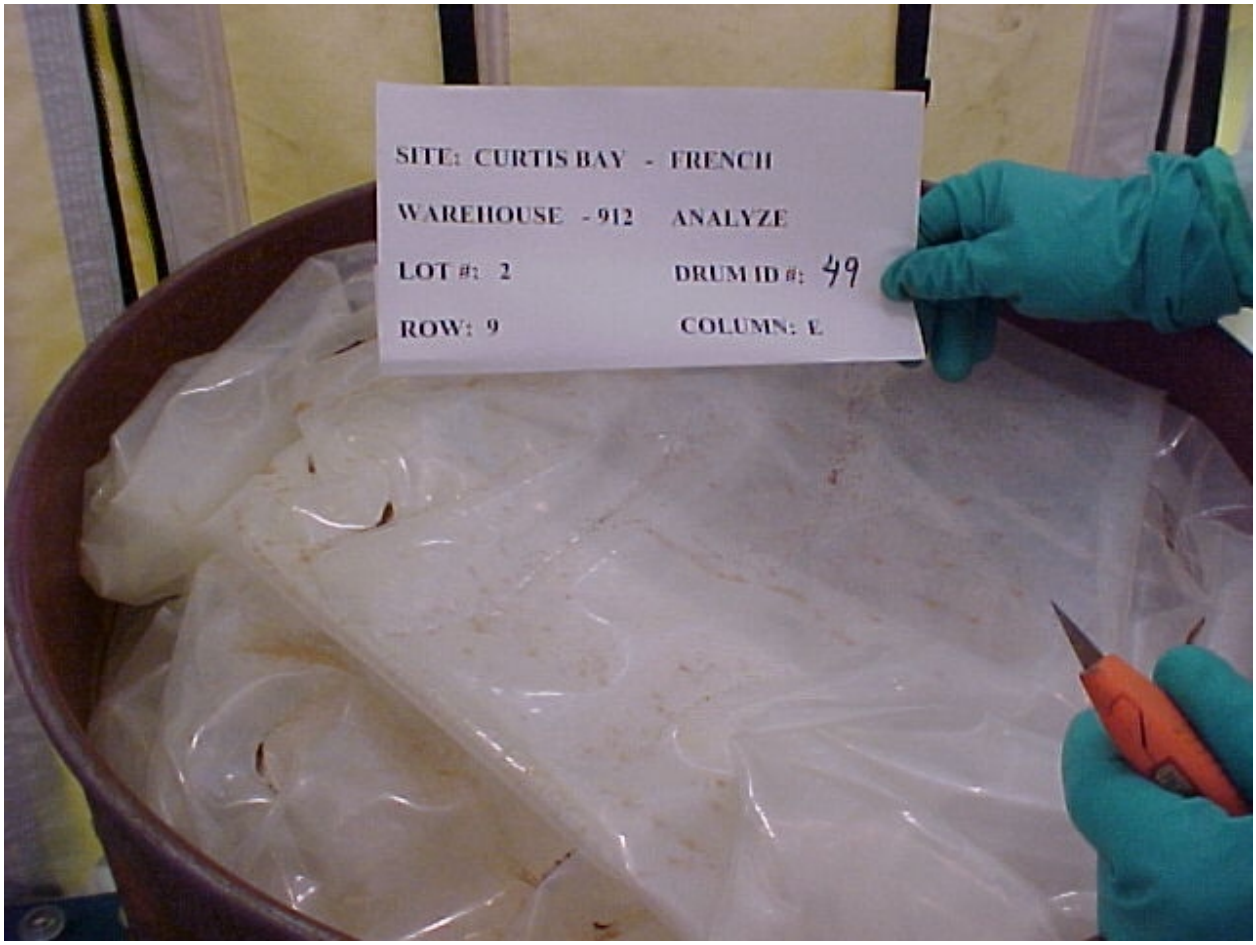
Date	7-8-2002	Time	13:30

Other Information

Photo No. 2 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	3.8 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	49	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	E

Inspection/Sample Date & Time

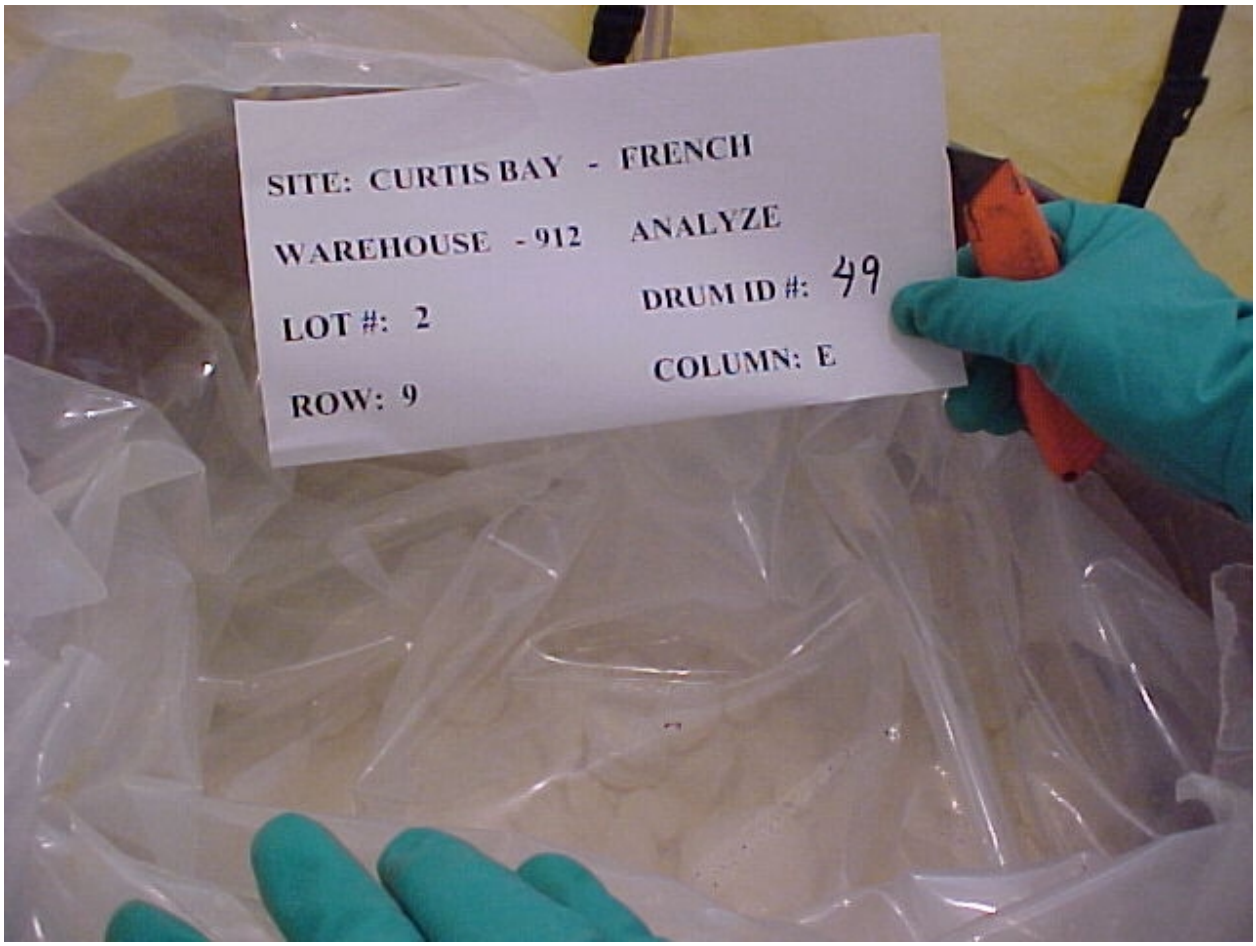
Date	7-8-2002	Time	13:30

Other Information

Photo No. 3 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	3.8 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	49	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	E

Inspection/Sample Date & Time

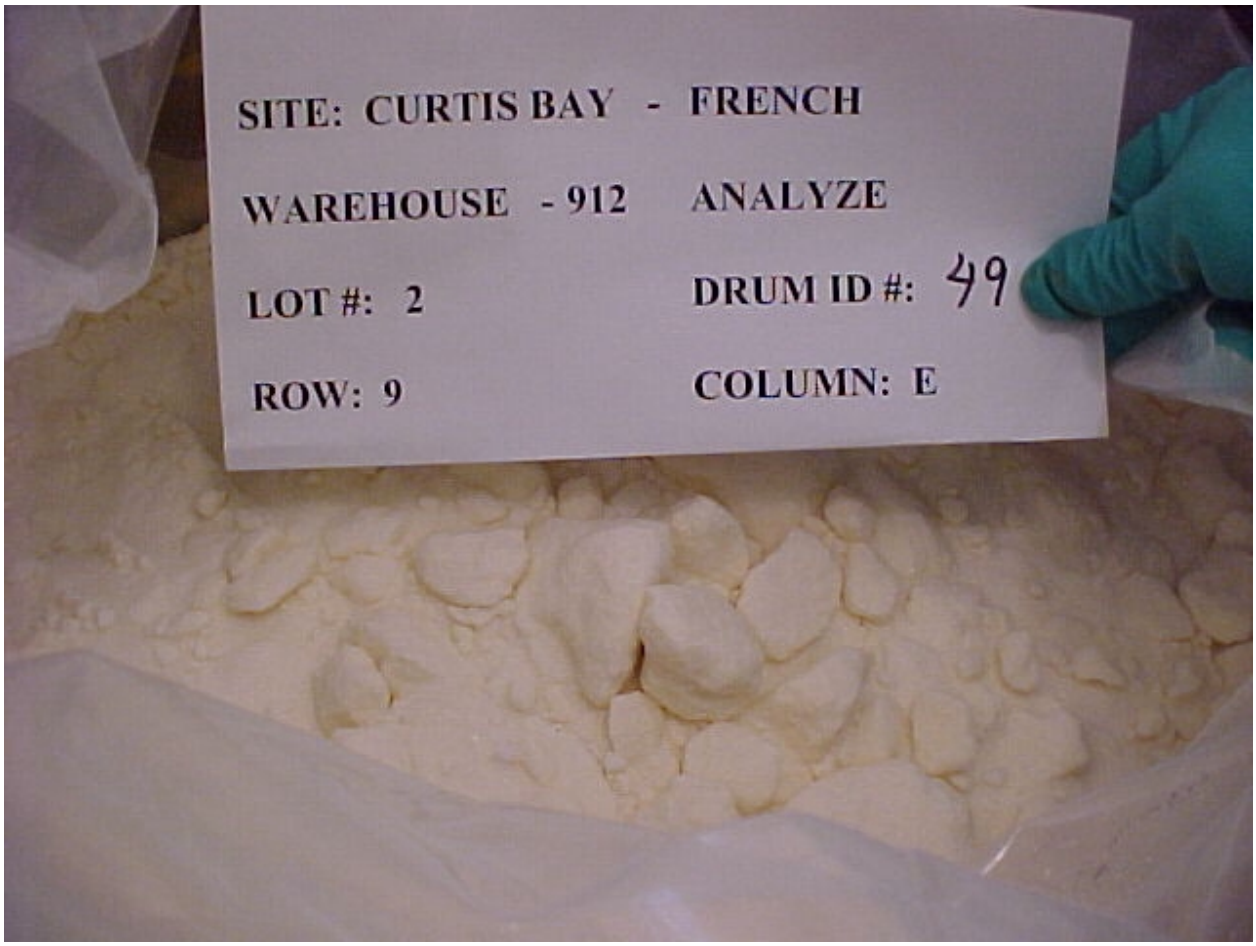
Date	7-8-2002	Time	13:30

Other Information

Photo No. 4 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	3.8 mR/hr

Thorium Nitrate – Some gravel pieces but most is Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	49	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	E

Inspection/Sample Date & Time

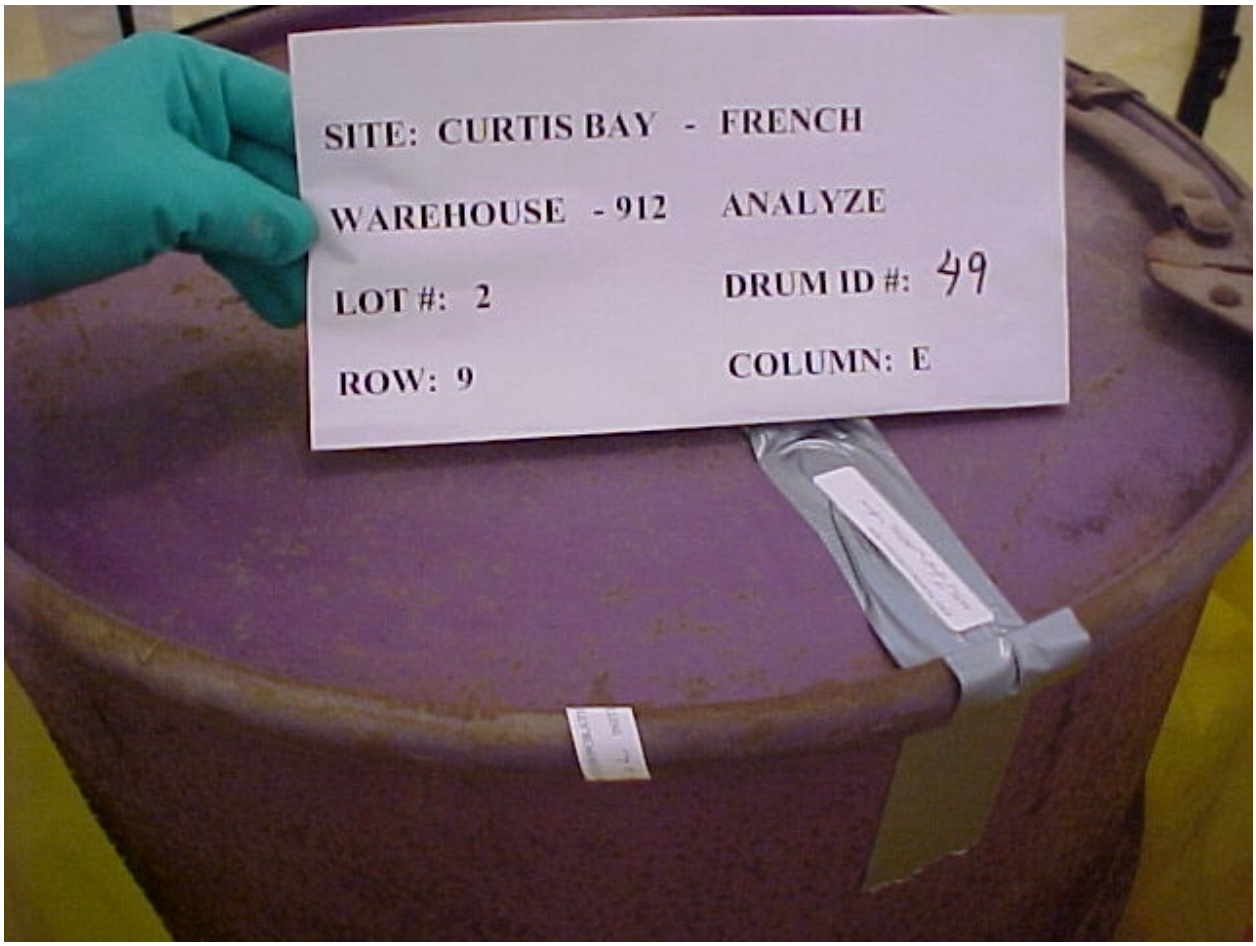
Date	7-8-2002	Time	13:30

Other Information

Photo No. 5 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	3.8 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #F-3 – Drum #95
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-3 Drum ID #: 95 Location: Warehouse 912 – Column E - Row 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 4.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	95	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	5
		Column	E

Inspection/Sample Date & Time

Date	7-8-2002	Time	14:15

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	44 mR/hr	
	1 meter	4.0 mR/hr	

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	95	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	5
		Column	E

Inspection/Sample Date & Time

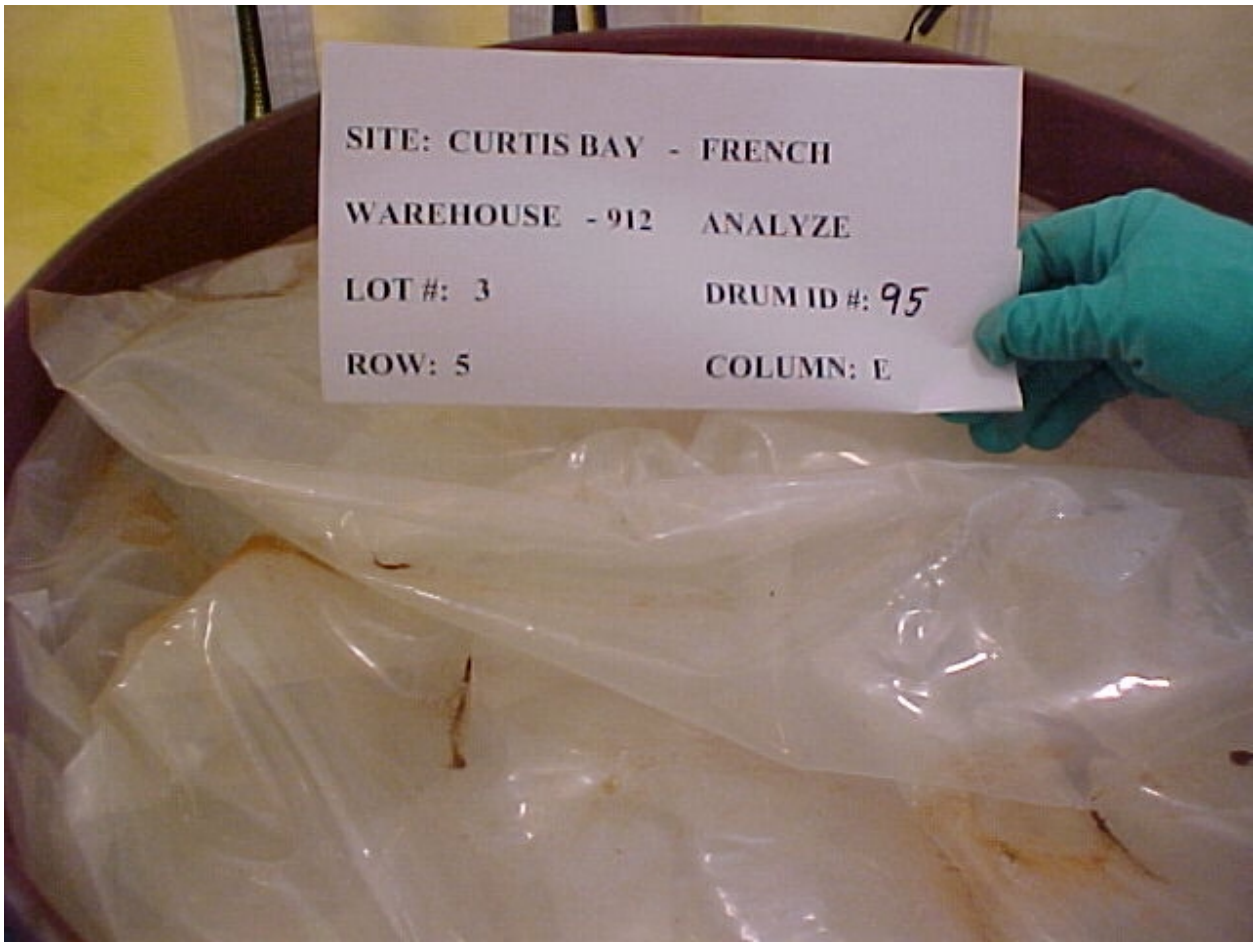
Date	7-8-2002	Time	14:15

Other Information

Photo No. 2 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	95	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	5
		Column	E

Inspection/Sample Date & Time

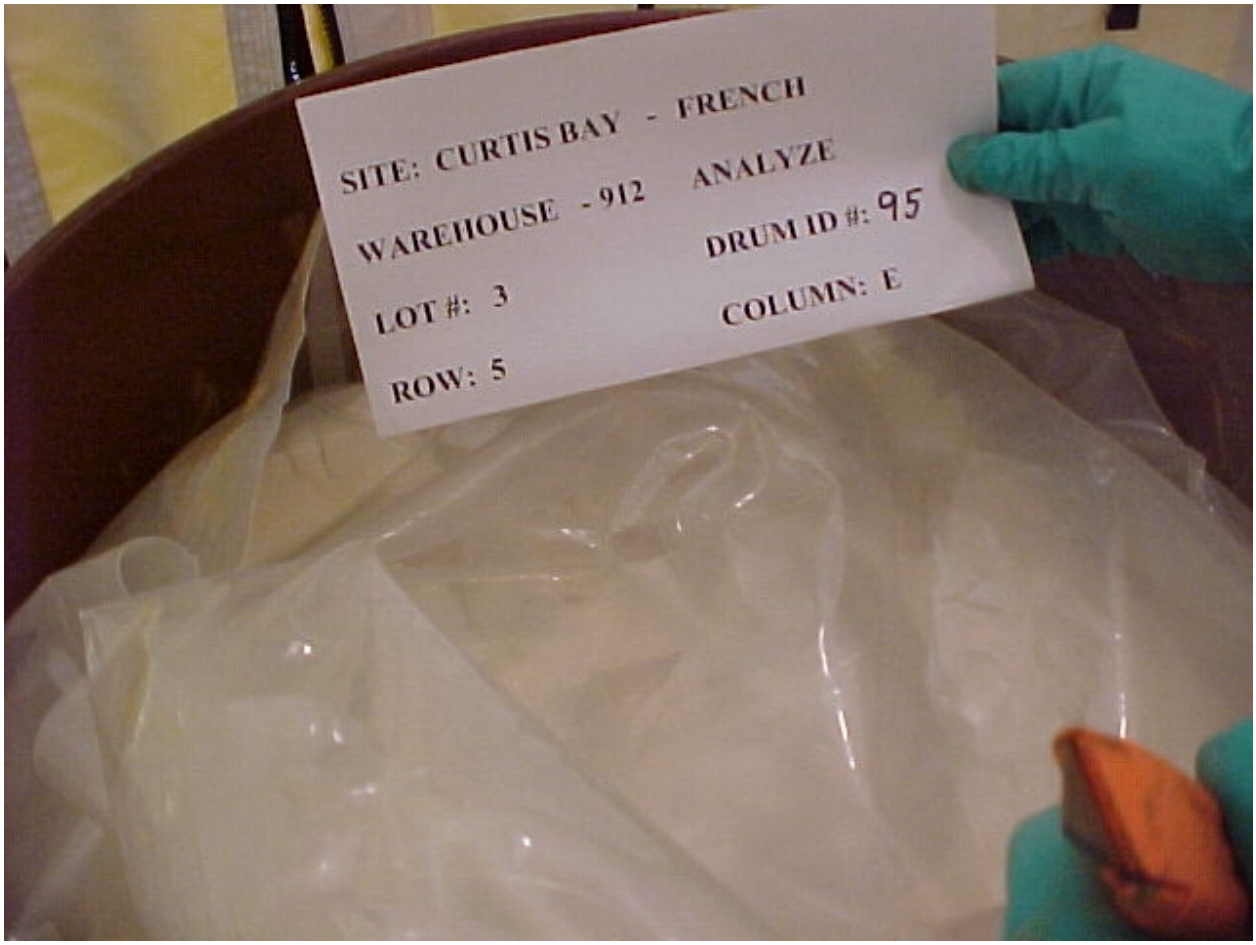
Date	7-8-2002	Time	14:15

Other Information

Photo No. 3 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	95	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	5
		Column	E

Inspection/Sample Date & Time

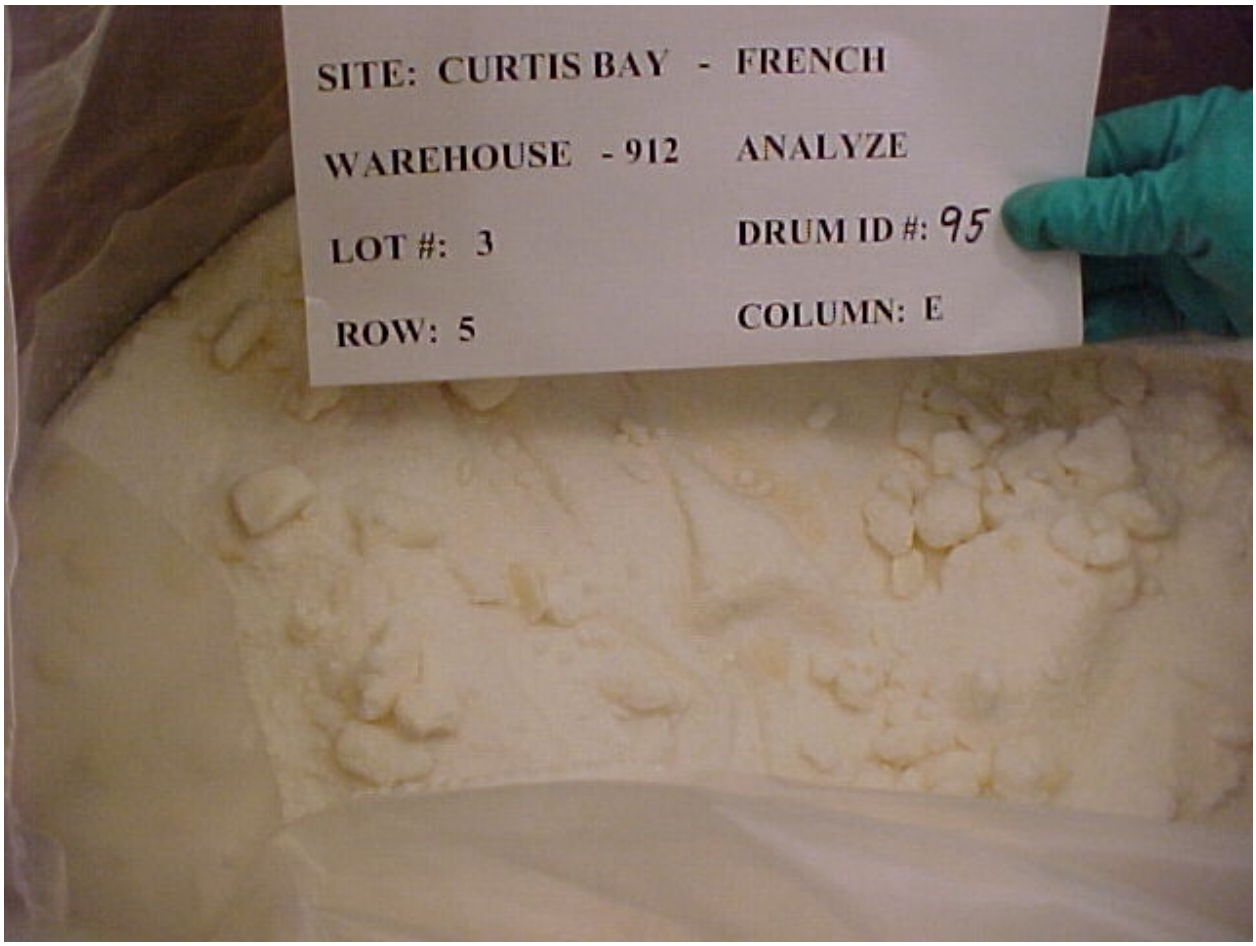
Date	7-8-2002	Time	14:15

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	95	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	5
		Column	E

Inspection/Sample Date & Time

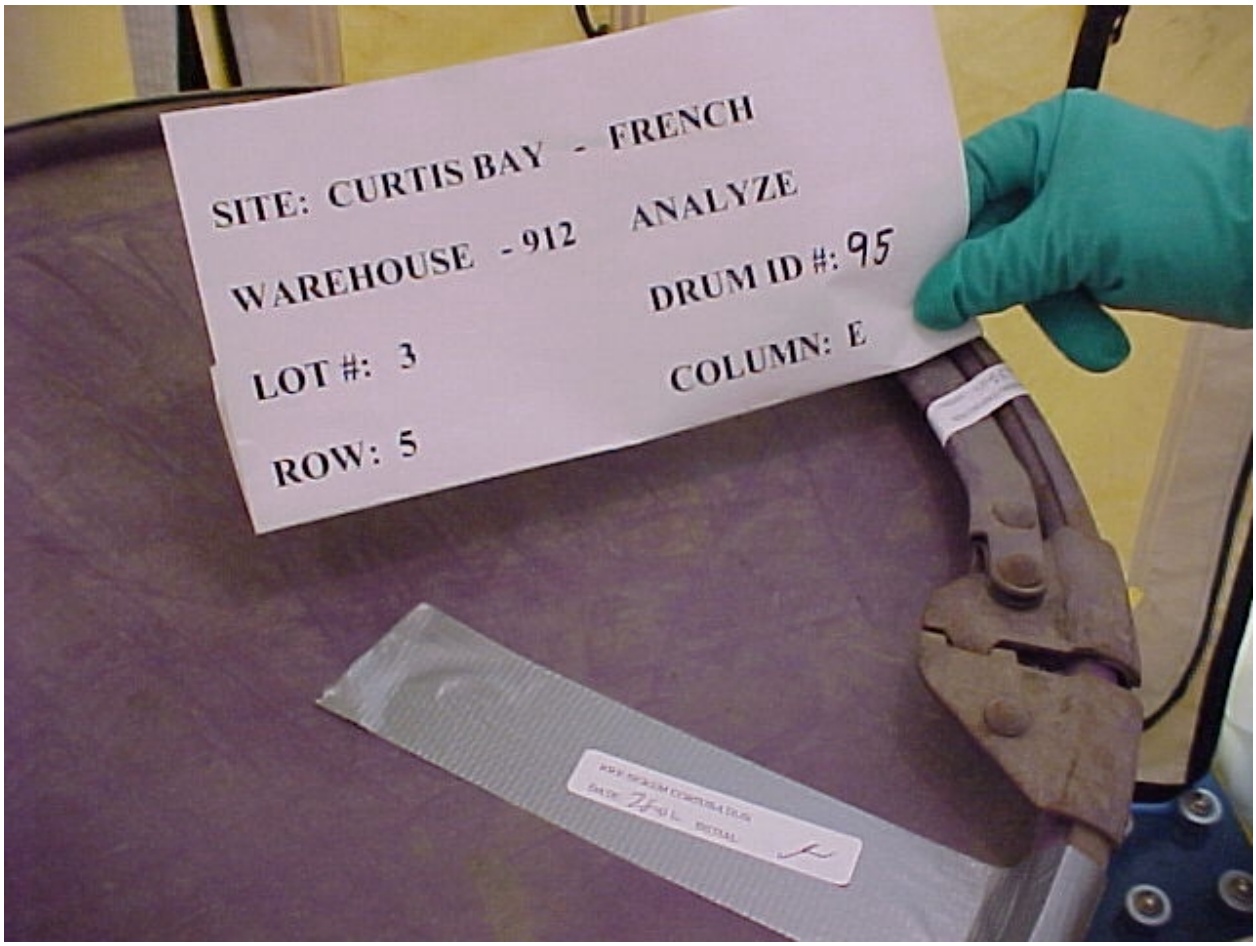
Date	7-8-2002	Time	14:15

Other Information

Photo No. 5 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

Sealed/Dated – Completed



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Curtis Bay Depot
Lot #F-4 – Drum #29
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-4 Drum ID #: 29 Location: Warehouse 912 – Column E – Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 4.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	29	Disposition	Analyze

Physical Location of Drum

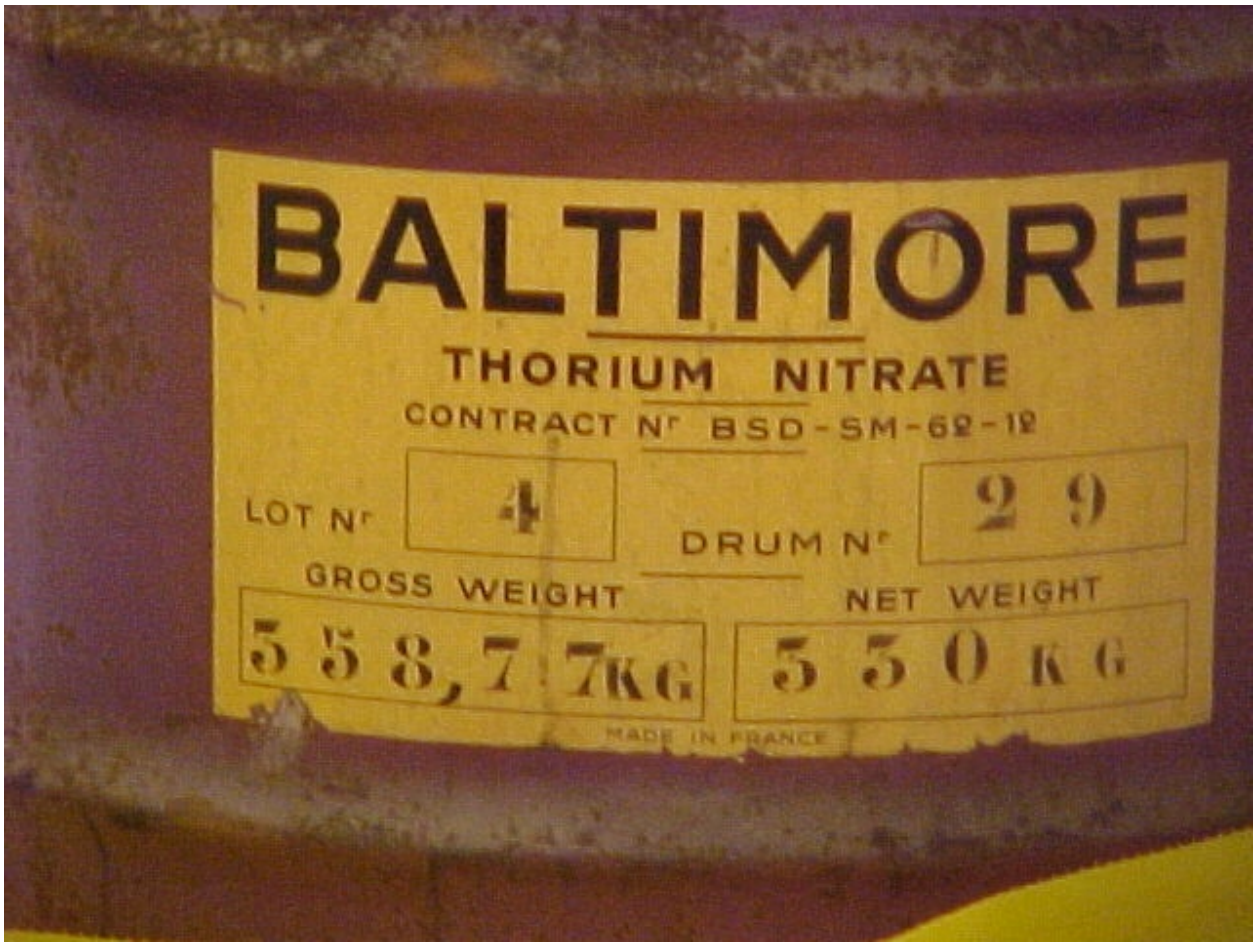
Warehouse	912	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-8-2002	Time	14:00

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface 44 mR/hr		
	1 meter 4.0 mR/hr		



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	29	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	3
		Column	E

Inspection/Sample Date & Time

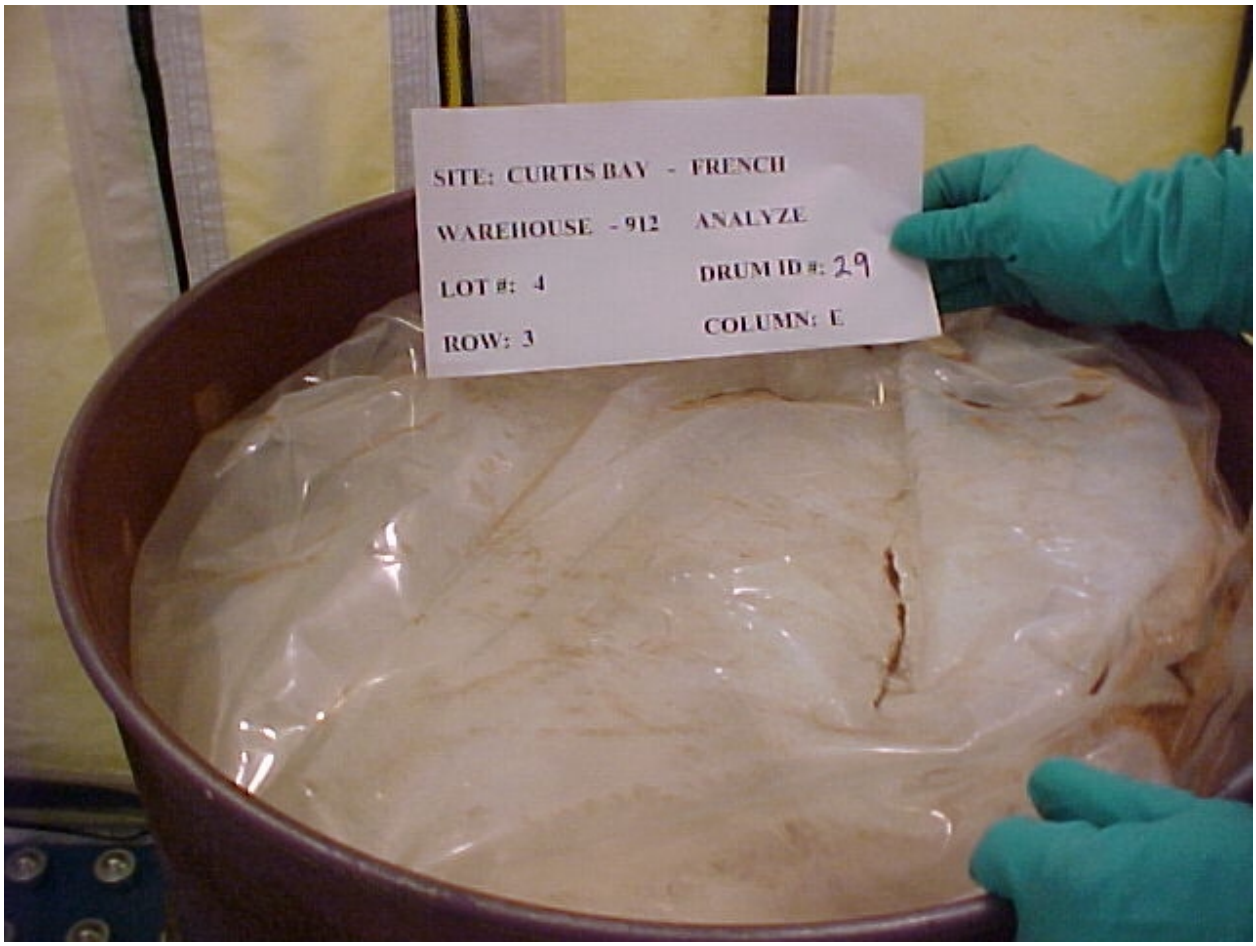
Date	7-8-2002	Time	14:00

Other Information

Photo No. 2 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

1st polyliner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	29	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	3
		Column	E

Inspection/Sample Date & Time

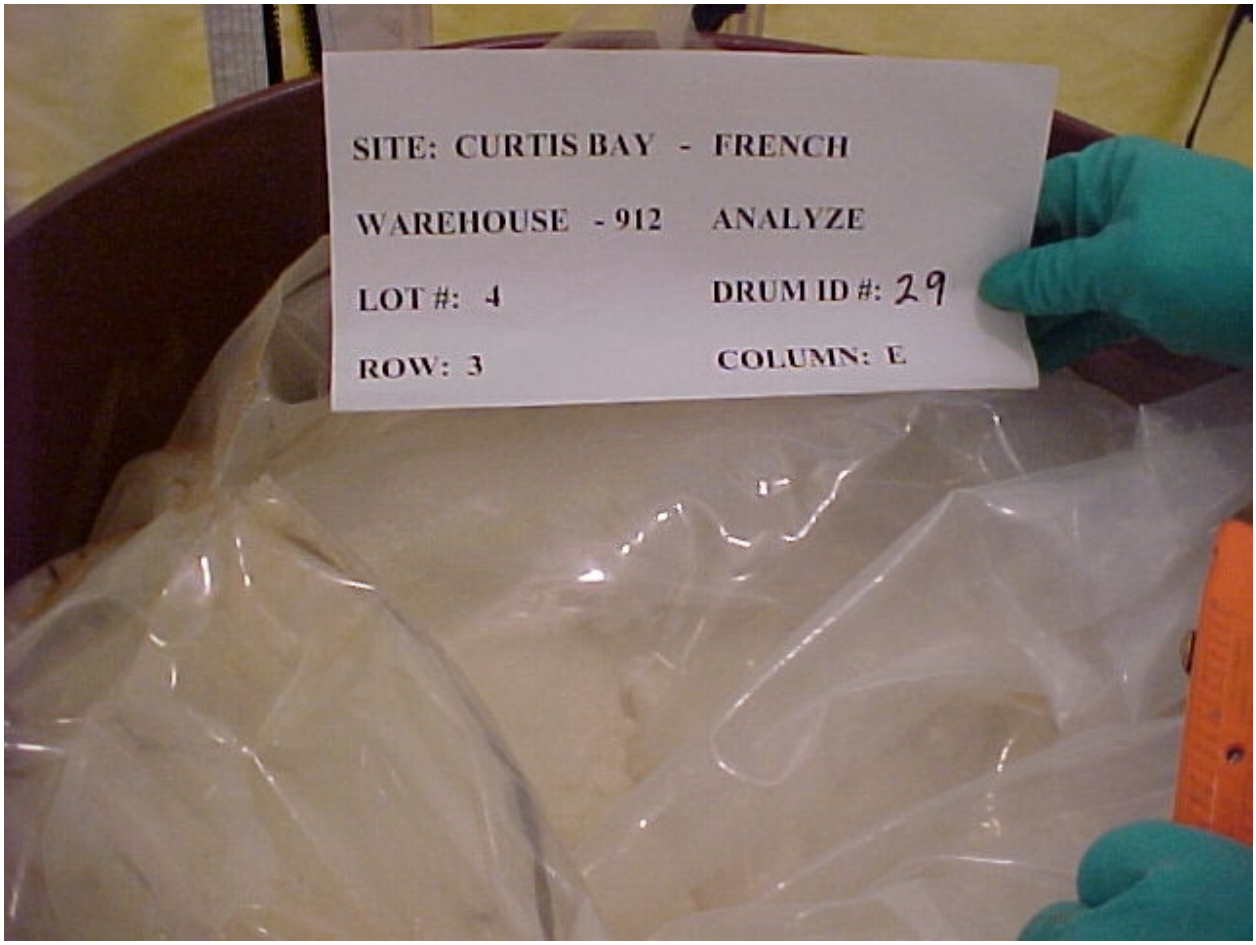
Date	7-8-2002	Time	14:00

Other Information

Photo No. 3 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

2nd polyliner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	29	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	3
		Column	E

Inspection/Sample Date & Time

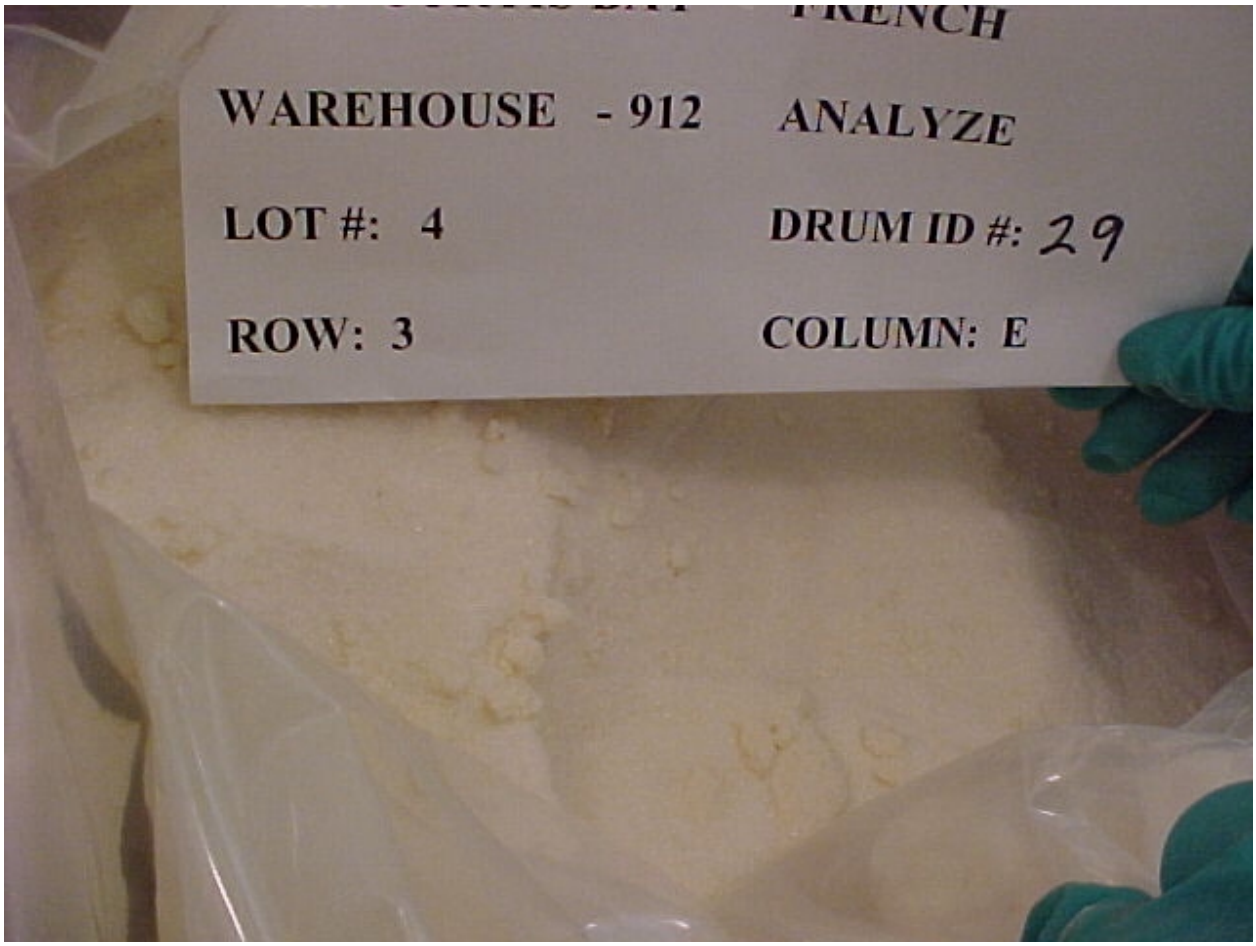
Date	7-8-2002	Time	14:00

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	29	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	3
		Column	E

Inspection/Sample Date & Time

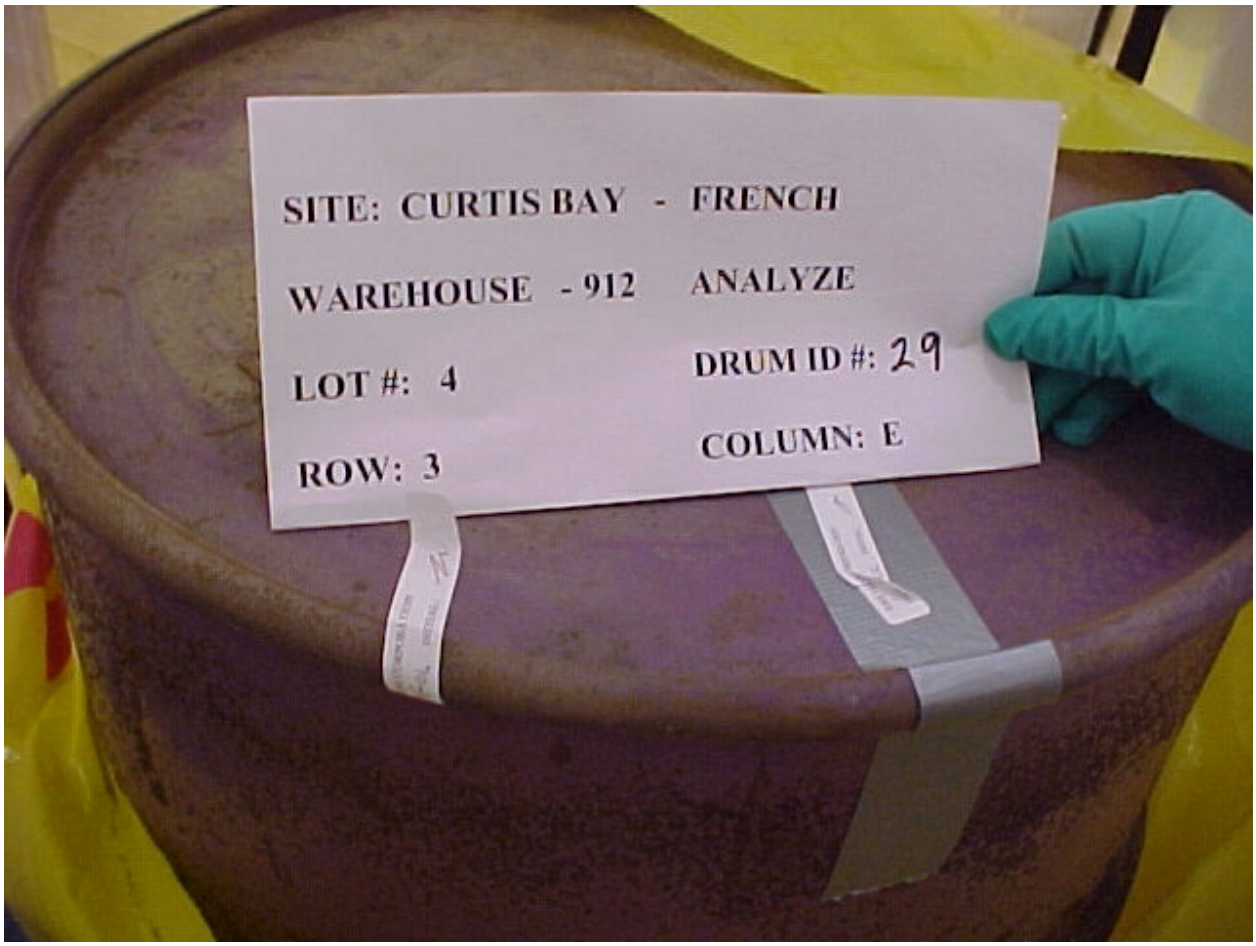
Date	7-8-2002	Time	14:00

Other Information

Photo No. 5 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	4.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #F-6 – Drum #100
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-6 Drum ID #: 100 Location: Warehouse 912 – Column E – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 42mR/hr DR at 1 meter 4.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	100	Disposition	Analyze

Physical Location of Drum

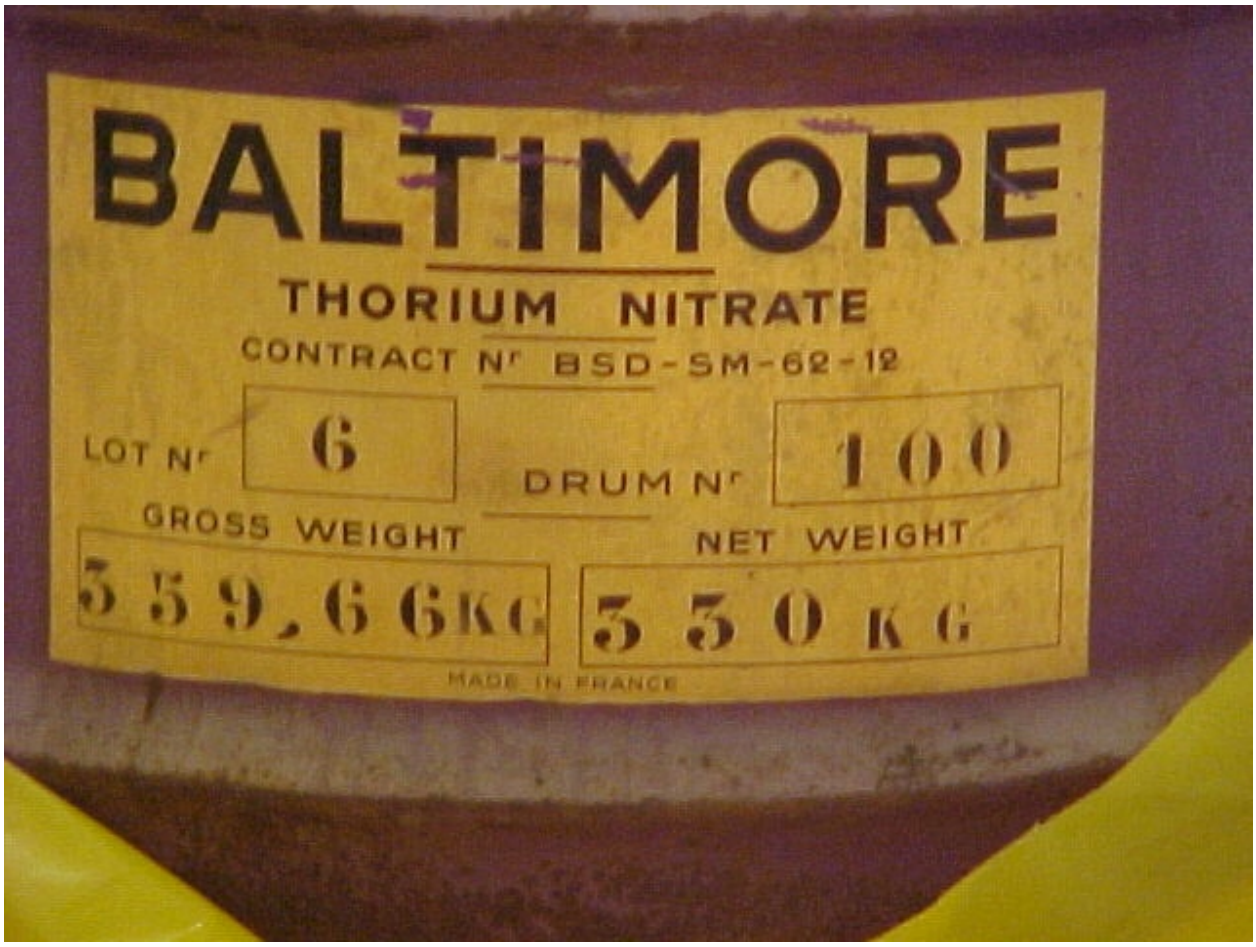
Warehouse	912	Row	2
		Column	E

Inspection/Sample Date & Time

Date	7-8-2002	Time	13:45

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	42 mR/hr	
	1 meter	4.0 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	100	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	E

Inspection/Sample Date & Time

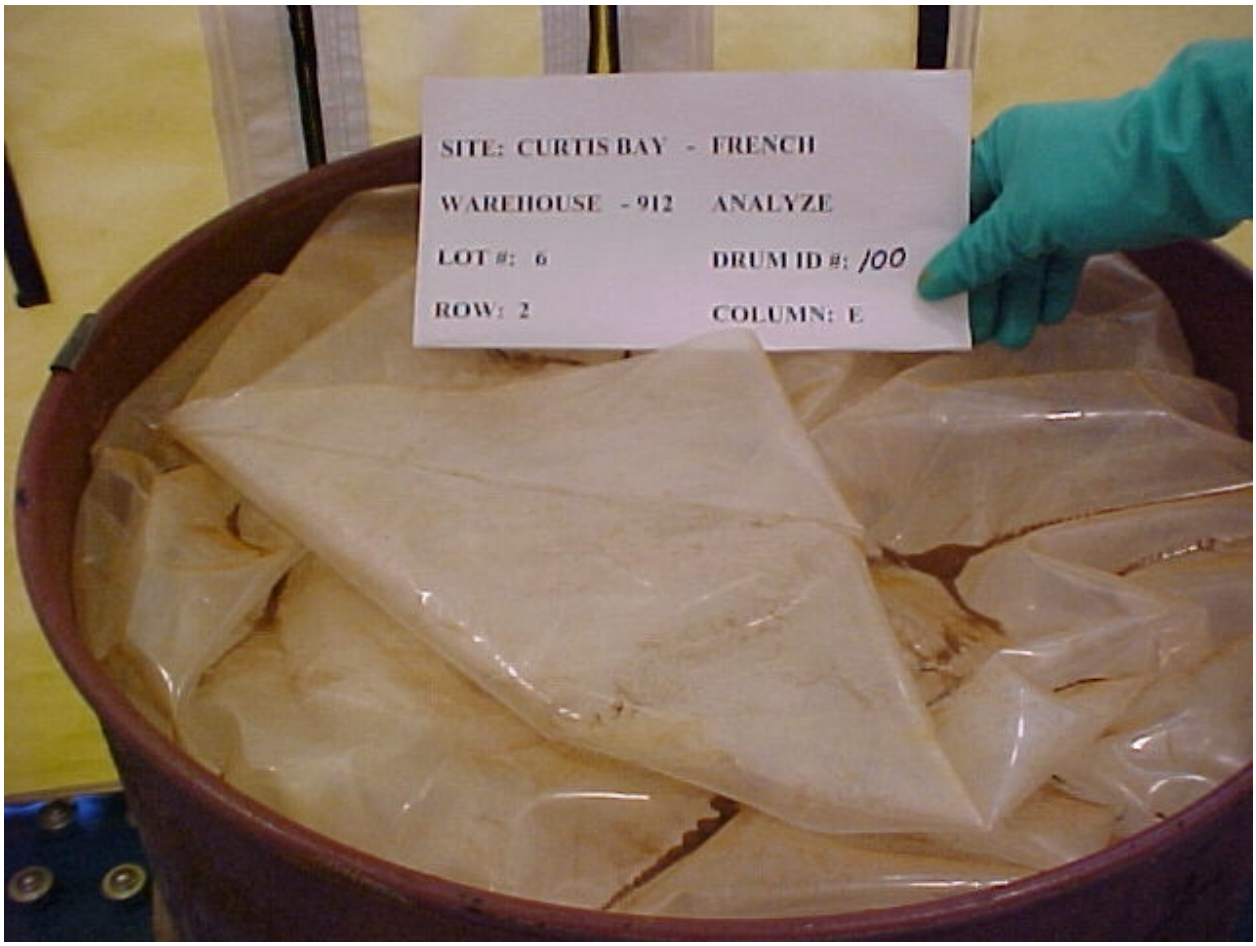
Date	7-8-2002	Time	13:45

Other Information

Photo No. 2 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	100	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	E

Inspection/Sample Date & Time

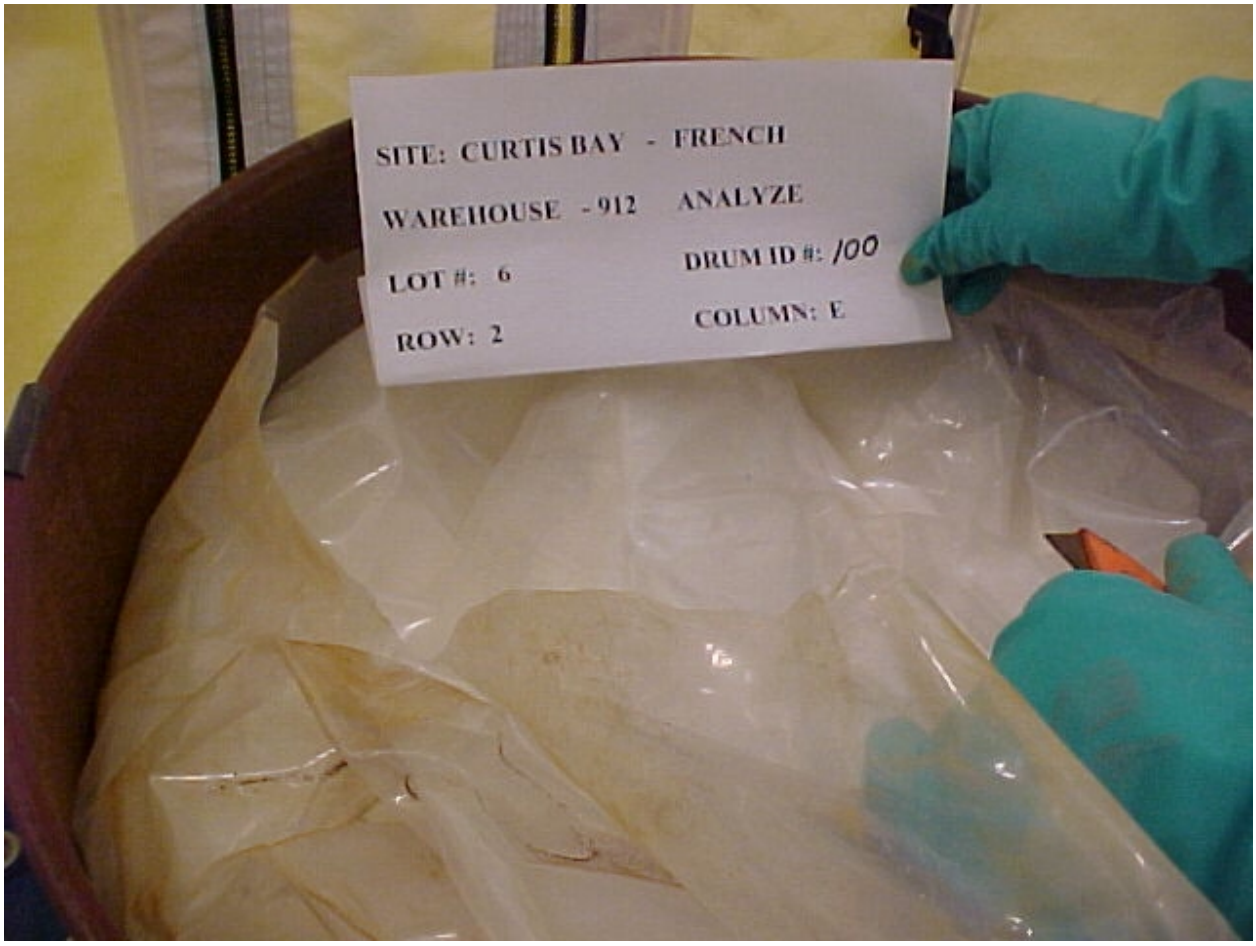
Date	7-8-2002	Time	13:45

Other Information

Photo No. 3 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	100	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	E

Inspection/Sample Date & Time

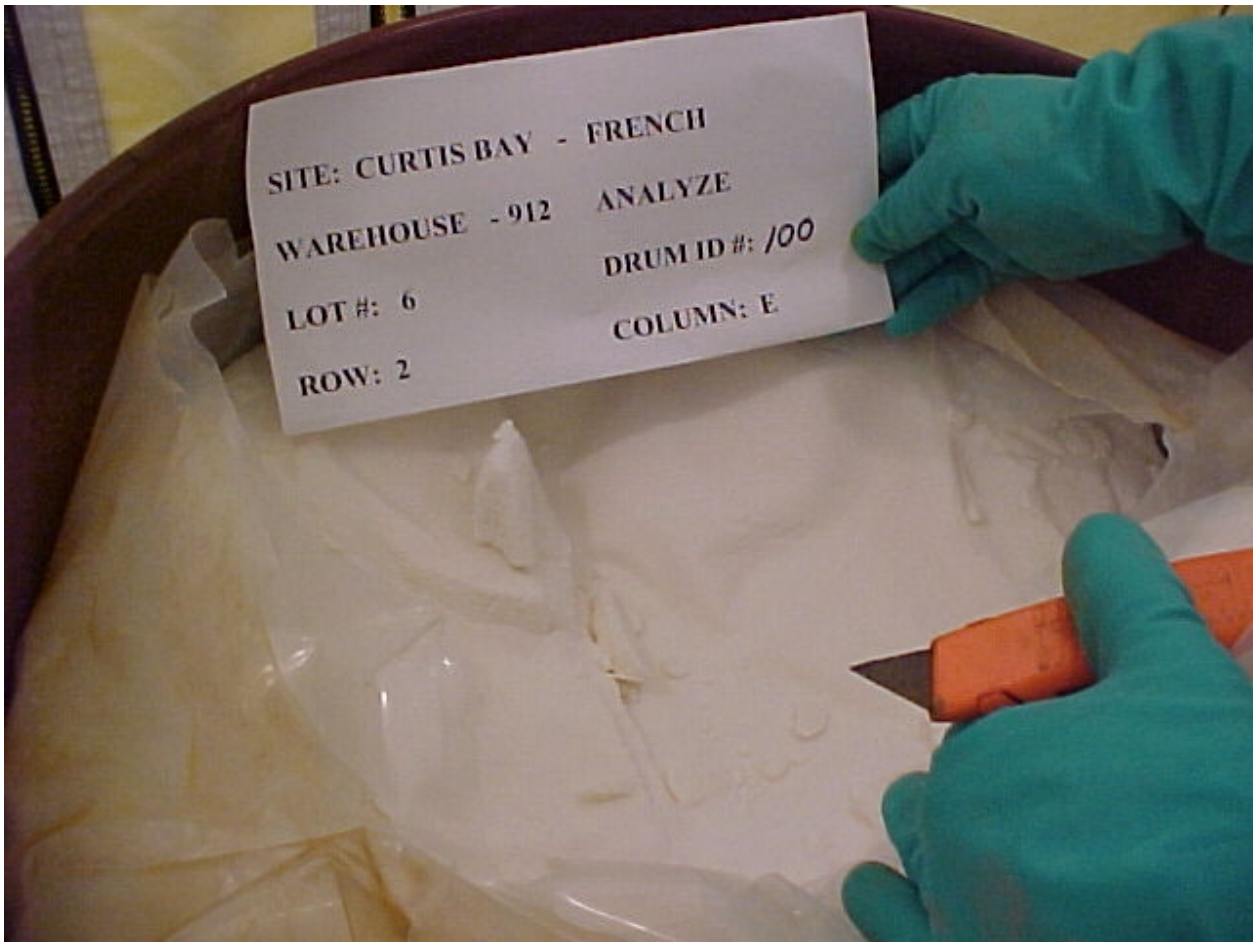
Date	7-8-2002	Time	13:45

Other Information

Photo No. 4 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	100	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	E

Inspection/Sample Date & Time

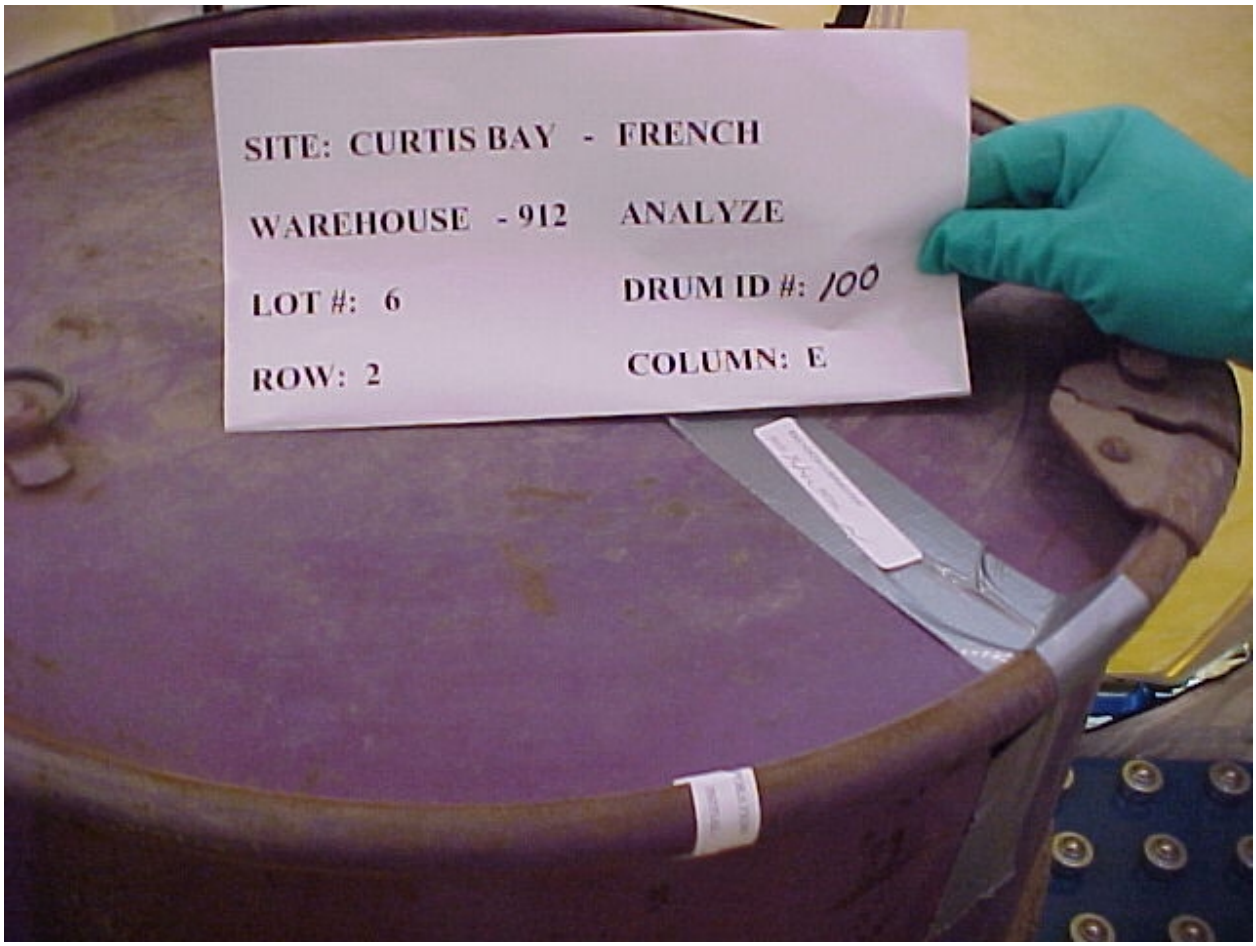
Date	7-8-2002	Time	13:45

Other Information

Photo No. 4 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #F-9 – Drum #51
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-9 Drum ID #: 51 Location: Warehouse 912 – Column E – Row 1

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 3.8mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	51	Disposition	Analyze

Physical Location of Drum

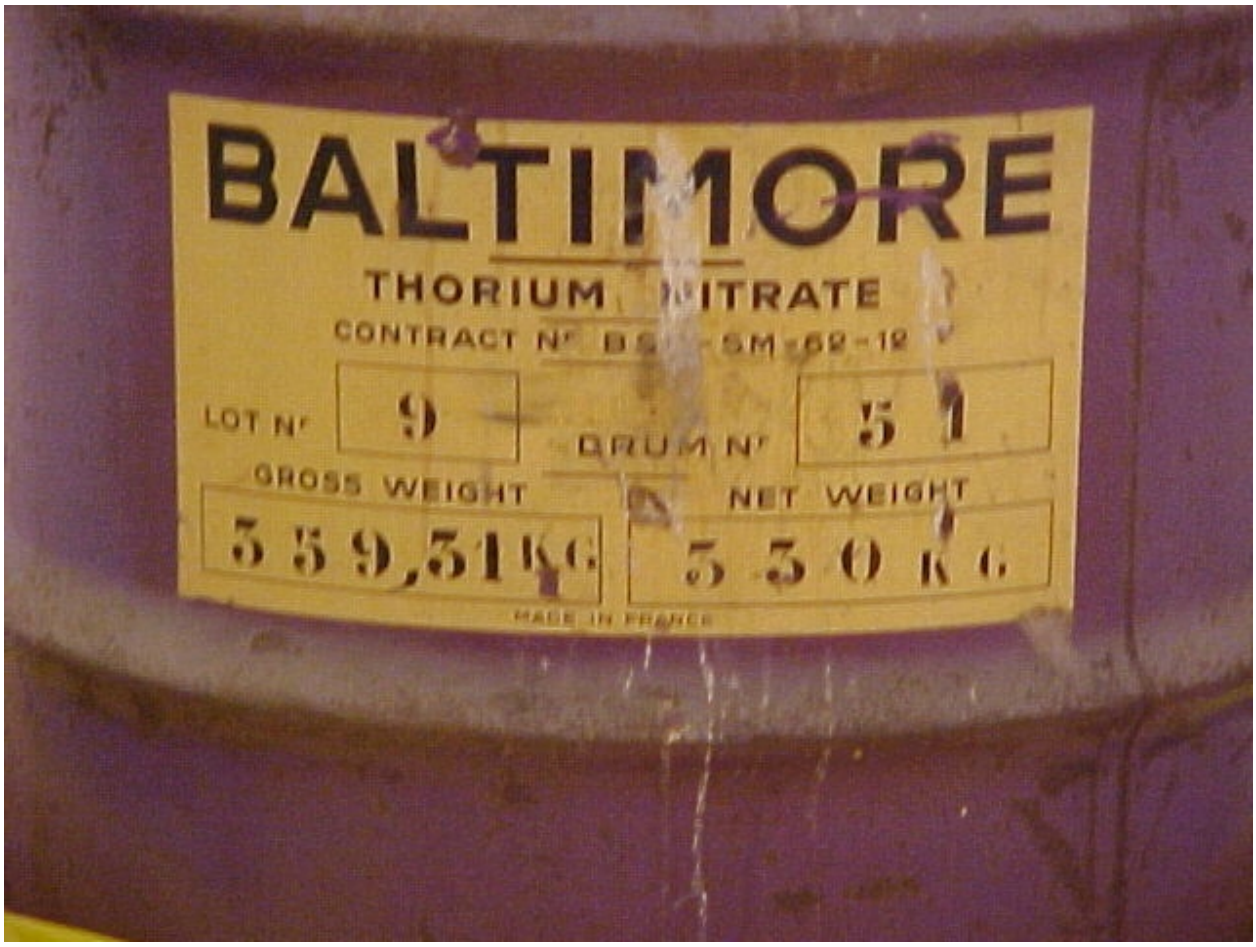
Warehouse	912	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-8-2002	Time	12:30

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	44 mR/hr	
	1 meter	3.8 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	51	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-8-2002	Time	12:30

Other Information

Photo No. 2 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

1st poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	51	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	E

Inspection/Sample Date & Time

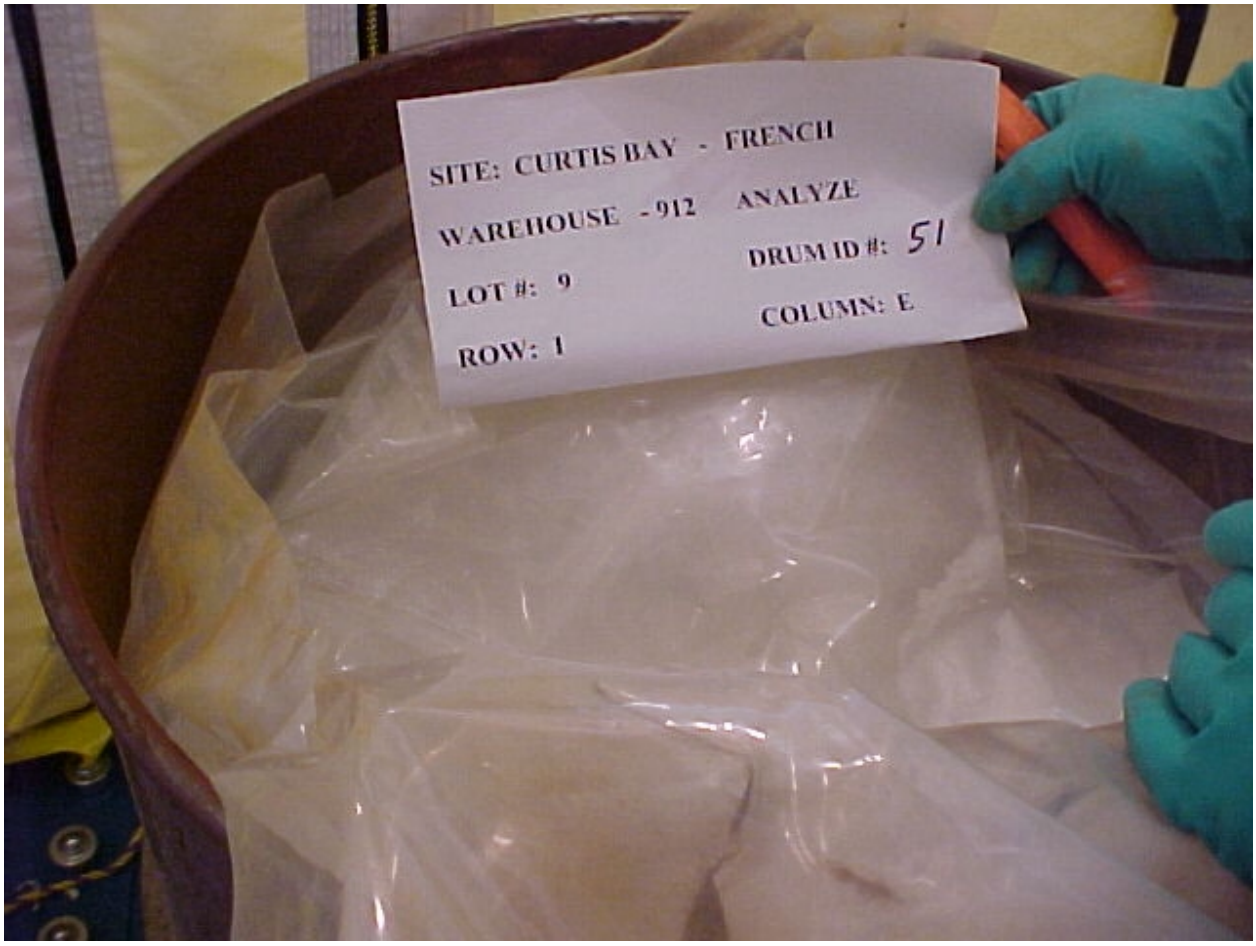
Date	7-8-2002	Time	12:30

Other Information

Photo No. 3 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	51	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	E

Inspection/Sample Date & Time

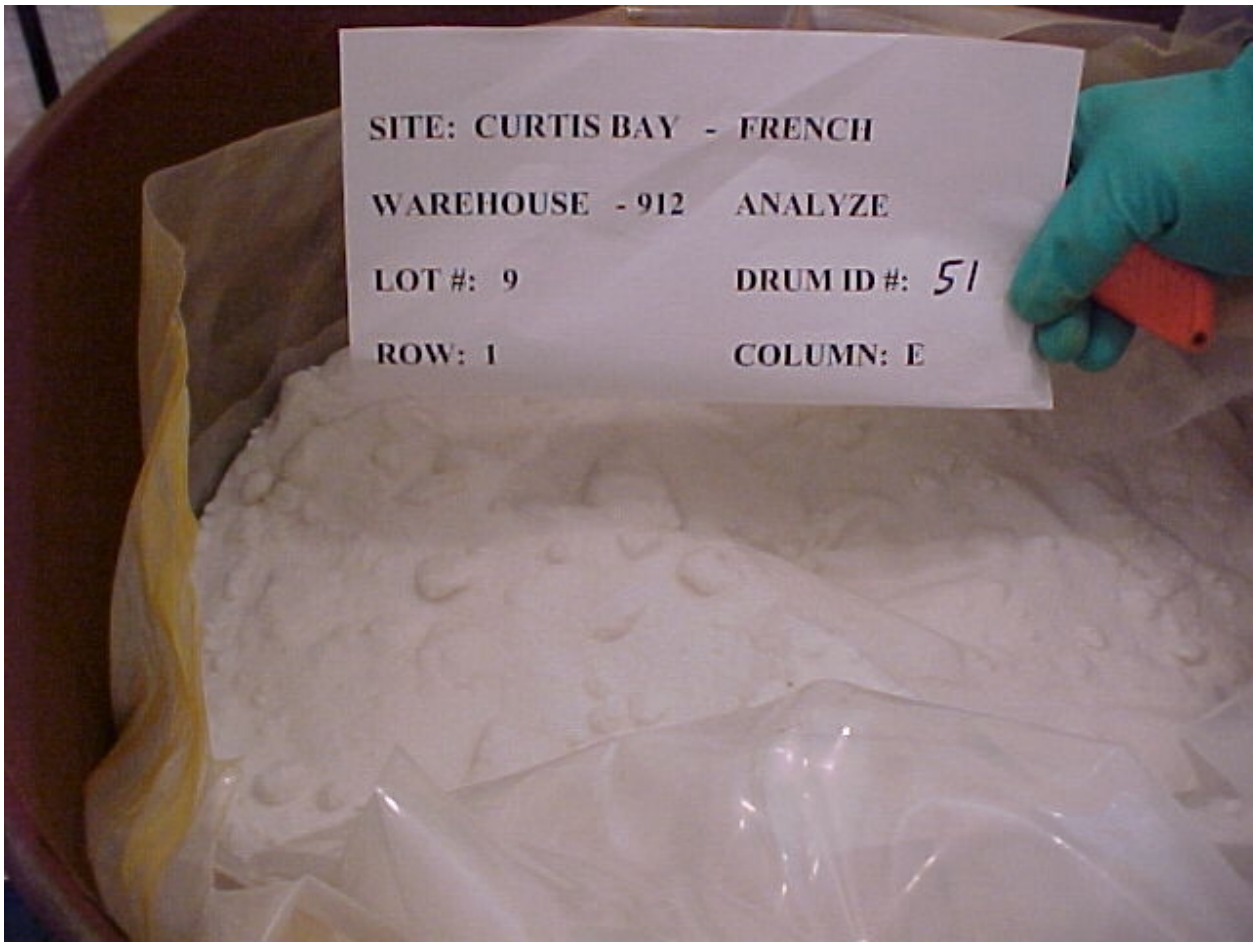
Date	7-8-2002	Time	12:30

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	51	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	E

Inspection/Sample Date & Time

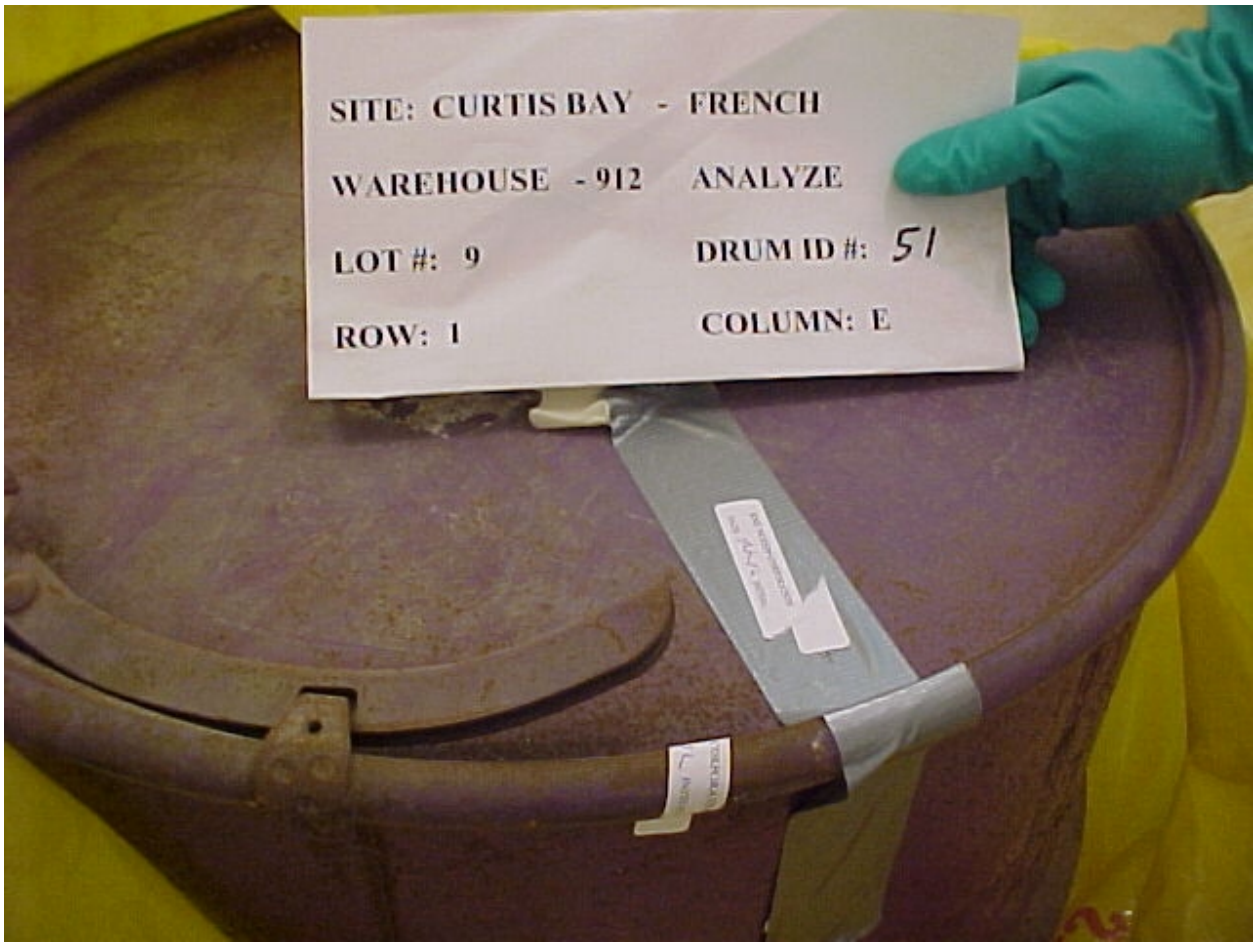
Date	7-8-2002	Time	12:30

Other Information

Photo No. 5 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #F-10 – Drum #94
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-10 Drum ID #: 94 Location: Warehouse 911 – Column E – Row 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 5.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	94	Disposition	Analyze

Physical Location of Drum

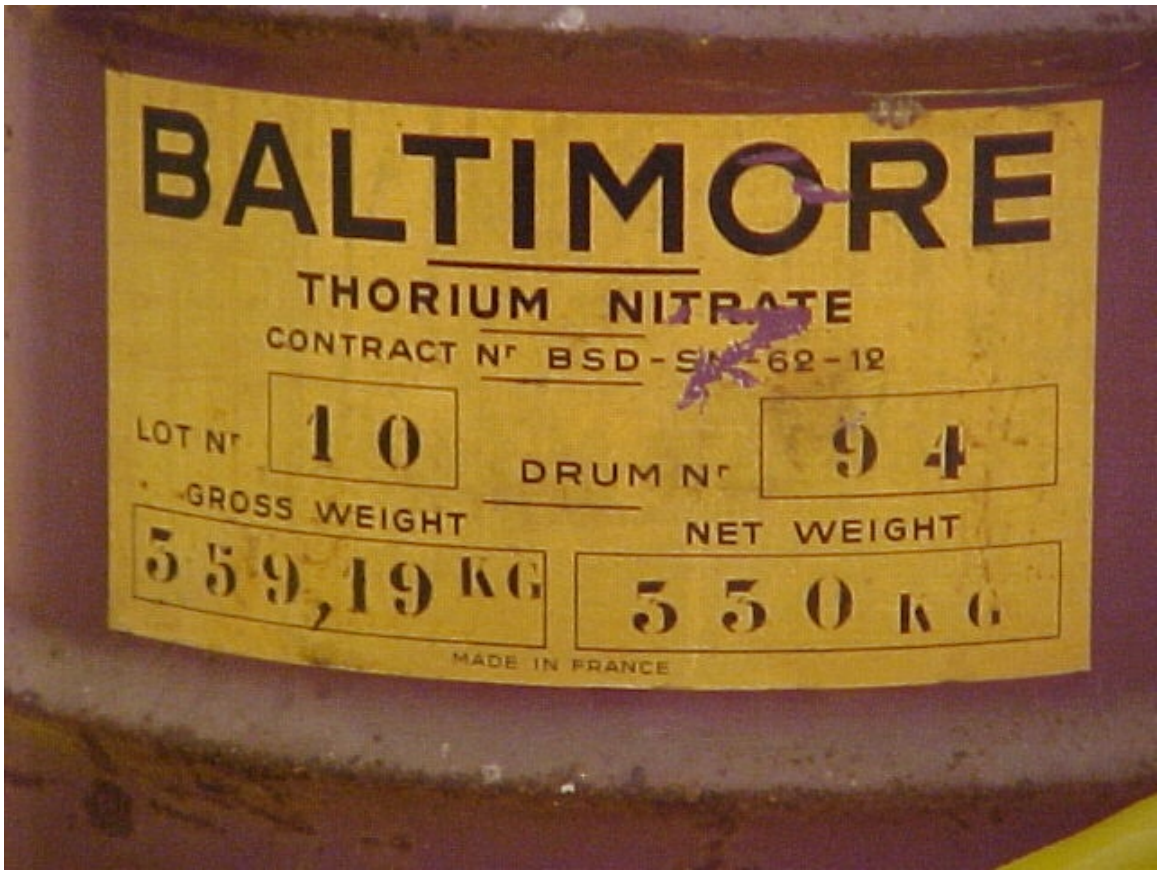
Warehouse	911	Row	6
		Column	E

Inspection/Sample Date & Time

Date	7-2-2002	Time	11:40

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	44 mR/hr	
	1 meter	5.0 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	94	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	E

Inspection/Sample Date & Time

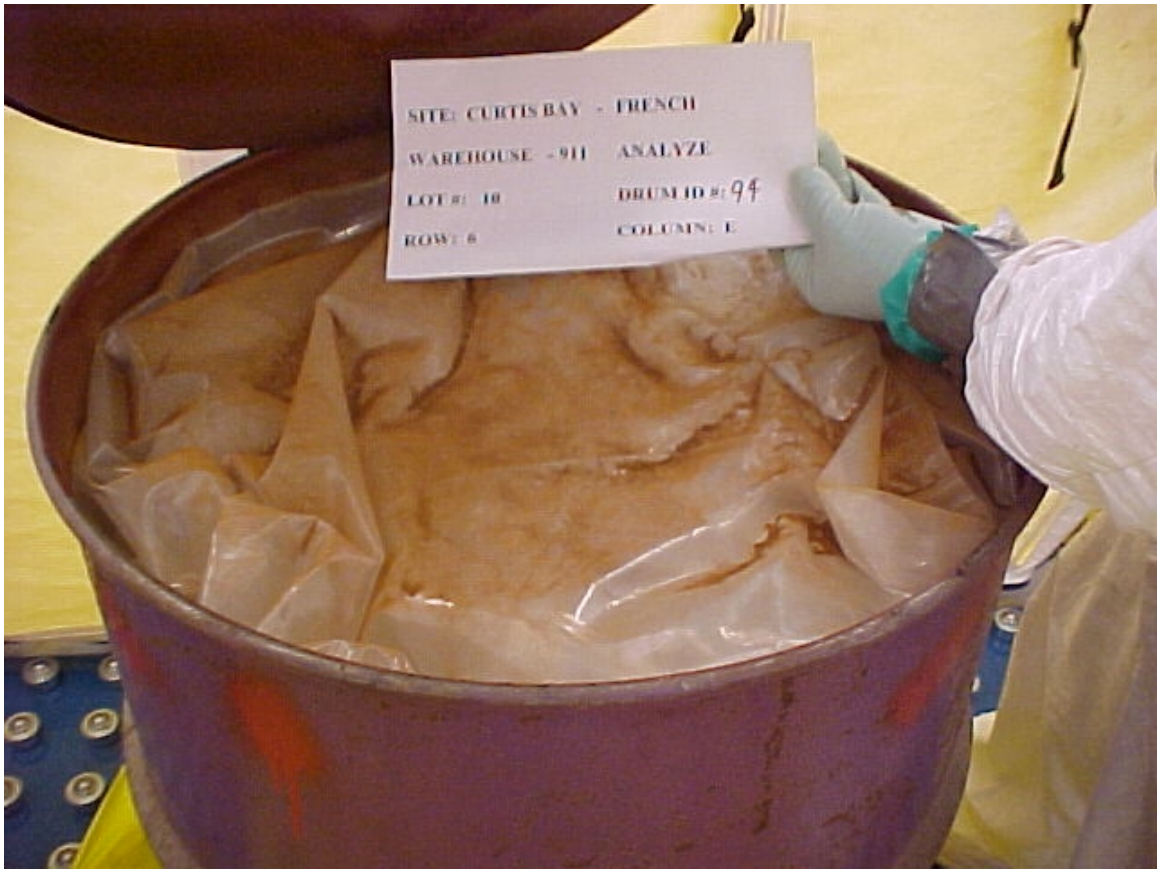
Date	7-2-2002	Time	11:40

Other Information

Photo No. 2 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	94	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	E

Inspection/Sample Date & Time

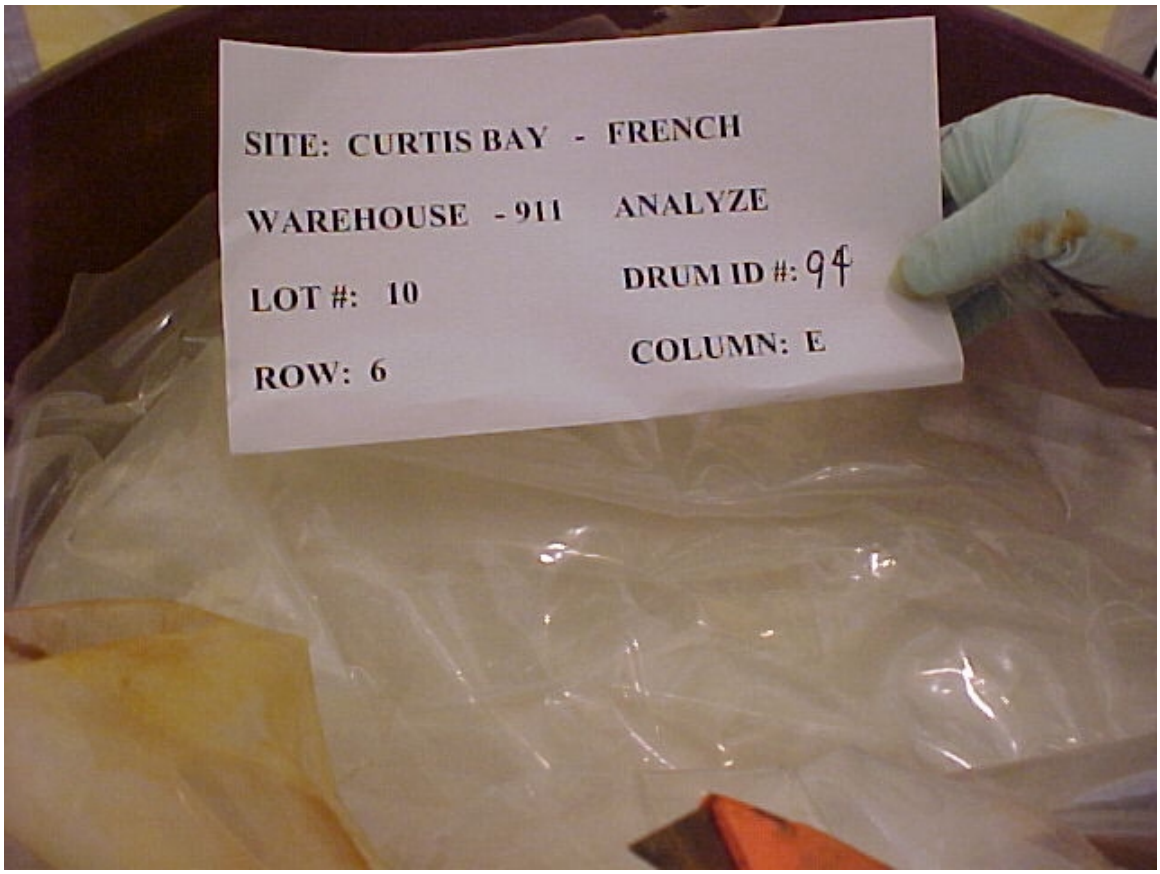
Date	7-2-2002	Time	11:40

Other Information

Photo No. 3 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	94	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	E

Inspection/Sample Date & Time

Date	7-2-2002	Time	11:40

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

French – Thorium Nitrate – Powder – white – dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	94	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	6
		Column	E

Inspection/Sample Date & Time

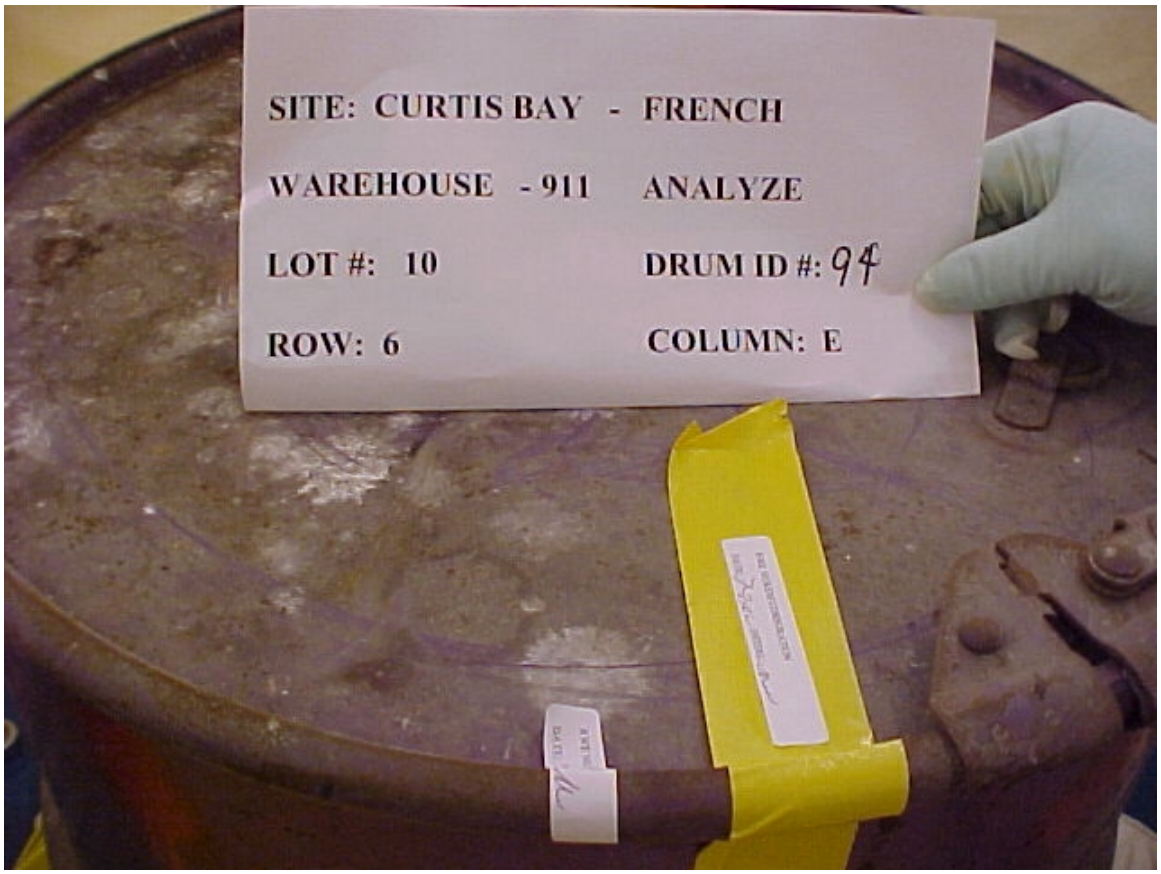
Date	7-2-2002	Time	11:40

Other Information

Photo No. 5 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #F-11 – Drum #42
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-11 Drum ID #: 42 Location: Warehouse 911 – Column E – Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 4.2mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

Date	7-2-2002	Time	09:40

Other Information

Photo No.	1 of 8		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	44 mR/hr	
	1 meter	4.2 mR/hr	

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

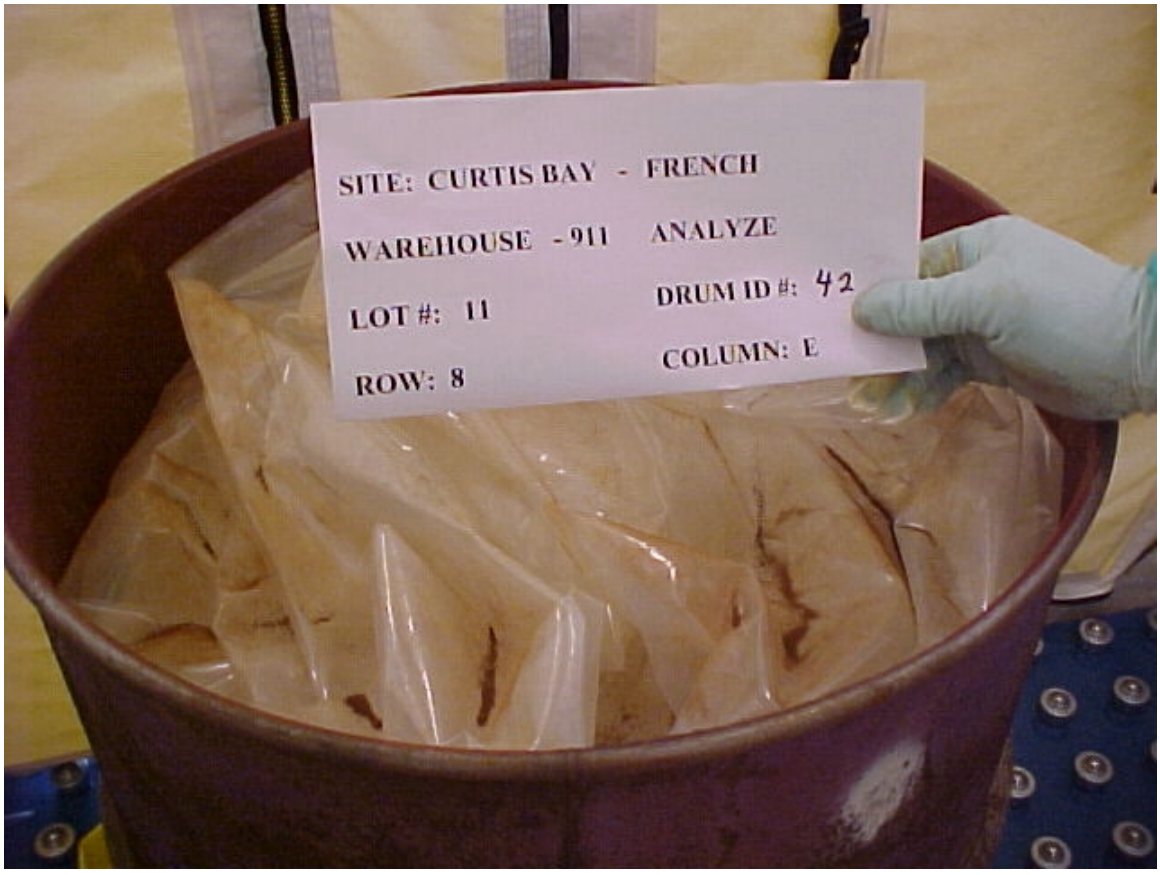
Date	7-2-2002	Time	09:40

Other Information

Photo No. 2 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

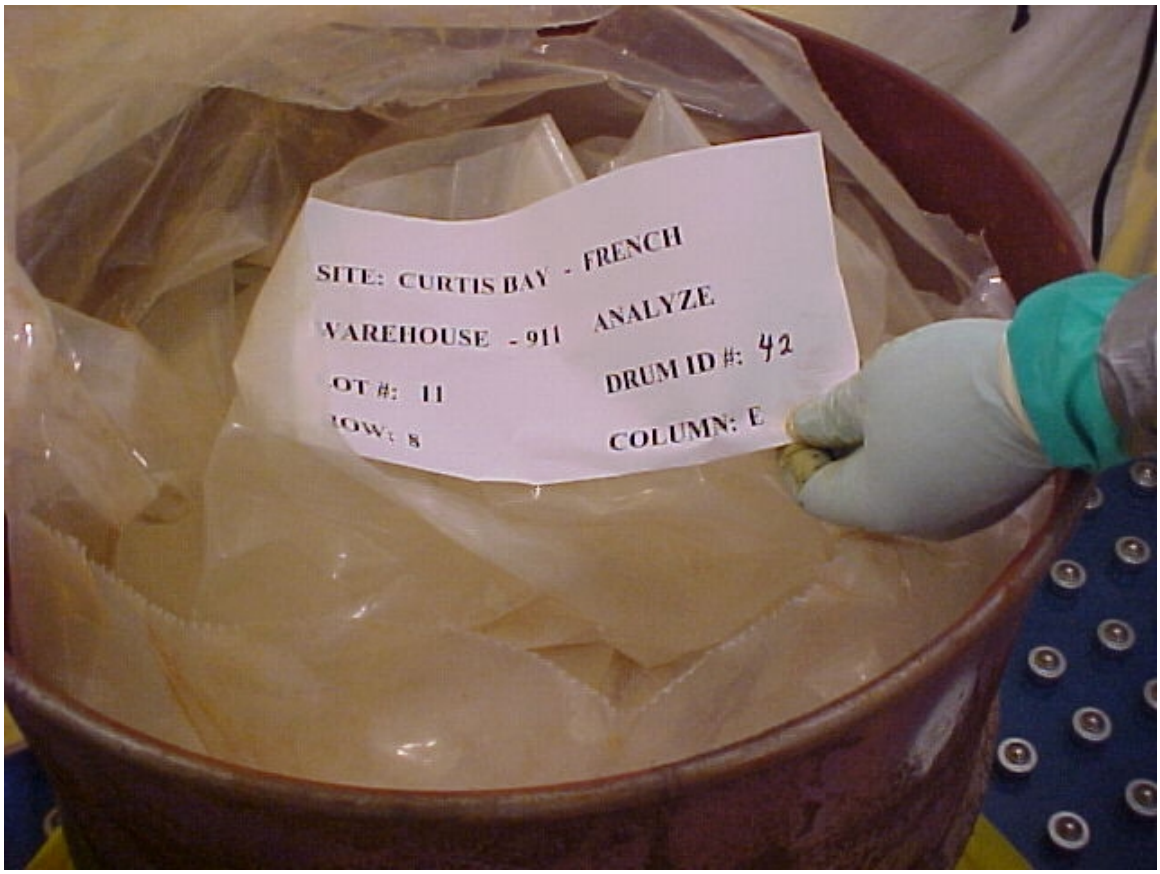
Date	7-2-2002	Time	09:40

Other Information

Photo No. 3 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

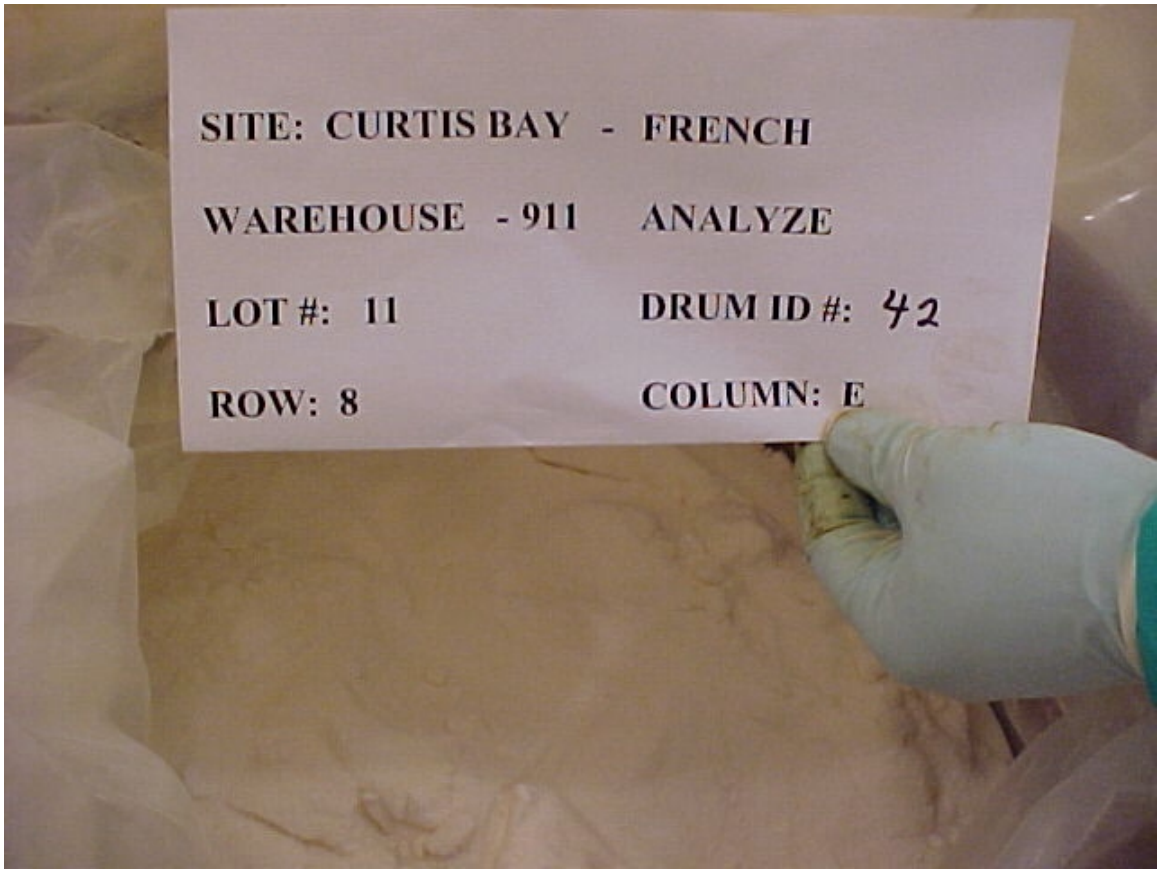
Date	7-2-2002	Time	09:40

Other Information

Photo No. 4 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

French – Thorium Nitrate – powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

Date	7-2-2002	Time	09:40

Other Information

Photo No. 5 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

Close-up of the Powder (Thorium Nitrate)
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

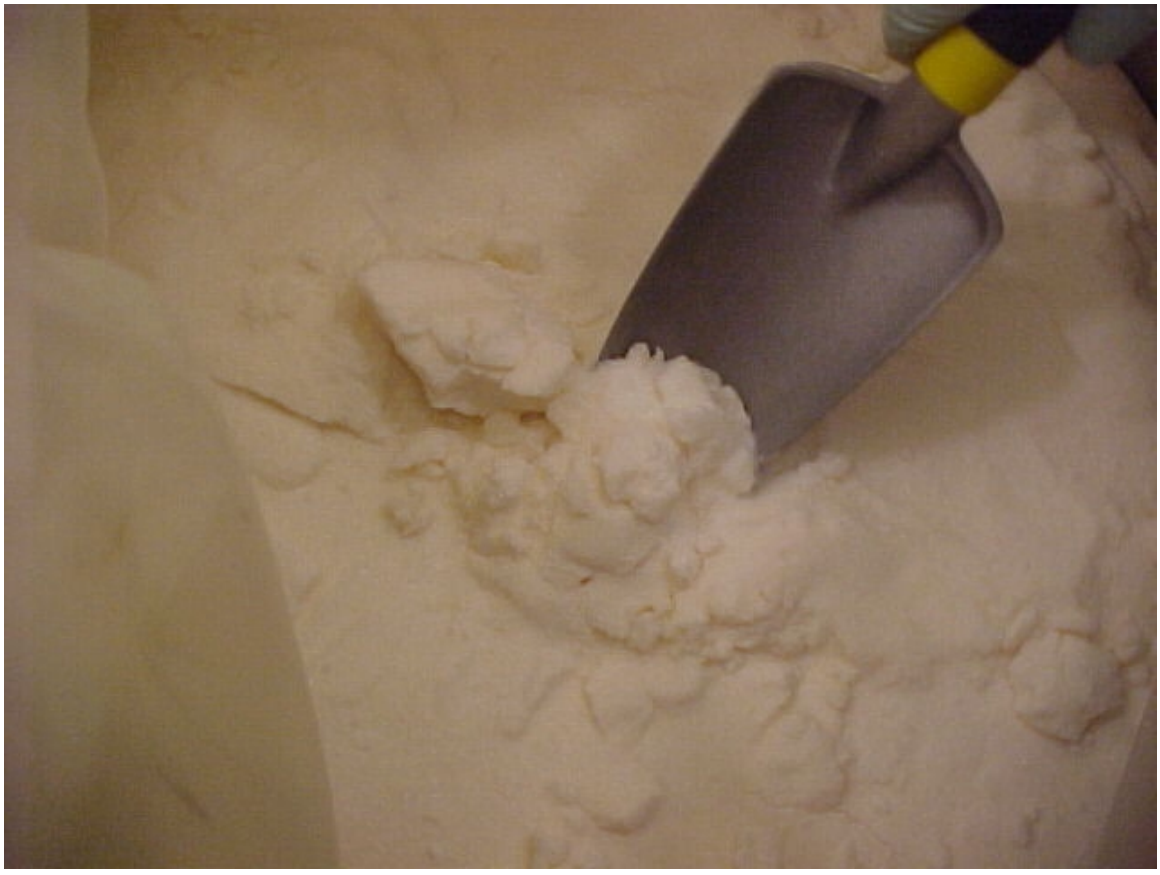
Date	7-2-2002	Time	09:40

Other Information

Photo No. 6 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

This photo shows the ThN material in the powder form as the scoop is used to collect the sample
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

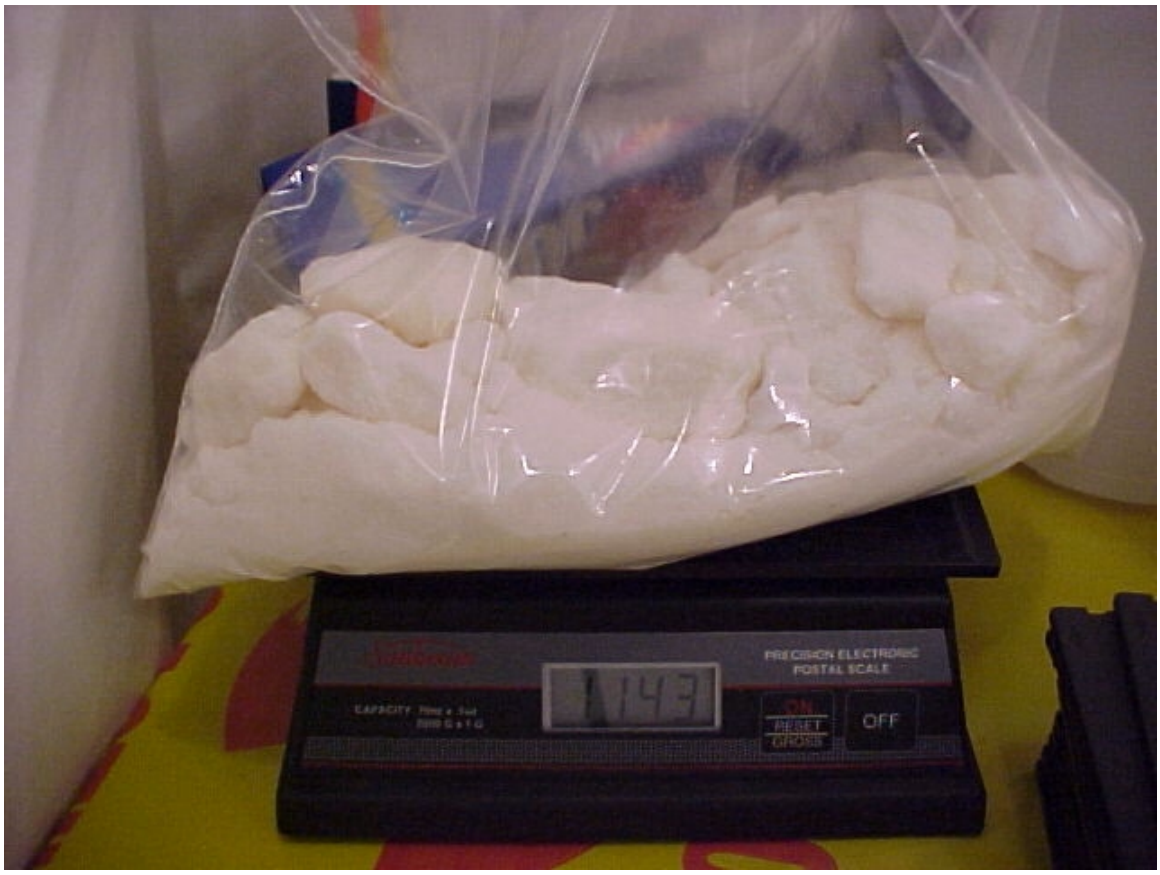
Date	7-2-2002	Time	09:40

Other Information

Photo No. 7 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

This photo shows the ThN material being weighed for shipment
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	42	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	E

Inspection/Sample Date & Time

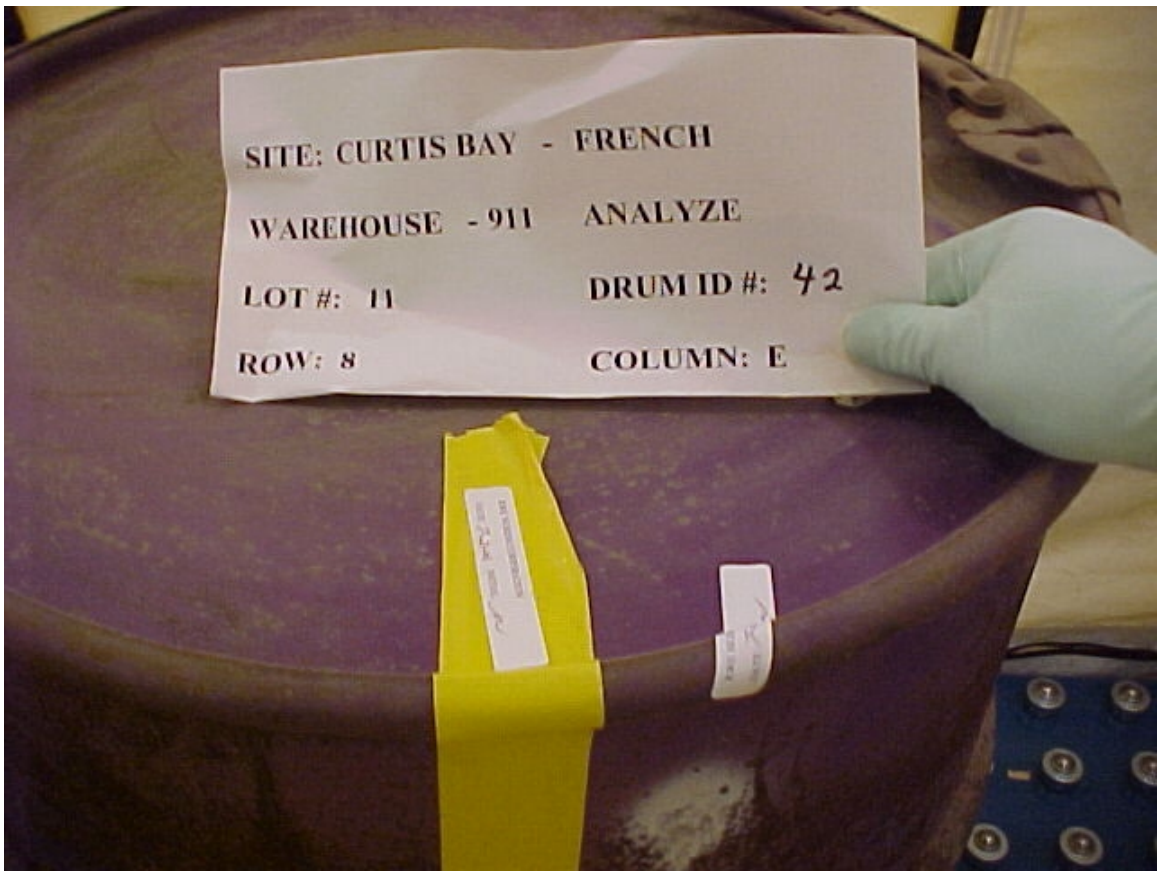
Date	7-2-2002	Time	09:40

Other Information

Photo No. 8 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

Sealed/Dated - Completed



Curtis Bay Depot
Lot #F-13 – Drum #137
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-13 Drum ID #: 137 Location: Warehouse 912 – Column F – Row 9

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44 mR/hr DR at 1 meter 3.8 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	137	Disposition	Analyze

Physical Location of Drum

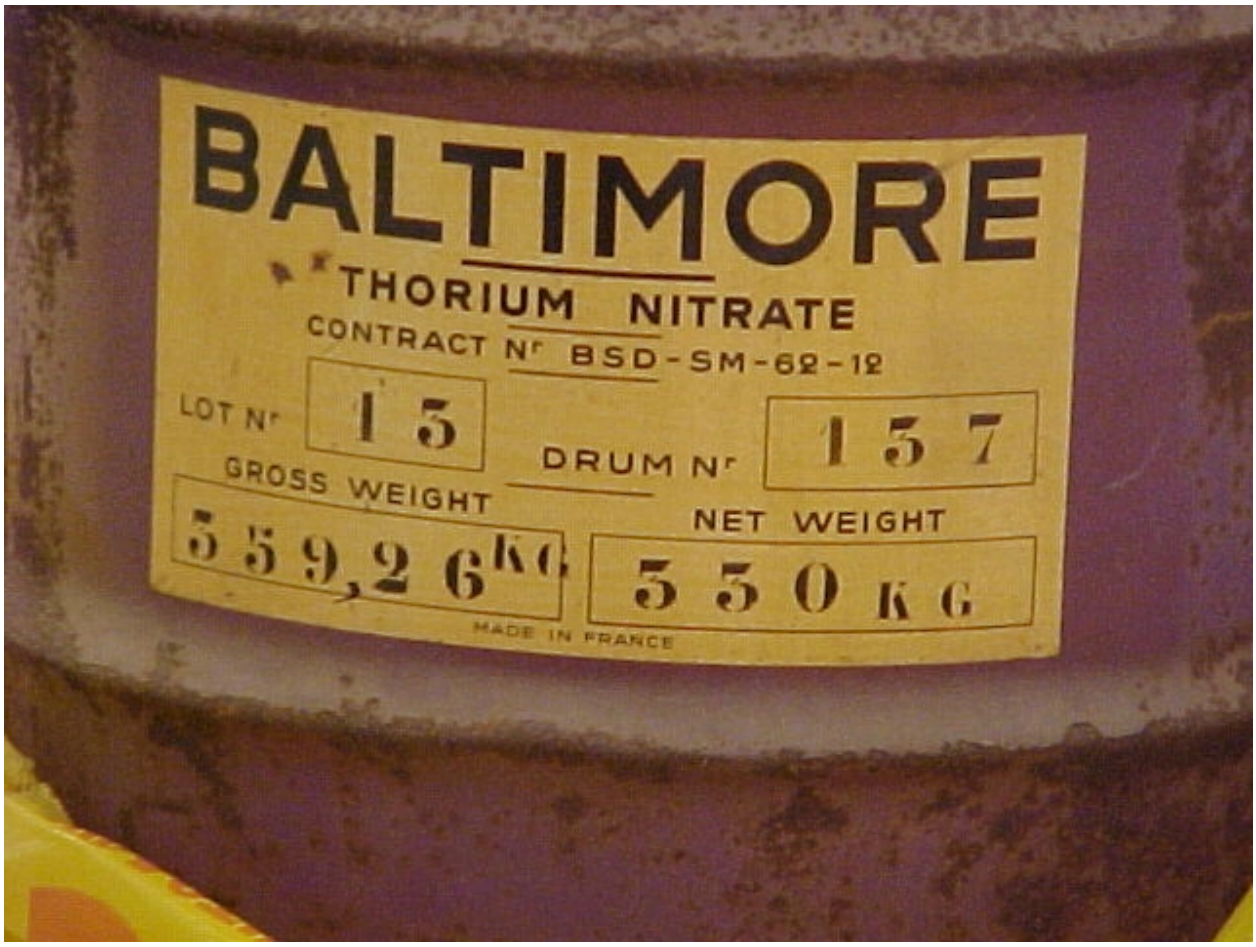
Warehouse	912	Row	9
		Column	F

Inspection/Sample Date & Time

Date	7-8-2002	Time	12:45

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	44 mR/hr	
	1 meter	3.8 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	137	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	F

Inspection/Sample Date & Time

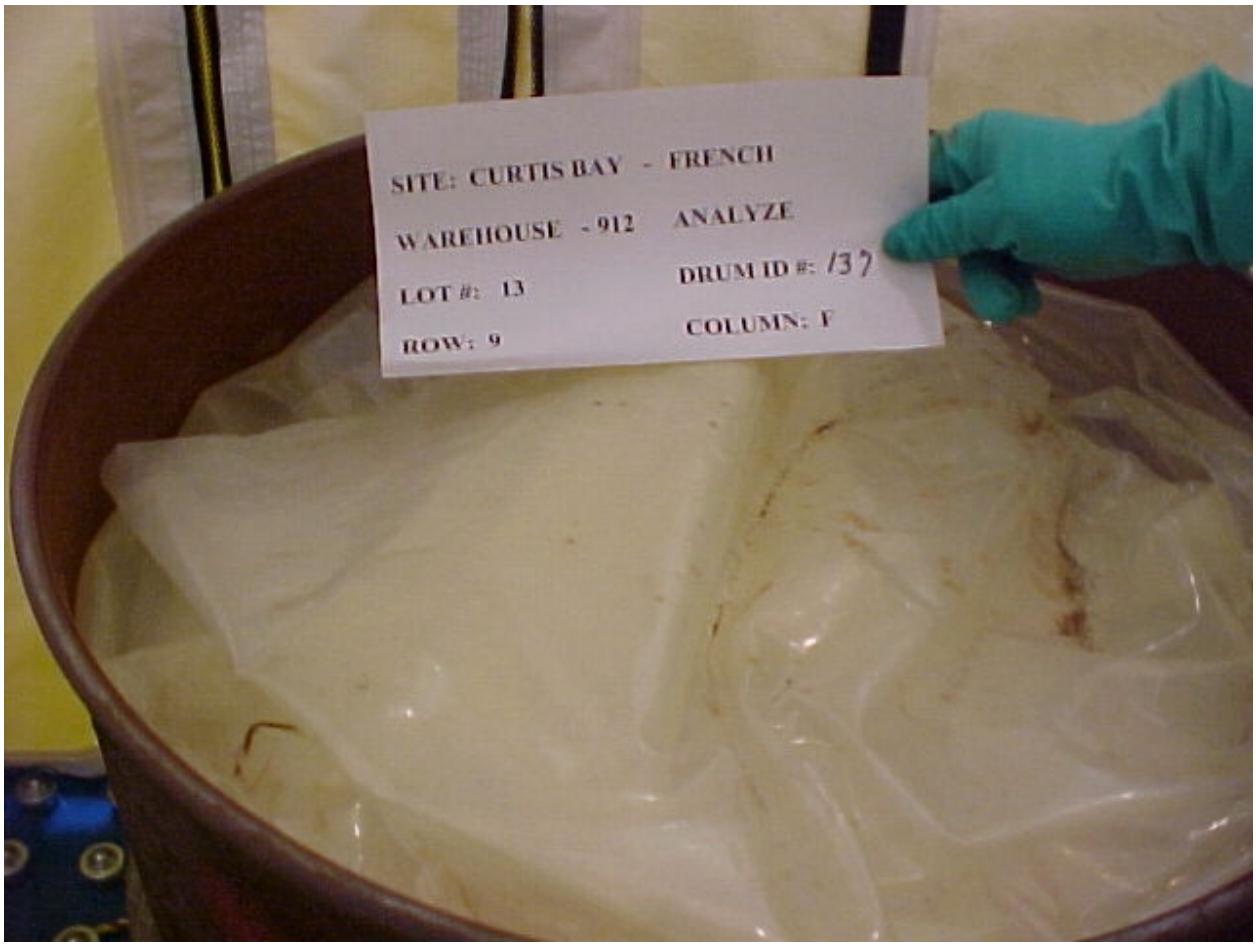
Date	7-8-2002	Time	12:45

Other Information

Photo No. 2 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	137	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	F

Inspection/Sample Date & Time

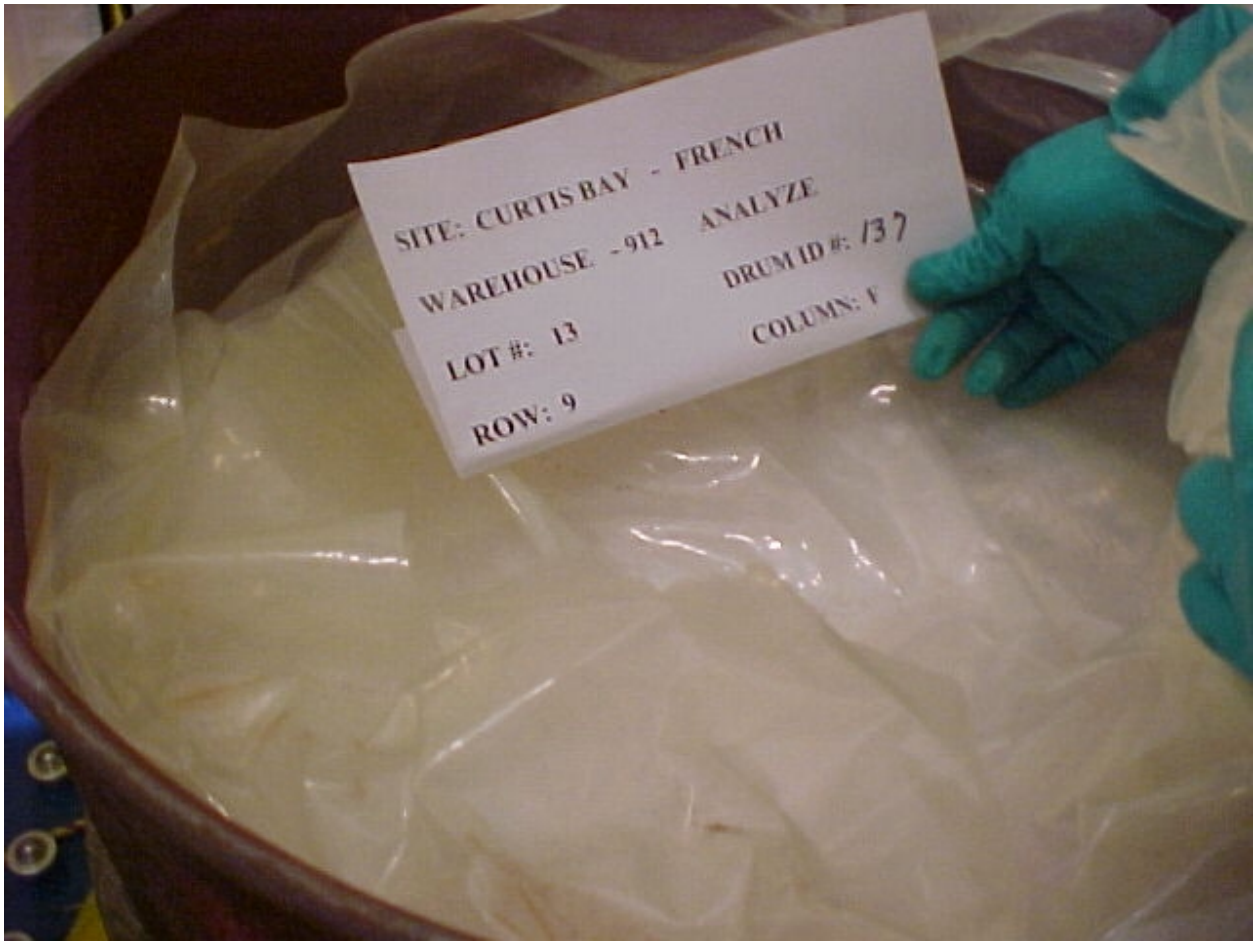
Date	7-8-2002	Time	12:45

Other Information

Photo No. 3 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	137	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	F

Inspection/Sample Date & Time

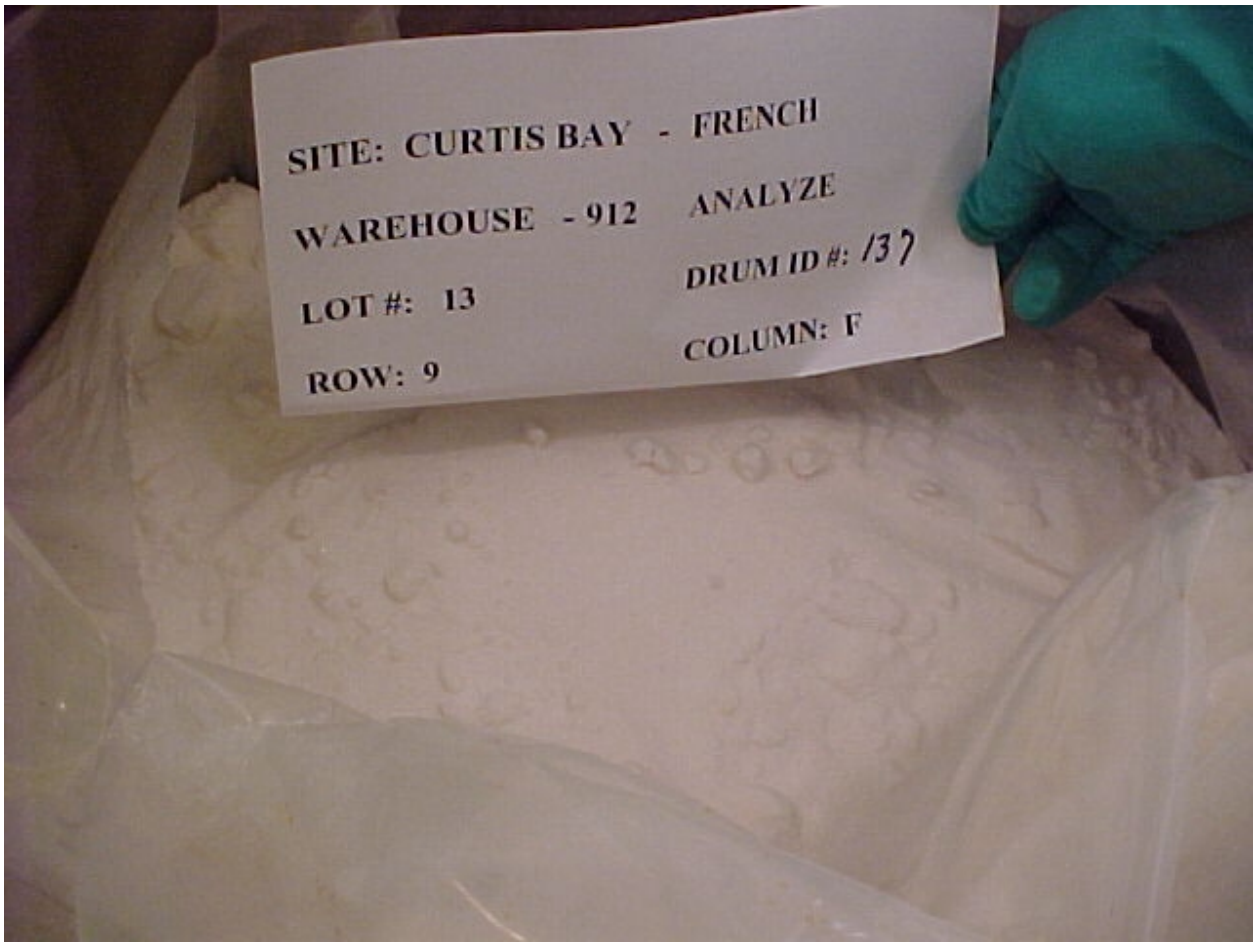
Date	7-8-2002	Time	12:45

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	137	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	9
		Column	F

Inspection/Sample Date & Time

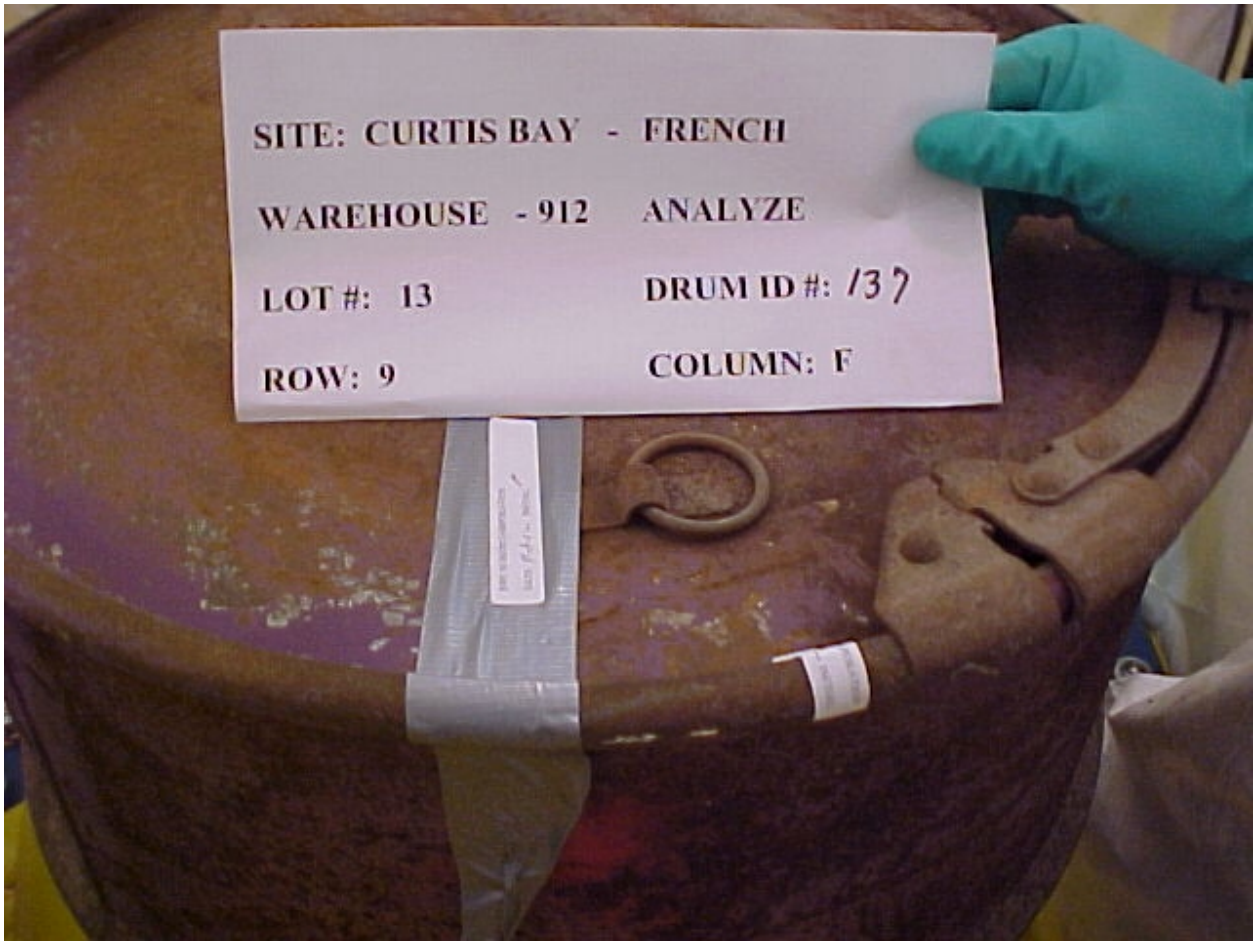
Date	7-8-2002	Time	12:45

Other Information

Photo No. 4 of 5

Dose Rate	Surface	44 mR/hr
	1 meter	3.8 mR/hr

Sealed/Dated – Completed



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Curtis Bay Depot
Lot #F-14 – Drum #78
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-14 Drum ID #: 78 Location: Warehouse 911 – Column E – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* NA (85-gal outer drum) Units:
Rad Measurements at the time of opening: DR at Surface 38 mR/hr DR at 1 meter 4.5 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4 Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #4: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

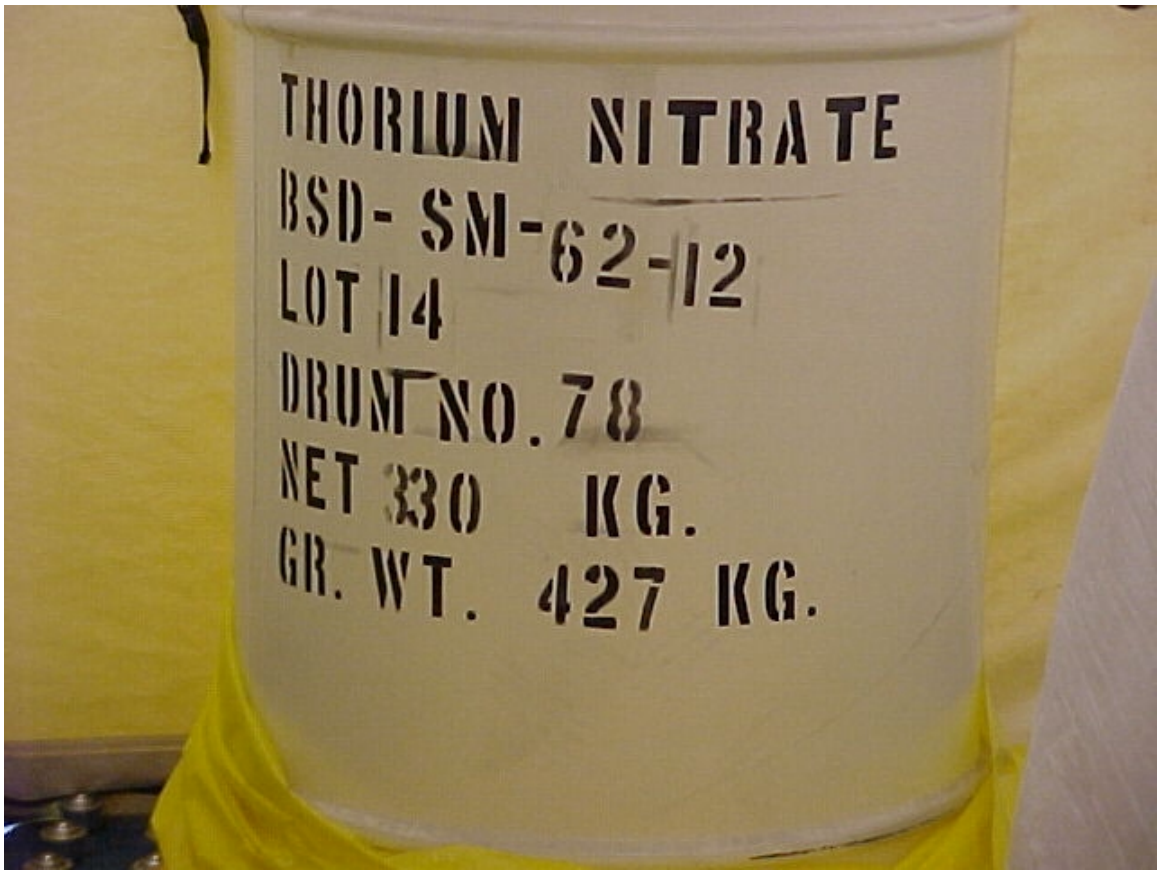
Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	09:55

Other Information

Photo No.	1 of 6		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	38 mR/hr	
	1 meter	4.5 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

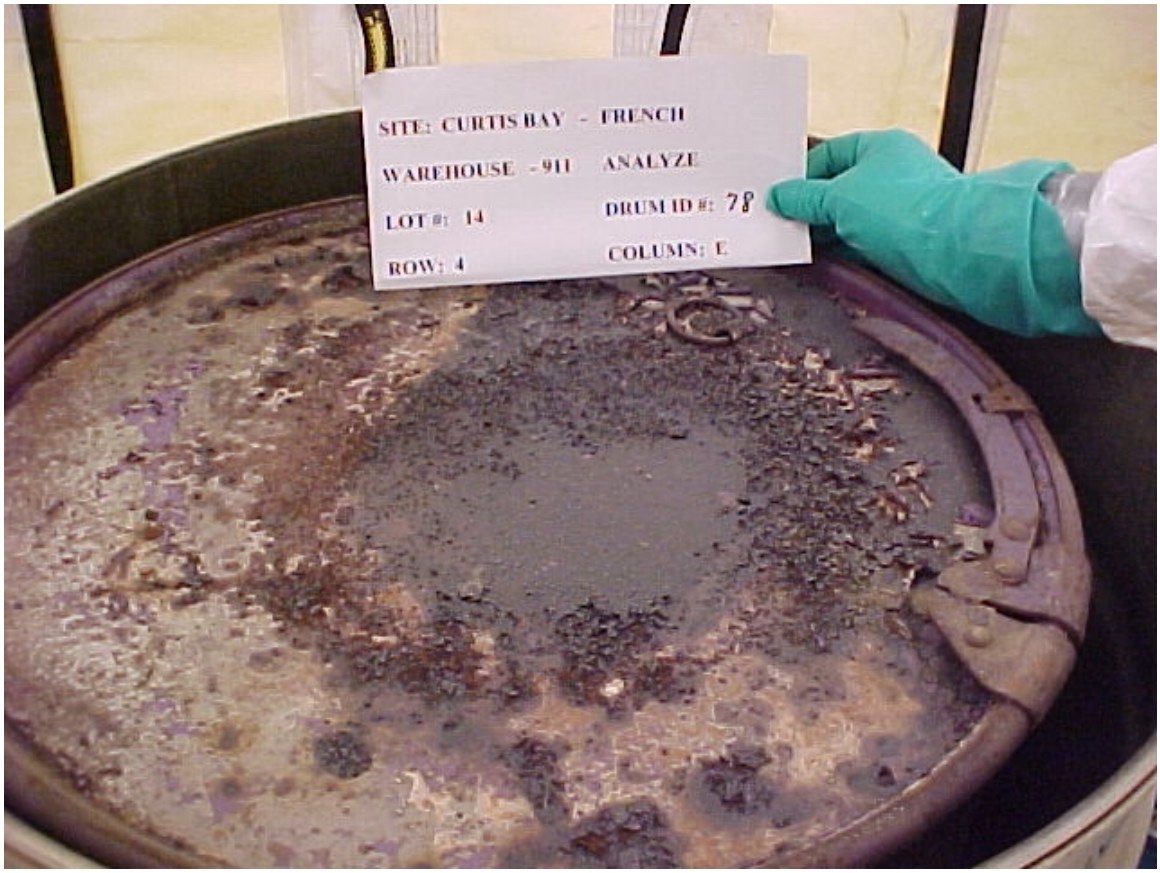
Date	7-3-2002	Time	09:55

Other Information

Photo No. 2 of 6

Dose Rate	Surface	38 mR/hr
	1 meter	4.5 mR/hr

55-gal drum – fair condition
Ring on the container was in very bad condition – the ring was replaced
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

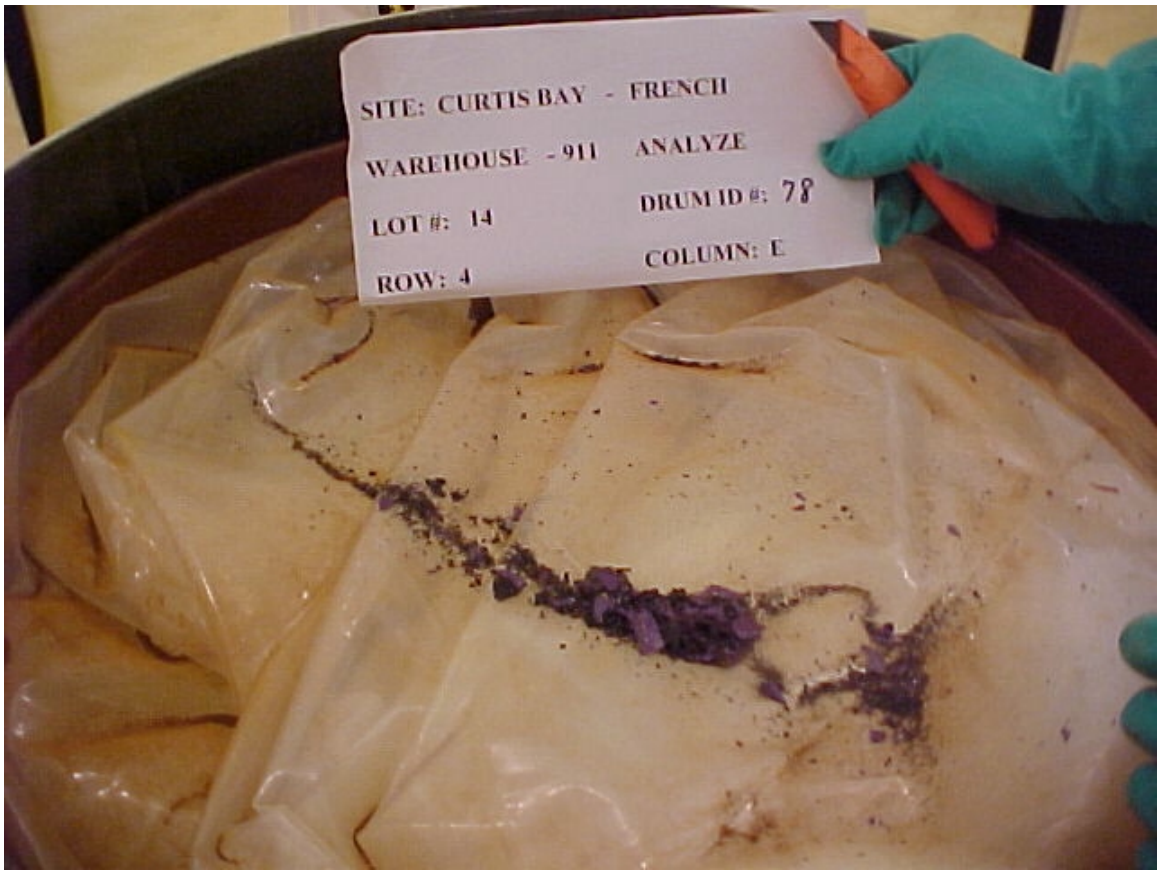
Date	7-3-2002	Time	09:55

Other Information

Photo No. 3 of 6

Dose Rate	Surface	38 mR/hr
	1 meter	4.5 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

Date	7-3-2002	Time	09:55

Other Information

Photo No. 4 of 6

Dose Rate	Surface	38 mR/hr
	1 meter	4.5 mR/hr

2nd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

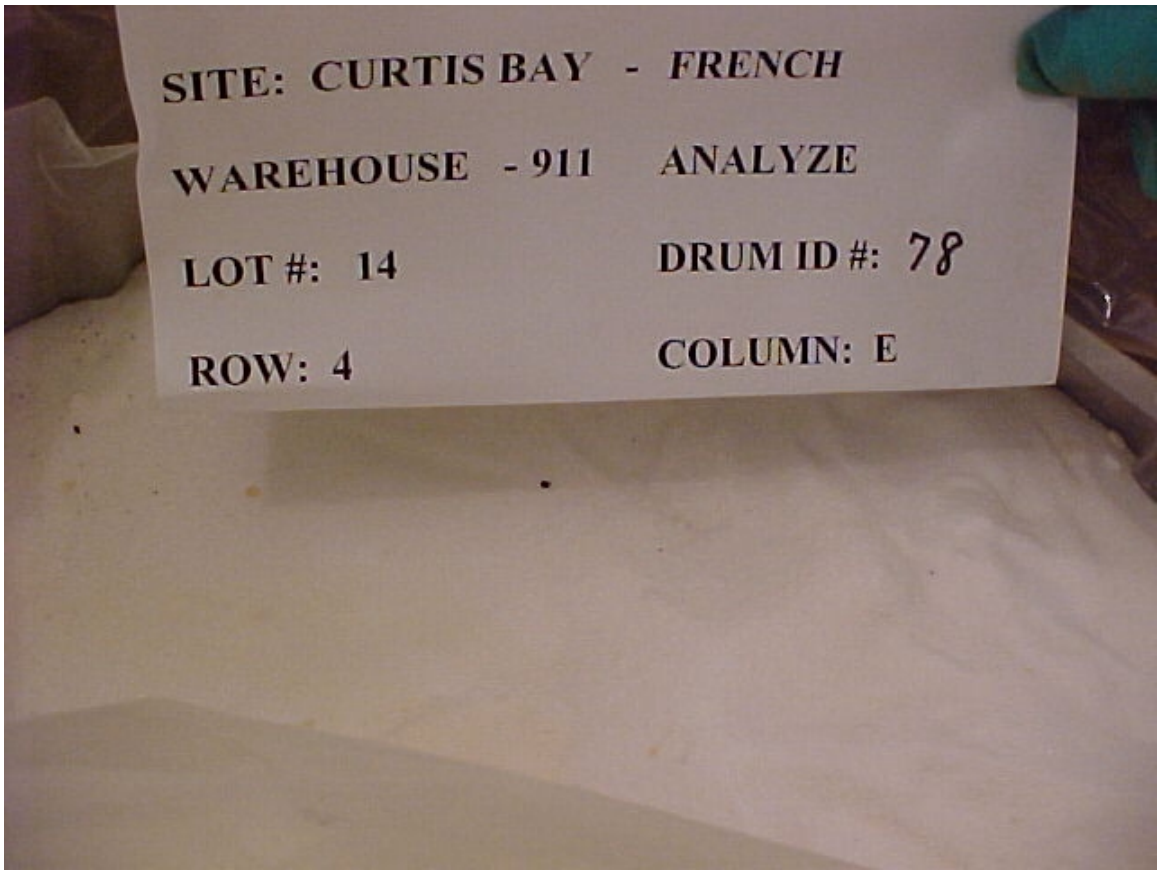
Date	7-3-2002	Time	09:55

Other Information

Photo No. 5 of 6

Dose Rate	Surface	38 mR/hr
	1 meter	4.5 mR/hr

Thorium Nitrate – Powder form – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

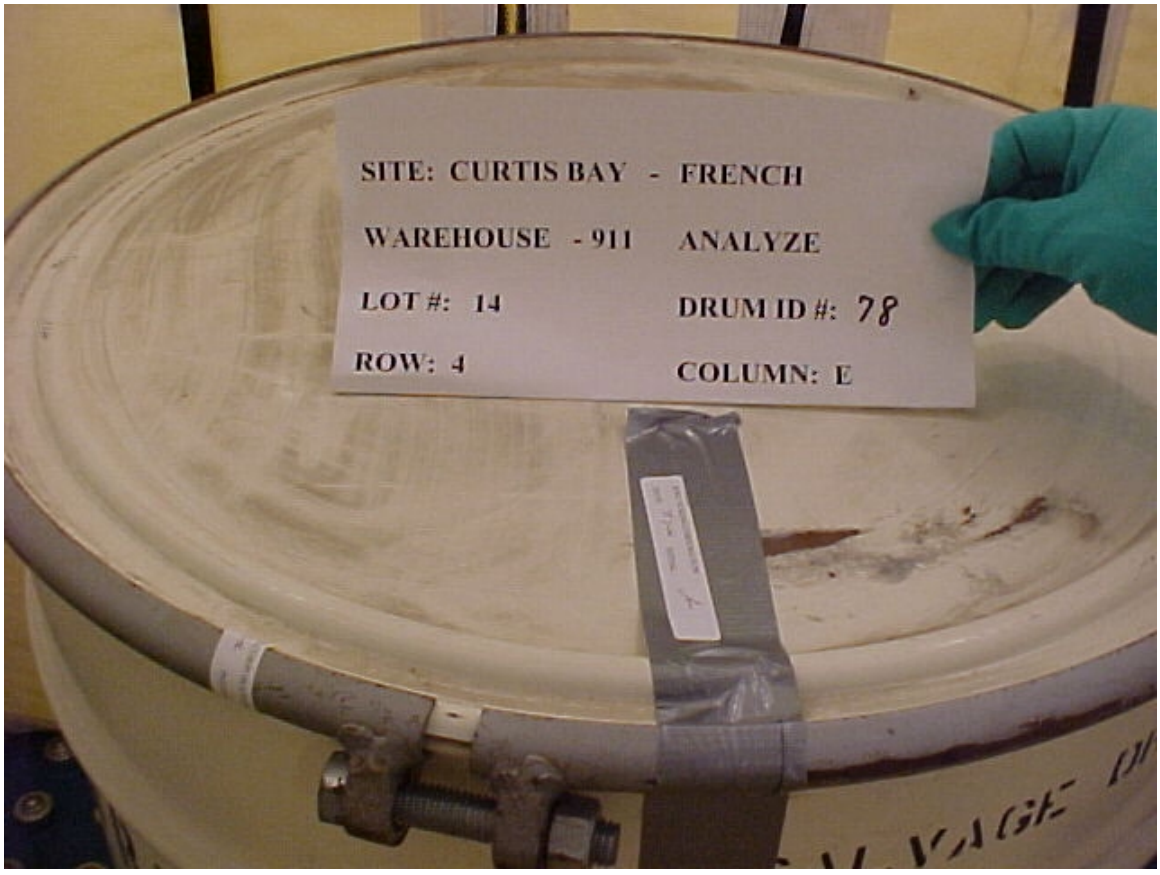
Date	7-3-2002	Time	09:55

Other Information

Photo No. 6 of 6

Dose Rate	Surface	38 mR/hr
	1 meter	4.5 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #F-16 – Drum #57
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-16 Drum ID #: 57 Location: Warehouse 912 – Column F – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 43 mR/hr DR at 1 meter 4.0 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3 Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	F

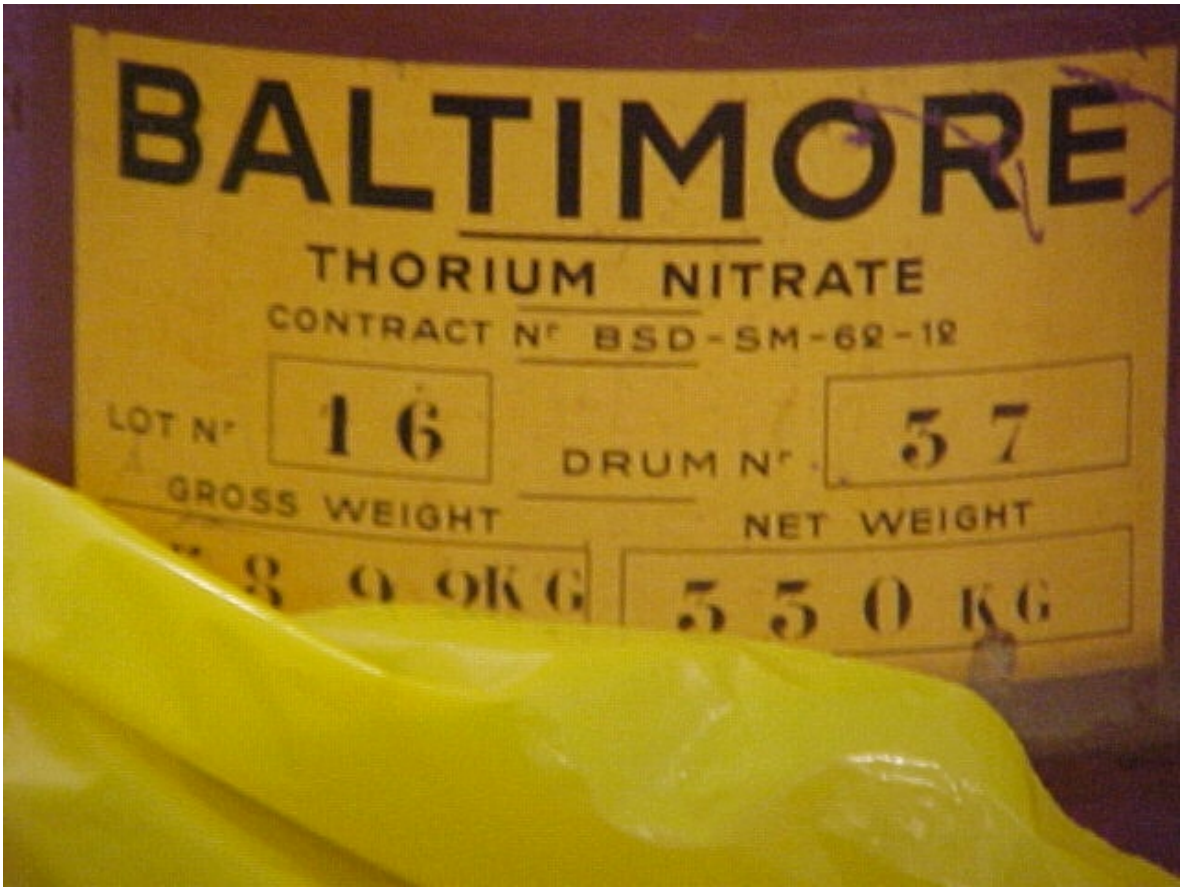
Inspection/Sample Date & Time

Date	7-8-2002	Time	14:30

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	43 mR/hr	
	1 meter	4.0 mR/hr	

No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	F

Inspection/Sample Date & Time

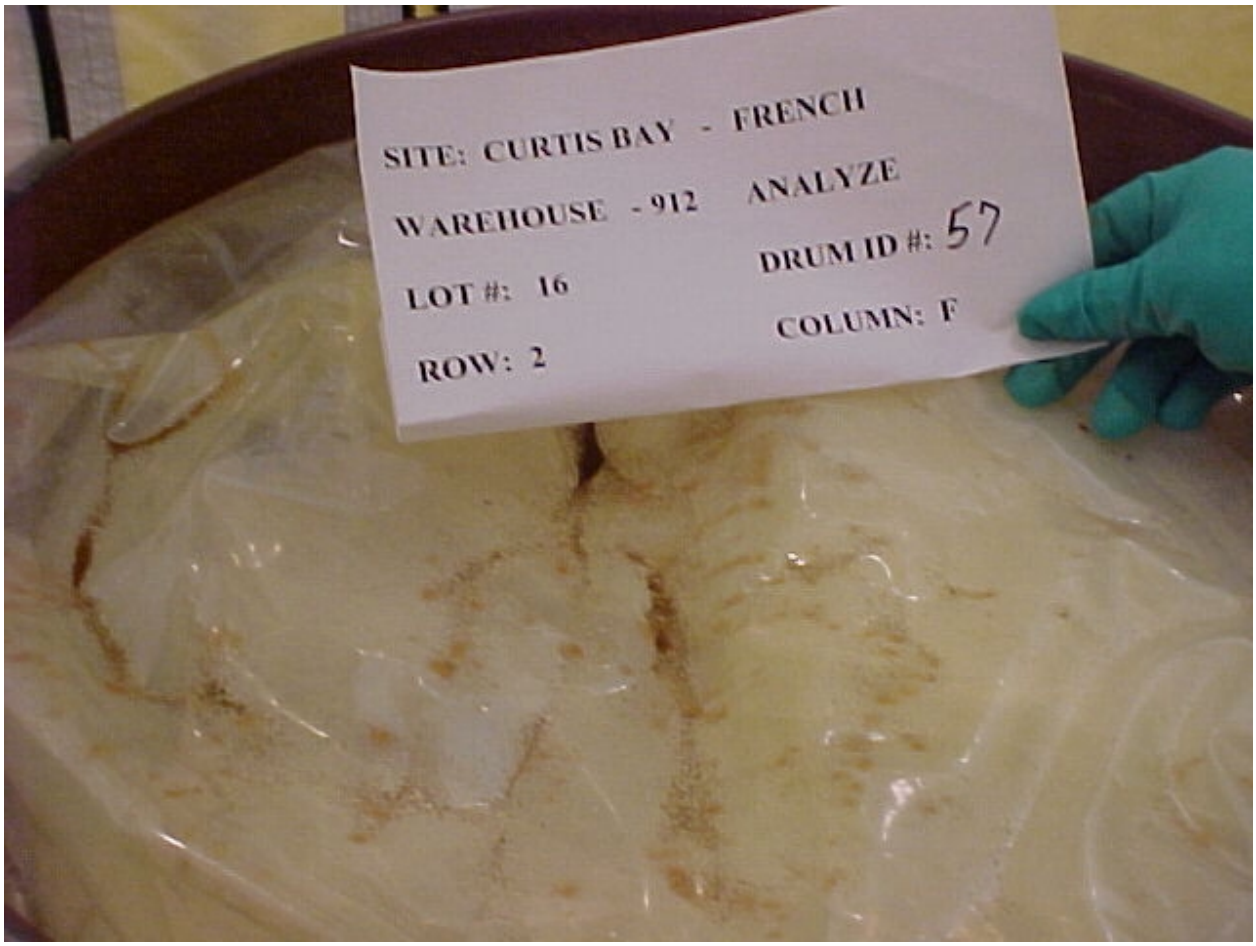
Date	7-8-2002	Time	14:30

Other Information

Photo No. 2 of 5

Dose Rate	Surface	43 mR/hr
	1 meter	4.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	F

Inspection/Sample Date & Time

Date	7-8-2002	Time	14:30

Other Information

Photo No. 3 of 5

Dose Rate	Surface	43 mR/hr
	1 meter	4.0 mR/hr

2nd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	F

Inspection/Sample Date & Time

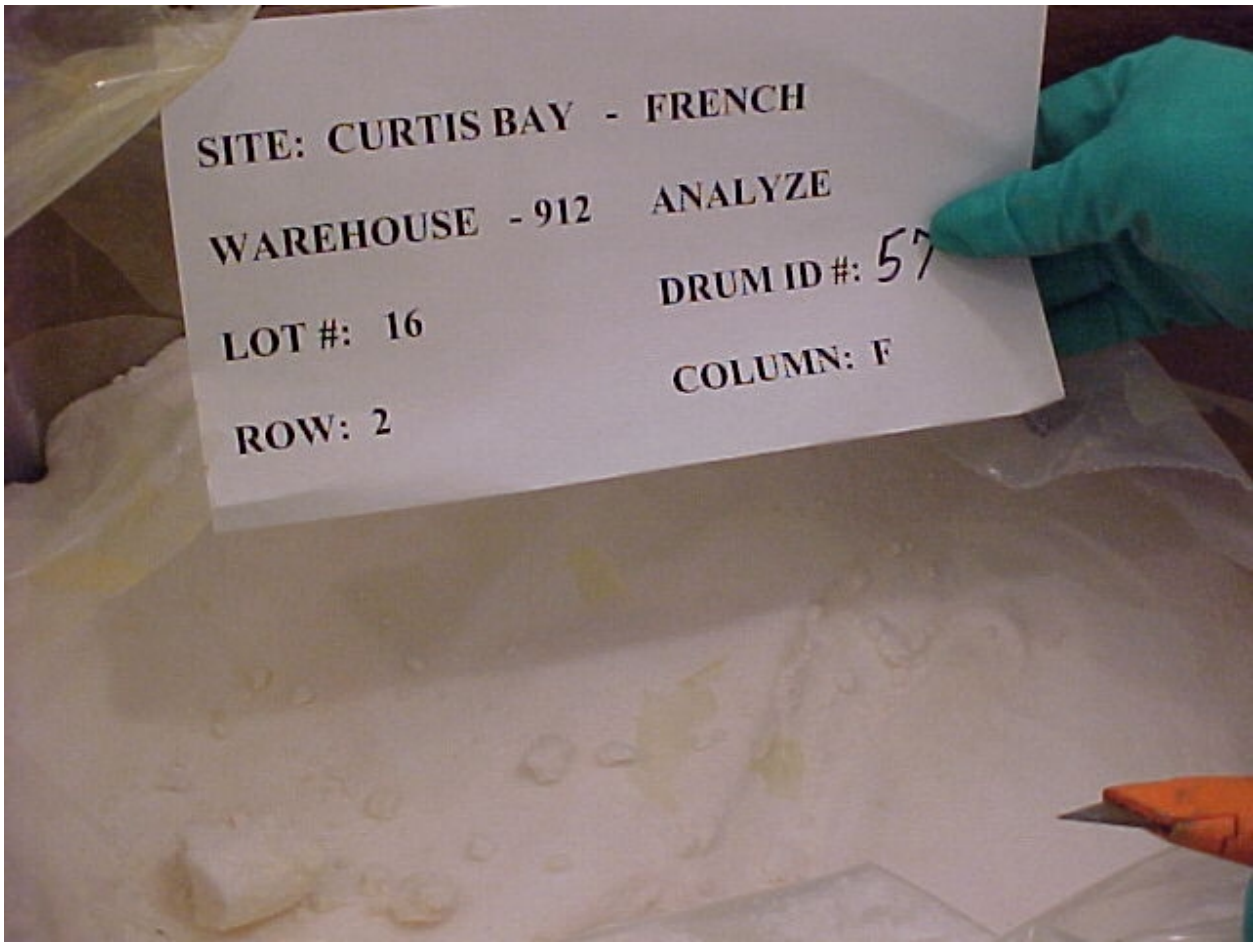
Date	7-8-2002	Time	14:30

Other Information

Photo No. 4 of 5

Dose Rate	Surface	43 mR/hr
	1 meter	4.0 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	F

Inspection/Sample Date & Time

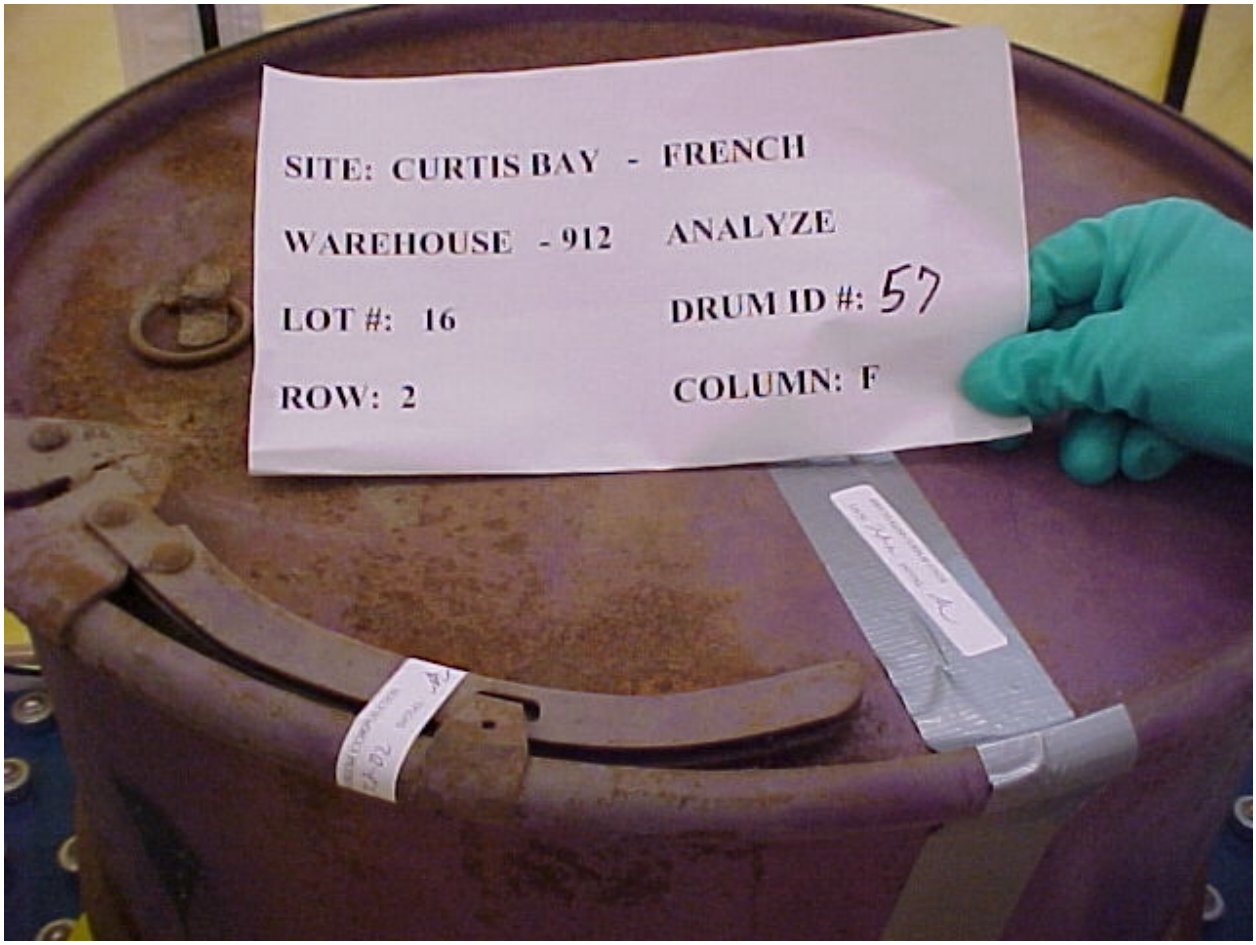
Date	7-8-2002	Time	14:30

Other Information

Photo No. 4 of 5

Dose Rate	Surface	43 mR/hr
	1 meter	4.0 mR/hr

Sealed/Dated – Completed



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Curtis Bay Depot
Lot #F-17 – Drum #6
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-17 Drum ID #: 6 Location: Warehouse 912 – Column F - Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 45 mR/hr DR at 1 meter 4.0 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3 Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	F

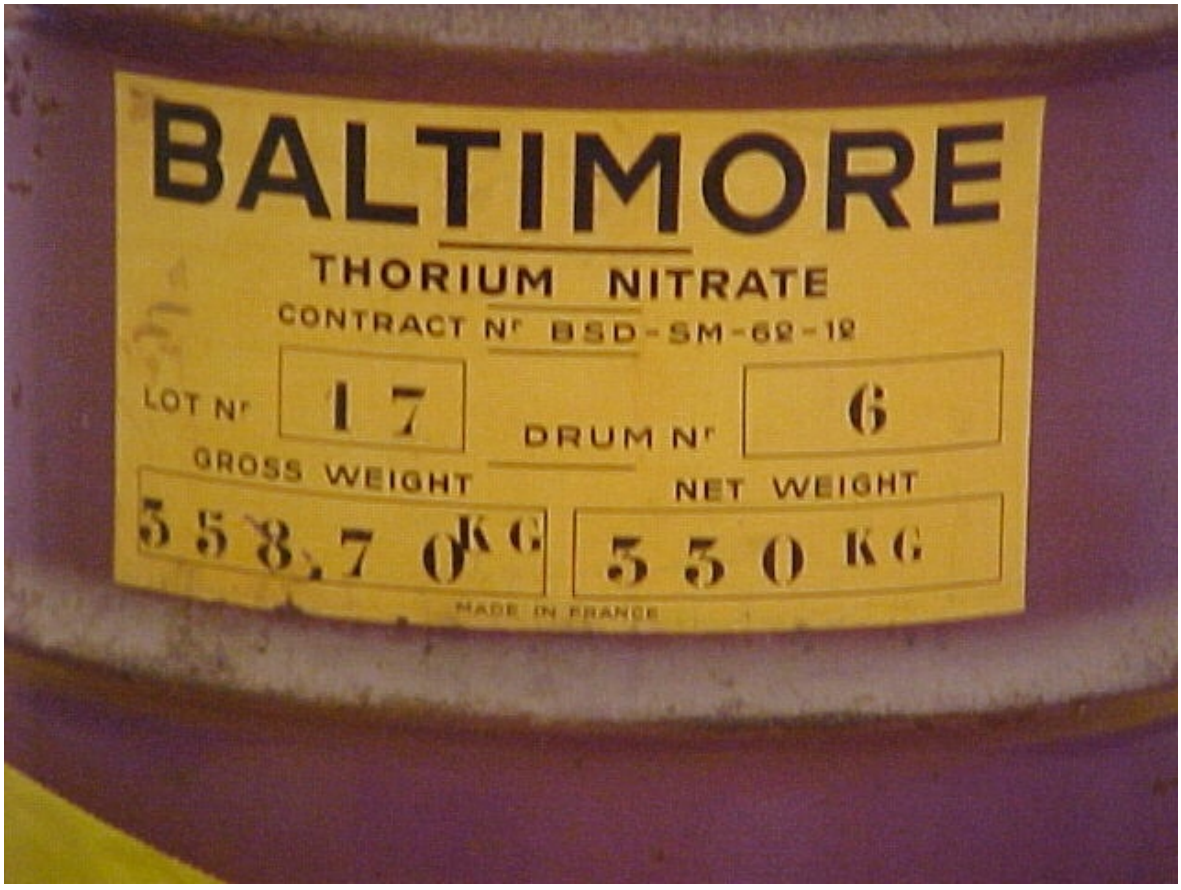
Inspection/Sample Date & Time

Date	7-8-2002	Time	13:10

Other Information

Photo No.	1 of 5		
Container	55-gallon steel drum	Container Condition	Fair
Container Wall Thickness	0.1565 in		
Dose Rate	Surface	45 mR/hr	
	1 meter	4.0 mR/hr	

No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	F

Inspection/Sample Date & Time

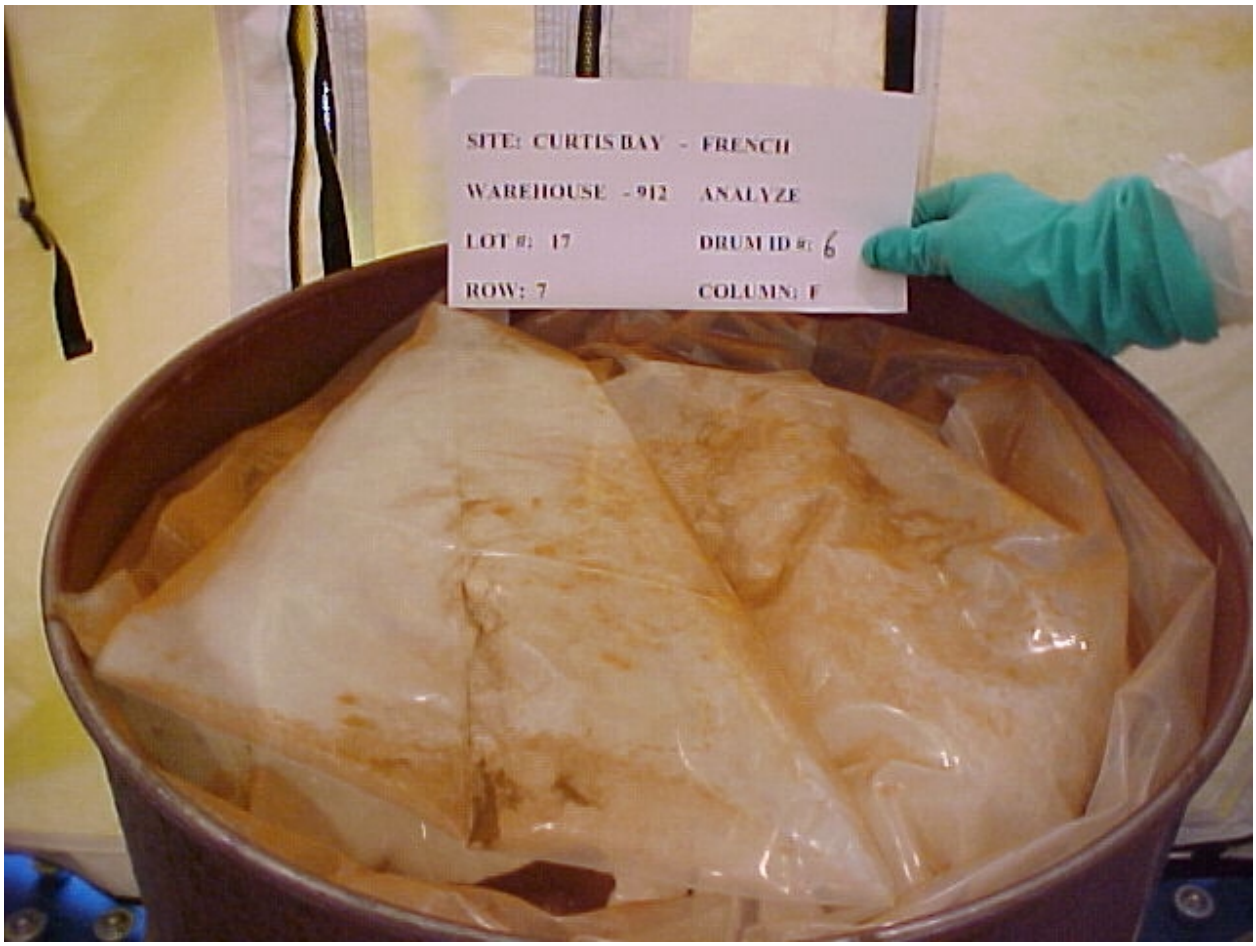
Date	7-8-2002	Time	13:10

Other Information

Photo No. 2 of 5

Dose Rate	Surface	45 mR/hr
	1 meter	4.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	F

Inspection/Sample Date & Time

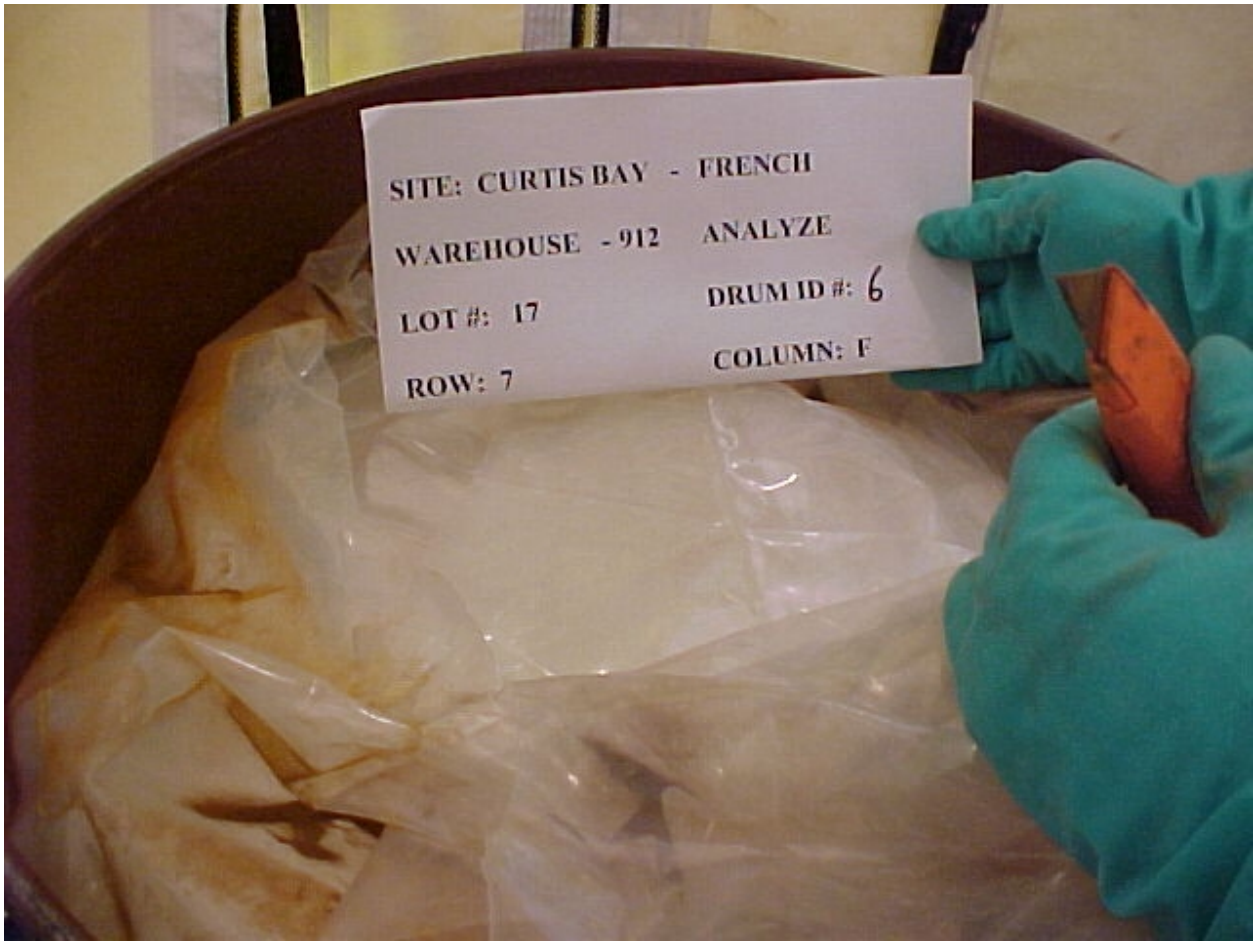
Date	7-8-2002	Time	13:10

Other Information

Photo No. 3 of 5

Dose Rate	Surface	45 mR/hr
	1 meter	4.0 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	F

Inspection/Sample Date & Time

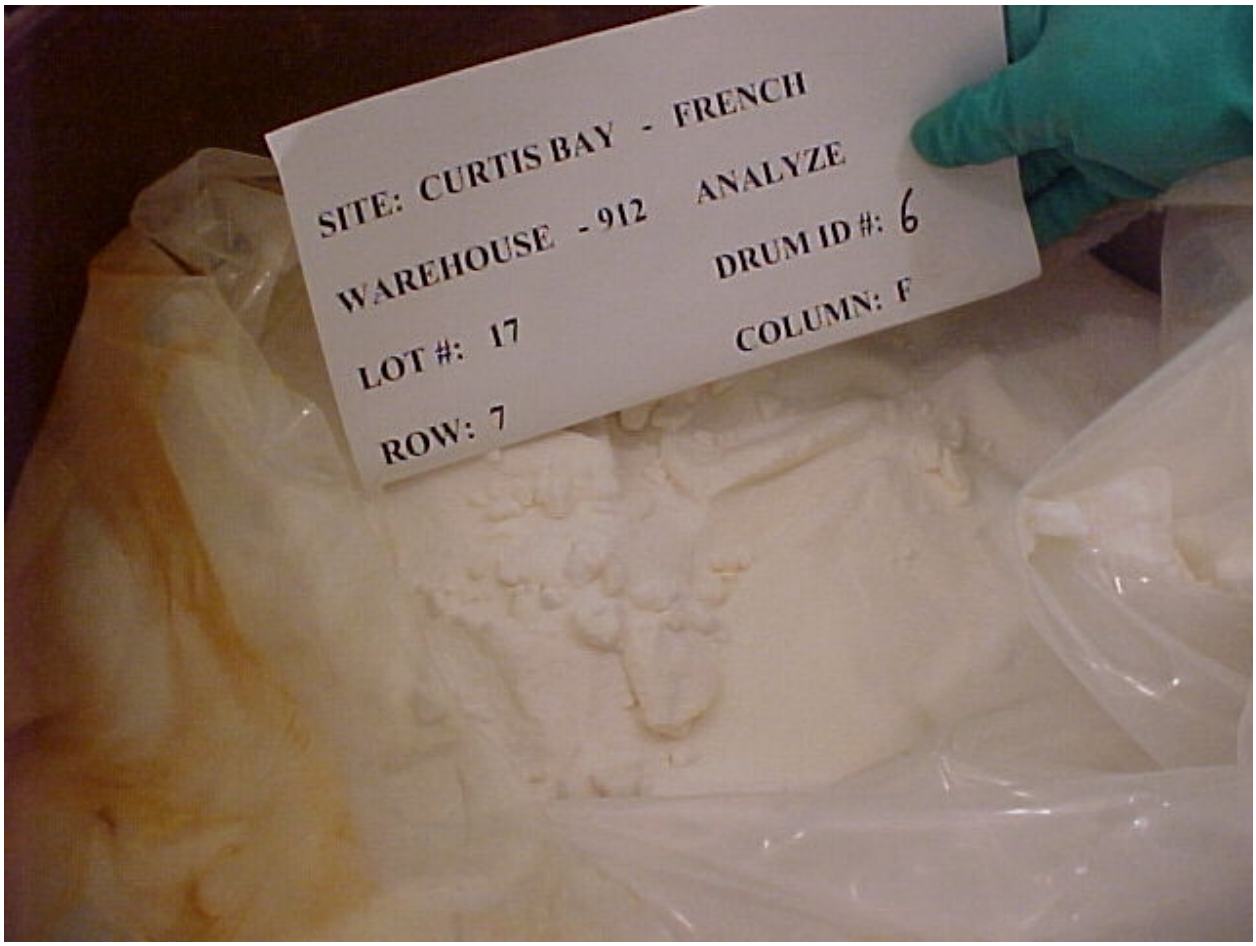
Date	7-8-2002	Time	13:10

Other Information

Photo No. 4 of 5

Dose Rate	Surface	45 mR/hr
	1 meter	4.0 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	7
		Column	F

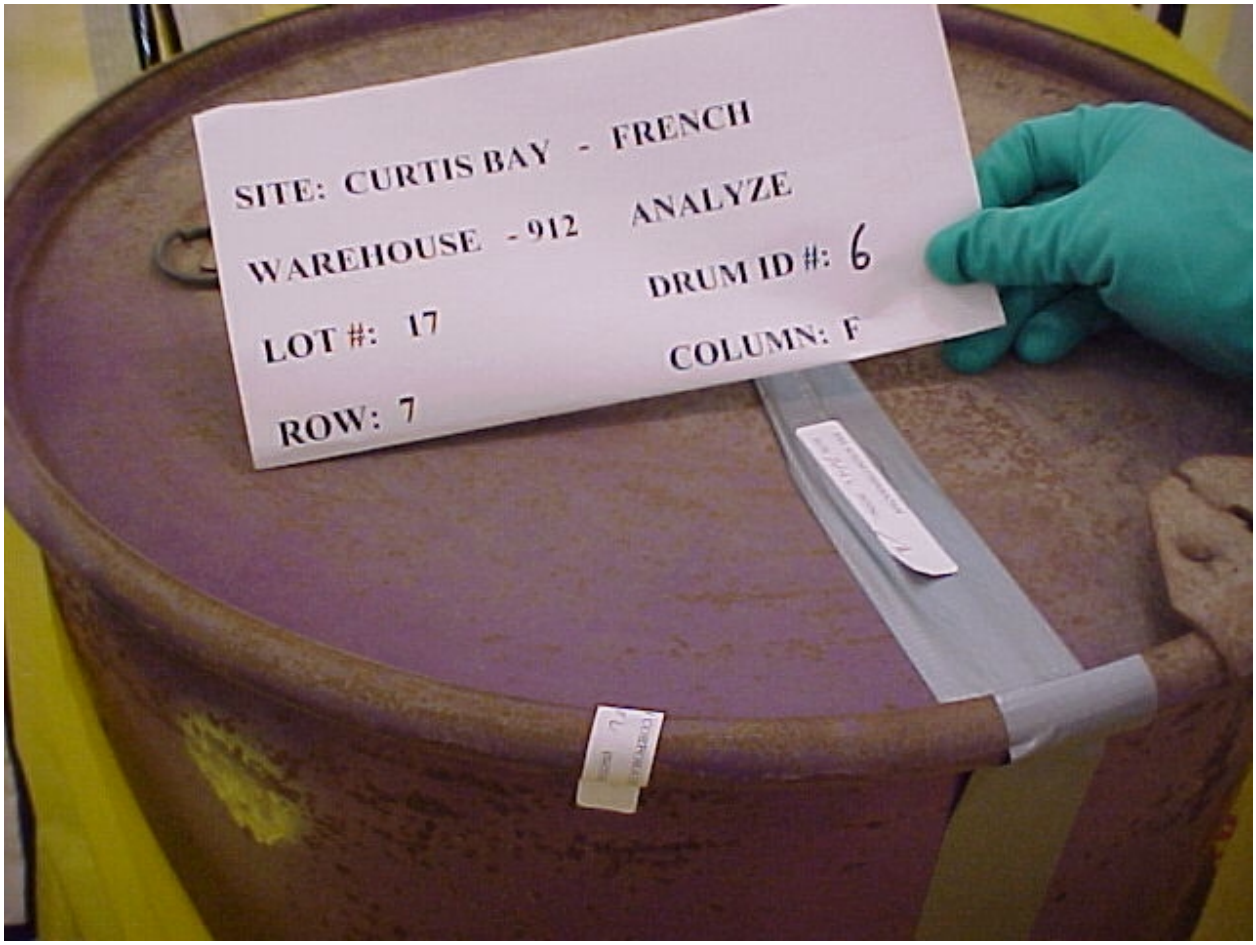
Inspection/Sample Date & Time

Date	7-8-2002	Time	13:10

Other Information

Photo No.	4 of 5	
Dose Rate	Surface	45 mR/hr
	1 meter	4.0 mR/hr

Sealed/Dated – Completed



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Curtis Bay Depot
Lot #F-19 – Drum #58
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-19 Drum ID #: 58 Location: Warehouse 912 – Column F – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 85-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* NA (85-gal outer drum) Units:
Rad Measurements at the time of opening: DR at Surface 36 mR/hr DR at 1 meter 3.0 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 55-gal Drum
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 4 Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #4: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02

General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	58	Disposition	Analyze

Physical Location of Drum

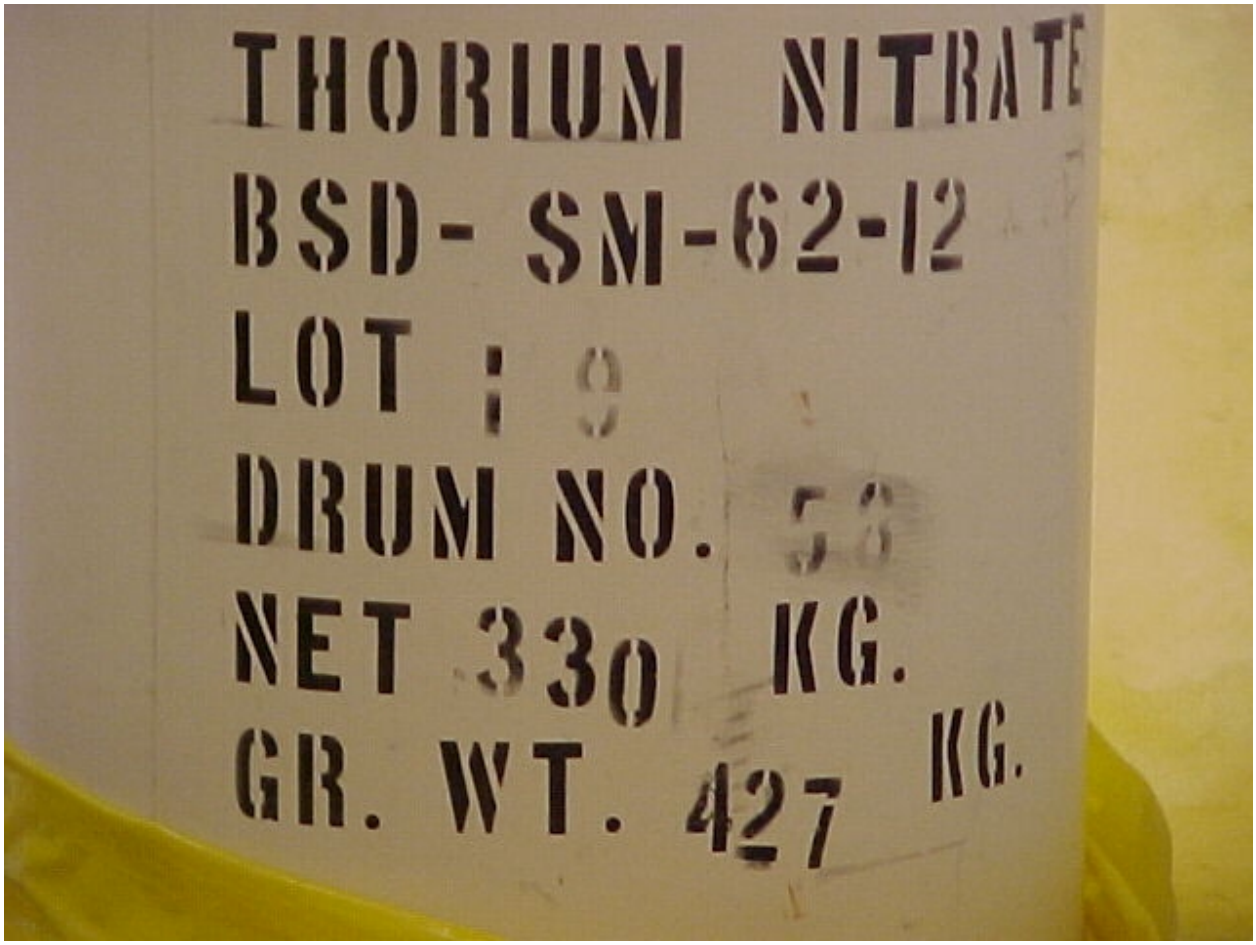
Warehouse	912	Row	4
		Column	F

Inspection/Sample Date & Time

Date	7-8-2002	Time	15:00

Other Information

Photo No.	1 of 6		
Container	85-gallon steel drum	Container Condition	Good
Dose Rate	Surface	36 mR/hr	
	1 meter	3.0 mR/hr	



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	58	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	F

Inspection/Sample Date & Time

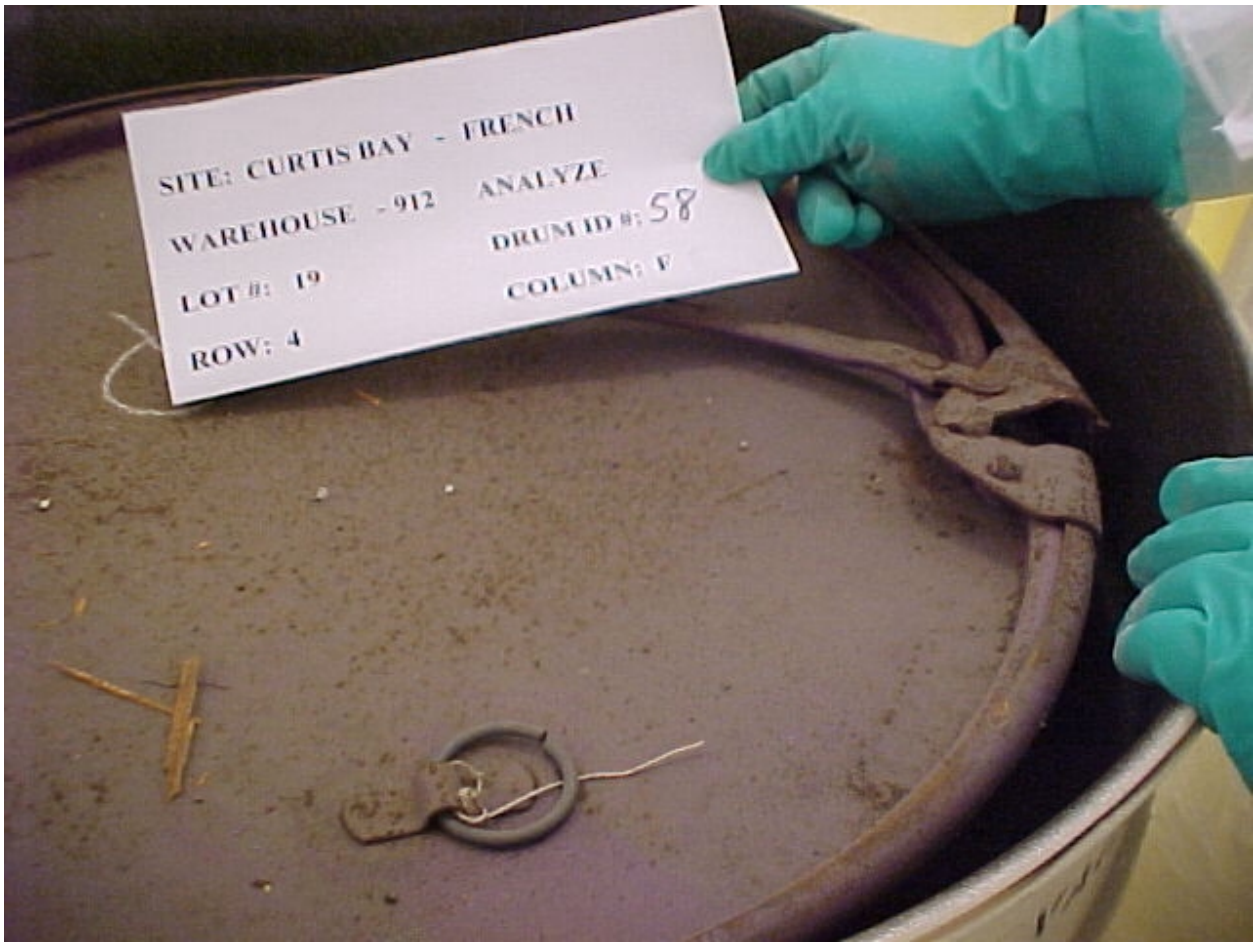
Date	7-8-2002	Time	15:00

Other Information

Photo No. 2 of 6

Dose Rate	Surface	36 mR/hr
	1 meter	3.0 mR/hr

55-gal drum – fair condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	58	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	F

Inspection/Sample Date & Time

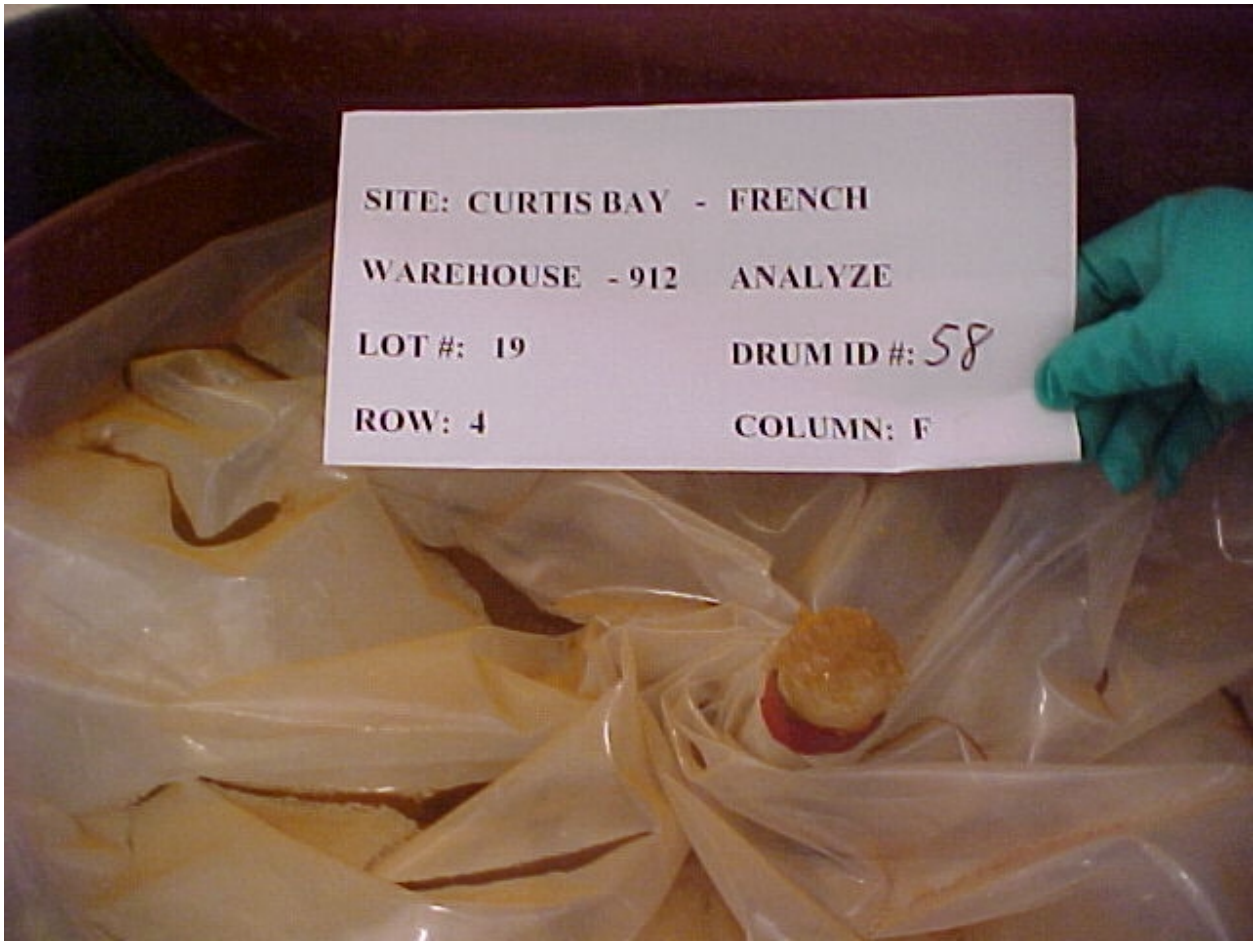
Date	7-8-2002	Time	15:00

Other Information

Photo No. 3 of 6

Dose Rate	Surface	36 mR/hr
	1 meter	3.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	58	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	F

Inspection/Sample Date & Time

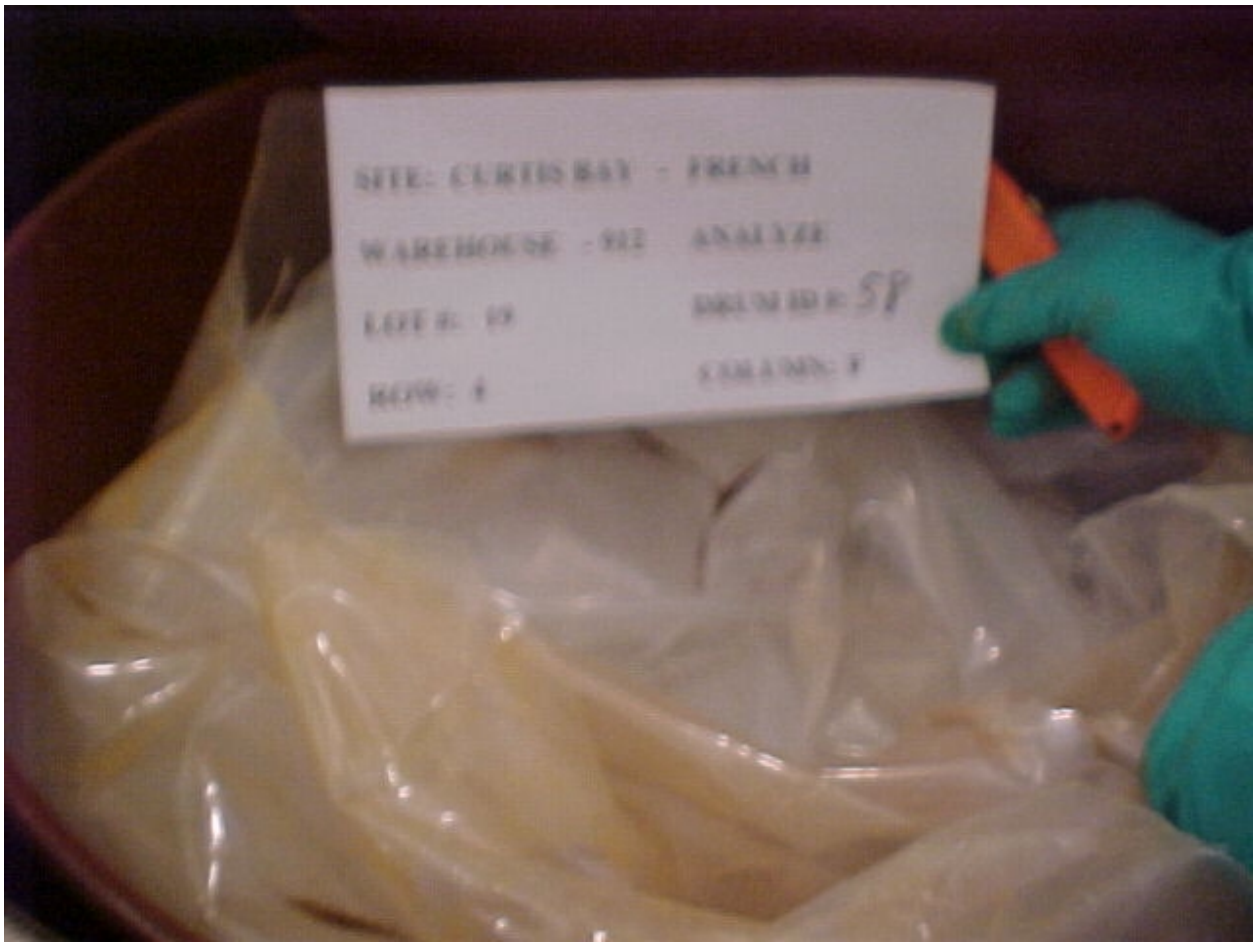
Date	7-8-2002	Time	15:00

Other Information

Photo No. 4 of 6

Dose Rate	Surface	36 mR/hr
	1 meter	3.0 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	58	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	F

Inspection/Sample Date & Time

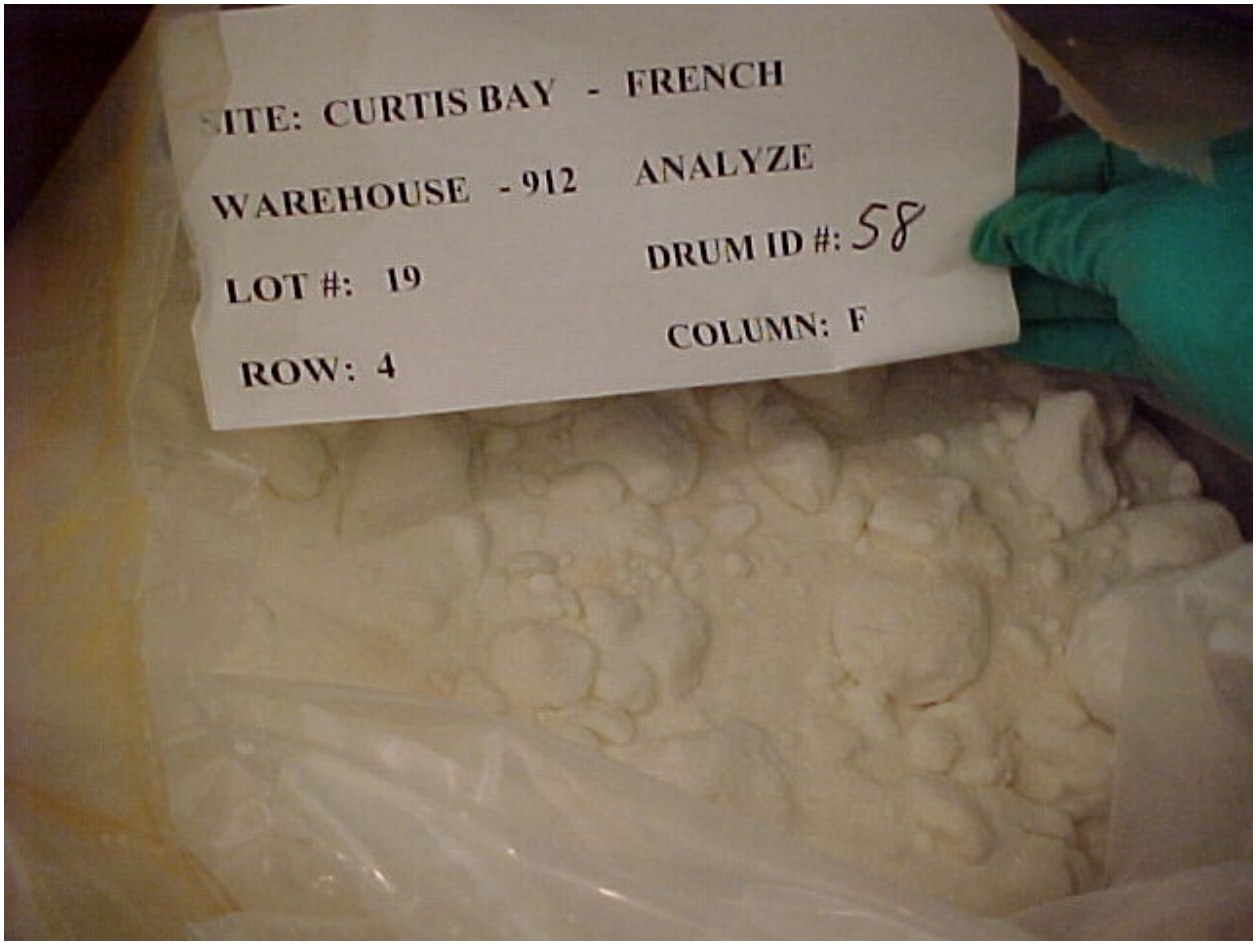
Date	7-8-2002	Time	15:00

Other Information

Photo No. 5 of 6

Dose Rate	Surface	36 mR/hr
	1 meter	3.0 mR/hr

Thorium Nitrate – Powder – white – dry
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	French		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	58	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	F

Inspection/Sample Date & Time

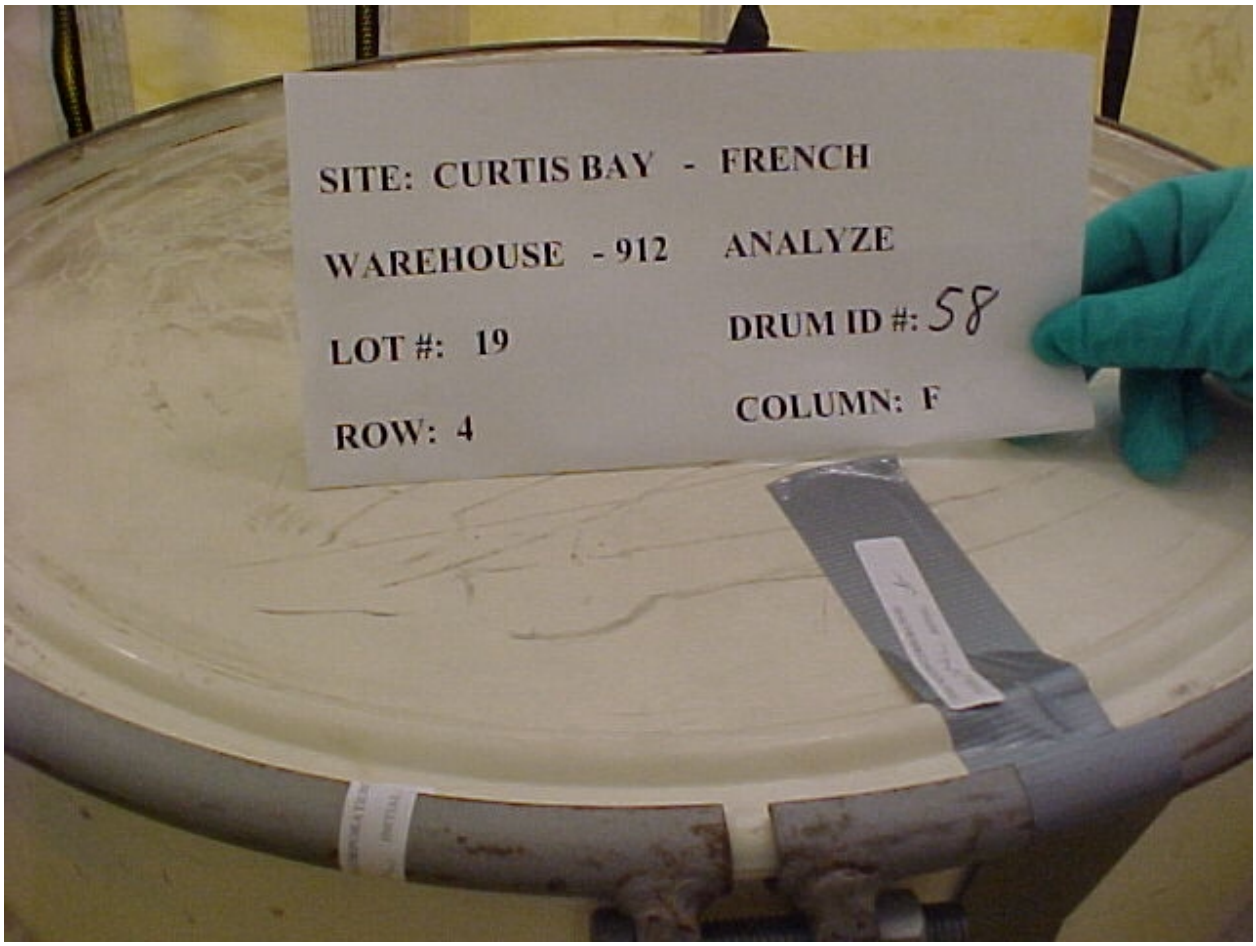
Date	7-8-2002	Time	15:00

Other Information

Photo No. 6 of 6

Dose Rate	Surface	36 mR/hr
	1 meter	3.0 mR/hr

Sealed/Dated – Completed



APPENDIX E

CURTIS BAY DEPOT
DRUMS SAMPLED FOR OFF-SITE ANALYSES
(FOURTH SAMPLE SHIPMENT)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Curtis Bay Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were sampled and shipped off-site for analyses per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were shipped to UT Battelle's contracted off-site laboratory per Shipment No. 6990-001-005 (i.e. the fourth shipment of samples to the laboratory for this project). All lots/drums included in this appendix came from Thorium Nitrate materials originating from domestic sources.

This appendix includes data showing the visual inspections of a number of 30-gal steel drums. From the inspection of the drums, 73% of the 30-gal drums sampled for this shipment at one time contained internal pressure (either via release of gas during the visual inspection or the presence of indentations in the top lid). Lots that had internal gas pressure are indicated with a single asterisk in the following table. The lot with two asterisks was a 40-gal black plastic container.

Also included with this table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	17*	108	E-5
2	18*	212	E-19
3	22**	8	E-31
4	28*	240	E-43
5	29*	30	E-55
6	30	171	E-67
7	36	267	E-79
8	37*	19	E-91
9	45*	105	E-103
10	48*	119	E-117
11	61	86	E-129
12	65*	107	E-141

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Curtis Bay Depot
Lot #17 – Drum #108
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 17 Drum ID #: 108 Location: Warehouse 912 – Column A – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.5 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements: CH4: 4.6% LEL NO +50ppm NOx +50ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

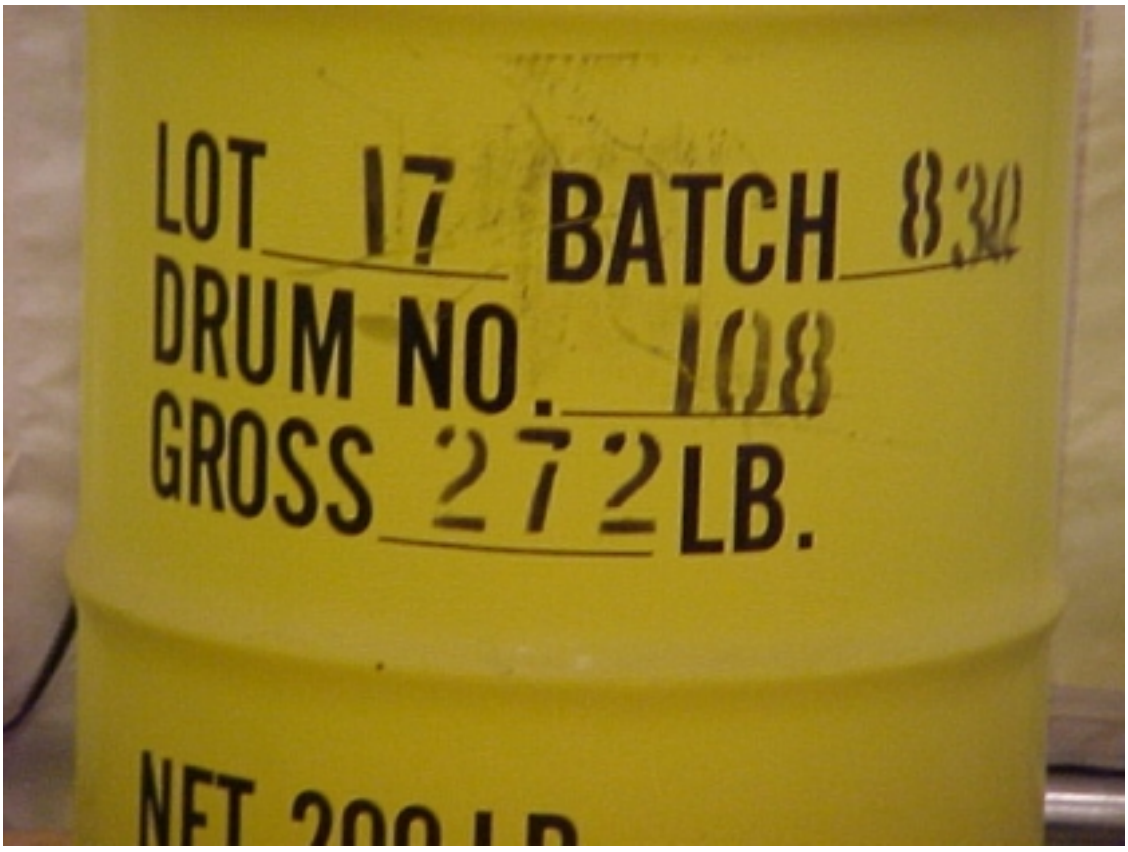
Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No.	1 of 11		
Container	30-gallon steel drum	Container Condition	Good
Dose Rate	Surface	24 mR/hr	
	1 meter	2.5 mR/hr	

Drum released pressure while loosening/removing bolt from 30-gal drum ring
Gasses present during initial loosening of drum ring – until evacuated by HEPA blower
(relatively short timeframe – typically less than a few seconds)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No. 2 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Black plastic lid from rigid poly drum liner – good condition
Raised lid indicates gas pressure buildup inside of inner poly bag(s) – internal pressure is sufficient to push drum lid through center of drum ring after the ring has been loosened

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No. 3 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

1st poly liner/bag – good condition
Internal pressure of inner packaging raises the poly liner/bag
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

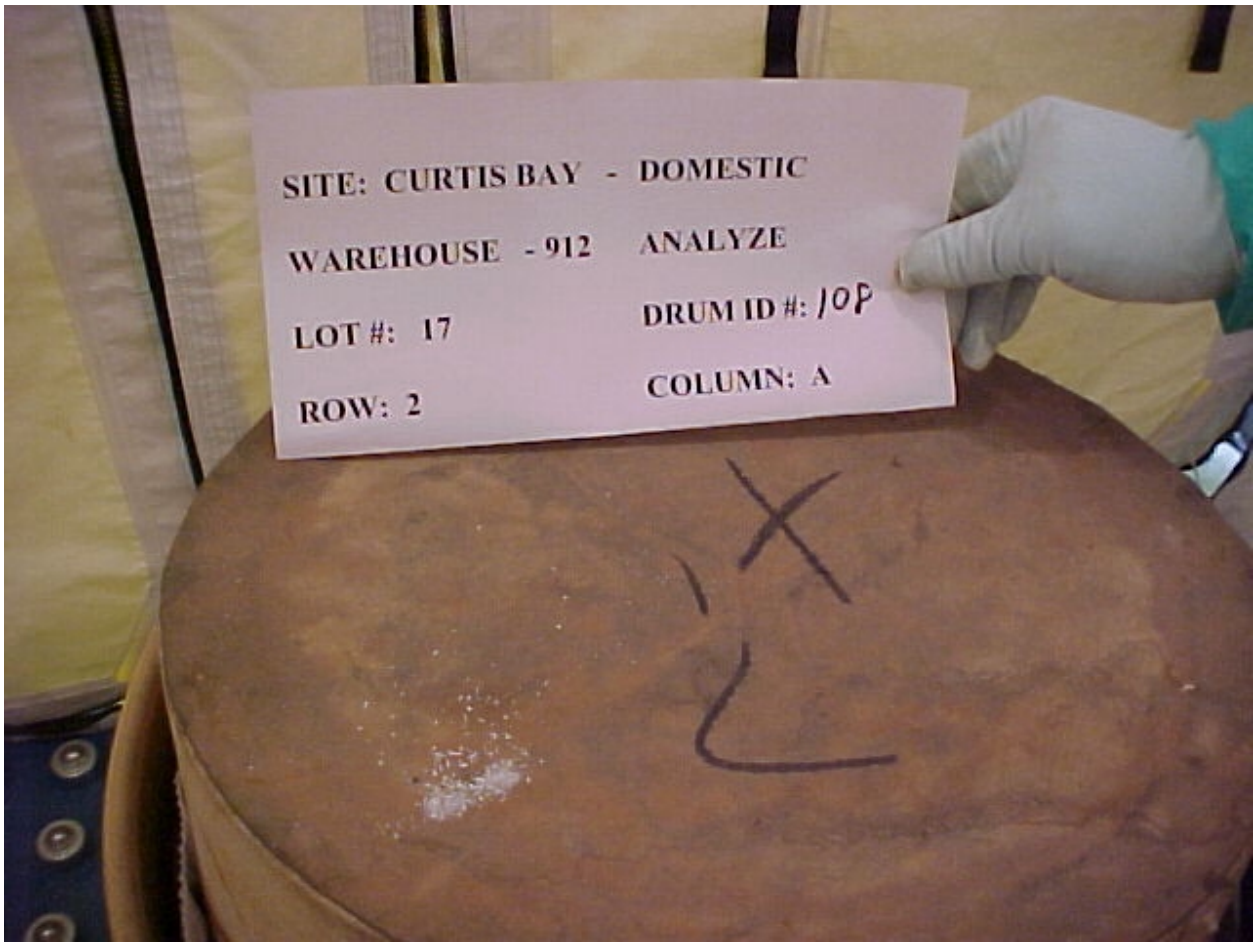
Date	7-10-2002	Time	11:00

Other Information

Photo No. 4 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Fiber lid of fiber drum – good condition
Internal pressure causes the tape seal around the fiber drum/lid to separate after the 30-gal drum lid is removed.
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

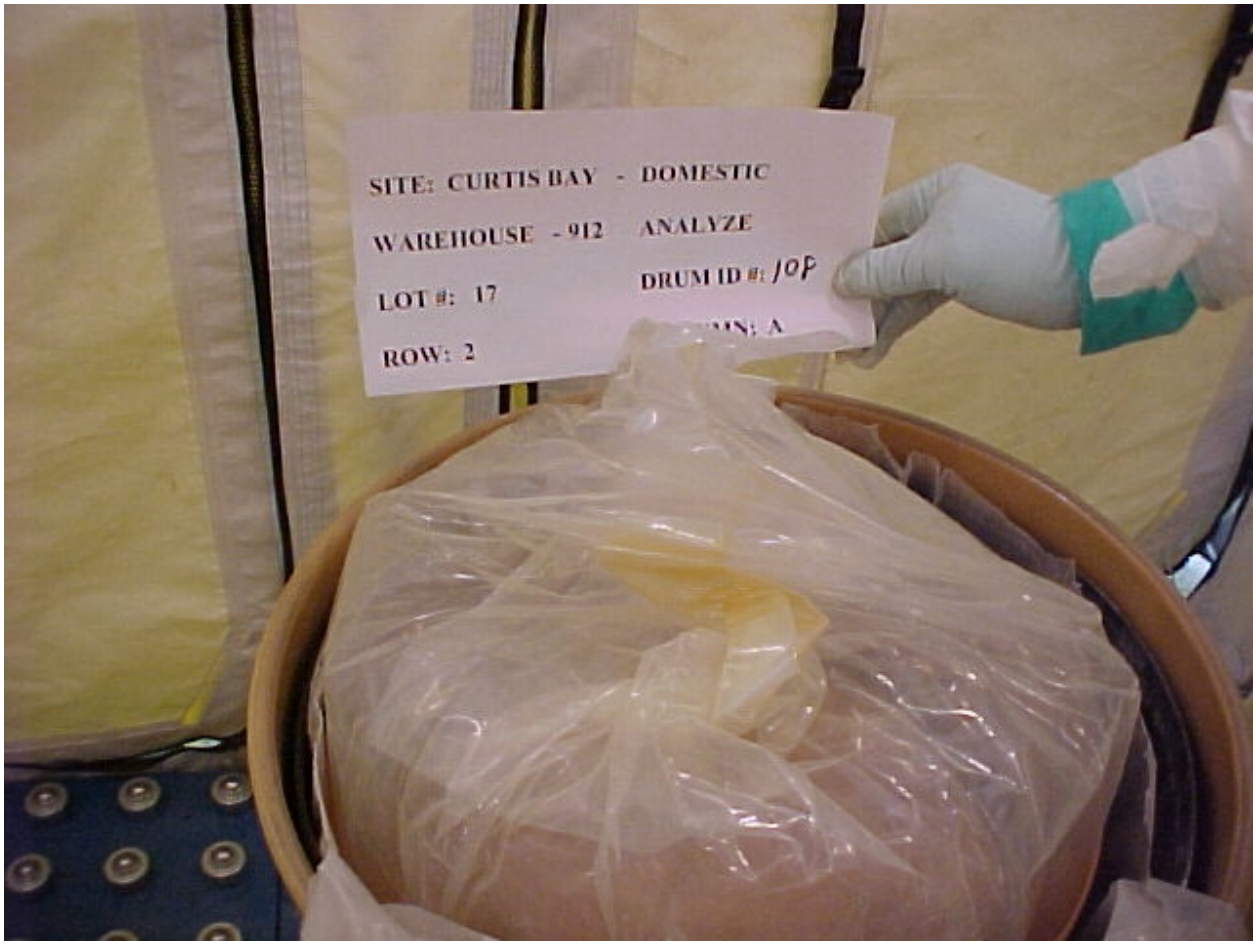
Date	7-10-2002	Time	11:00

Other Information

Photo No. 5 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

2nd poly liner/bag – good condition
Poly bag's appearance is similar to an inflated balloon due to internal pressure buildup
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No. 6 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

3rd poly liner/bag – good condition
Opened Poly liner/bag – No gasses in breathing zone
Gasses in headspace – LEL – 4.6% LEL - NO - >50.0ppm – NOx – >50.0ppm
Drum vented - All gasses dissipated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No. 7 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Wooden Lid (on inner fiber/overpack container) – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No. 8 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Labpack container "paper" lid (underside of wooden lid) – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No. 9 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

4th poly (thin film) liner/bag – good condition – note how thin film is slightly "puffed" out – indicating a slight pressure inside of the thin film.
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	11:00

Other Information

Photo No. 10 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Thorium Nitrate material – monolith – white – solid - dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	17	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	108	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	A

Inspection/Sample Date & Time

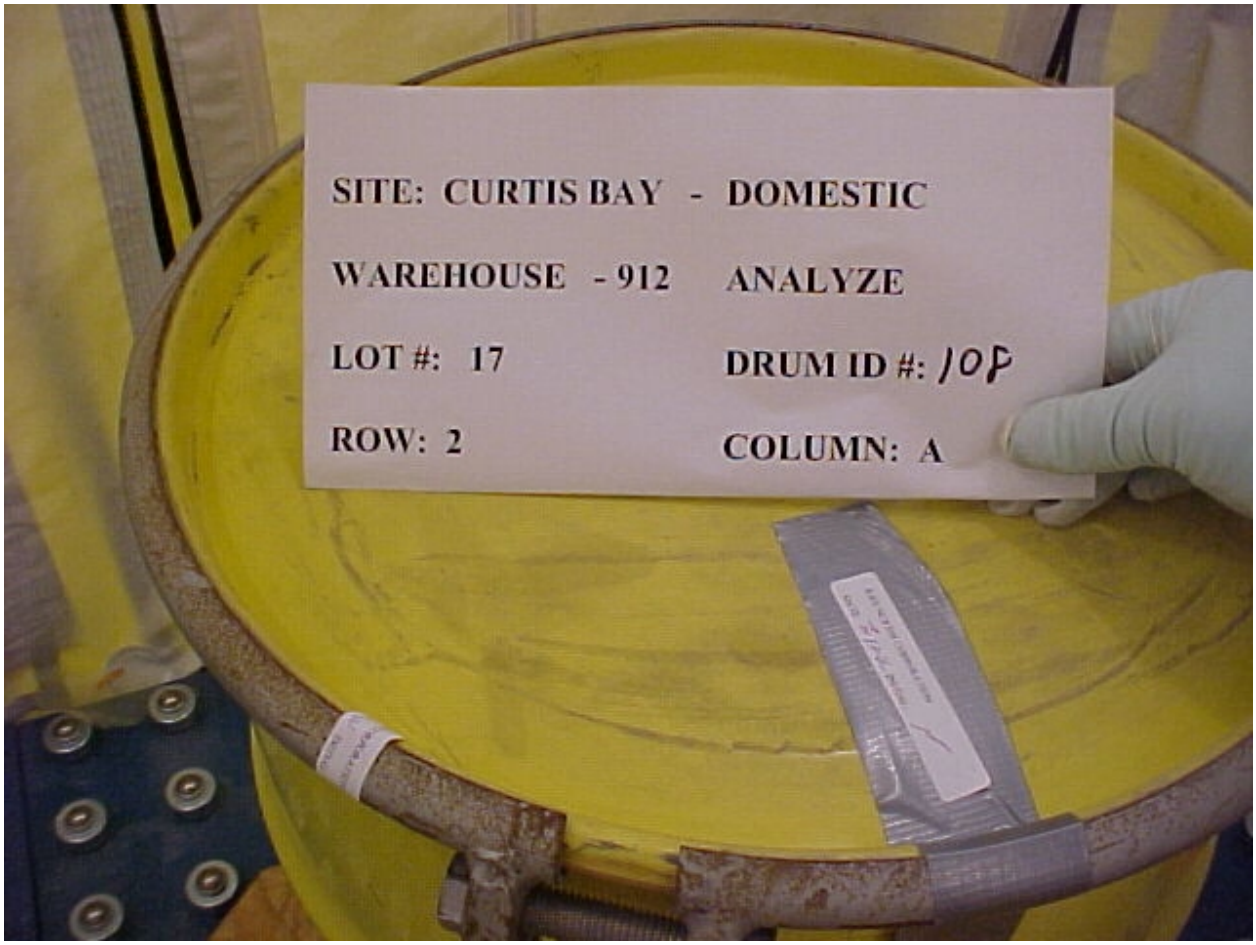
Date	7-10-2002	Time	11:00

Other Information

Photo No. 10 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Sealed & Dated - Completed



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Curtis Bay Depot
Lot #18 – Drum #212
Inspect, Sample & Analyze

Container Inspection Checklist

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 18 Drum ID #: 212 Location: Warehouse 912 – Column C - Row 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements: CH4: 3.2% LEL NO +50ppm NOx +50ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-9-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

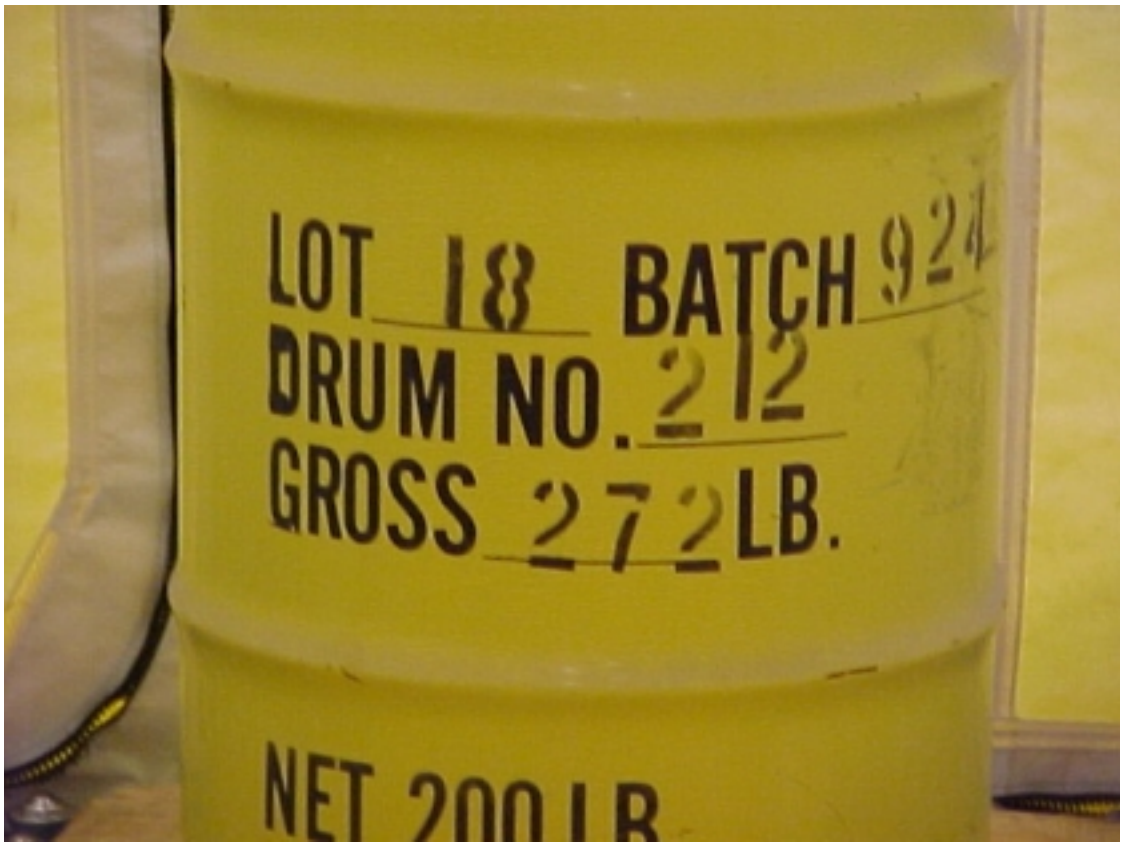
Inspection/Sample Date & Time

Date	7-09-2002	Time	14:10

Other Information

Photo No.	1 of 10		
Container	30-gallon steel drum	Container Condition	Good
Dose Rate	Surface	24 mR/hr	
	1 meter	2.6 mR/hr	

Drum released pressure while loosening/removing bolt from 30-gal drum ring
Gasses present during initial loosening of drum ring – until evacuated by HEPA blower (relatively short timeframe – typically less than a few seconds)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

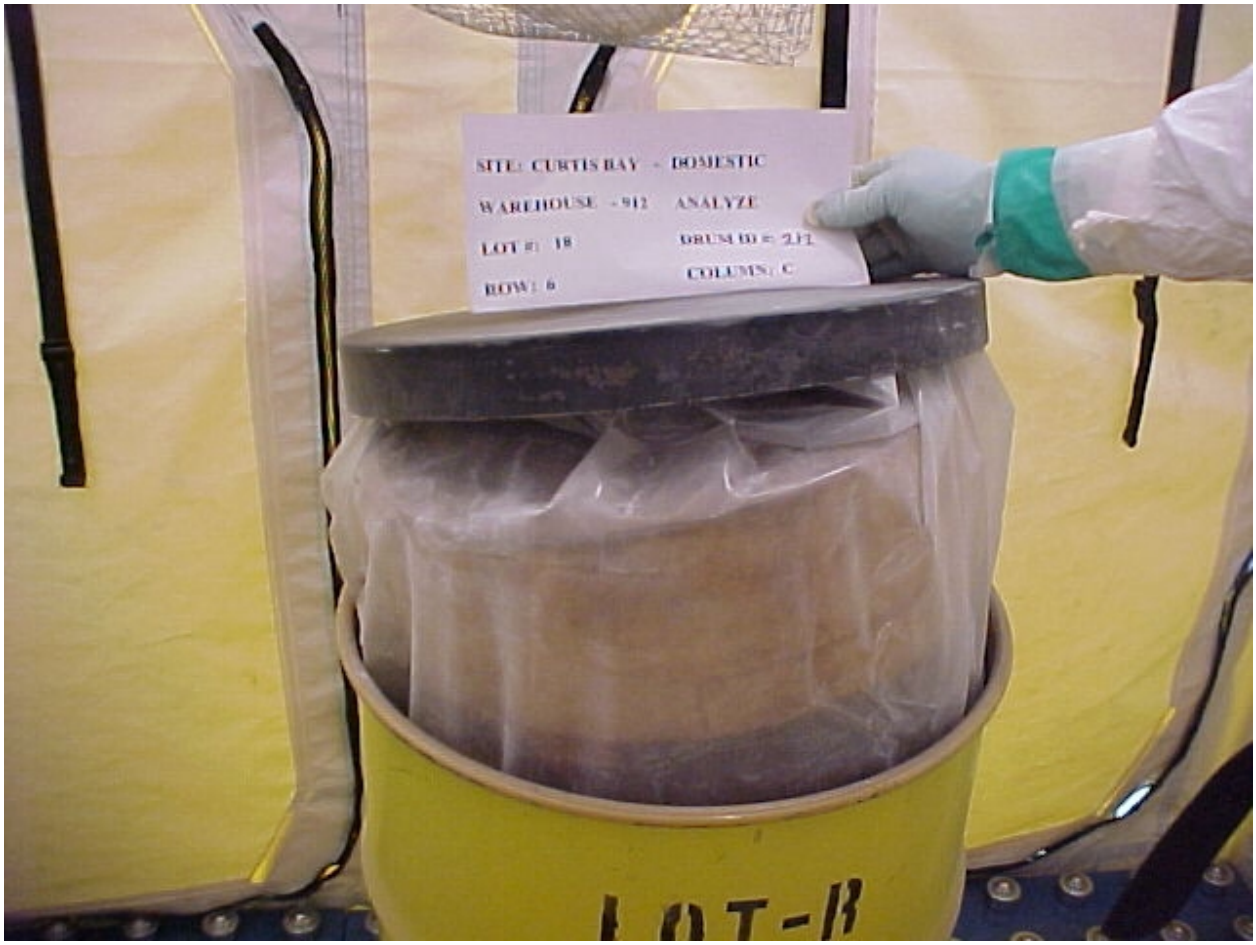
Date	7-09-2002	Time	14:10

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Black plastic lid from rigid poly drum liner – good condition
Raised lid indicates gas pressure buildup inside of inner poly bag(s) – internal pressure is sufficient to push drum lid through center of drum ring after the ring has been loosened



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:10

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

1st poly liner/bag – good condition
Internal pressure of inner packaging raises the poly liner/bag
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

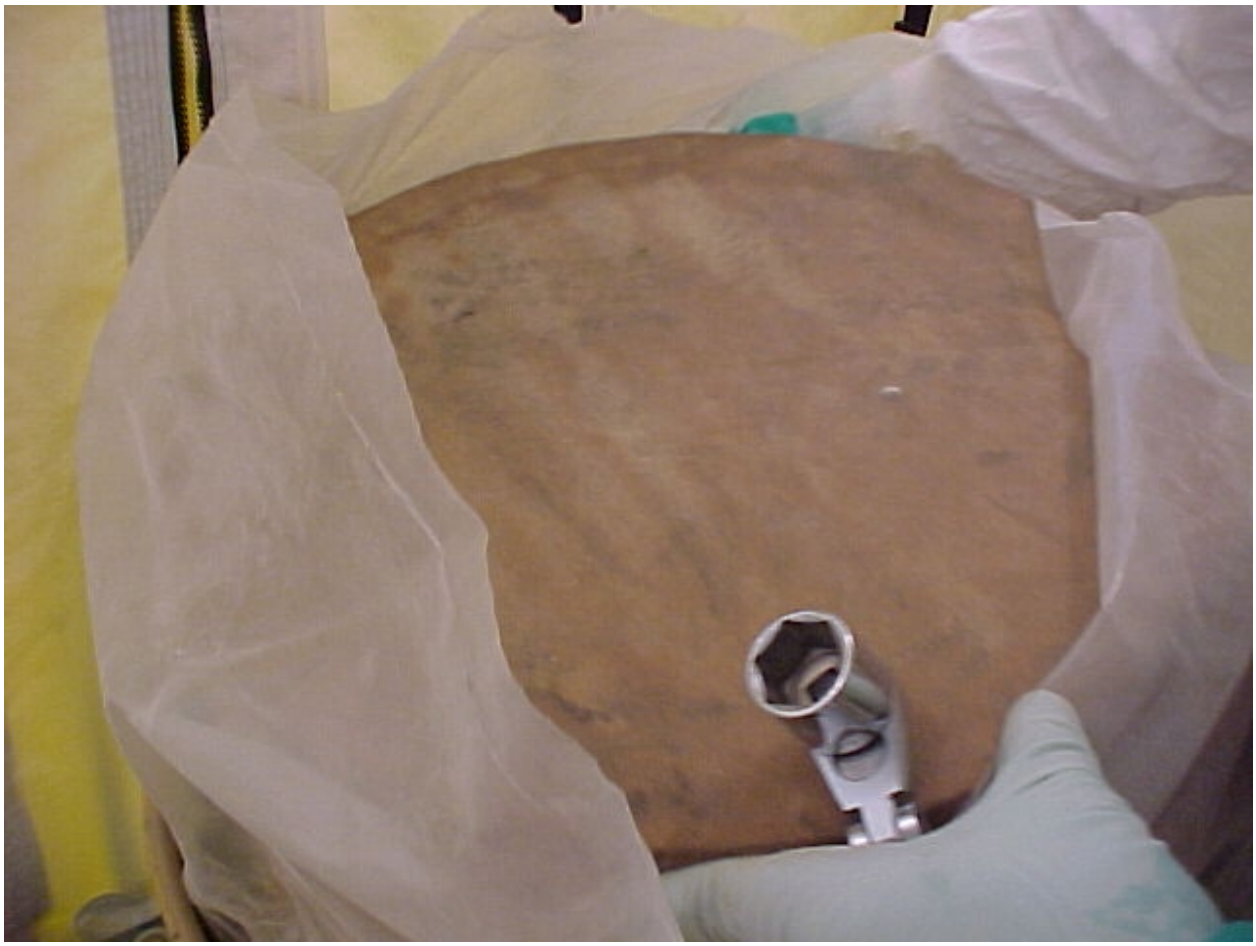
Date	7-09-2002	Time	14:10

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Fiber lid of fiber drum – good condition
Internal pressure causes the tape seal around the fiber drum/lid to separate after the 30-gal drum lid is removed.
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

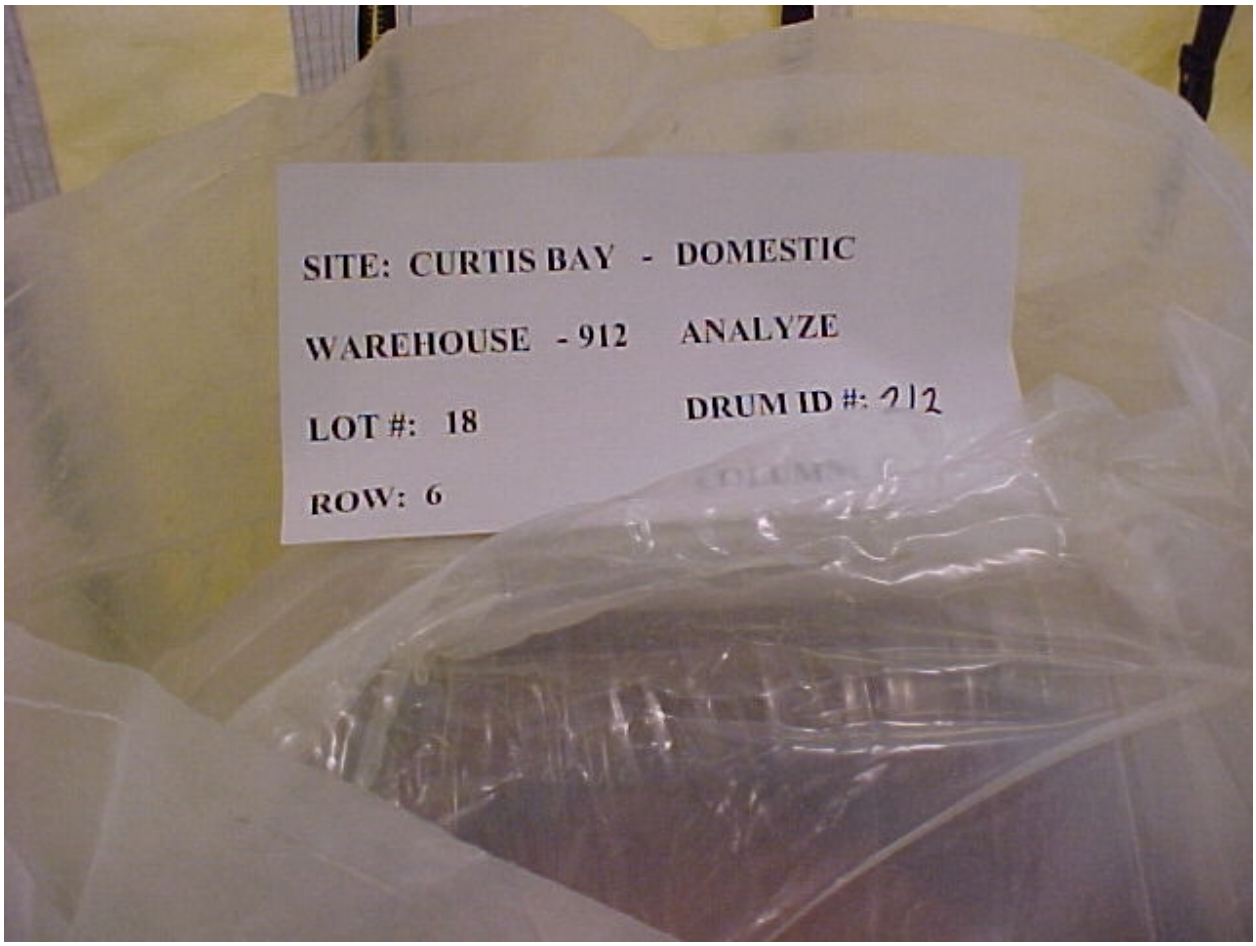
Date	7-09-2002	Time	14:10

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

2nd poly liner/bag – good condition – although heat seal has separated due to internal pressure from inner poly bag
Poly bag's appearance is similar to an inflated balloon due to internal pressure buildup
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

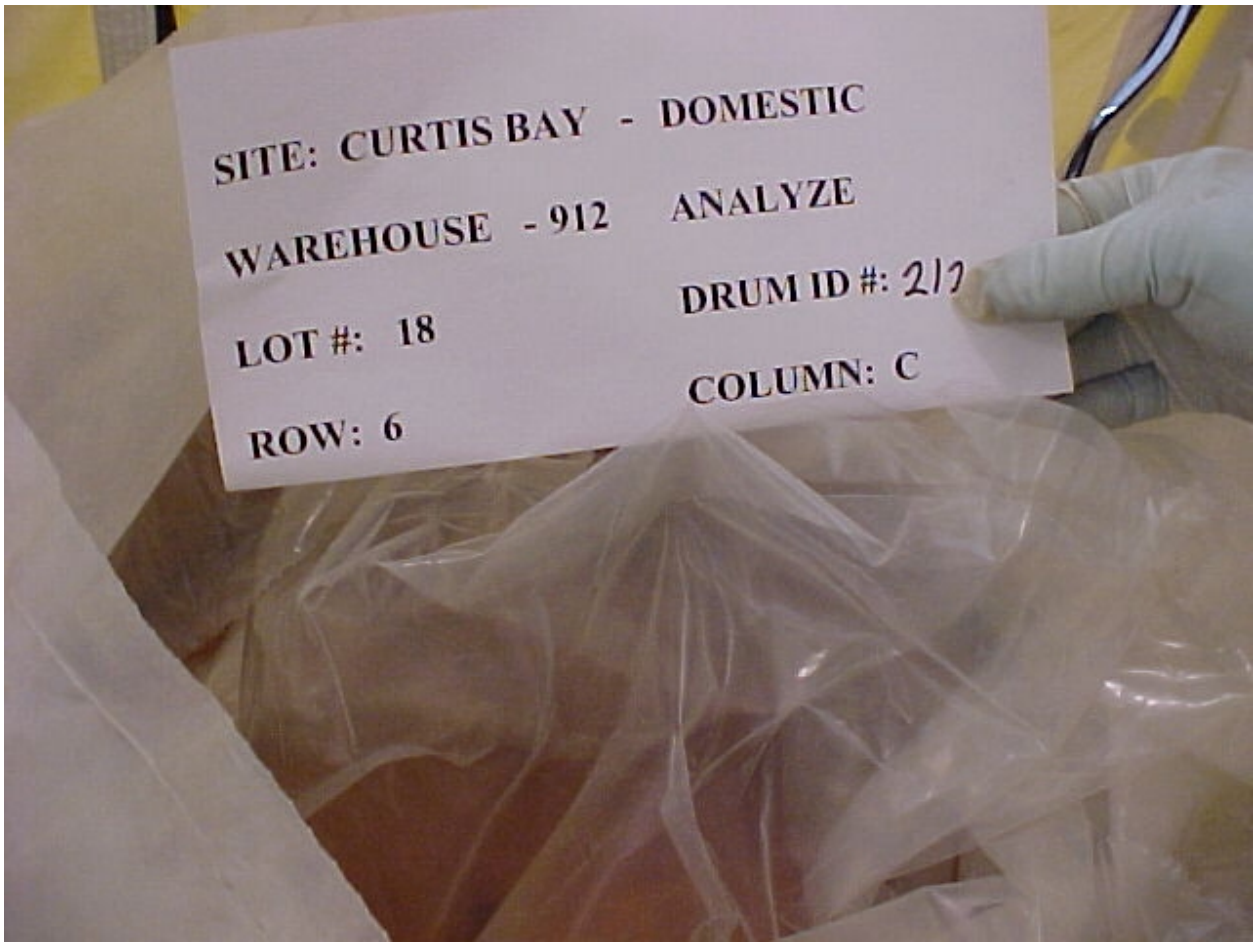
Date	7-09-2002	Time	14:10

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

3rd poly liner/bag – good condition
Opened Poly liner/bag – No gasses in breathing zone
Gasses in headspace – LEL – 3.2% LEL - NO - >50.0ppm – NOx – >50.0ppm
Drum vented - All gasses dissipated



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:10

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Wooden lid on inner fiber drum (overpack) – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:10

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

4th poly "thin film" liner/bag - good condition
Slight expansion of thin film shows slight pressurization inside of innermost bag
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:10

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Thorium Nitrate – monolith – white – solid - dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	212	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	6
		Column	C

Inspection/Sample Date & Time

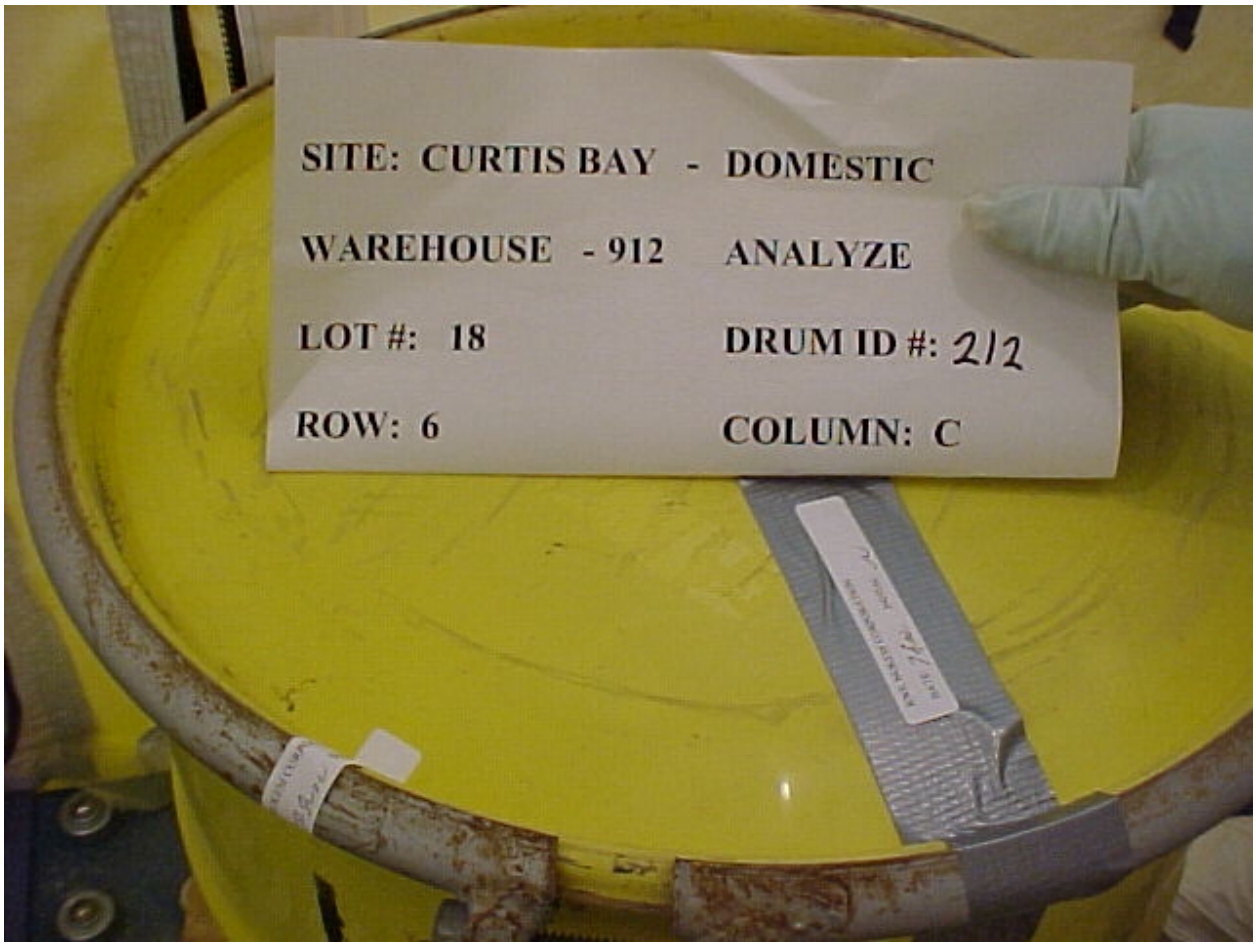
Date	7-09-2002	Time	14:10

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #22 – Drum #8
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 22 Drum ID #: 8 Location: Warehouse 912 – Column D - Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 40-gal black poly container
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0% LEL NO +0 ppm NOx +0 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

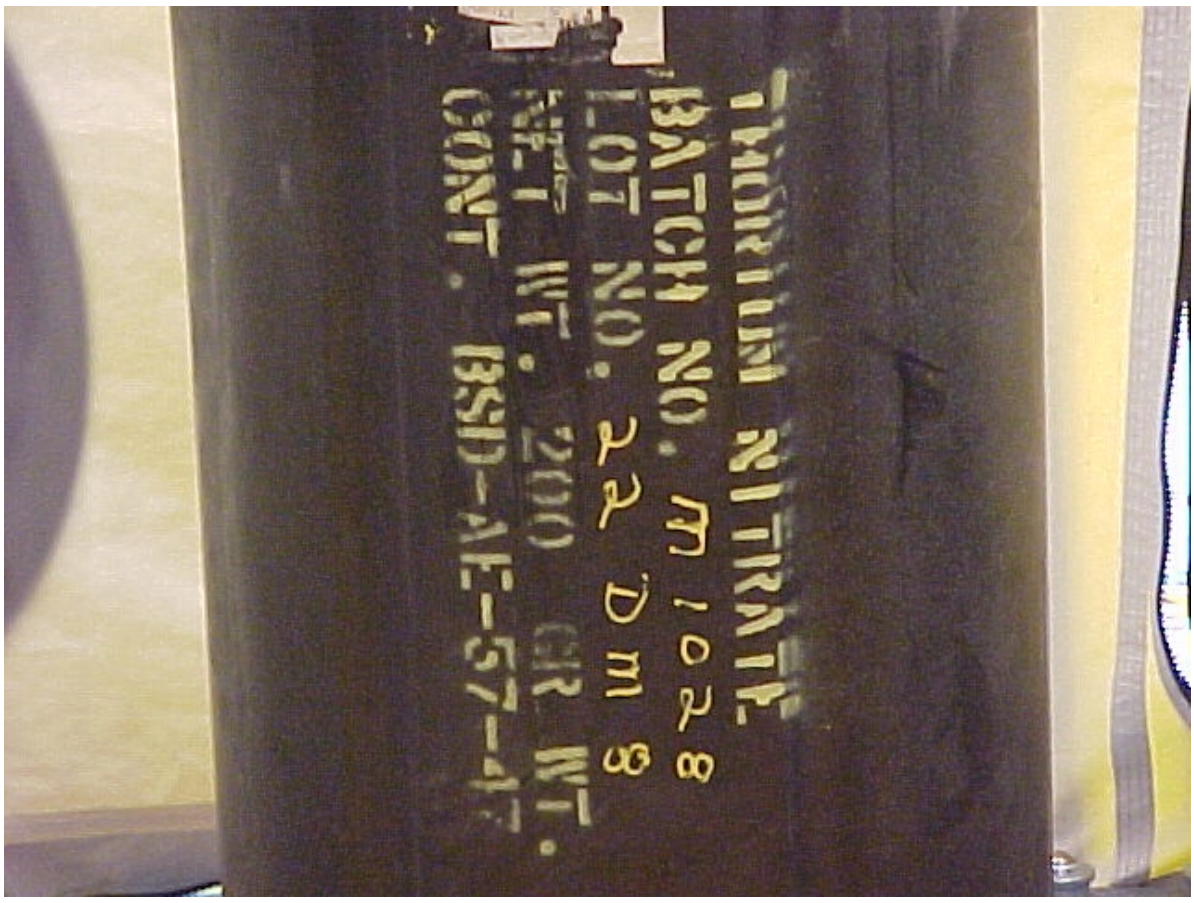
Date	7-10-2002	Time	13:30

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

40-gal black poly container with bolt-on lid – good condition
Unable to grasp container with forklift attachment – container did not have sufficient strength to pickup on sides. Other than the outer 30-gal drum and inner black drum liner for the 30-gal drums, these drums have the same type and number of layers as the 30-gal domestic drums. The outer 40-gal drum lid does not have as good of a seal as the 30-gal drum lid that may account for no detection of gas buildup in these 40-gal drums.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

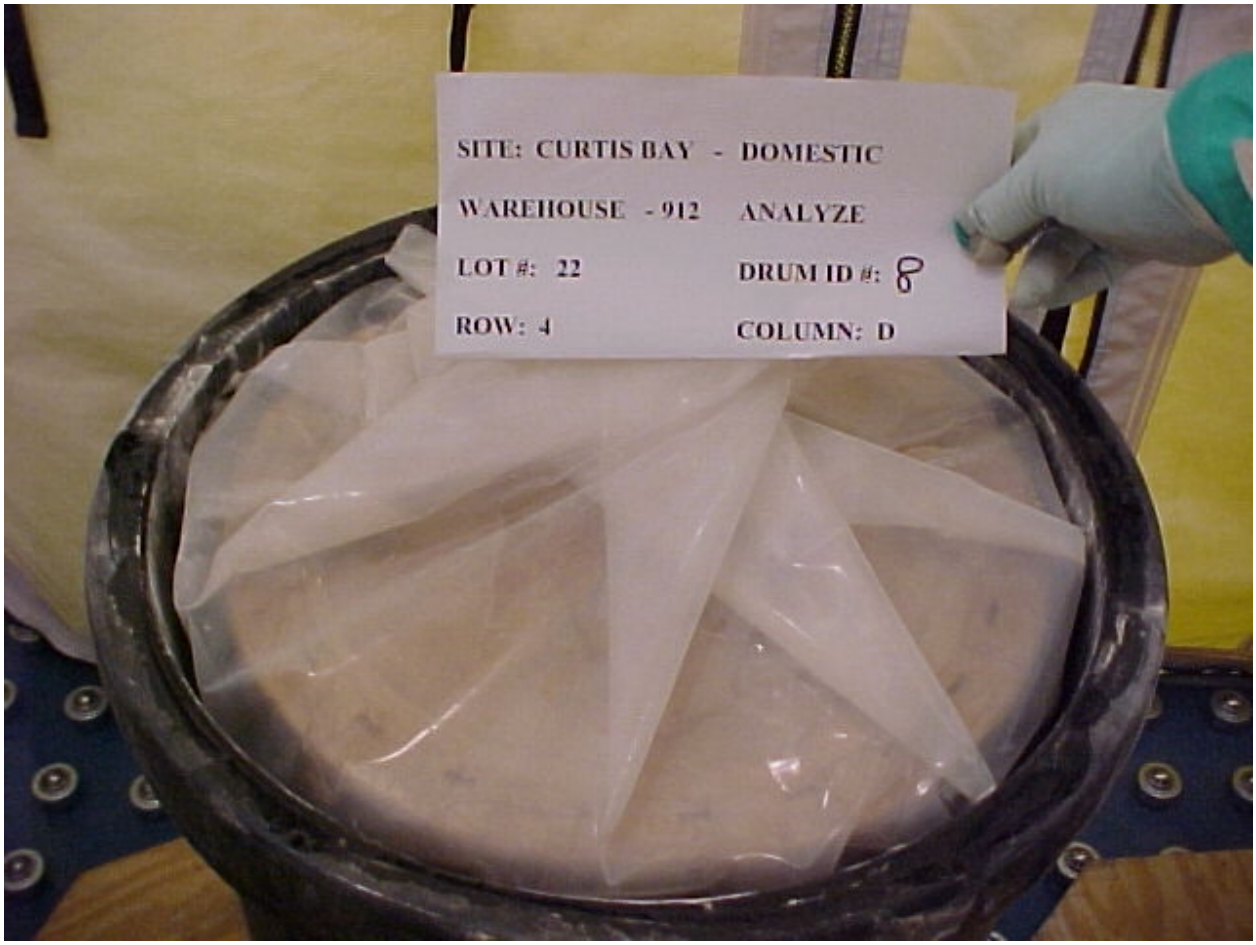
Date	7-10-2002	Time	13:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

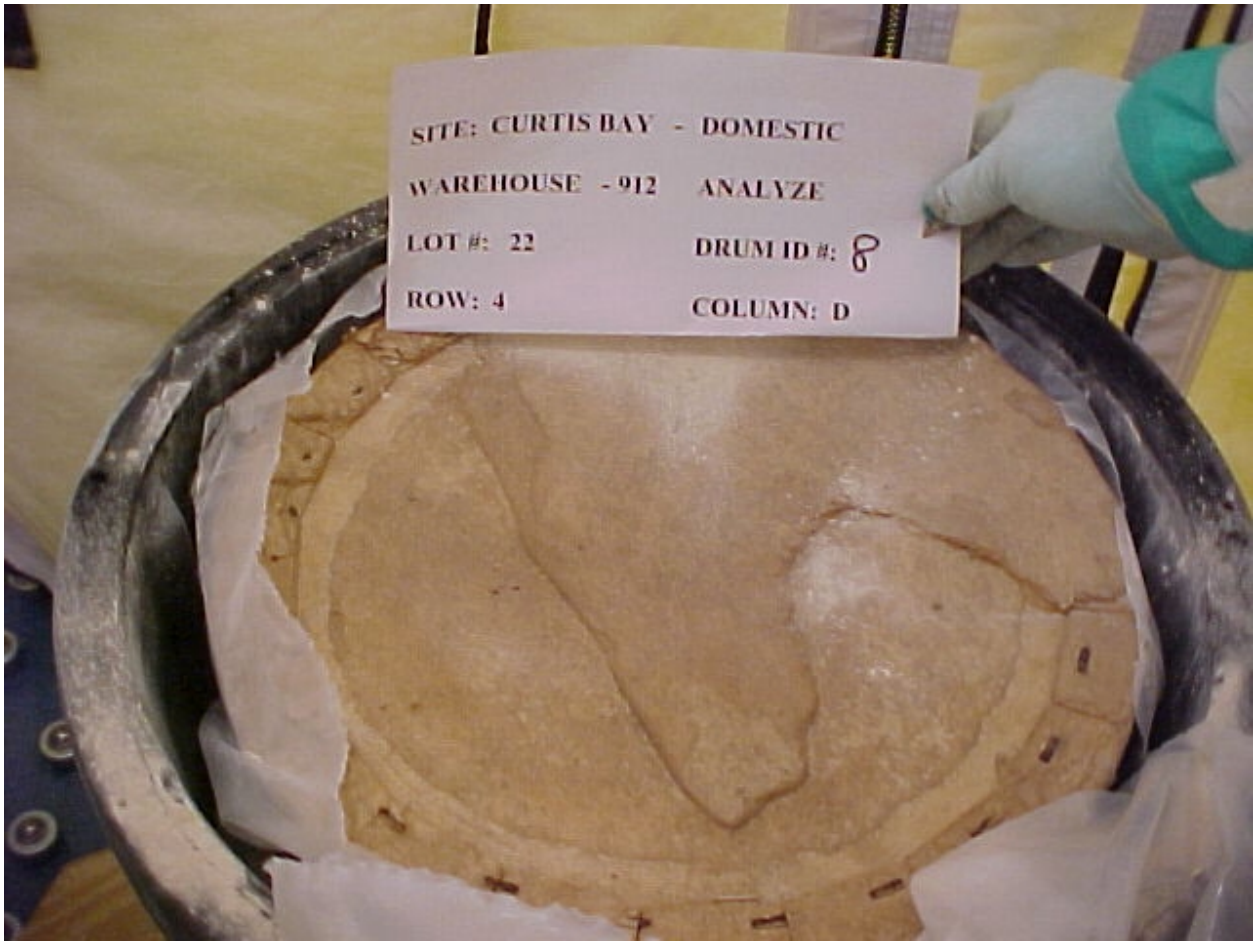
Date	7-10-2002	Time	13:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

Fiber lid – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

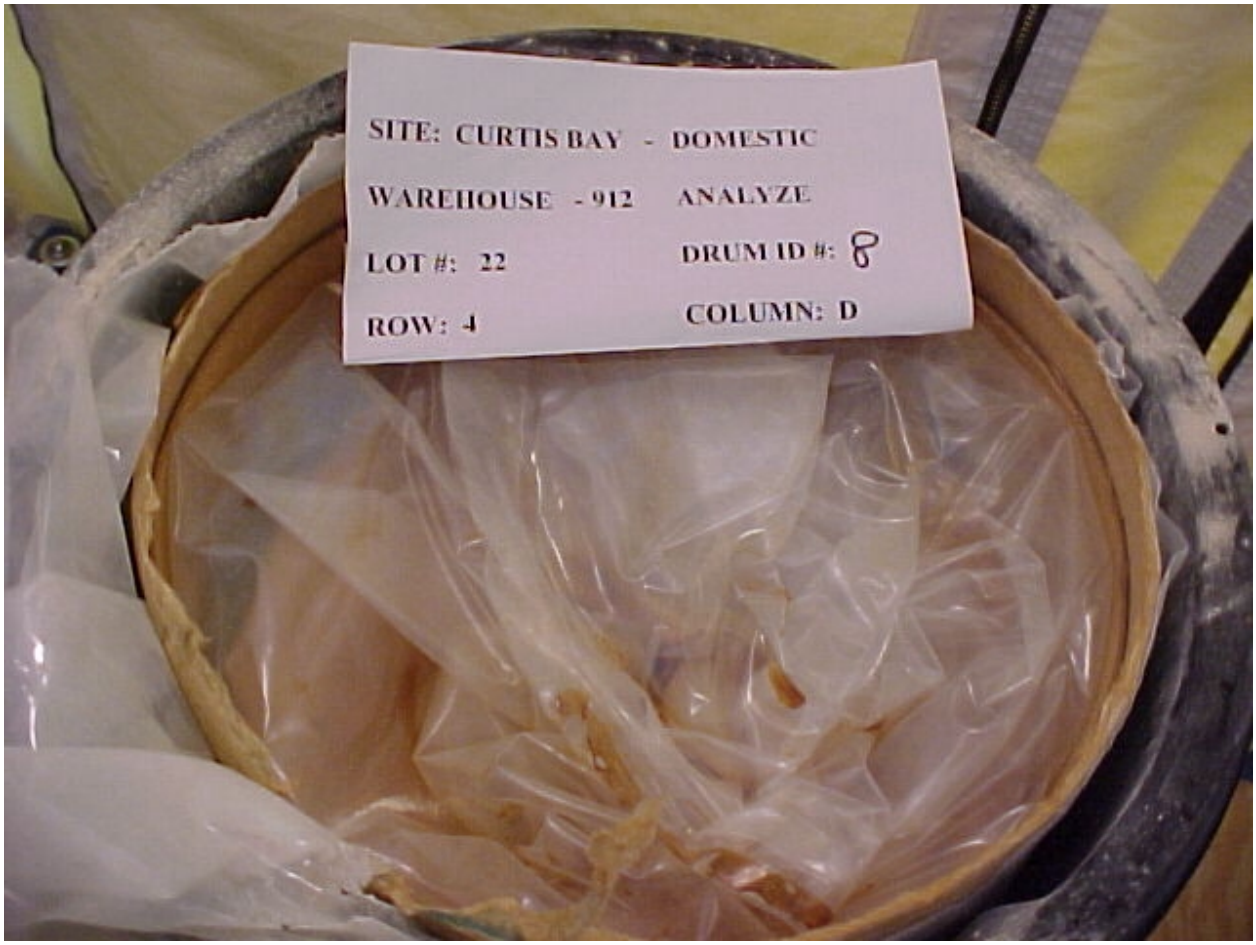
Date	7-10-2002	Time	13:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	13:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

3rd polyliner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

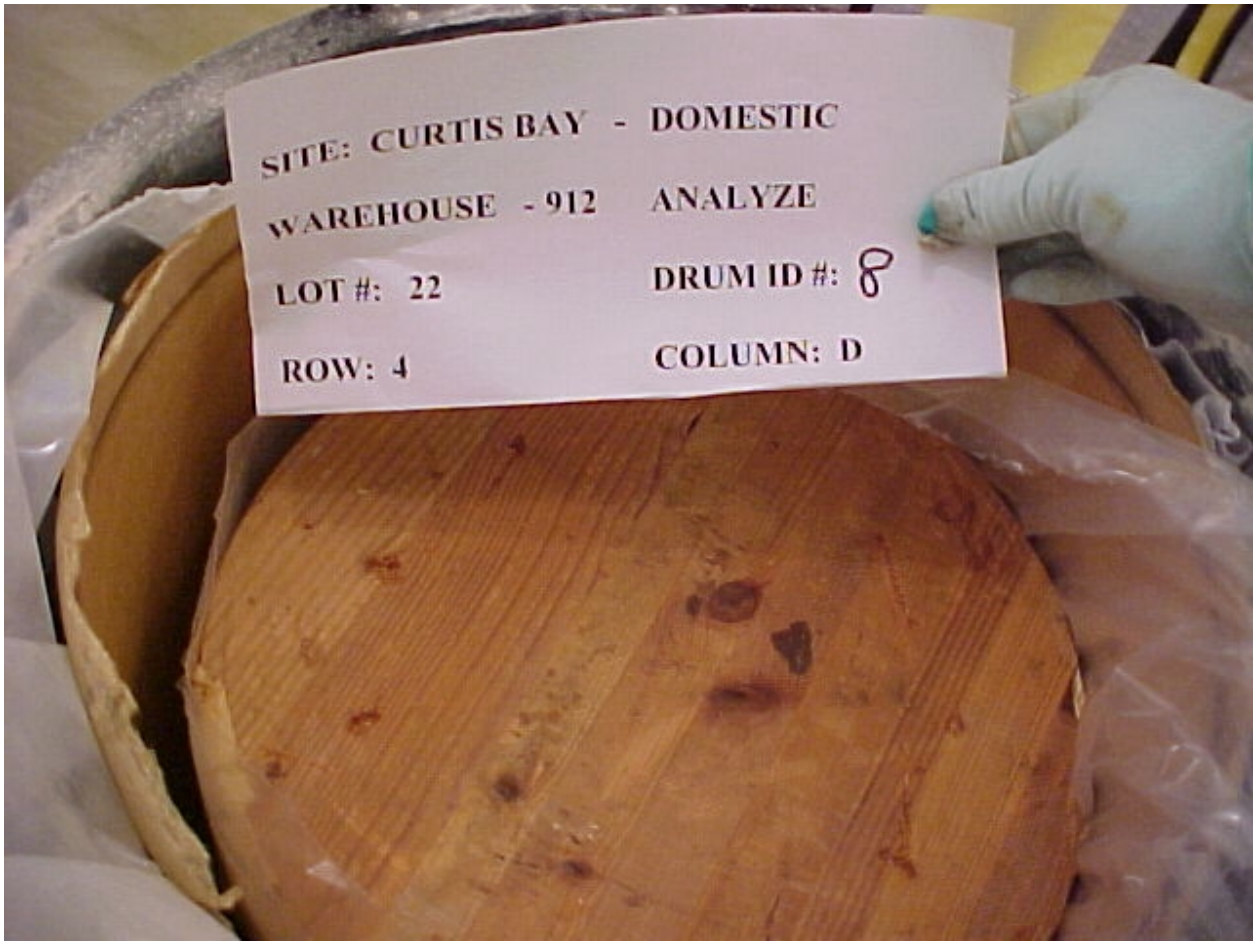
Date	7-10-2002	Time	13:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

Wooden lid on inner fiber overpack container – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

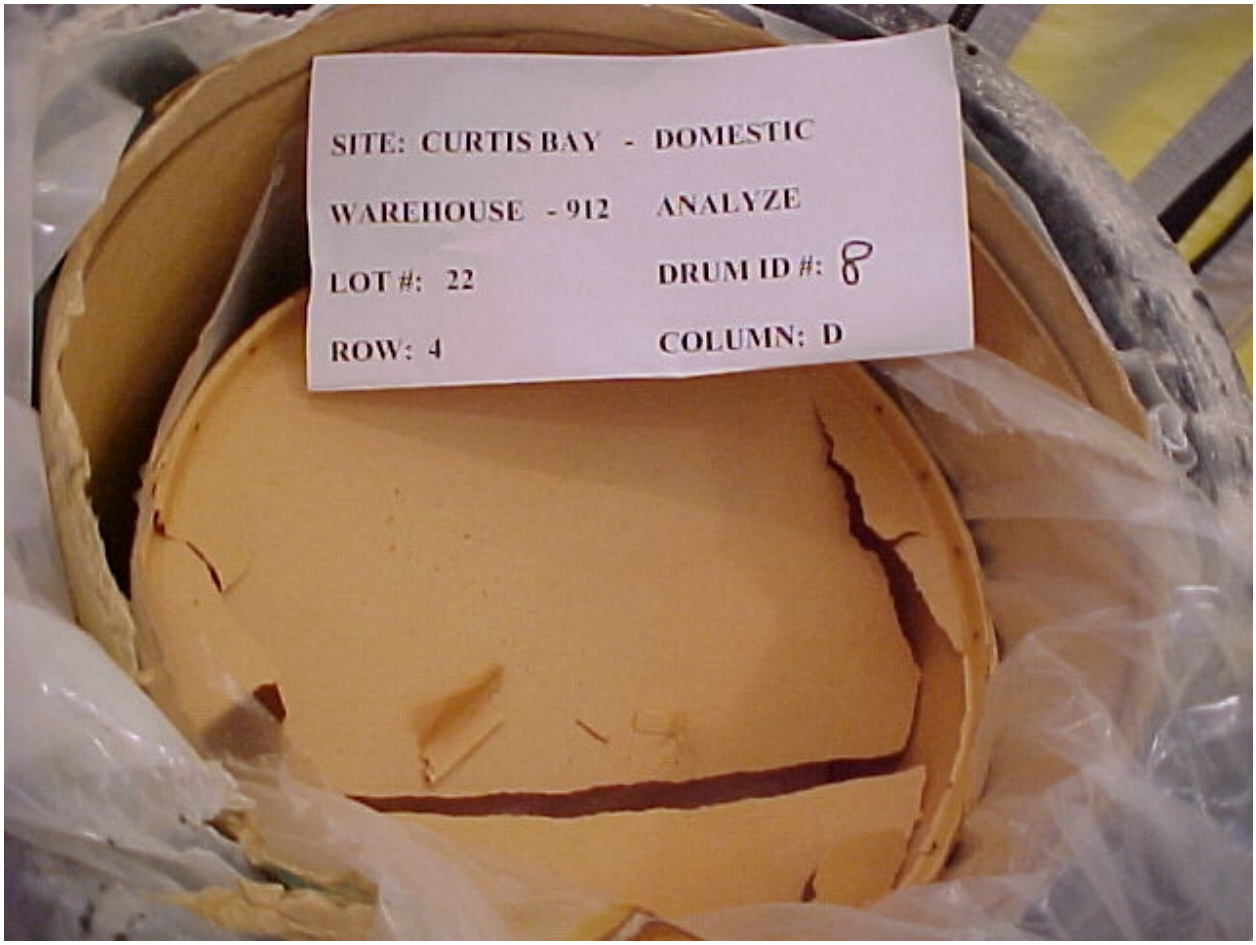
Date	7-10-2002	Time	13:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

Labpack (thin paper) container lid is shown
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	13:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

4th poly “thin film” liner/bag - good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	13:30

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

Thorium Nitrate – monolith – white – solid - dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	22	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	8	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	D

Inspection/Sample Date & Time

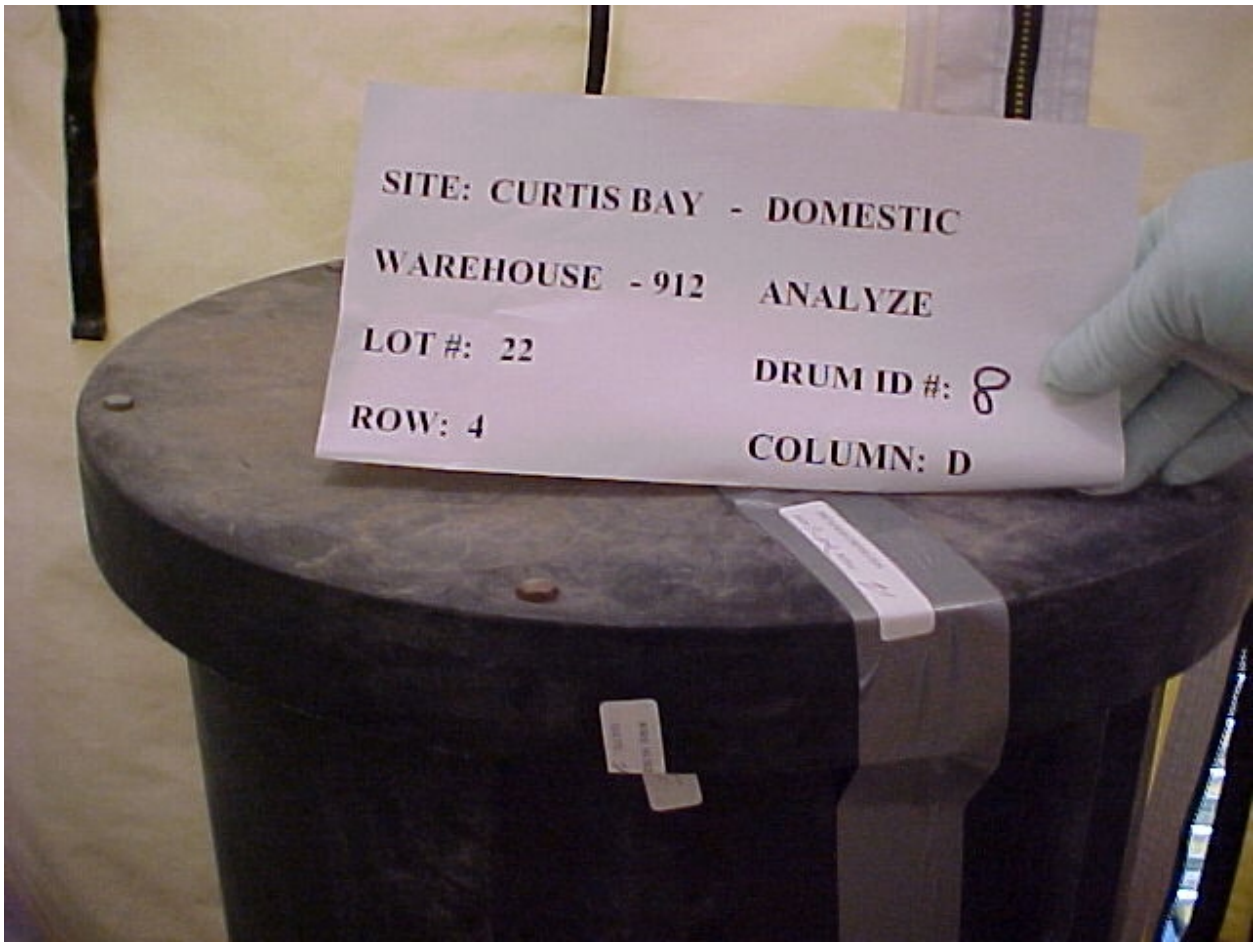
Date	7-10-2002	Time	13:30

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2 mR/hr

Sealed/Dated – Completed



Curtis Bay Depot
Lot #28 – Drum #240
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 28 Drum ID #: 240 Location: Warehouse 911 – Column D – Row 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0% LEL NO +7.2 ppm NOx +20.9 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	12:30

Other Information

Photo No.	1 of 10		
Container	30-gallon steel drum	Container Condition	Good
Dose Rate	Surface	22 mR/hr	
	1 meter	3.0 mR/hr	

Drum released pressure while loosening/removing bolt from 30-gal drum ring
Gasses present during initial loosening of drum ring – until evacuated by HEPA blower (relatively short timeframe – typically less than a few seconds)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

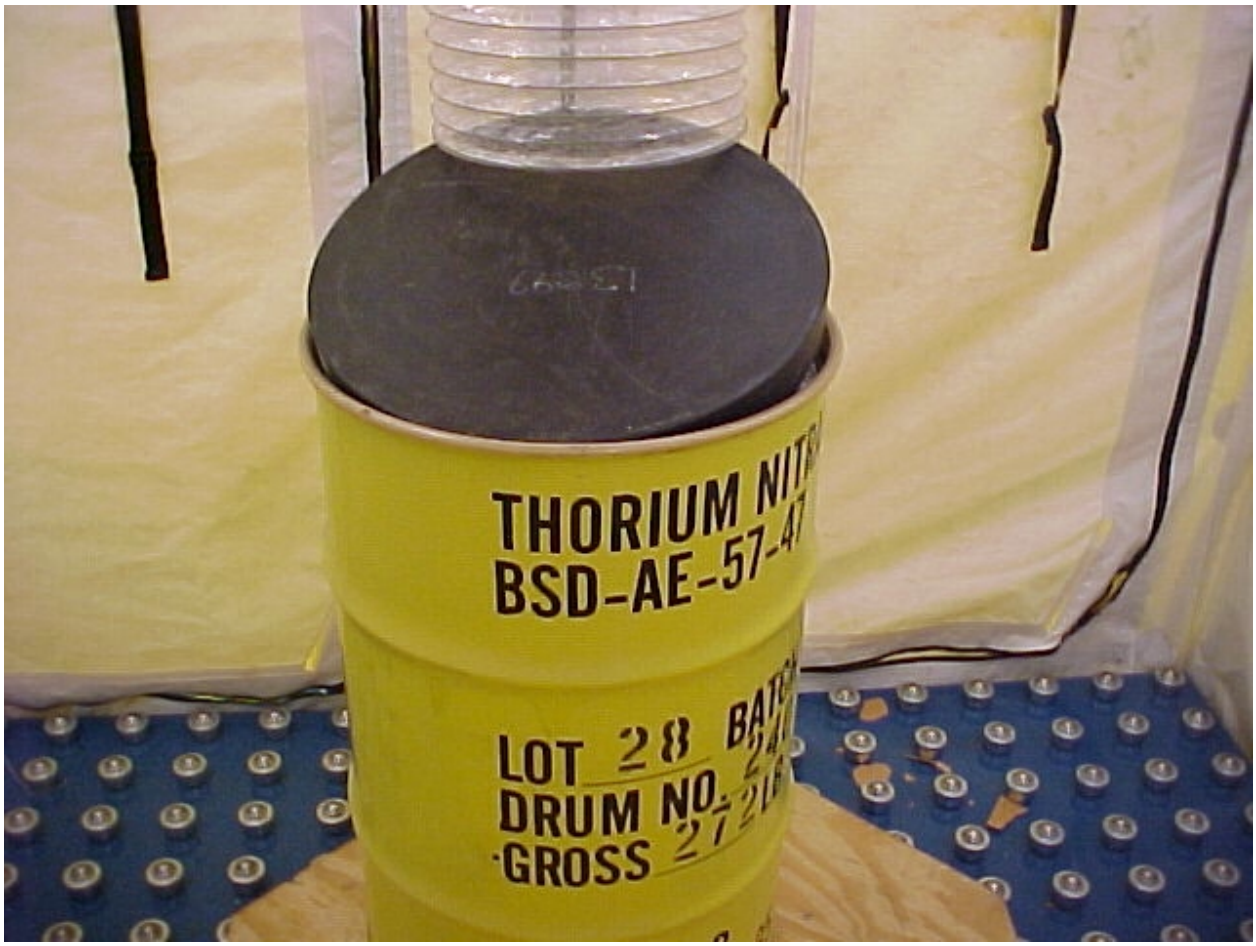
Date	7-1-2002	Time	12:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

After opening the 30gal drum the plastic lid is shown and in good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

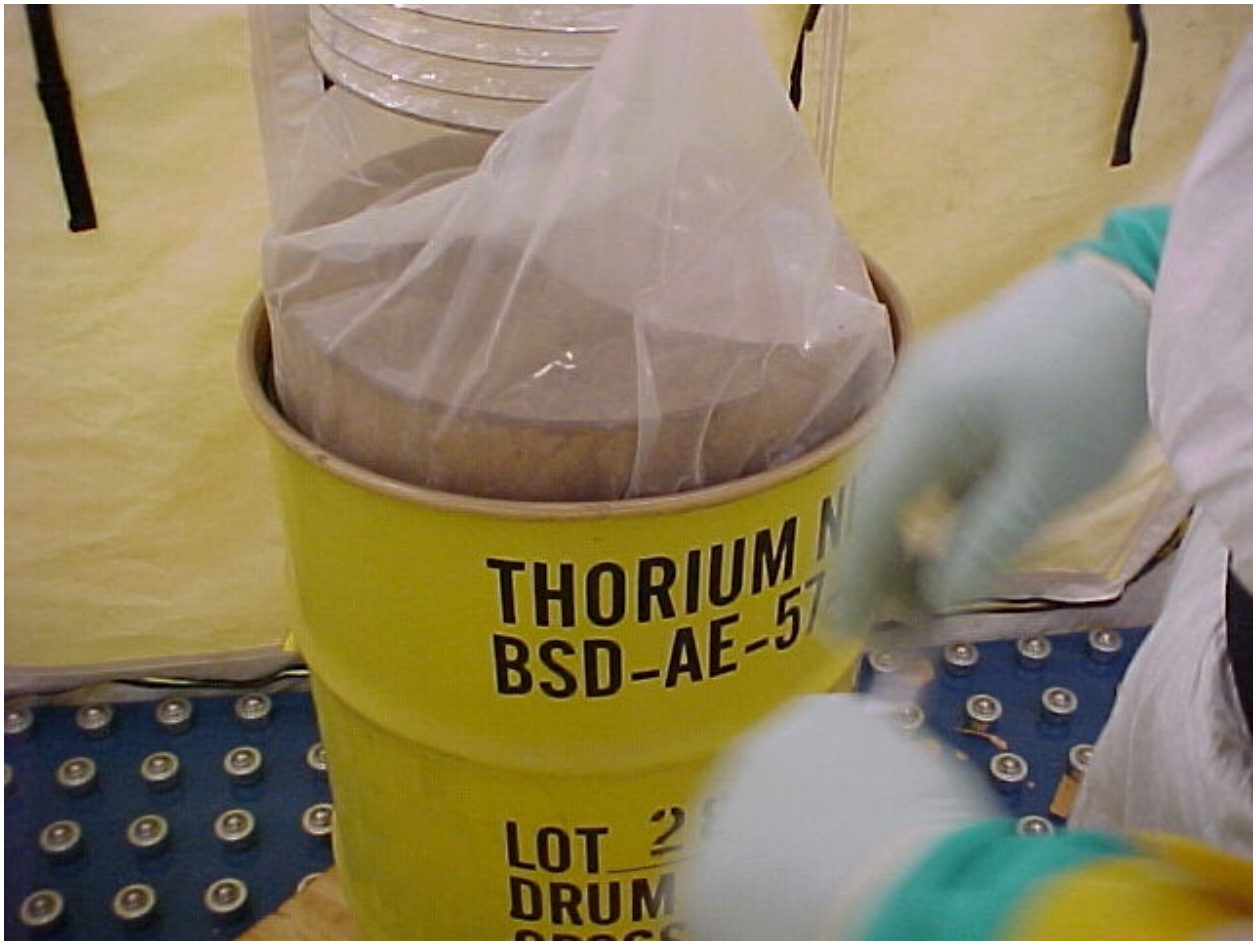
Date	7-1-2002	Time	12:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	12:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Fiber Lid & Drum – Good Condition
Internal pressure causes the tape seal around the fiber drum/lid to separate after the 30-gal drum lid is removed.
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	12:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

2nd poly liner/bag shows a bubble that is from the pressure buildup inside the 3rd poly bag
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	12:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

3rd poly liner/bag - good condition – shows internal pressure buildup inside the bag Upon measuring gas buildup inside of bag, instrumentation indicated NO – 7.2 ppm and NOx – 30.1 ppm.
No gasses present (exterior to bag)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	12:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

The wooden lid mounted on inner most fiber drum that protects the Thorium Nitrate – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	12:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

The final poly liner/bag ("thin film" layer) before the Thorium Nitrate – bag shows slight expansion indicating internal pressure inside the bag – apparently gas is being generated by the ThN material then slowly dissipates through all bags then finally builds up inside the 30-gal drum if the drum is tightly sealed.
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	12:30

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Thorium Nitrate – good condition – monolith – dry – no gasses present following evacuation by HEPA blower.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	28	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	240	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	D

Inspection/Sample Date & Time

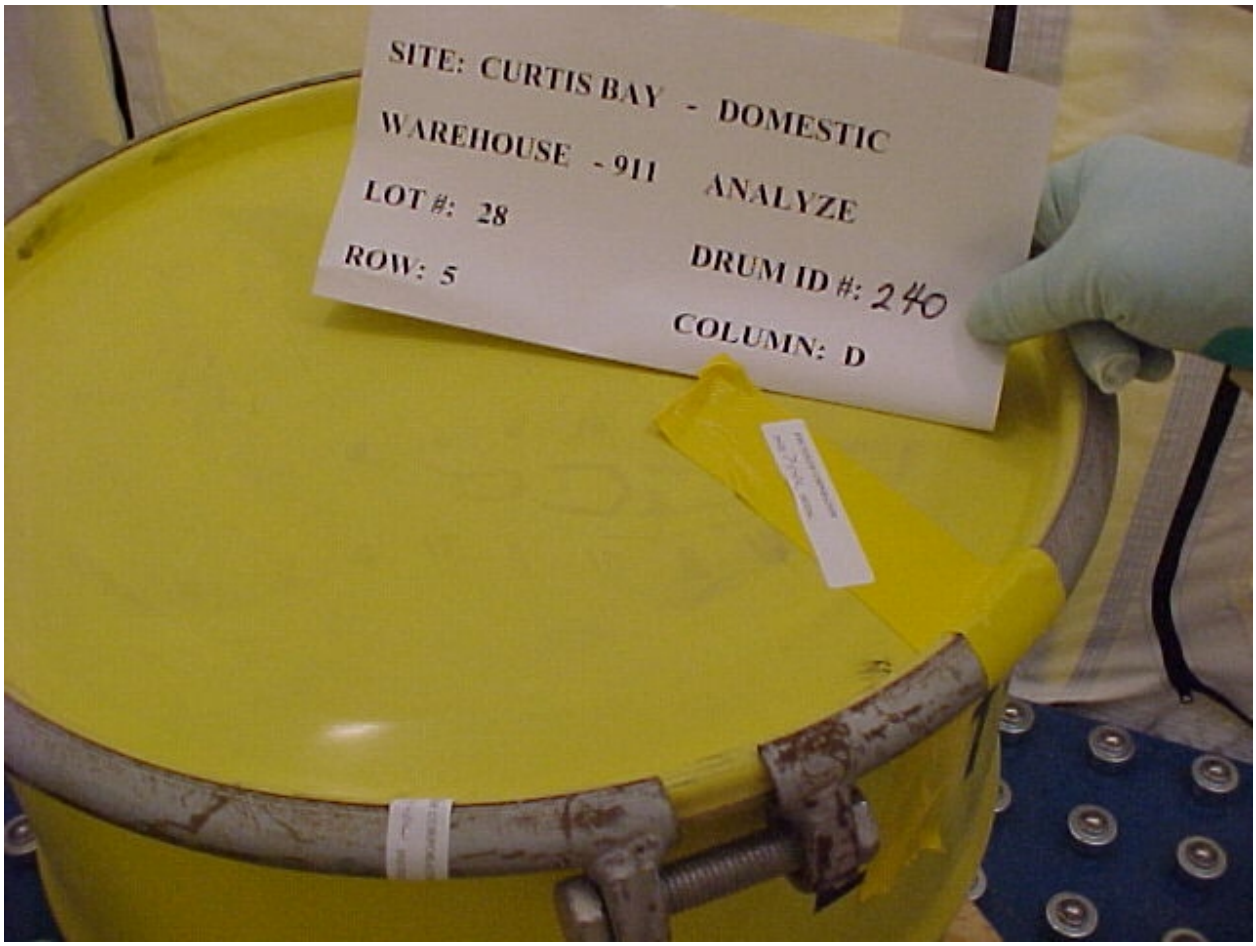
Date	7-1-2002	Time	12:30

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Sealed/Dated – Completed



Curtis Bay Depot
Lot #29 – Drum #30
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 29 Drum ID #: 30 Location: Warehouse 912 – Column C - Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-09-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

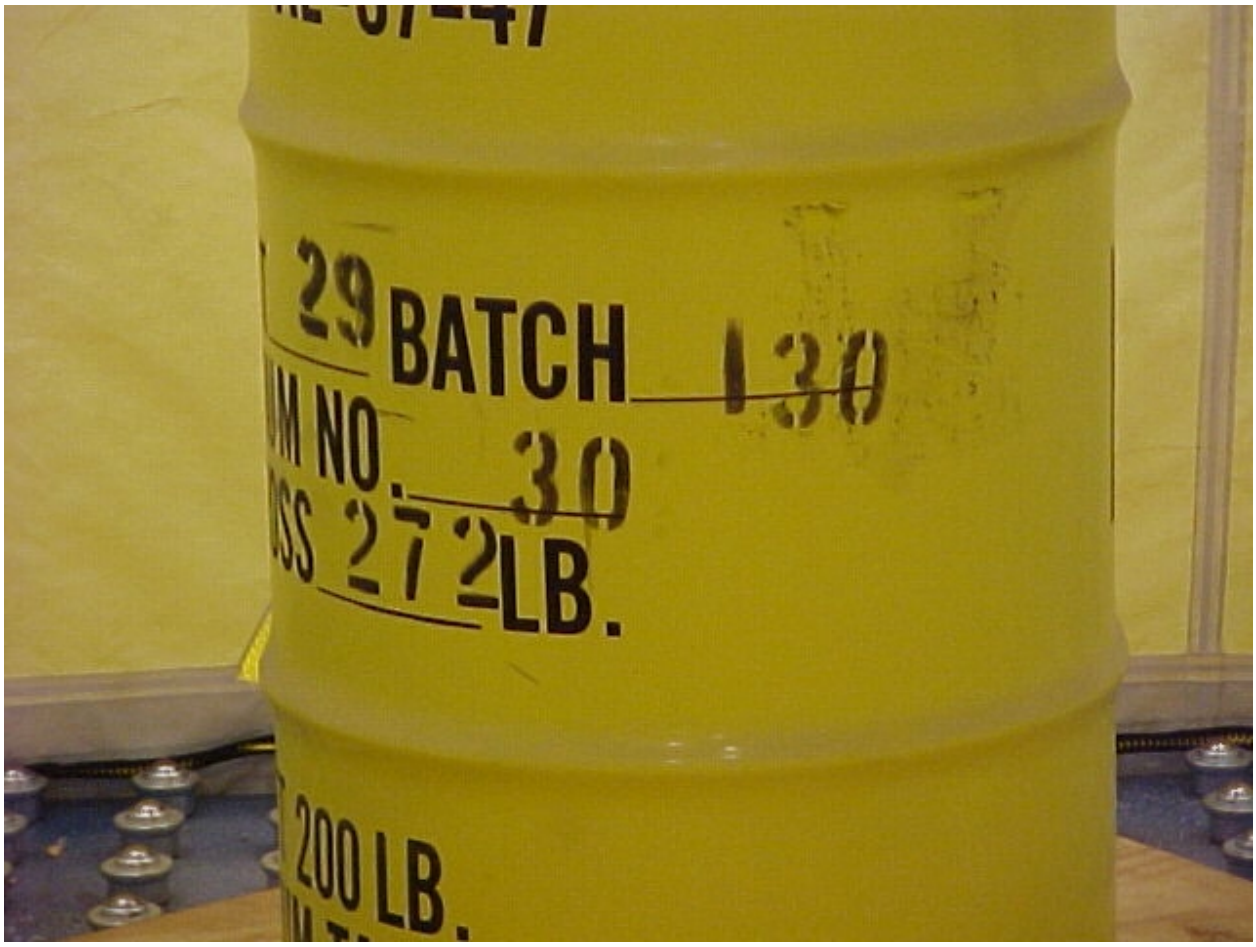
Date	7-09-2002	Time	14:45

Other Information

Photo No. 1 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
Drum released pressure while loosening/removing bolt from 30-gal drum ring
Gasses present during initial loosening of drum ring – until evacuated by HEPA blower
(relatively short timeframe – typically less than a few seconds)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:45

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
Pressure buildup inside container inflates innermost poly bags resulting in outer packagings being pushed vertically out of the drum (including the black plastic lid shown in this photograph)
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:45

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Gas pressure buildup inside container raises poly liner/bag vertically out of drum.
No gasses present (exterior to bag – please note that HEPA blower is operating directly above drum which would evacuate any gasses slowing dissipating through packagings prior to instrumentation being able to measure these small quantities).

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

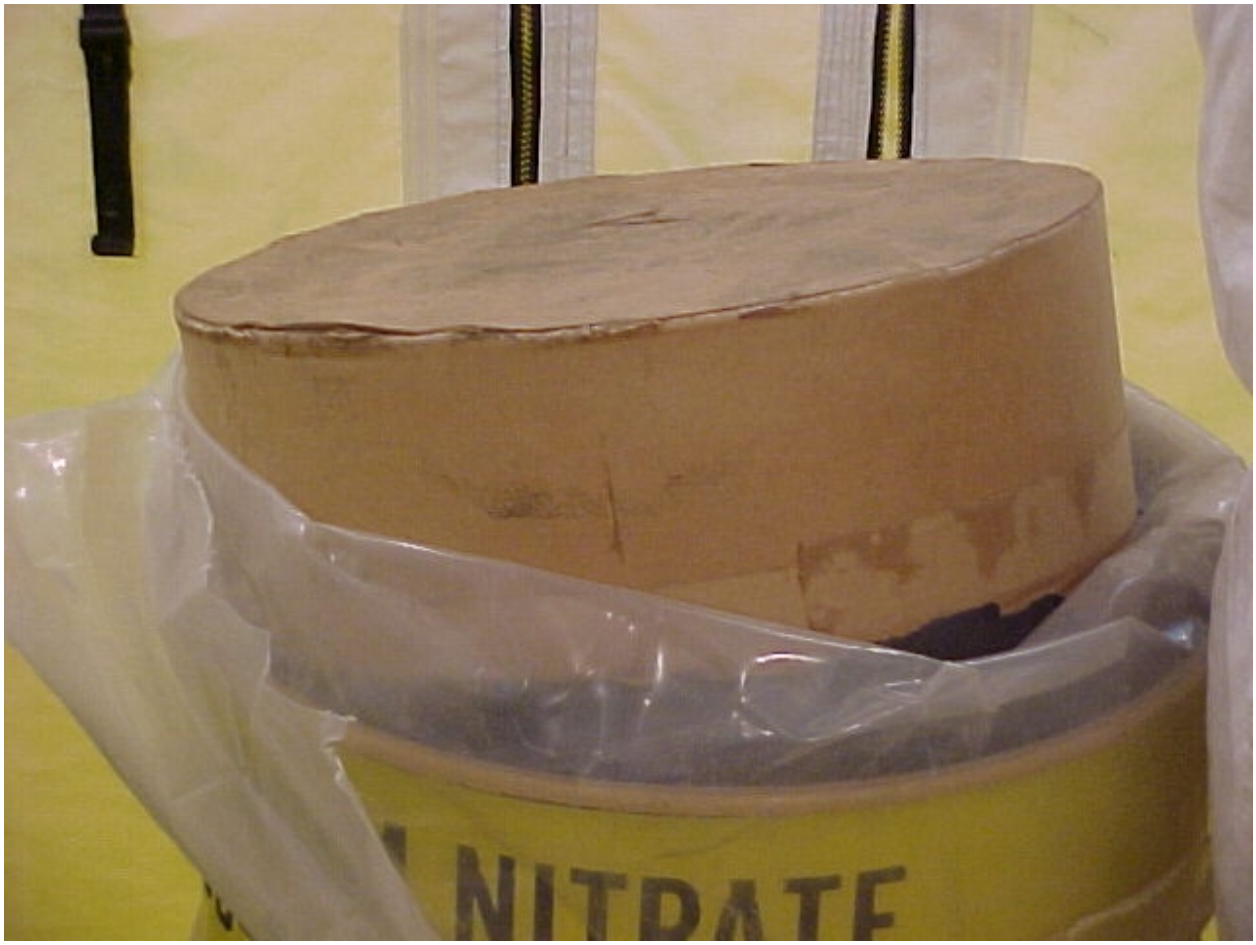
Date	7-09-2002	Time	14:45

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Fiber lid on outermost fiber drum – good condition
Pressure buildup inside container raises poly liner/bag
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:45

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside container raises poly liner/bag
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:45

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
Pressure buildup inside container raises poly liner/bag
Opened Poly liner/bag – No Gasses in breathing zone
Gasses in headspace– LEL – 4.6% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:45

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Wooden lid mounted on innermost fiber (overpack) drum – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:45

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag (thin film) - good condition – shows slight pressurization indicating gas generation from ThN monolith block
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:45

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Thorium Nitrate – monolith – white – solid - dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	29	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	30	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	2
		Column	C

Inspection/Sample Date & Time

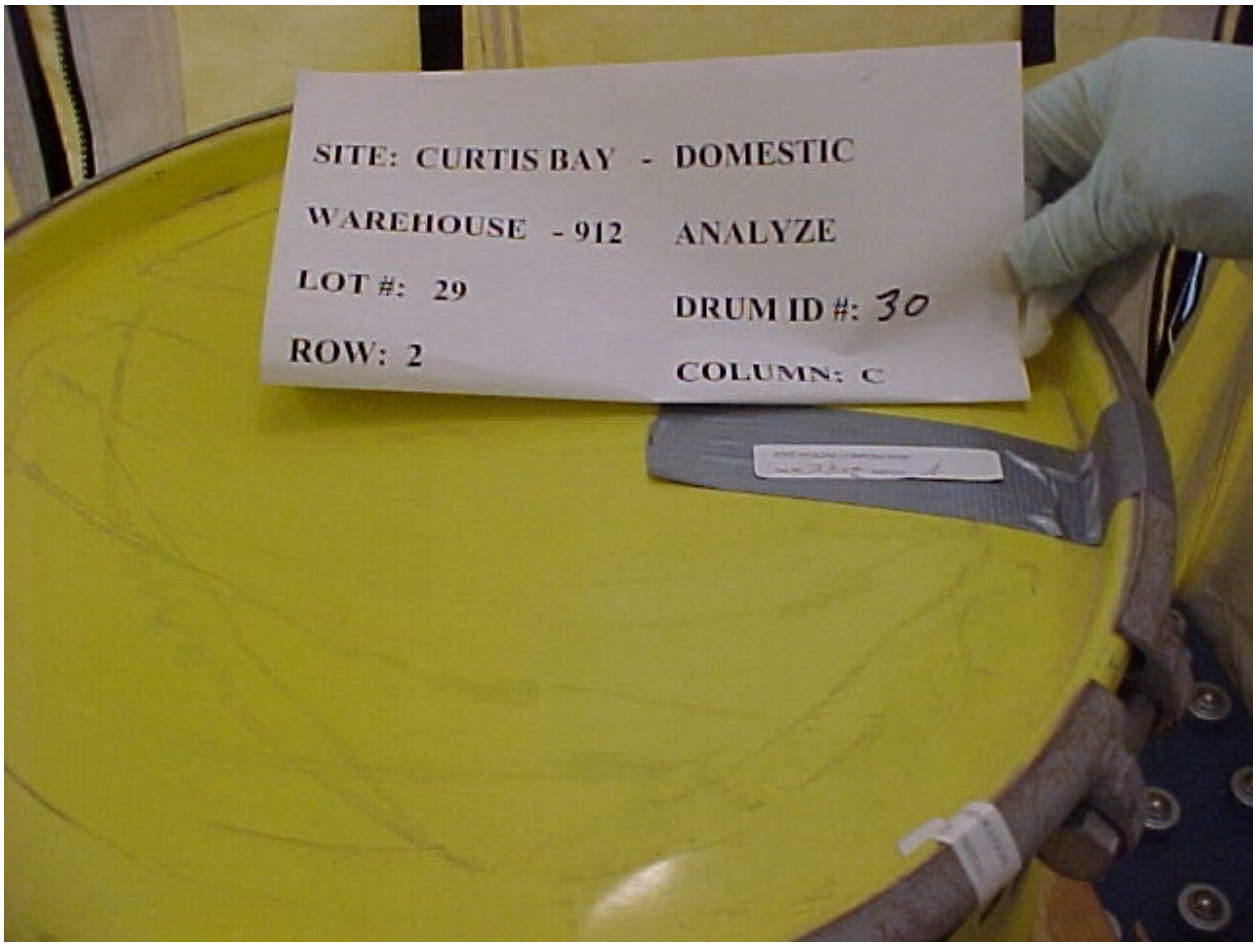
Date	7-09-2002	Time	14:45

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #30 – Drum #171
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 30 Drum ID #: 171 Location: Warehouse 911 – Column B - Row 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO +0 ppm NOx +0 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

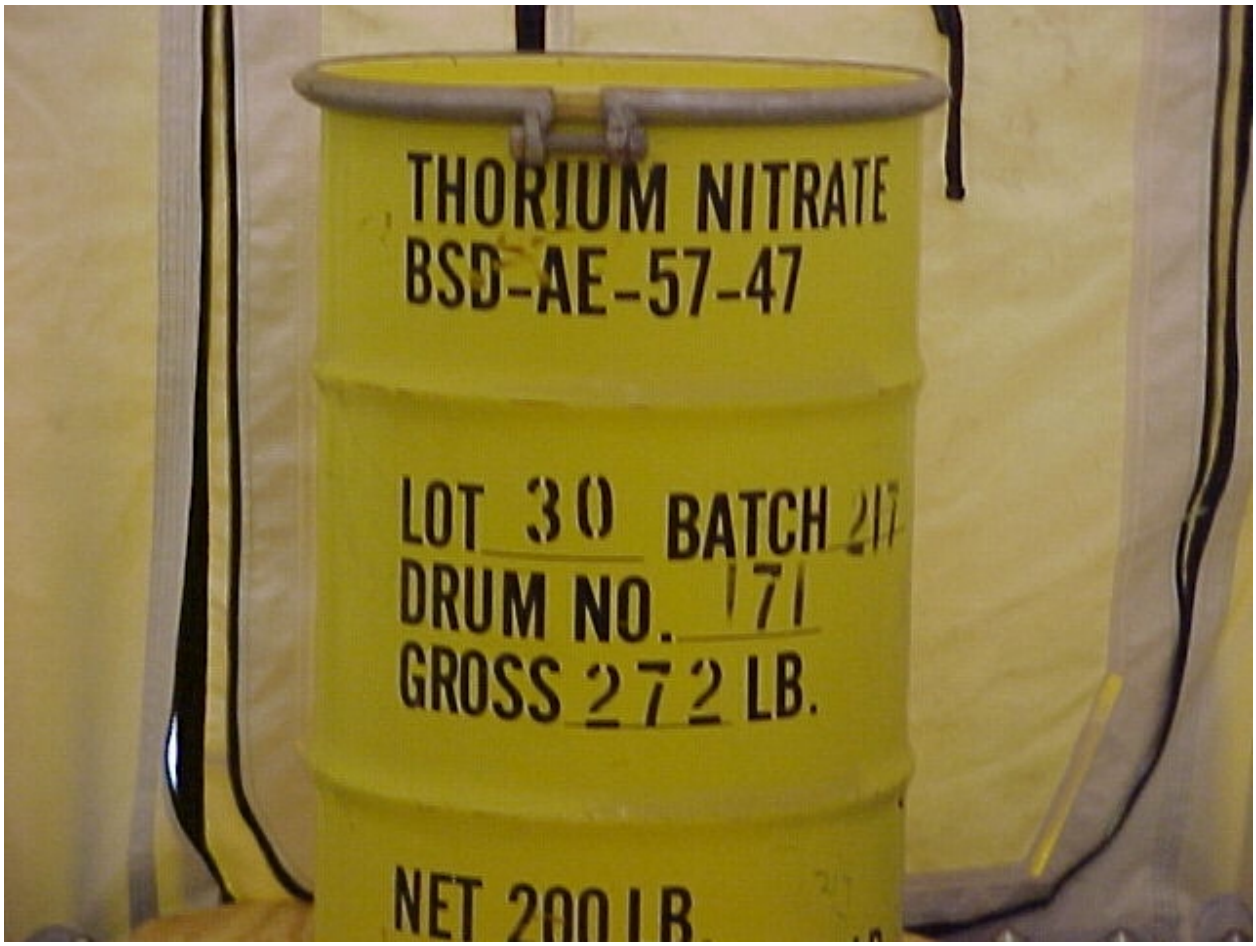
Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:40

Other Information

Photo No.	1 of 10		
Dose Rate	Surface	22 mR/hr	
	1 meter	3.0 mR/hr	
Container	30-gallon steel drum	Container Condition	Good



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

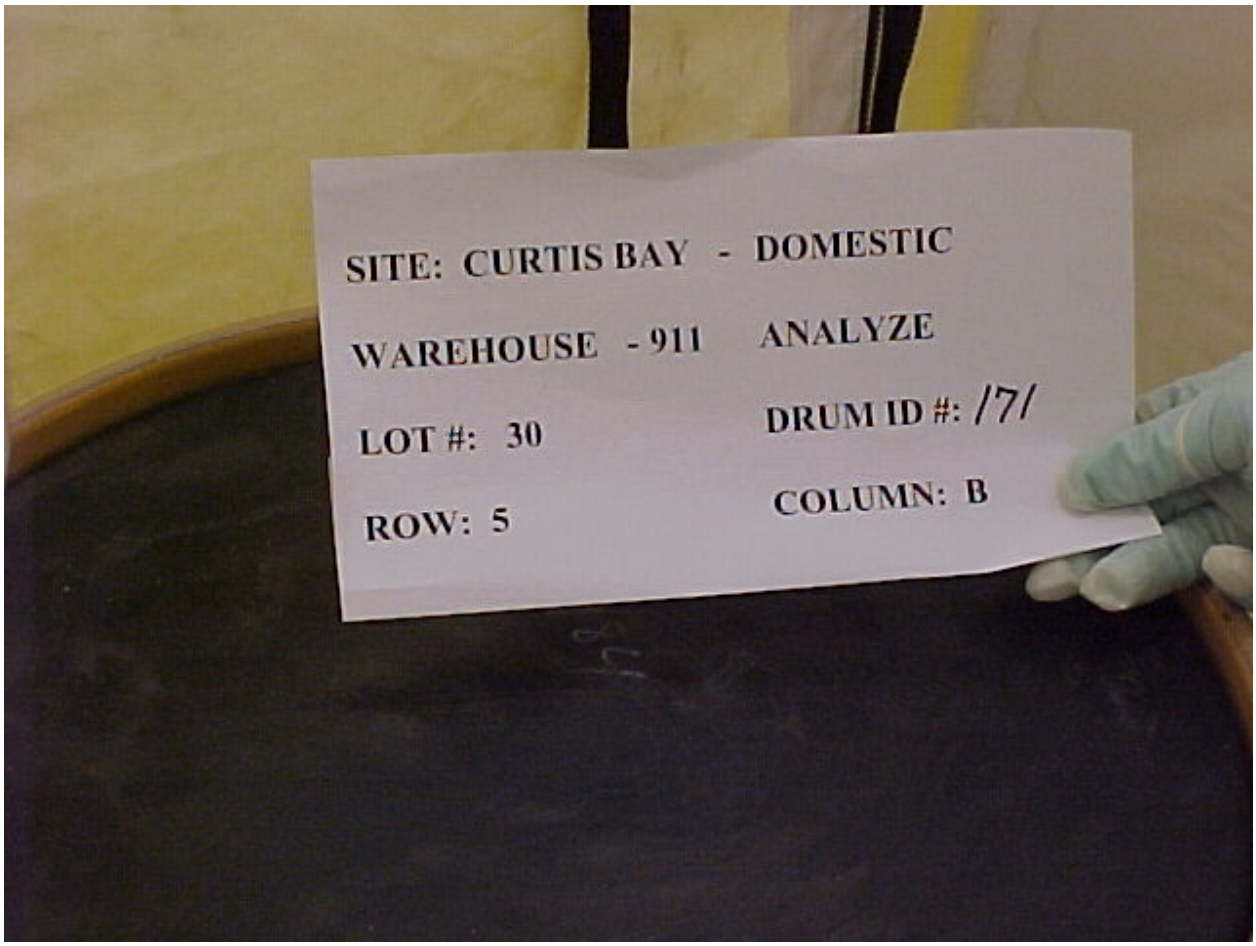
Date	6-28-2002	Time	11:40

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

The lid of the black plastic drum liner – since lid is not raised – typically indicates no internal pressure
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

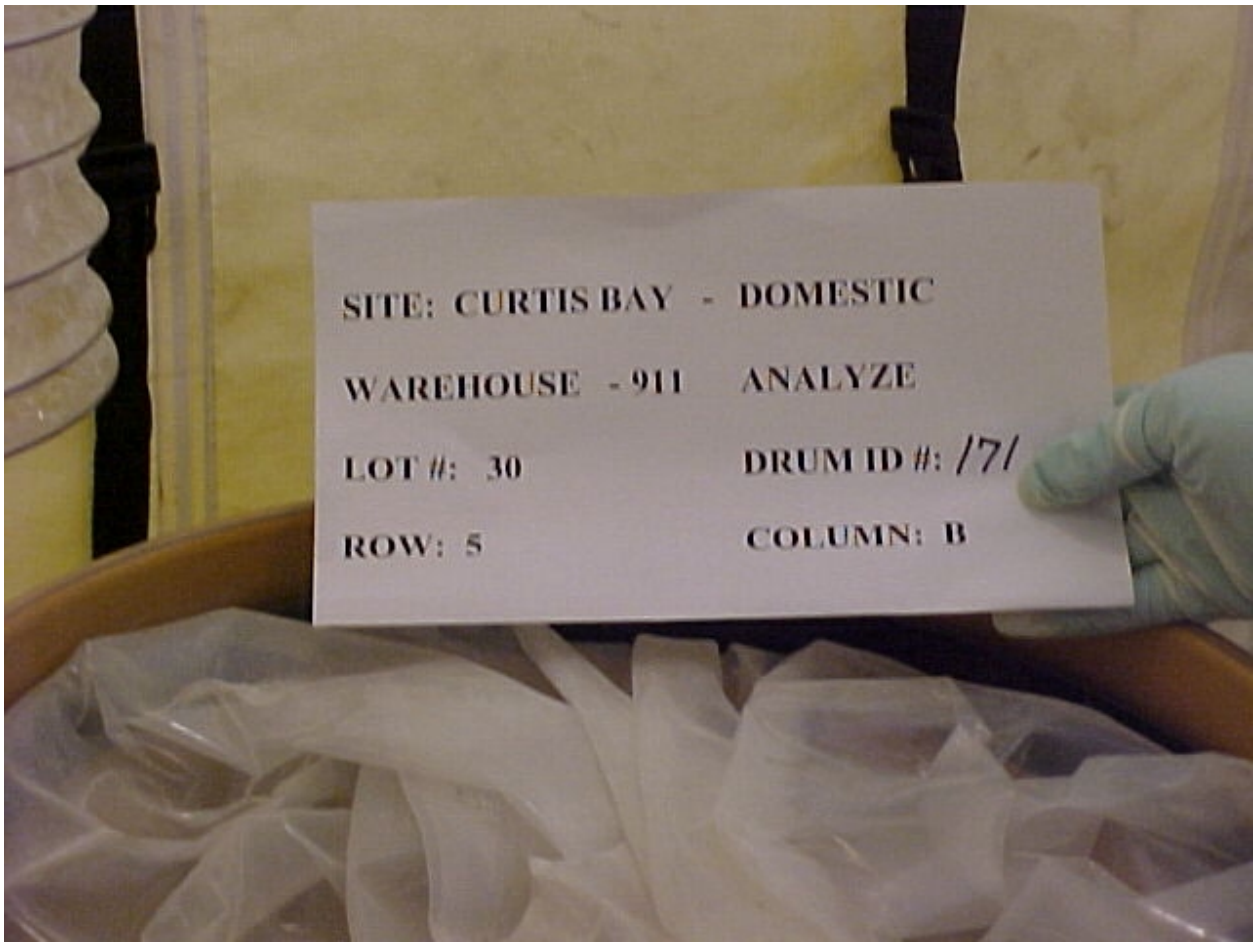
Date	6-28-2002	Time	11:40

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

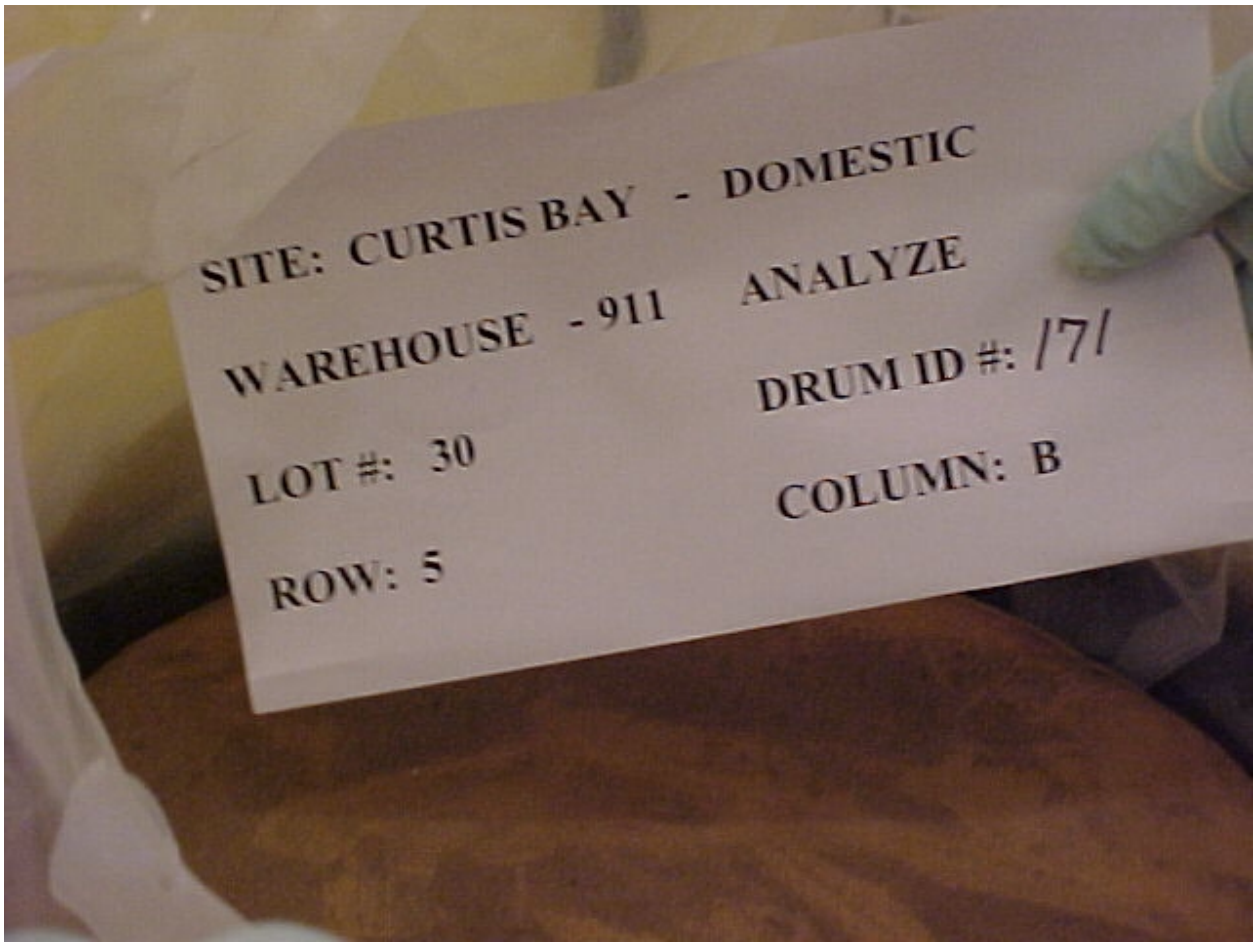
Date	6-28-2002	Time	11:40

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

This picture shows the fiber lid on the outermost fiber drum inside of the 30-gal drum
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

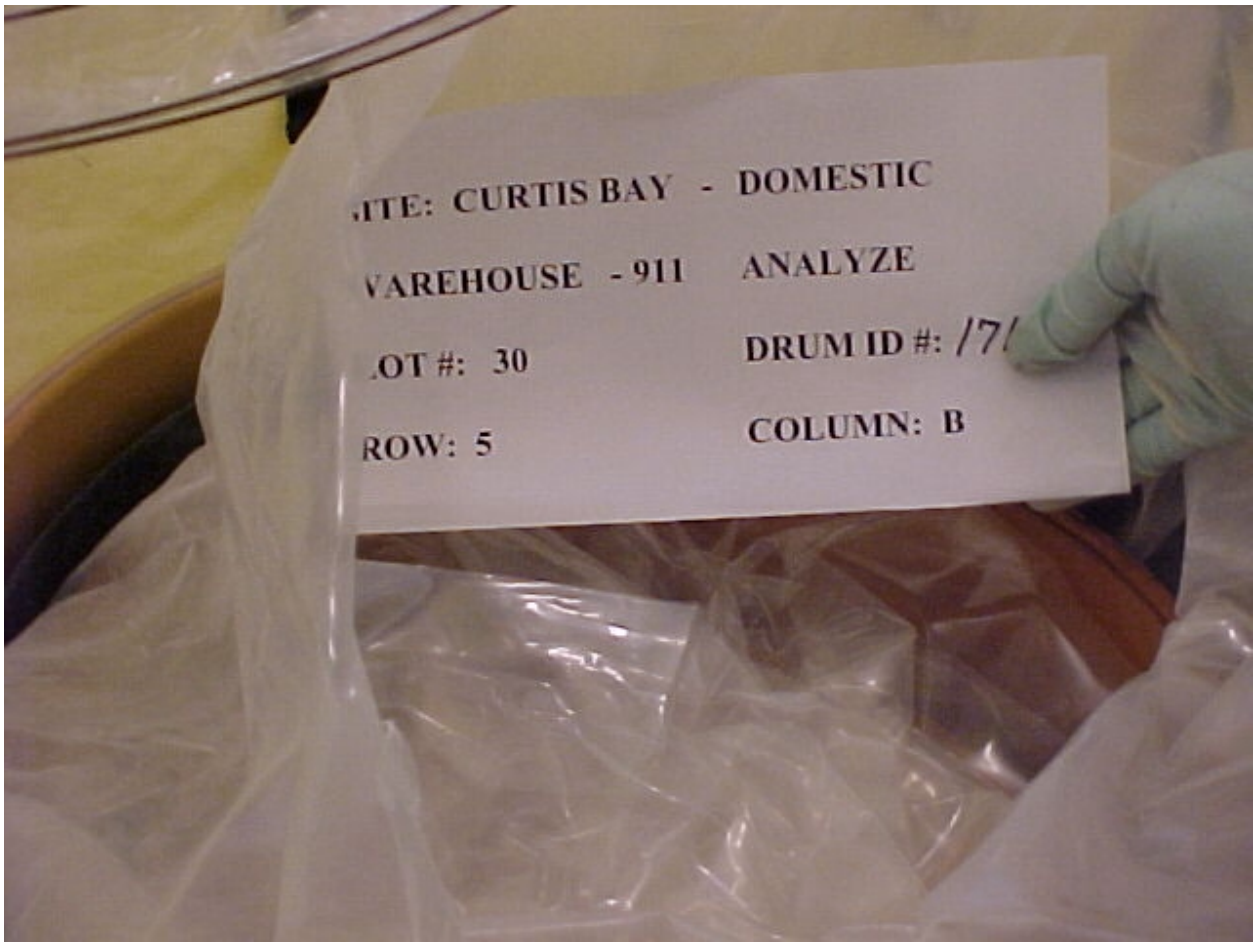
Date	6-28-2002	Time	11:40

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

After opening the 2nd poly liner/bag – a picture is taken showing the 3rd poly liner/bag
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:40

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

4th poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:40

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

A picture of the wooden lid on in the inner most fiber (overpack) drum – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:40

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Picture of the labpack “paper thin” lid after removing the wooden lid
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:40

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Picture of ThN material – monolith – dry – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	30	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	171	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	5
		Column	B

Inspection/Sample Date & Time

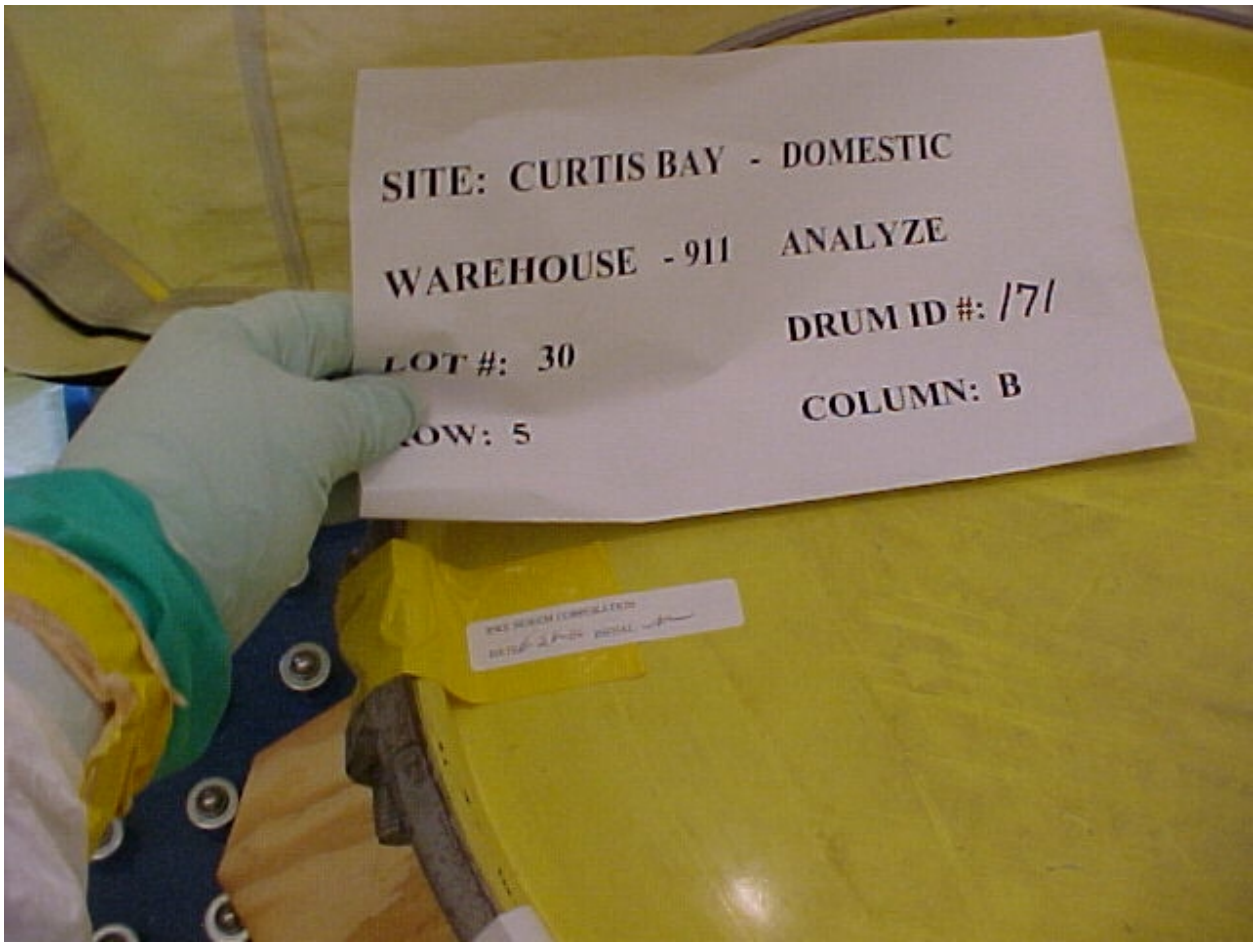
Date	6-28-2002	Time	11:40

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #36 – Drum #267
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 36 Drum ID #: 267 Location: Warehouse 911 – Column D - Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO +0 ppm NOx +0 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No.	1 of 10		
Dose Rate	Surface	24 mR/hr	
	1 meter	3.2 mR/hr	
Container	30-gallon steel drum	Container Condition	Good

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

After opening the 30-gal drum, the black plastic lid is shown – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

1st poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

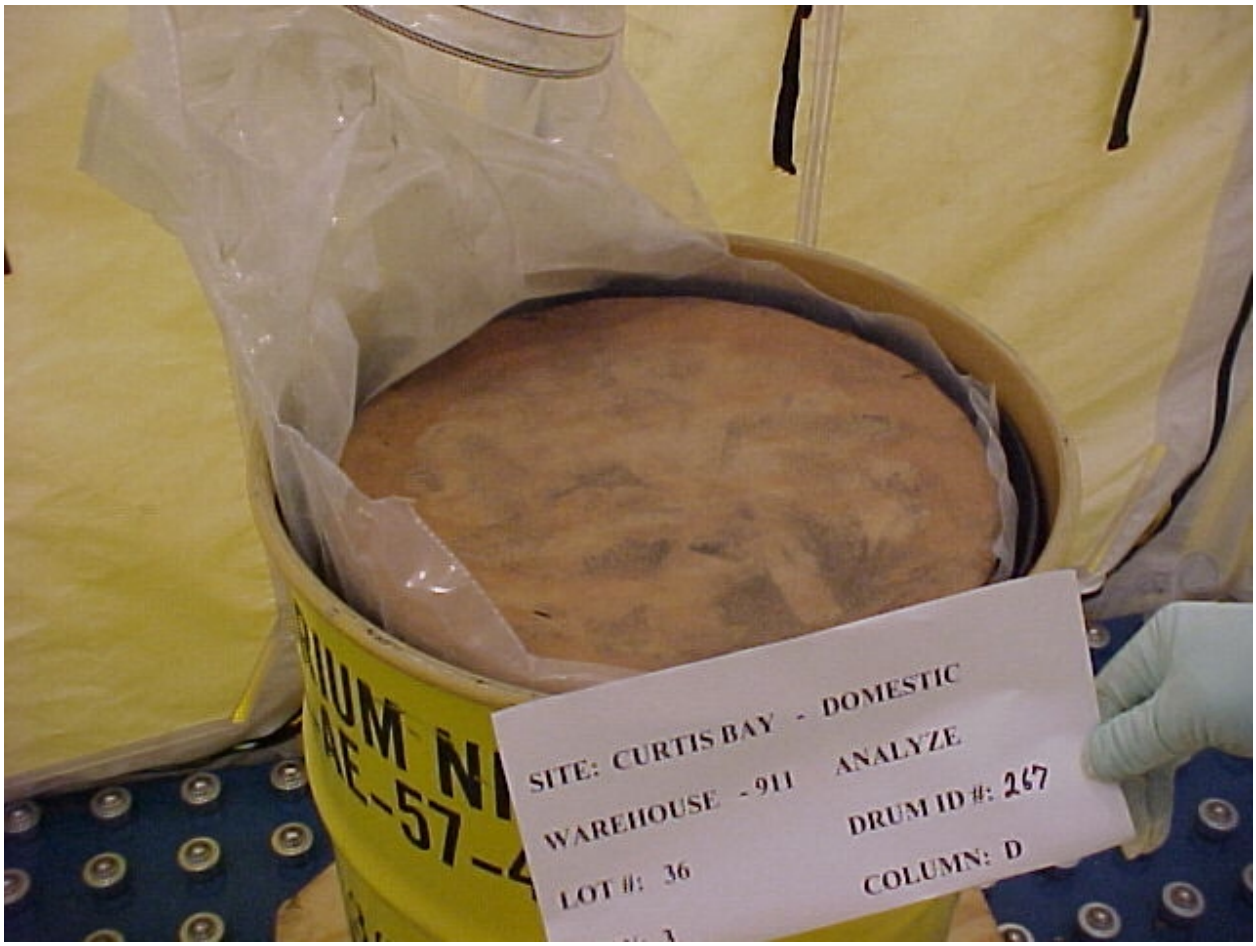
Date	7-01-2002	Time	11:40

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Fiber lid from outermost fiber drum inside of drum – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

2nd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

3rd poly liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

The wooden lid on the innermost fiber (lab-pack) drum – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

A piece of the lab-pack "paper" lid and the final poly liner protecting the ThN material
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

Date	7-01-2002	Time	11:40

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

ThN material – monolith – dry - solid
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	36	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	267	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	3
		Column	D

Inspection/Sample Date & Time

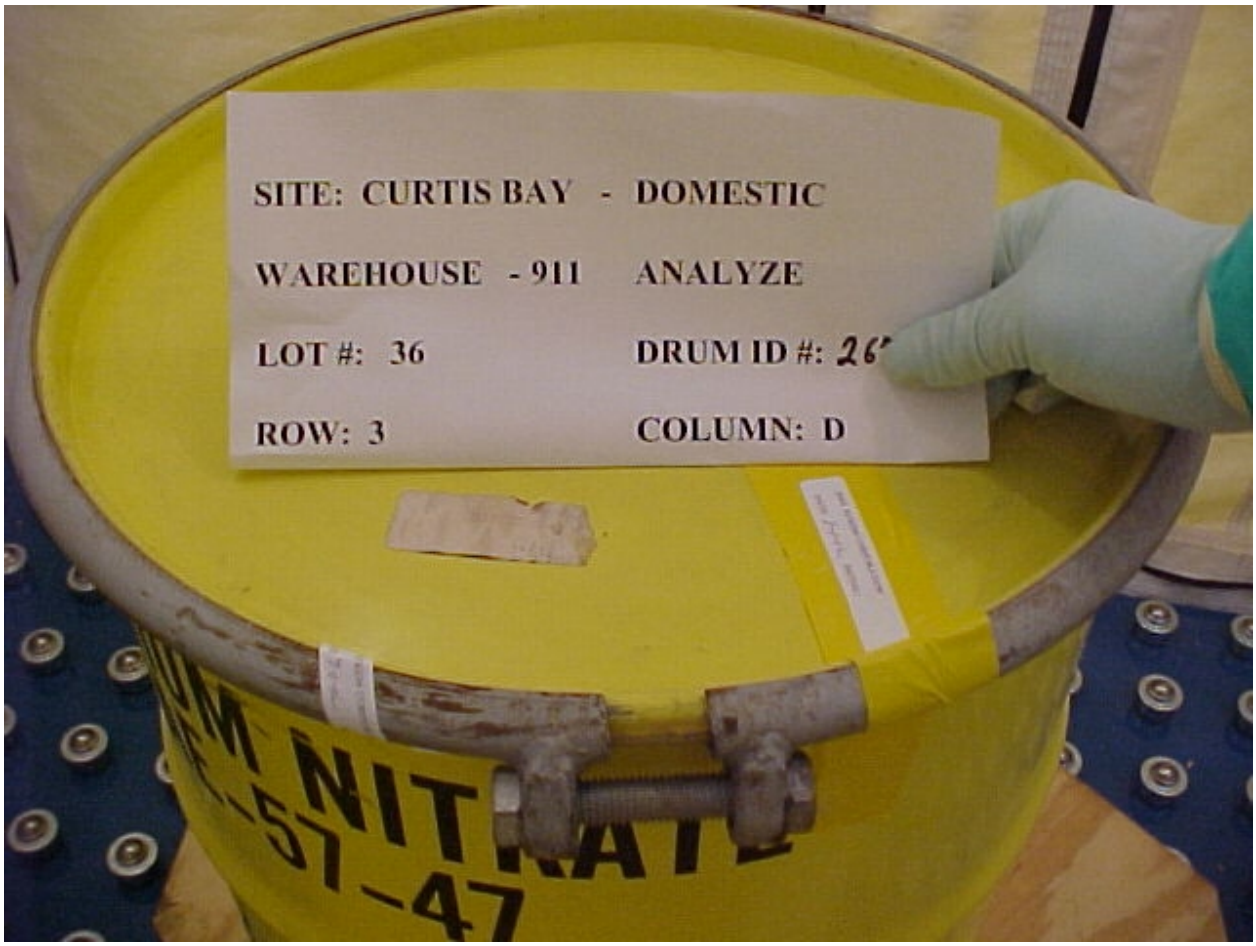
Date	7-01-2002	Time	11:40

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #37 – Drum #19
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 37 Drum ID #: 19 Location: Warehouse 912 – Column B – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO +0 ppm NOx +0 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:30

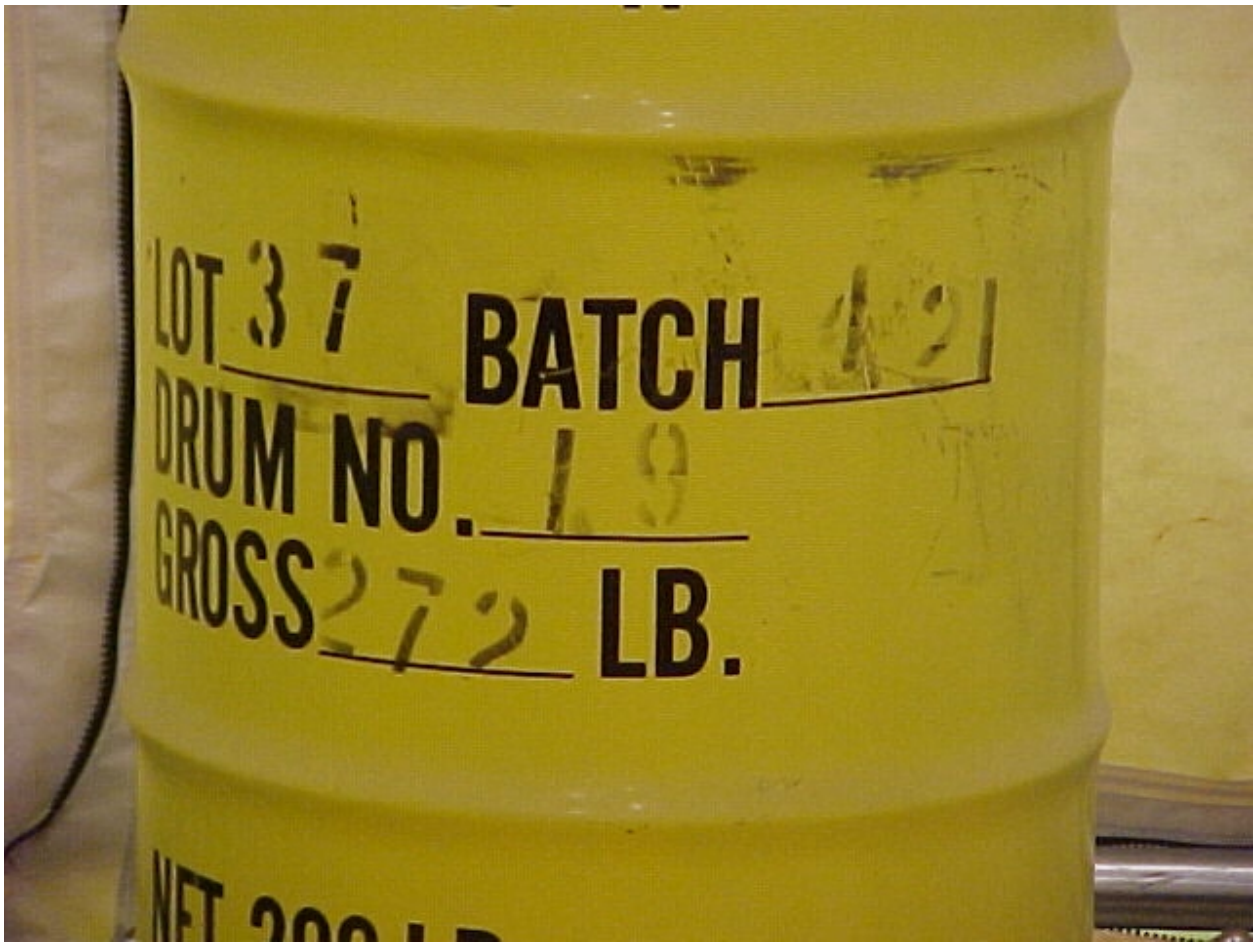
Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Container	30-gallon steel drum	Container Condition	Has indentations on lid

Indentations indicate drum is currently pressurized or has relieved through drum gasket seal – drum was not pressurized from tap test and no gas vented while loosening bolt on drum ring; therefore, indentations probably indicate that internal pressure has probably vented through drum gasket seal.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid from 30-gal poly drum liner – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

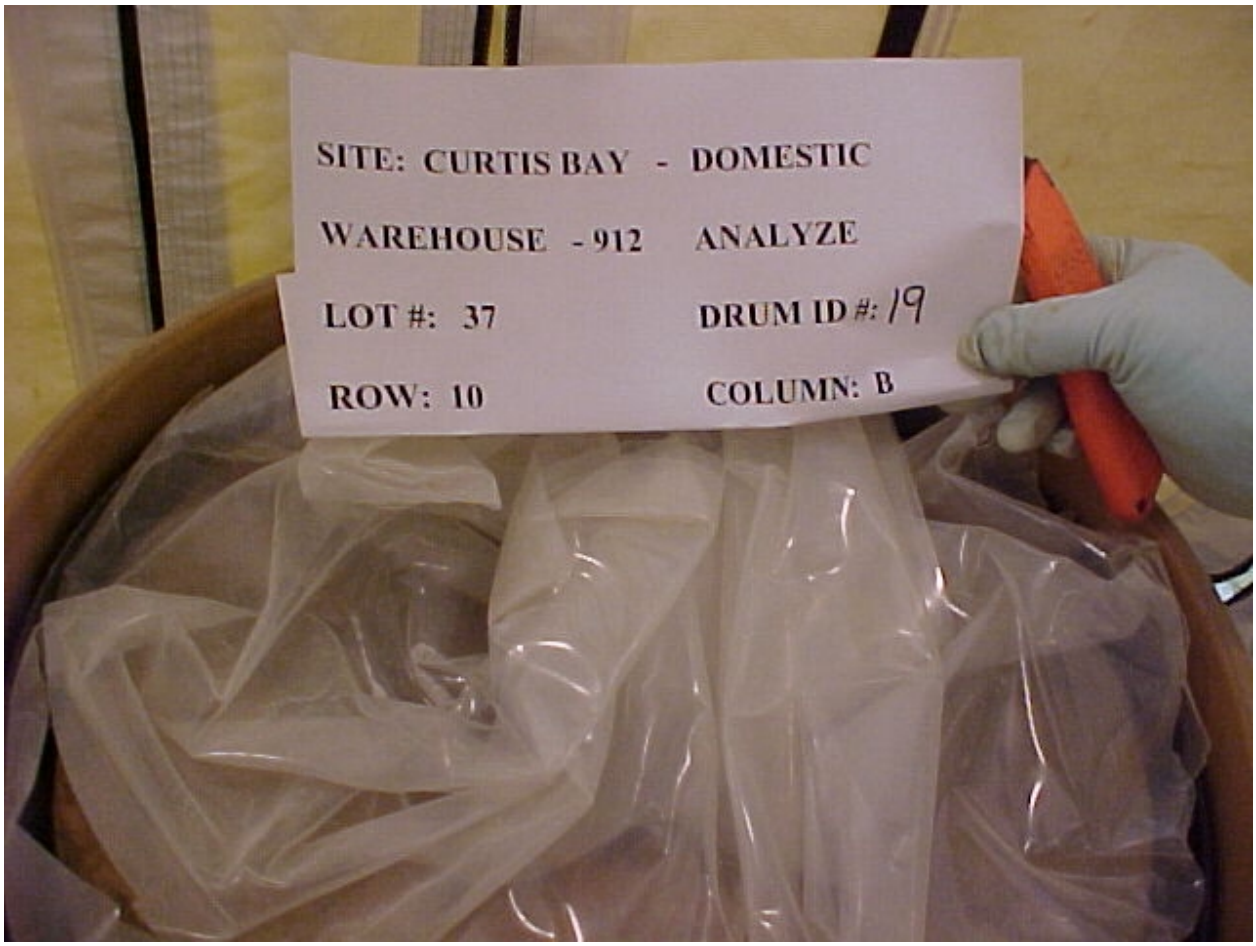
Date	7-10-2002	Time	09:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

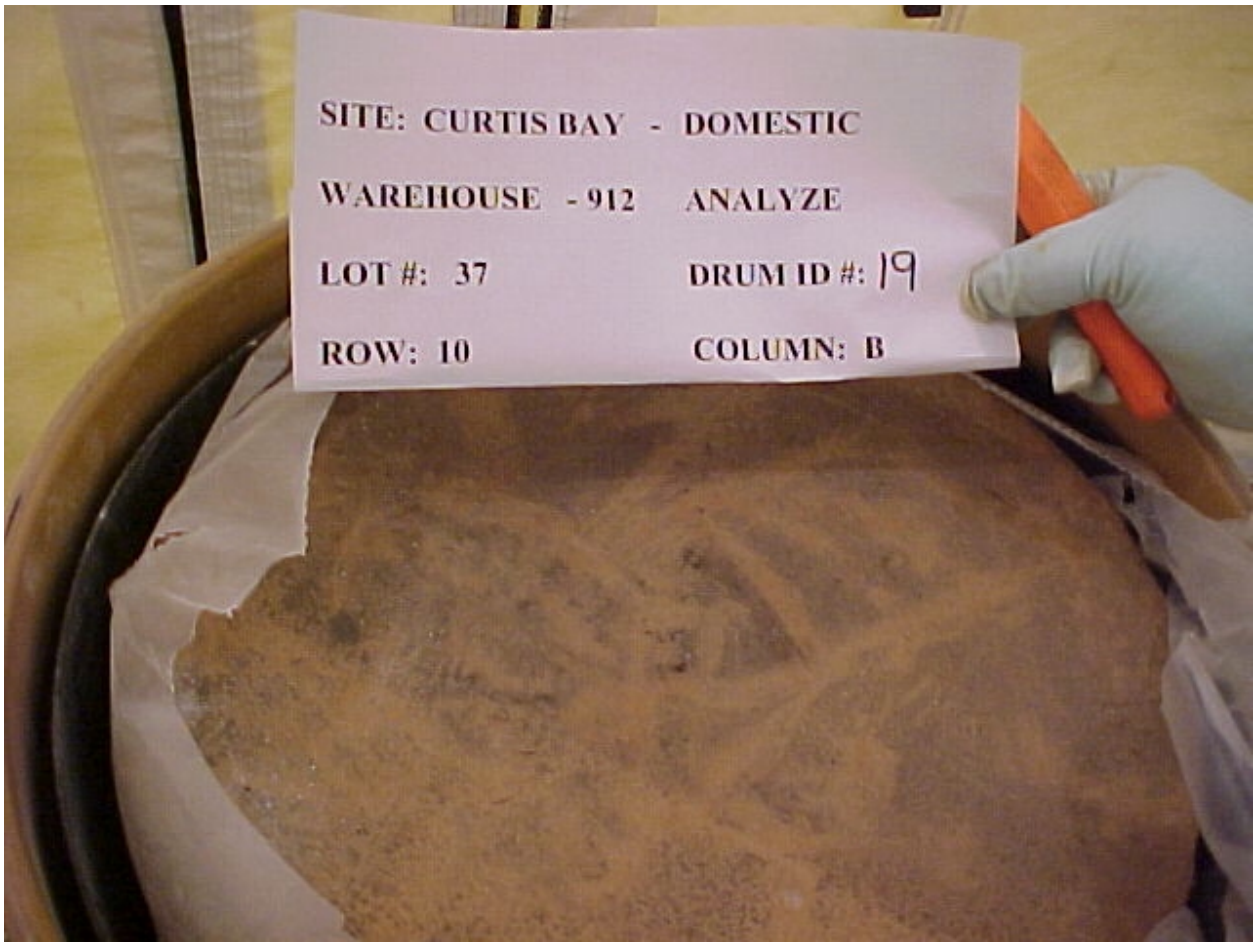
Date	7-10-2002	Time	09:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber lid from outermost fiber drum in drum – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

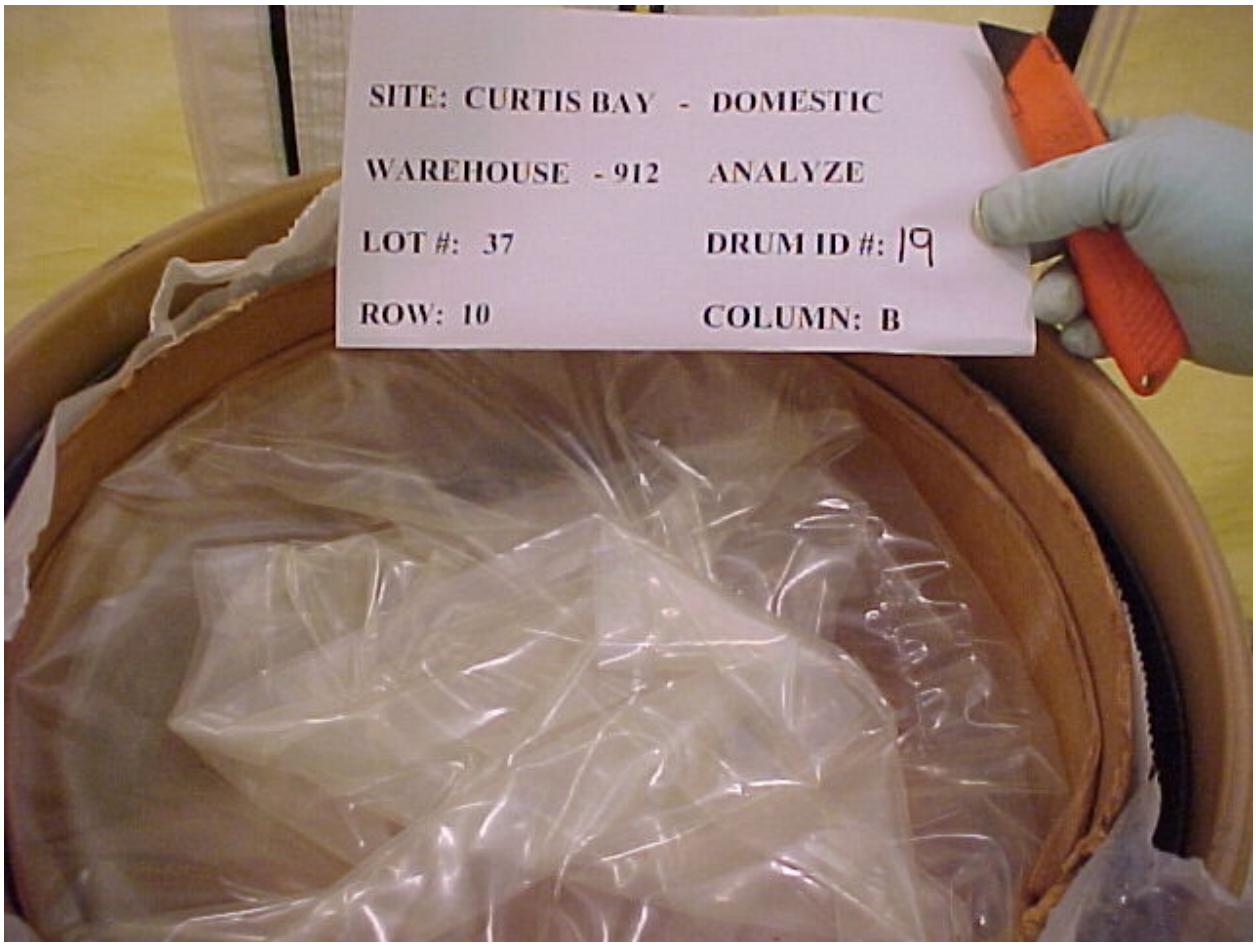
Date	7-10-2002	Time	09:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

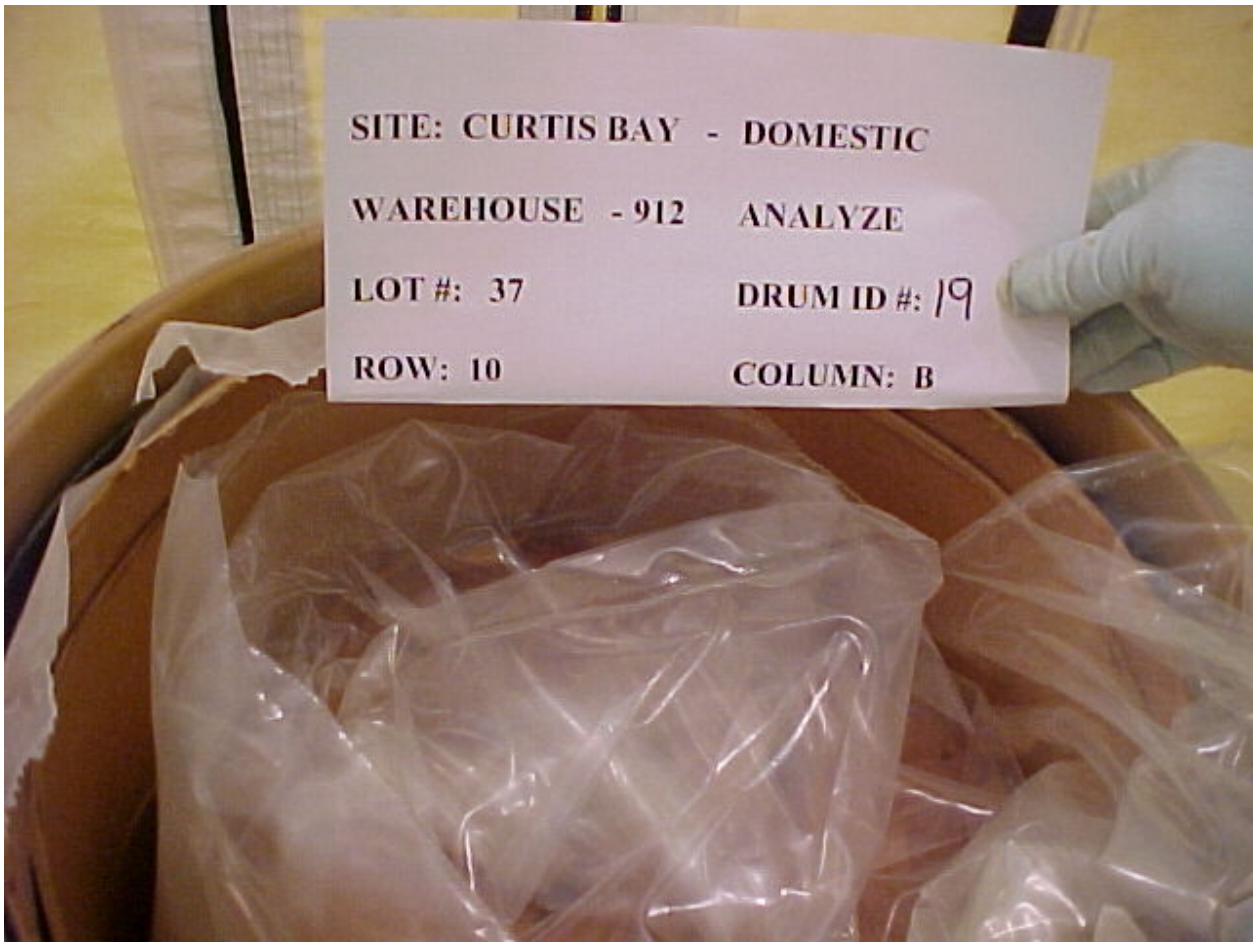
Date	7-10-2002	Time	09:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid on innermost fiber (lab-pack) drum – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly (thin film) liner/bag – good condition
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid - dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	37	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	19	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	10
		Column	B

Inspection/Sample Date & Time

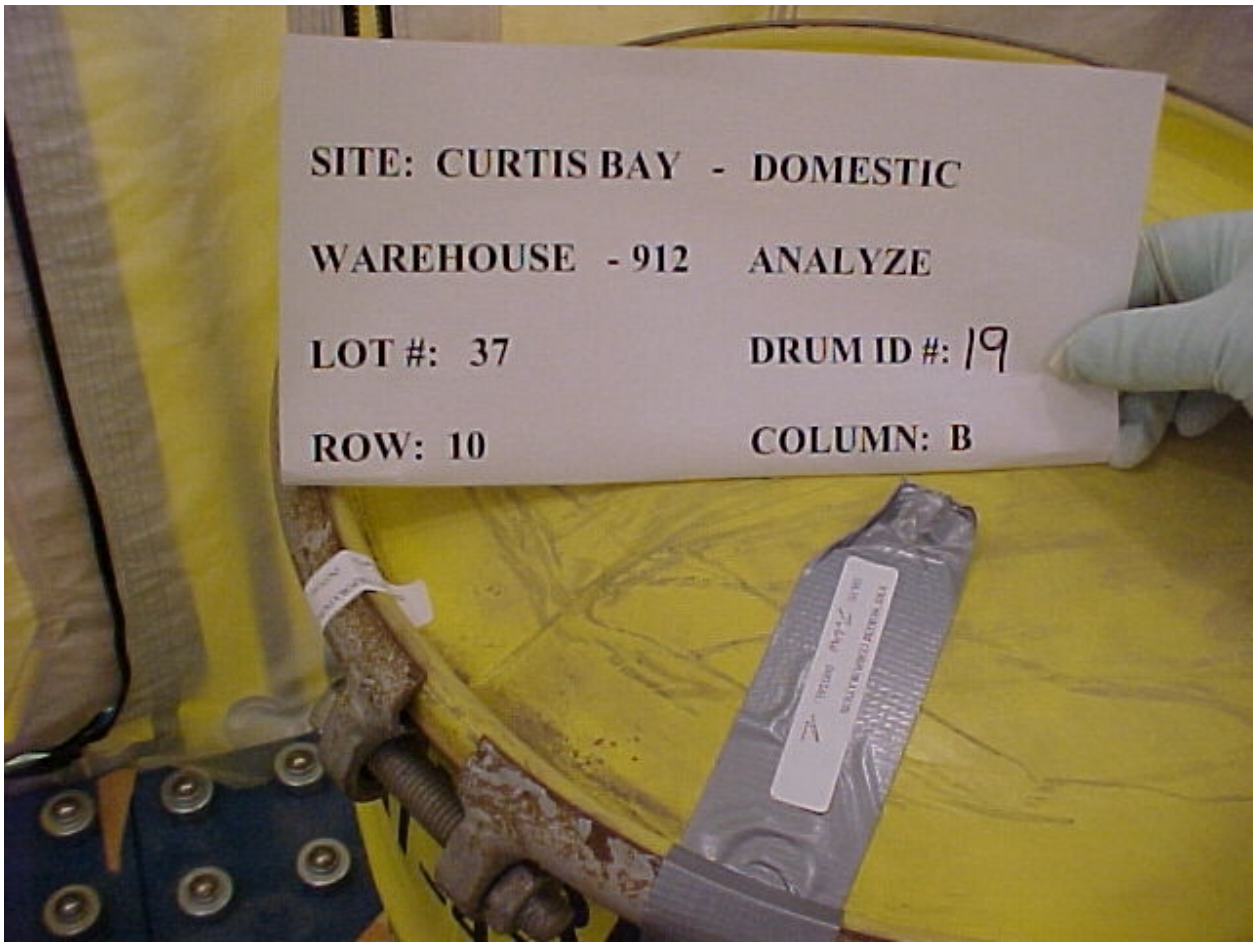
Date	7-10-2002	Time	09:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - completed



Curtis Bay Depot
Lot #45 – Drum #105
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 45 Drum ID #: 105 Location: Warehouse 911 – Column A - Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.8 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:30

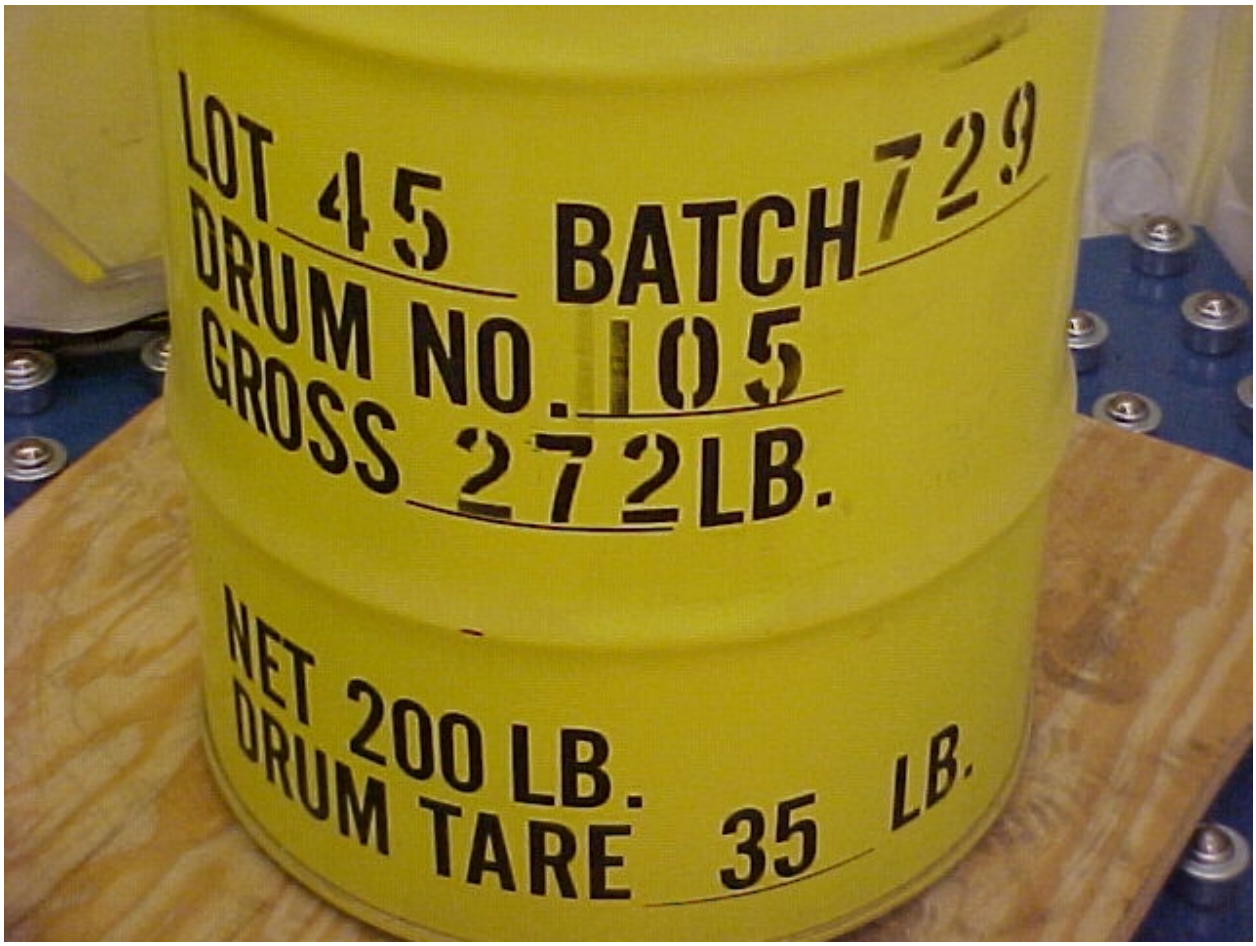
Other Information

Photo No. 1 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Container	30-gallon steel drum	Container Condition	good

Upon loosening bolt on drum ring, gasses slowly dissipated from the drum – continued loosening bolt on bolt ring until drum lid pushed through center of bolt ring.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

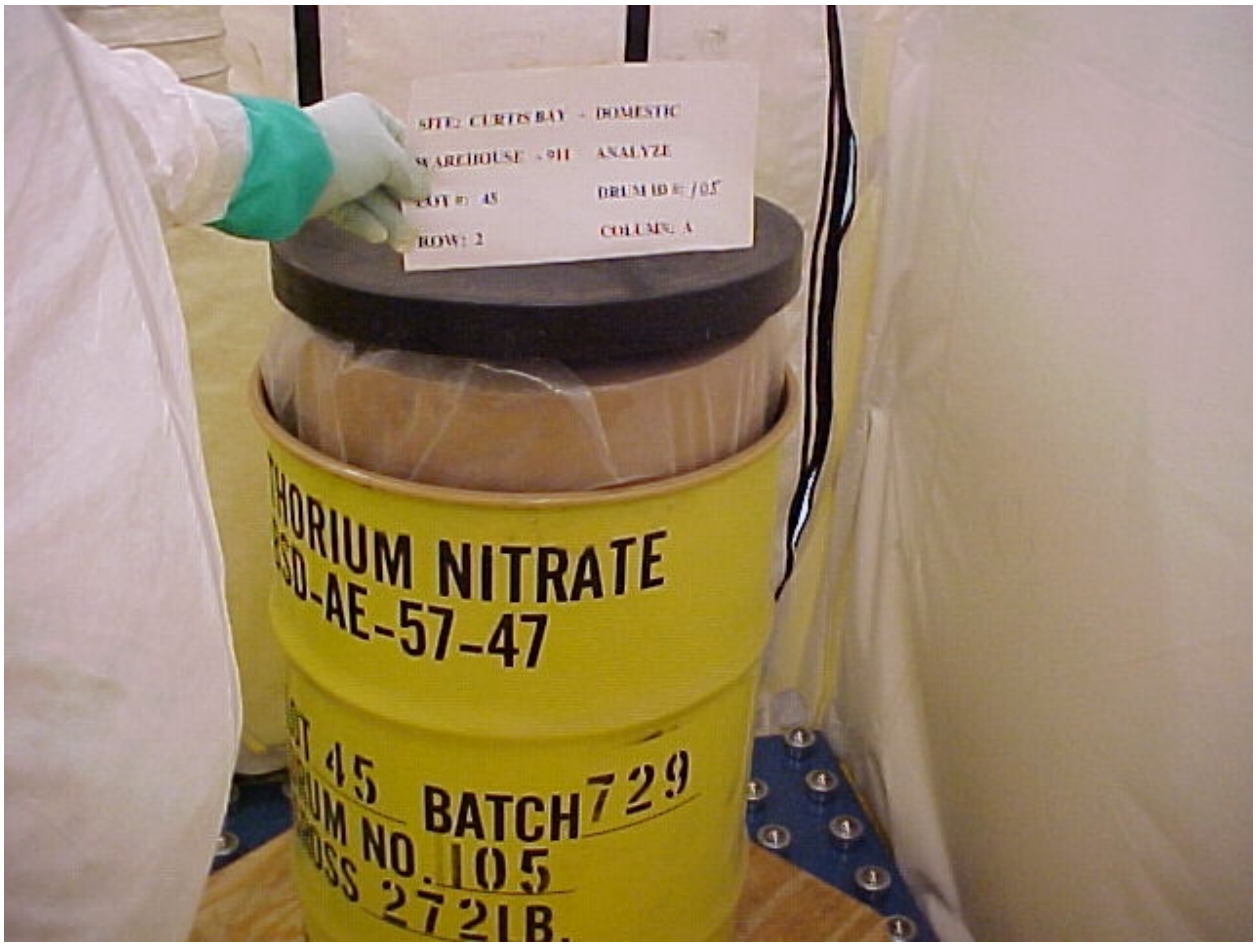
Date	6-28-2002	Time	09:30

Other Information

Photo No. 2 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Raised bag indicates internal pressure inside of drum packaging
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

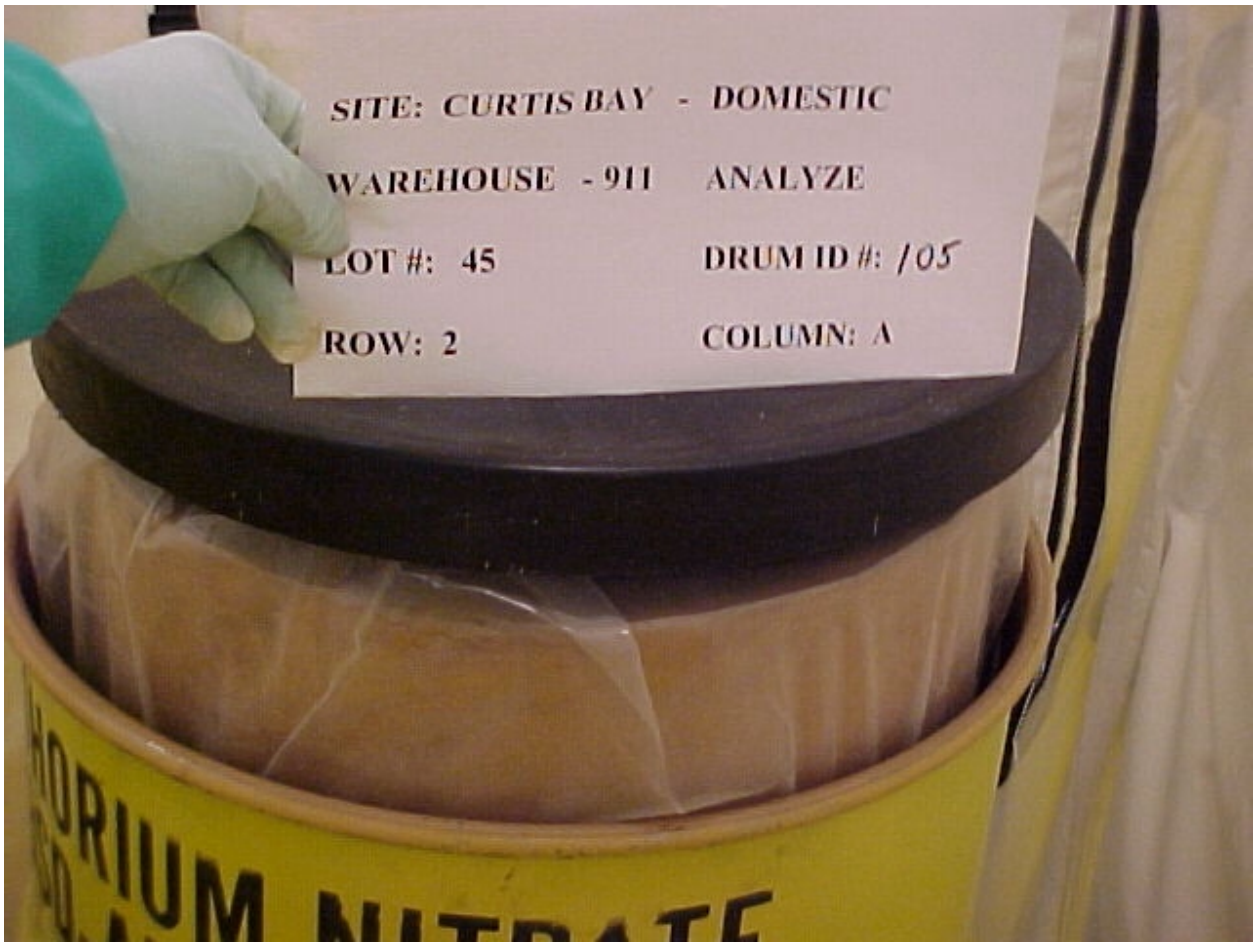
Date	6-28-2002	Time	09:30

Other Information

Photo No. 3 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Another view of the internal pressure on this drum
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

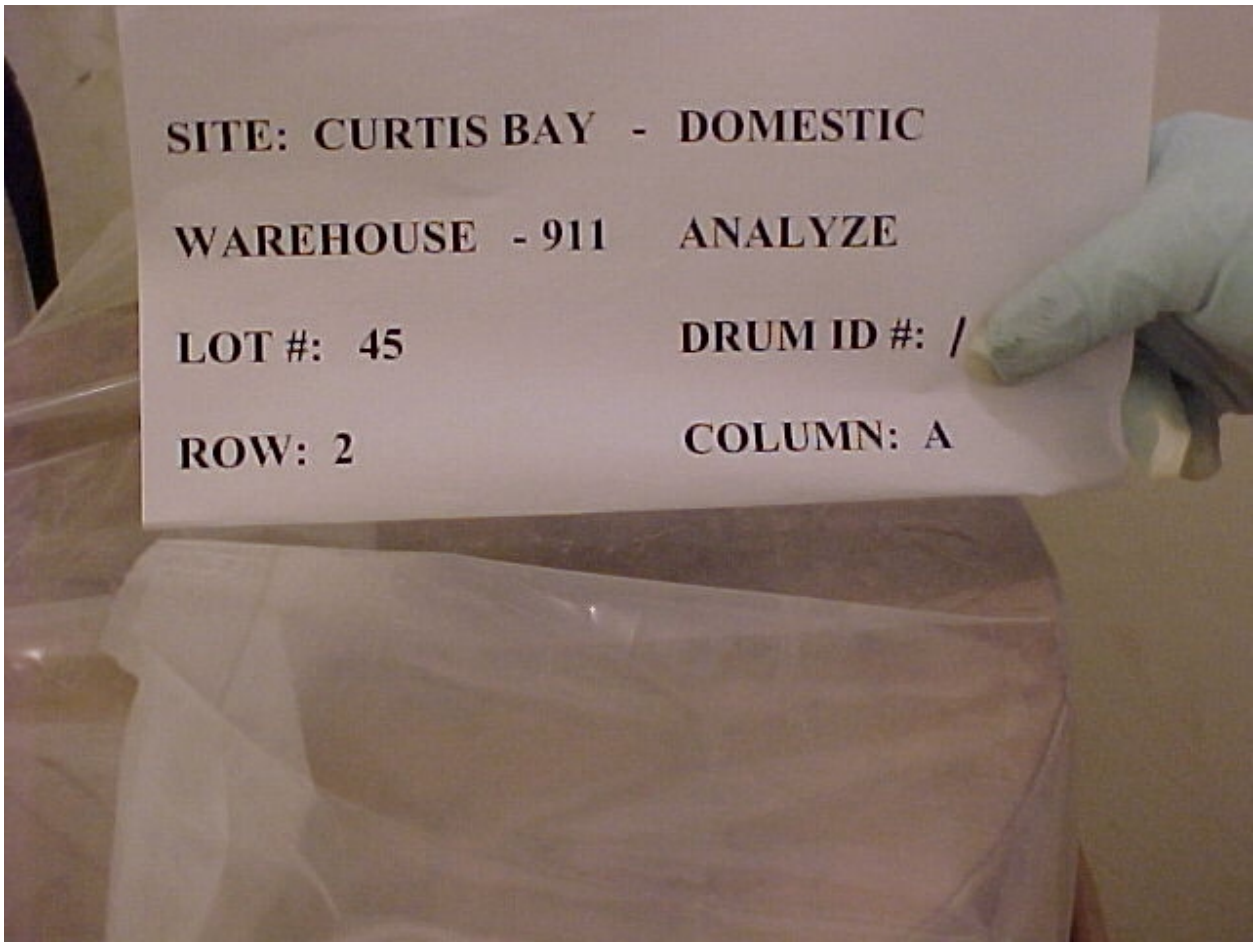
Date	6-28-2002	Time	09:30

Other Information

Photo No. 4 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

1st poly liner/bag – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

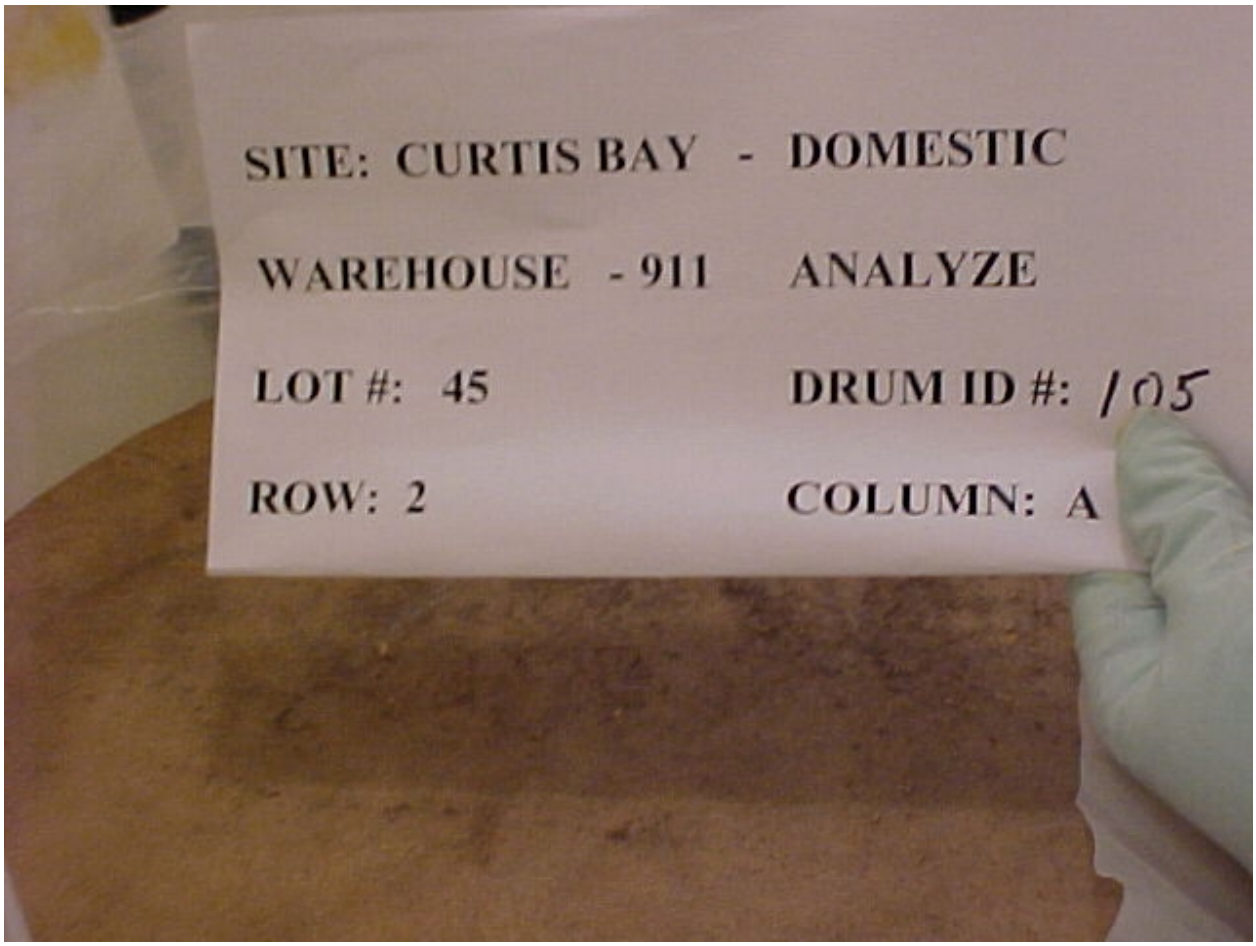
Date	6-28-2002	Time	09:30

Other Information

Photo No. 5 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Outermost fiber drum lid (inside of 30-gal drum) – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

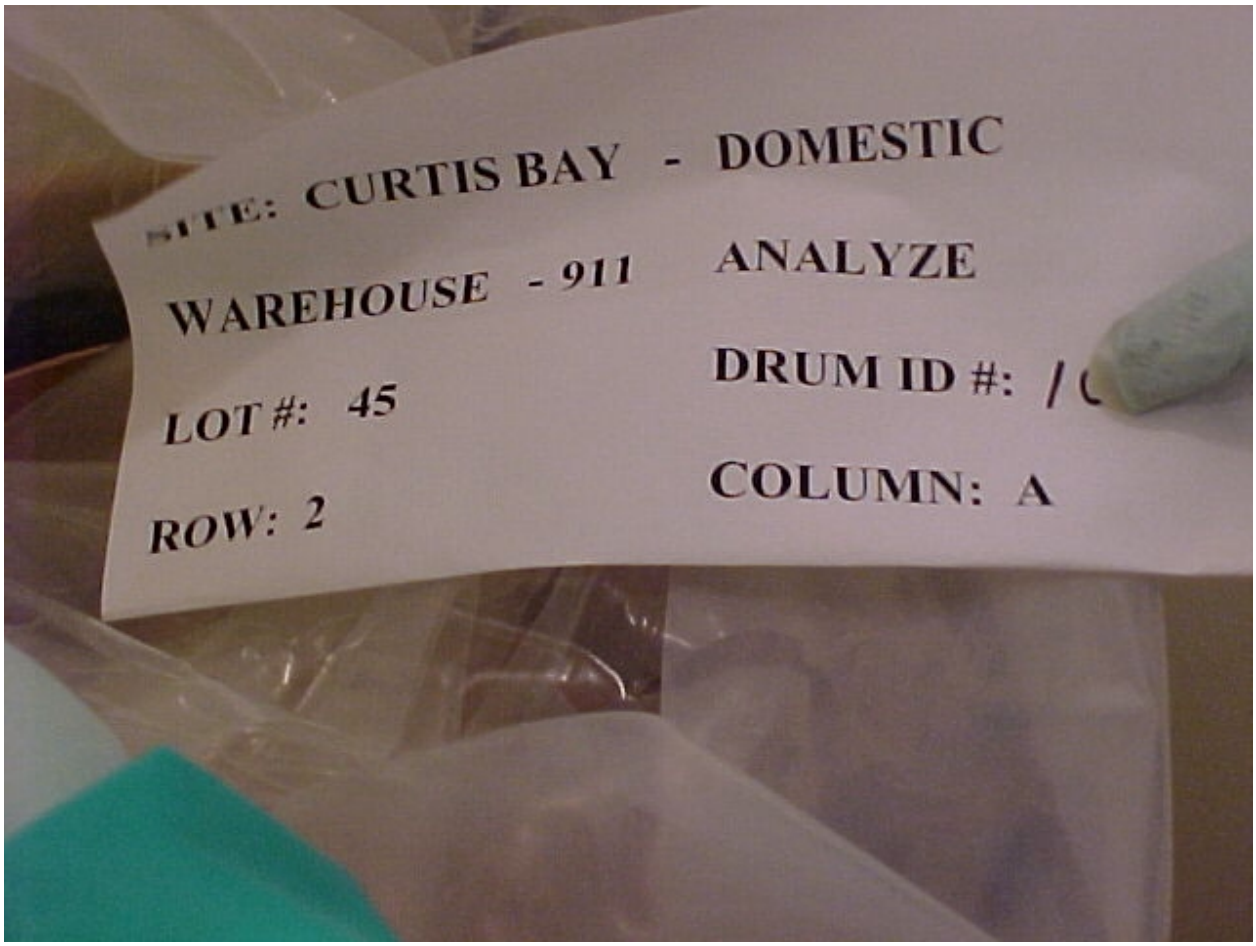
Date	6-28-2002	Time	09:30

Other Information

Photo No. 6 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

2nd poly liner/bag – good condition
No gasses present exterior to bag



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

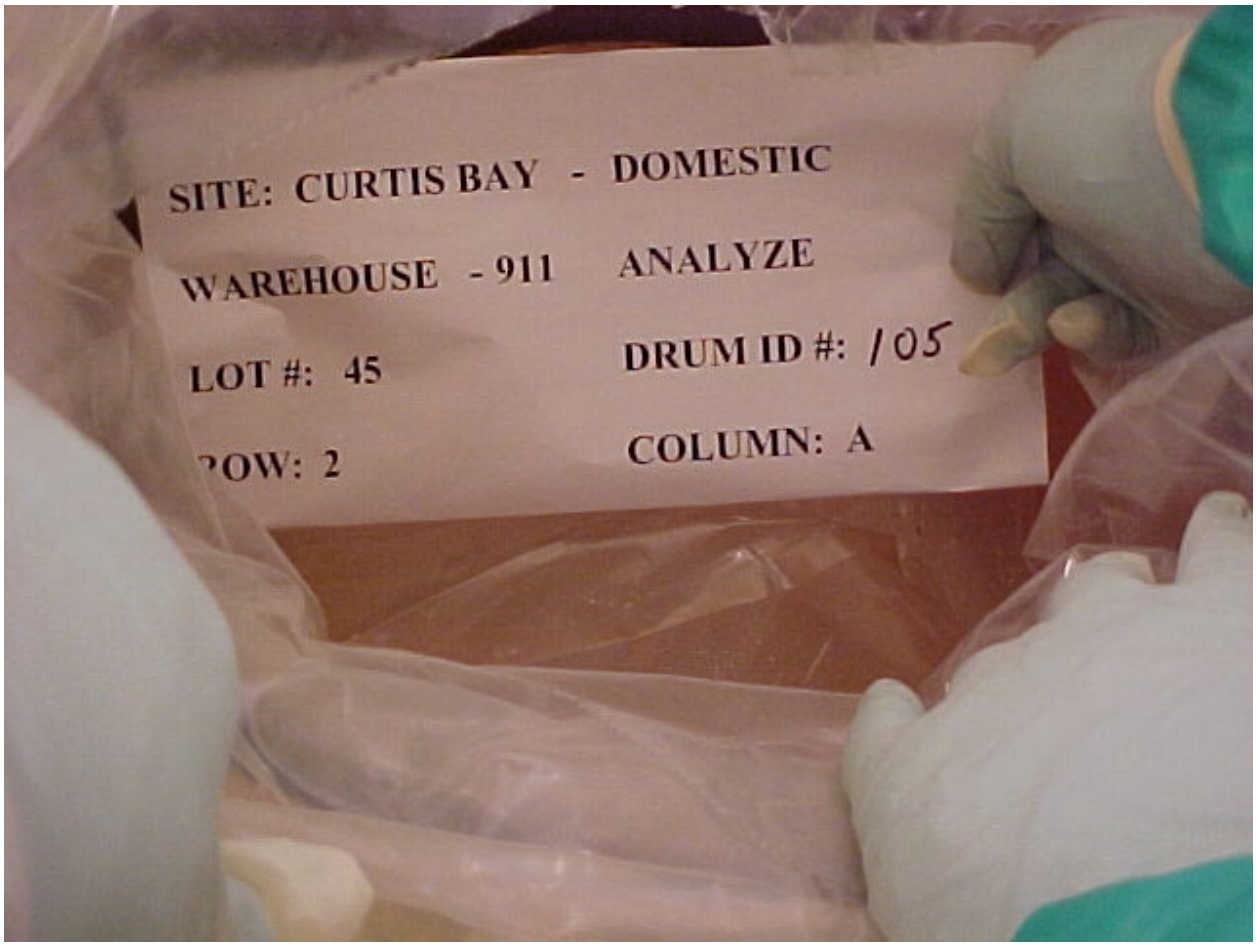
Date	6-28-2002	Time	09:30

Other Information

Photo No. 7 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

3rd poly liner/bag – good condition (holds majority of inner pressure)
No gasses present exterior to bag – did not measure internal gas pressure



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

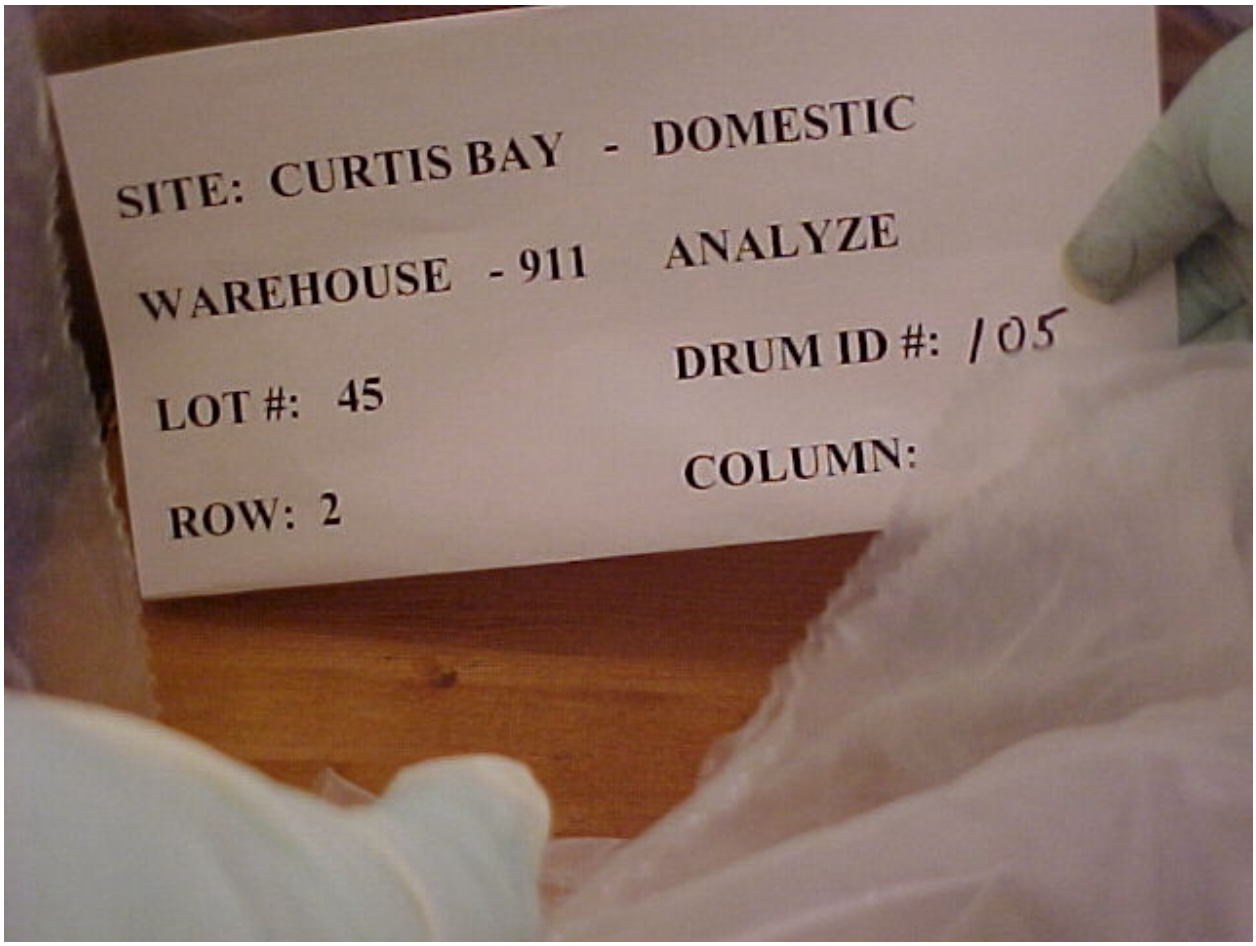
Date	6-28-2002	Time	09:30

Other Information

Photo No. 8 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Wooden lid mounted on inner fiber (lab-pack) container – good condition
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:30

Other Information

Photo No. 9 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Final poly liner/bag – good condition ("thin film" plastic – thickness similar to "Saran" wrap or similar grocery product)
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:30

Other Information

Photo No. 10 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Using the "manual" coring tool to breakup – essentially utilized as a hammer – the tool would not make a good core since material would break apart due to force of impact hammer on sampling tool

No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:30

Other Information

Photo No. 11 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Here is a picture of a representative sample – since the coring machine could not be utilized per UT Battelle instructions, each sample had to be shaped to fit into the 2-liter sample bottle lid. Typically two samples would be shaped (carved utilizing chisels), placed in a plastic zip lock bag then placed into the 2-liter sample bottle. Samples from two drums would then be overpacked into a "Rubbermaid" container and packaged from off-site shipment to the analytical laboratory.
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	45	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	105	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	2
		Column	A

Inspection/Sample Date & Time

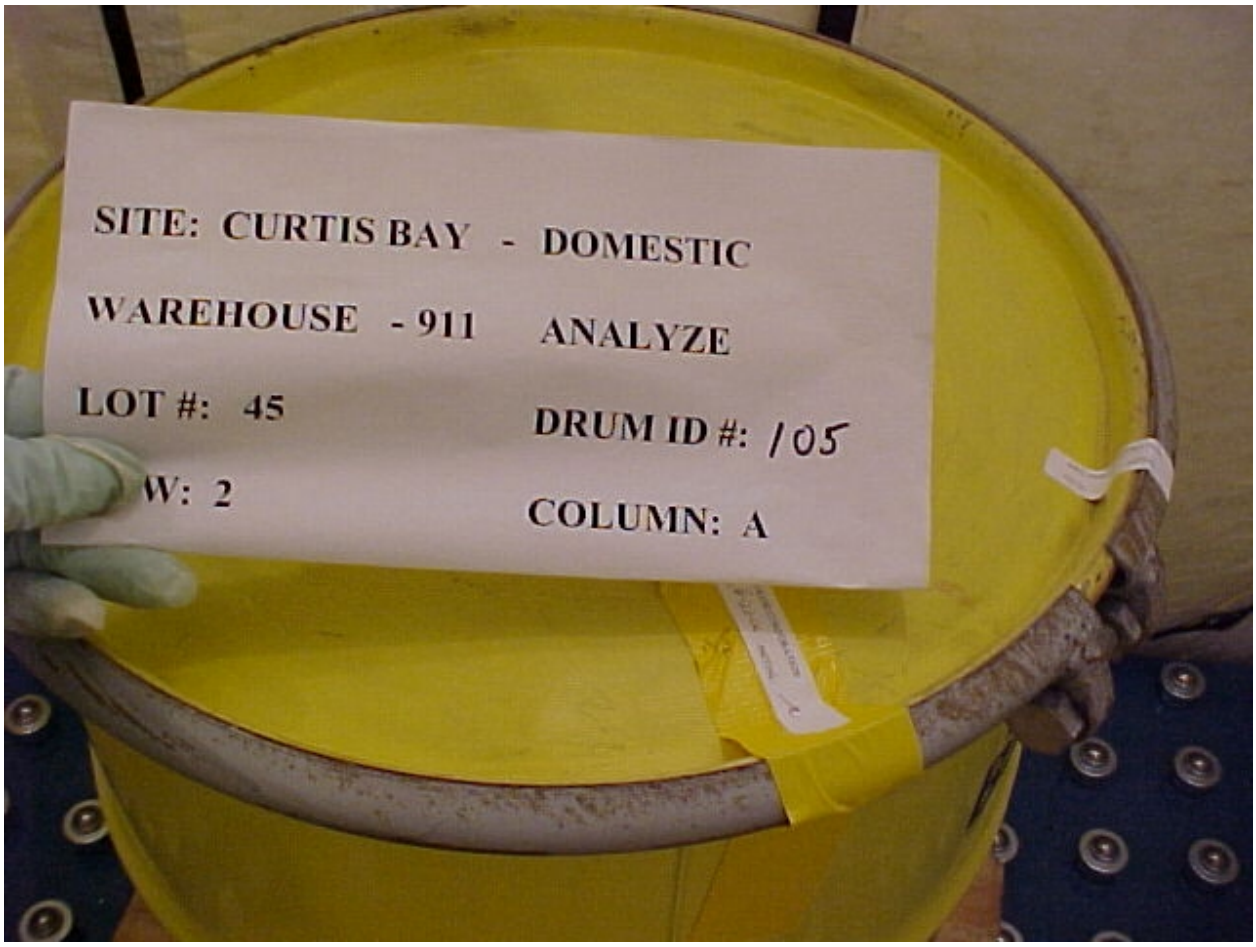
Date	6-28-2002	Time	09:30

Other Information

Photo No. 11 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.8 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #48 – Drum #119
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 48 Drum ID #: 119 Location: Warehouse 911 – Column A - Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 20 mR/hr DR at 1 meter 2.8 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-27-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	14:45

Other Information

Photo No.	1 of 10			
Dose Rate	Surface	20 mR/hr		
	1 meter	2.8 mR/hr		
Container	30-gallon steel drum		Container Condition	good

Upon loosening bolt on drum ring, gasses slowly dissipated from the drum – continued loosening bolt on bolt ring until drum lid pushed through center of bolt ring.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

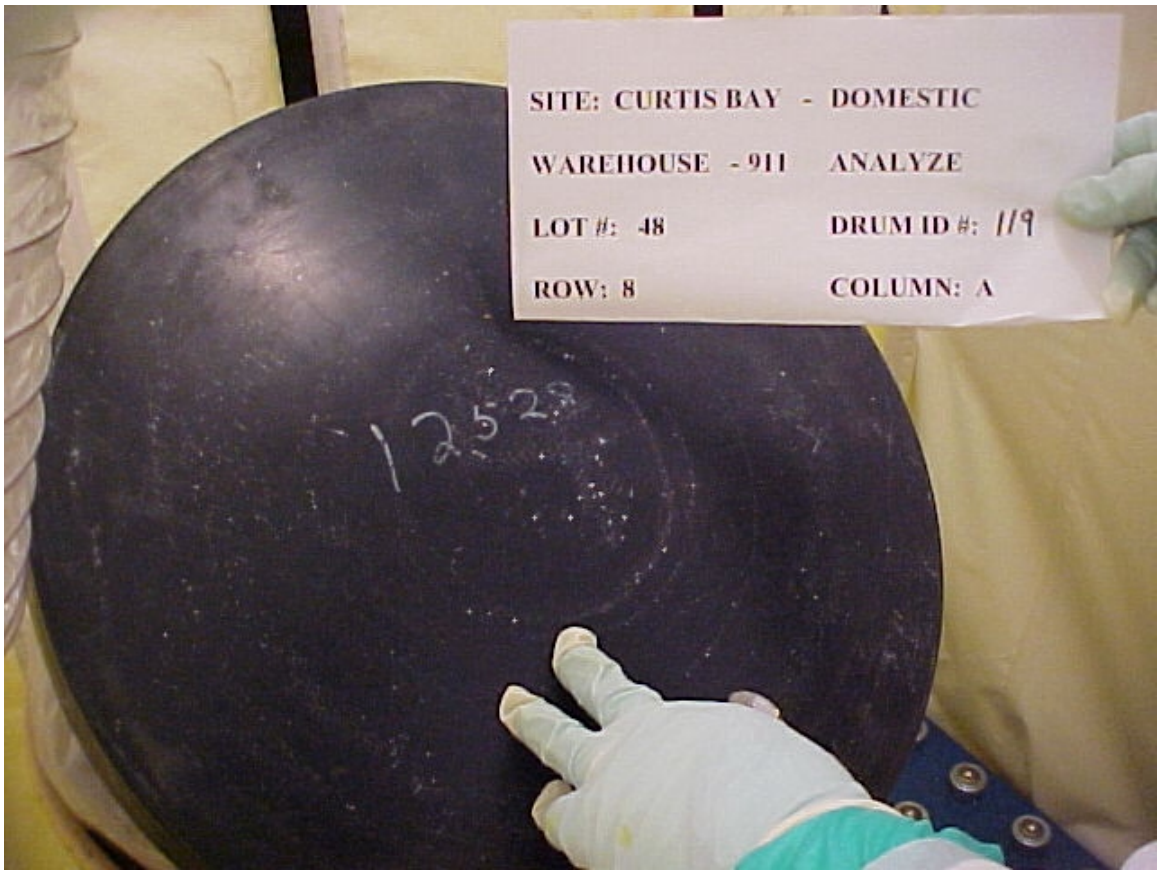
Date	6-27-2002	Time	14:45

Other Information

Photo No. 2 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

The black plastic lid of the inner drum liner – good condition – being pushed upward indicates the packaging inside of the drum is pressurized.
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

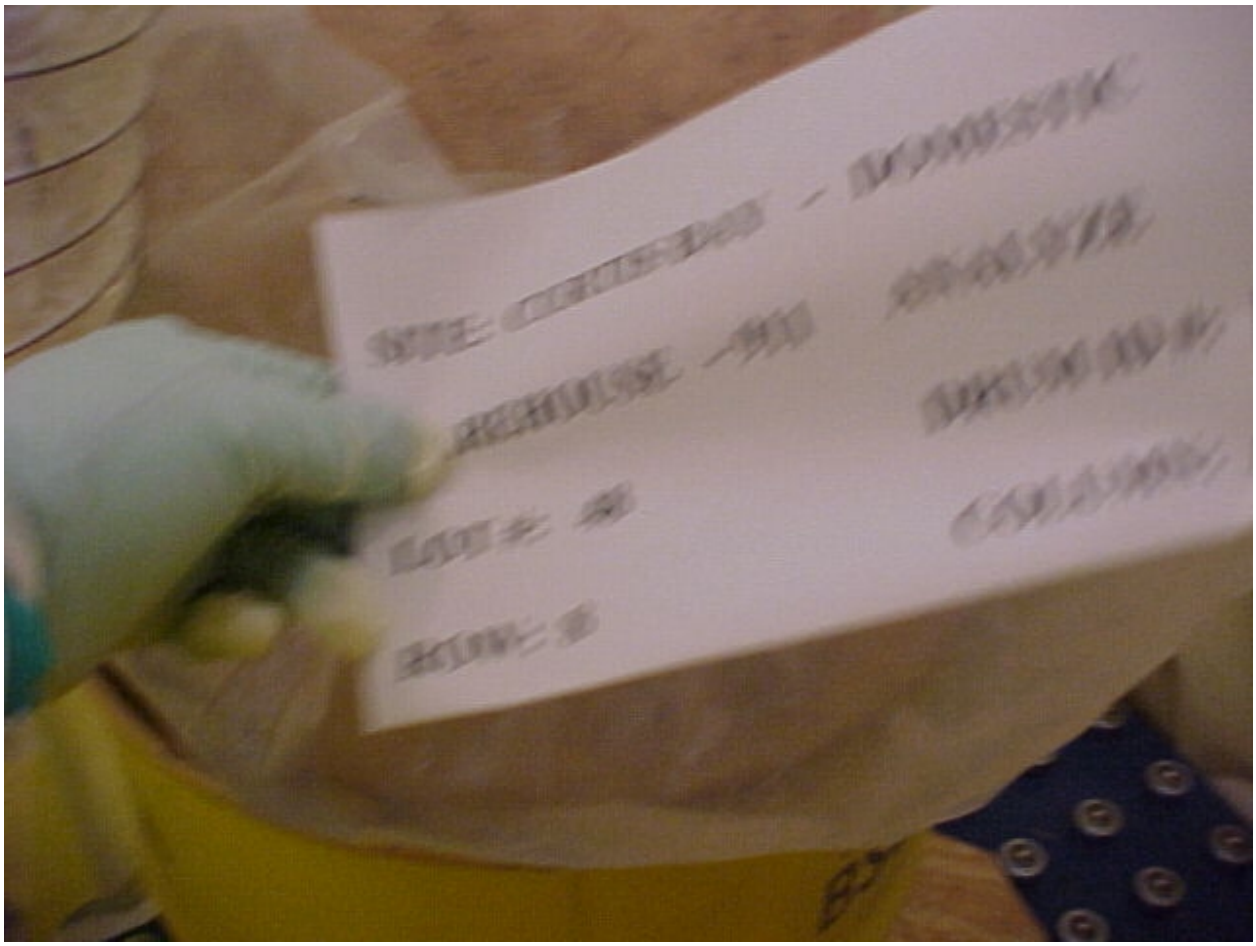
Date	6-27-2002	Time	14:45

Other Information

Photo No. 3 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

1st poly liner/bag – good condition – heat seal of bag is split open from internal pressure that caused lids to raise vertical upon removal of the drum lid
No gasses present (external to bag)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

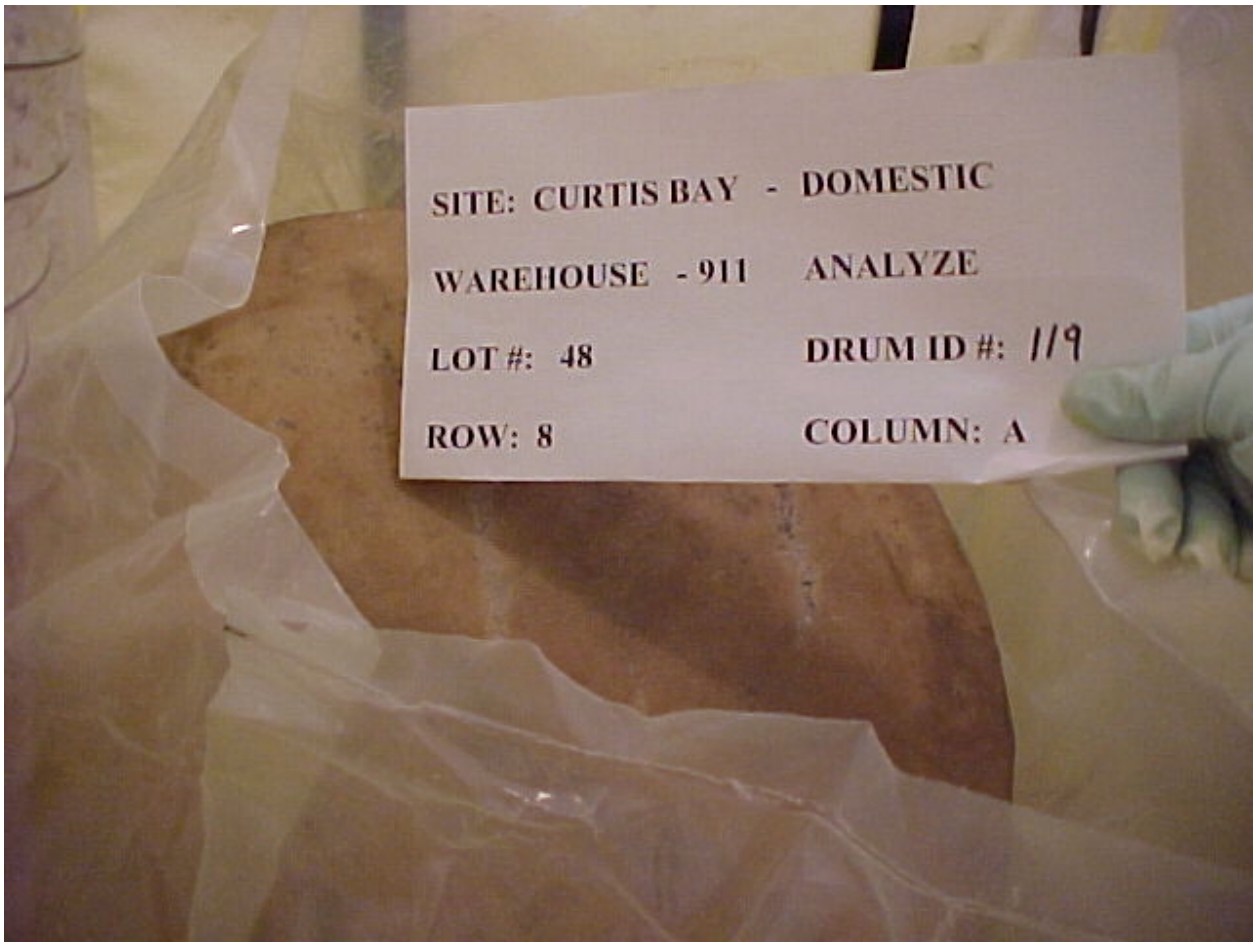
Date	6-27-2002	Time	14:45

Other Information

Photo No. 4 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

The fiber lid of the outermost fiber drum inside of the 30-gal drum – good condition – internal pressure caused tape seal of fiber drum lid to split raising the lid in a vertical extension.
No gasses present (external to bag)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

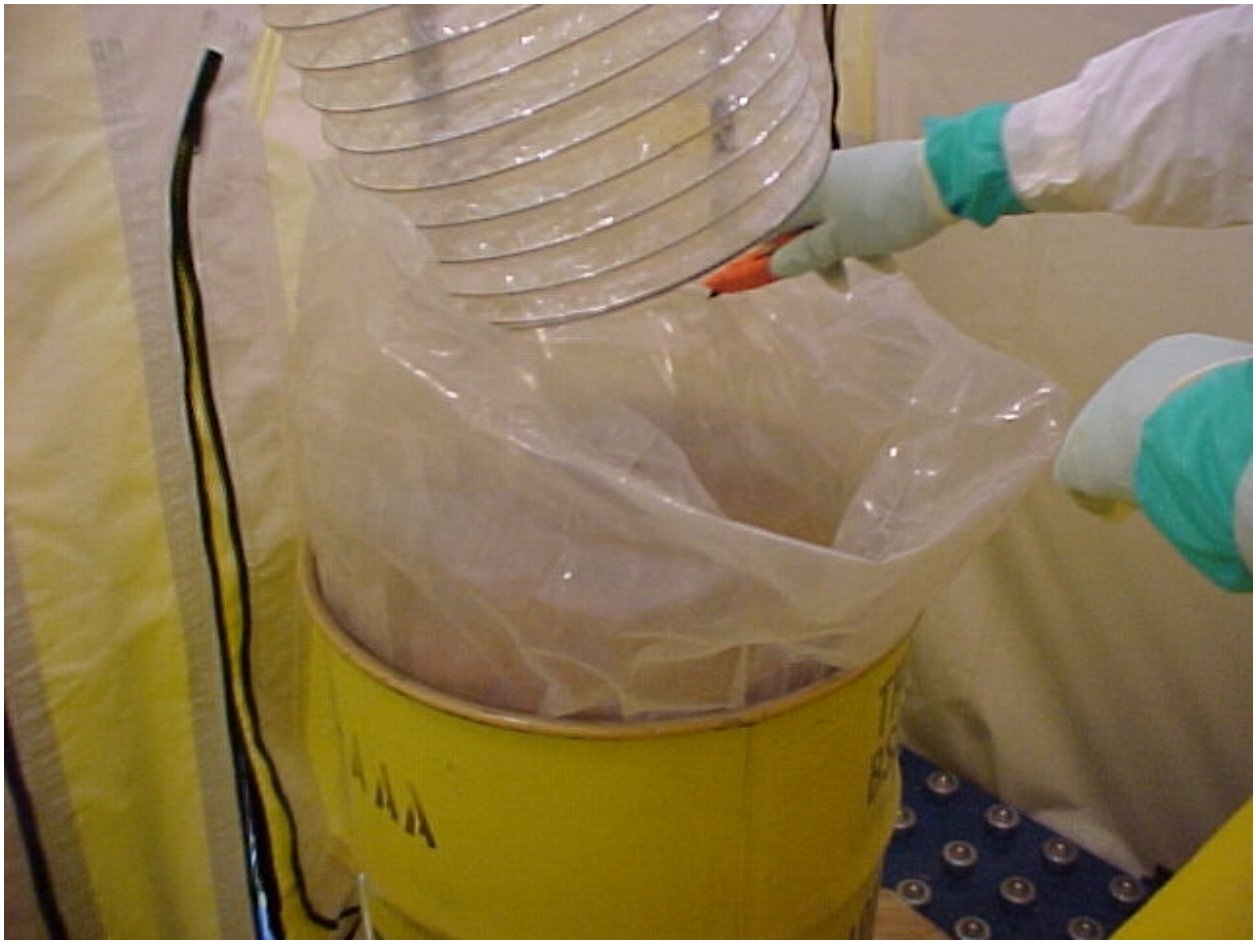
Date	6-27-2002	Time	14:45

Other Information

Photo No. 5 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

This picture show the venting of any gasses that might be present (after cutting through the 2nd & 3rd poly liners/bags inside of the drum – 3rd bag contained majority of internal pressure – 3rd bag appeared to be similar to an inflated balloon, but did not "pop" upon cutting with utility knife).
Did not measure the gases from this drum.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

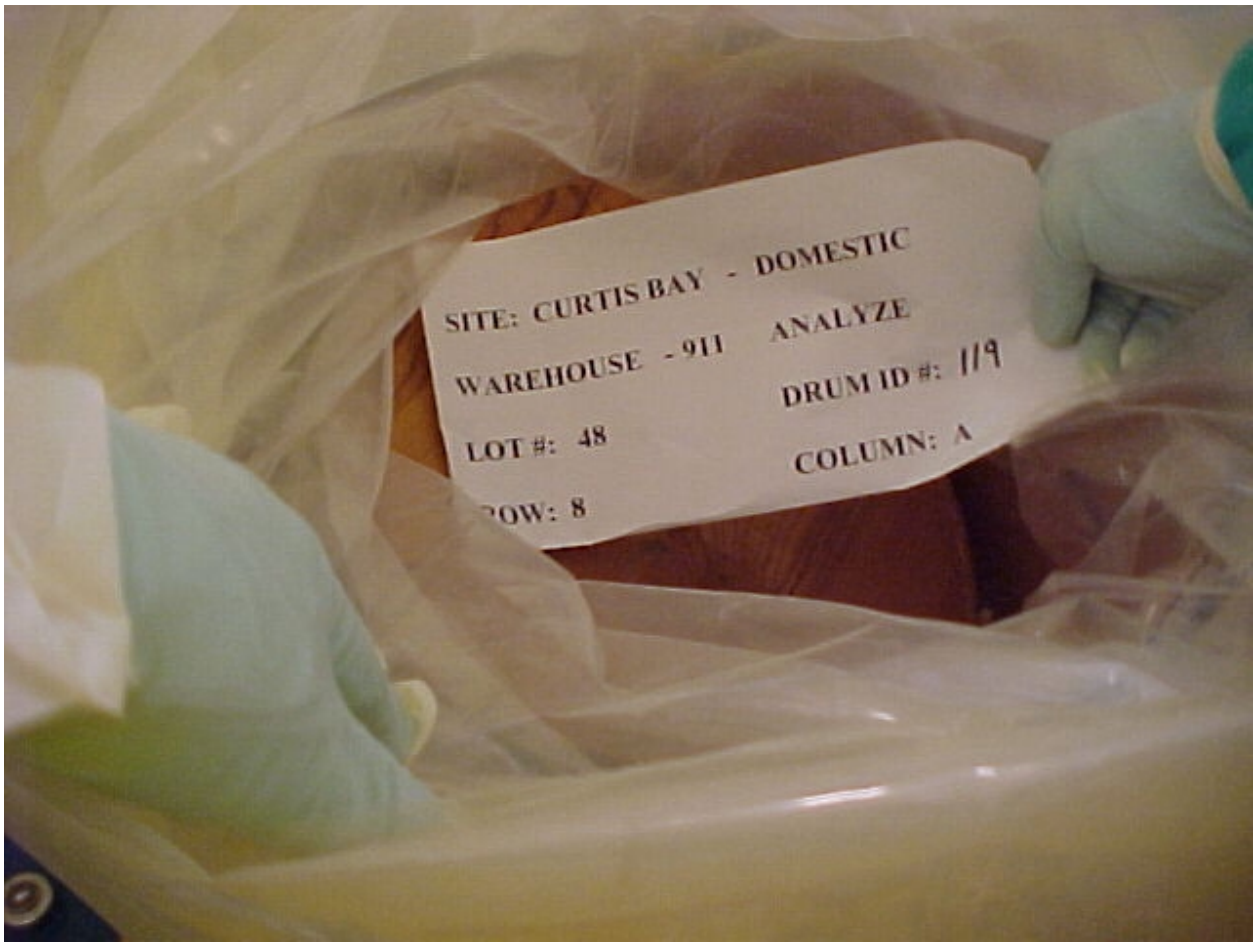
Date	6-27-2002	Time	14:45

Other Information

Photo No. 6 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Picture of wooden lid mounted on innermost fiber (lab-pack) drum – good condition
No gasses present (external to lid)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	14:45

Other Information

Photo No. 7 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

This photograph shows the lab-pack lid (thin film paper attached to the underside of the wooden lid)
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

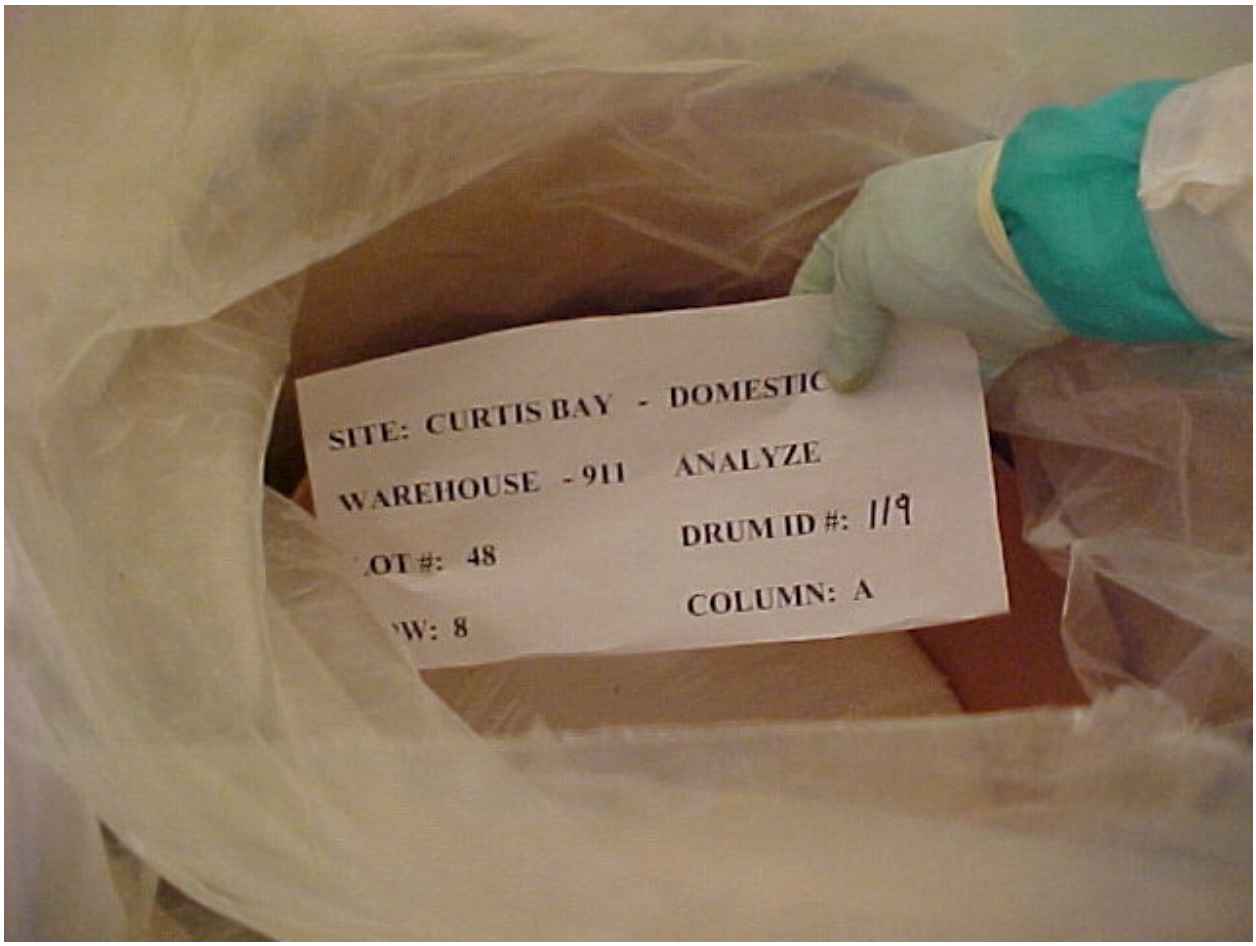
Date	6-27-2002	Time	14:45

Other Information

Photo No. 8 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Last plastic "thin film" liner before coring
No gasses present



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	14:45

Other Information

Photo No. 9 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Another picture of the 4th and last plastic "thin film" liner before coring – ThN material is a monolith, solid, white and dry
No gasses present

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	48	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	119	Disposition	Analyze

Physical Location of Drum

Warehouse	911	Row	8
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	14:45

Other Information

Photo No. 10 of 10

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Sealed & dated - Complete

Curtis Bay Depot
Lot #61 – Drum #86
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 61 Drum ID #: 86 Location: Warehouse 912 – Column C - Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 23 mR/hr DR at 1 meter 2.4 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-09-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

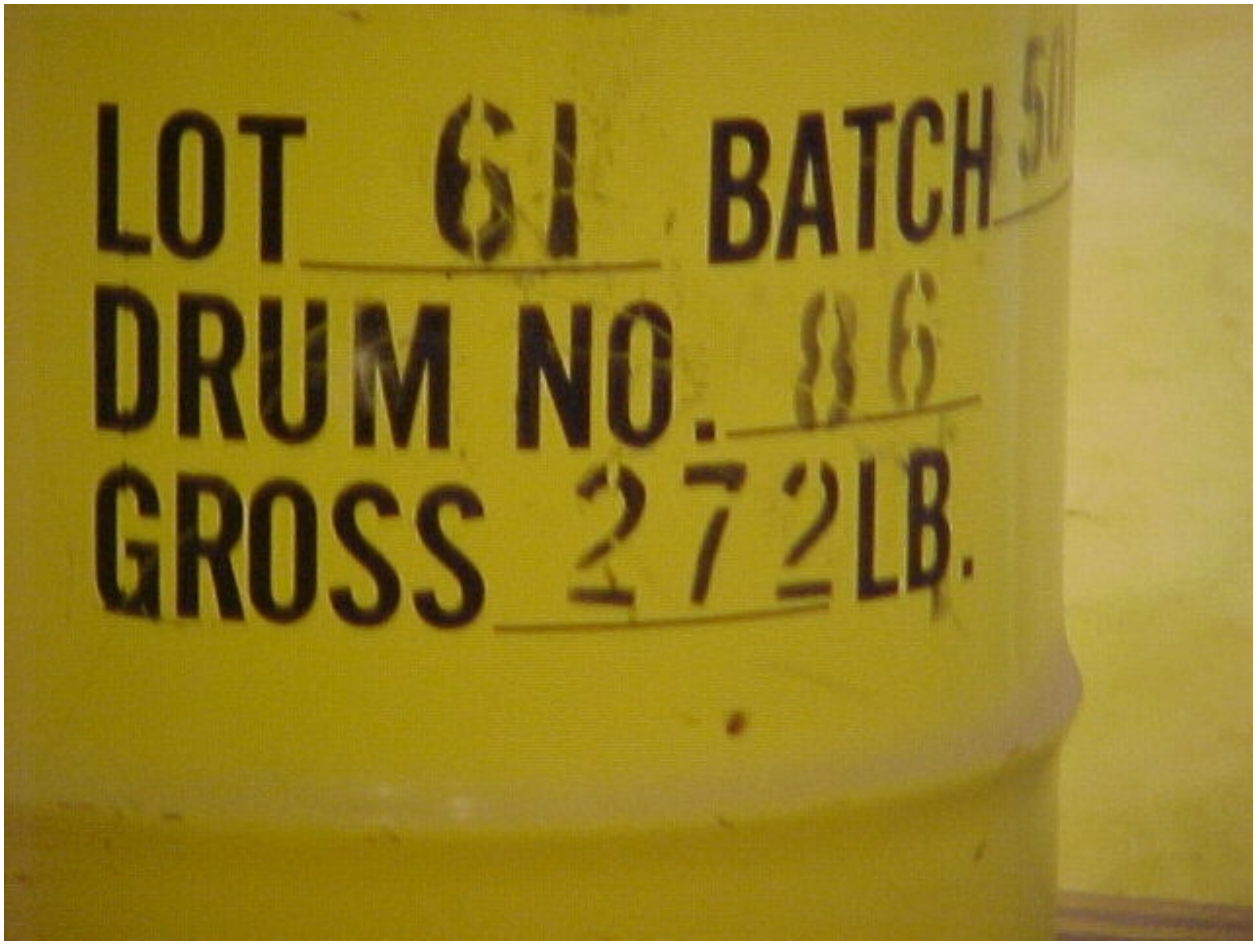
Date	7-09-2002	Time	14:15

Other Information

Photo No. 1 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

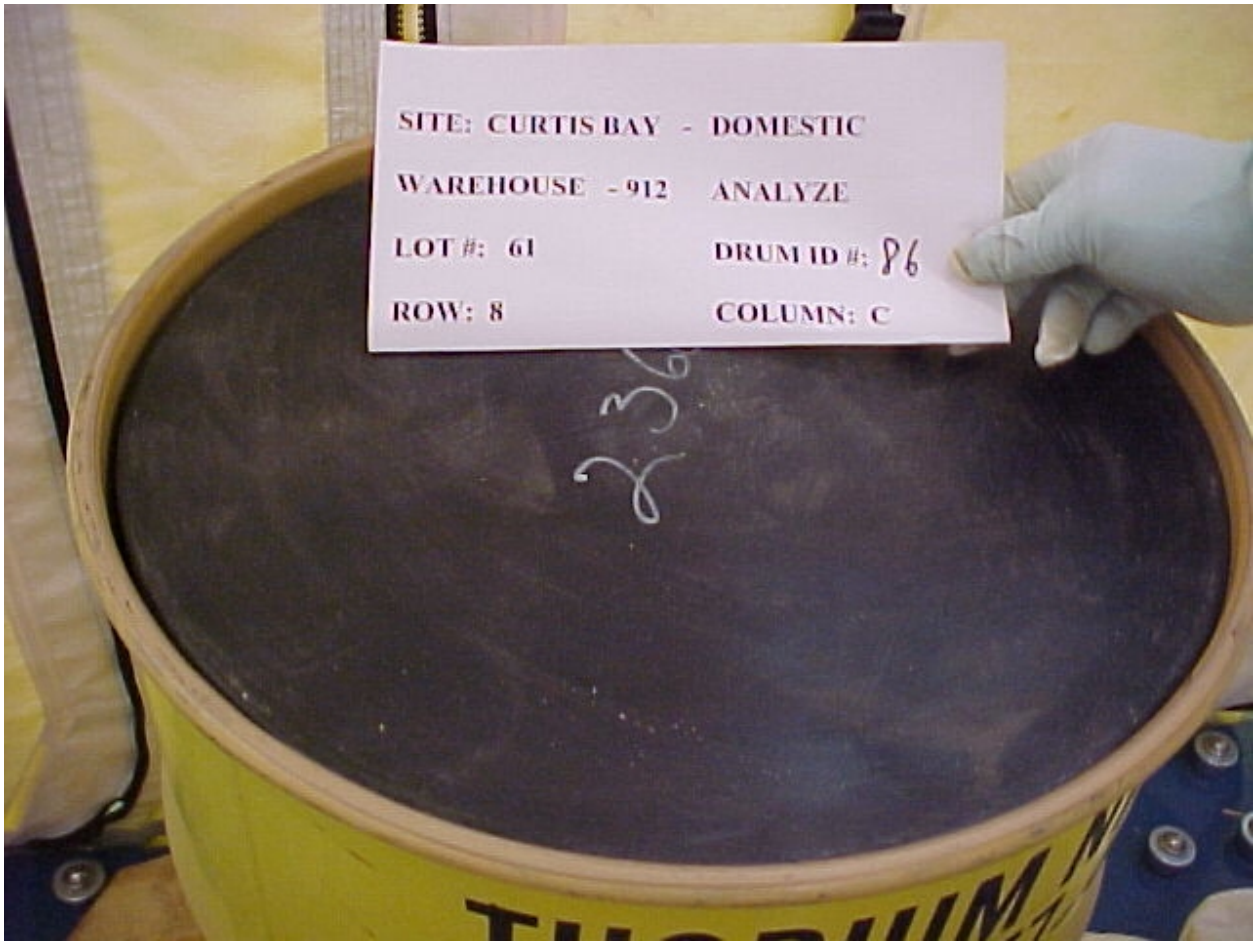
Date	7-09-2002	Time	14:15

Other Information

Photo No. 2 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

Black plastic lid of plastic drum liner – good condition
No gasses present (breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

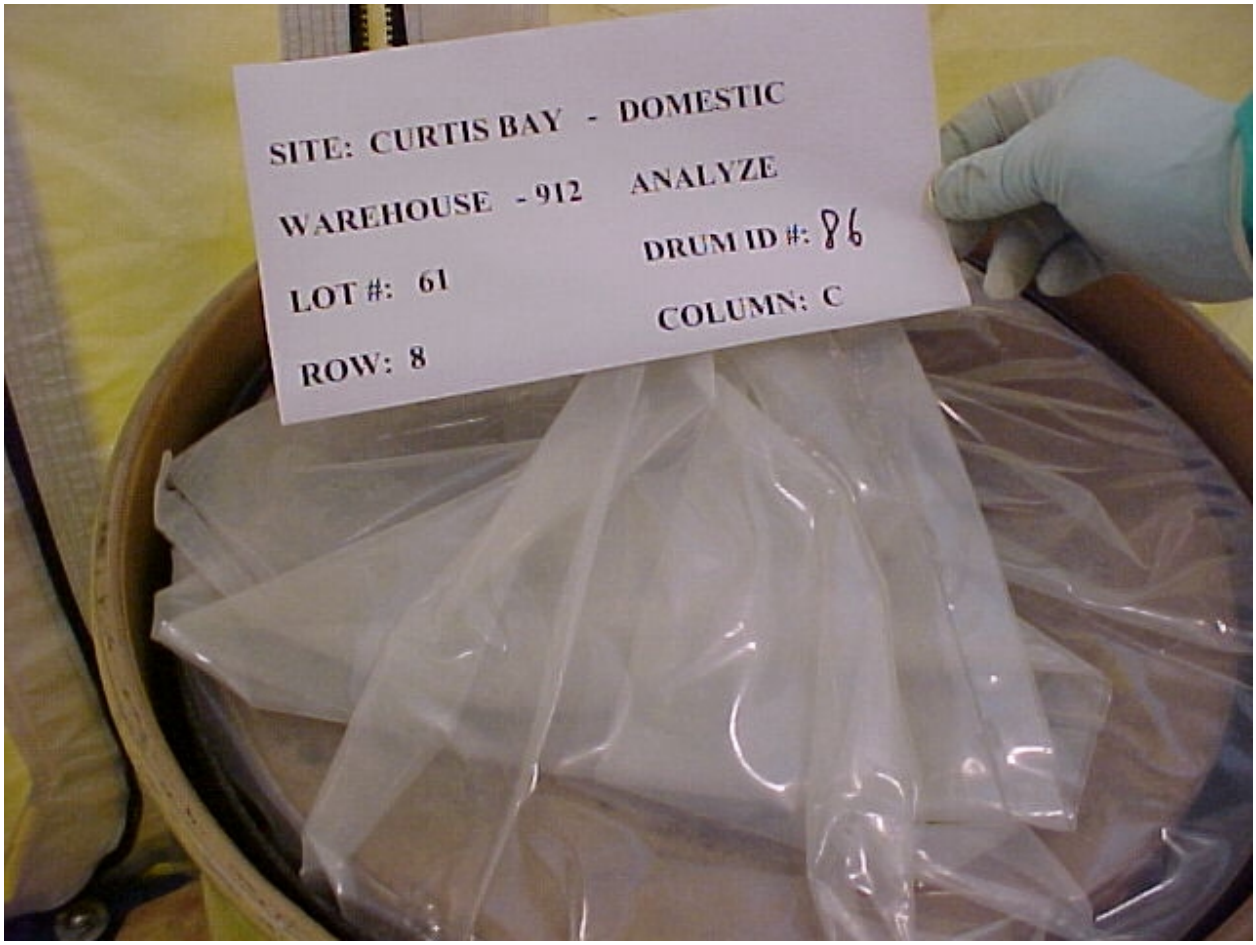
Date	7-09-2002	Time	14:15

Other Information

Photo No. 3 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

1st poly liner/bag – good condition
No gasses present (breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

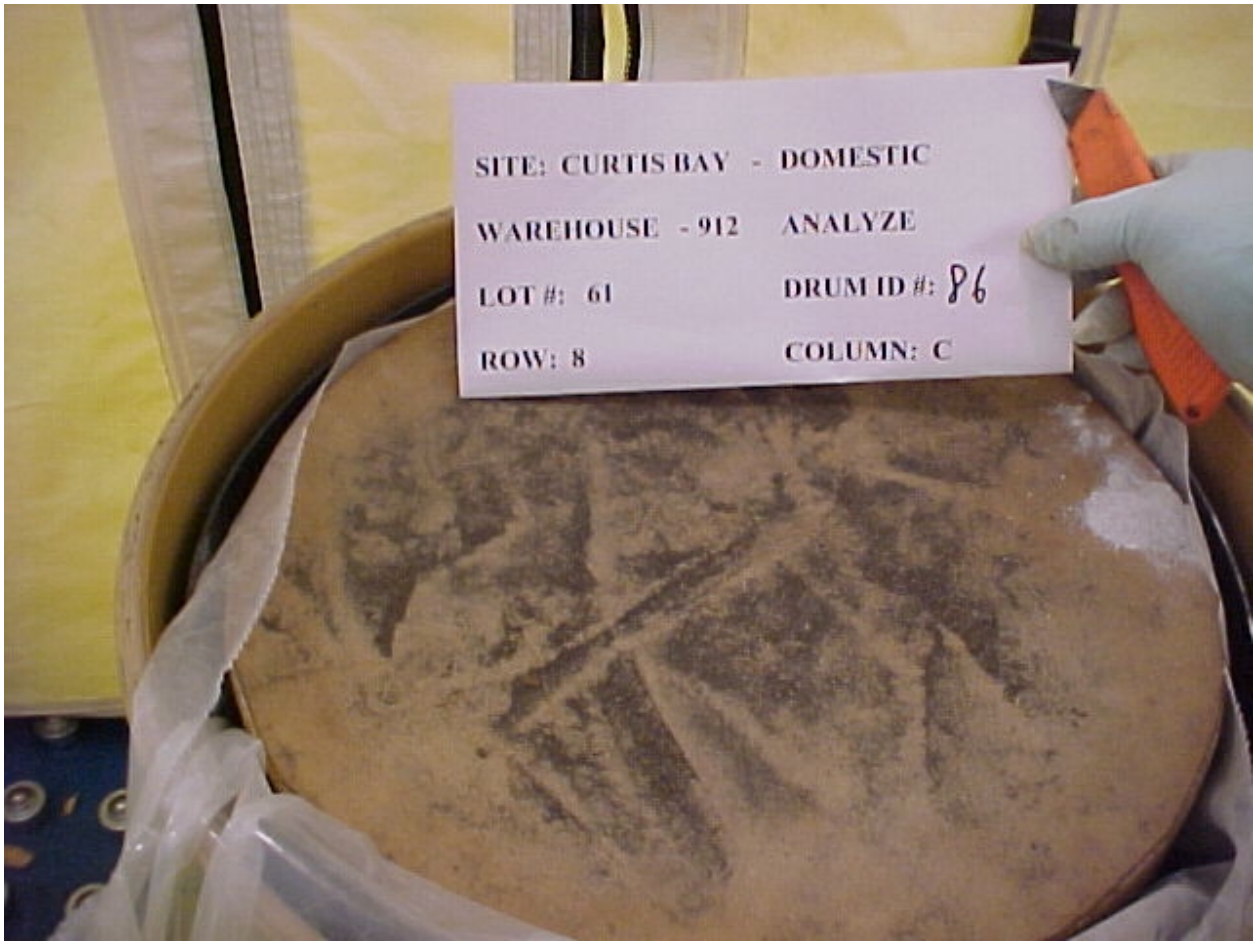
Date	7-09-2002	Time	14:15

Other Information

Photo No. 4 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

Fiber lid from outermost fiber drum inside of 30-gal drum – good condition
No gasses present (breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

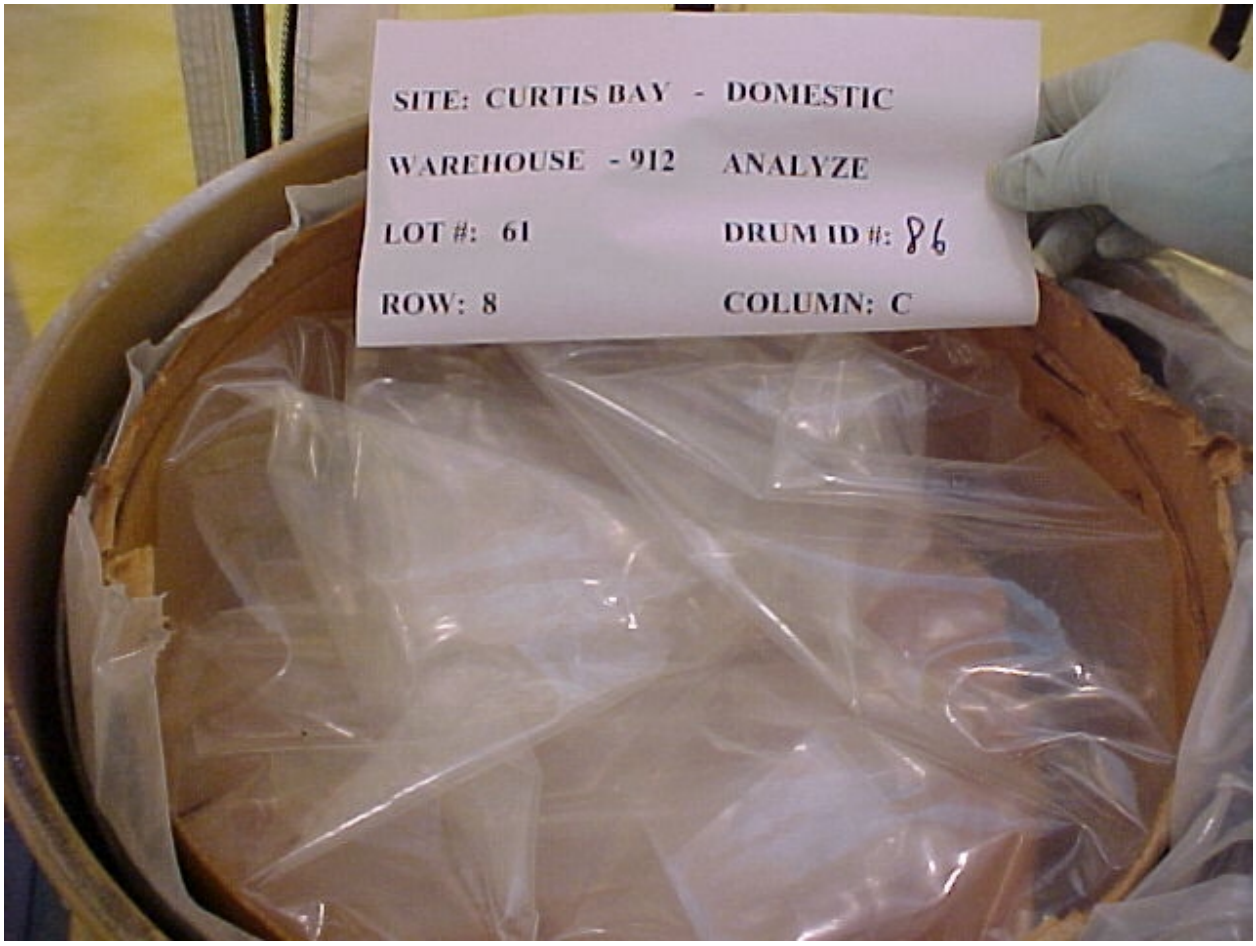
Date	7-09-2002	Time	14:15

Other Information

Photo No. 5 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

2nd poly liner/bag – good condition
No gasses present (breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

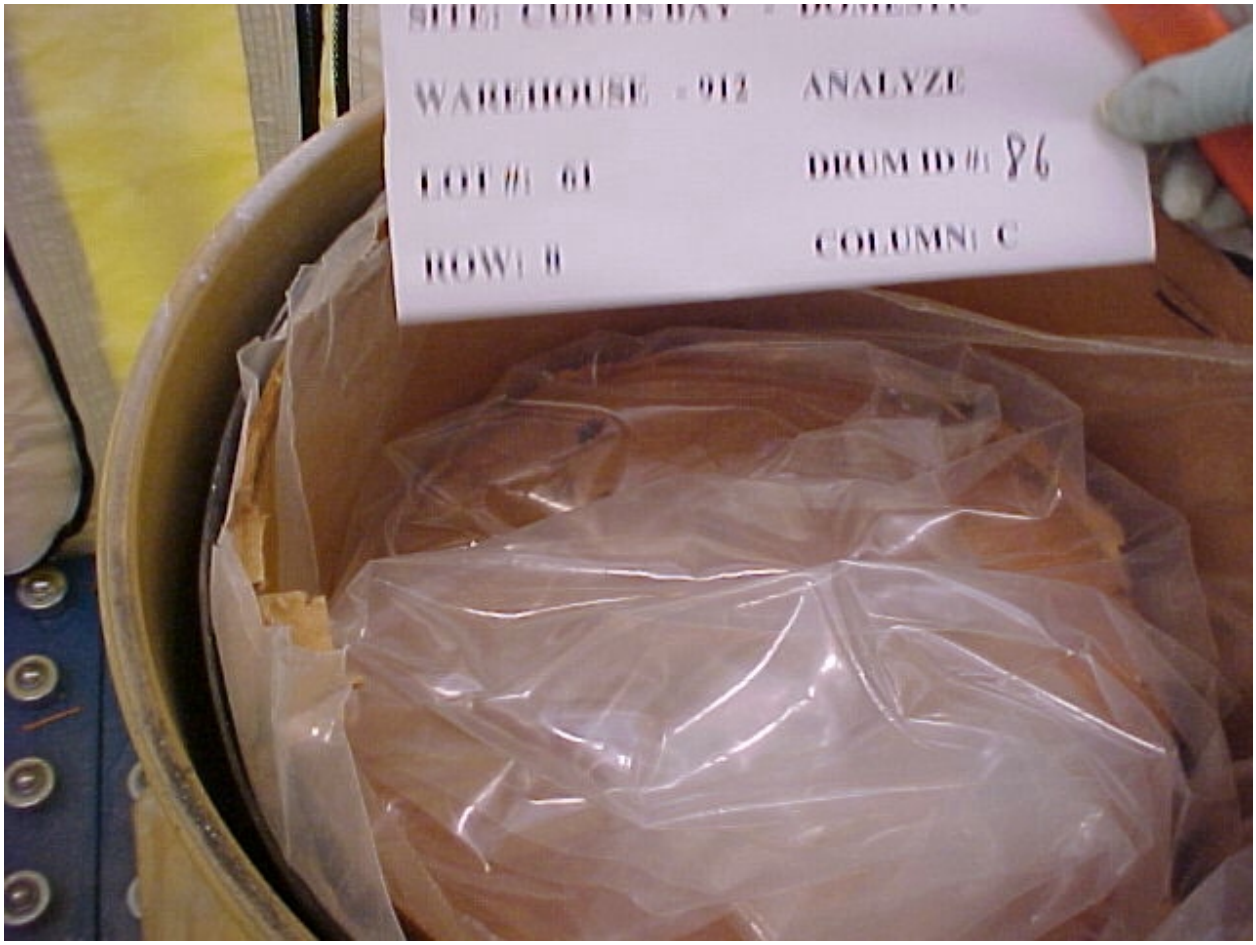
Date	7-09-2002	Time	14:15

Other Information

Photo No. 6 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

3rd poly liner/bag – good condition
No gasses present (breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:15

Other Information

Photo No. 7 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

Wooden lid on the innermost fiber drum (lab-pack) – good condition
No gasses present (breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:15

Other Information

Photo No. 8 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

Part of paper that is positioned underneath the wooden lid on the lab-pack drum
No gasses present (breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:15

Other Information

Photo No. 9 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

ThN material – solid – monolith – white - dry
No gasses present (breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	61	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	86	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	C

Inspection/Sample Date & Time

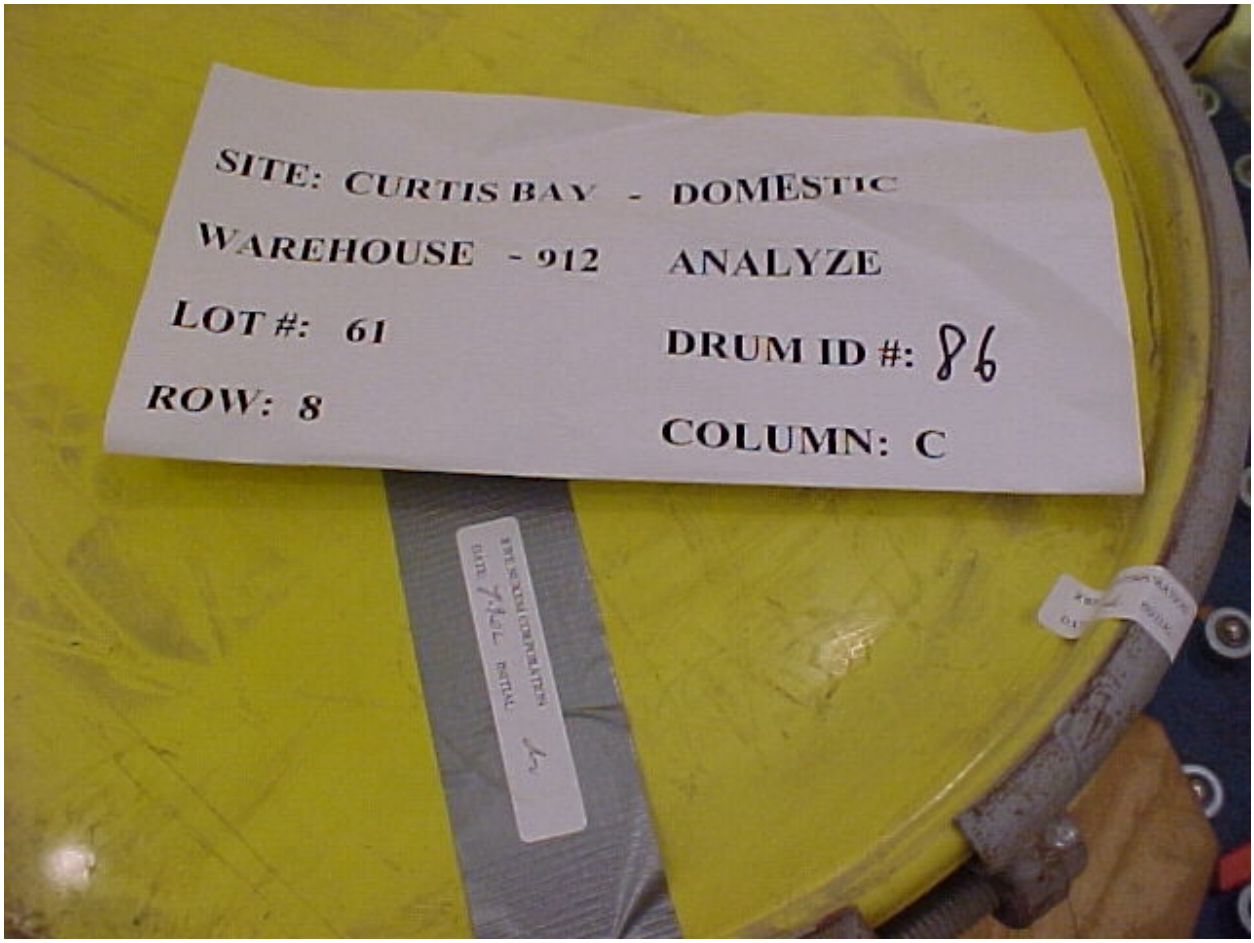
Date	7-09-2002	Time	14:15

Other Information

Photo No. 10 of 10

Dose Rate	Surface	23 mR/hr
	1 meter	2.4 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #65 – Drum #107
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 65 Drum ID #: 107 Location: Warehouse 912 – Column C - Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.5 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-09-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:30

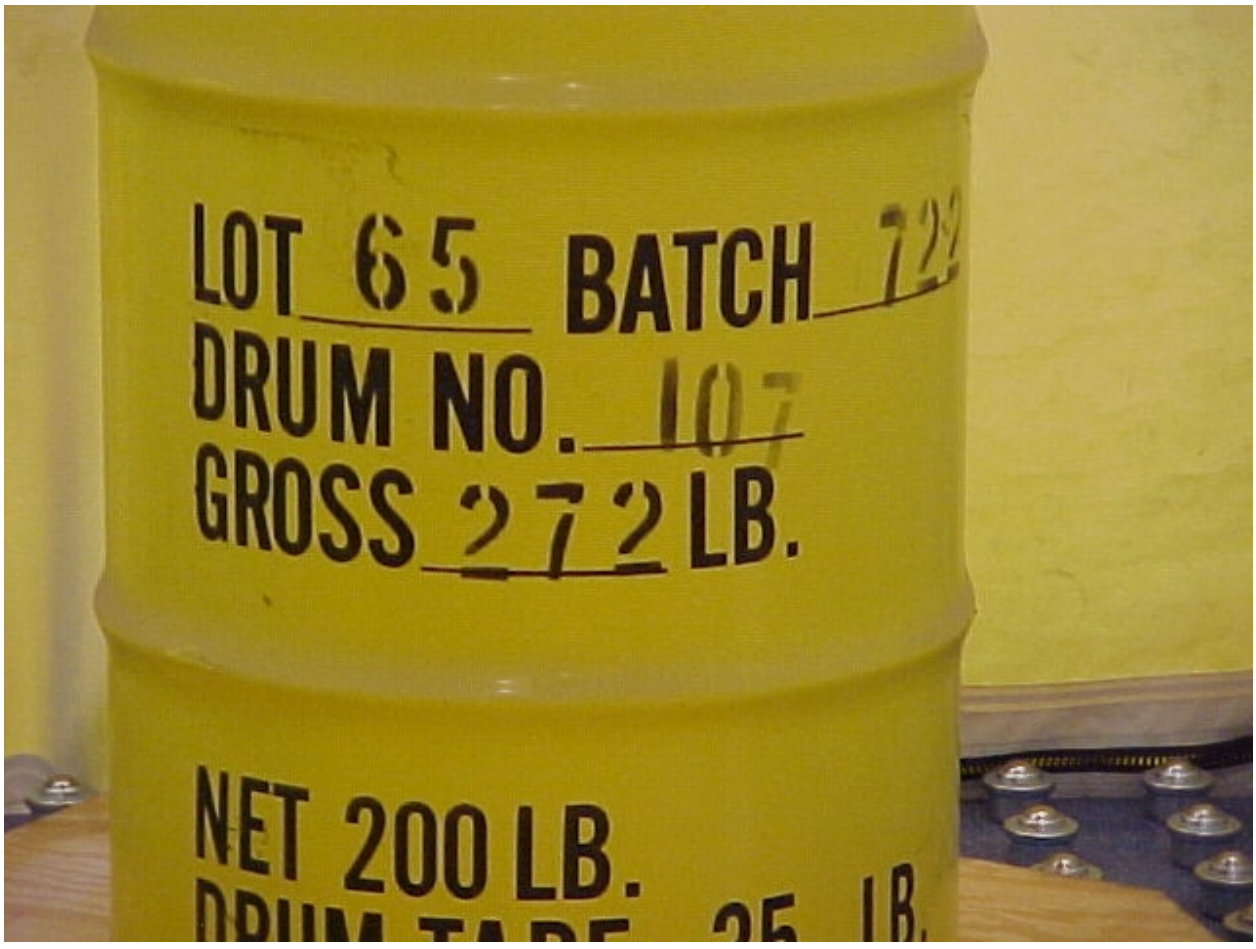
Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

Container	30-gallon steel drum	Container Condition	Has indentations on lid

Indentations indicate drum is currently pressurized or has relieved through drum gasket seal – drum was not pressurized from tap test and no gas vented while loosening bolt on drum ring; therefore, indentations probably indicate that internal pressure has probably vented through drum gasket seal.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

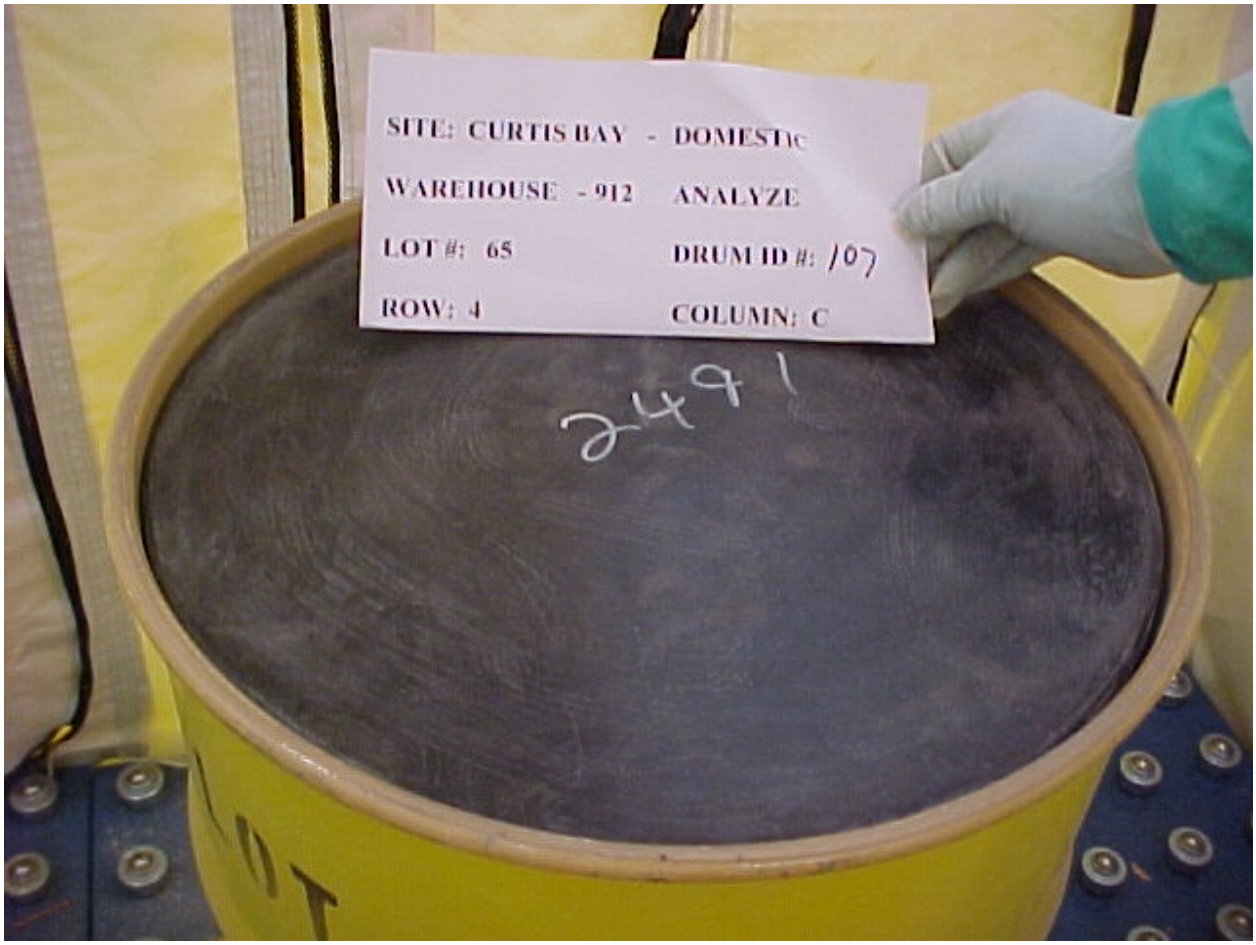
Date	7-09-2002	Time	14:30

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

Black plastic lid from inner drum liner – good condition (lid is not sealed to drum liner – merely sits on top of the drum liner)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

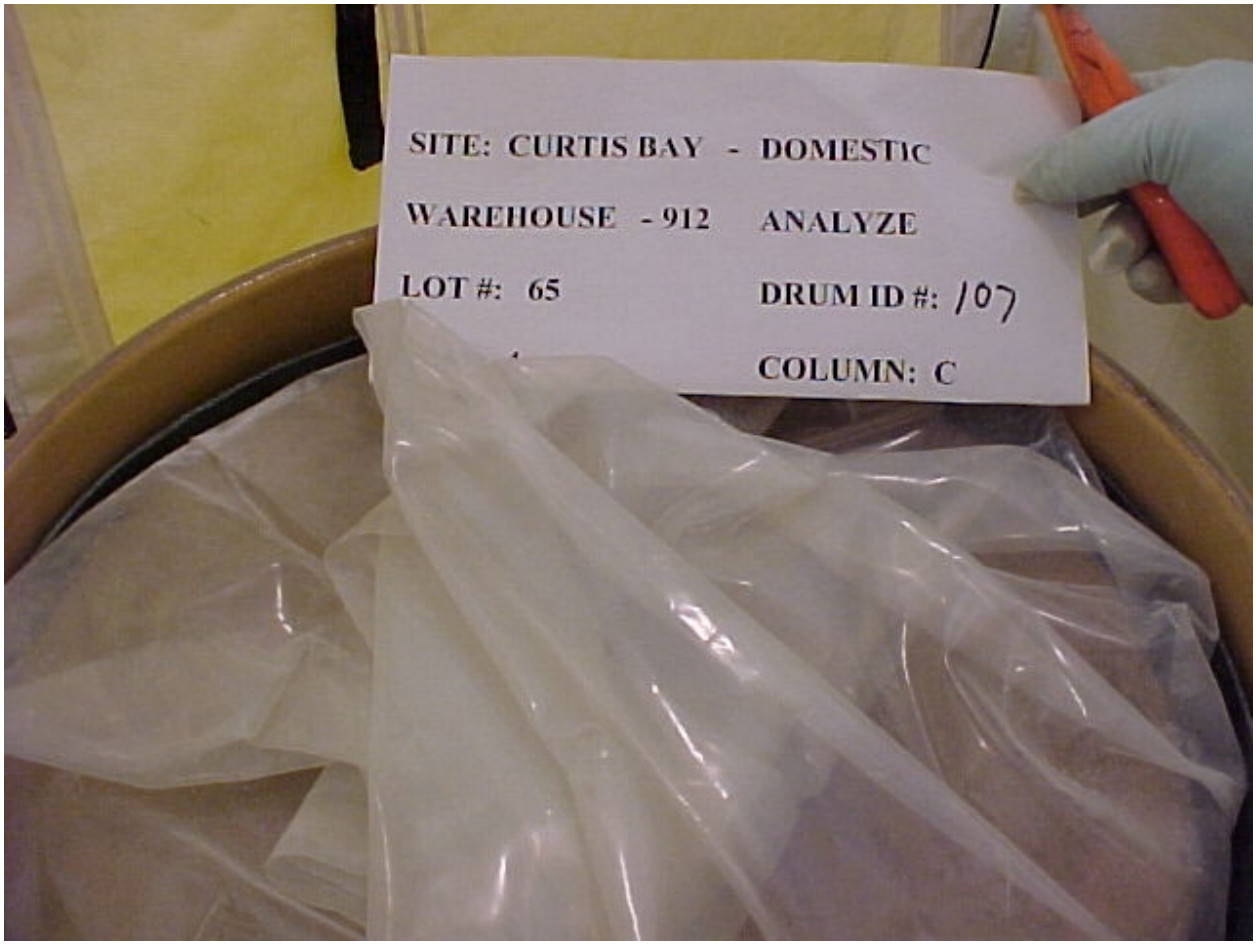
Date	7-09-2002	Time	14:30

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

1st poly liner/bag – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

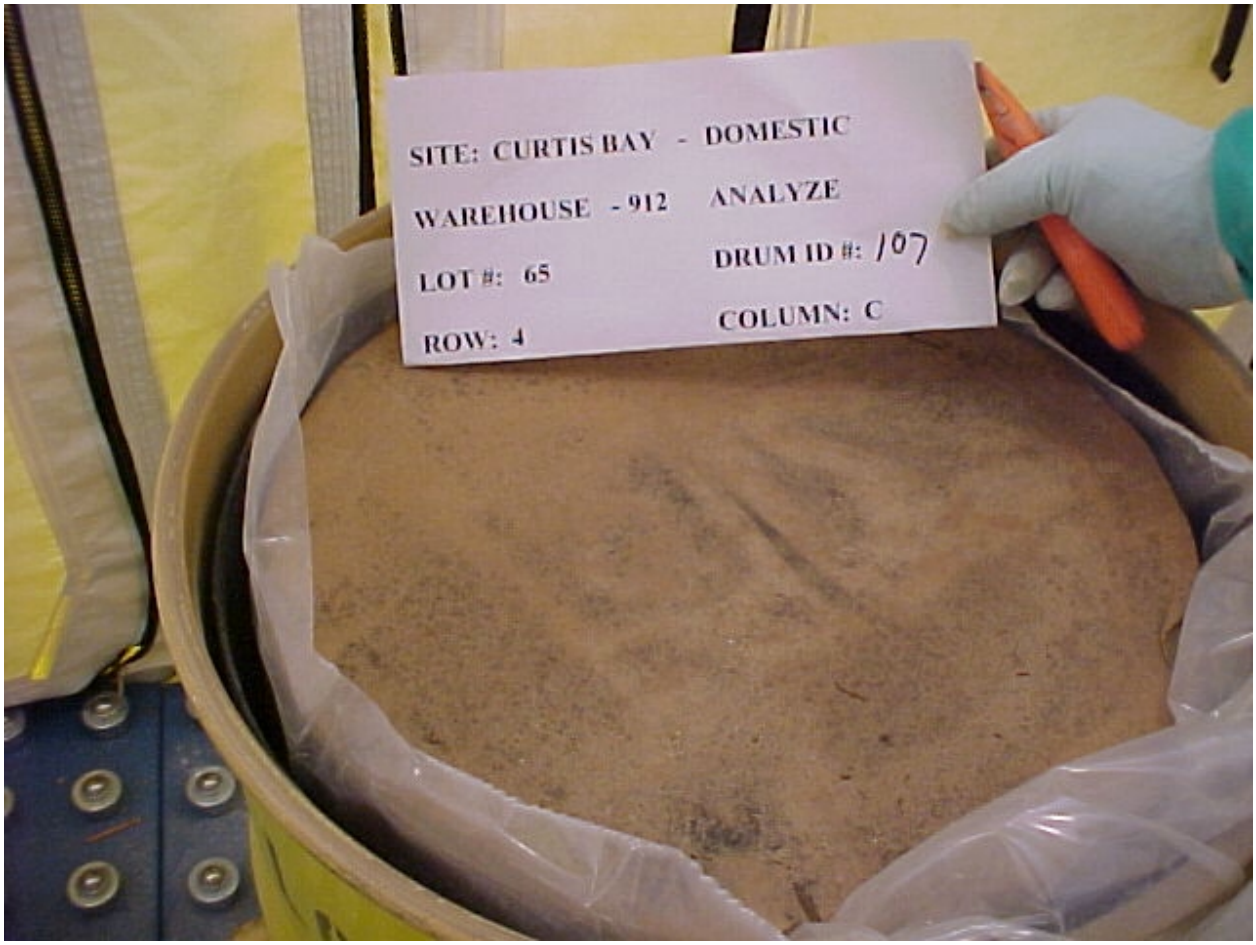
Date	7-09-2002	Time	14:30

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

Fiber drum lid from outermost fiber drum inside of 30-gal drum – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:30

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

2nd poly liner/bag – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:30

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

3rd poly liner/bag – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:30

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

Wooden lid mounted on innermost fiber drum/lab-pack – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:30

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

Lab-pack container lid – may be intergral part of wooden lid that is mounted on the fiber (lab-pack) drum – thin film paper
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:30

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

4th poly liner/bag – thin film plastic
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-09-2002	Time	14:30

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

ThN material – solid – white – monolith - dry
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	65	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	107	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	4
		Column	C

Inspection/Sample Date & Time

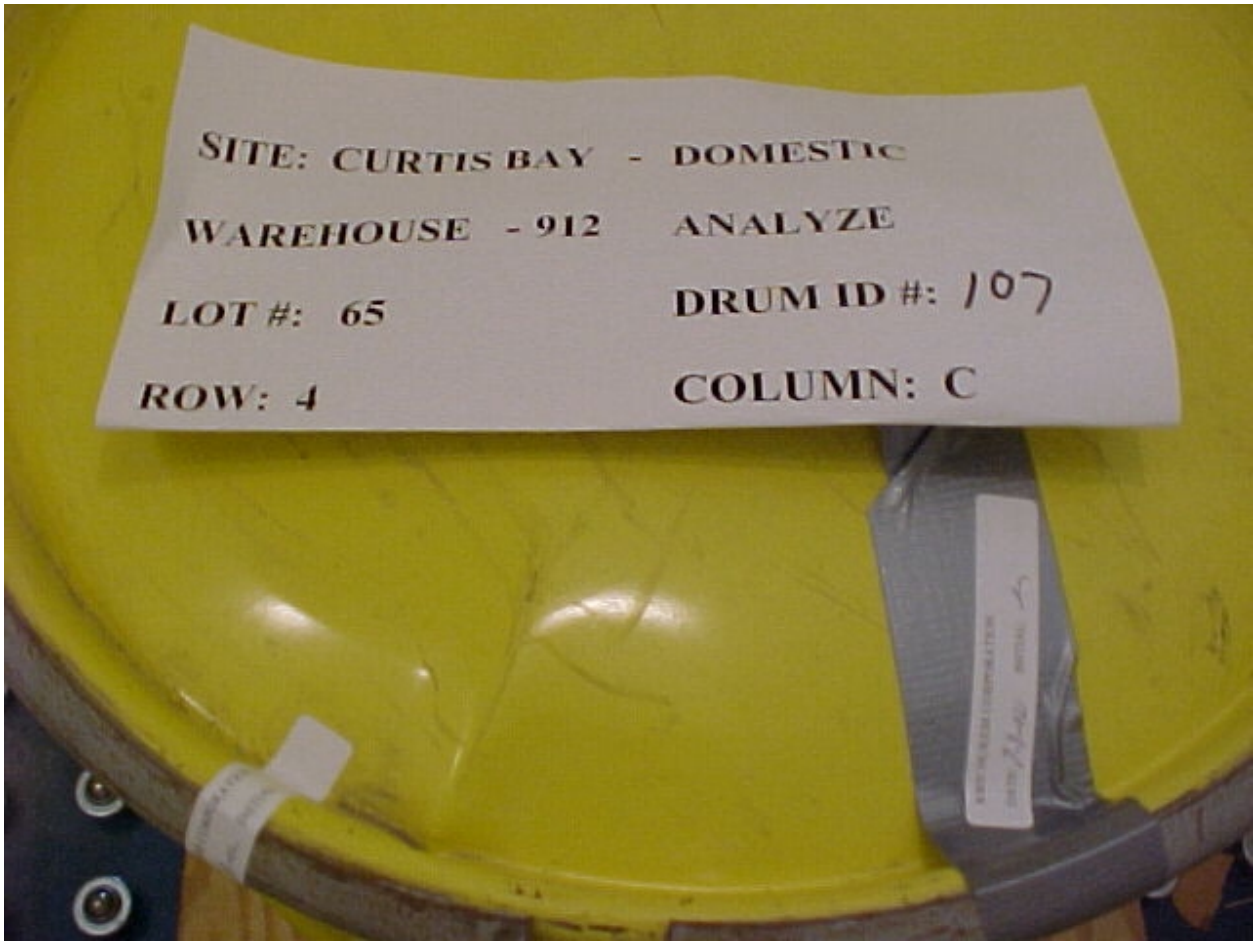
Date	7-09-2002	Time	14:30

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.5 mR/hr

Sealed & dated - Complete



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APPENDIX F

CURTIS BAY DEPOT
DRUMS SAMPLED FOR OFF-SITE ANALYSES
(FIFTH SAMPLE SHIPMENT)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Curtis Bay Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were sampled and shipped off-site for analyses per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were shipped to UT Battelle's contracted off-site laboratory per Shipment No. 6990-001-006 (i.e. the fifth shipment of samples to the laboratory for this project). All lots/drums included in this appendix came from Thorium Nitrate materials originating from domestic sources.

The data in this appendix contains visual inspection and applicable sampling data only for 30-gal steel drums. From the inspection of the drums, 70% of the 30-gal drums sampled for this shipment at one time contained internal pressure (either via release of gas during the visual inspection or the presence of indentations in the top lid). Lots that had internal gas pressure are indicated with a single asterisk in the following table.

Also included with this table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	2*	78	F-5
2	3	57	F-17
3	11	248	F-31
4	12*	136	F-43
5	14*	123	F-57
6	15	239	F-69
7	20*	11	F-81
8	44*	182	F-93
9	52*	194	F-105
10	58*	97	F-119

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Curtis Bay Depot
Lot #2 – Drum #78
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 2 Drum ID #: 78 Location: Warehouse 913 – Column F - Row 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 26 mR/hr DR at 1 meter 2.1 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

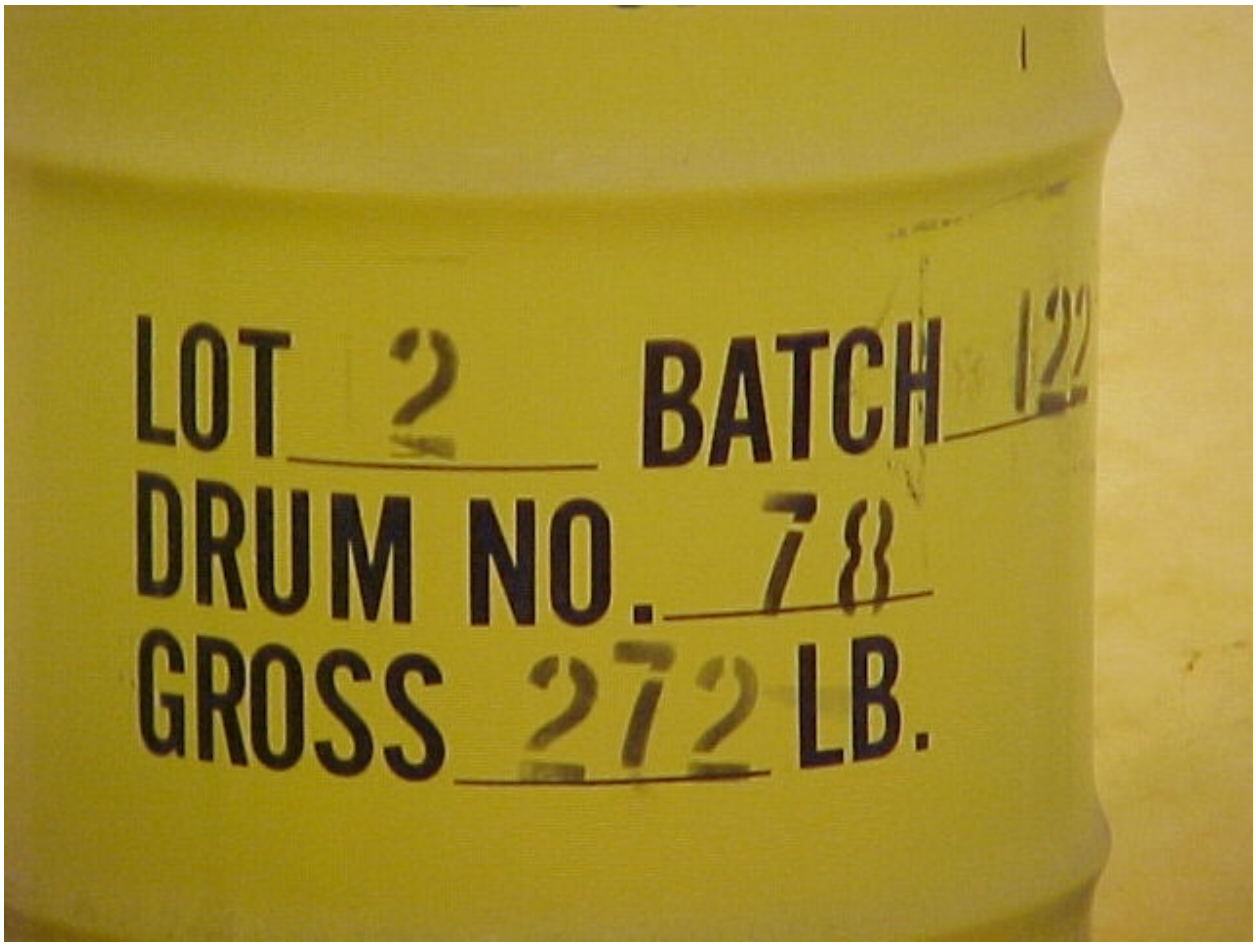
Other Information

Photo No. 1 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Container	30-gallon steel drum	Container Condition	good

Drum released pressure as bolt on drum ring was loosened – prior to complete removal of the drum ring, the drum lid pushed through the center of the ring springing off the drum 1' to 2' vertically. Utilized remote extension on air ratchet to loosen bolt to provide safe distance between operator and drum lid.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

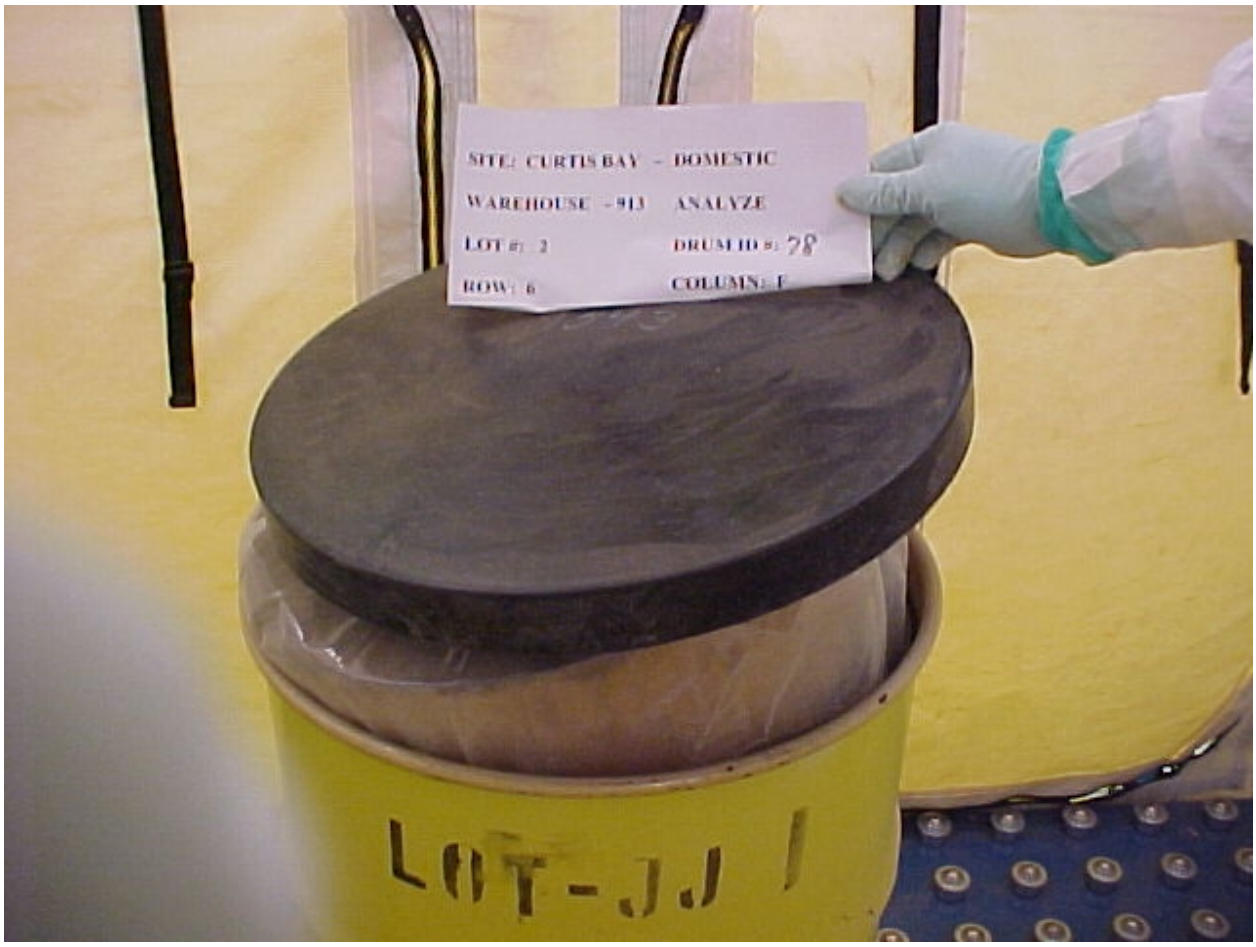
Other Information

Photo No. 2 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Black plastic lid – good condition Fiber lid – good condition

Pressure buildup inside of container raises poly liner/bag and lids vertically when drum lid is removed. No gasses present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

Other Information

Photo No. 3 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

1st poly liner/bag – good condition – bag is pushed out of the drum vertically due to internal pressure buildup inside of innermost poly liner/bag (not the "thin film" poly liner around the actual ThN material).

No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

Other Information

Photo No. 4 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Photo shows the fiber drum lid on outermost fiber drum (inside of 30-gal drum) – good condition. Lid tape has separated from fiber drum due to internal pressure inside of drum.
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

Other Information

Photo No. 5 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

2nd poly liner/bag – good condition – pressure buildup inside container raises this poly liner/bag vertically out of container

No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

Other Information

Photo No. 6 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

3rd poly liner/bag – good condition – this bag appears to be holding majority of gas pressure inside of drum; although, it does not "pop" when you cut the bag with an utility knife.
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in headspace – LEL – 4.6% - NO - +50.0ppm – NOx – +50.0ppm
Drum/bag vented - All gasses dissipated through HEPA blower suction directly over drum

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

Other Information

Photo No. 7 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Wooden lid [mounted to inner fiber drum (lab-pack container)] – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

Other Information

Photo No. 8 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

4th poly liner/bag ("thin film" plastic) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:00

Other Information

Photo No. 9 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Thorium Nitrate – monolith – white – solid - dry
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	78	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	6
		Column	F

Inspection/Sample Date & Time

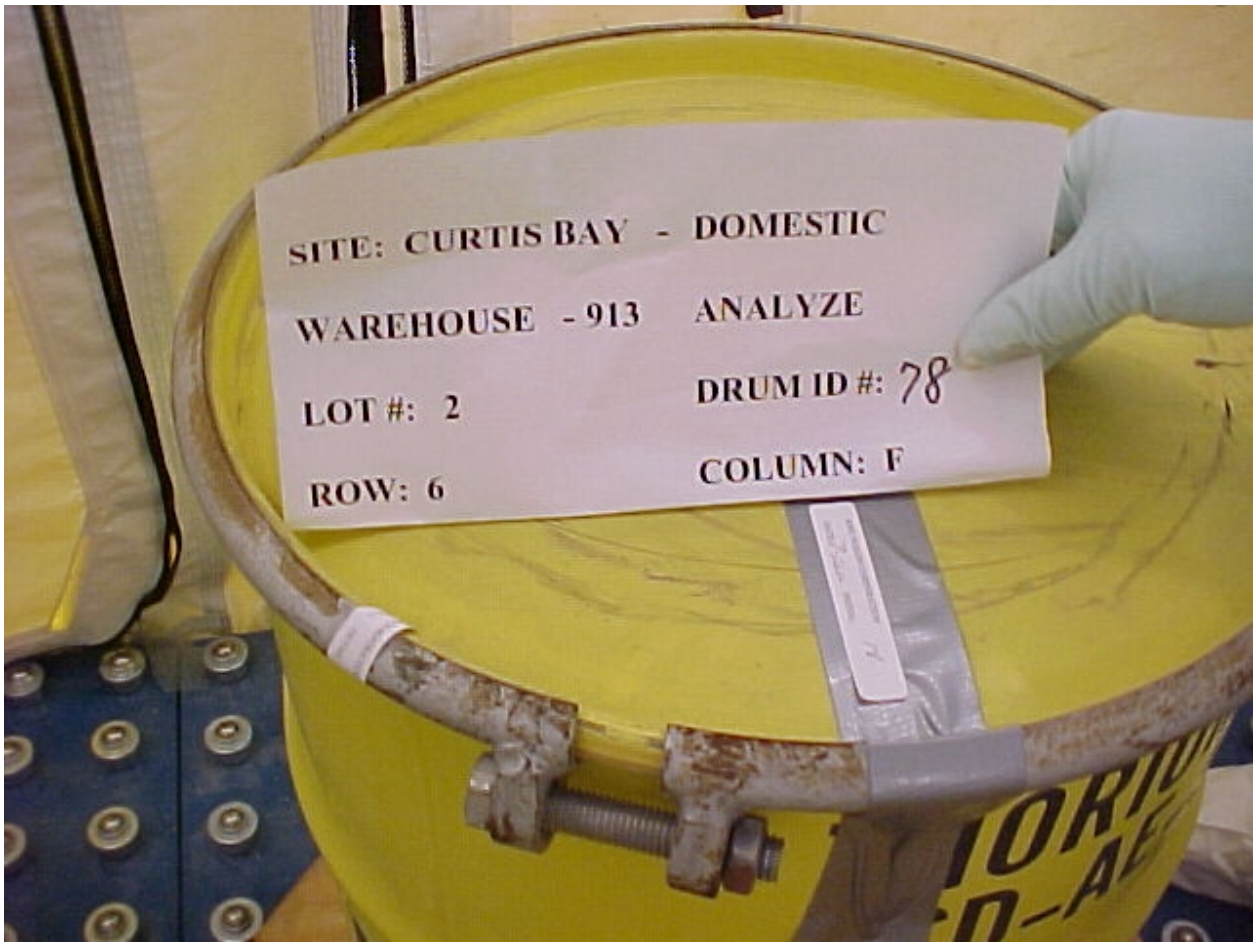
Date	7-12-2002	Time	08:00

Other Information

Photo No. 10 of 10

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #3 – Drum #57
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 3 Drum ID #: 57 Location: Warehouse 913 – Column F – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 25 mR/hr DR at 1 meter 2.5 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-11-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

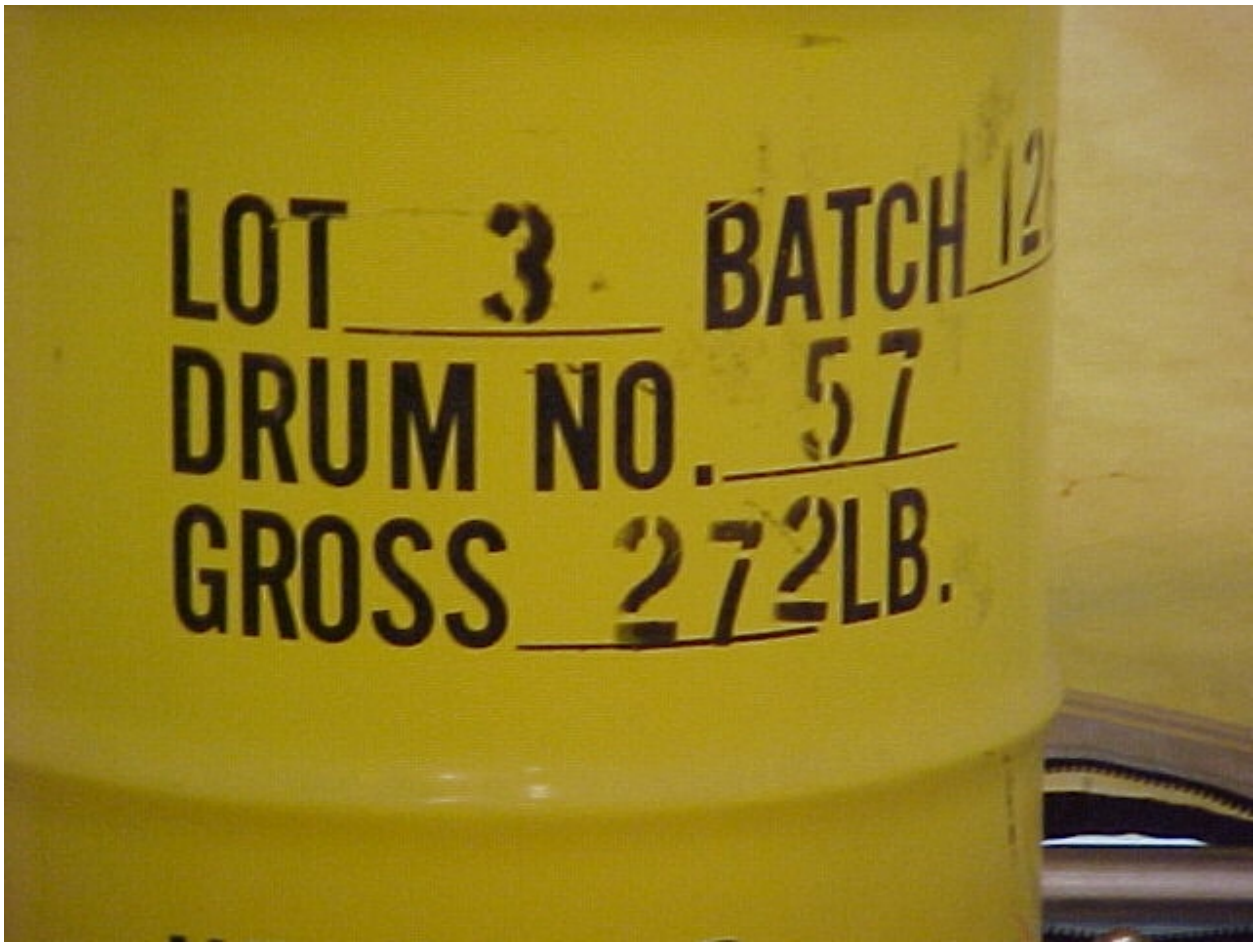
Date	7-11-2002	Time	14:00

Other Information

Photo No. 1 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

30-gal steel drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

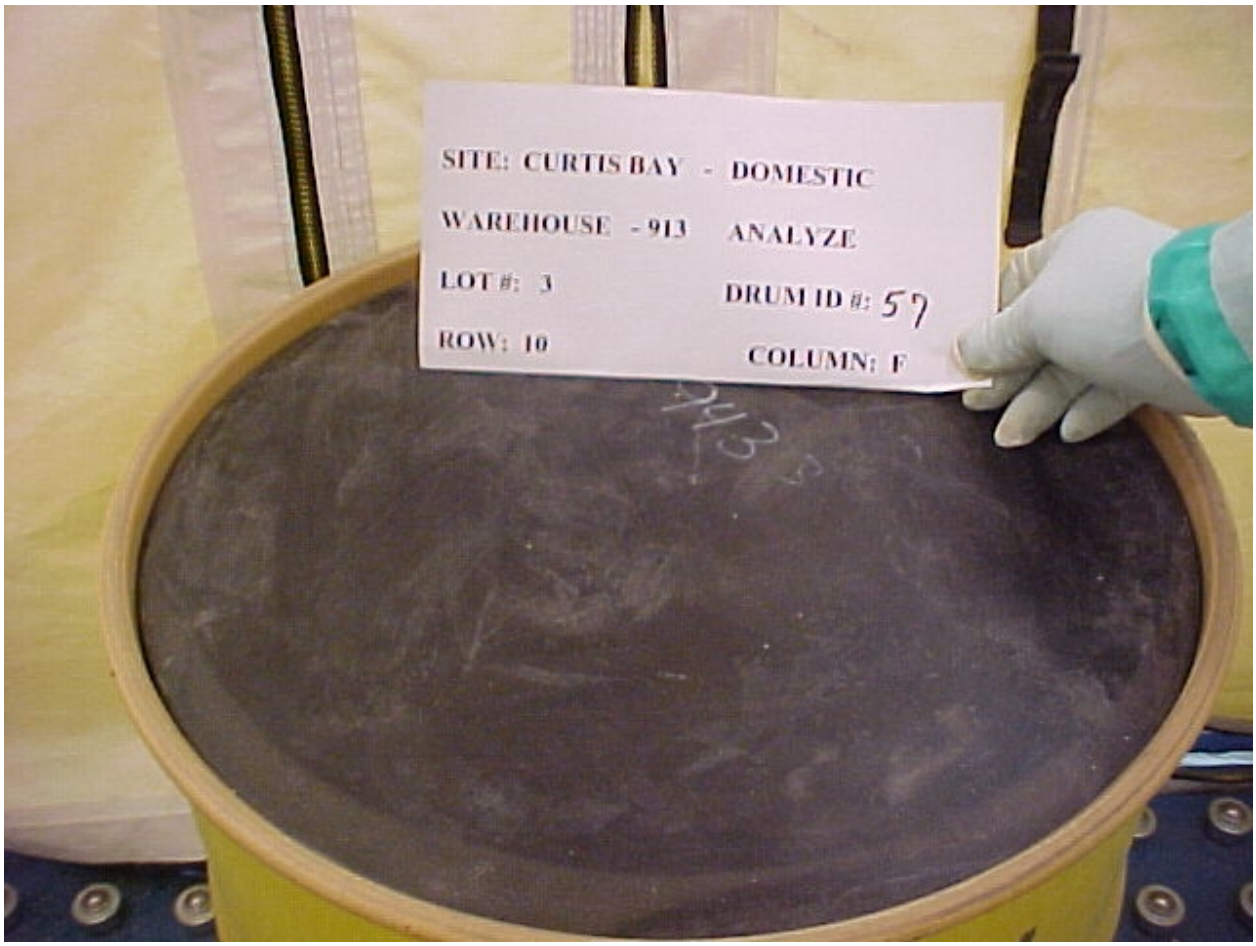
Date	7-11-2002	Time	14:00

Other Information

Photo No. 2 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

Black plastic lid (from drum liner) – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:00

Other Information

Photo No. 3 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

1st poly liner/bag – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

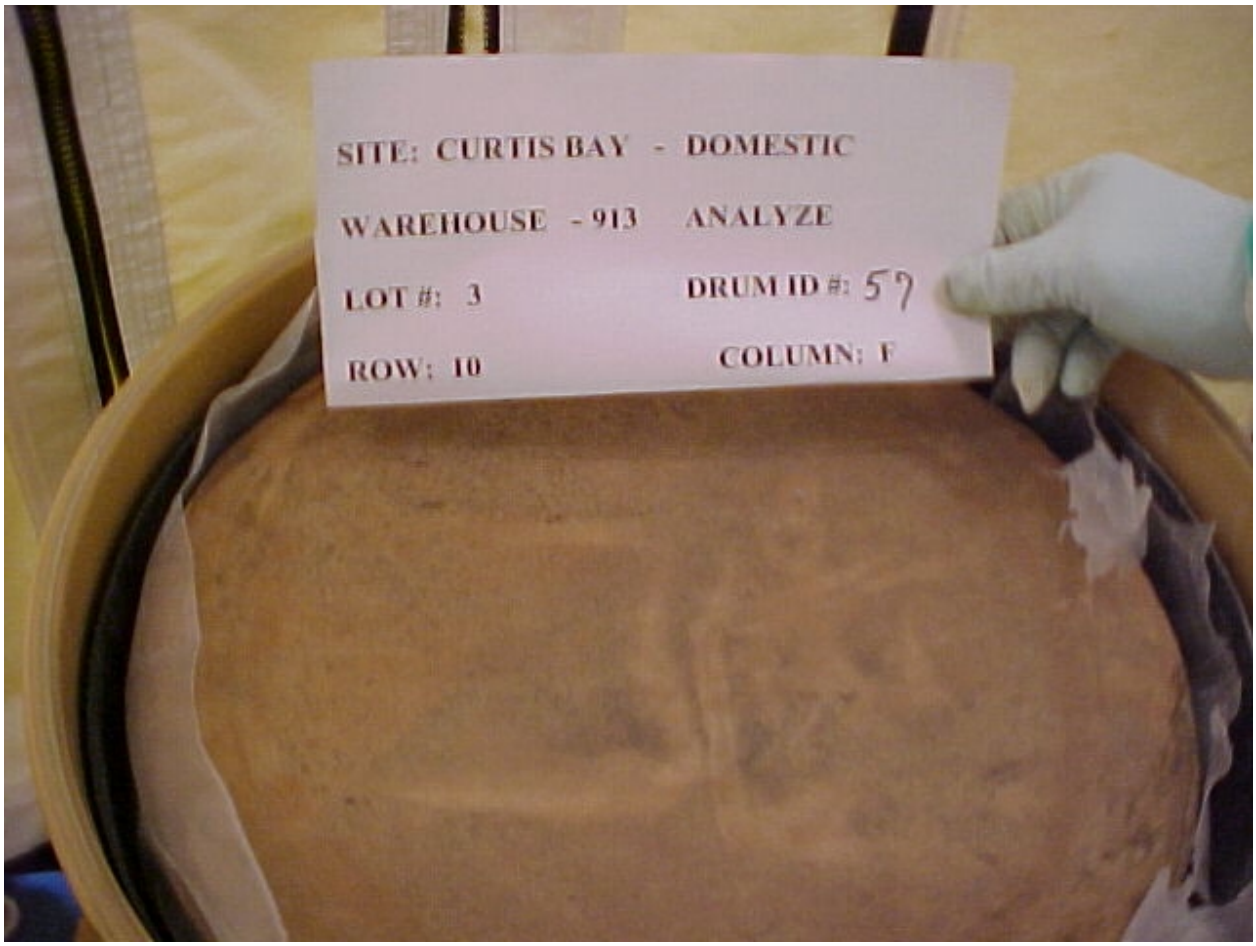
Date	7-11-2002	Time	14:00

Other Information

Photo No. 4 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

Fiber lid (from outermost fiber drum) – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

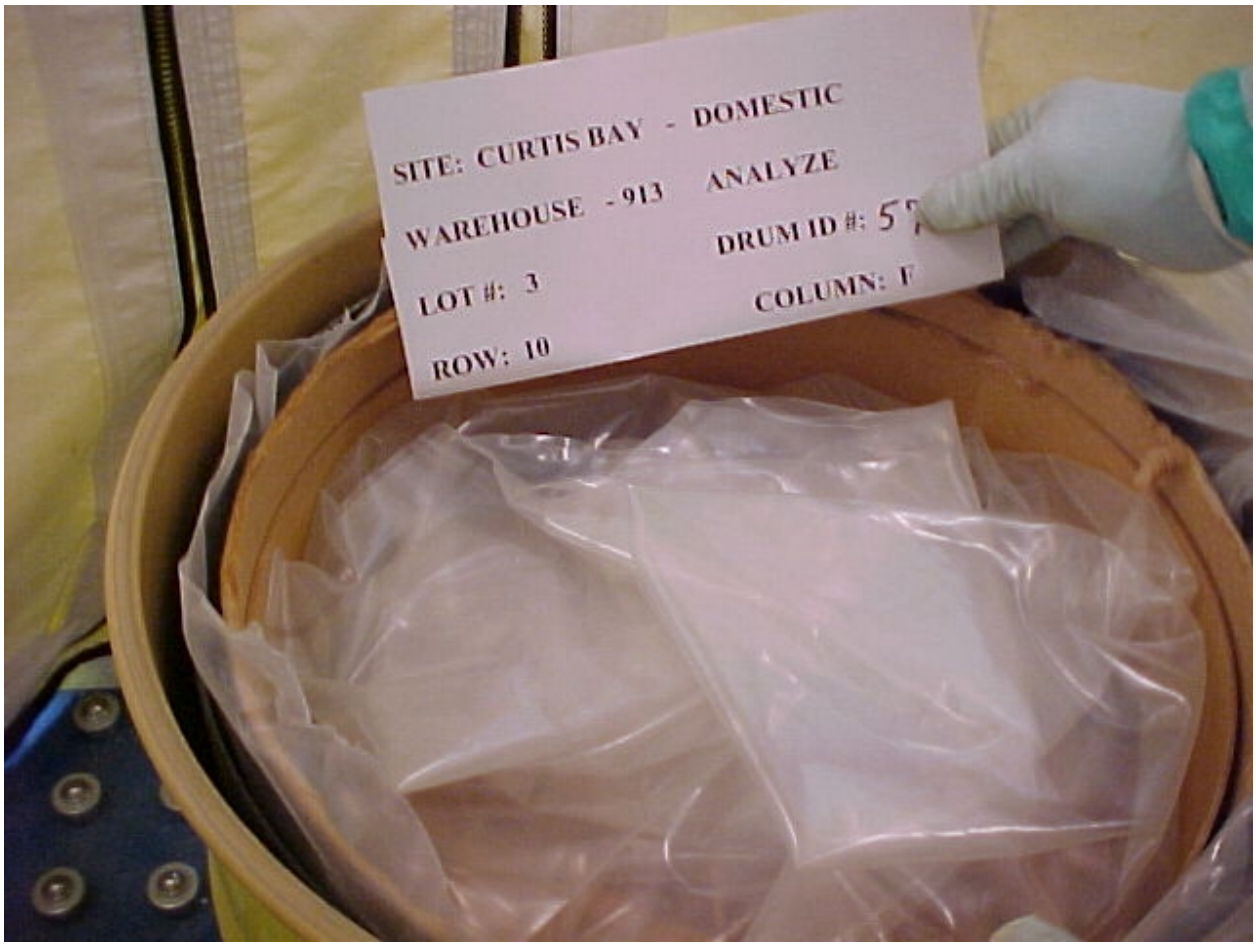
Date	7-11-2002	Time	14:00

Other Information

Photo No. 5 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

2nd poly liner/bag – good condition
No gasses present (in breathing zone)



eneral Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

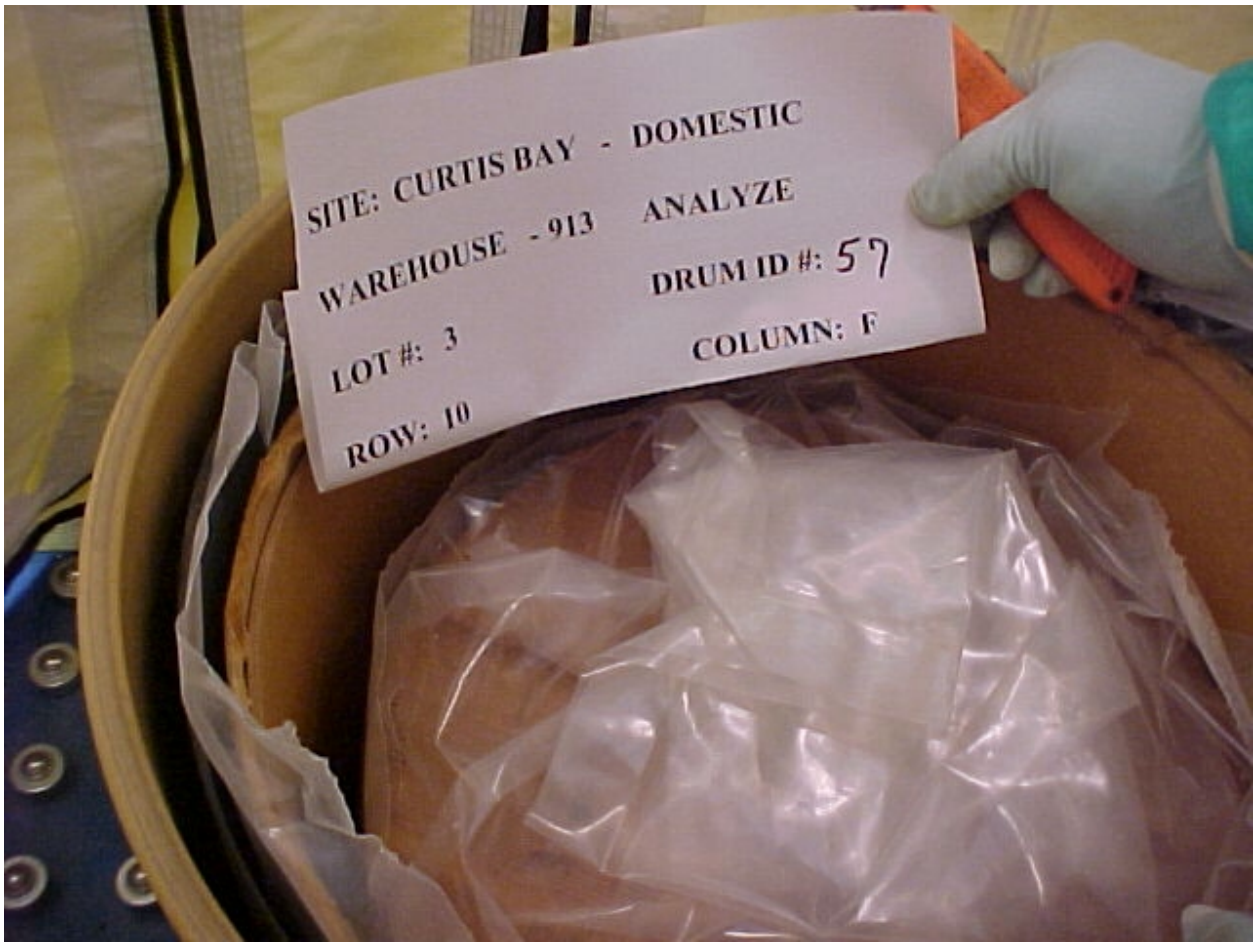
Date	7-11-2002	Time	14:00

Other Information

Photo No. 6 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

3rd poly liner/bag – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:00

Other Information

Photo No. 7 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

Wooden lid [mounted to inner fiber drum (lab-pack)] – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:00

Other Information

Photo No. 8 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

Inner fiber drum (lab-pack) is shown in this photo – there is a thin paper layer under the wooden lid (previous photo) that is part of this fiber drum – the paper typically tears when you remove the wooden lid.

No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:00

Other Information

Photo No. 9 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

4th poly liner/bag (thin film plastic) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:00

Other Information

Photo No. 10 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

ThN material – monolith – solid – white - dry
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	3	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	57	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	F

Inspection/Sample Date & Time

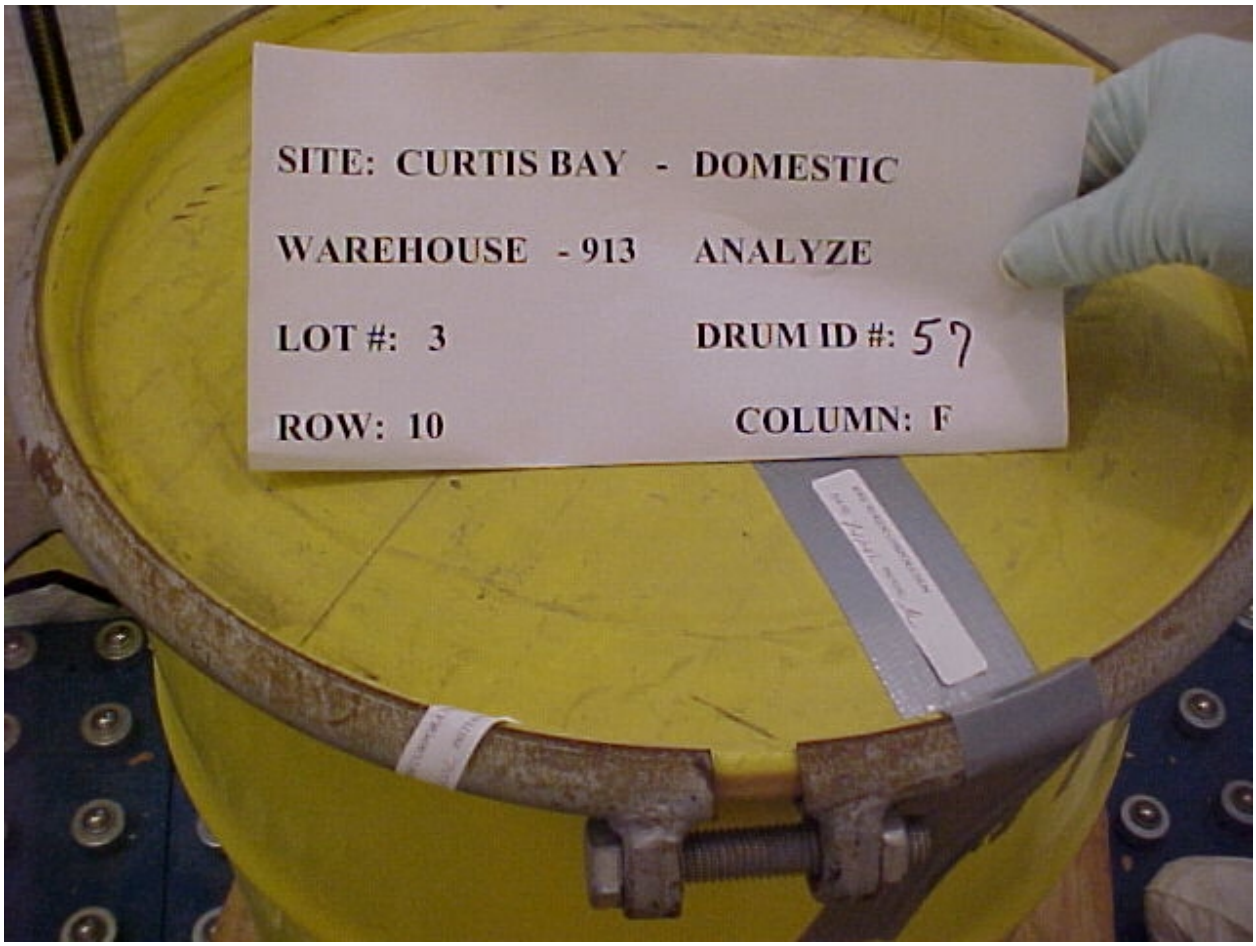
Date	7-11-2002	Time	14:00

Other Information

Photo No. 11 of 11

Dose Rate	Surface	≅ 25 mR/hr
	1 meter	≅ 2.5 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #11 – Drum #248
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 11 Drum ID #: 248 Location: Warehouse 913 – Column E - Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

30-gal drum – good condition

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

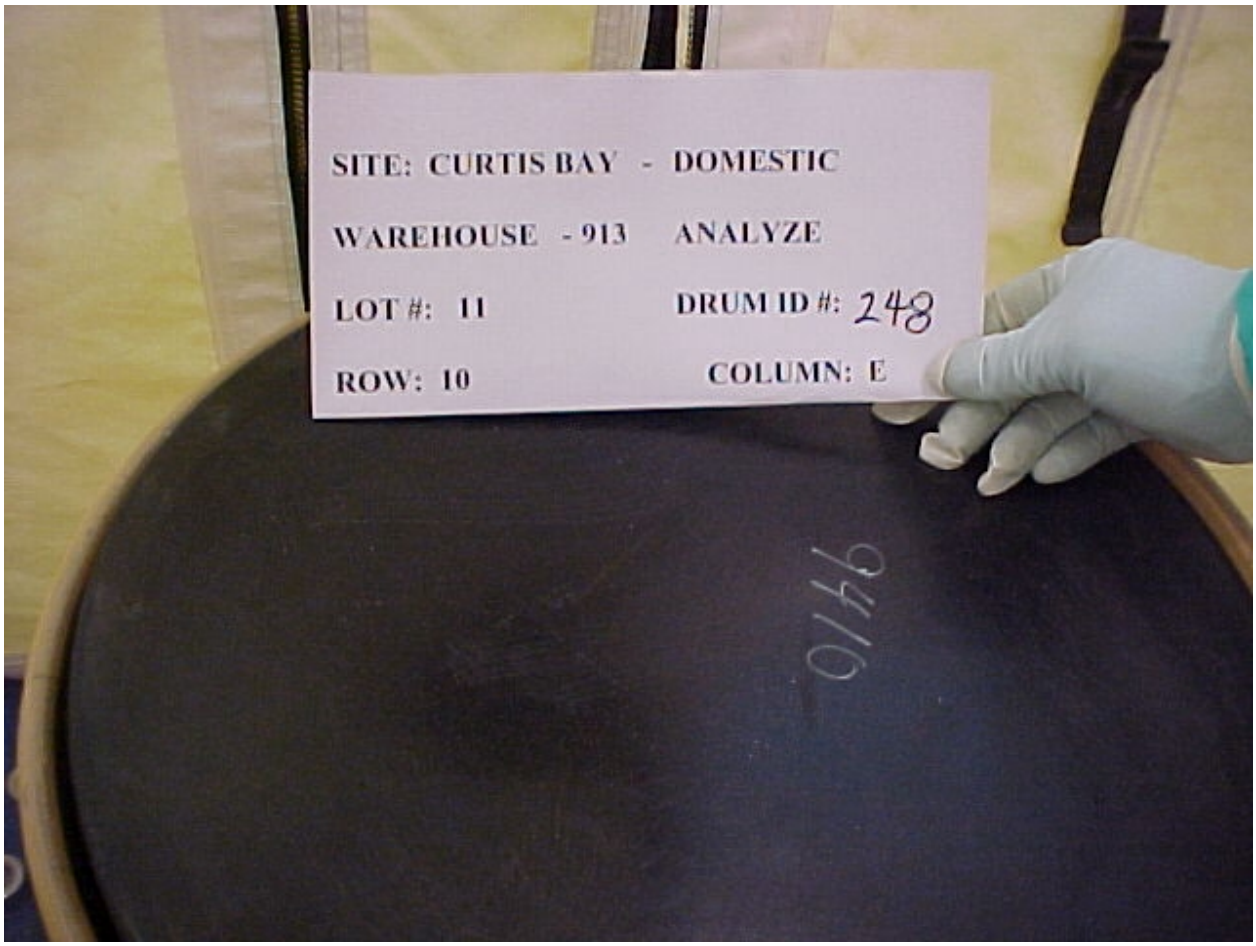
Date	7-12-2002	Time	14:15

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Black plastic lid on drum liner – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

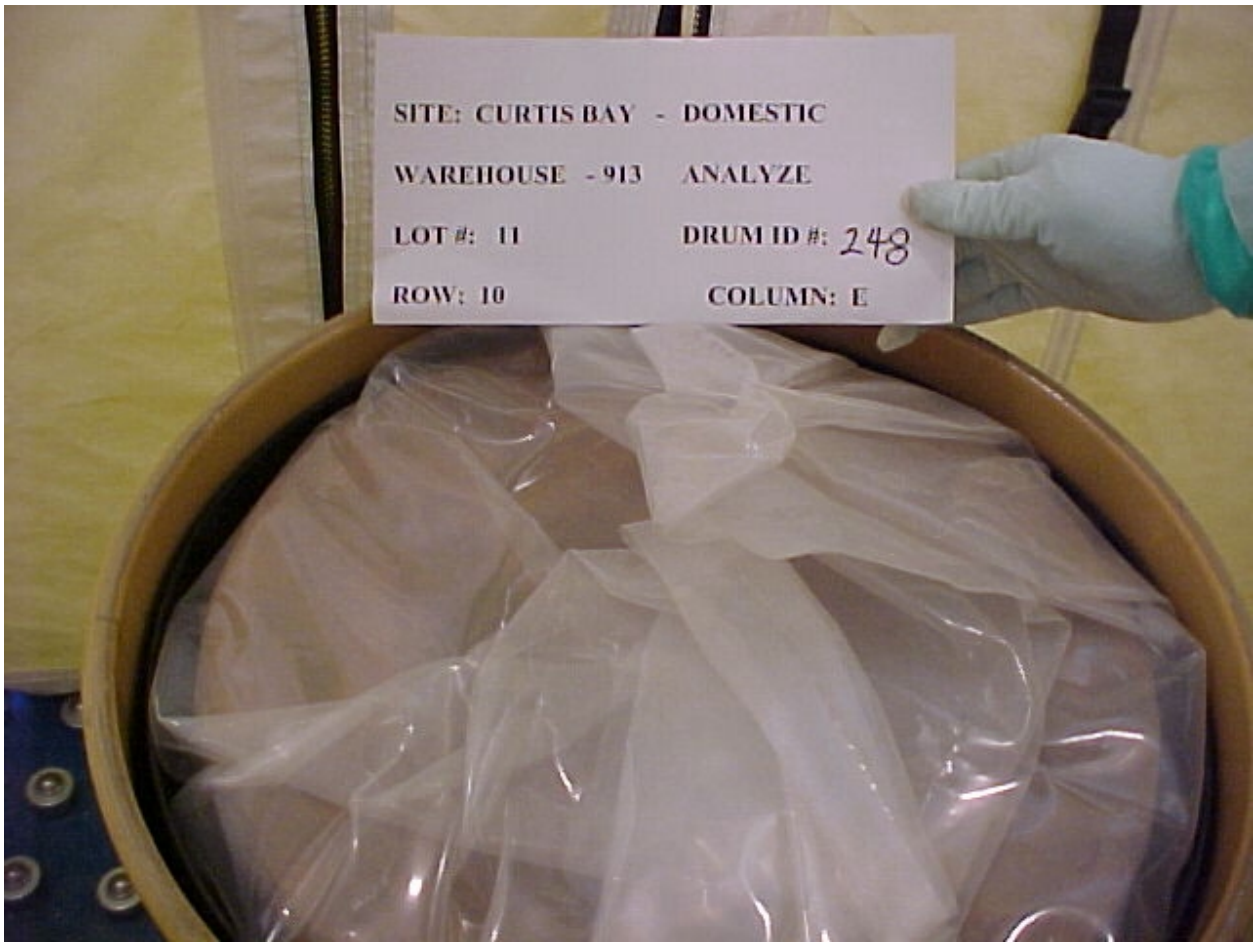
Date	7-12-2002	Time	14:15

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

1st poly liner/bag – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

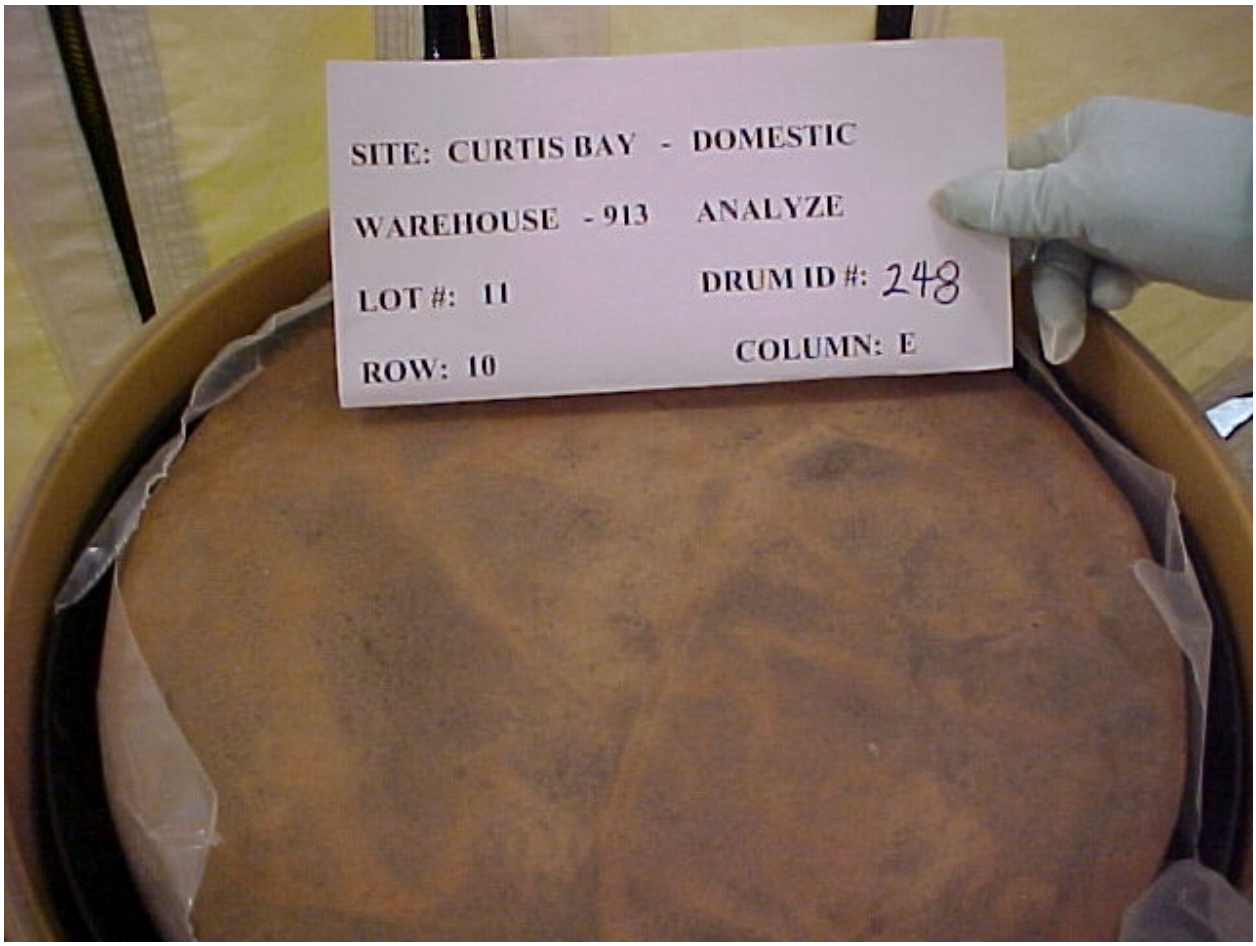
Date	7-12-2002	Time	14:15

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Fiber lid on outermost fiber drum – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

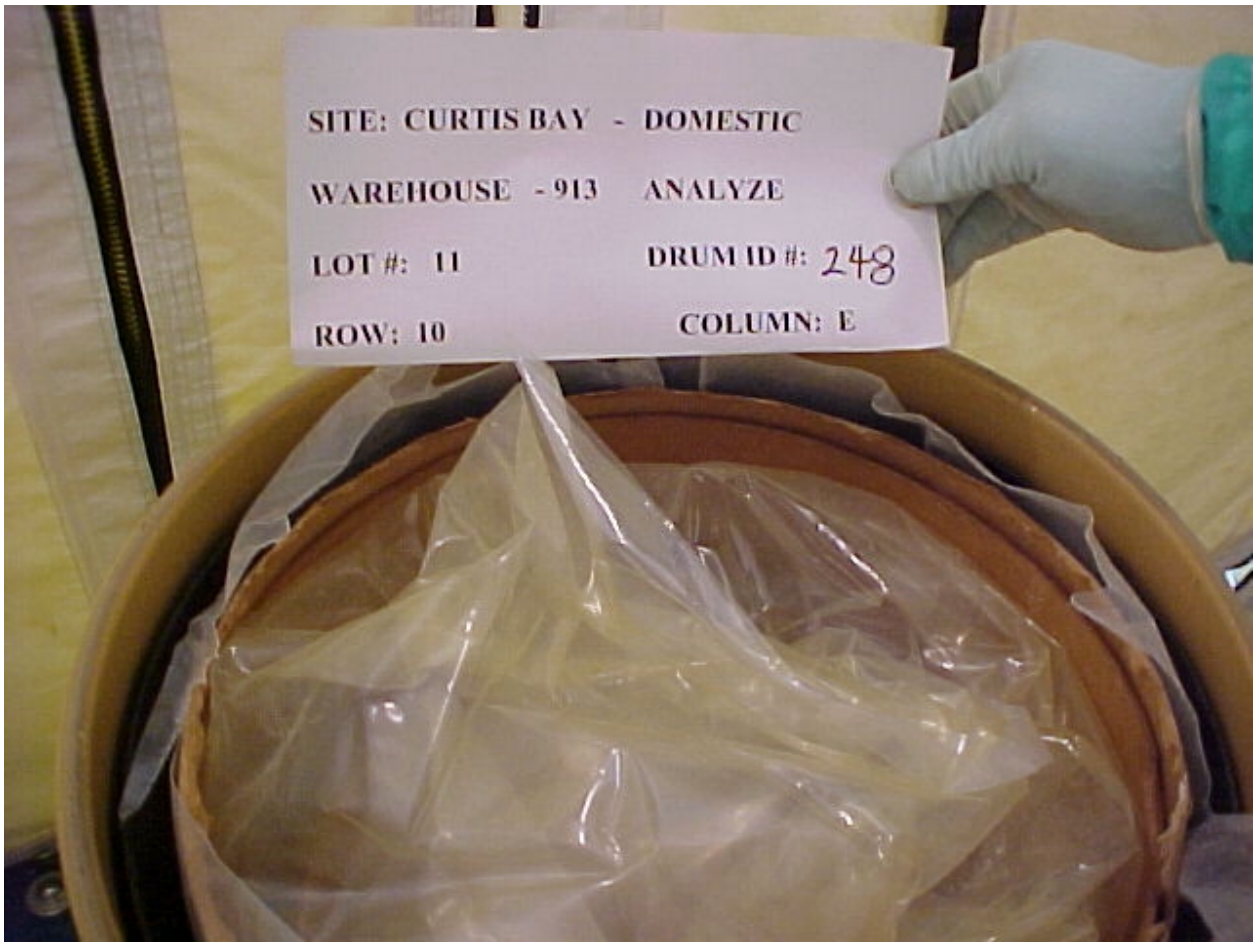
Date	7-12-2002	Time	14:15

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

2nd poly liner/bag – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

3rd poly liner/bag – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Wooden lid that fits onto the inner fiber drum (lab-pack) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

4th poly liner/bag (thin film plastic) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	11	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	248	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	10
		Column	E

Inspection/Sample Date & Time

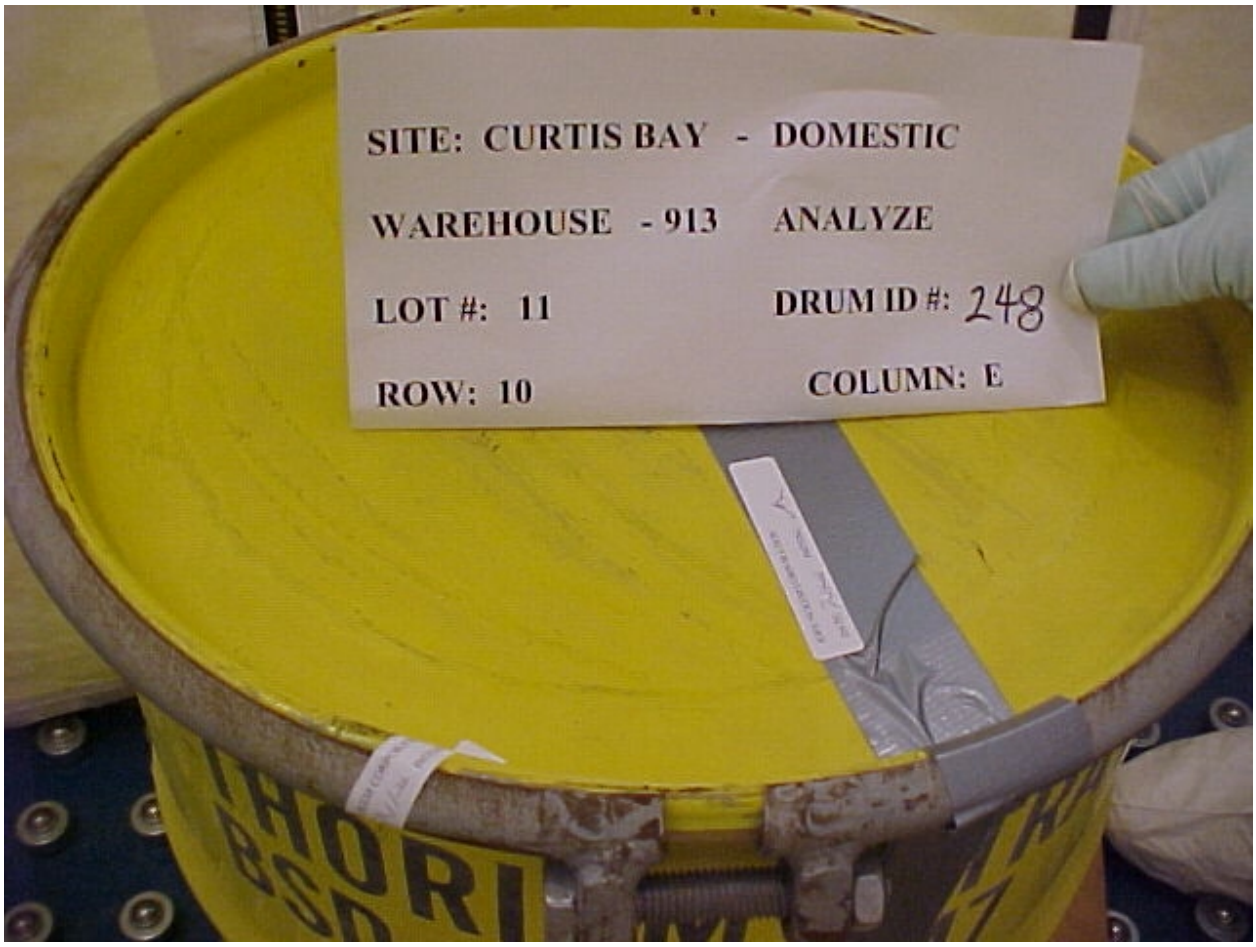
Date	7-12-2002	Time	14:15

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #12 – Drum #136
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 12 Drum ID #: 136 Location: Warehouse 913 – Column E - Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 6.0% LEL NO +50 ppm NOx +50 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-11-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

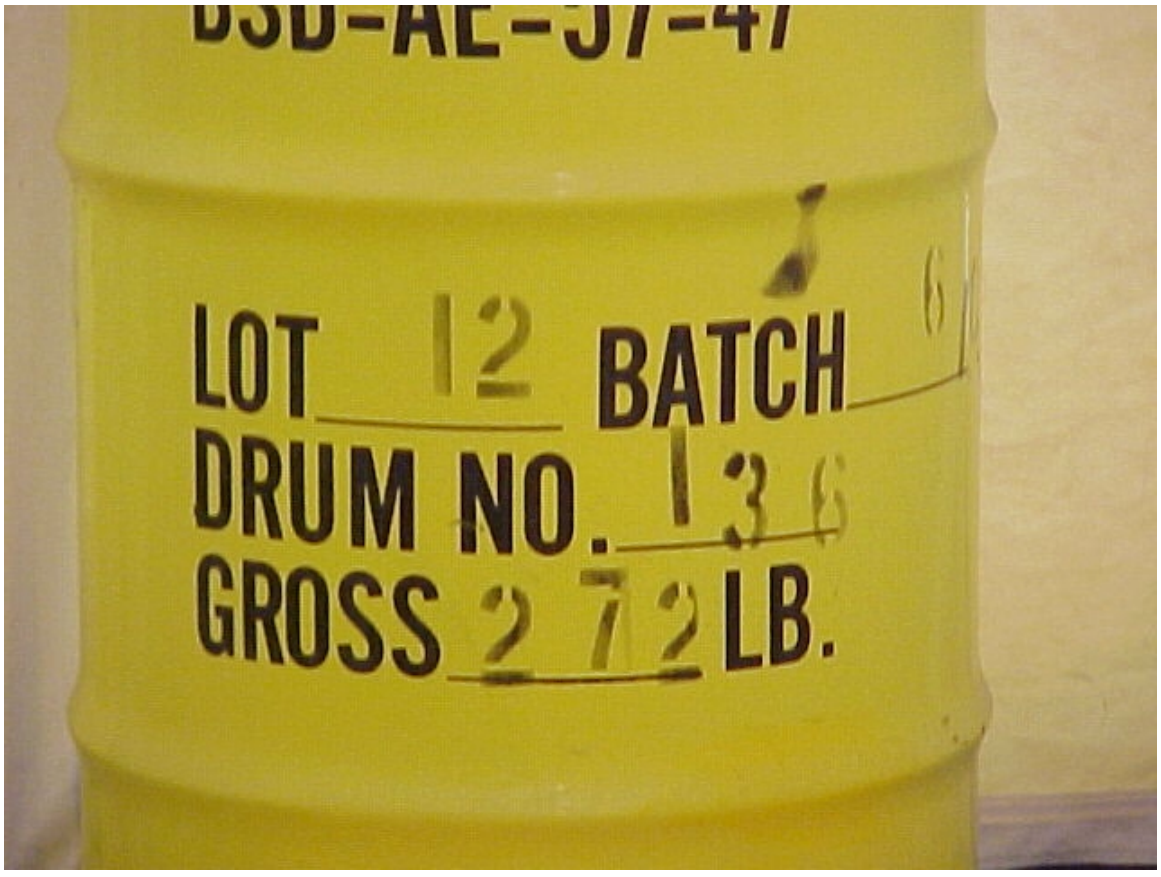
Date	7-12-2002	Time	09:00

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

30-gal drum – good condition (drum released pressure when bolt was loosened on drum ring)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

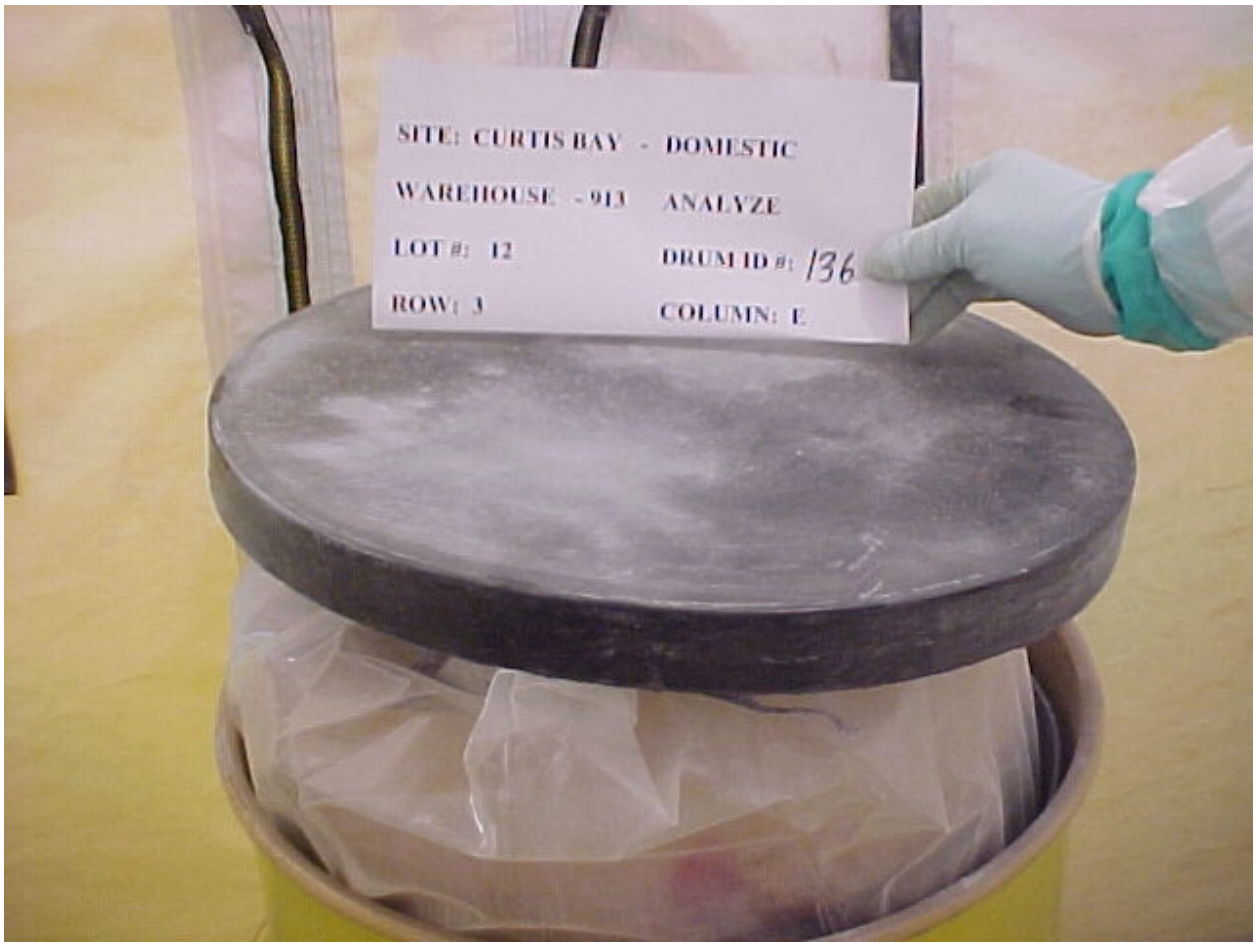
Date	7-12-2002	Time	09:00

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Black plastic lid (from drum liner) – good condition – lid is pushed outward due to buildup of pressure inside of an inner poly bag
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:00

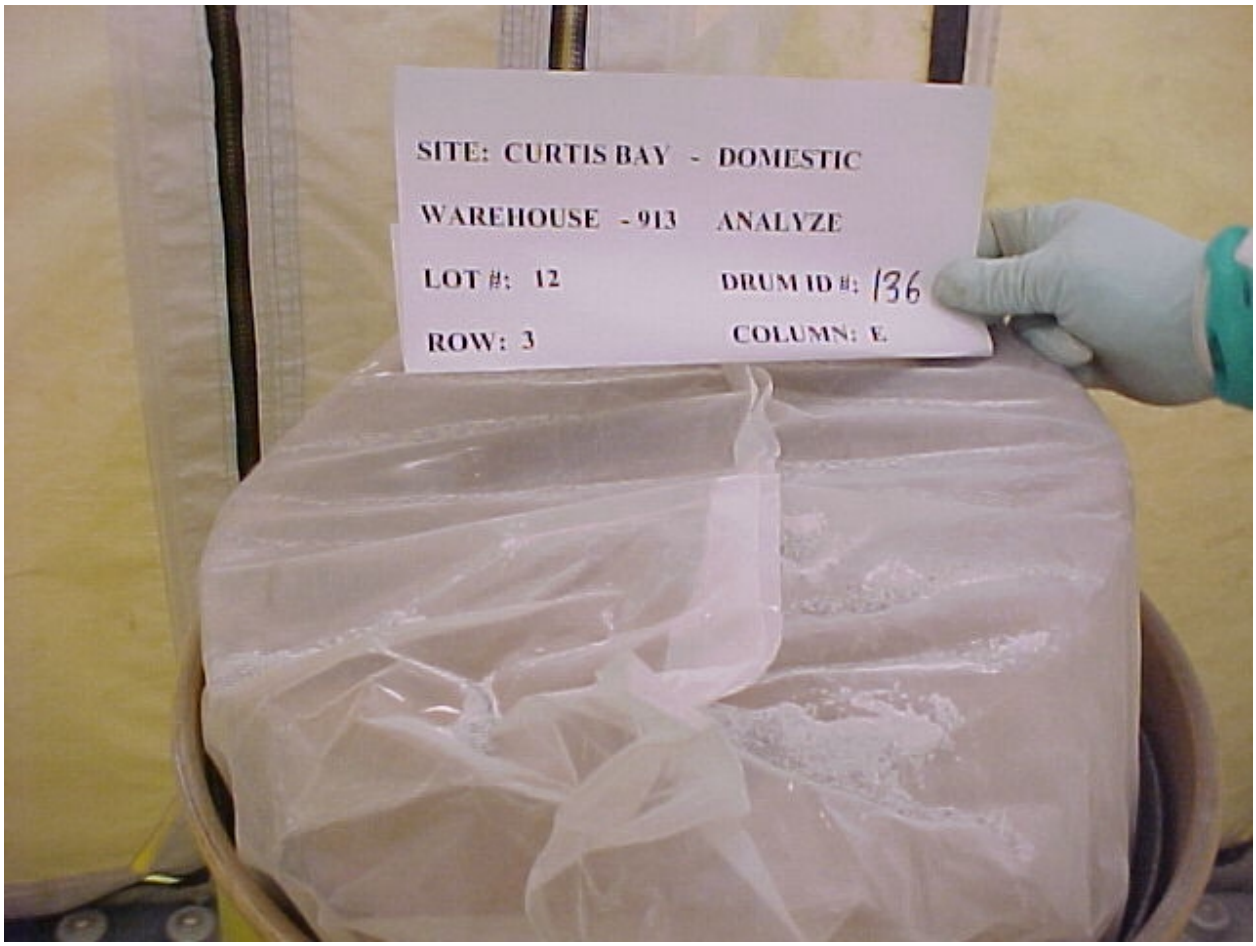
Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

1st poly liner/bag – good condition – bag is pushed outward due to buildup of pressure inside of an inner poly bag

No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

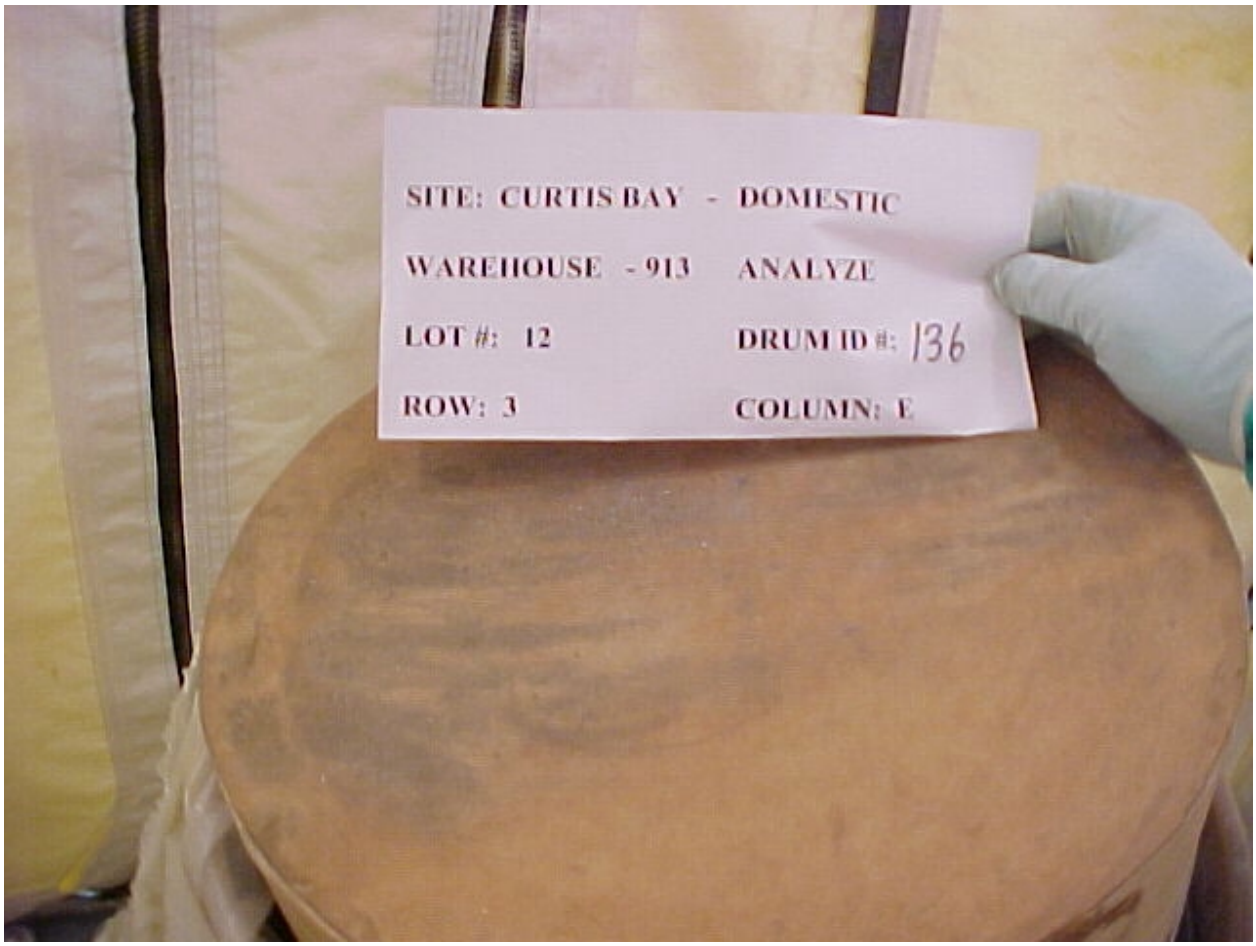
Date	7-12-2002	Time	09:00

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Fiber drum lid (from outermost fiber drum) – good condition – lid is pushed vertically upward due to buildup of pressure inside of an inner poly bag
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:00

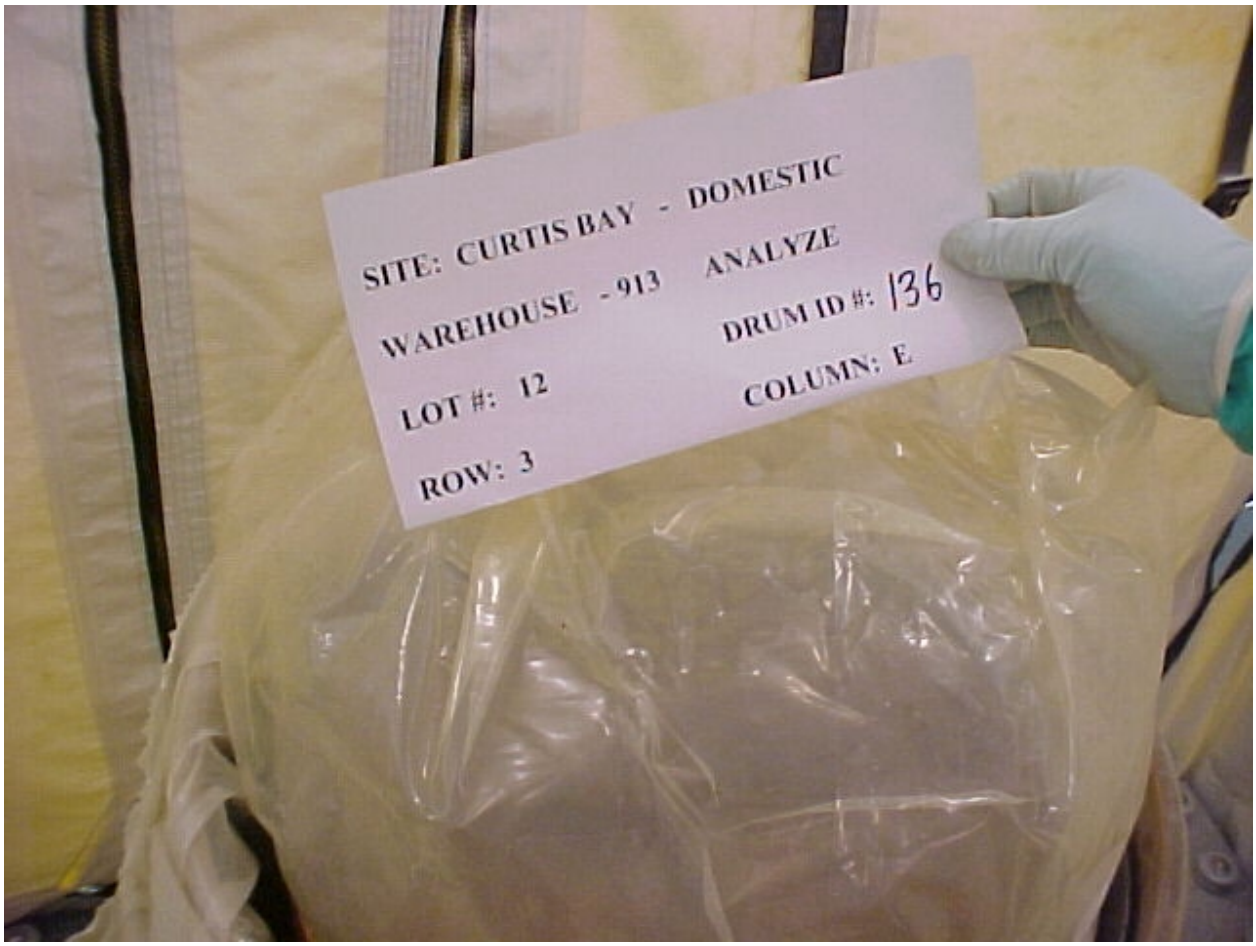
Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

2nd poly liner/bag – good condition – bag is pushed vertically upward due to buildup of pressure inside of an inner poly bag

No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:00

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

3rd poly liner/bag – good condition – this bag contains the majority of the pressure buildup inside of the drum; although, it does not "pop" when cut by a utility knife
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in headspace of bag – LEL – 6.0% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated through HEPA blower exhaust positioned directly over drum being inspected.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:00

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Wooden lid (on innermost fiber drum – sometimes referred to as a lab-pack in this documentation) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:00

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Lab-pack lid [thin paper layer – this thin layer of paper is attached to the fiber drum and is physically underneath the wooden lid (previous photograph)] – fair condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:00

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

4th poly liner/bag (thin film plastic) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:00

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	12	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	136	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	3
		Column	E

Inspection/Sample Date & Time

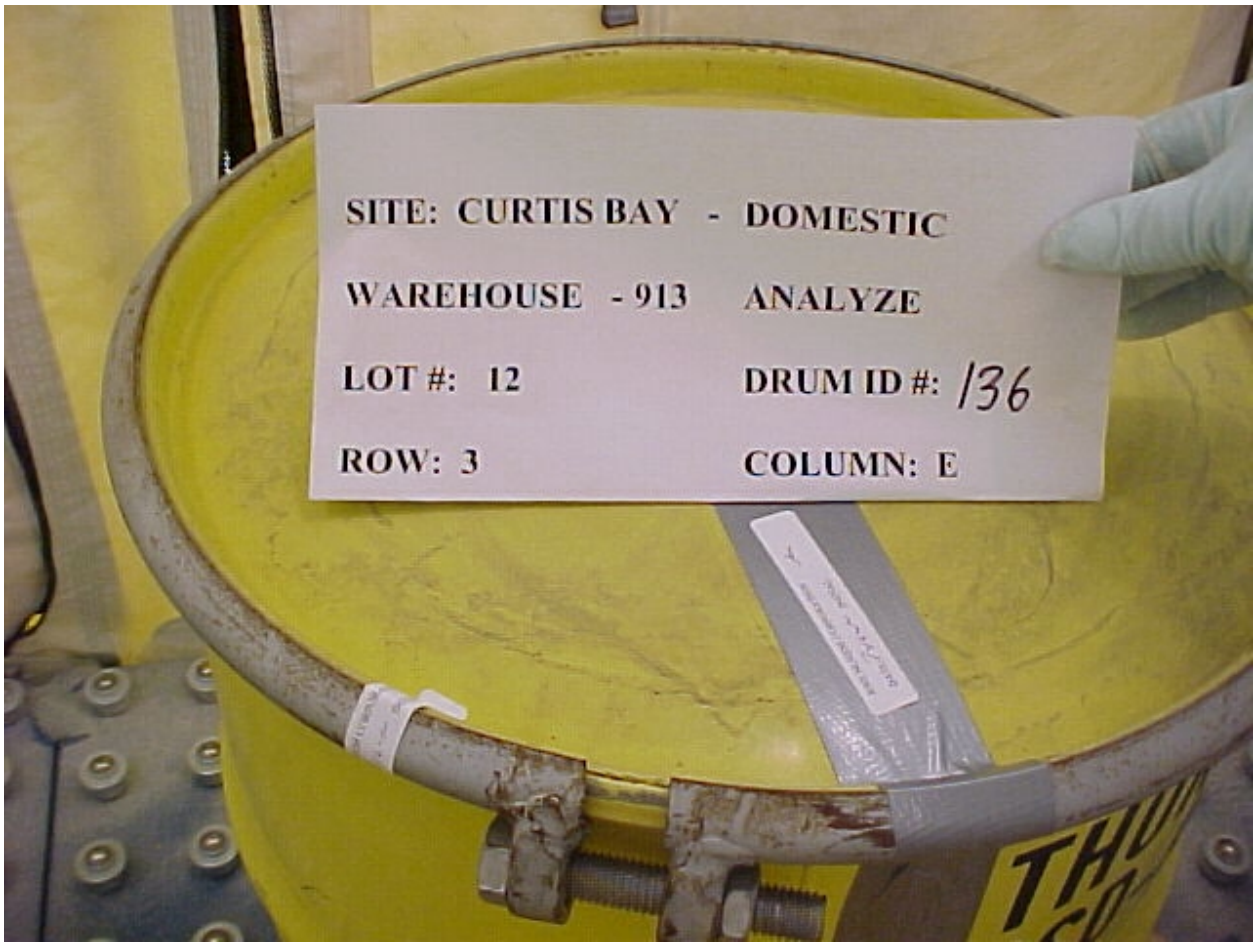
Date	7-12-2002	Time	09:00

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #14 – Drum #123
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 14 Drum ID #: 123 Location: Warehouse 913 – Column C - Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 6.1% LEL NO +50 ppm NOx +50 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

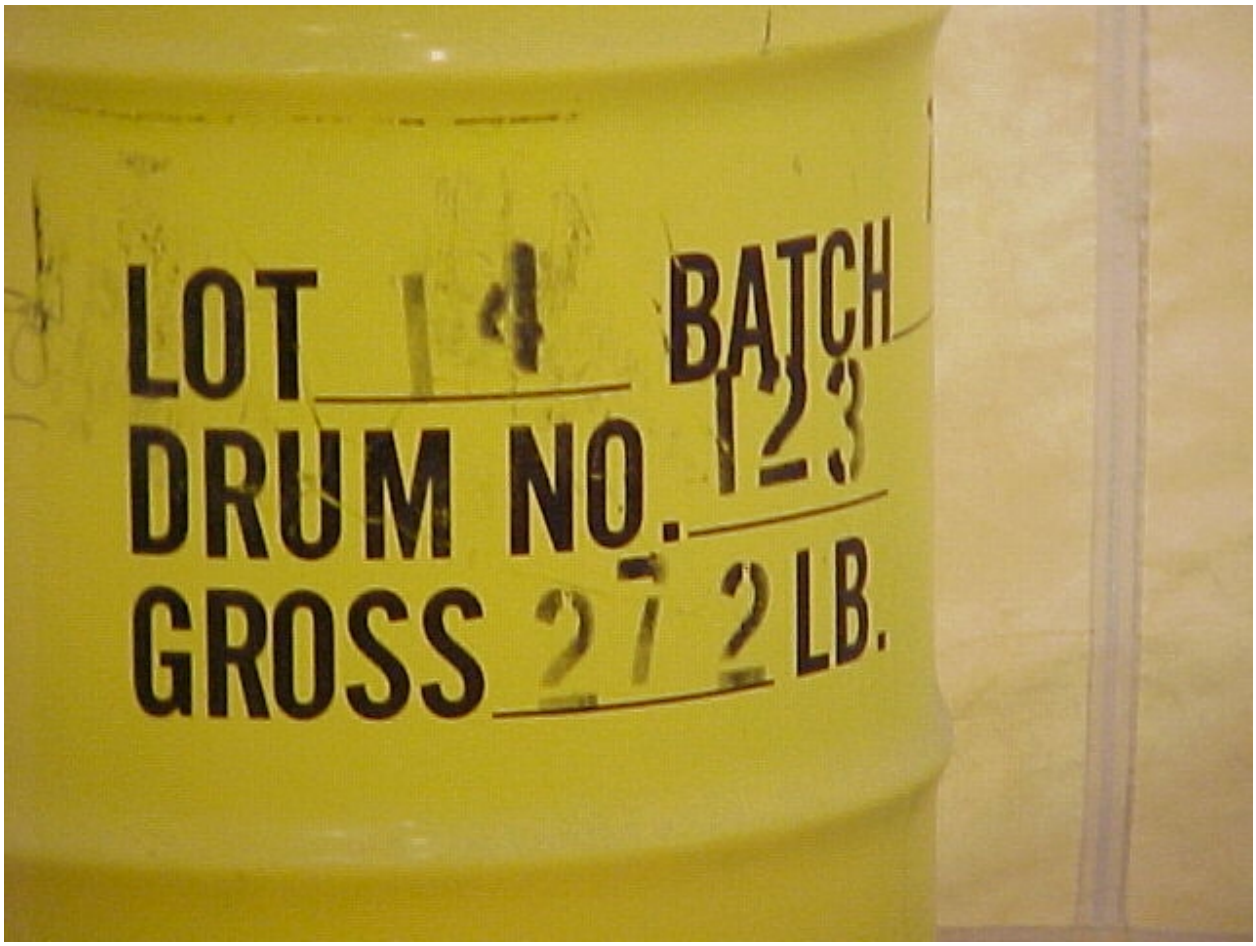
Date	7-12-2002	Time	11:30

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

30-gal drum – good condition (drum released pressure as bolt was loosened on drum ring)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Black plastic lid (on drum liner) – good condition (photo indicates a gas pressure buildup inside of an inner poly bag that causes the lid to be pushed vertically out of top of drum)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

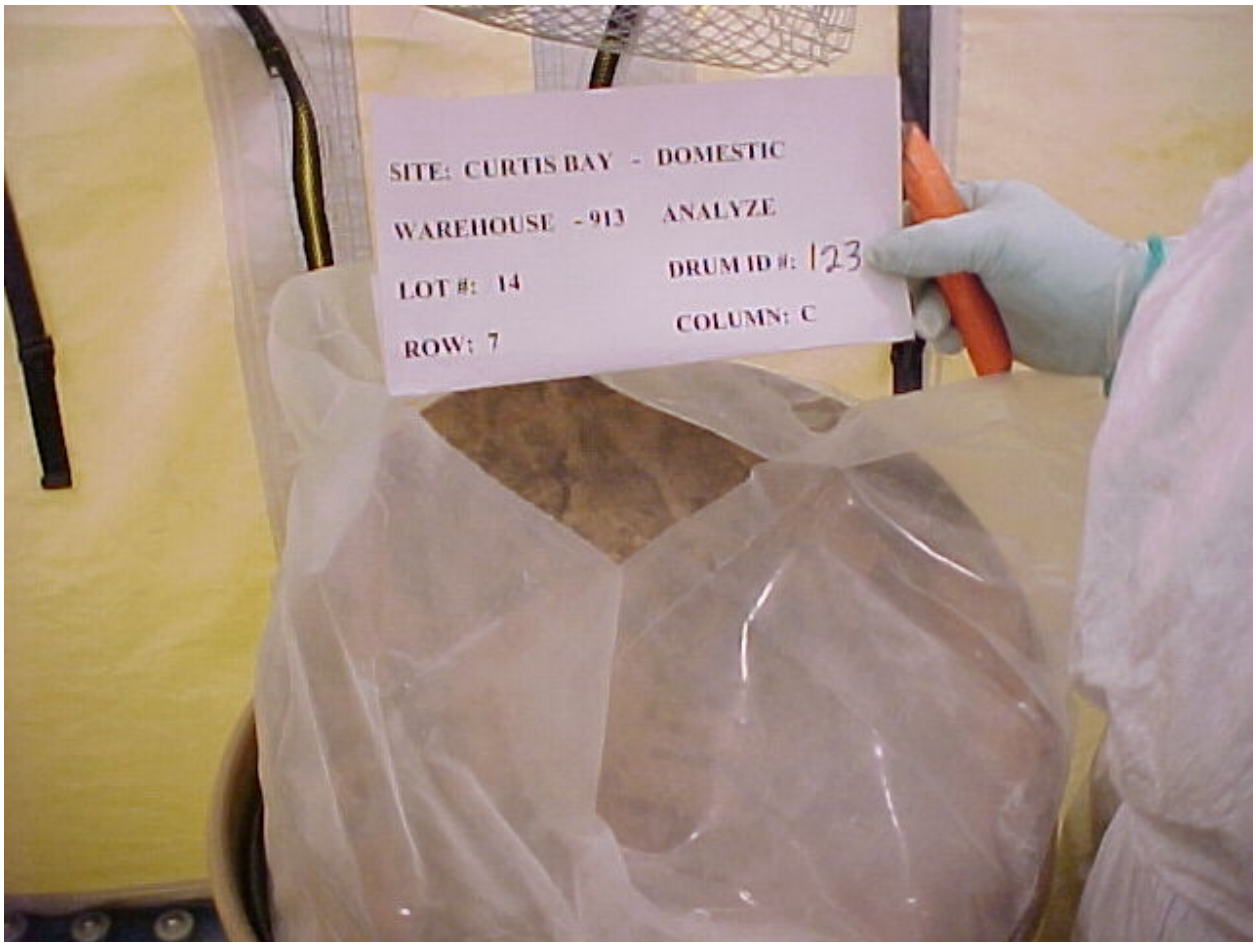
Date	7-12-2002	Time	11:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

1st poly liner/bag – good condition (photo indicates a gas pressure buildup inside of an inner poly bag that causes the bag to be pushed vertically out of top of drum)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

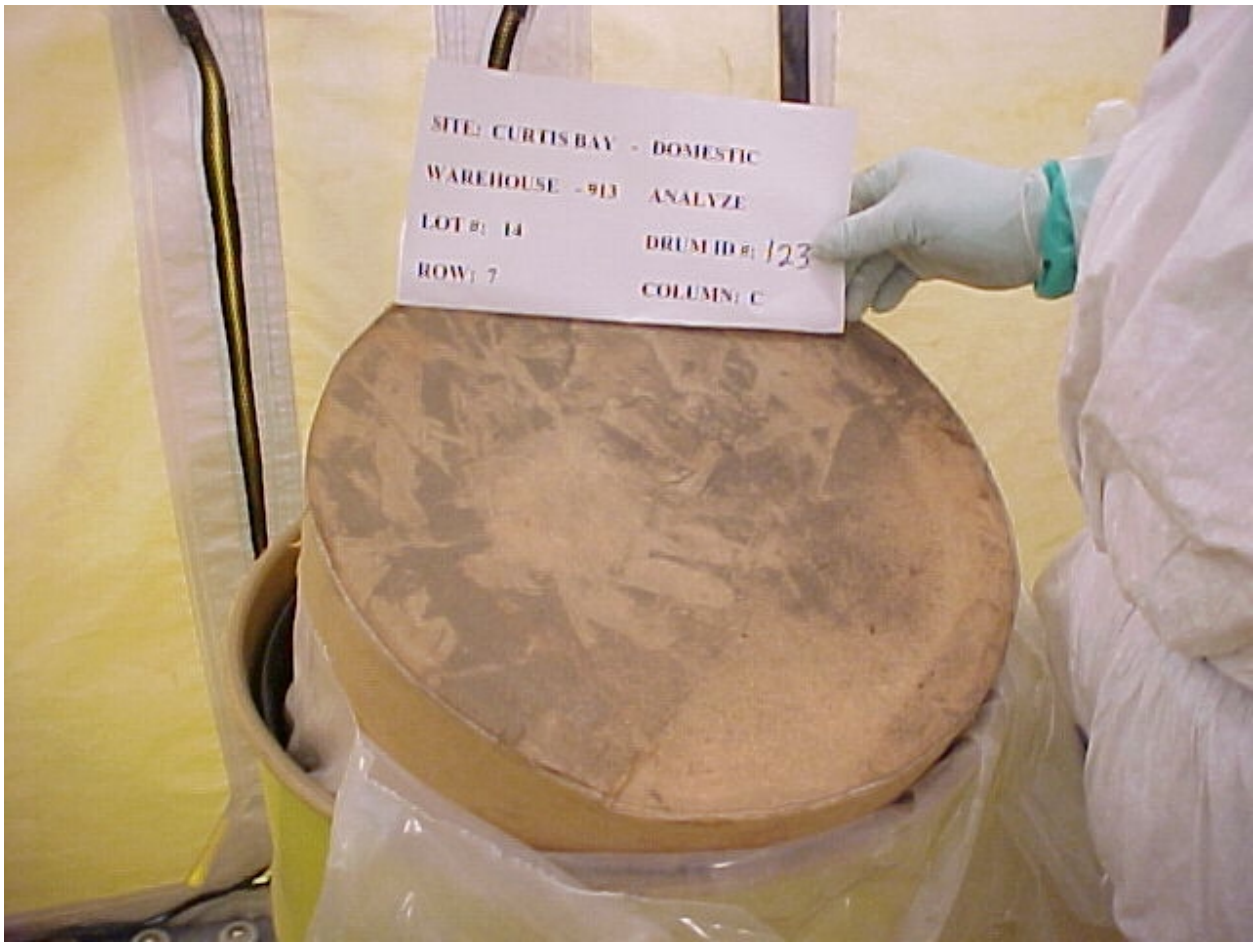
Date	7-12-2002	Time	11:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Fiber drum lid (from outermost fiber drum) – good condition (photo indicates a gas pressure buildup inside of an inner poly bag that causes the lid to be pushed vertically out of top of drum)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

2nd poly liner/bag – good condition (photo indicates a gas pressure buildup inside of an inner poly bag that causes the bag to be pushed vertically out of top of drum)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

3rd poly liner/bag – this layer contains majority of gas buildup inside of the drum; although, the bag does not "pop" when cut – slowly deflates
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in headspace – LEL – 6.1% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated through HEPA blower exhaust

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Wooden lid [on inner fiber (lab-pack) drum] – good condition
Drum vented - No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

4th poly liner/bag – good condition (thin film plastic)
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in headspace – LEL – 4.6% - No - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

ThN material – monolith – solid – white – no liquid
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	14	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	123	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	C

Inspection/Sample Date & Time

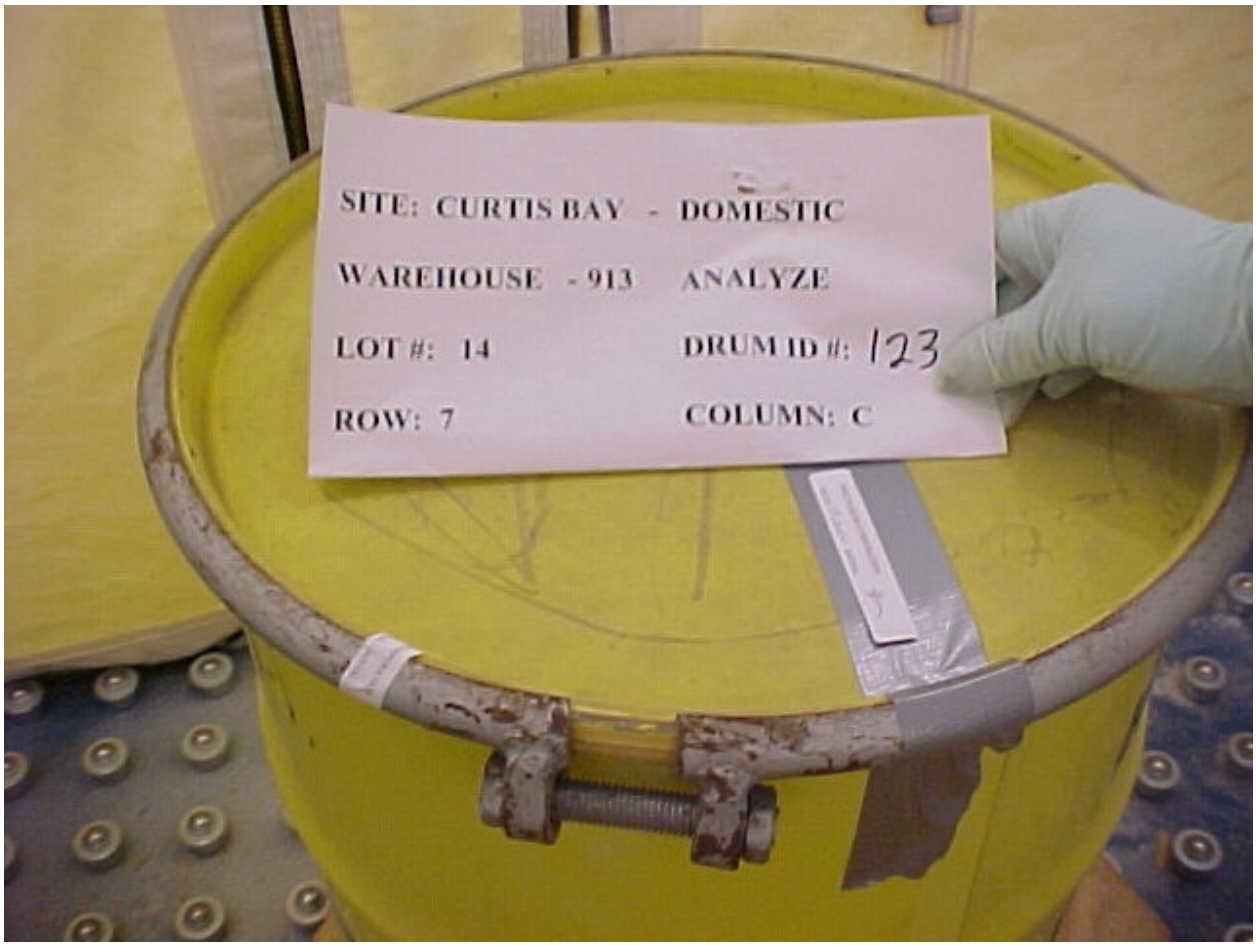
Date	7-12-2002	Time	11:30

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #15 – Drum #239
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 15 Drum ID #: 239 Location: Warehouse 913 – Column E - Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 26 mR/hr DR at 1 meter 2.1 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container (wooden lid & paper not on lab-pack like other 30-gal drum packagings)
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-11-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

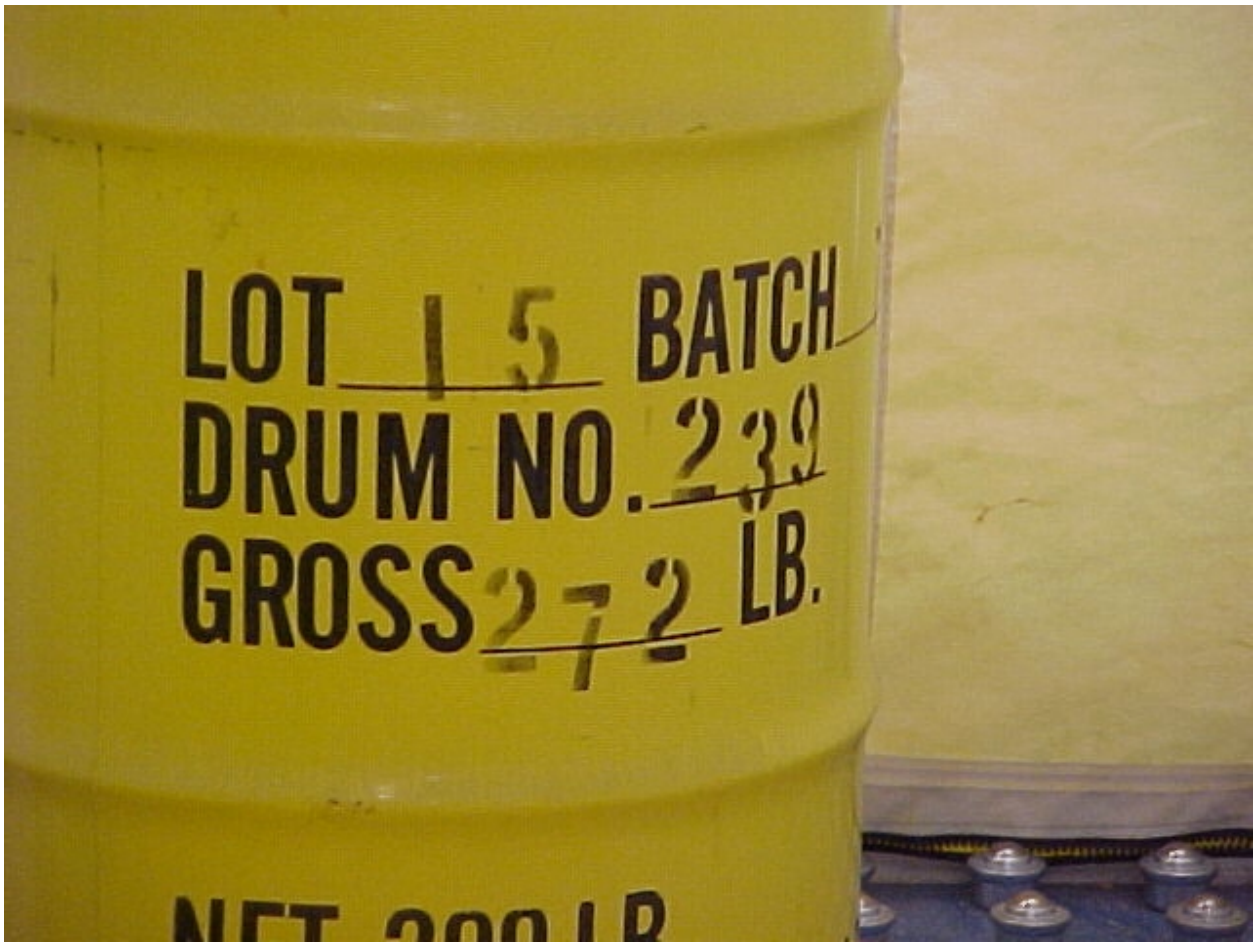
Date	7-11-2002	Time	15:00

Other Information

Photo No. 1 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

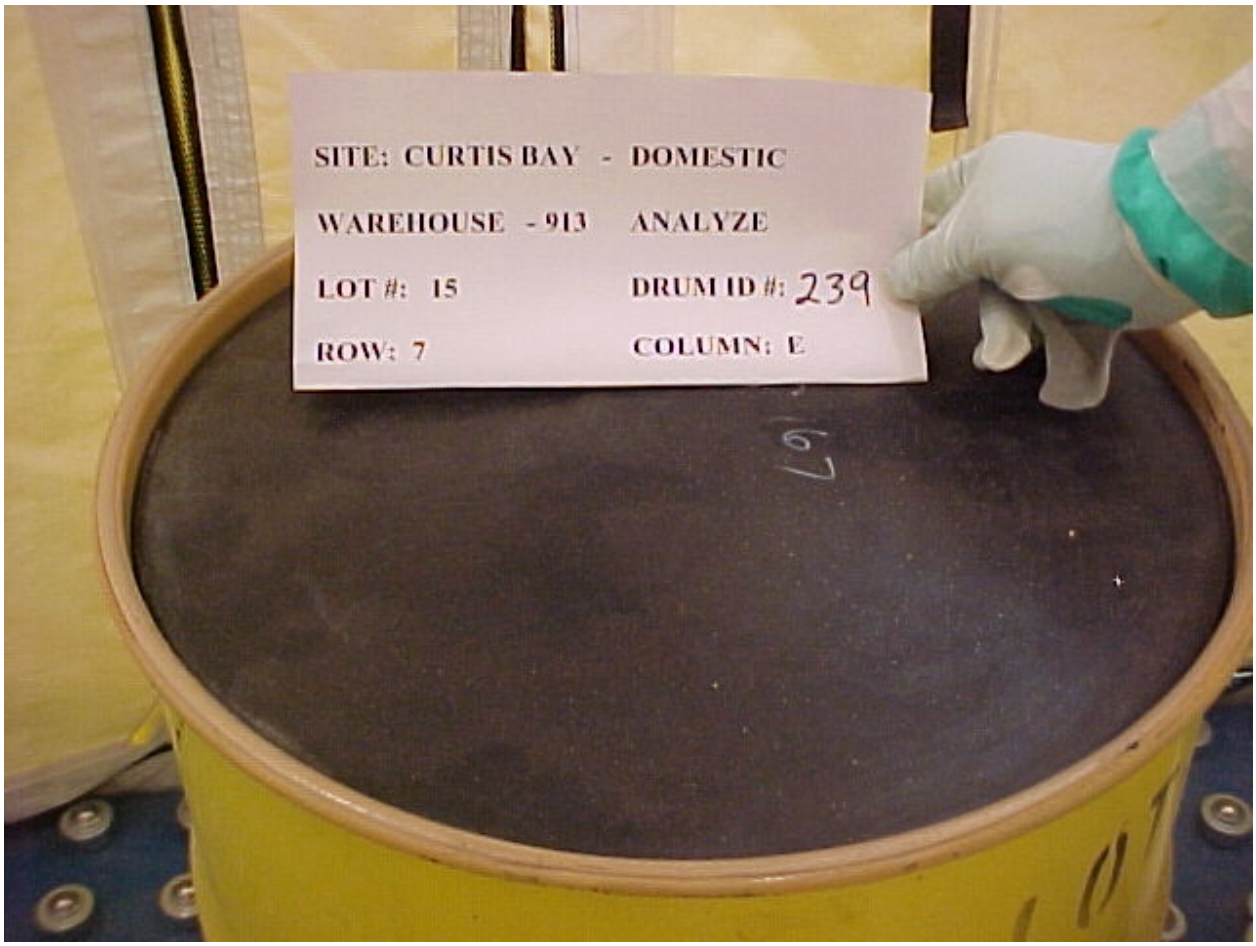
Date	7-11-2002	Time	15:00

Other Information

Photo No. 2 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Black plastic lid (from drum liner) – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

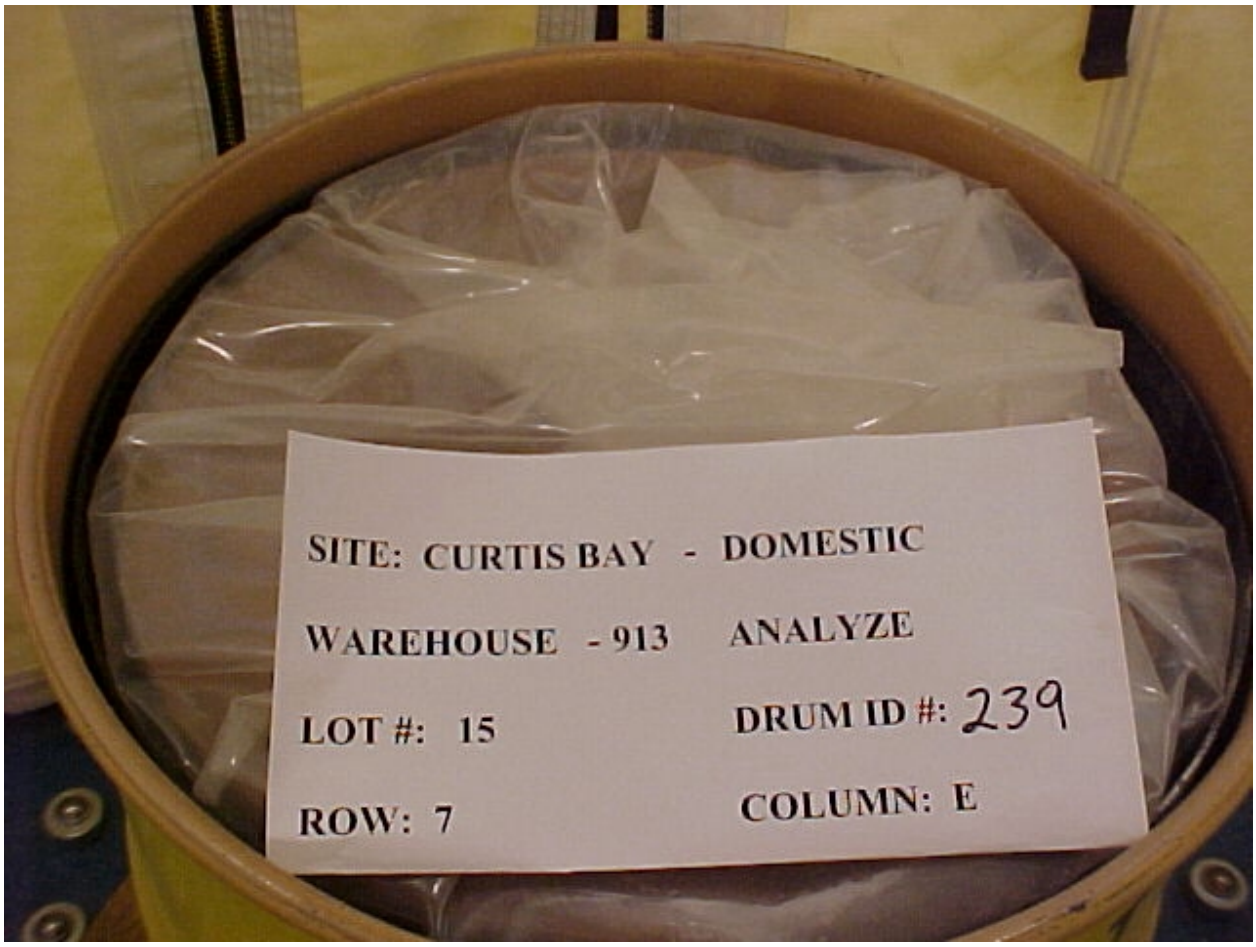
Date	7-11-2002	Time	15:00

Other Information

Photo No. 3 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

1st poly liner/gas – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

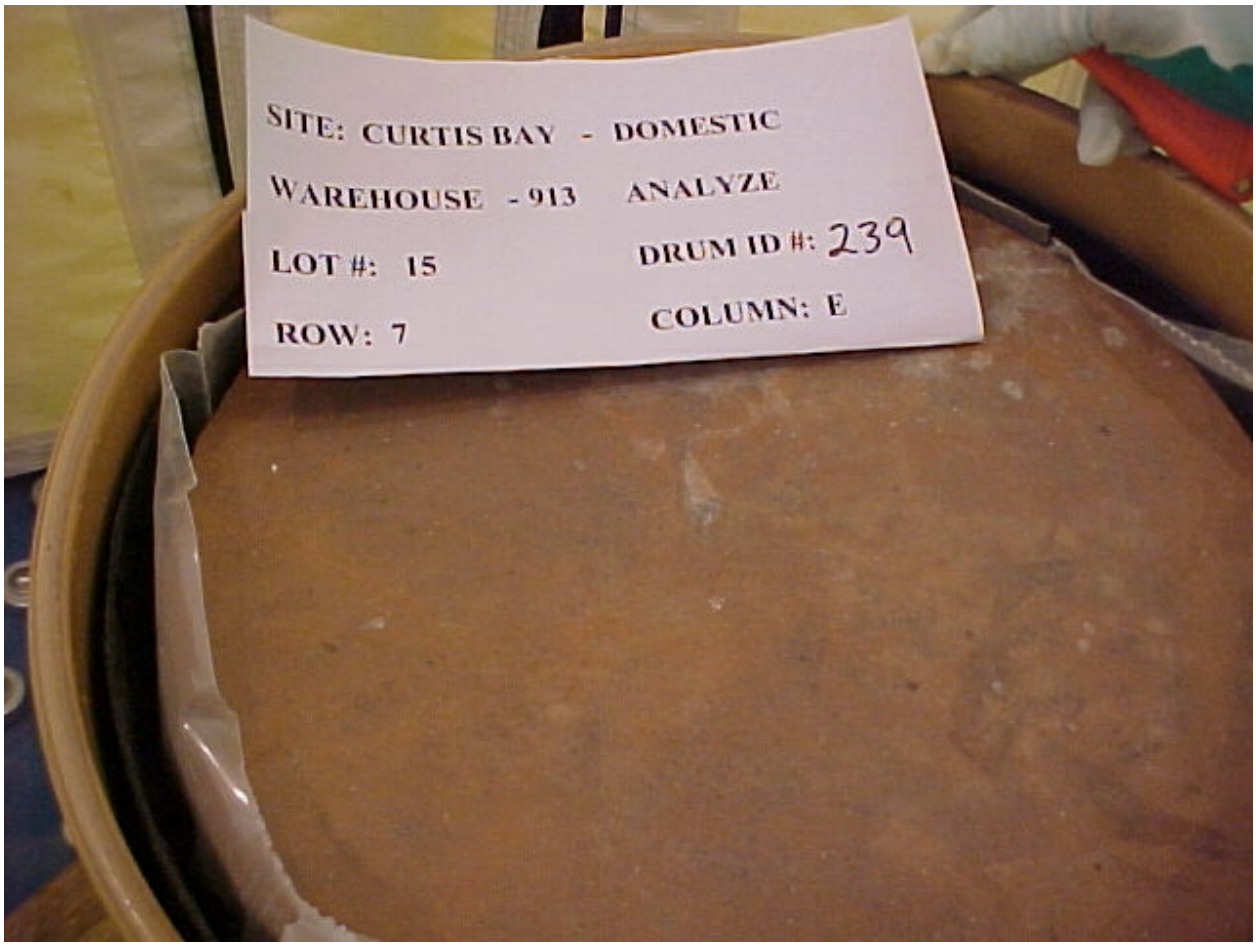
Date	7-11-2002	Time	15:00

Other Information

Photo No. 4 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Fiber drum lid (from outermost fiber drum) good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

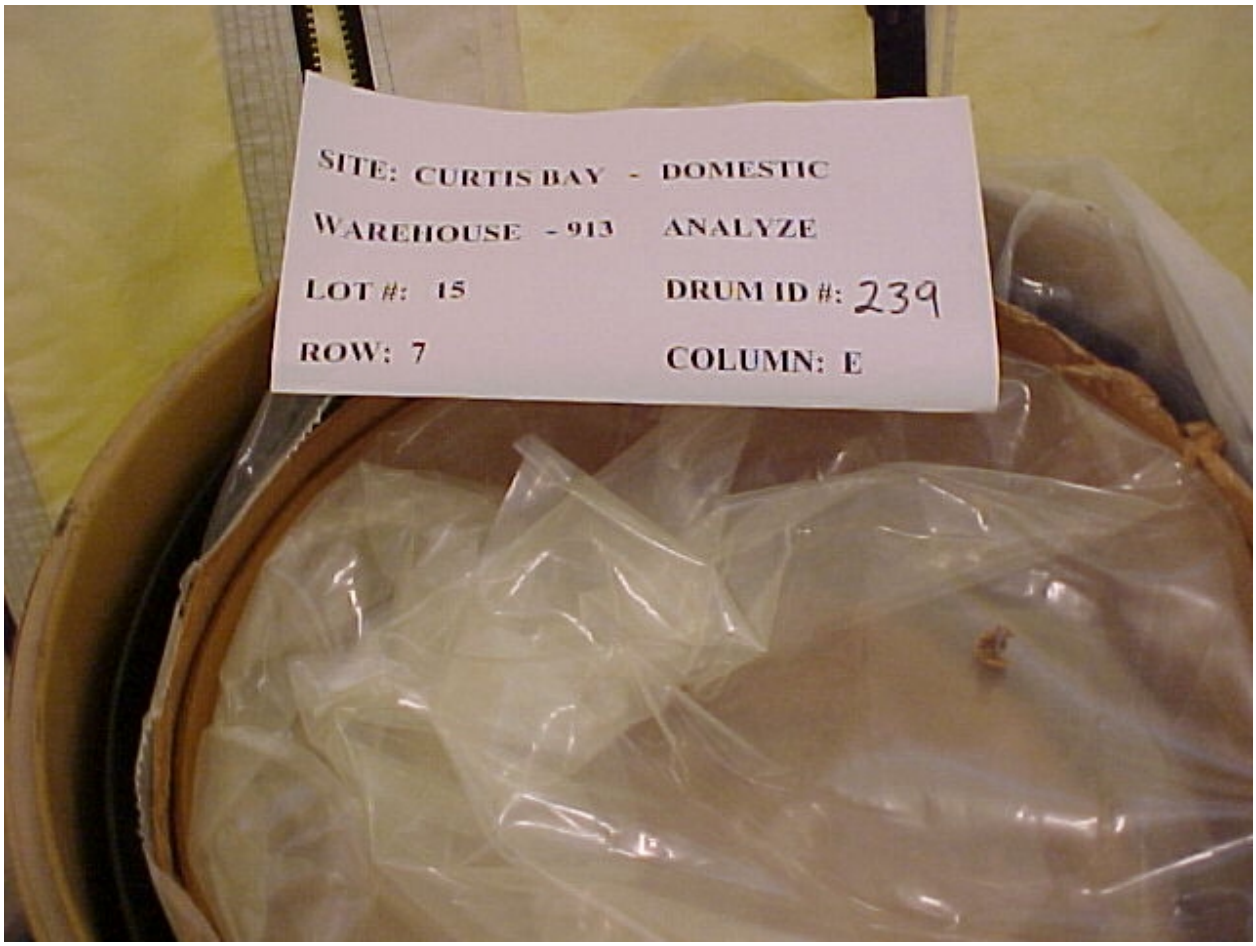
Date	7-11-2002	Time	15:00

Other Information

Photo No. 5 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

2nd poly liner/bag – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	15:00

Other Information

Photo No. 6 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

3rd poly liner/bag – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	15:00

Other Information

Photo No. 7 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

4th poly liner/bag – good condition (wooden lid not on drum)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	15:00

Other Information

Photo No. 8 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

ThN material – monolith – white – solid - dry
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	15	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	239	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	7
		Column	E

Inspection/Sample Date & Time

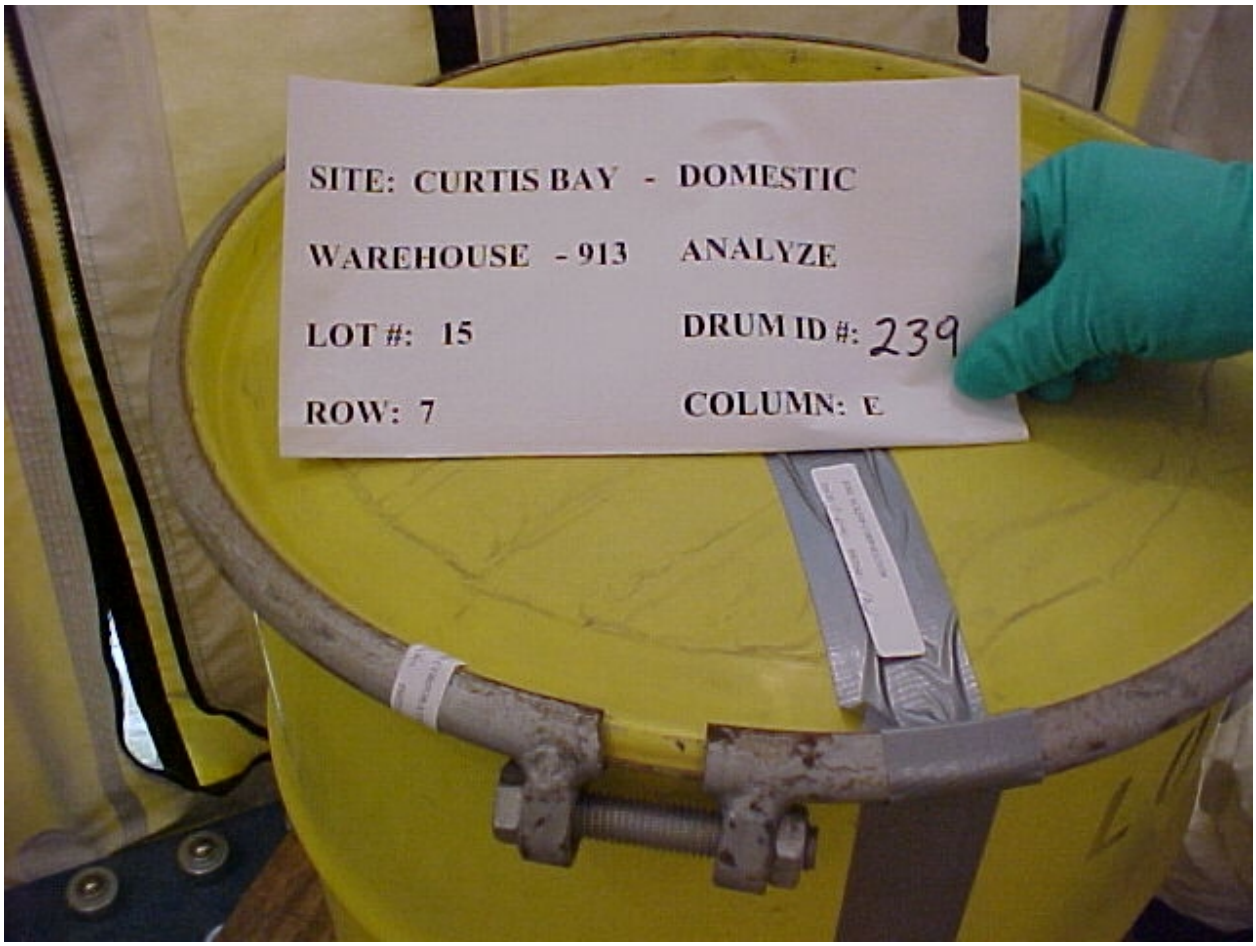
Date	7-11-2002	Time	15:00

Other Information

Photo No. 9 of 9

Dose Rate	Surface	26 mR/hr
	1 meter	2.1 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #20 – Drum #11
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 20 Drum ID #: 11 Location: Warehouse 912 – Column B - Row 1

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.5 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 5.2% LEL NO +50 ppm NOx +50 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

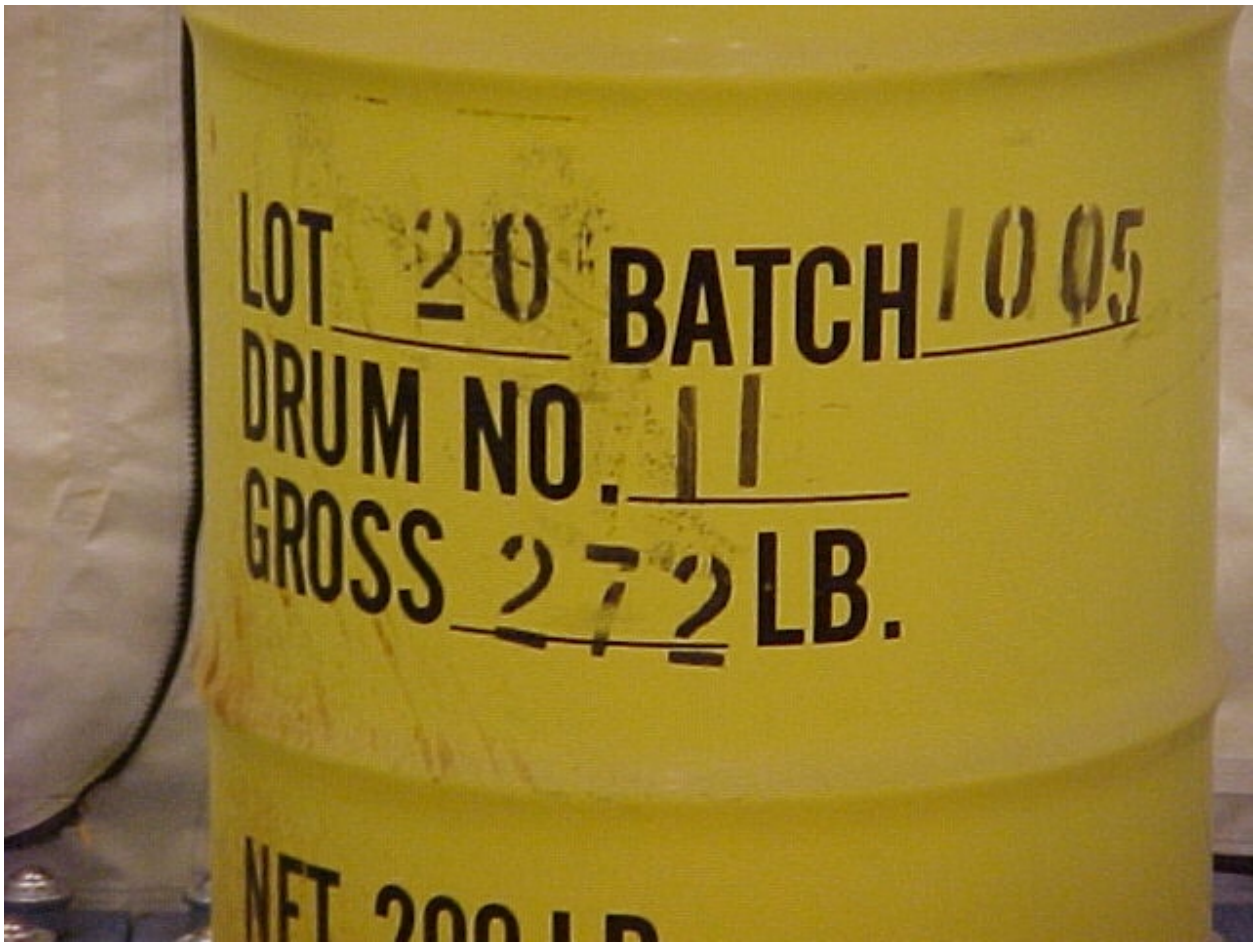
Date	7-10-2002	Time	10:45

Other Information

Photo No. 1 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

30-gal drum – good condition (released pressure as bolt on drum ring was loosened)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:45

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Black plastic lid (from drum liner) – good condition (raised lid indicates internal pressure inside of drum packaging)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:45

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

1st poly liner/bag – good condition (raised bag indicates internal pressure inside of drum packaging)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

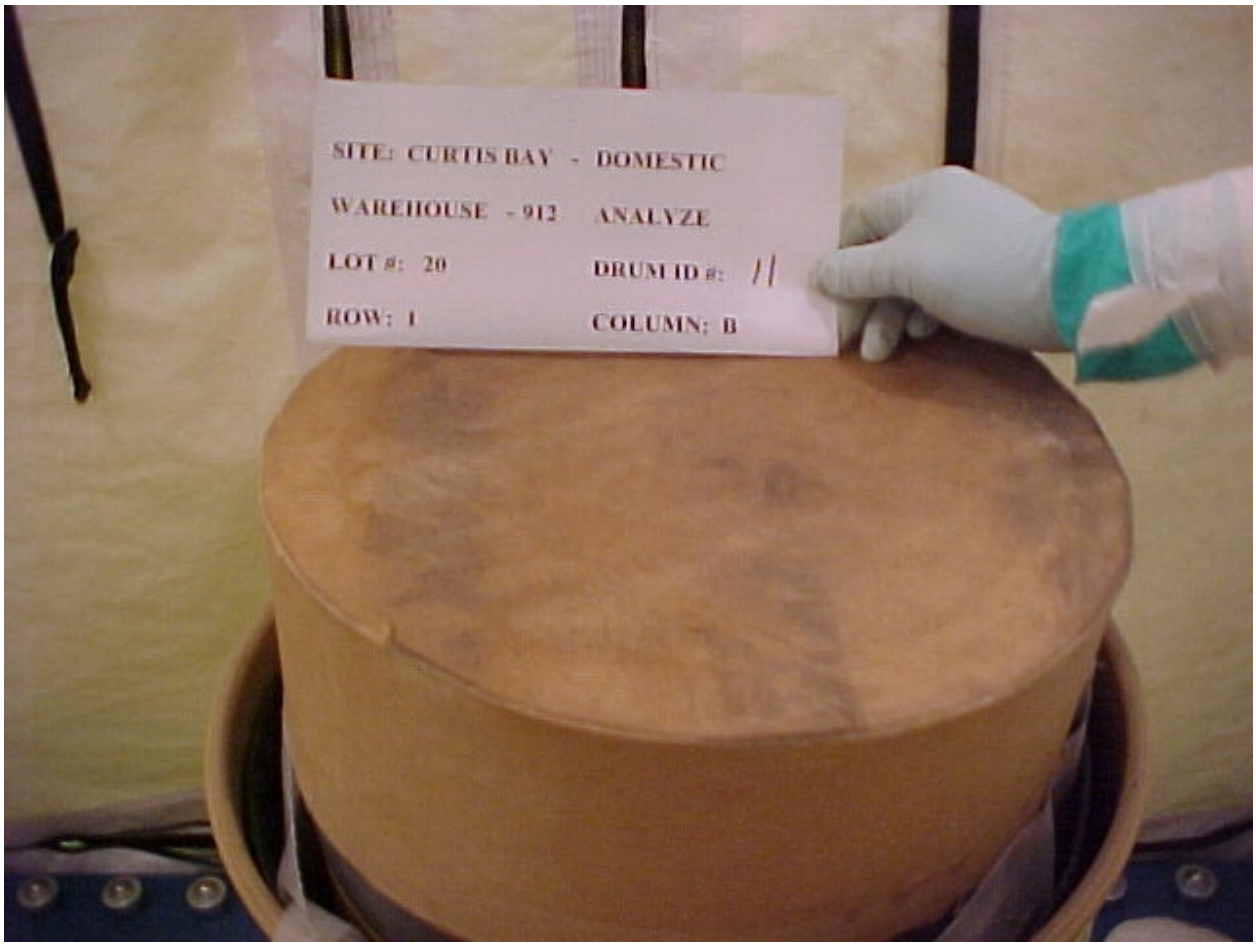
Date	7-10-2002	Time	10:45

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Fiber drum lid (from outermost fiber drum) – good condition (raised lid indicates internal pressure inside of drum packaging)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:45

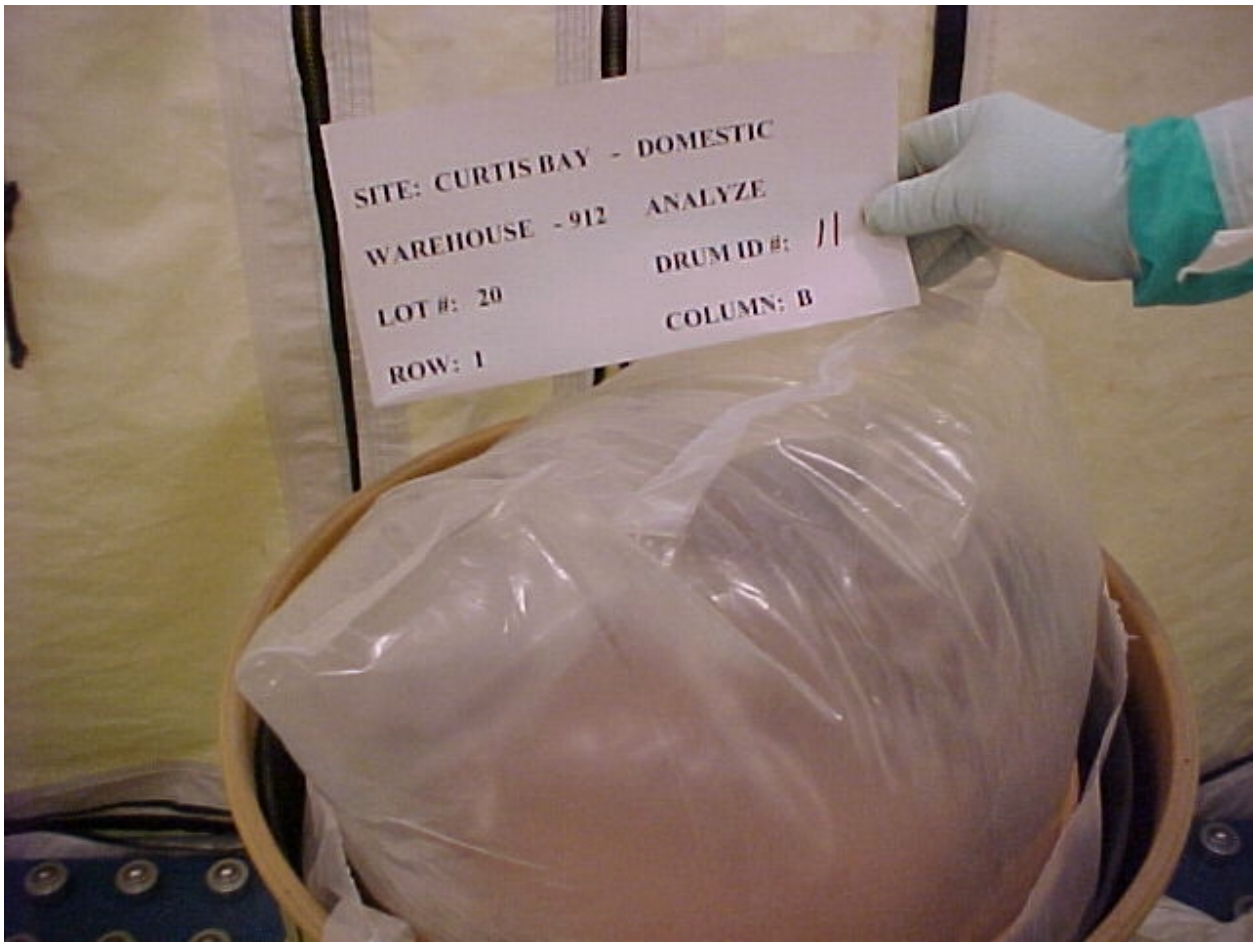
Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

2nd poly liner/bag – good condition (raised bag indicates internal pressure inside of drum packaging)

No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:45

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

3rd poly liner/bag – good condition (raised bag indicates internal pressure inside of drum packaging) – this bag contains majority of internal pressure buildup (although, the bag does not "pop" once it is penetrated with a knife)
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in bag headspace – LEL – 5.2% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:45

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Wooden lid [on inner fiber drum (lab-pack)] – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:45

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

4th poly liner/bag – good condition (raised bag indicates internal pressure inside of drum packaging)
Opened poly liner/bag - No gasses present (in breathing zone)
Pressure built up inside container raises polyliner/bag
Gasses in bag headspace – LEL – 4.6% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:45

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	20	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	11	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	1
		Column	B

Inspection/Sample Date & Time

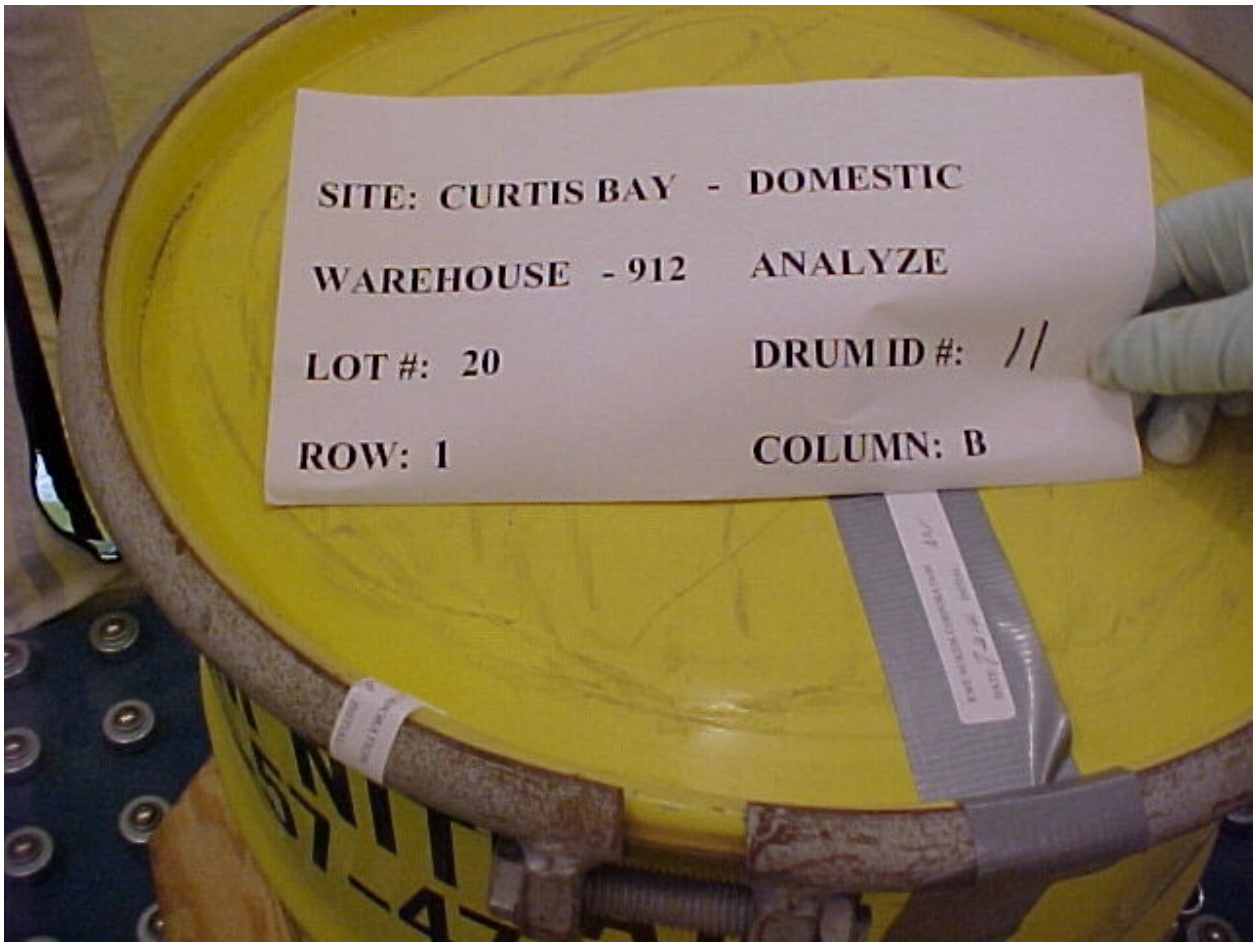
Date	7-10-2002	Time	10:45

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #44 – Drum #182
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 44 Drum ID #: 182 Location: Warehouse 913 – Column B - Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

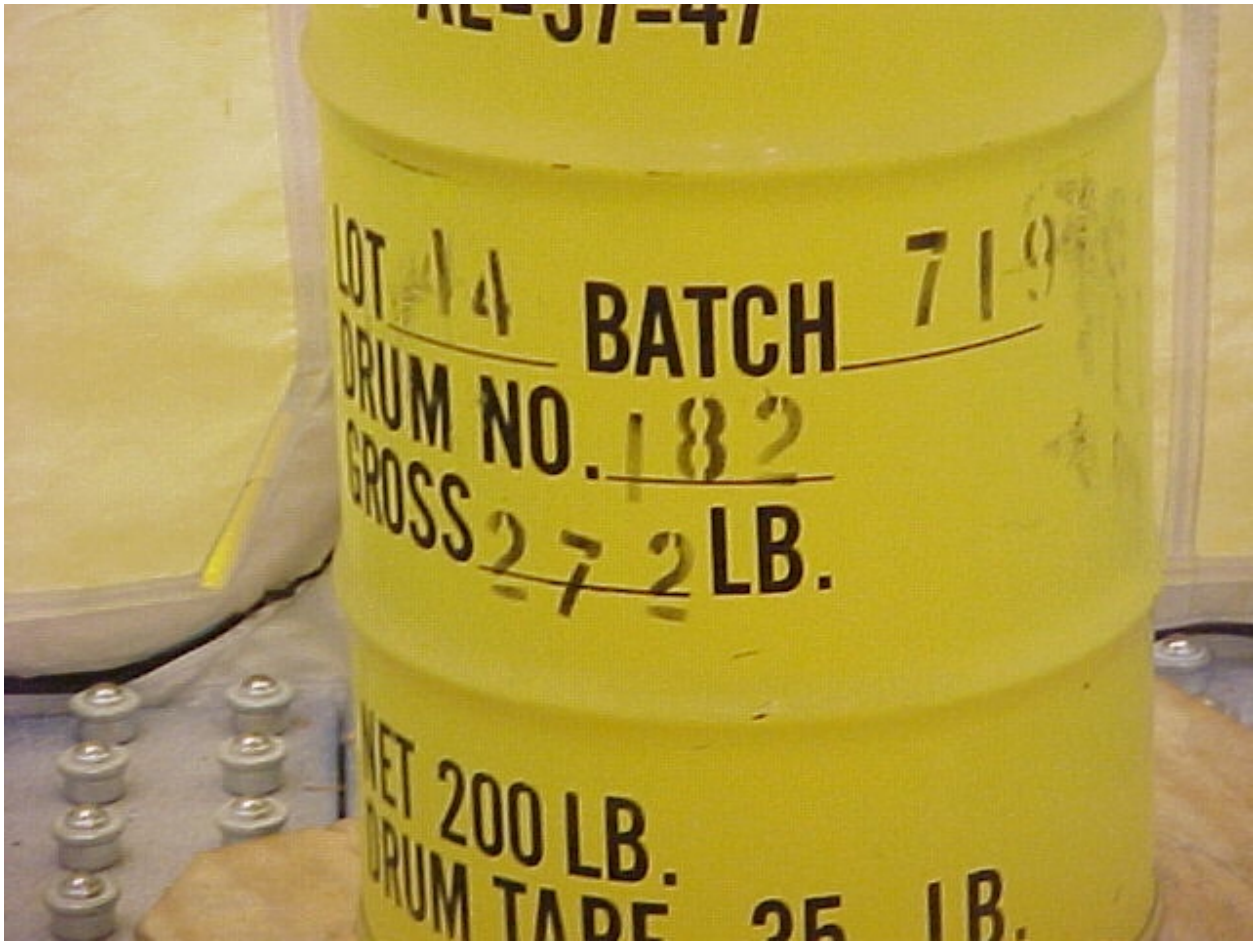
Date	7-12-2002	Time	15:00

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

30-gal drum – good condition (released gas while loosening bolt on drum ring)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	15:00

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Black drum lid – photograph did not take
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	15:00

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

1st poly liner/bag – good condition (inflated/raised bag is a result of internal pressure buildup inside the packaging)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

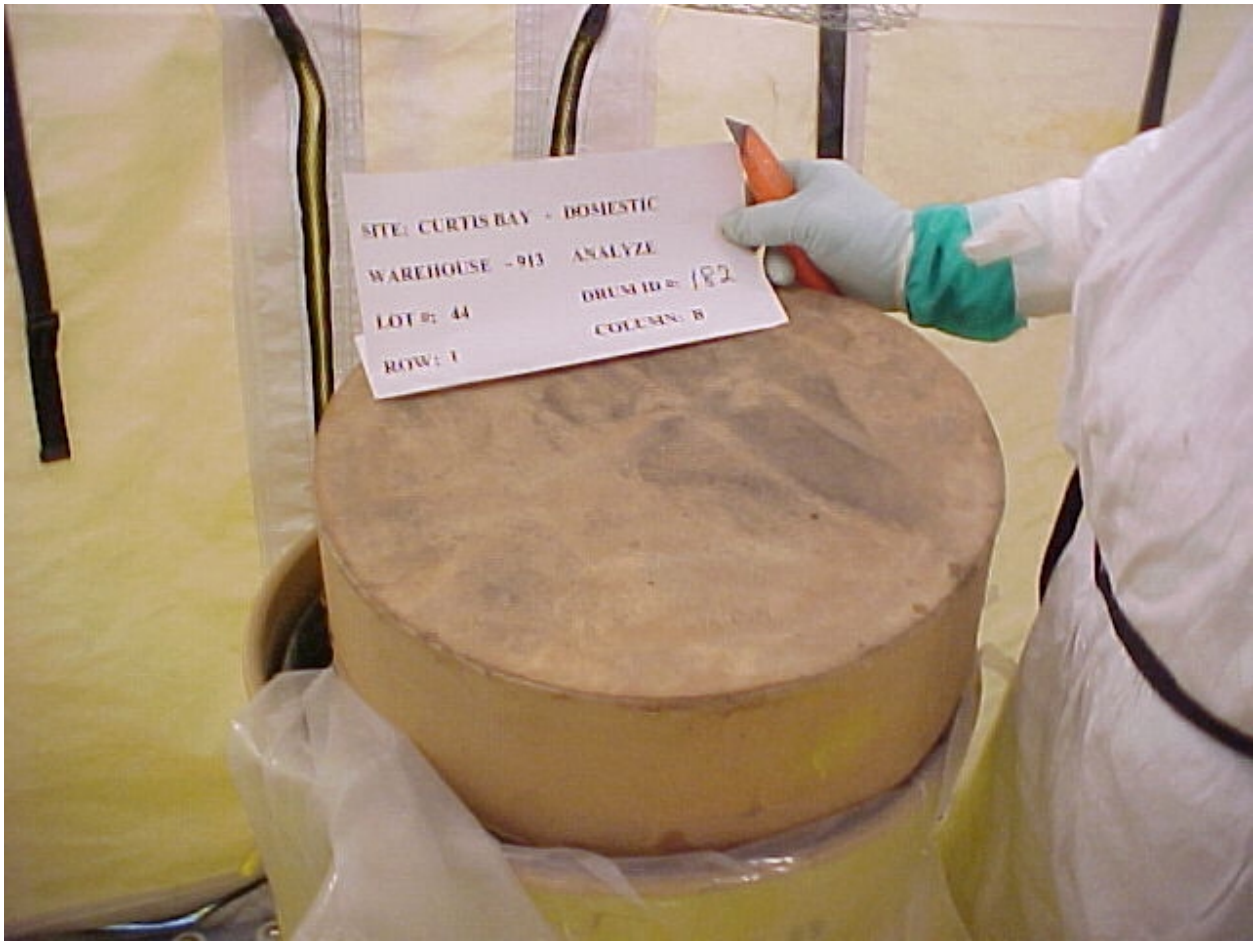
Date	7-12-2002	Time	15:00

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Fiber drum lid (from outermost fiber drum) – good condition (inflated/raised lid is a result of internal pressure buildup inside the packaging)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	15:00

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

2nd poly liner/bag – good condition (inflated/raised bag is a result of internal pressure buildup inside the packaging)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

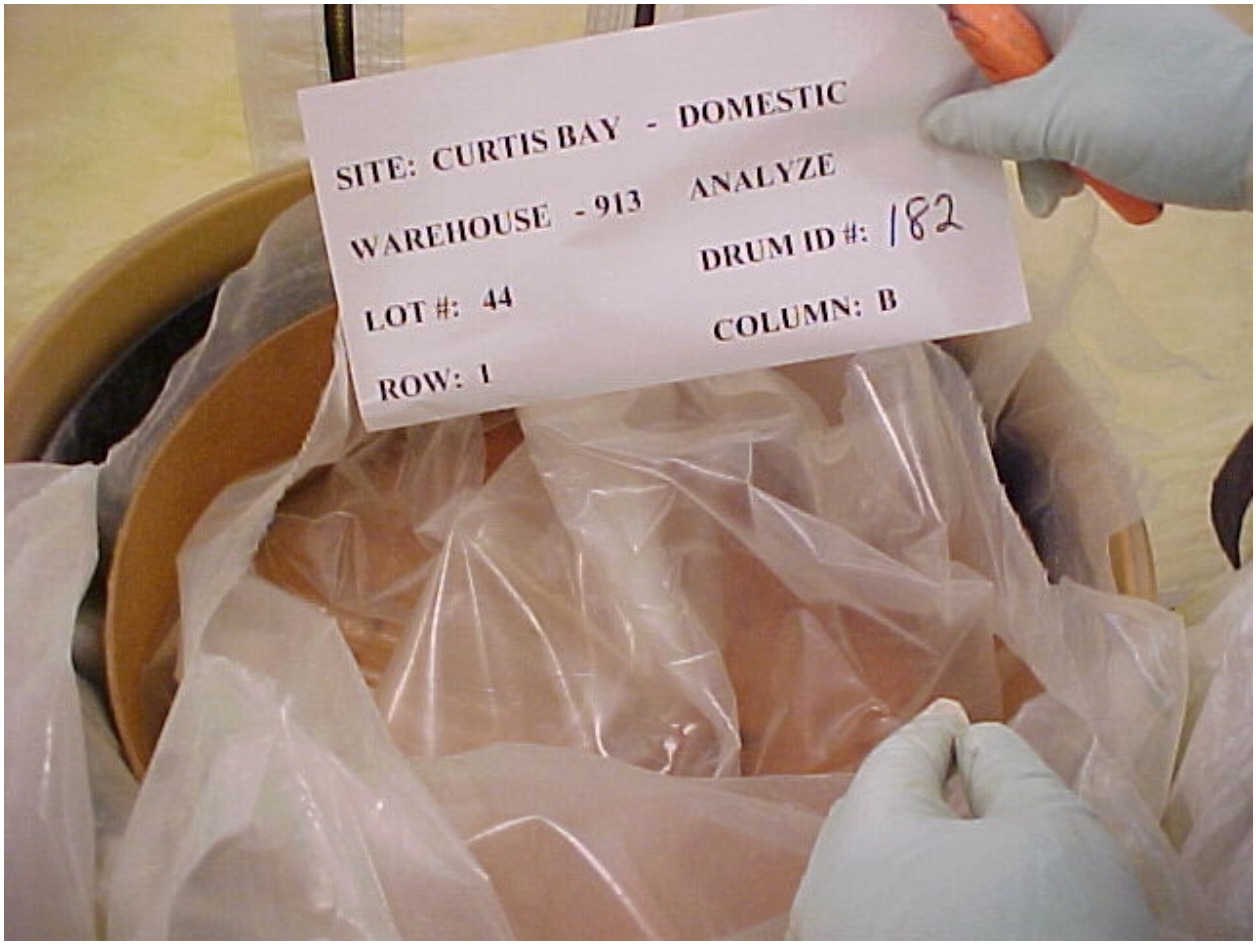
Date	7-12-2002	Time	15:00

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

3rd poly liner/bag – good condition (inflated/raised bag is a result of internal pressure buildup inside the packaging)
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in headspace – LEL – 4.6% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

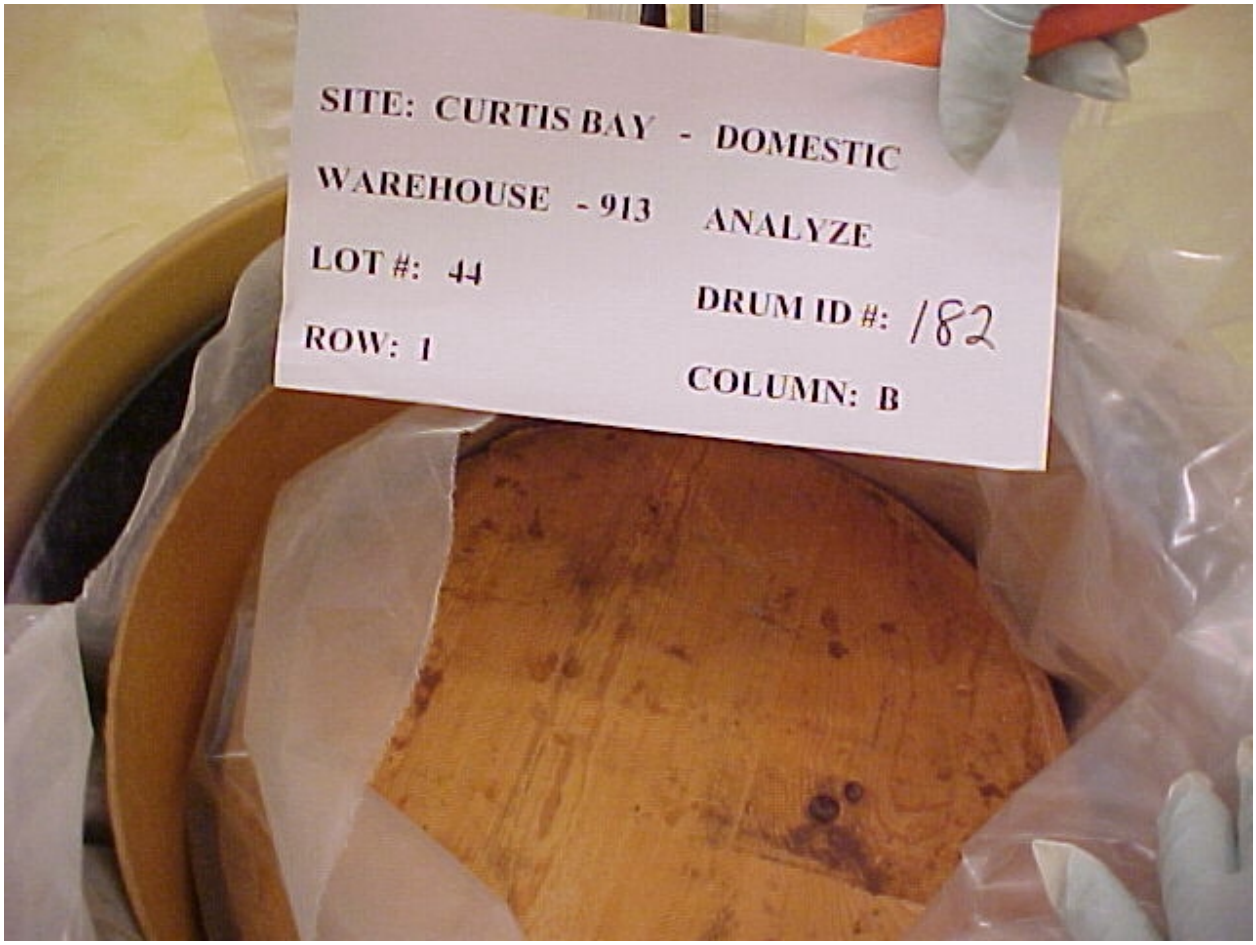
Date	7-12-2002	Time	15:00

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Wooden lid (cover to inner fiber drum – sometimes referred to as a lab-pack container in this documentation) – good condition
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	15:00

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

4th poly liner/bag – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	15:00

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	44	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	182	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

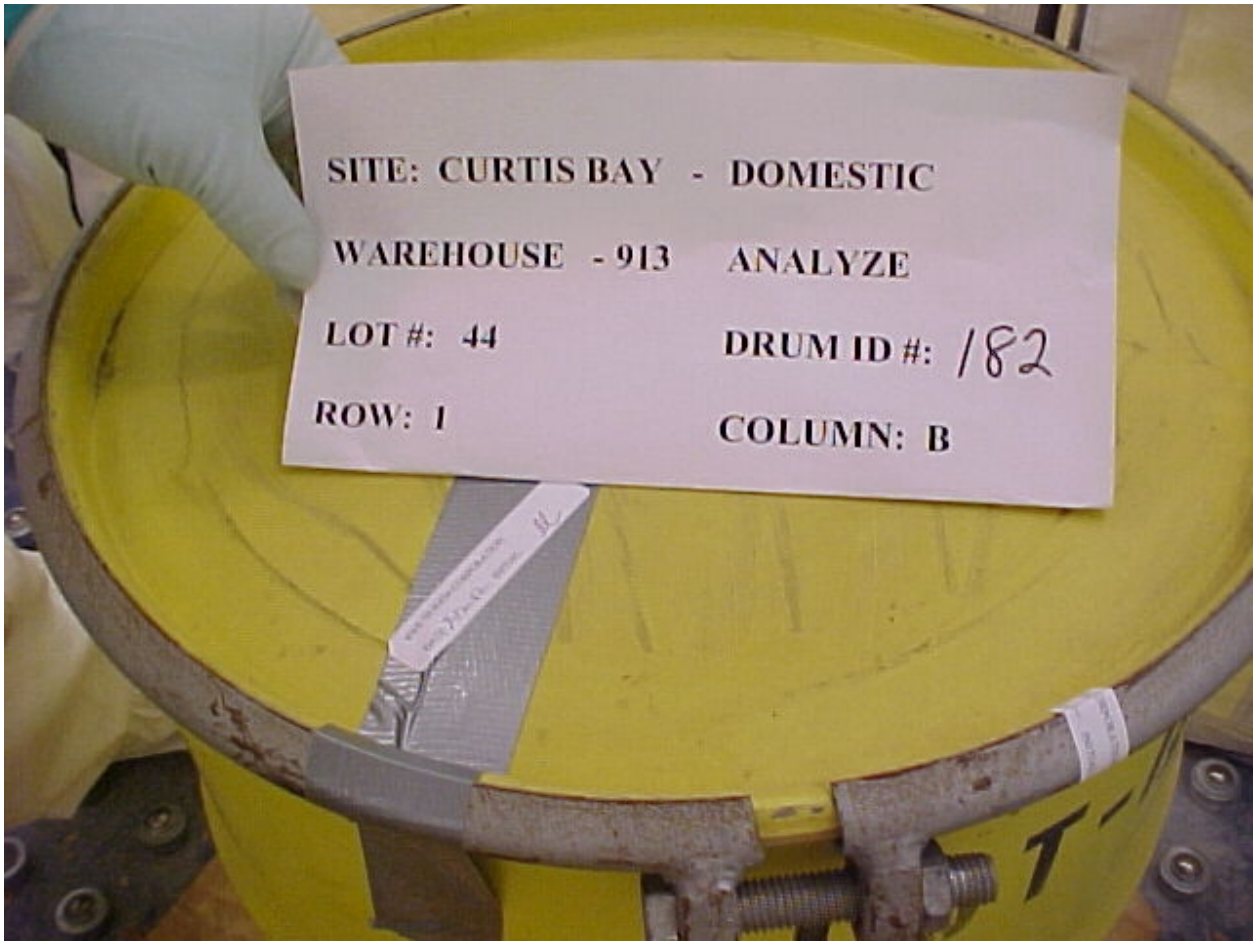
Date	7-12-2002	Time	15:00

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #52 – Drum #194
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 52 Drum ID #: 194 Location: Warehouse 912 – Column B - Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 26 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

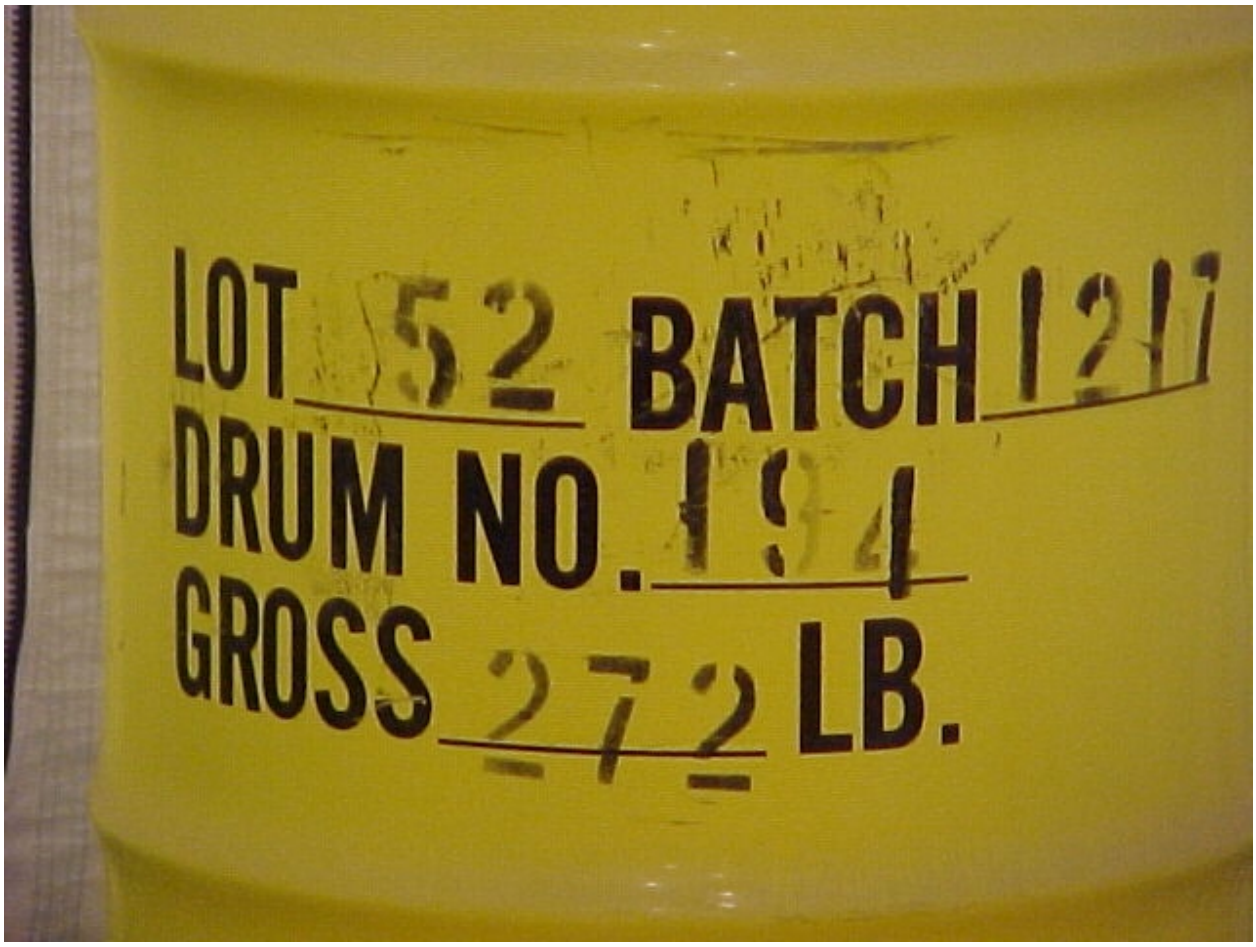
Date	7-10-2002	Time	09:45

Other Information

Photo No. 1 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition (drum released pressure when initially loosening bolt on drum ring – slowly opened to allow gas to dissipate inside the headspace of the drum while the lid was still being held in place with the drum ring)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

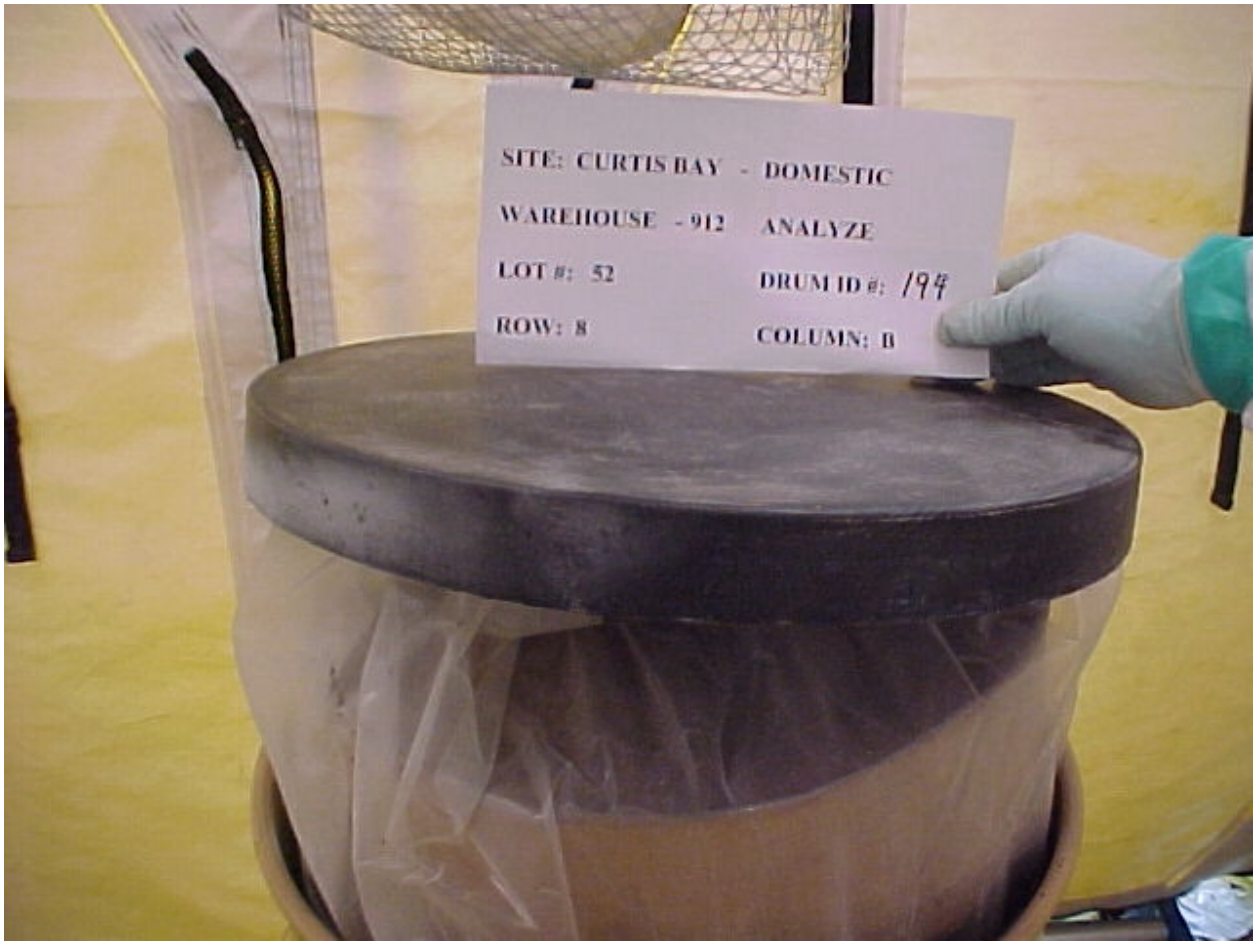
Date	7-10-2002	Time	09:45

Other Information

Photo No. 2 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid of drum liner – good condition (raised lid indicates internal pressure buildup internal to the packaging)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

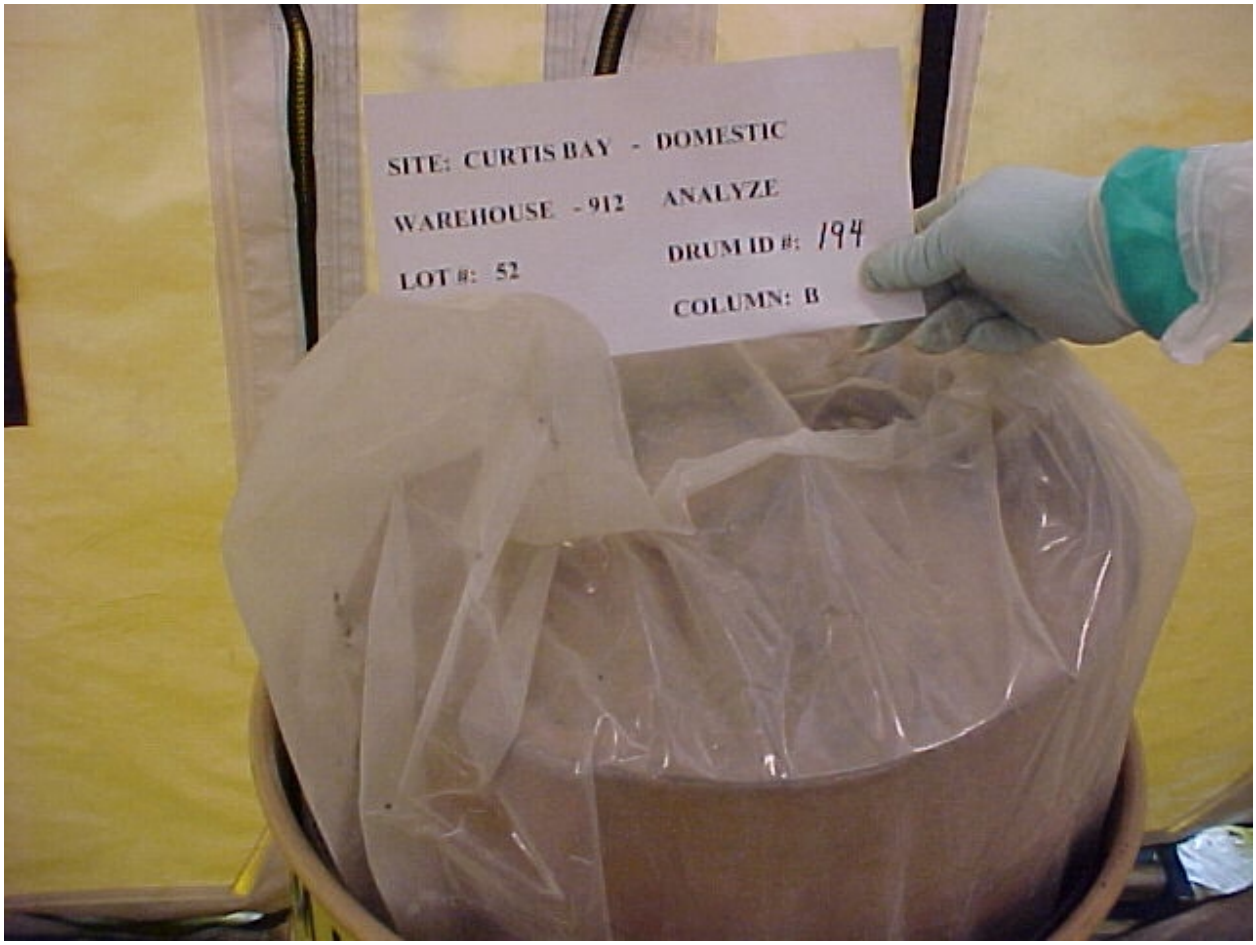
Date	7-10-2002	Time	09:45

Other Information

Photo No. 3 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition (raised bag indicates internal pressure buildup internal to the packaging)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

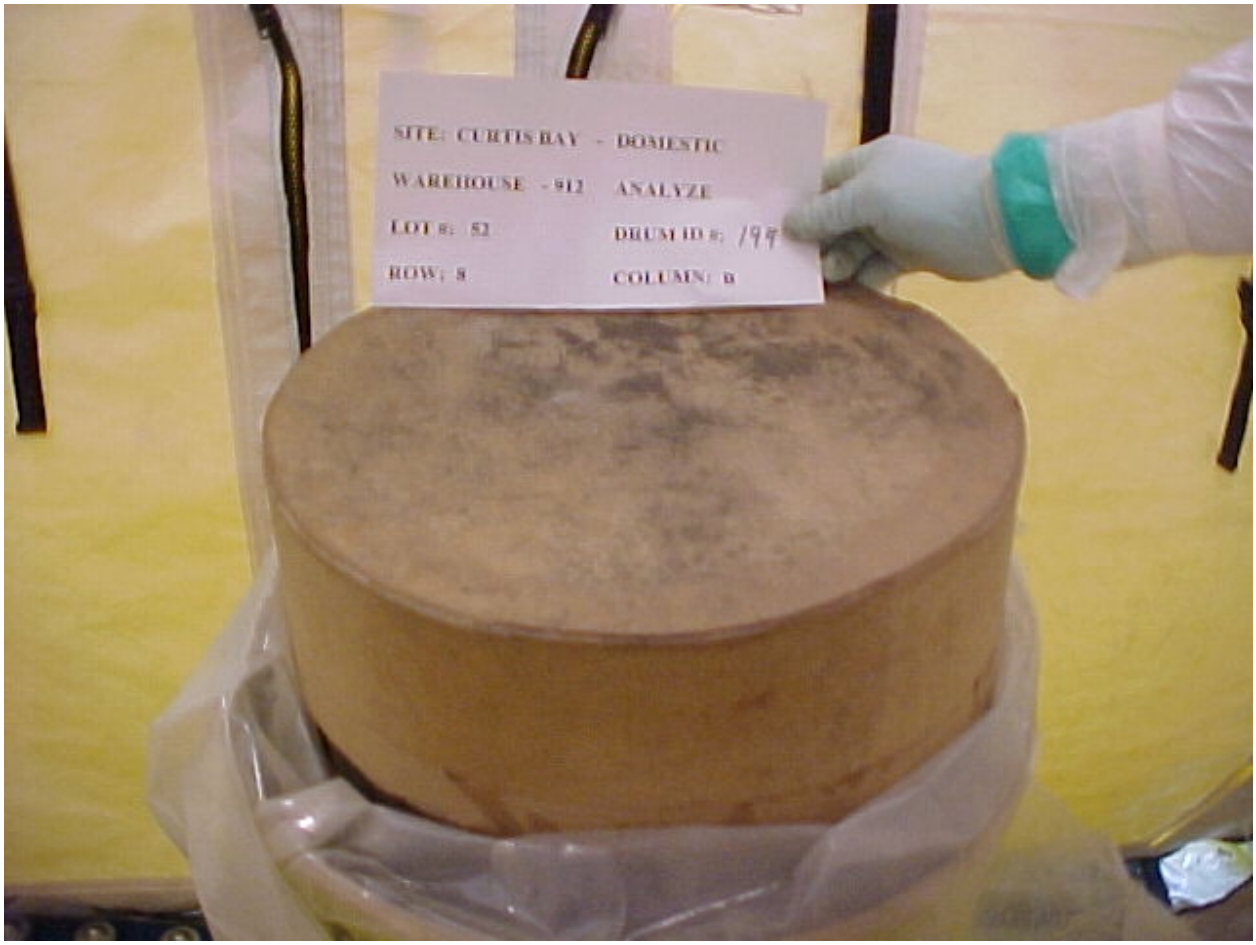
Date	7-10-2002	Time	09:45

Other Information

Photo No. 4 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

Fiber lid of outermost fiber drum – good condition (raised lid indicates internal pressure buildup internal to the packaging)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:45

Other Information

Photo No. 5 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition (raised bag indicates internal pressure buildup internal to the packaging)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

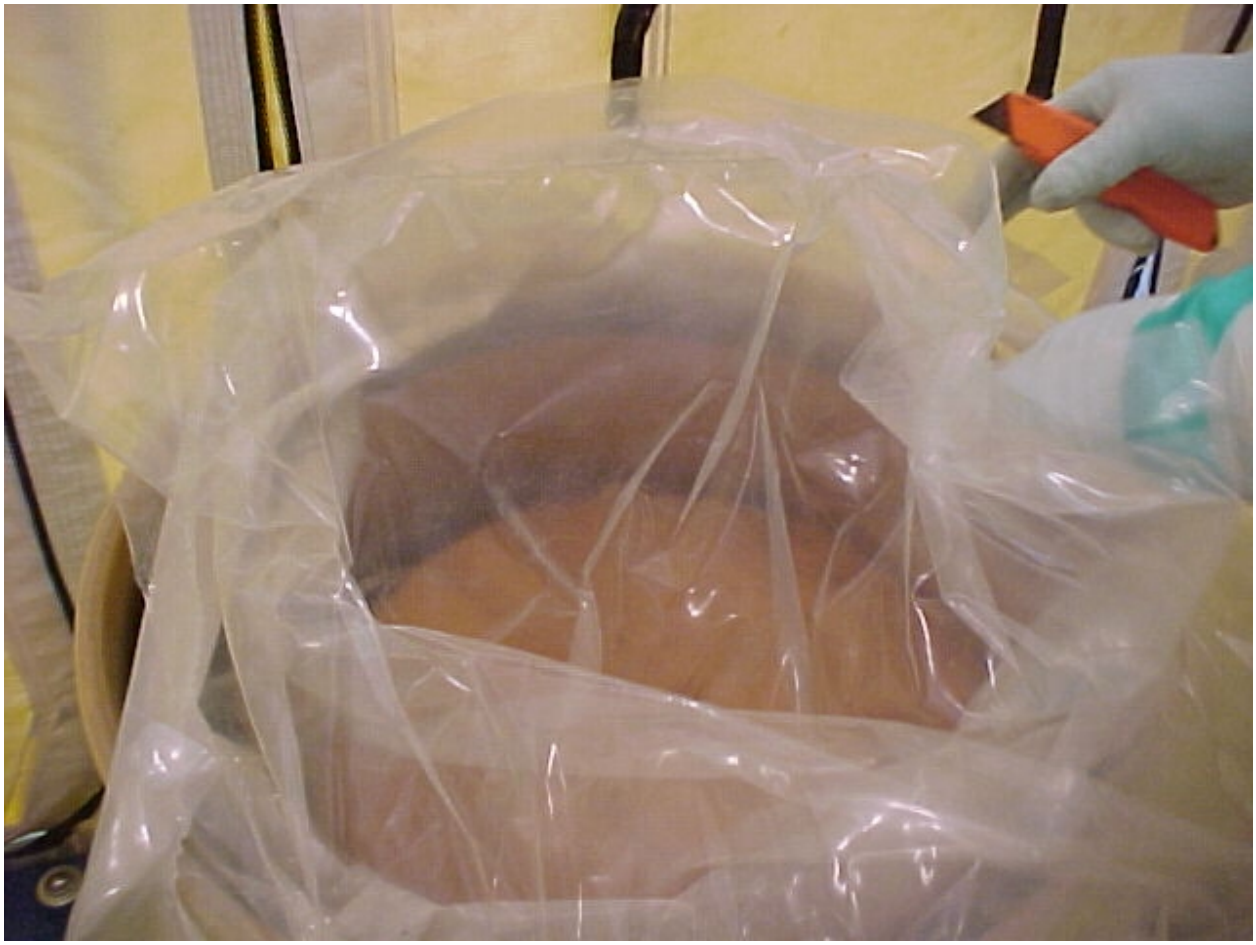
Date	7-10-2002	Time	09:45

Other Information

Photo No. 6 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition (this bag contains majority of internal pressure buildup – bag similar to inflated balloon; although, it does not "pop" when penetrated with a utility knife)
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in headspace – LEL – 4.6% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:45

Other Information

Photo No. 7 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

Wooden lid (mounted to top of inner fiber drum) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:45

Other Information

Photo No. 8 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

Inner fiber drum (lab-pack) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:45

Other Information

Photo No. 9 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition (bag slightly inflated indicating some internal pressure buildup in the bag)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:45

Other Information

Photo No. 10 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – solid – white - dry
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	52	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	194	Disposition	Analyze

Physical Location of Drum

Warehouse	912	Row	8
		Column	B

Inspection/Sample Date & Time

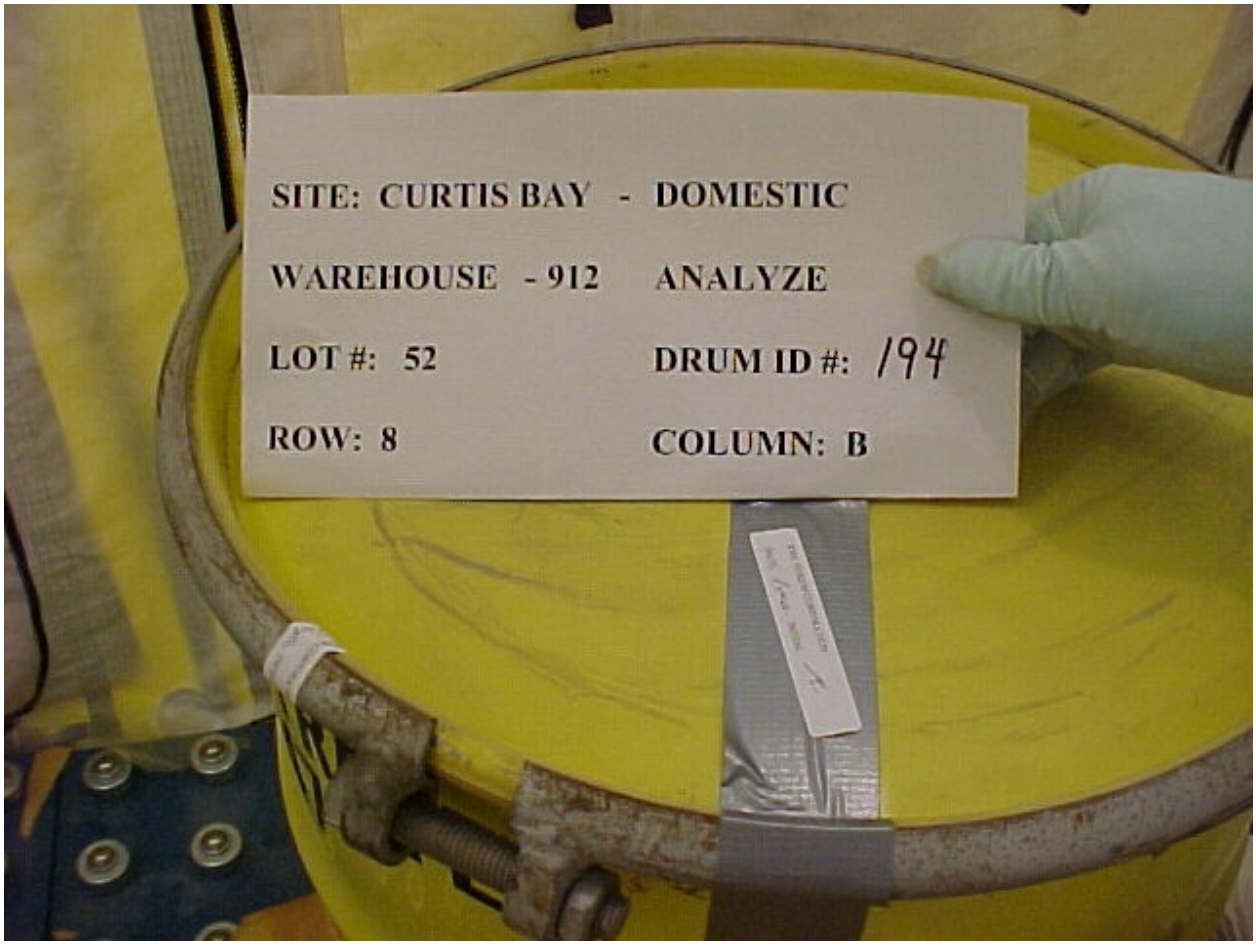
Date	7-10-2002	Time	09:45

Other Information

Photo No. 11 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #58 – Drum #97
Inspect, Sample & Analyze

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 58 Drum ID #: 97 Location: Warehouse 913 – Column C - Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.2% LEL NO +50 ppm NOx +50 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

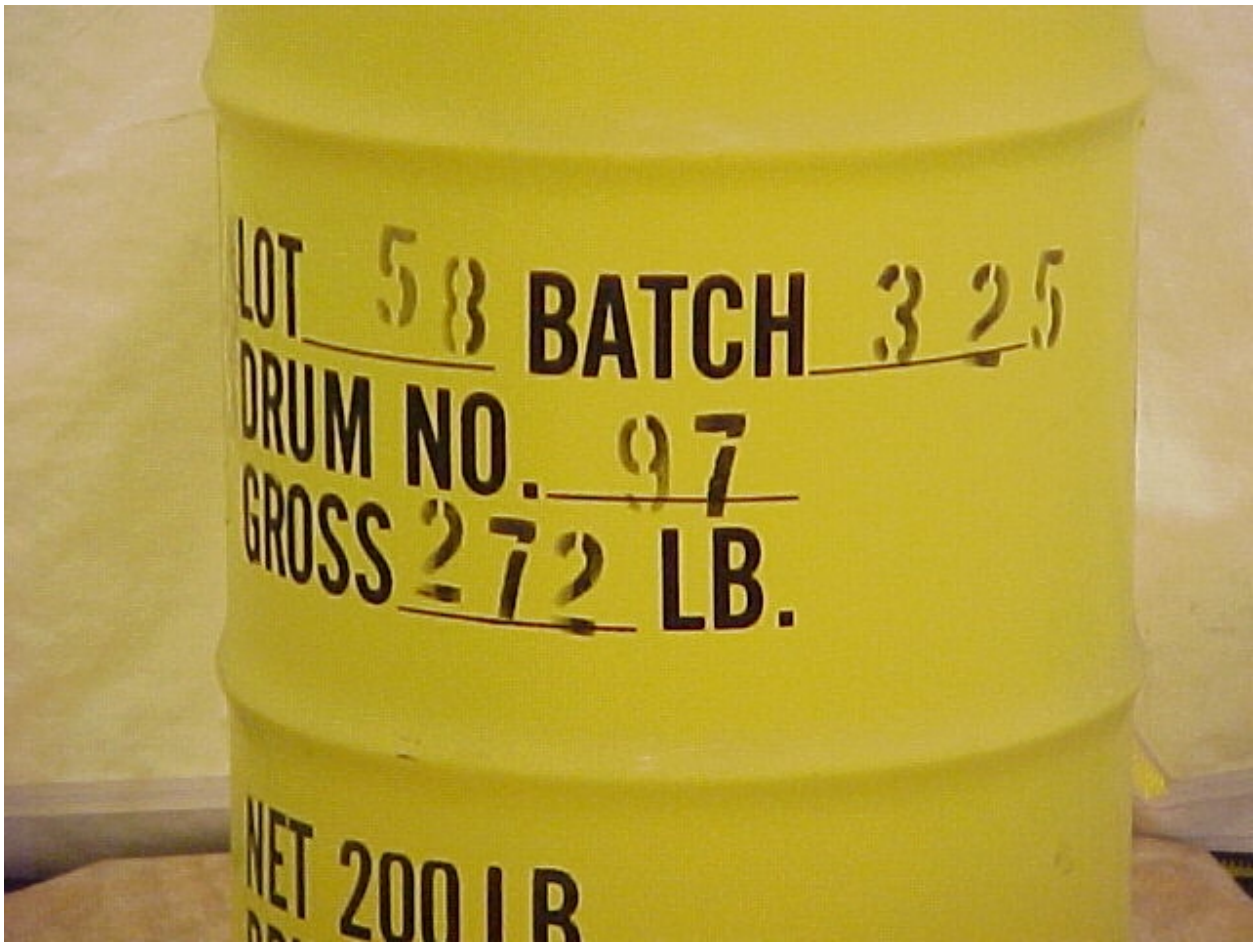
Date	7-12-2002	Time	14:15

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

30-gal drum – good condition (drum released pressure while loosening bolt on drum ring – the tap test on the drum lid was an excellent aid to determine if a pressure buildup was present in the drum)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Black plastic lid (from drum liner) – good condition (raised lid indicates internal gas pressure buildup inside of packaging)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

1st poly liner/bag – good condition (raised bag indicates internal gas pressure buildup inside of packaging)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

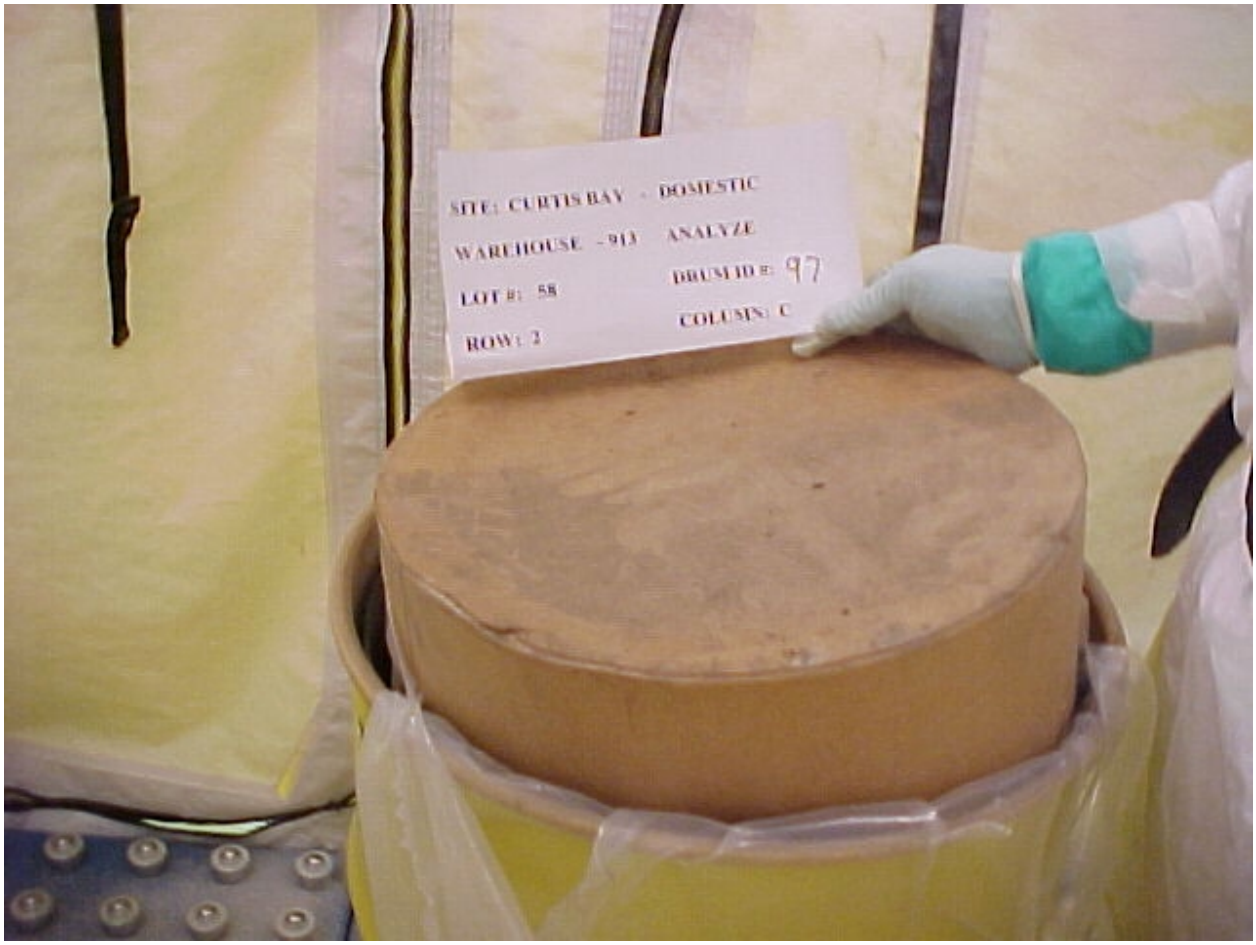
Date	7-12-2002	Time	14:15

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Fiber drum lid (from outermost fiber drum within the 30-gal drum) – good condition (raised lid indicates internal gas pressure buildup inside of packaging)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

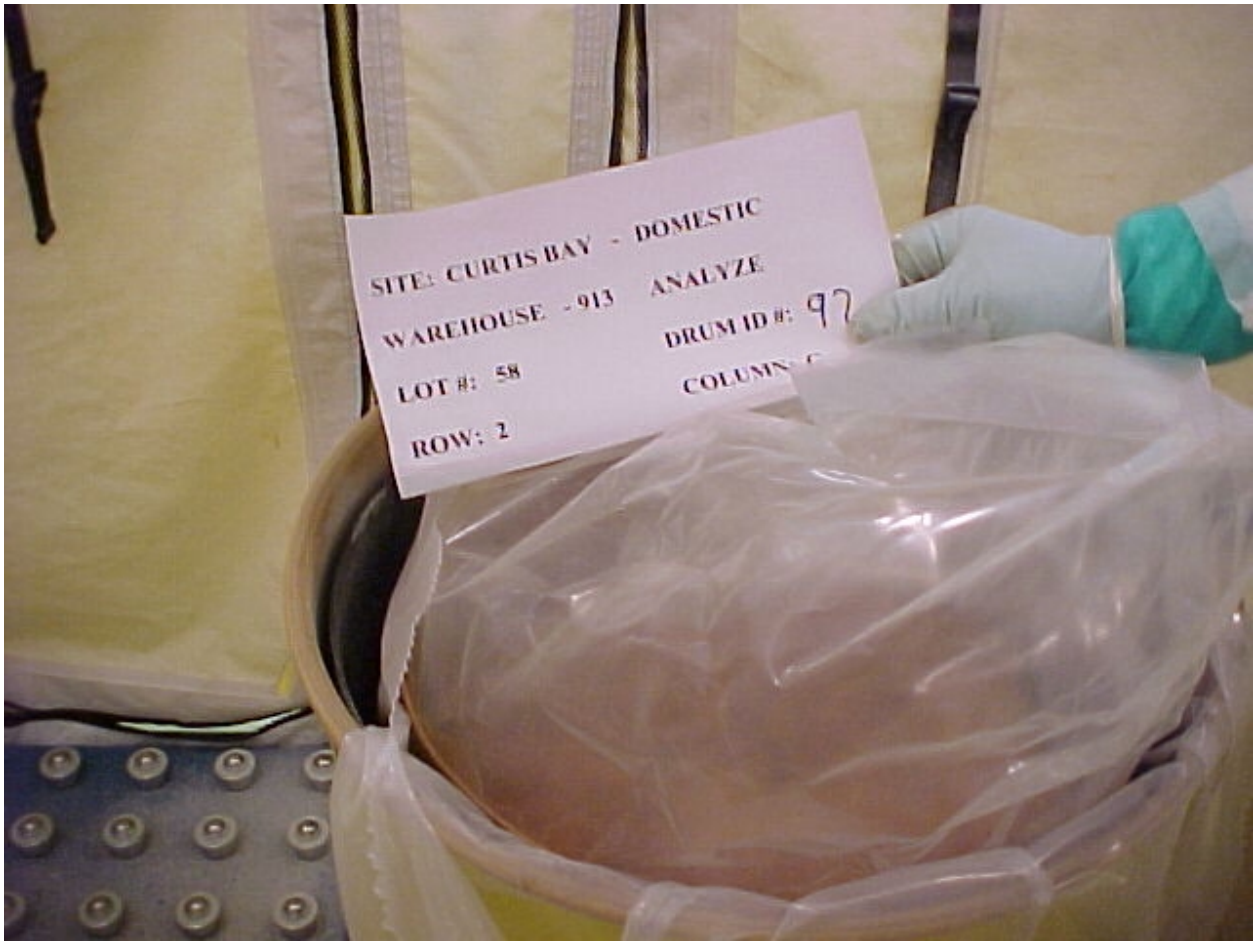
Date	7-12-2002	Time	14:15

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

2nd poly liner/bag – good condition (raised bag indicates internal gas pressure buildup inside of packaging)
No gasses present (in breathing zone)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

3rd poly liner/bag – good condition (raised bag indicates internal gas pressure buildup inside of packaging) (this bag contains majority of gas volume creating internal pressure within the packaging)
Opened poly liner/bag - No gasses present (in breathing zone)
Gasses in headspace – LEL – 4.2% - NO - +50.0ppm – NOx – +50.0ppm
Drum vented - All gasses dissipated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Wooden lid (mounted on inner fiber/lab-pack drum) – good condition
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Thin paper lid layer on the inner fiber/lab-pack drum – good condition (paper typically tears when removing wooden lid)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

4th poly liner/bag – good condition (inflated bag indicates internal pressure buildup in this thin film plastic liner)
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:15

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	58	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	97	Disposition	Analyze

Physical Location of Drum

Warehouse	913	Row	2
		Column	C

Inspection/Sample Date & Time

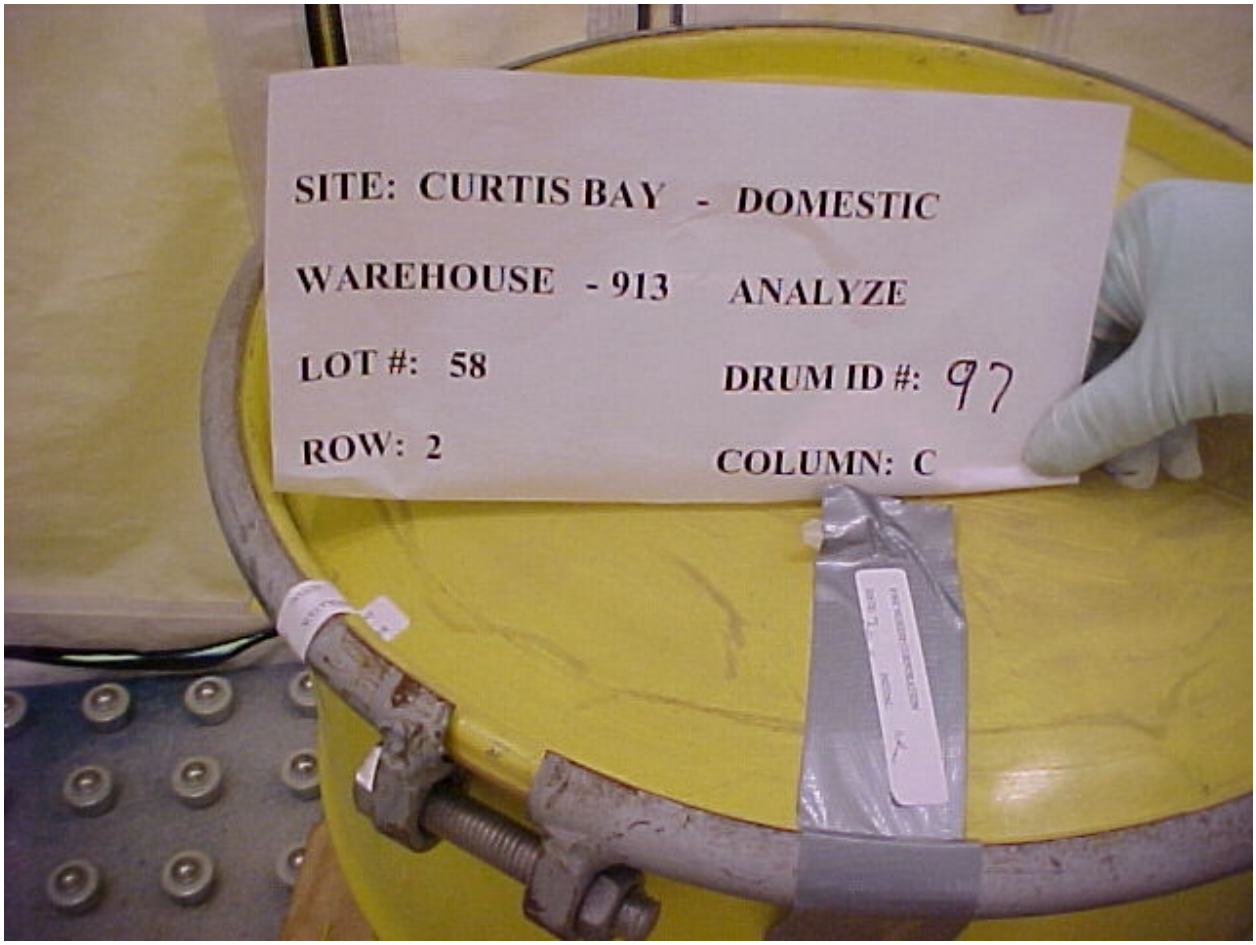
Date	7-12-2002	Time	14:15

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Sealed & dated - Complete



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APPENDIX G

CURTIS BAY DEPOT
DRUMS SAMPLED FOR ON-SITE ARCHIVE
(FIRST DRUM OF ARCHIVED SAMPLES)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Curtis Bay Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were placed in storage as archived samples per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were placed into archive storage in Warehouse 913 at the Curtis Bay Depot in Drum ID No. 6990-001-A1 (i.e. the first drum of samples archived at the Curtis Bay Depot). All lots/drums included in this appendix came from Thorium Nitrate materials originating from domestic sources.

The data in this appendix contains visual inspection and applicable sampling data from only 30-gal steel drums (designated as MD-1 drums). From the inspection of the drums, 85.7% of the 30-gal drums included in this data set at one time contained internal pressure (either via release of gas during the visual inspection or the presence of indentations in the top lid). Lots that had internal gas pressure are indicated with a single asterisk in the following table.

Also included with this table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	34*	80	G-5
2	35	203	G-17
3	38*	75	G-31
4	39*	6	G-45
5	40*	35	G-57
6	41*	142	G-71
7	42*	154	G-83
8	43*	179	G-99
9	50	3	G-111
10	51*	155	G-123
11	56*	48	G-137
12	60*	285	G-151
13	64*	00	G-167
14	71*	192	G-181

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Curtis Bay Depot
Lot #34 – Drum #80
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 34 Drum ID #: 80 Location: Warehouse 911 – Column C – Row 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-1-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:15

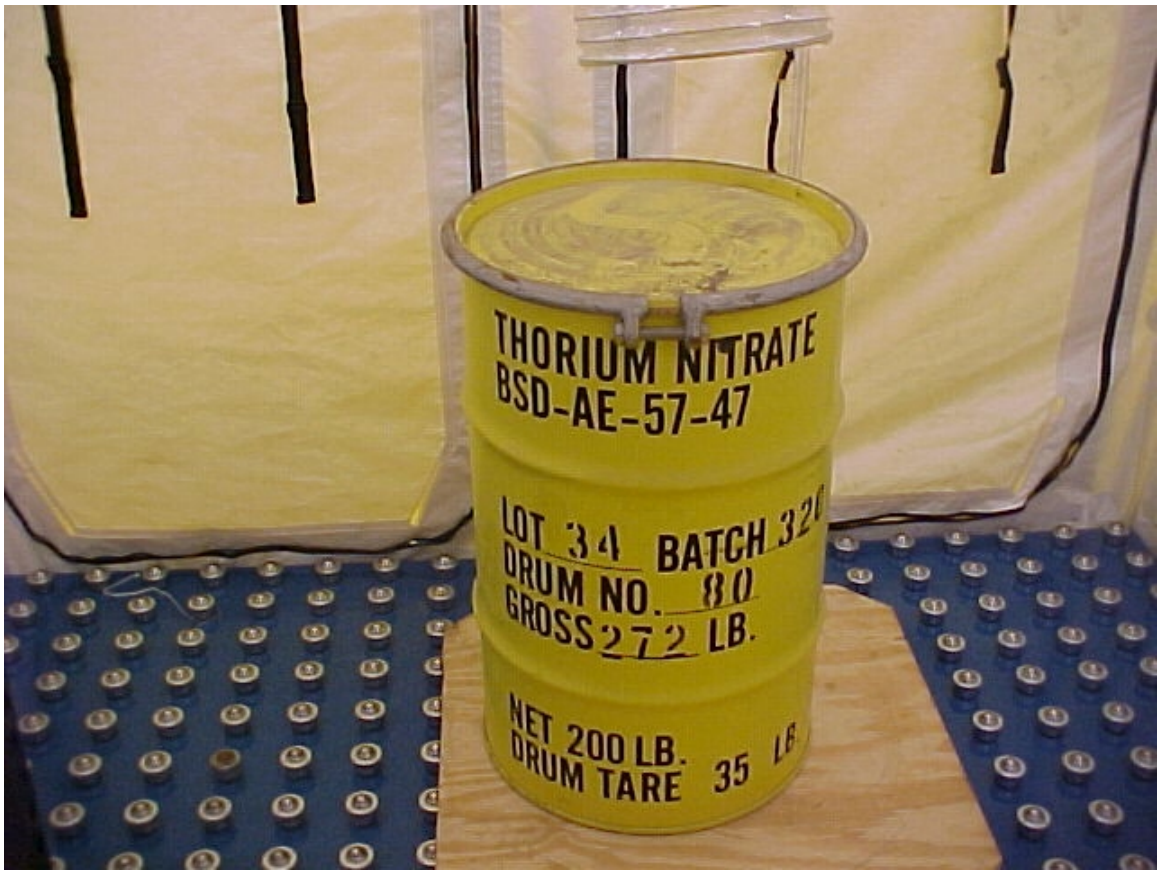
Other Information

Photo No. 1 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Container	30-gallon steel drum	Container Condition	good

Drum released pressure as bolt on drum ring was loosened – prior to complete removal of the drum ring, the drum lid pushed through the center of the ring springing off the drum 1' to 2' vertically. Utilized remote extension on air ratchet to loosen bolt to provide safe distance between operator and drum lid.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:15

Other Information

Photo No. 2 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Black plastic lid of inner drum liner – internal pressure in the packaging pushes the lid vertically out of the drum after the outer lid is removed.
No gasses present in the headspace

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

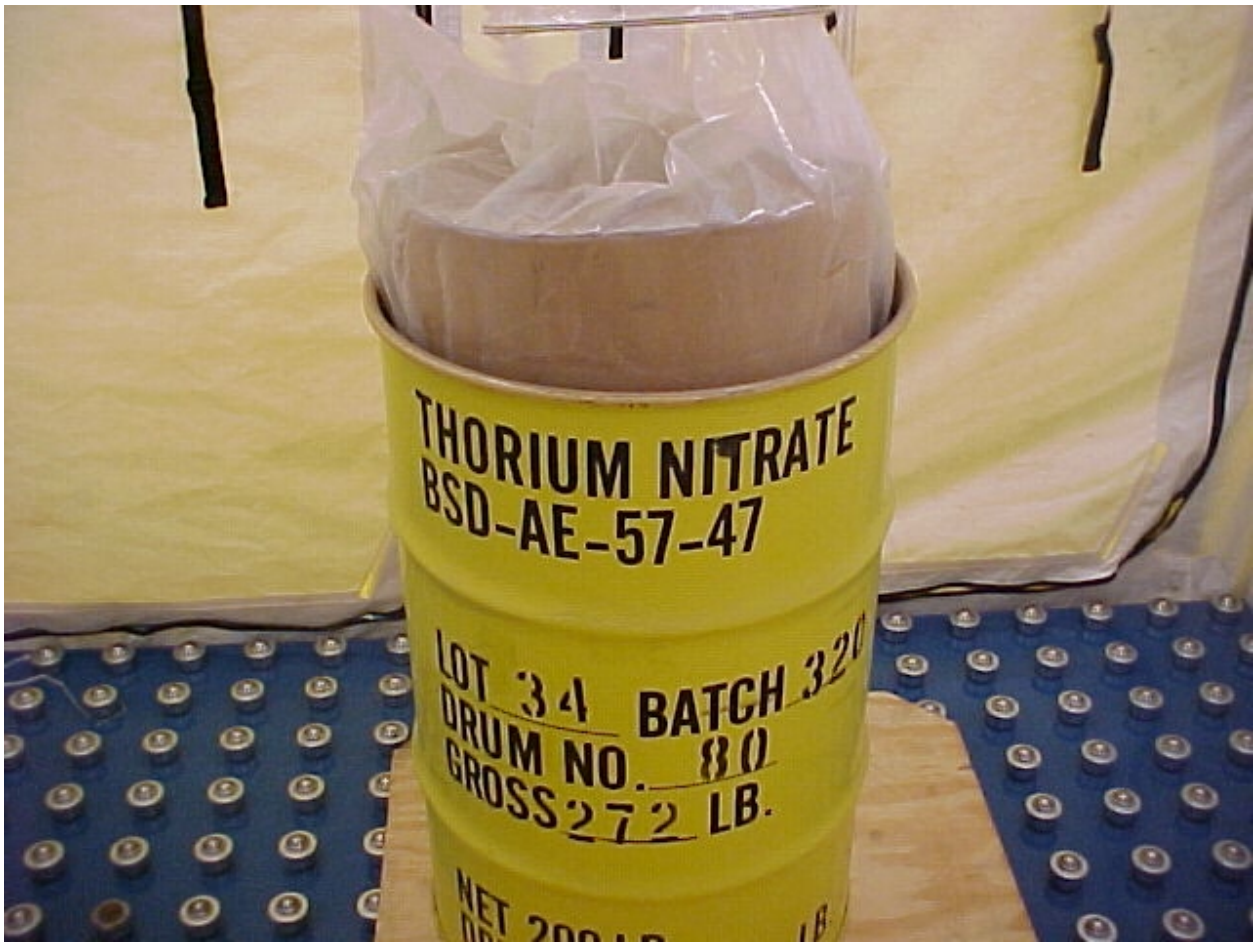
Date	7-1-2002	Time	11:15

Other Information

Photo No. 3 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

1st poly liner/bag – good condition
No gasses present in the headspace



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:15

Other Information

Photo No. 4 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

2nd poly liner/bag – good condition
No gasses present in the headspace
Picture shows where pressure has built up inside of the container packaging materials (i.e. 3rd poly bag)

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:15

Other Information

Photo No. 5 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

3rd poly liner/bag – good condition
No gasses present in the breathing zone
Picture shows where pressure has built up inside of this poly bag.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:15

Other Information

Photo No. 6 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Wooden lid (mounted on inner fiber drum) – good condition
No gasses present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:15

Other Information

Photo No. 7 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Final (4th) poly bag (thin film plastic lining) – good condition
No gasses present in the breathing zone
Picture shows where this poly bag is slightly inflated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:15

Other Information

Photo No. 8 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Thorium nitrate material – solid – very dry - white
No gasses present (in breathing zone)
Picture shows where this poly bag is slightly inflated

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	34	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	80	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	6
		Column	C

Inspection/Sample Date & Time

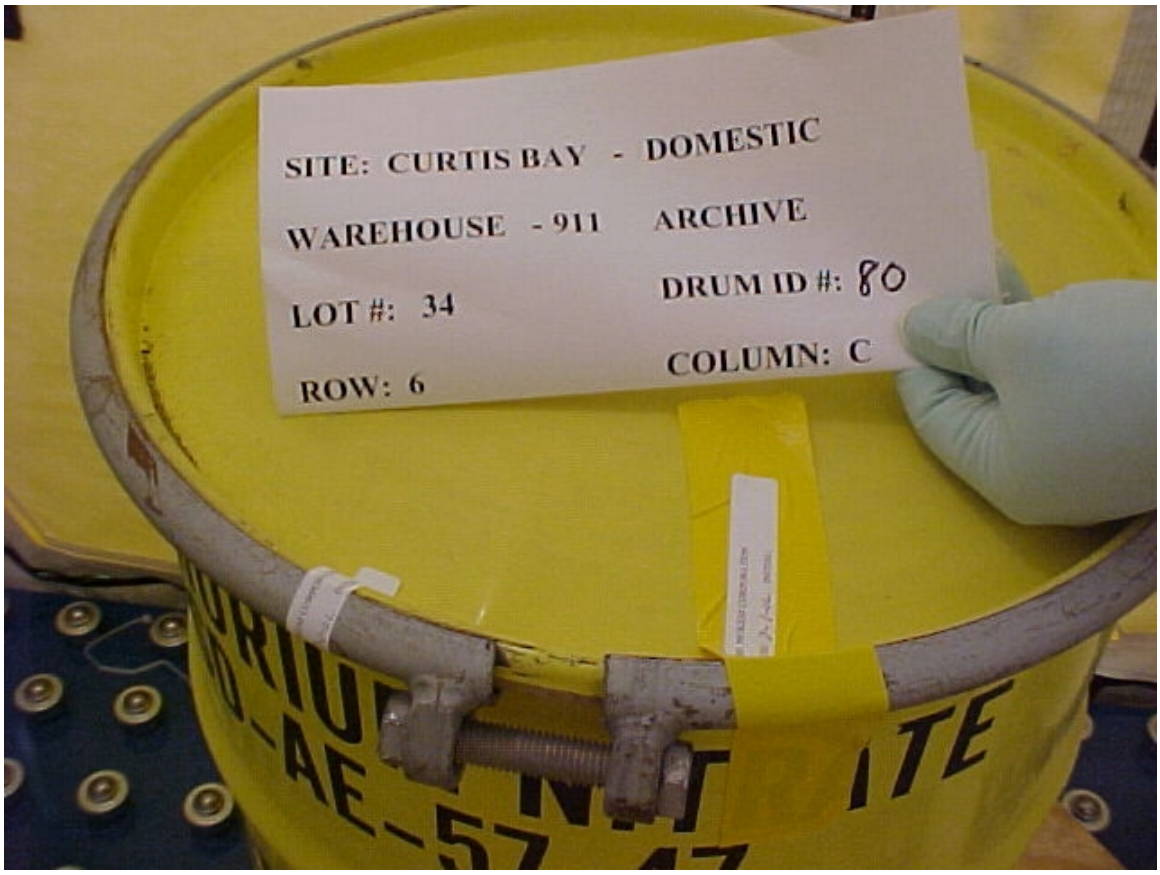
Date	7-1-2002	Time	11:15

Other Information

Photo No. 9 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #35 – Drum #203
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 35 Drum ID #: 203 Location: Warehouse 911 – Column B – Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 26 mR/hr DR at 1 meter 3.4 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 3.4 ppm NOx 27.4 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

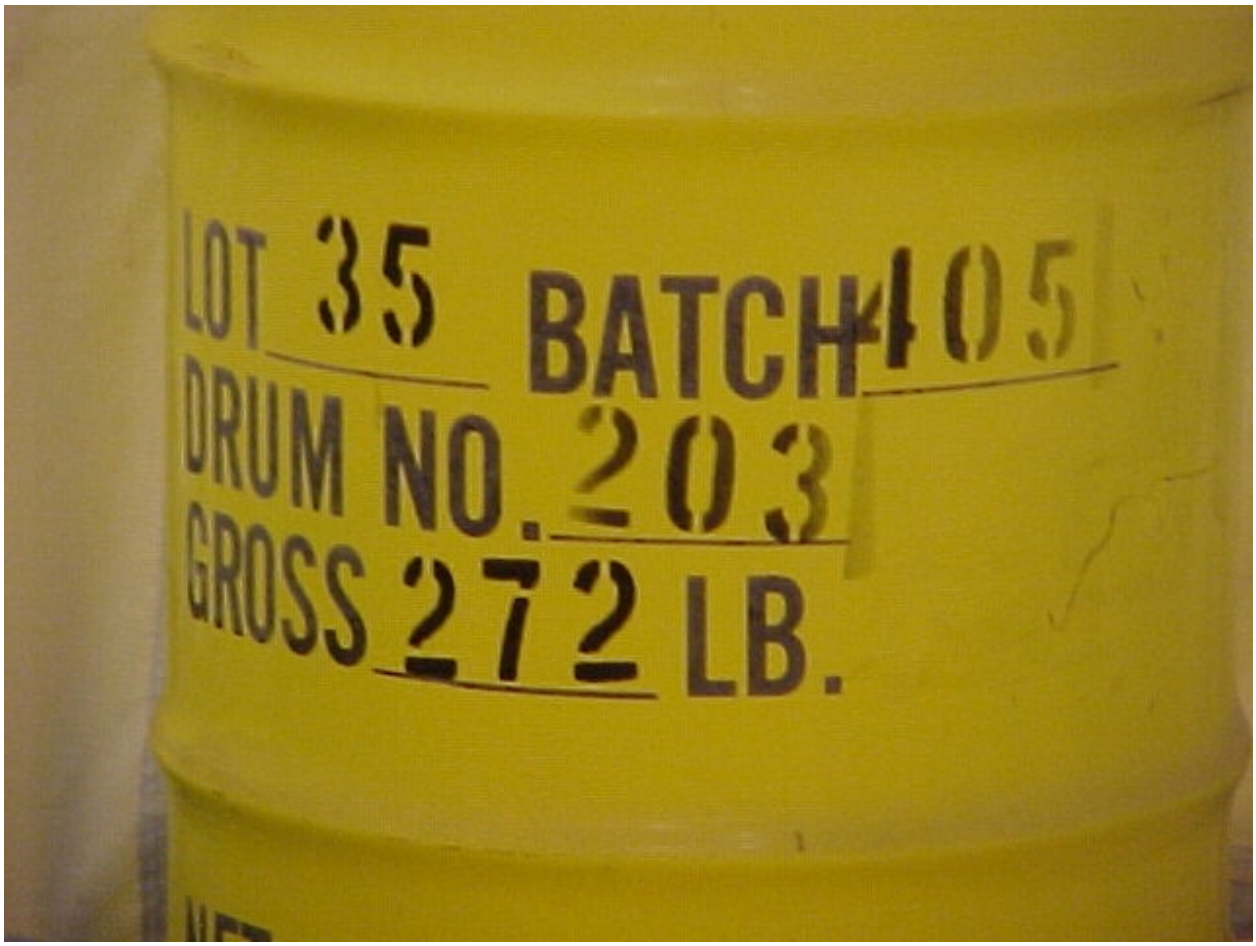
Date	6-28-2002	Time	10:00

Other Information

Photo No. 1 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

30-gal drum in good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

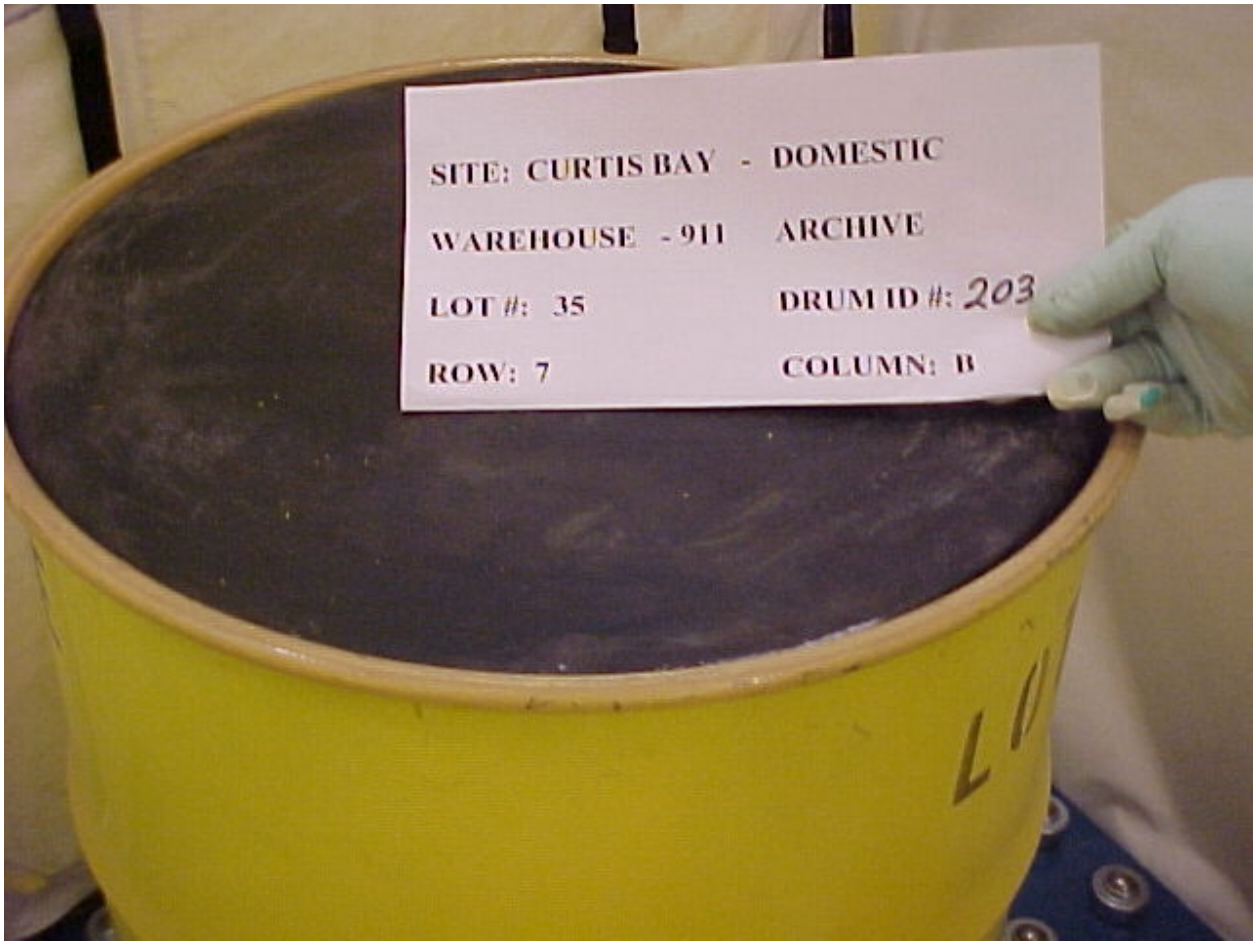
Date	6-28-2002	Time	10:00

Other Information

Photo No. 2 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Opened 30-gal drum in good condition – pressure in headspace of drum during removal – vented by loosening bolt on drum ring – gases measured during inspection and sampling process documented on Inspection Checklist



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

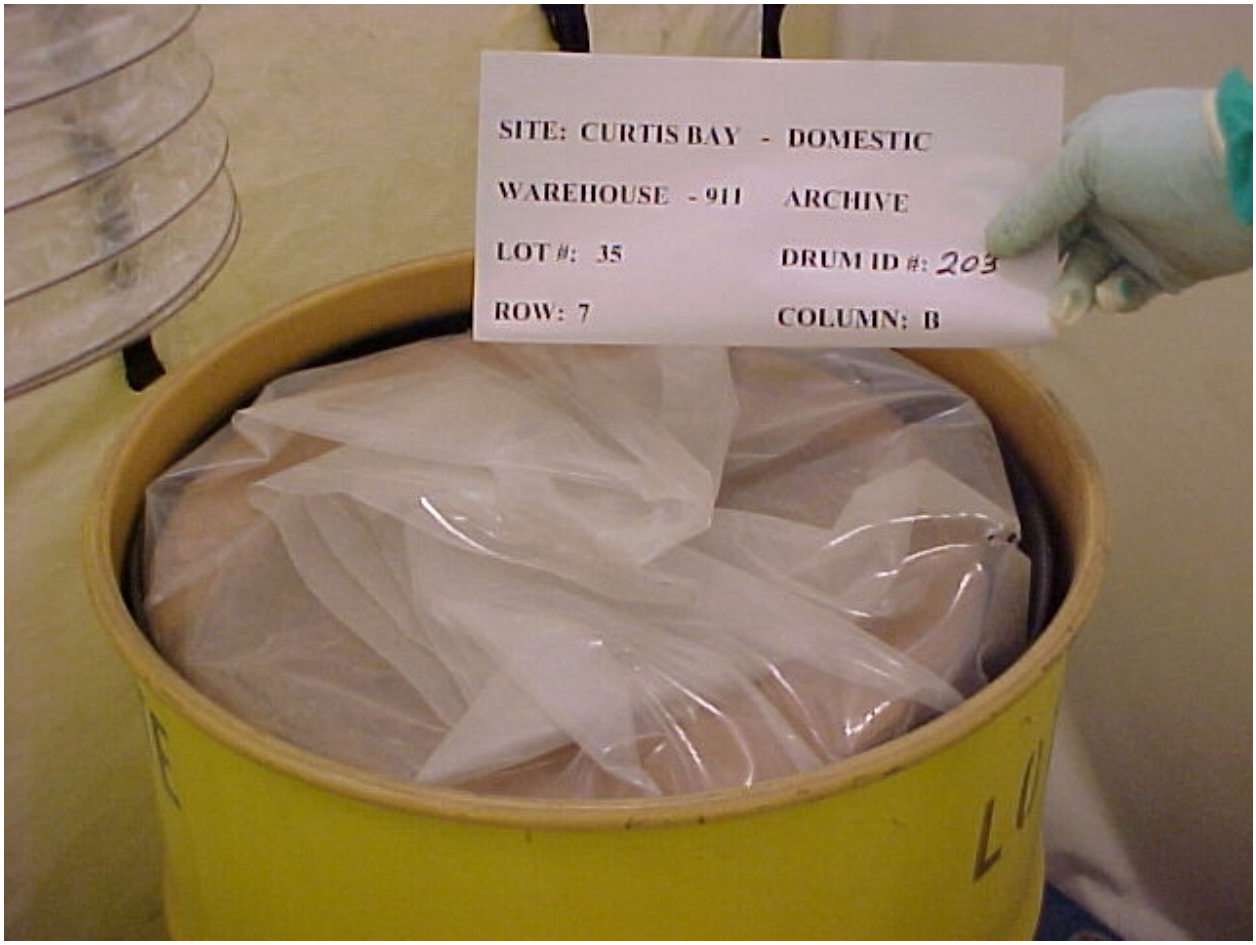
Date	6-28-2002	Time	10:00

Other Information

Photo No. 3 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

1st poly bag/liner – good condition
No gasses present in poly bag/liner headspace



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

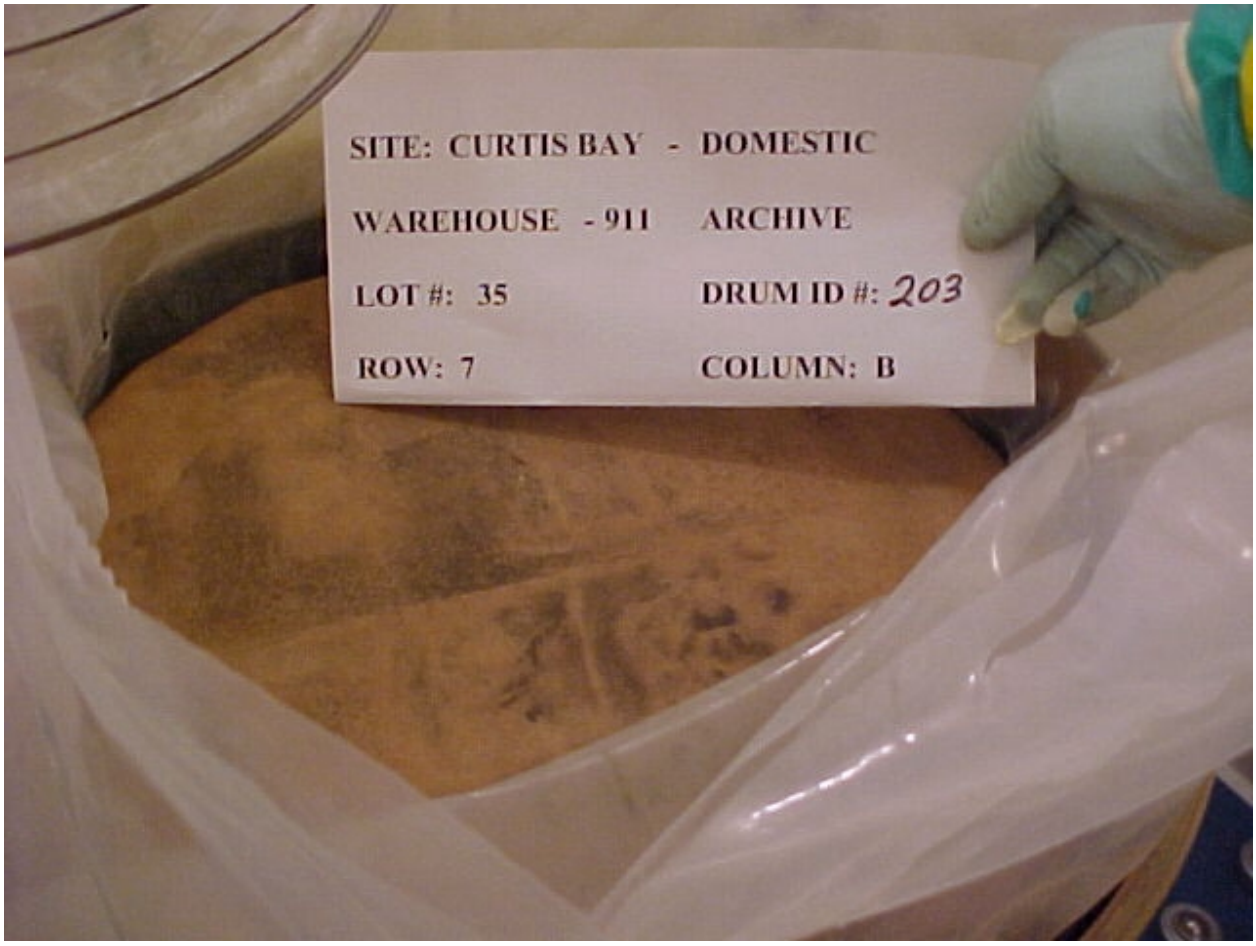
Date	6-28-2002	Time	10:00

Other Information

Photo No. 4 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Fiber lid (on outermost fiber drum inside of container) – good condition
No gasses present in fiber drum's headspace



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

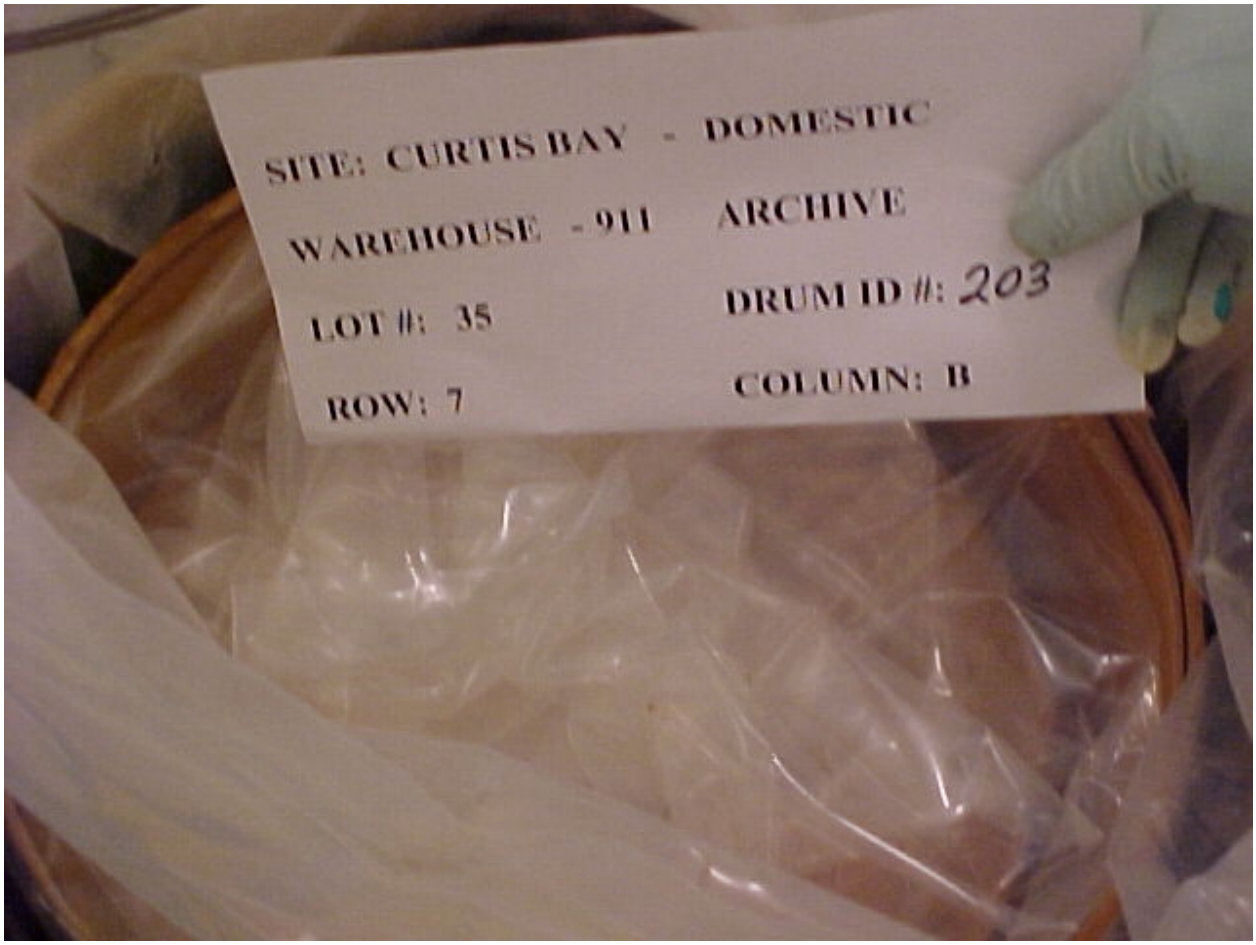
Date	6-28-2002	Time	10:00

Other Information

Photo No. 5 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

2nd poly liner/bag – good condition
No gasses present in bag's headspace



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

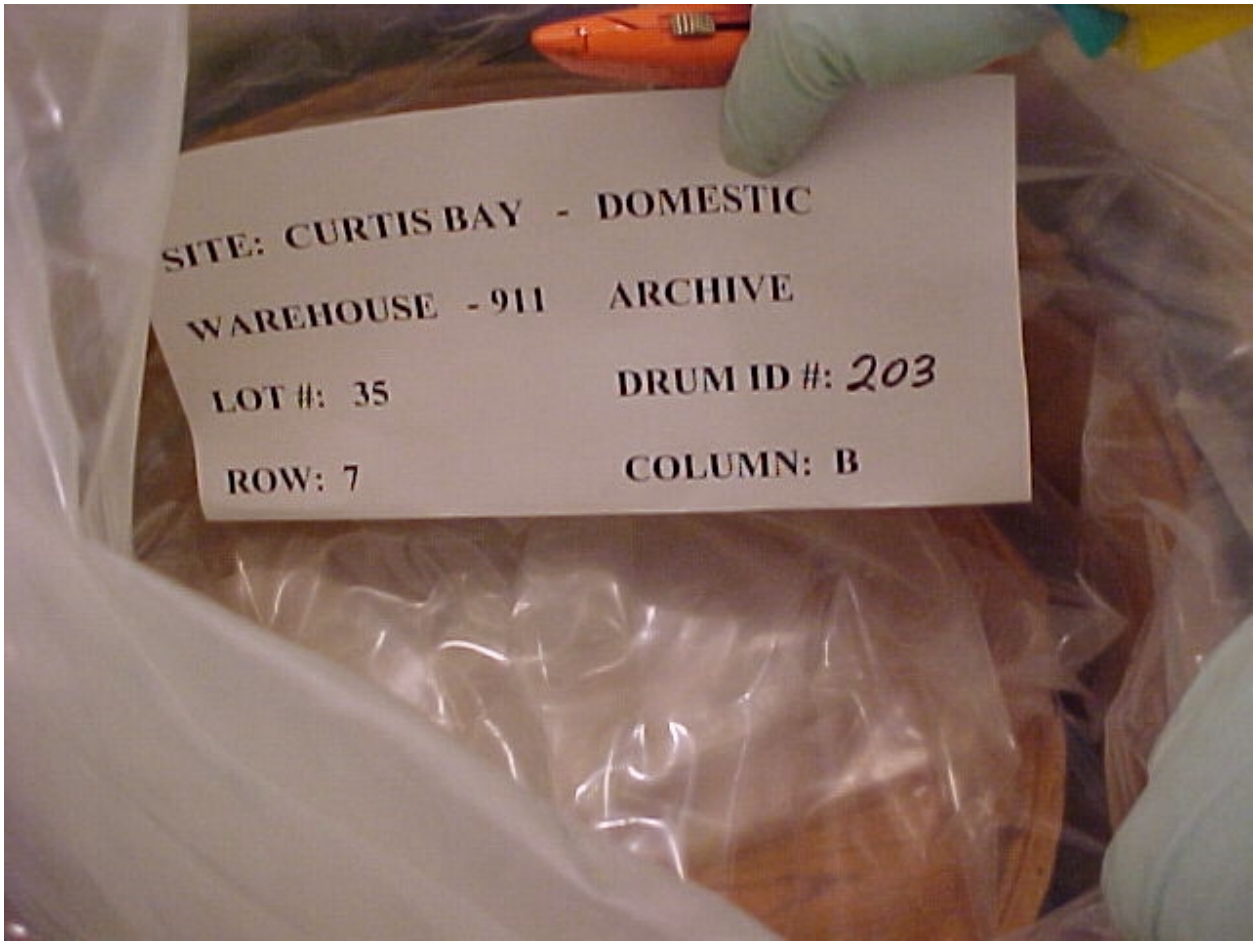
Date	6-28-2002	Time	10:00

Other Information

Photo No. 6 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

3rd poly liner/bag – good condition
No gasses present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

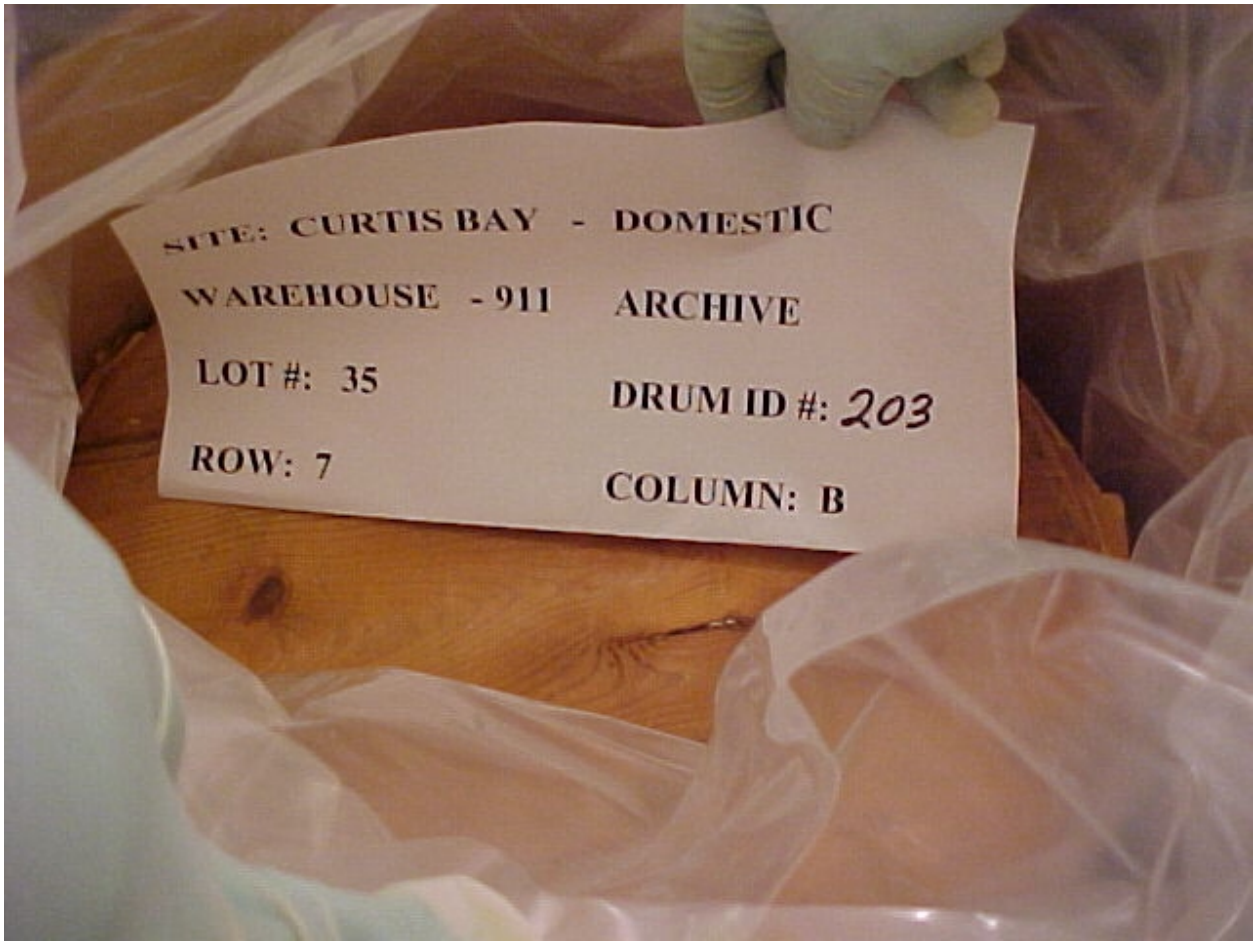
Date	6-28-2002	Time	10:00

Other Information

Photo No. 7 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Wooden lid (mounted on inner fiber drum) – good condition (lid protects the poly liner/bag before you actual ThN material)
No gasses present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	10:00

Other Information

Photo No. 8 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

"Paper thin" lid on the lab-pack (innermost fiber drum) comes off when you pull the wooden lid off.
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	10:00

Other Information

Photo No. 9 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

4th poly liner/bag – good condition
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	10:00

Other Information

Photo No. 10 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

ThN material prior to coring for a sample – good condition – very dry
Gasses present in headspace of fiber drum after opening inner poly liner: NO – 3.4 ppm & NOx – 27.4 ppm

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

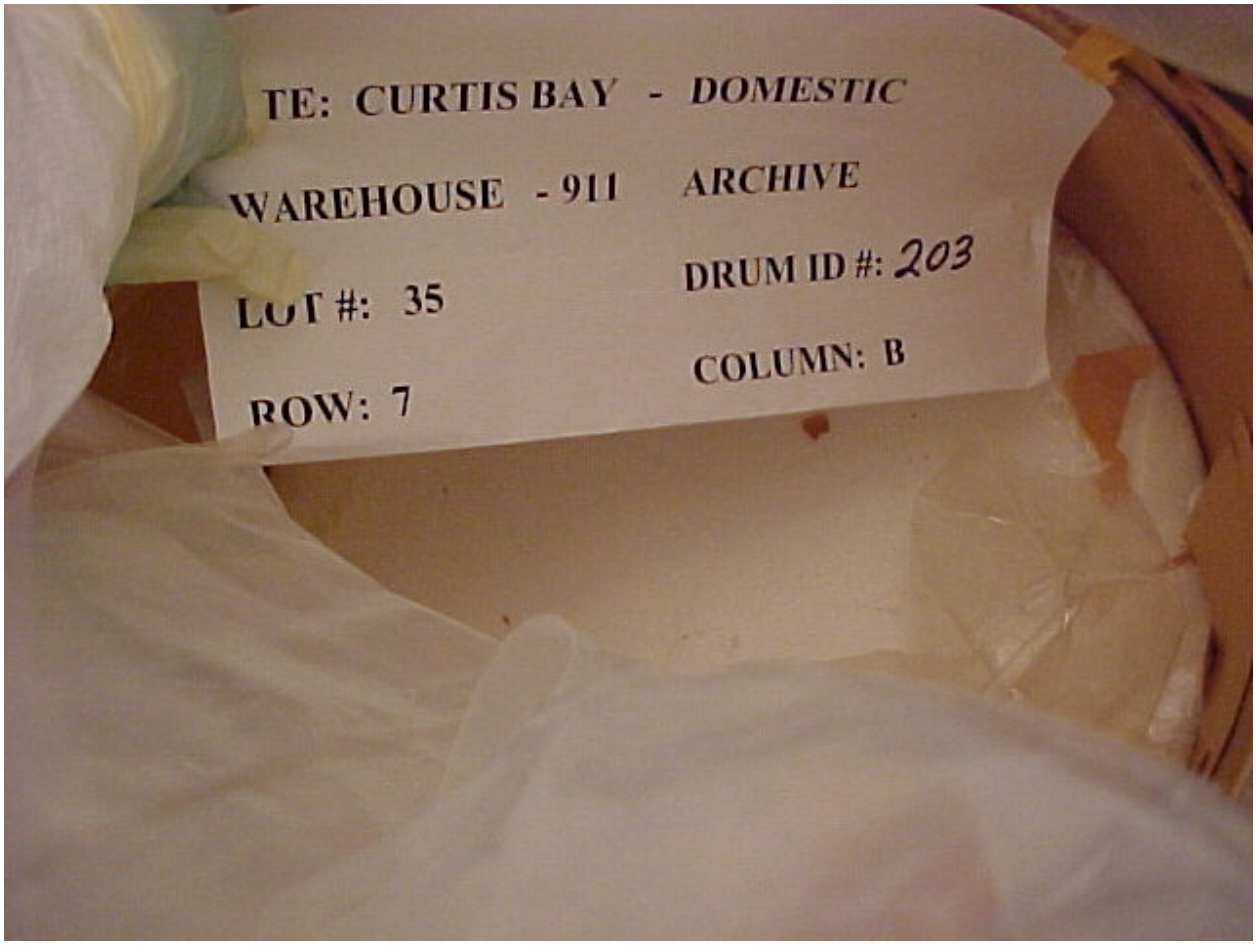
Date	6-28-2002	Time	10:00

Other Information

Photo No. 11 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Another photograph of the ThN material prior to sampling – good condition
No gases present in headspace following exhausting by HEPA blower discharge



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	35	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	203	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	10:00

Other Information

Photo No. 12 of 12

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Sealed & dated - Complete

Curtis Bay Depot
Lot #38 – Drum #75
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 38 Drum ID #: 75 Location: Warehouse 911 – Column D – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 3.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-02

General Information

Site Curtis Bay
ThN Origin Domestic

Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 1 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Picture was taken but it did not properly save on the diskette.
No pressure present in headspace of drum.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 2 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Picture of black "poly" lid from drum liner inside of 30-gal drum – good condition
No pressure present in drum – no gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 3 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

1st poly liner/bag – good condition
No pressure present in bag – no gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 4 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Fiber lid (on outermost fiber drum inside of drum) – good condition
No gases present in breathing zone
Fiber lid still in place – no internal pressure in inner packagings – had to cut lid open to access inner packagings.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 5 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

2nd poly liner/bag – good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 6 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

3rd poly liner/bag – good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 7 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Wooden lid [mounted on innermost fiber drum (lab-pack container)] – good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 8 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Lab-pack container lid – fair condition [thin layer paper underneath wooden lid and attached to this lab-pack container (innermost fiber drum)]
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 9 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

4th poly liner/bag – good condition (thin layer plastic film that covers the ThN material)
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:55

Other Information

Photo No. 10 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

ThN material – dry – solid – monolith - white
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	38	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	75	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	D

Inspection/Sample Date & Time

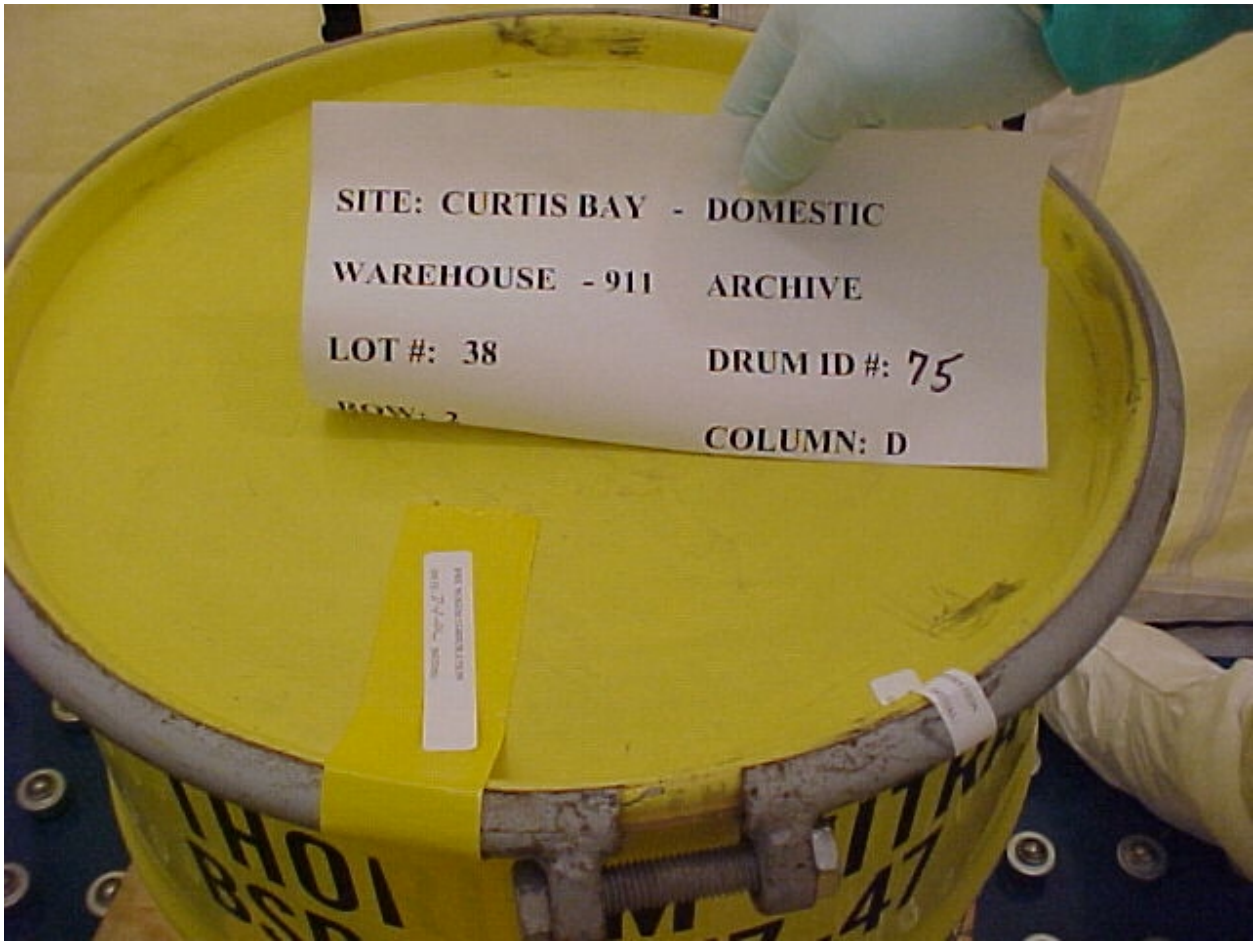
Date	7-1-2002	Time	11:55

Other Information

Photo No. 11 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #39 – Drum #6
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 39 Drum ID #: 6 Location: Warehouse 911 – Column C – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

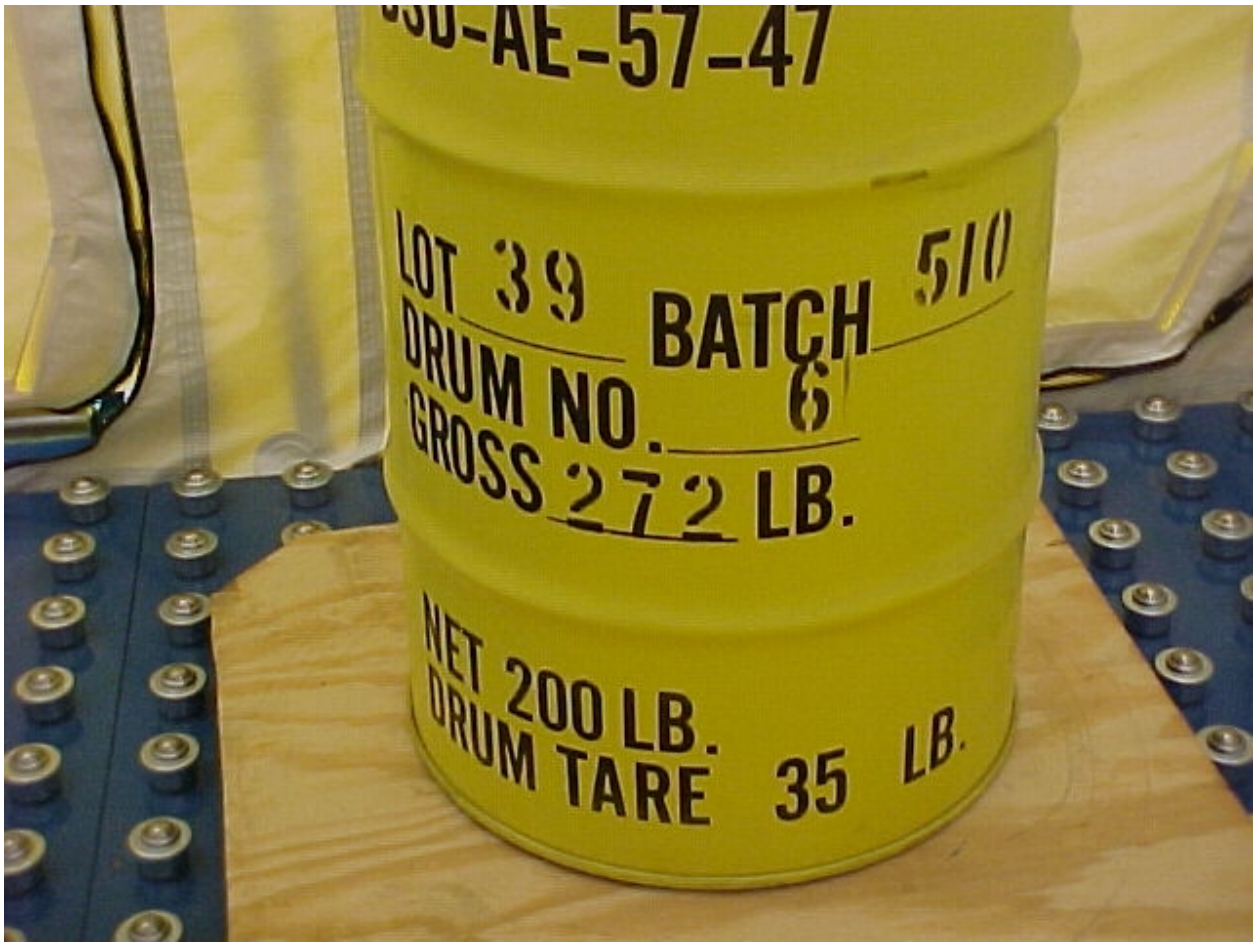
Date	7-1-2002	Time	10:00

Other Information

Photo No. 1 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

30-gal drum – good condition (container vented gas during drum lid opening operations)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:00

Other Information

Photo No. 2 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Black plastic lid (lid to black drum liner inside of metal drum) – good condition – this lid is raised due to the internal pressure inside of the drum packaging materials (poly bags)
No gasses present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

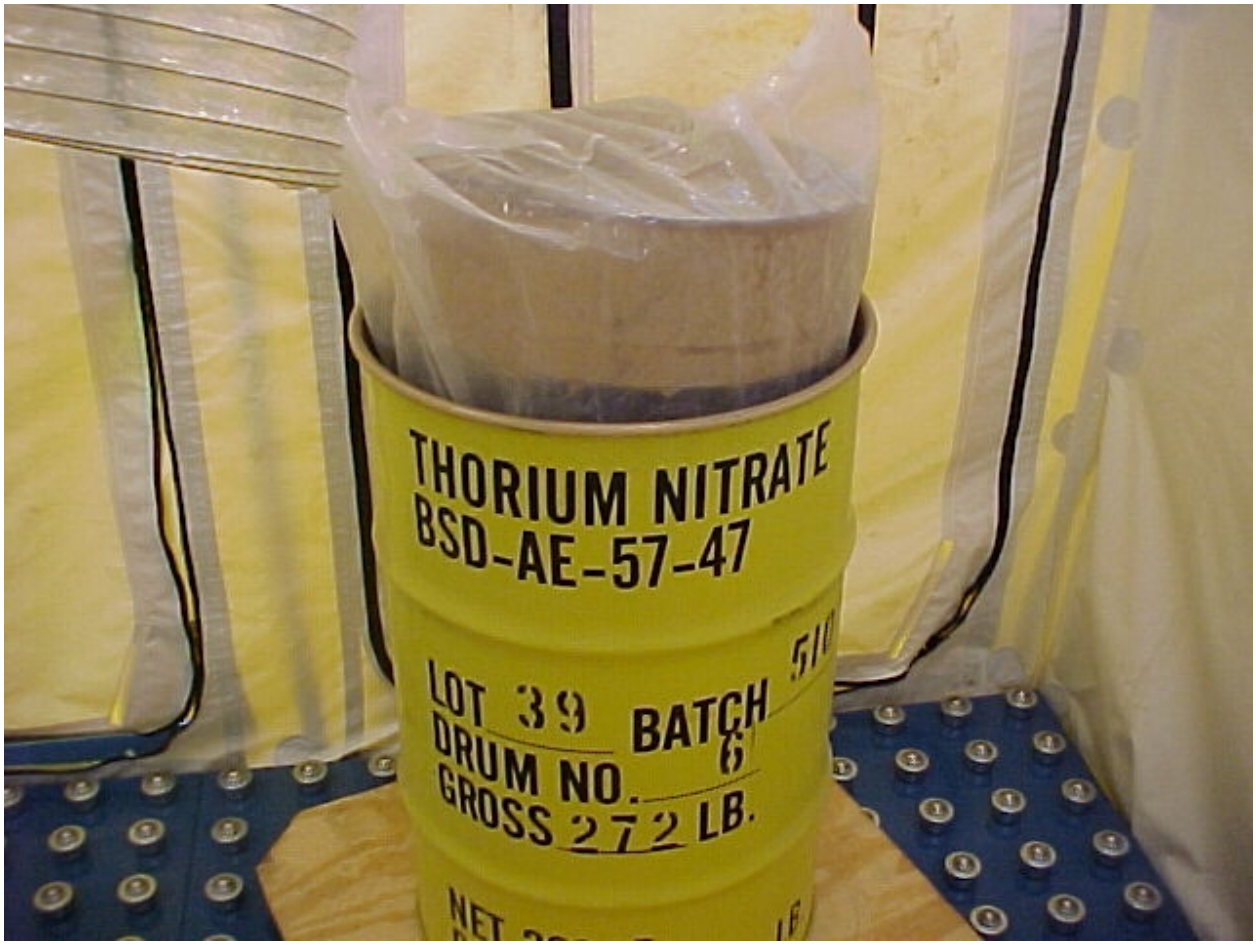
Date	7-1-2002	Time	10:00

Other Information

Photo No. 3 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

1st poly liner/bag – good condition
No gasses present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:00

Other Information

Photo No. 4 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Fiber drum lid – good condition
No gasses present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

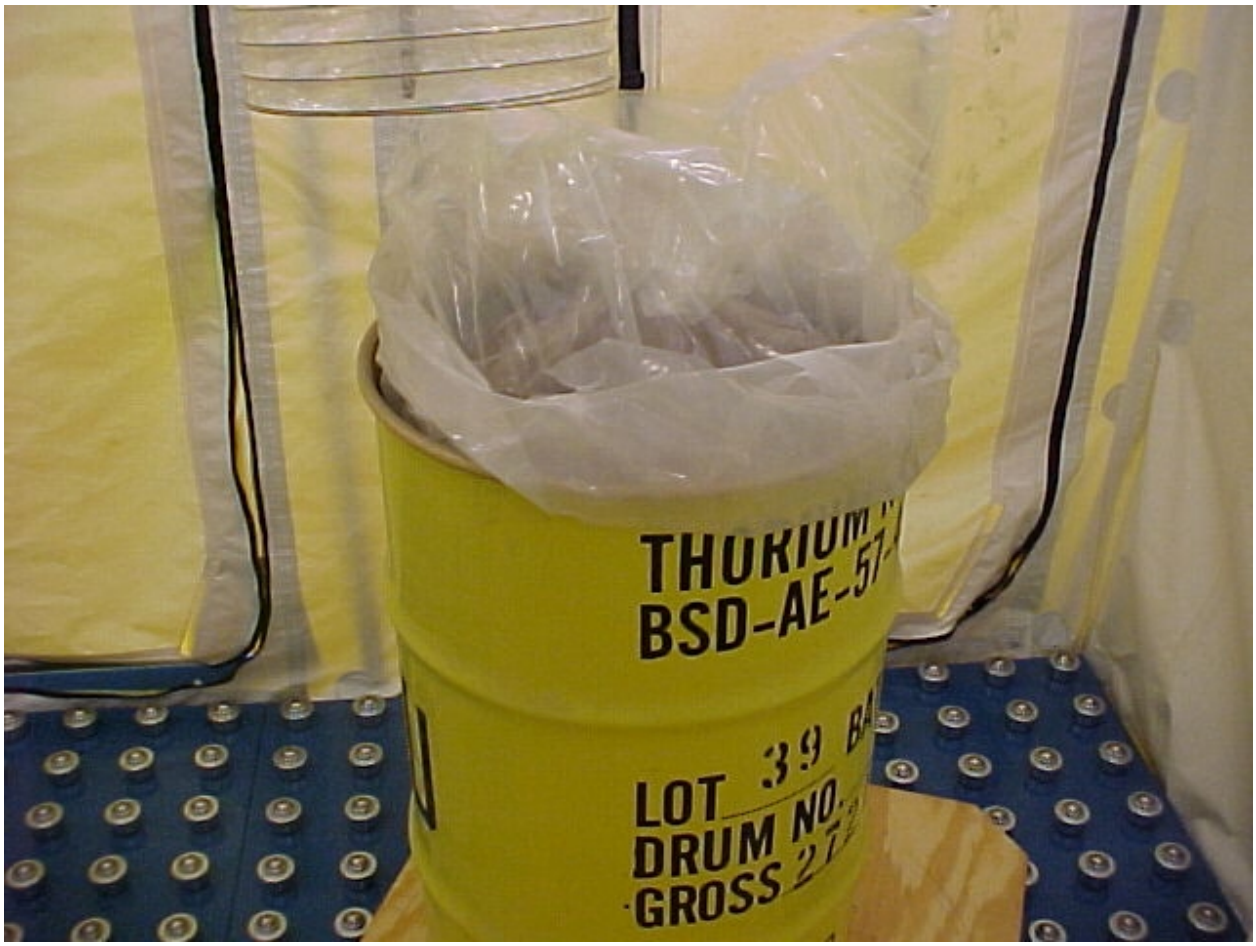
Date	7-1-2002	Time	10:00

Other Information

Photo No. 5 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

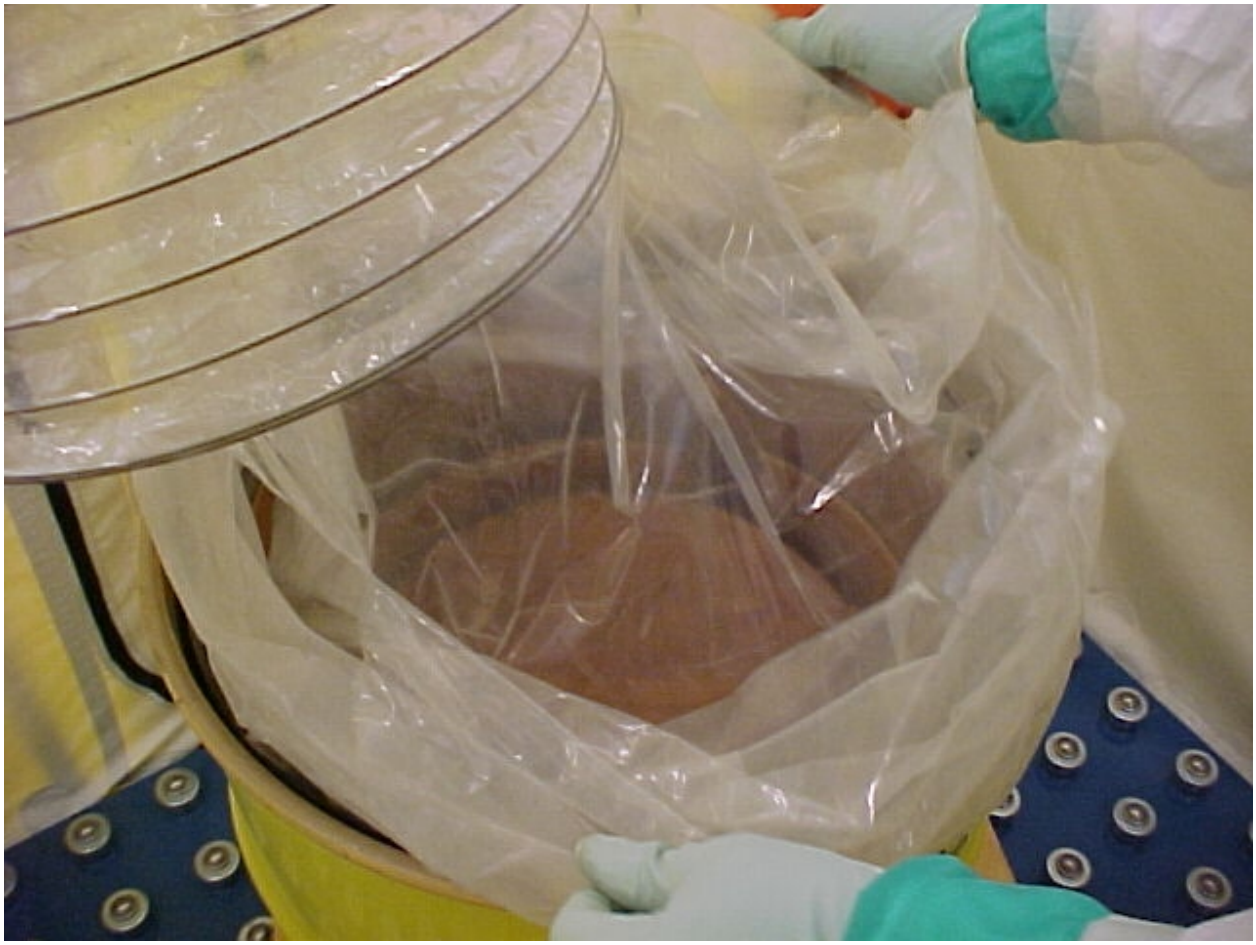
Date	7-1-2002	Time	10:00

Other Information

Photo No. 6 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

3rd poly liner/bag – good condition (this poly bag appears to contain the majority of the internal pressure buildup inside the drum that did not vent during initial drum lid opening)
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:00

Other Information

Photo No. 7 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Wooden lid (on innermost fiber drum) – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:00

Other Information

Photo No. 8 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

4th poly liner/bag – good condition (picture shows inflated bag – this bag is a thin film plastic material)
ThN material – dry – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	39	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	6	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	C

Inspection/Sample Date & Time

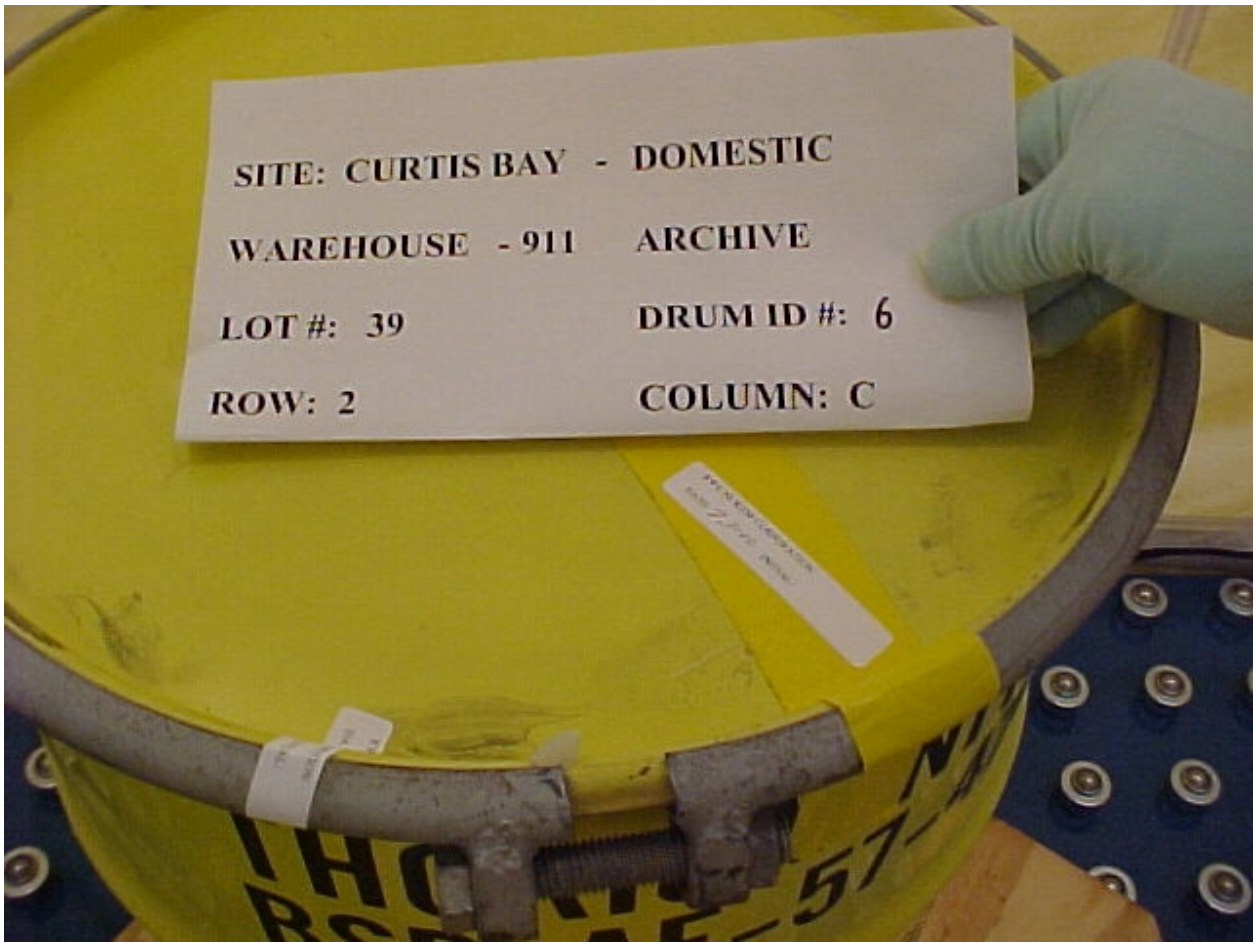
Date	7-1-2002	Time	10:00

Other Information

Photo No. 9 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #40 – Drum #35
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 40 Drum ID #: 35 Location: Warehouse 911 – Column C – Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 26 mR/hr DR at 1 meter 3.4 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 1 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

30-gal container – good condition

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 2 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Black plastic lid (on inner drum liner) – good condition – raised condition delineates pressure buildup inside of inner drum packagings
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

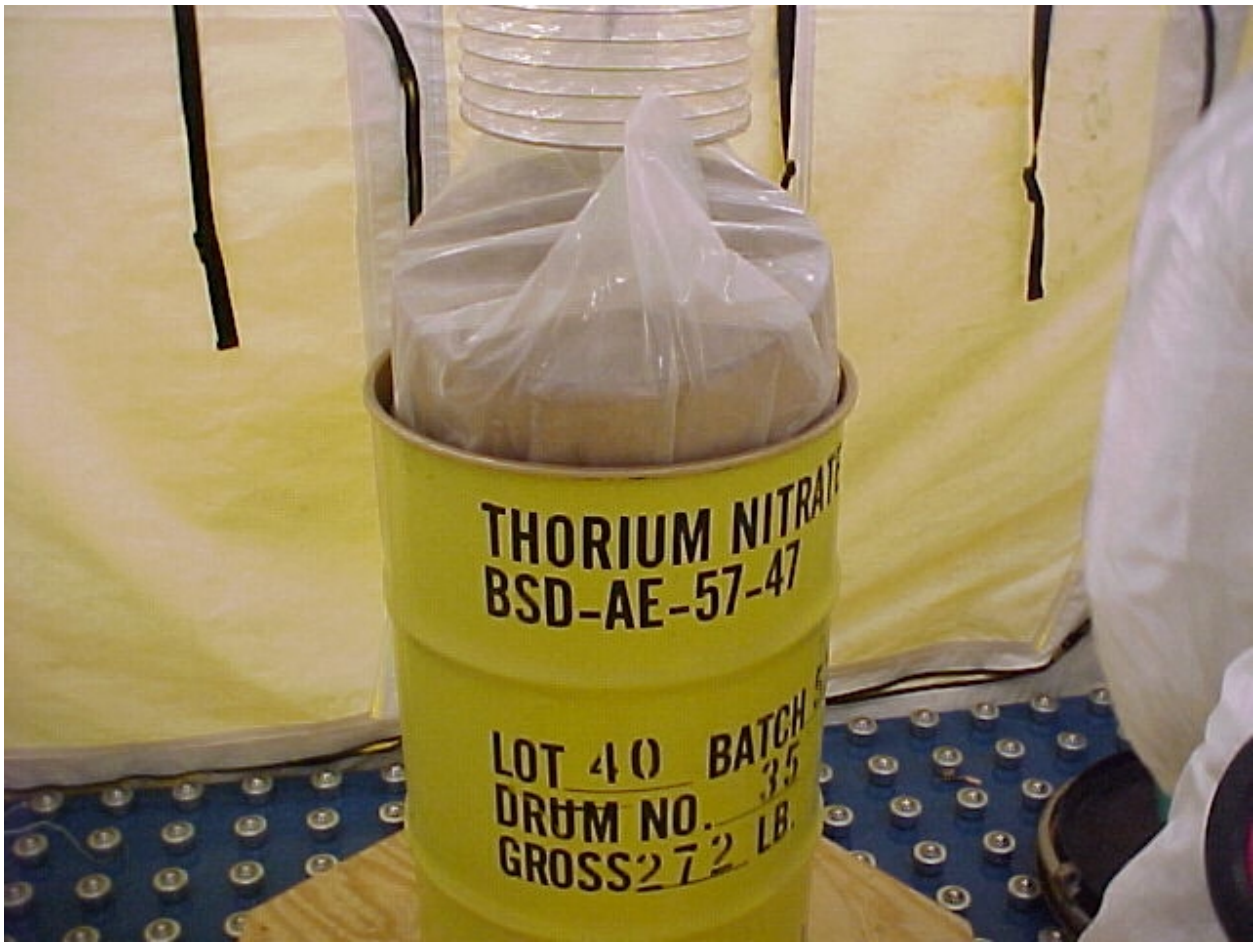
Date	7-1-2002	Time	11:35

Other Information

Photo No. 3 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

1st poly liner/bag – good condition
No gasses present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 4 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Fiber drum lid (on outermost fiber drum) – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 5 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

2nd poly liner/bag – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 6 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

3rd poly liner/bag – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 7 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Wooden lid (mounted on inner most fiber drum) – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 8 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

This picture shows the thin paper cover/lid on the lab-pack container (inner most fiber drum) – cover/lid typically disintegrates when the wooden lid is removed
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 9 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

4th (final) poly liner/bag – good condition – inflated condition shows buildup of gas inside this bag – gas is apparently being generated by ThN material
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	11:35

Other Information

Photo No. 10 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

ThN material – white, solid, monolithic structure - dry
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	40	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	35	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	8
		Column	C

Inspection/Sample Date & Time

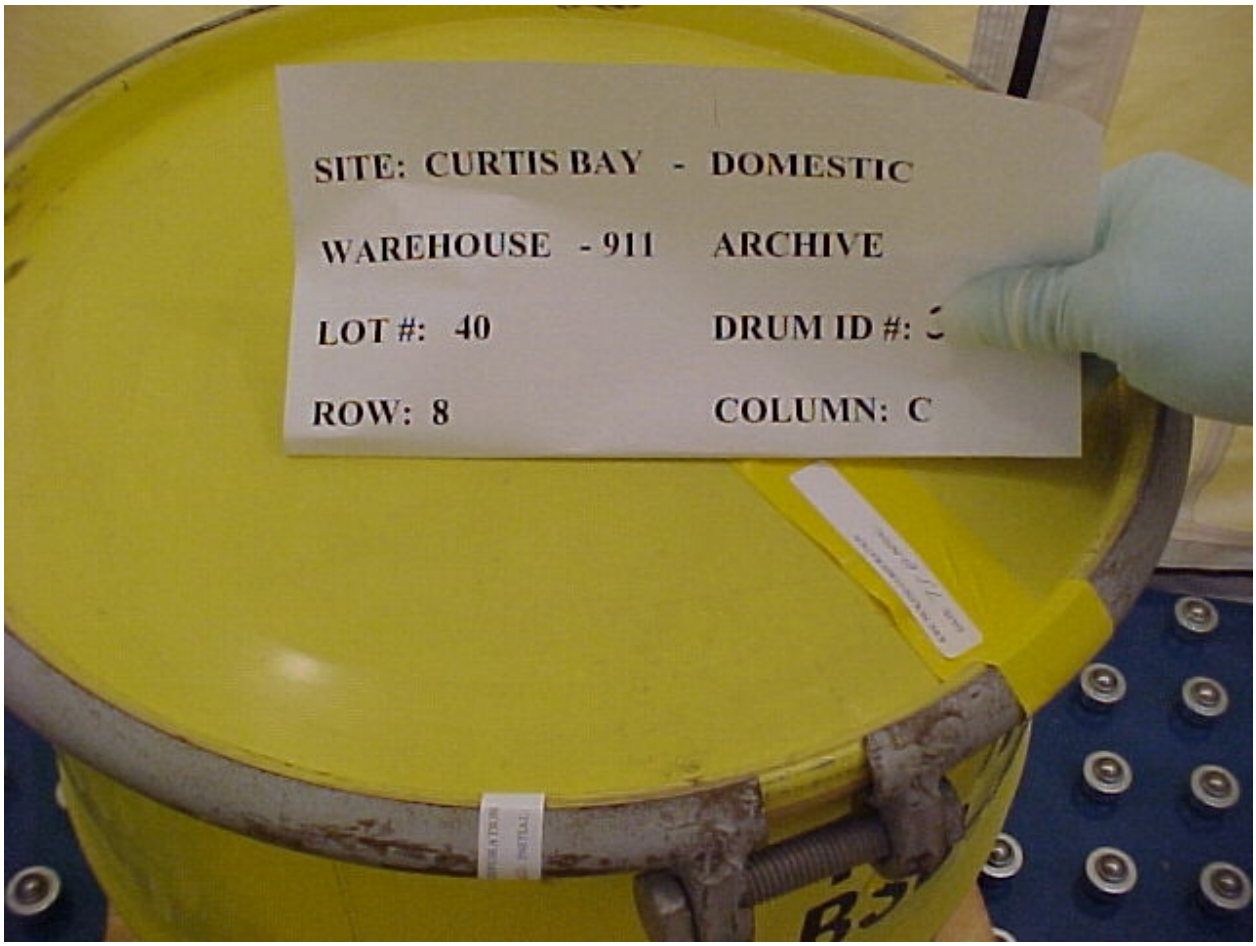
Date	7-1-2002	Time	11:35

Other Information

Photo No. 11 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.4 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #41 – Drum #142
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 41 Drum ID #: 142 Location: Warehouse 911 – Column B – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 1.3 ppm NOx 22.1 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-27-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

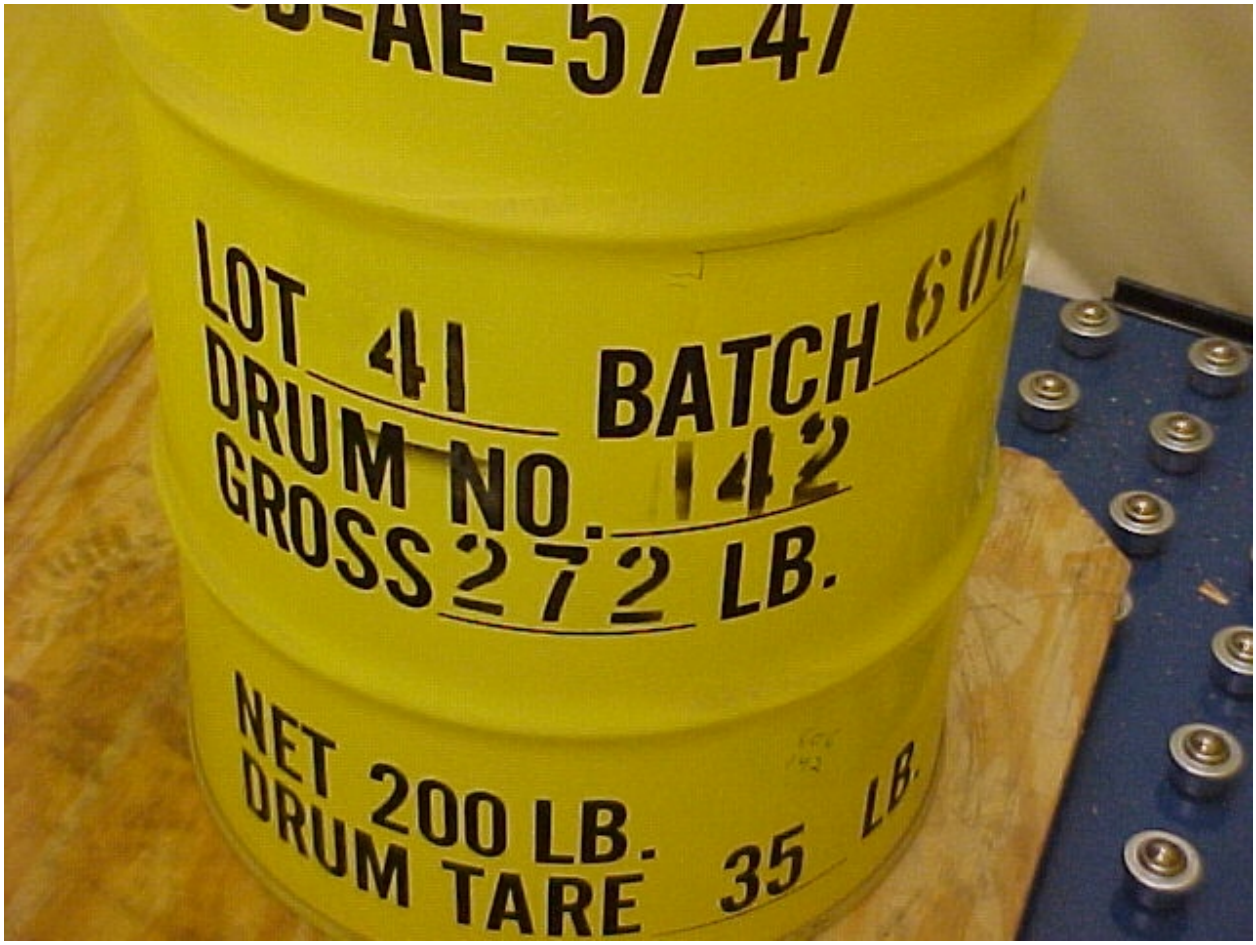
Date	6-27-2002	Time	12:30

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum in good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

Date	6-27-2002	Time	12:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – black drum liner lid in good condition – raised position indicates buildup of gas in internal packagings

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

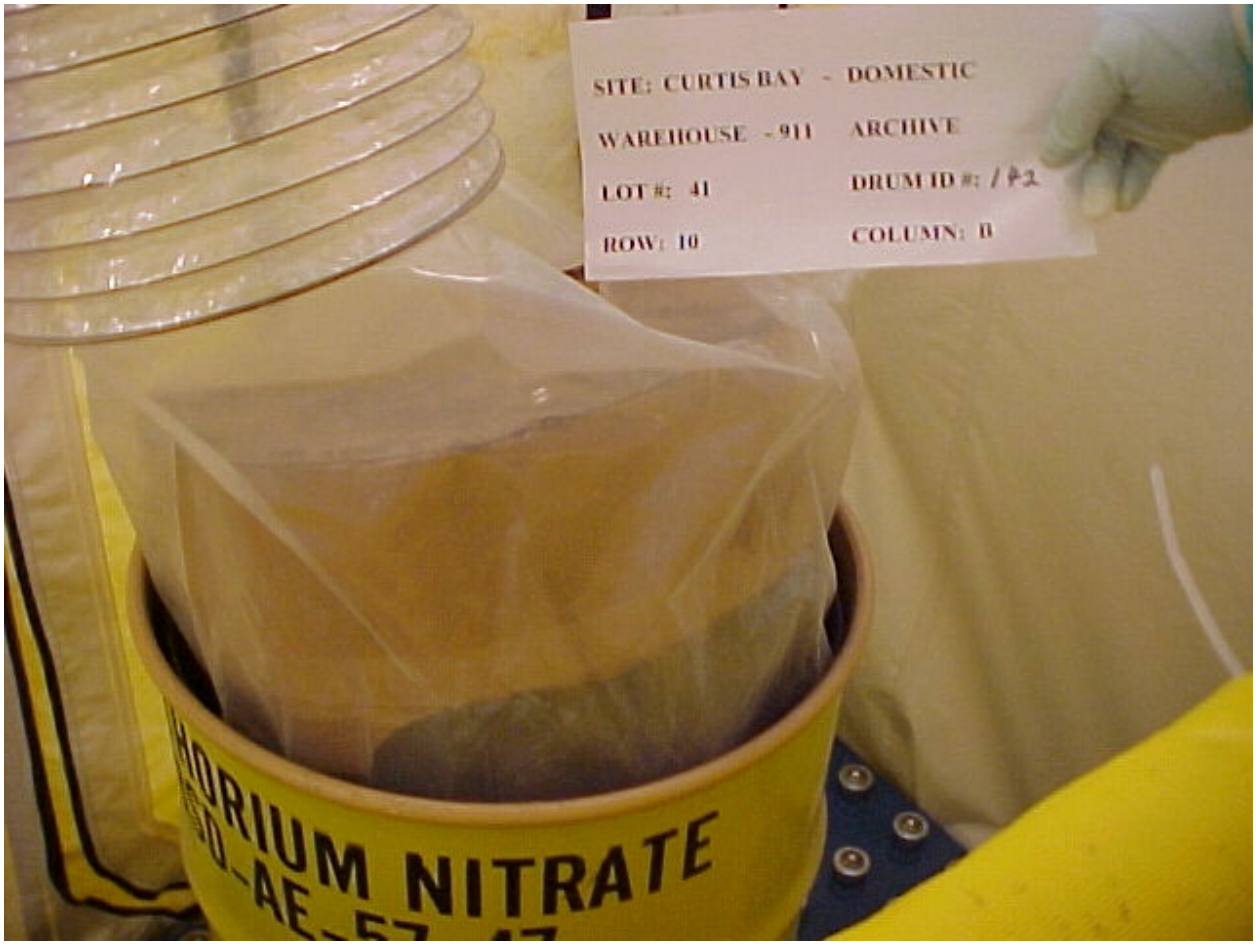
Date	6-27-2002	Time	12:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Opening liner/bag with utility knife
HEPA HVAC exhaust working properly



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

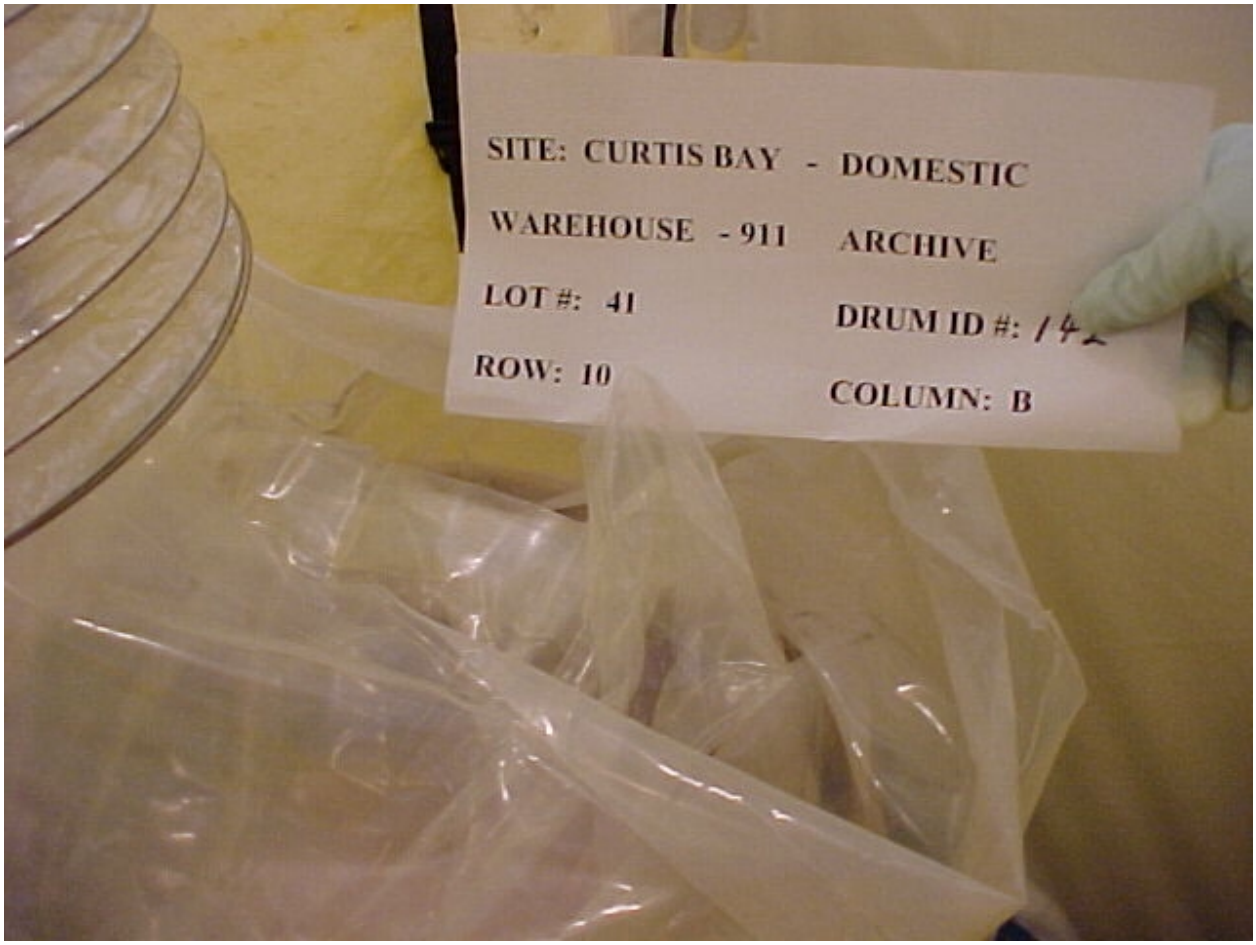
Date	6-27-2002	Time	12:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

This picture shows the fiber drum lid on the outermost fiber drum – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

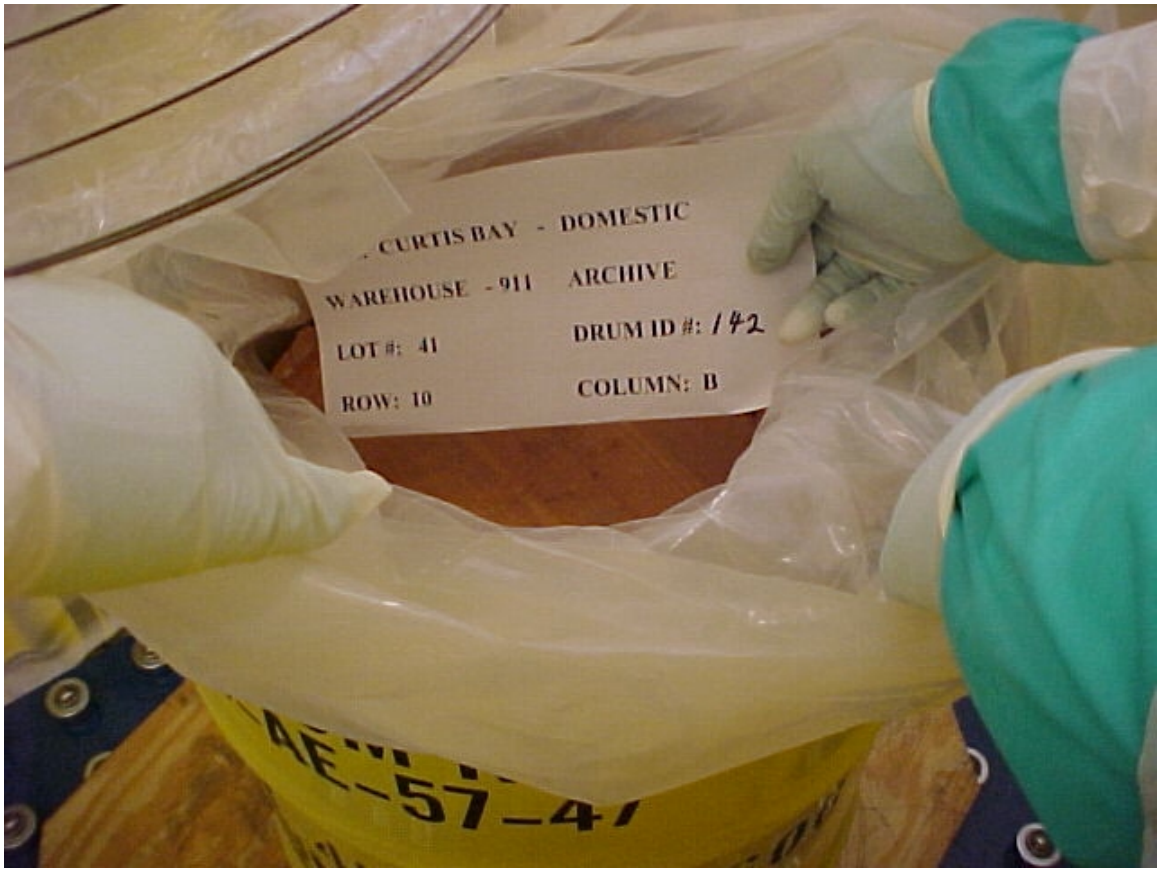
Date	6-27-2002	Time	12:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd & 3rd poly liner/bag in good condition
No gases present in breathing zone
Picture shows wooden lid on next inner container



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

Date	6-27-2002	Time	12:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Picture shows the wooden lid removed from the container
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

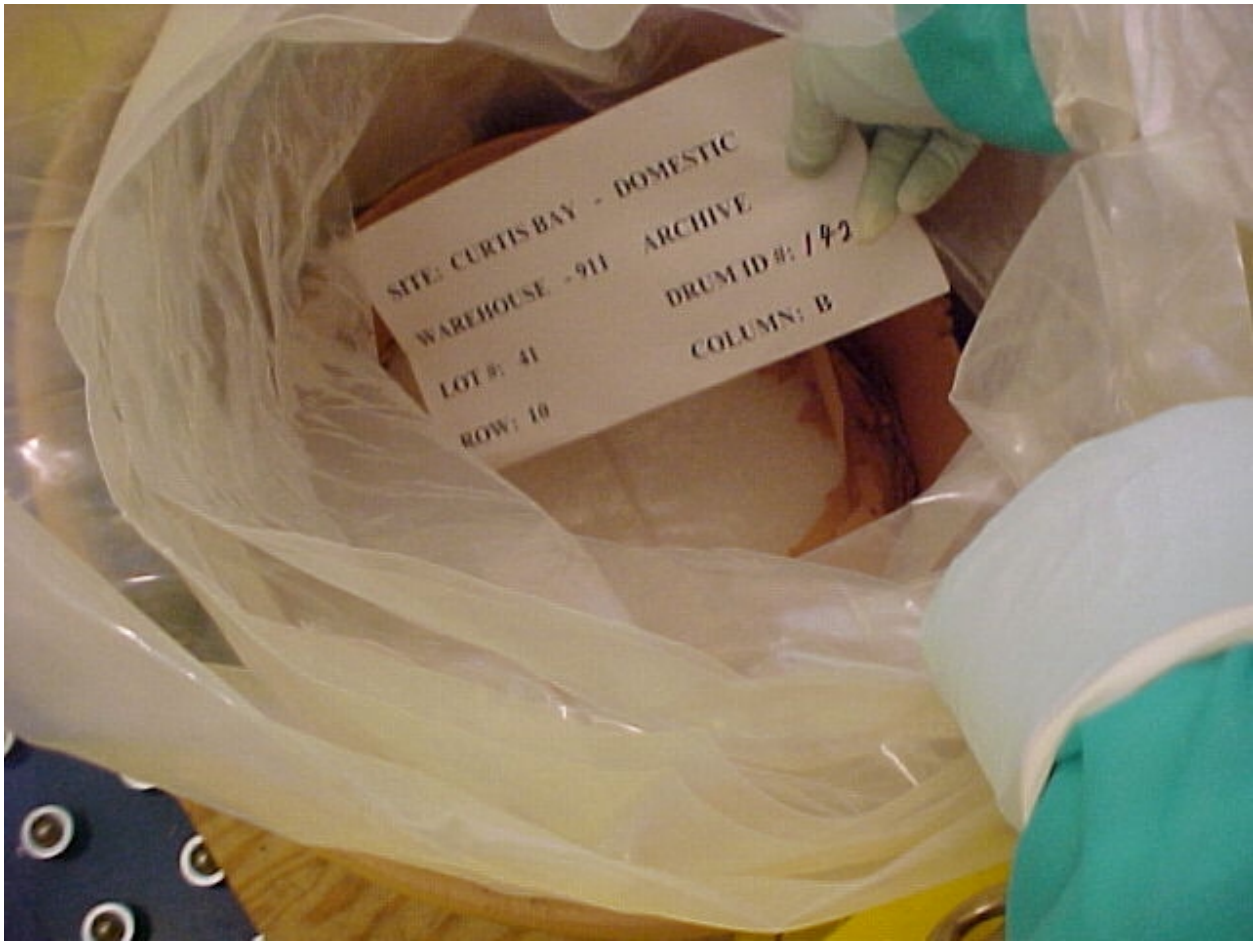
Date	6-27-2002	Time	12:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

This picture shows the final plastic bag in good condition (4th poly liner/bag)
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

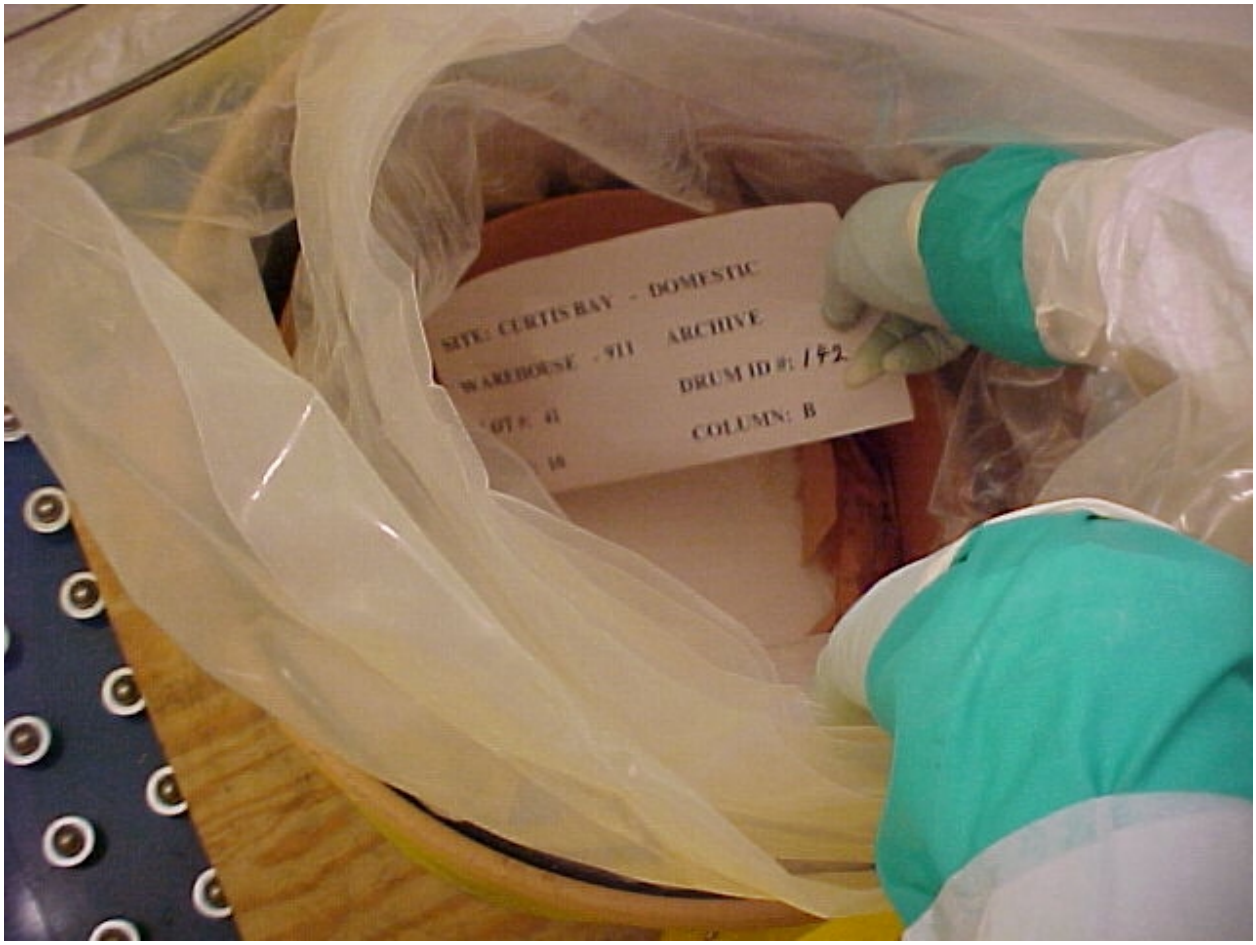
Date	6-27-2002	Time	12:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material prior to coring – gases in headspace above ThN material – NO – 1.3 ppm & NOx – 22.1 ppm
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

Date	6-27-2002	Time	12:30

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

This picture shows the actual sample of the ThN material
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	41	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	B

Inspection/Sample Date & Time

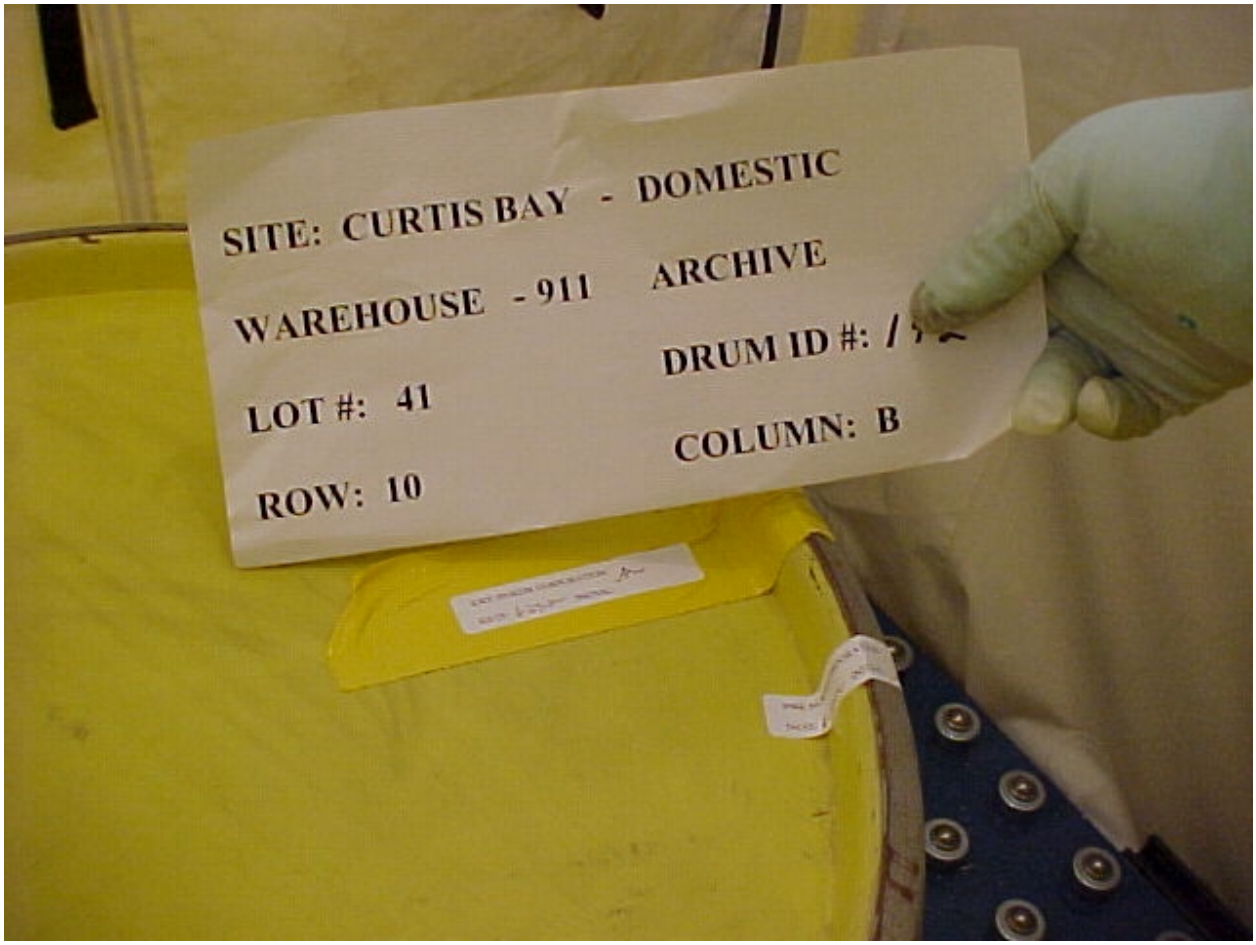
Date	6-27-2002	Time	12:30

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #42 – Drum #154
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 42 Drum ID #: 154 Location: Warehouse 911 – Column A – Row 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 6.9 ppm NOx 31.5 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:00

Other Information

Photo No. 1 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

30-gal drum – good condition
Drum vented gases during removal of bolt ring

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:00

Other Information

Photo No. 2 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

After removal of 30-gal metal lid – the black plastic interior lid (for the drum liner) is visible – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

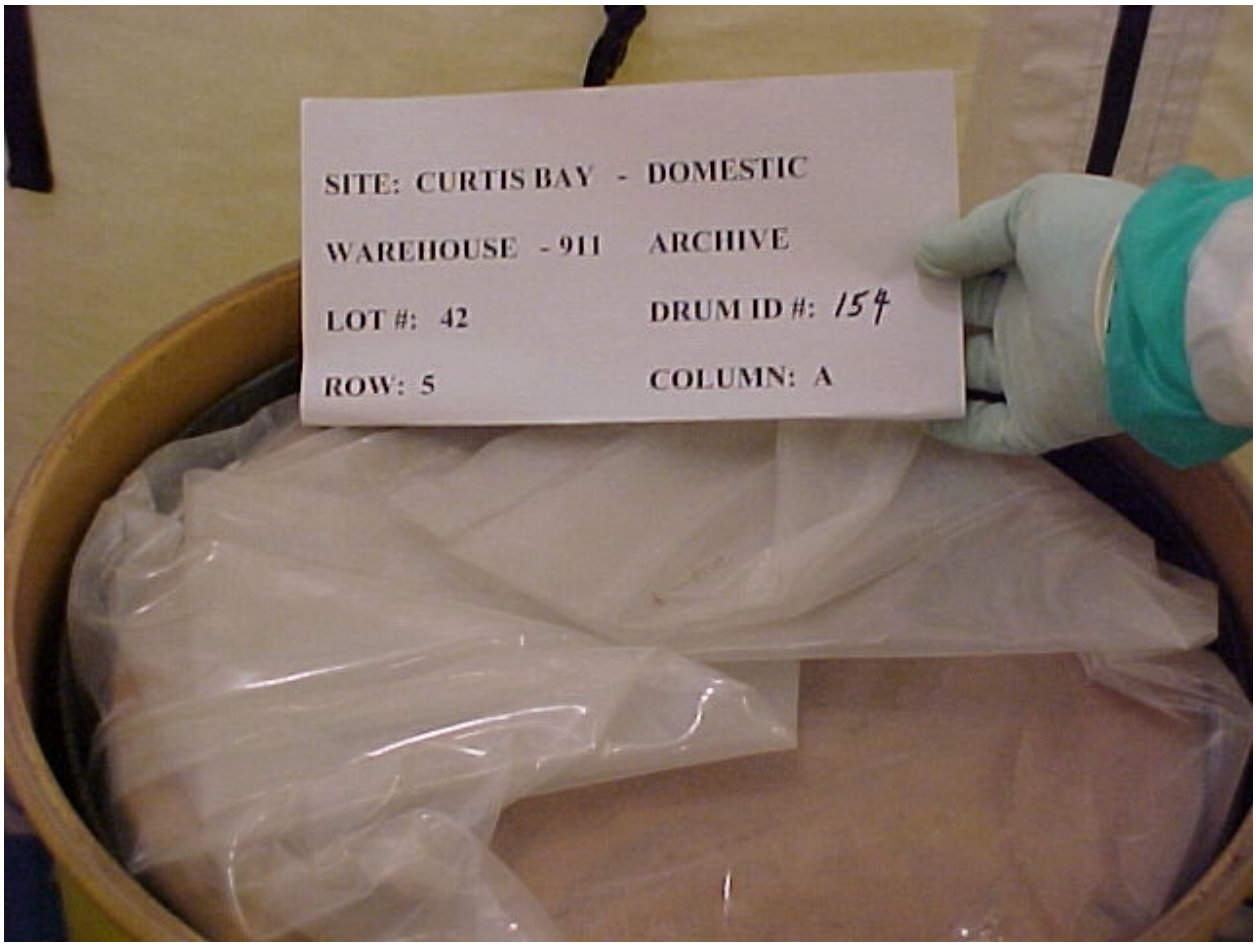
Date	6-28-2002	Time	09:00

Other Information

Photo No. 3 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

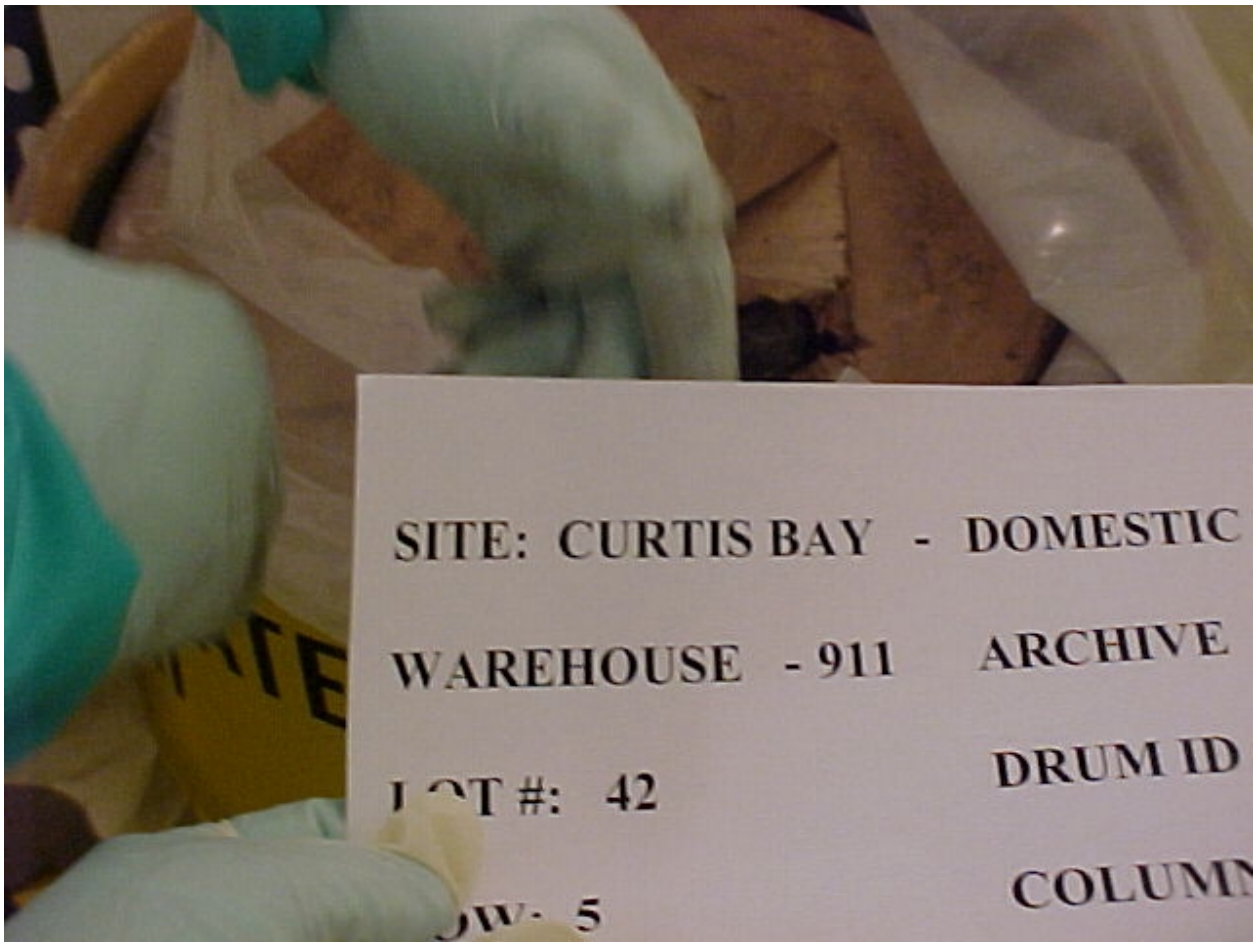
Date	6-28-2002	Time	09:00

Other Information

Photo No. 4 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

The fiber lid (on the outermost fiber drum) is taped to the drum – had to cut the lid in order to access inner packagings and ThN material
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

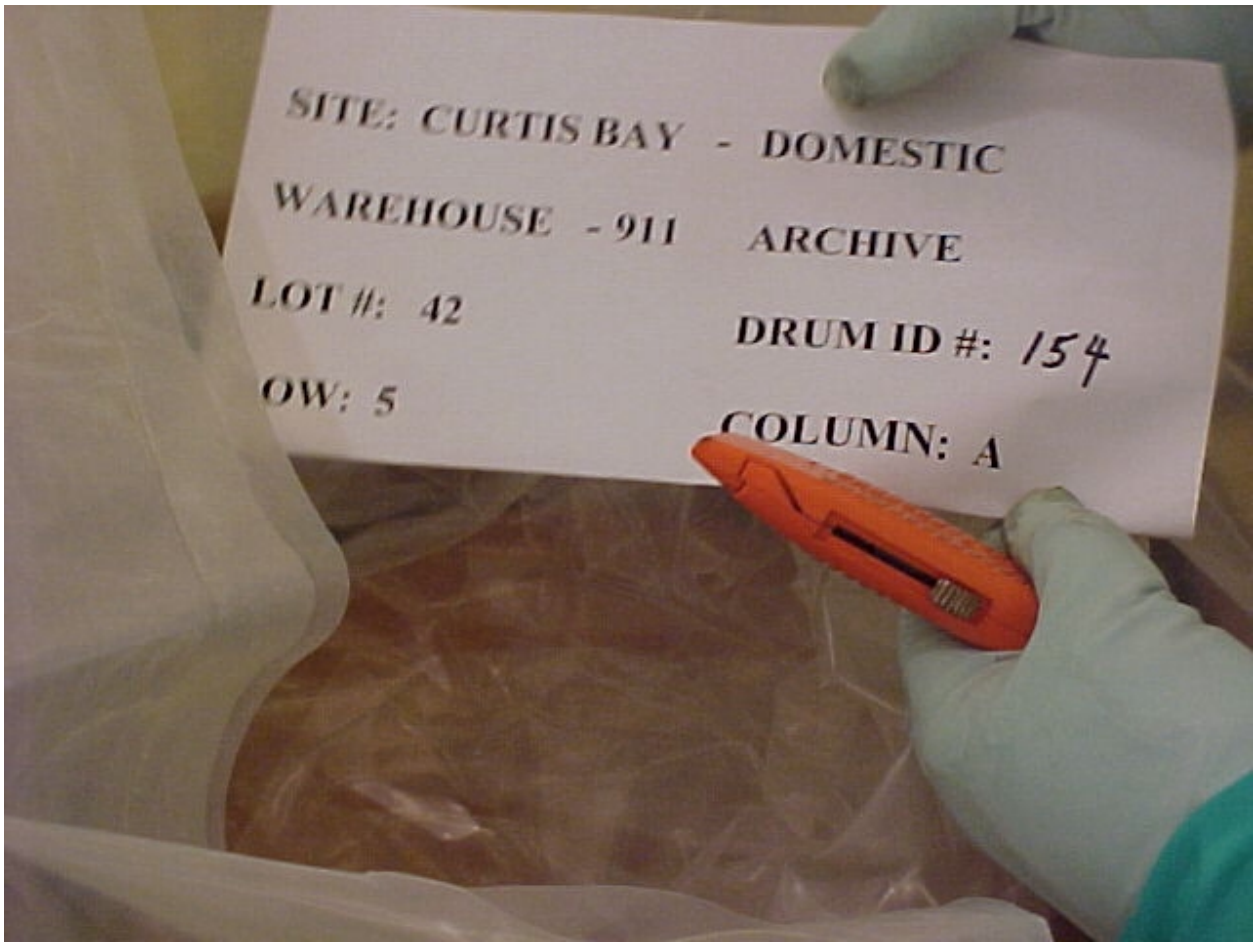
Date	6-28-2002	Time	09:00

Other Information

Photo No. 5 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

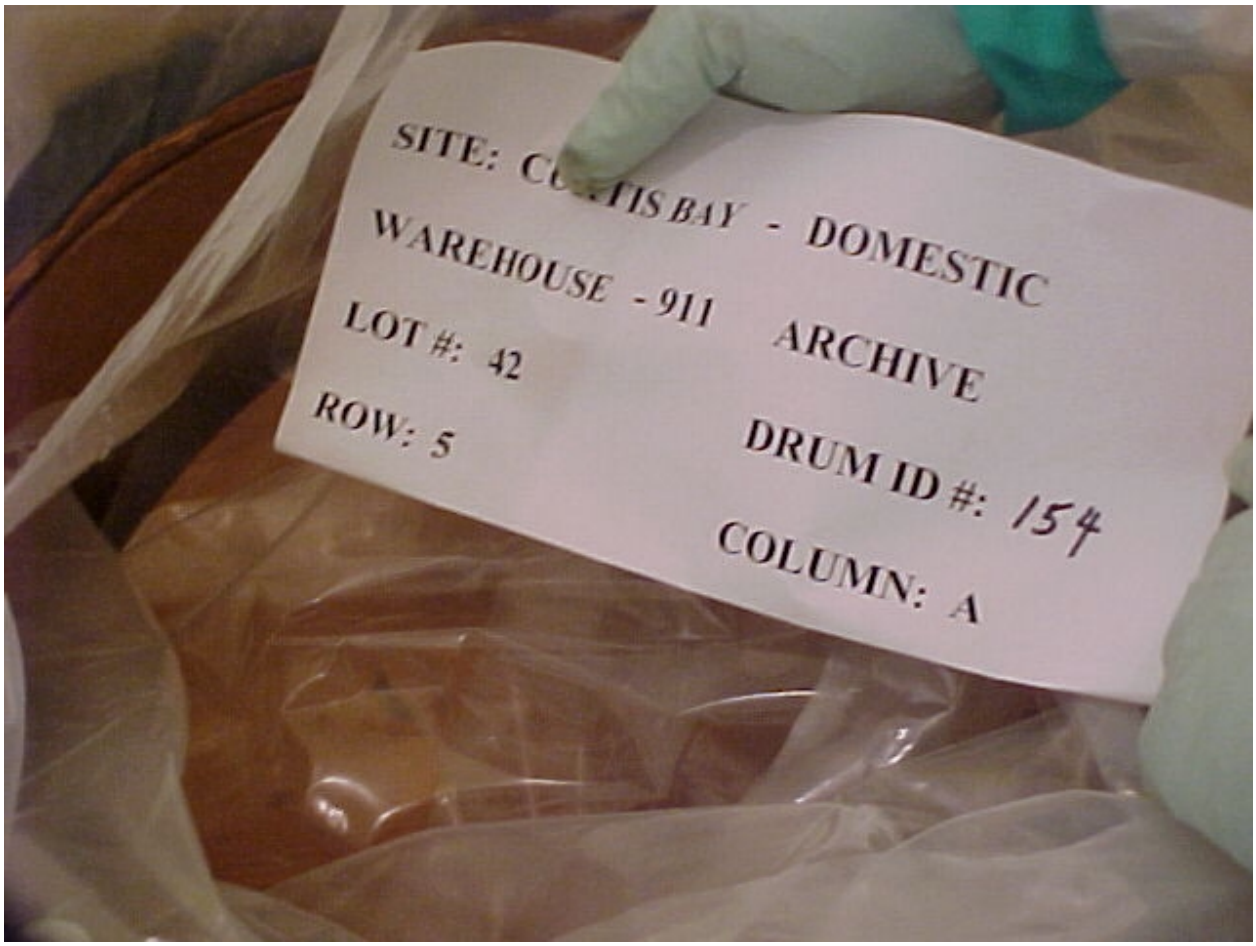
Date	6-28-2002	Time	09:00

Other Information

Photo No. 6 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

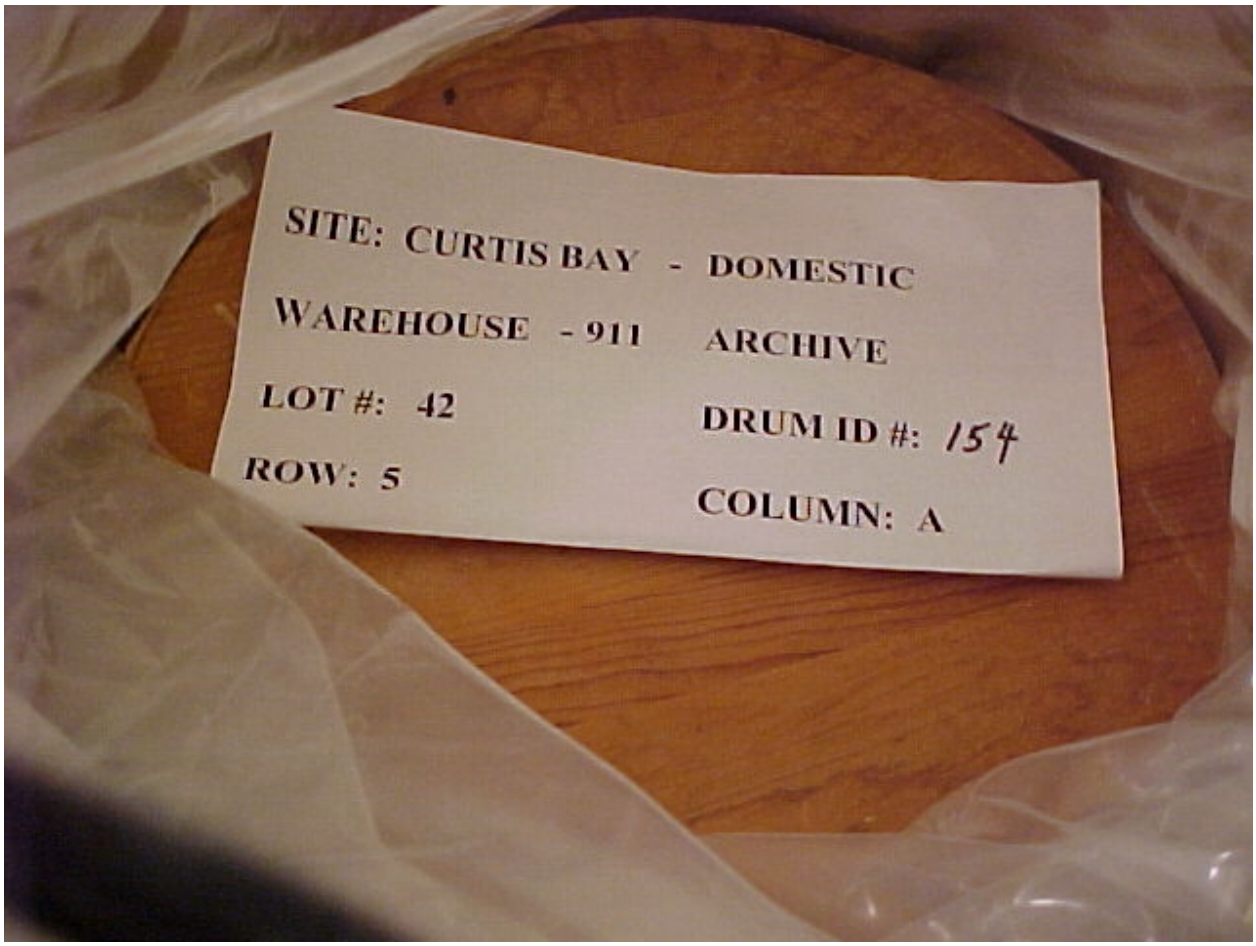
Date	6-28-2002	Time	09:00

Other Information

Photo No. 7 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Wooden lid (on innermost fiber drum) – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:00

Other Information

Photo No. 8 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

A picture of the lab-pack lid after the wooden lid has been removed
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

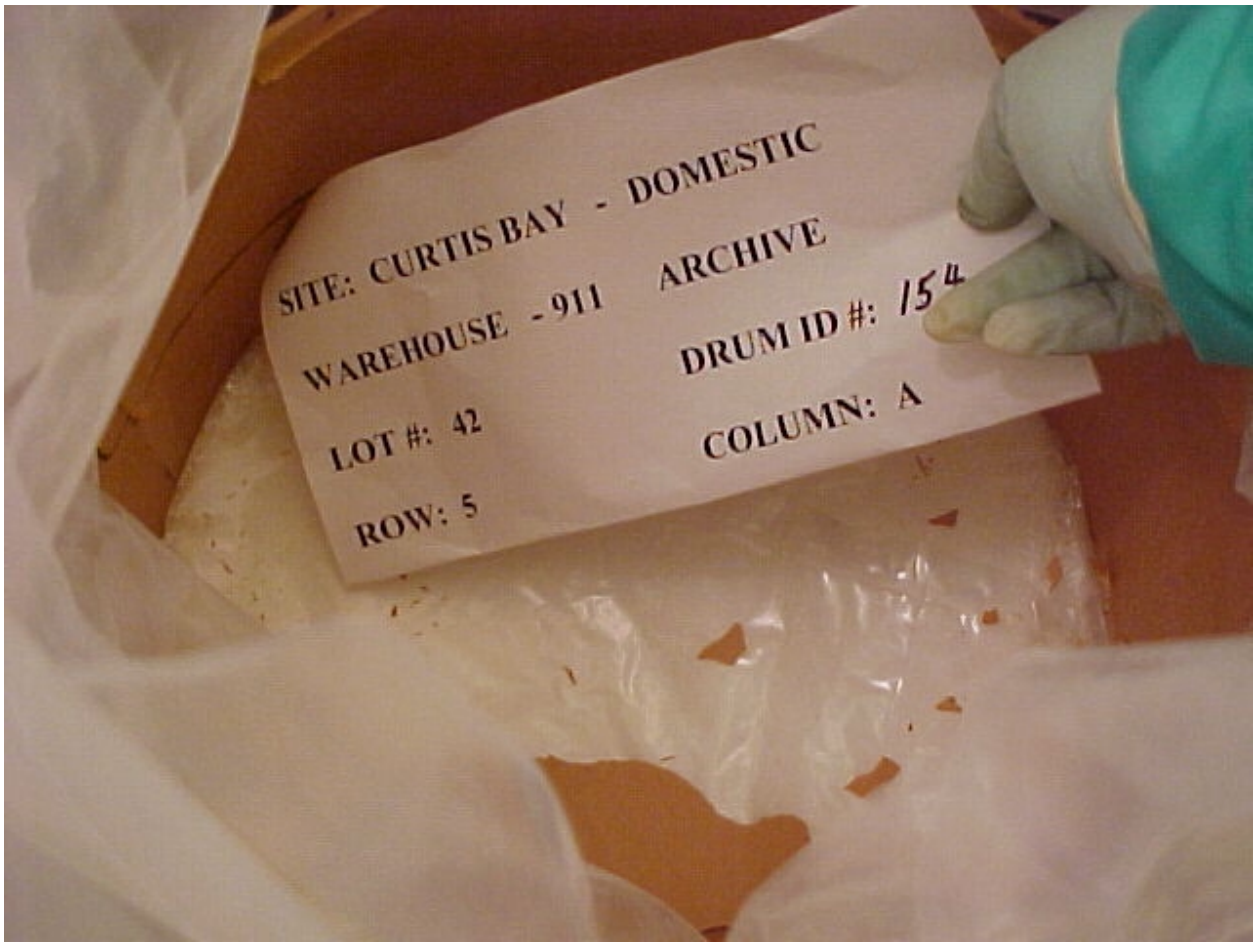
Date	6-28-2002	Time	09:00

Other Information

Photo No. 9 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Final (4th) poly liner/bag (thin film plastic) before accessing the ThN material
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

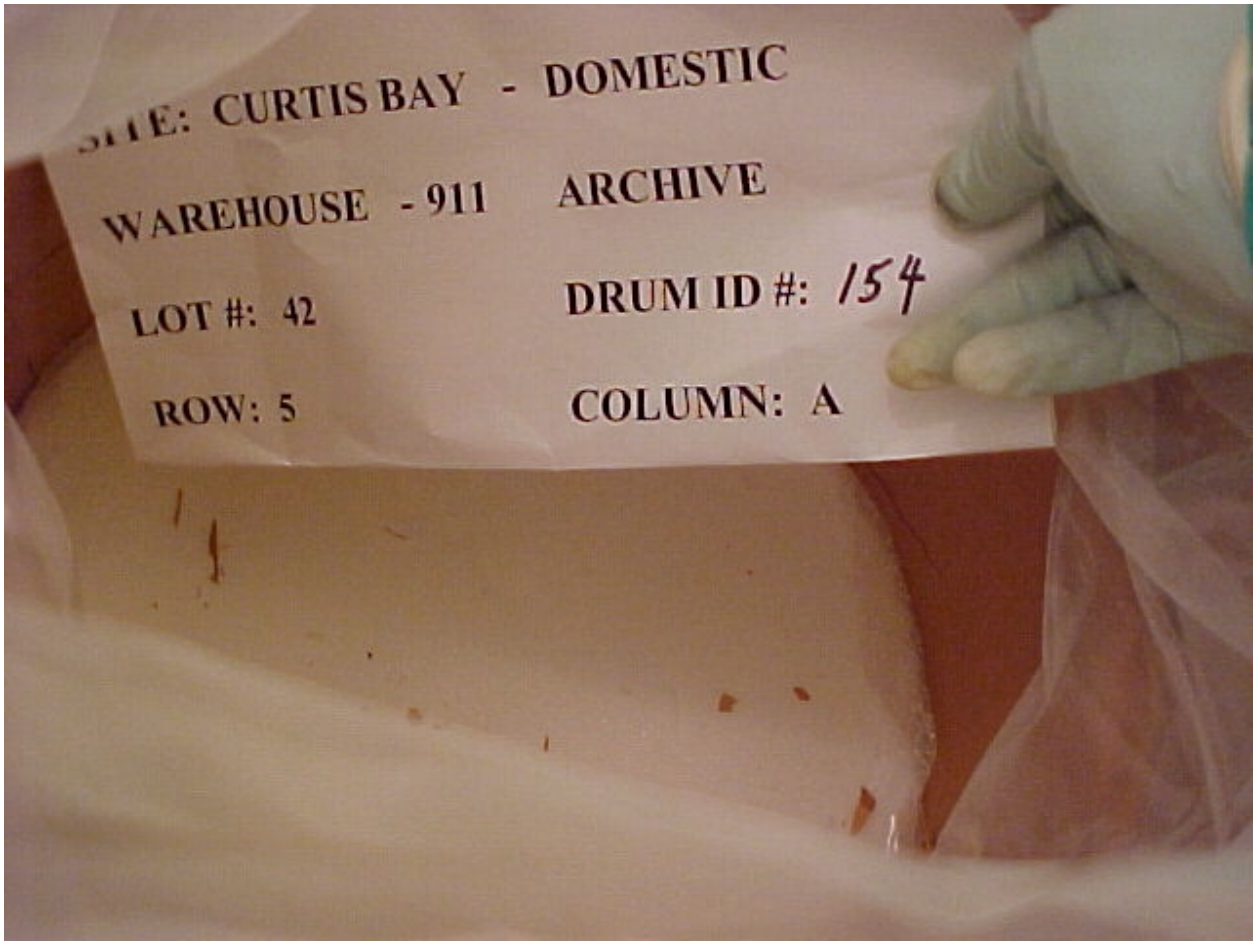
Date	6-28-2002	Time	09:00

Other Information

Photo No. 10 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

ThN material – white – solid – monolith – very dry
Gases present in headspace above ThN material: NO – 6.9 ppm & NOx – 31.5 ppm
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:00

Other Information

Photo No. 11 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Chiseling a sample piece to fit through the mouth of the 2-liter sample bottle
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

Date	6-28-2002	Time	09:00

Other Information

Photo No. 12 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Sampler removing sample from 30-gal container
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	42	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	154	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	5
		Column	A

Inspection/Sample Date & Time

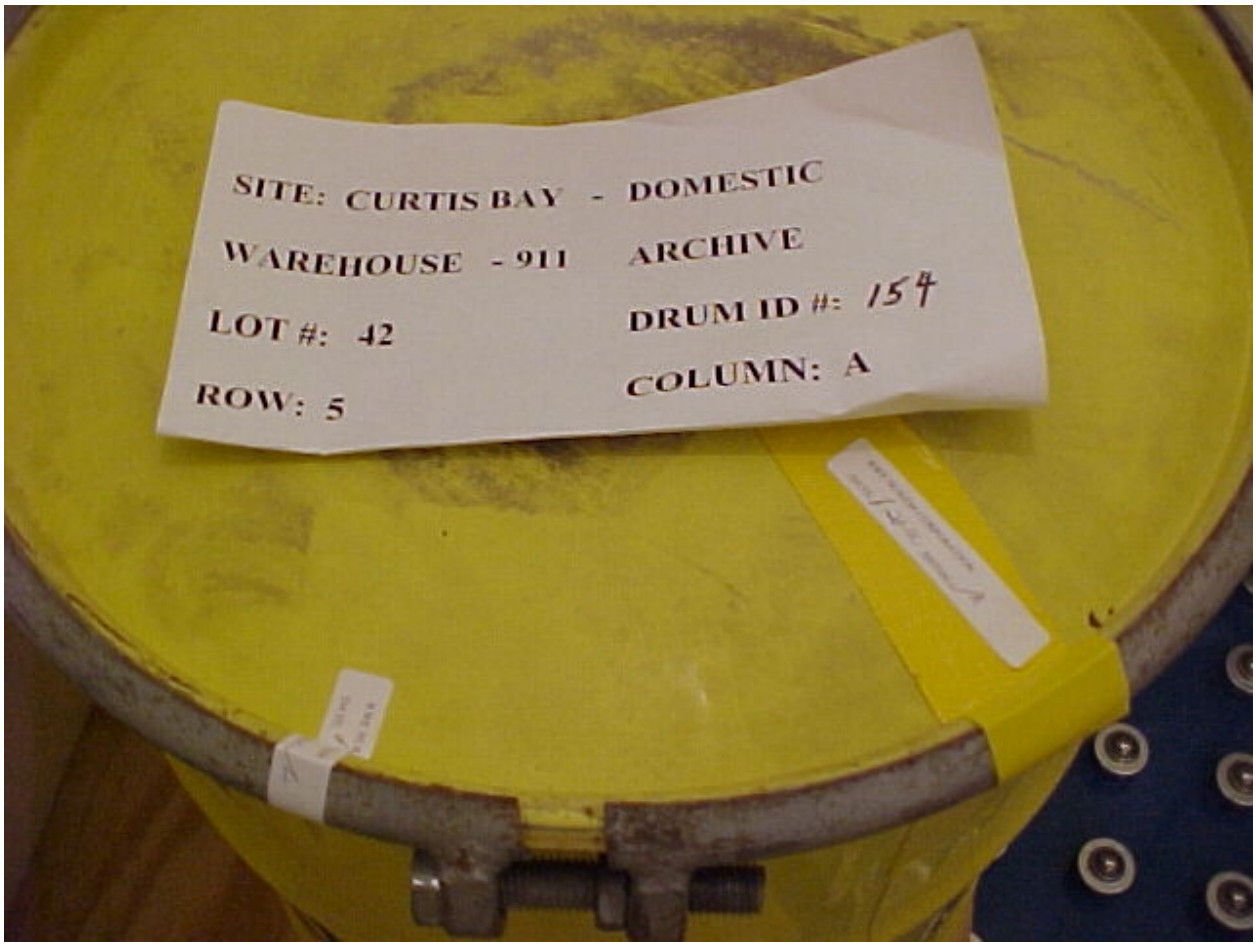
Date	6-28-2002	Time	09:00

Other Information

Photo No. 13 of 13

Dose Rate	Surface	22 mR/hr
	1 meter	3.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #43 – Drum #179
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 43 Drum ID #: 179 Location: Warehouse 911 – Column B – Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.8 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 7.1 ppm NOx 20.9 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:00

Other Information

Photo No. 1 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

30-gal drum – good condition
Drum vented gas as bolt on drum ring was loosened for removal.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:00

Other Information

Photo No. 2 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

Black plastic lid (on drum liner) – good condition – raised condition indicates gas pressure buildup in internal packaging materials in this drum
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

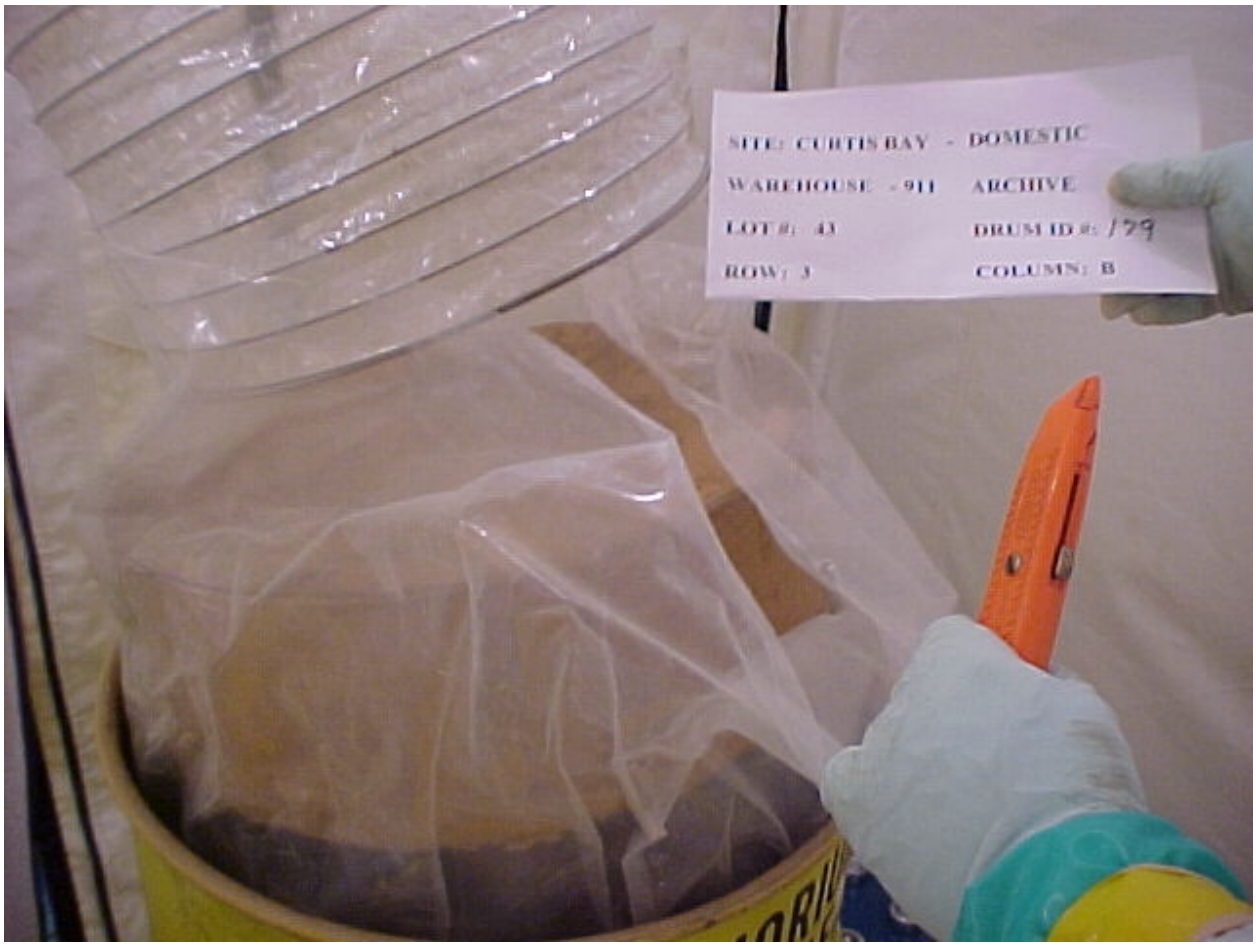
Date	6-28-2002	Time	11:00

Other Information

Photo No. 3 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

While making a cut in 3rd poly liner/bag –pressure is released
Prior to accessing the 3rd poly bag, opened the first poly liner/bag, then removed the fiber drum lid from outermost fiber drum inside of this package and removed the 2nd poly liner/bag
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:00

Other Information

Photo No. 4 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

Picture shows wooden lid on inner fiber drum – in most cases, was able to pry this wood lid open with flat head screwdriver
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:00

Other Information

Photo No. 5 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

HEPA exhaust duct positioned inside of poly bags removing gases inside of container headspace
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:00

Other Information

Photo No. 6 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

The thin paper layer/lid on the inner lab-pack after the wooden lid has been removed
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:00

Other Information

Photo No. 7 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

Last (4th poly liner/bag) before ThN material
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

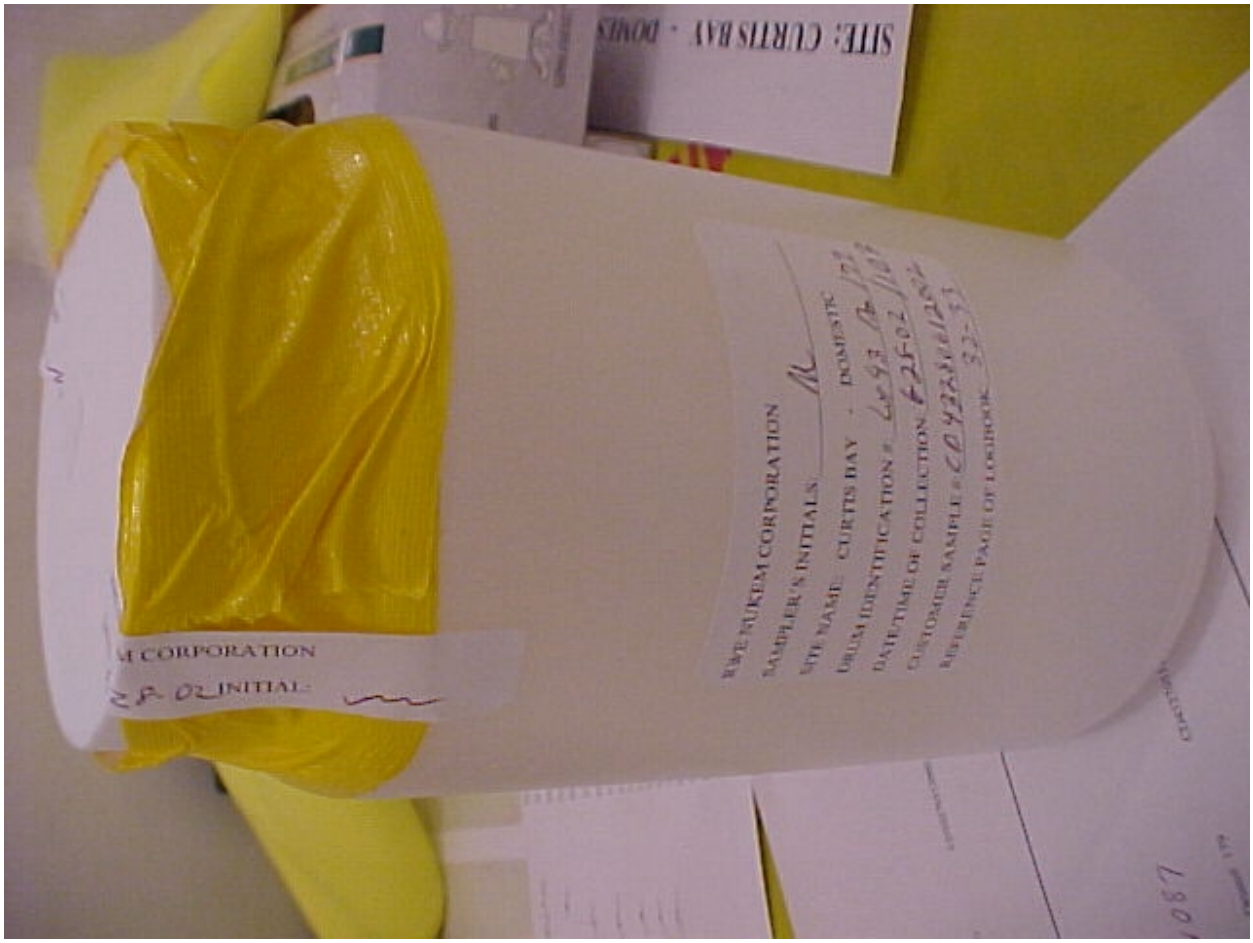
Date	6-28-2002	Time	11:00

Other Information

Photo No. 8 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

Picture shows sample inside the 2-liter sample bottle (being readied for on-site storage)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	43	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	179	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	B

Inspection/Sample Date & Time

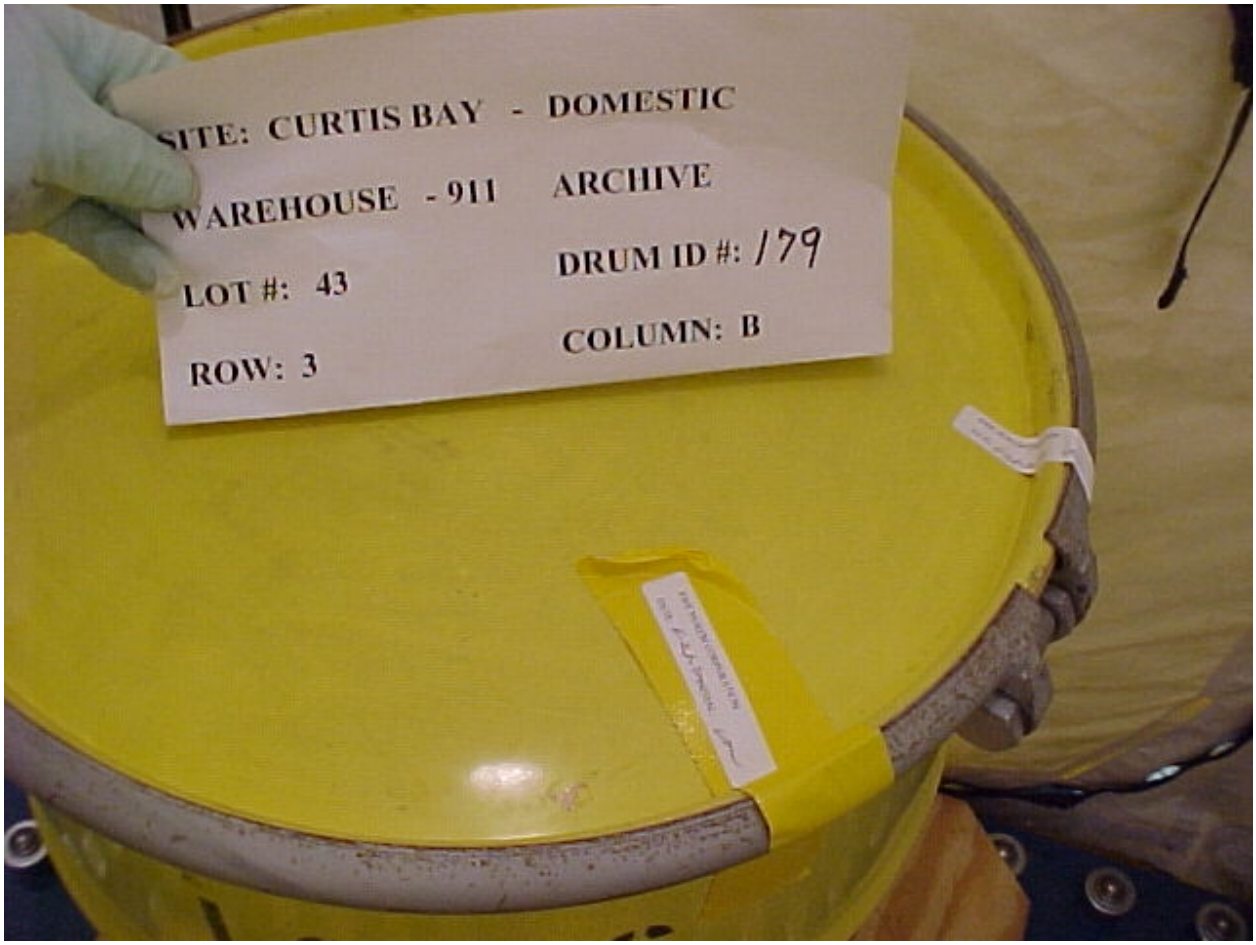
Date	6-28-2002	Time	11:00

Other Information

Photo No. 9 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	2.8 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #50 – Drum #3
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 50 Drum ID #: 3 Location: Warehouse 911 – Column B – Row 1

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

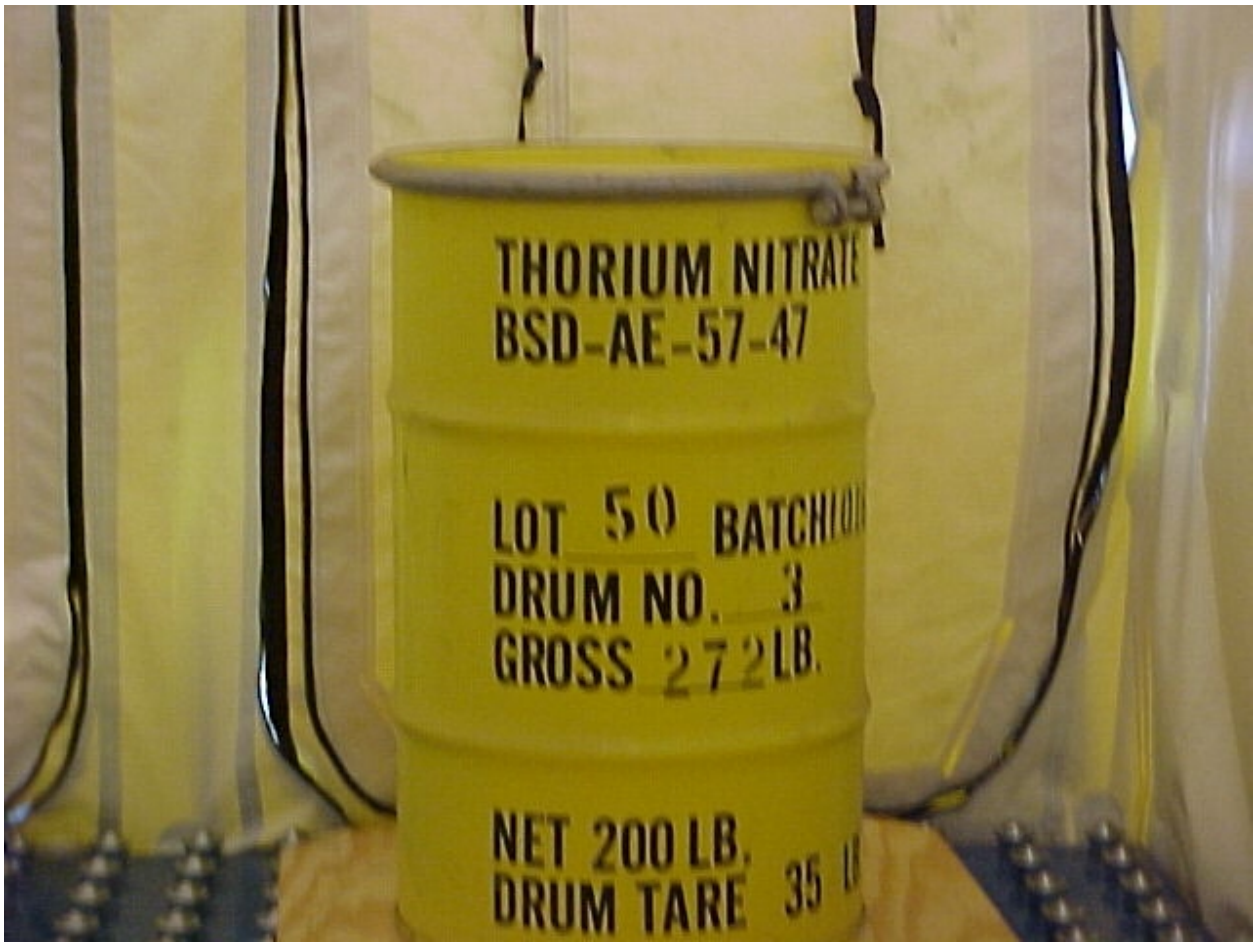
Date	6-28-2002	Time	11:15

Other Information

Photo No. 1 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

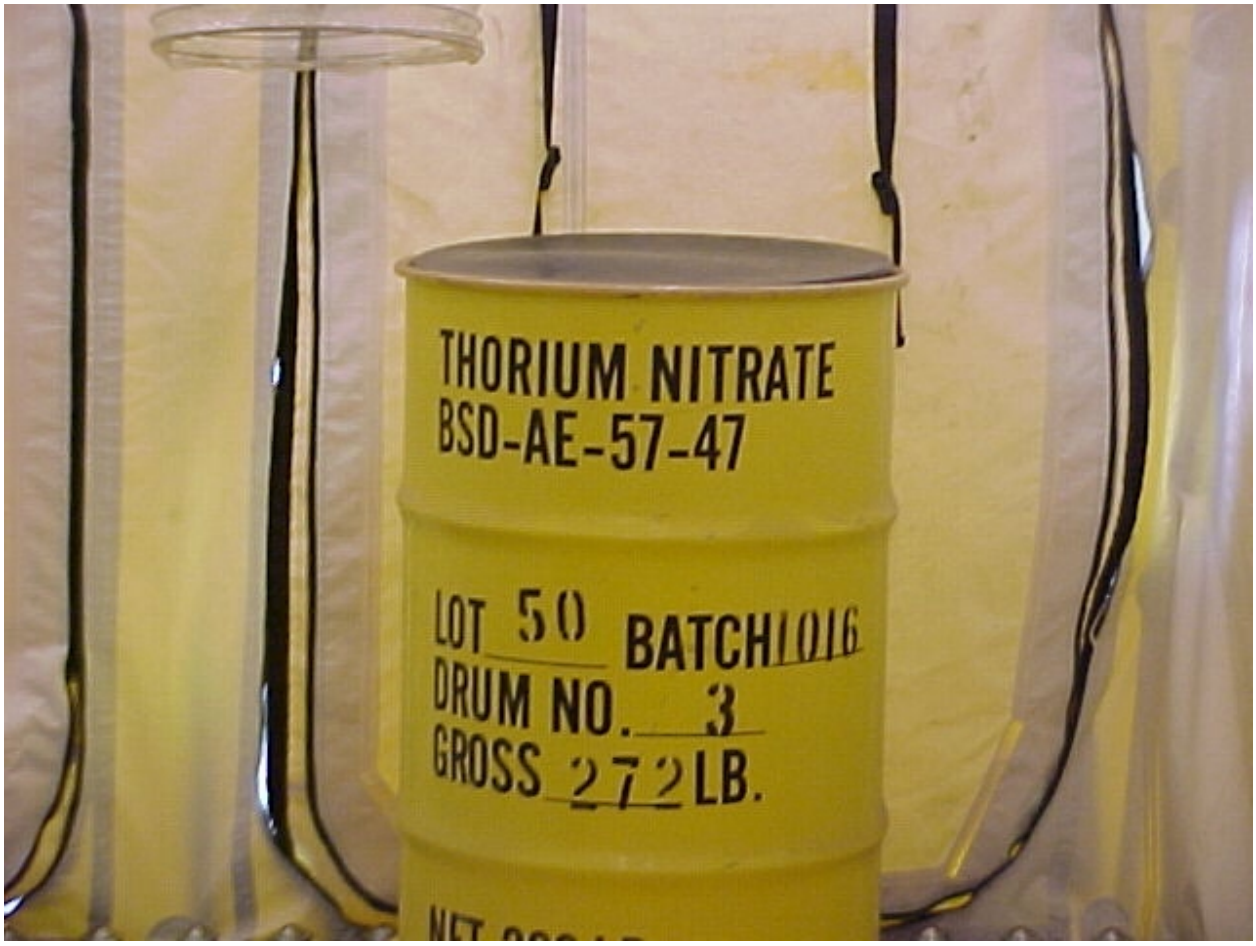
Date	6-28-2002	Time	11:15

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Another picture of the 30-gal drum – picture shows black plastic lid (from inner drum liner) visible following outer metal lid removal



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

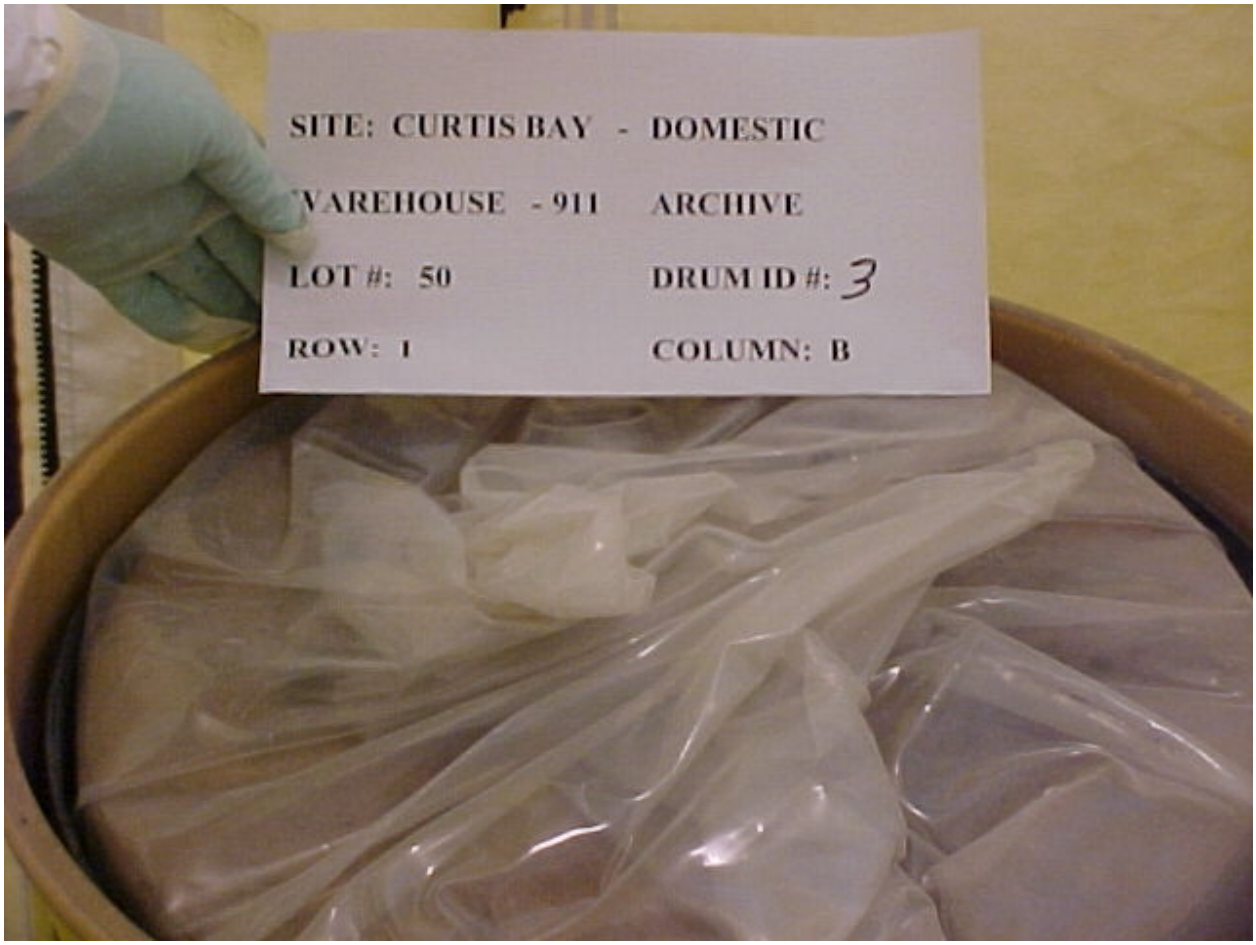
Date	6-28-2002	Time	11:15

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

1st poly liner/bag – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

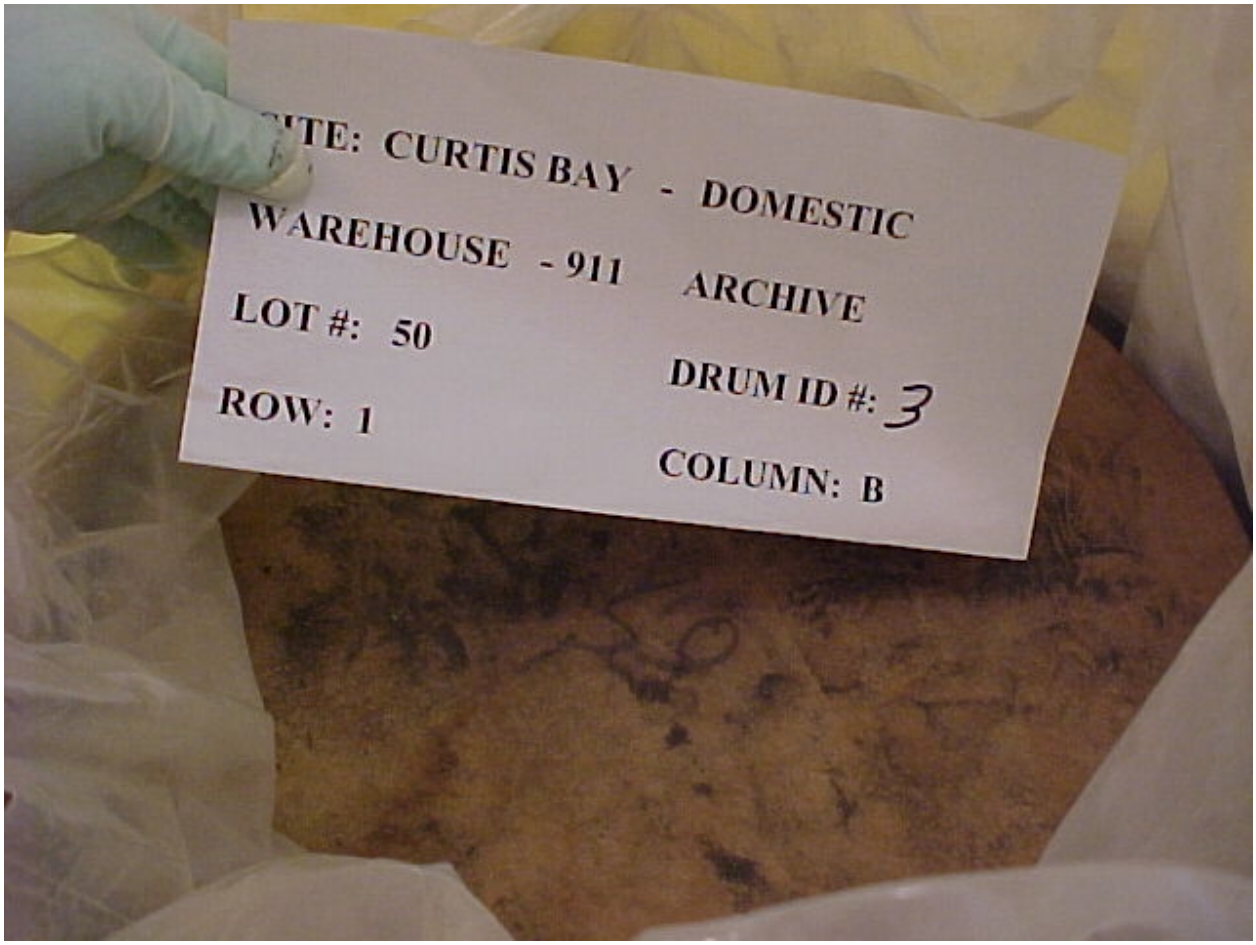
Date	6-28-2002	Time	11:15

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

The cardboard/fiber drum lid – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

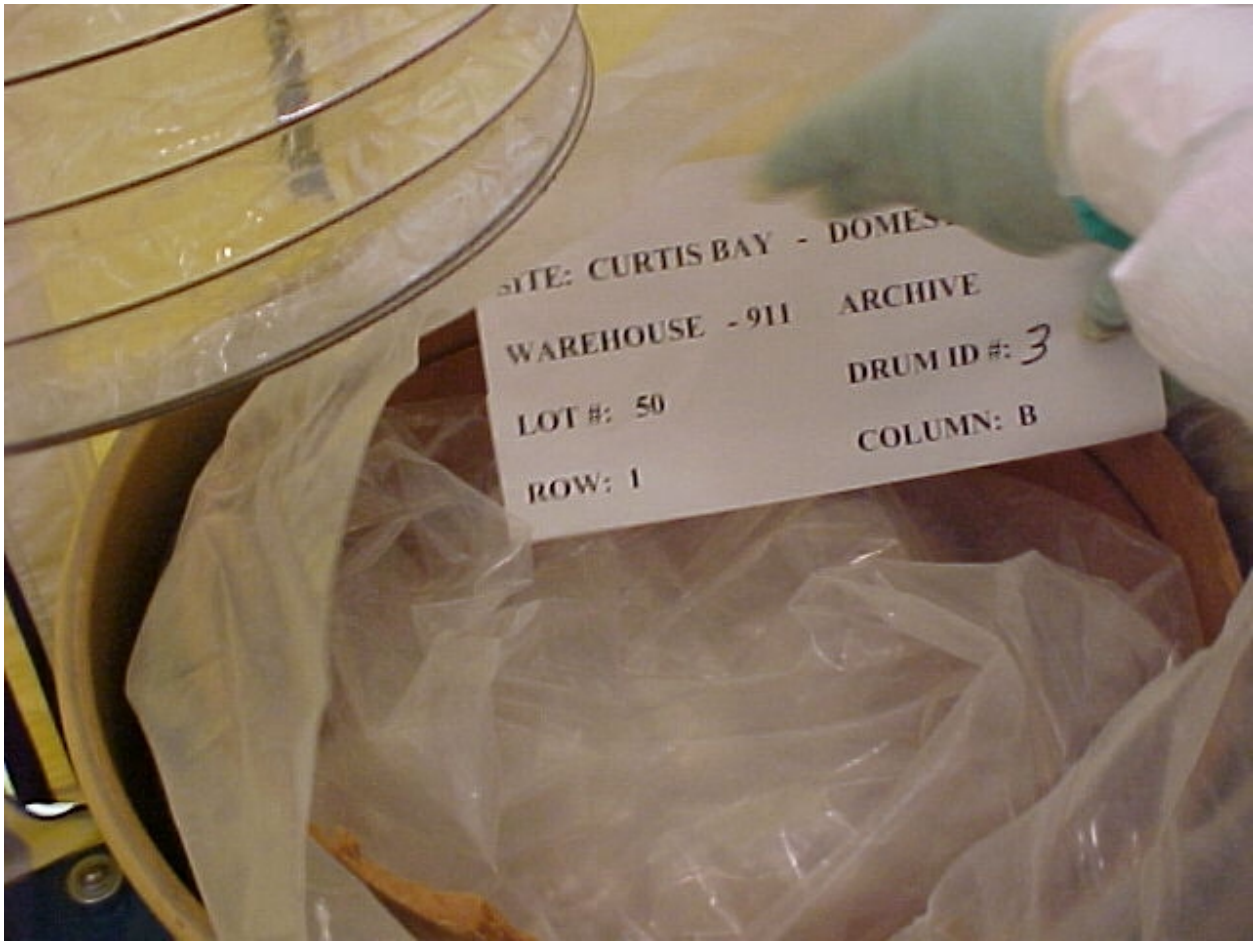
Date	6-28-2002	Time	11:15

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

2nd poly liner/bag – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:15

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

3rd poly liner/bag – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:15

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Wooden lid (mounted on interior fiber drum) – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:15

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

4th (final) poly liner/bag – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

Date	6-28-2002	Time	11:15

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

ThN material – white – solid – monolith – very dry
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	50	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	1
		Column	B

Inspection/Sample Date & Time

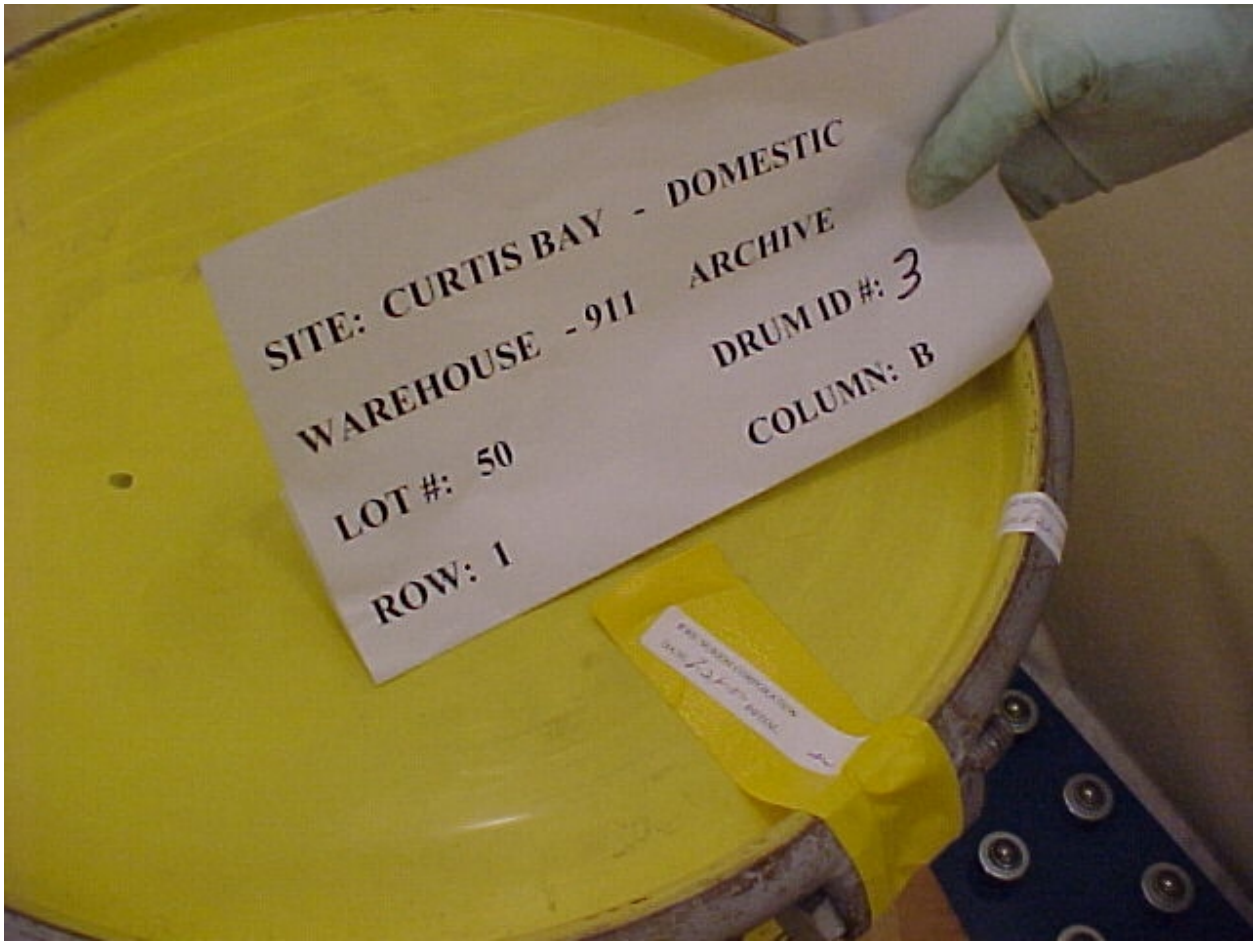
Date	6-28-2002	Time	11:15

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #51 – Drum #155
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 51 Drum ID #: 155 Location: Warehouse 911 – Column C – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

30-gal drum – good condition
Drum vented gas during removal of drum ring

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Picture shows black plastic lid of drum liner – good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

1st poly liner/bag – good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

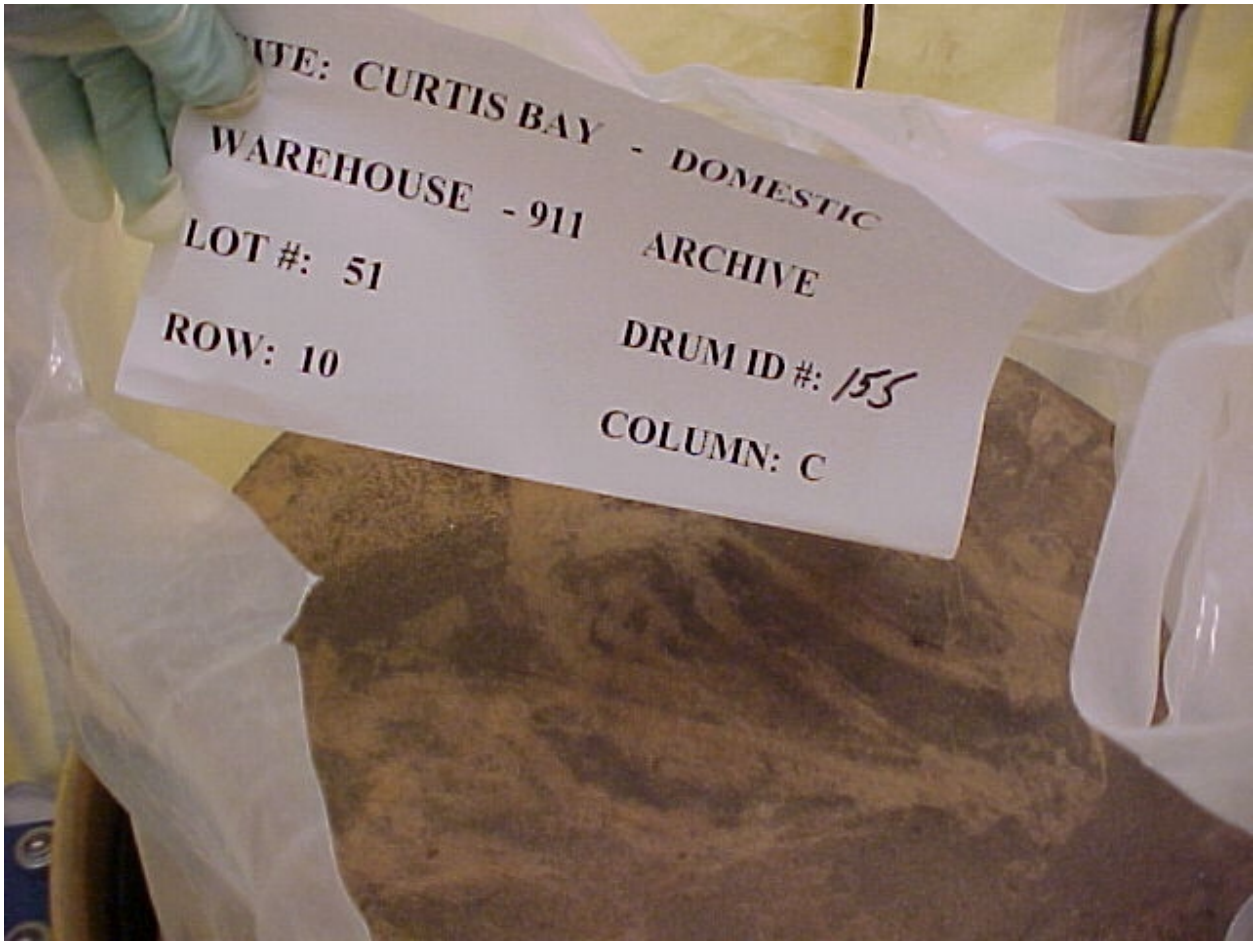
Date	6-28-2002	Time	14:40

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

After opening the 1st poly liner/bag, the next package object is the cardboard/fiber lid of the outermost fiber drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

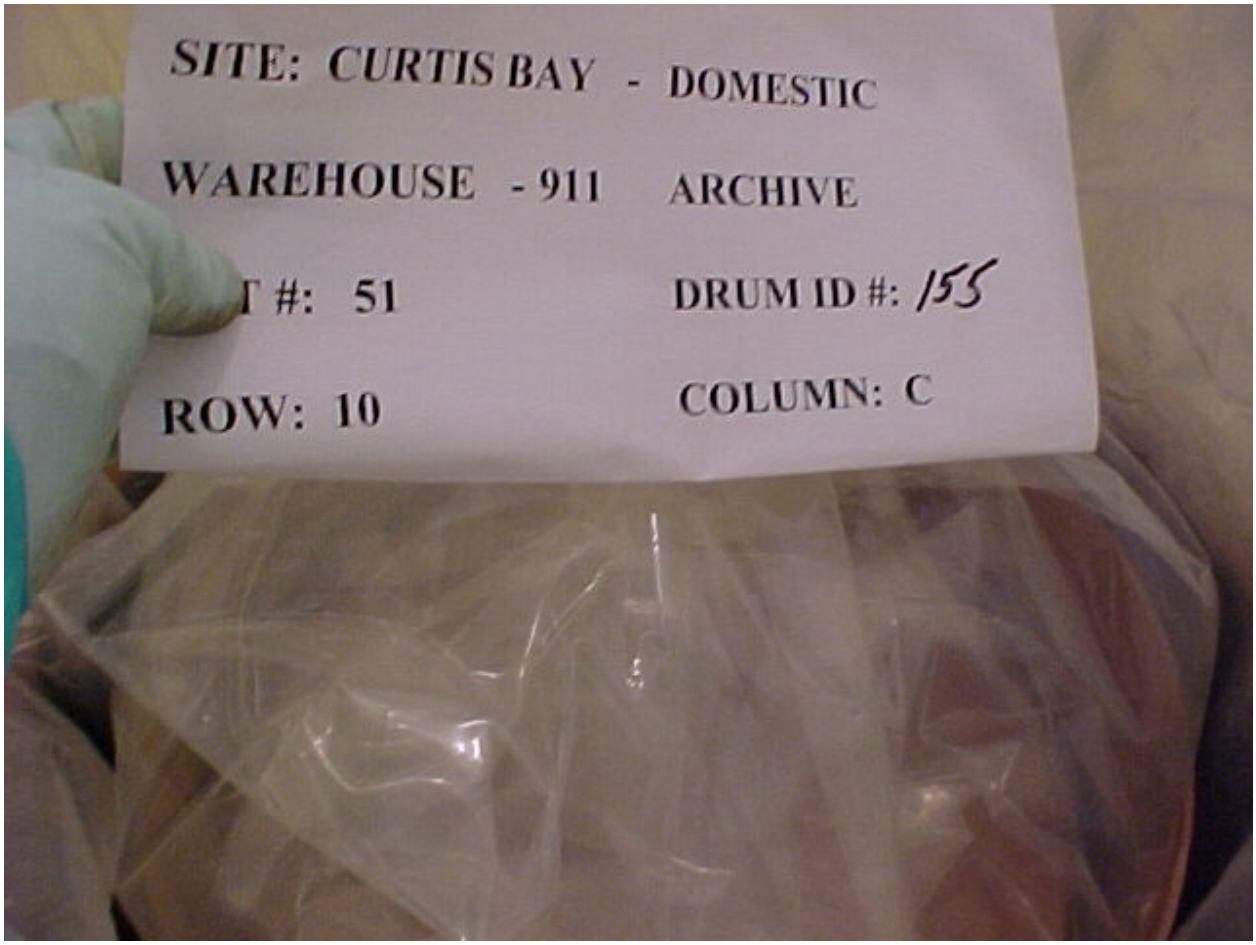
Date	6-28-2002	Time	14:40

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

This picture shows the wooden lid covering the final fiber drum, 4th poly liner/bag & ThN material
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

The lab-pack (inner fiber drum) lid was in good condition until the wooden lid mounted to the drum is removed.
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Final (4th) poly liner/bag – good condition
ThN material is solid & dry
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:40

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Thorium nitrate material – solid - dry
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	51	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	155	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	C

Inspection/Sample Date & Time

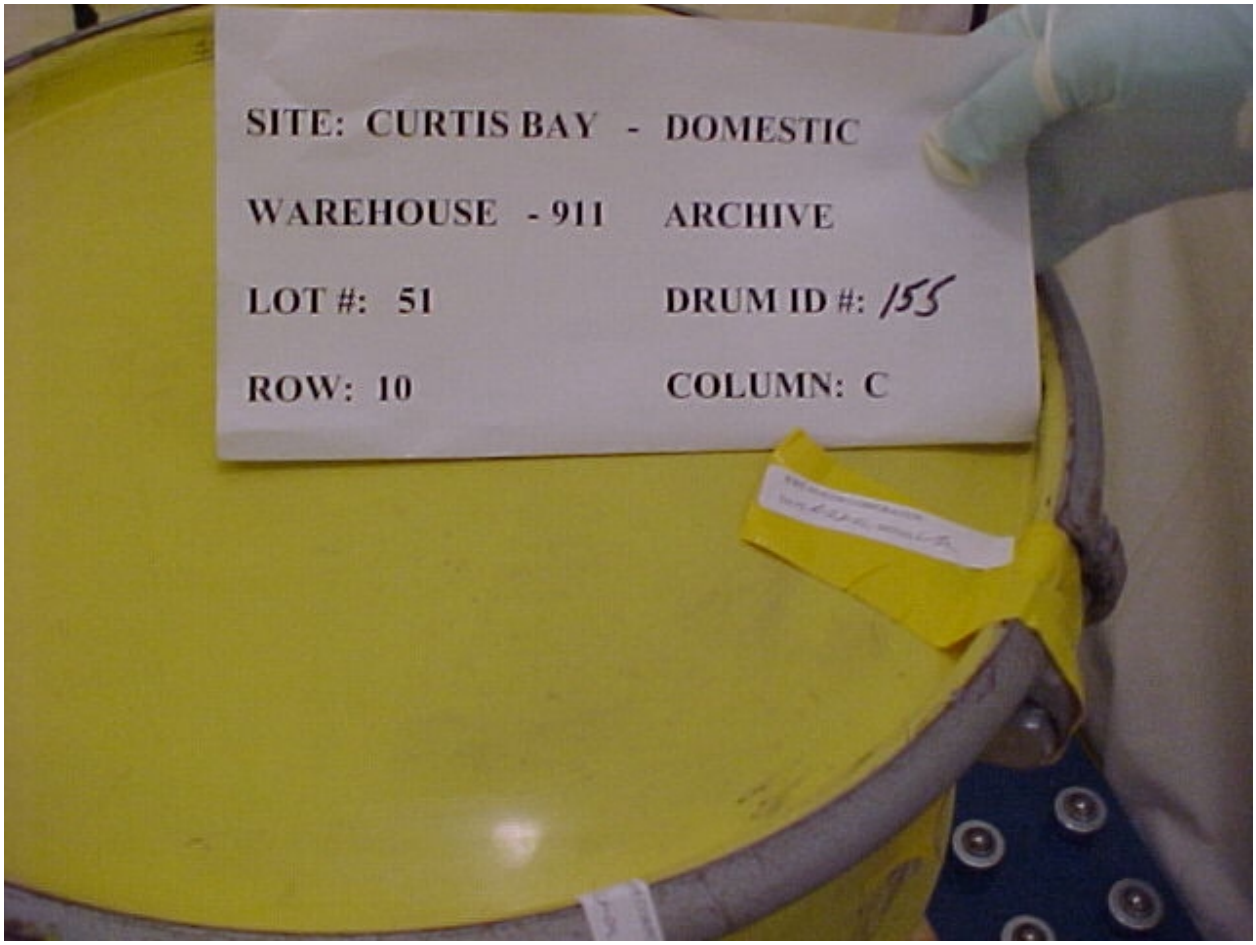
Date	6-28-2002	Time	14:40

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #56 – Drum #48
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 56 Drum ID #: 48 Location: Warehouse 911 – Column C – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 26 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:45

Other Information

Photo No. 1 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

30-gal container – good condition

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

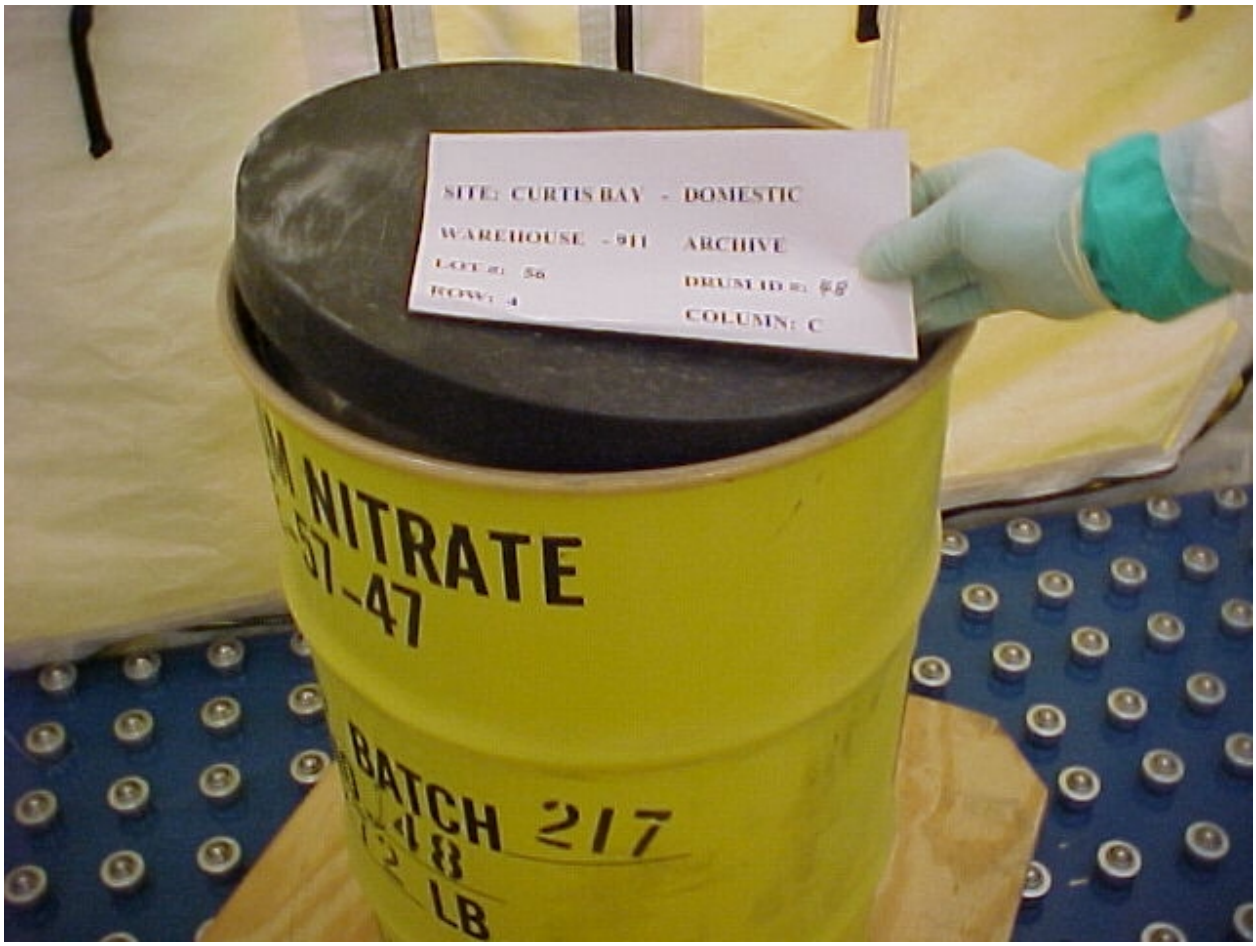
Date	7-1-2002	Time	10:45

Other Information

Photo No. 2 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

This picture shows the first lid in good condition (black plastic lid from drum liner)
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

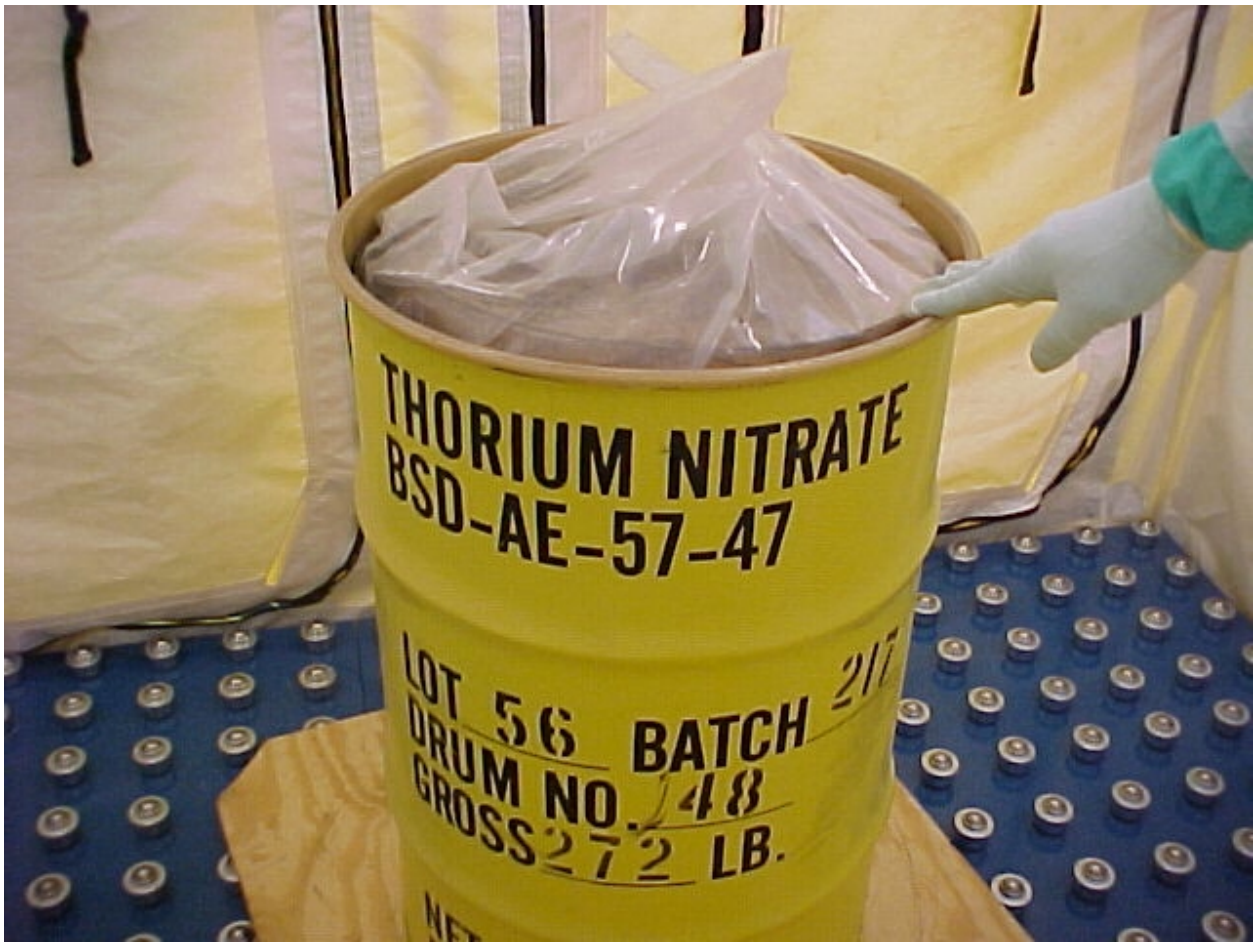
Date	7-1-2002	Time	10:45

Other Information

Photo No. 3 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

1st poly liner/bag – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:45

Other Information

Photo No. 4 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

Fiber lid from outermost fiber drum – raised from pressure in the drum
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

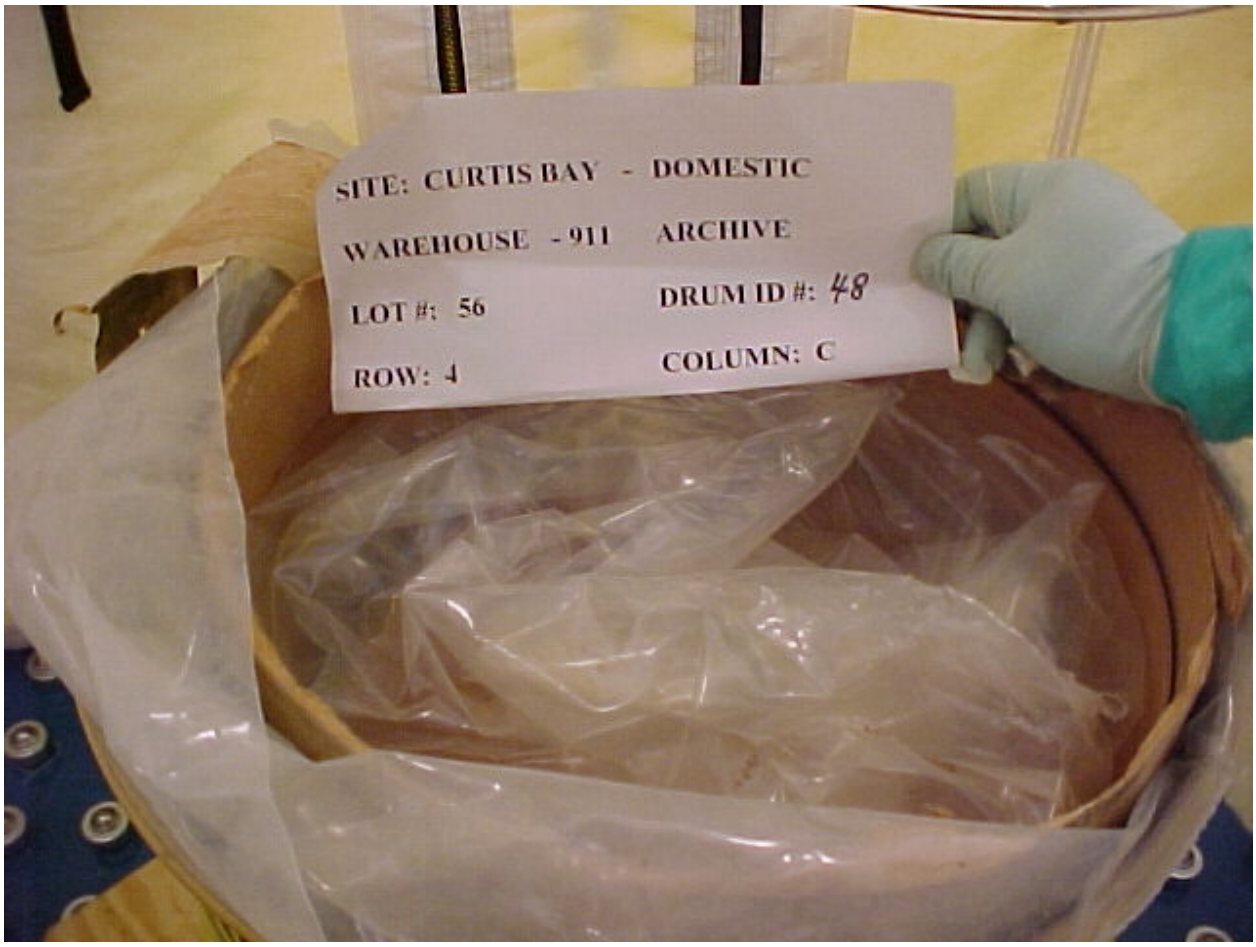
Date	7-1-2002	Time	10:45

Other Information

Photo No. 5 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

After removing the fiber lid – you see the 2nd poly liner/bag in good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

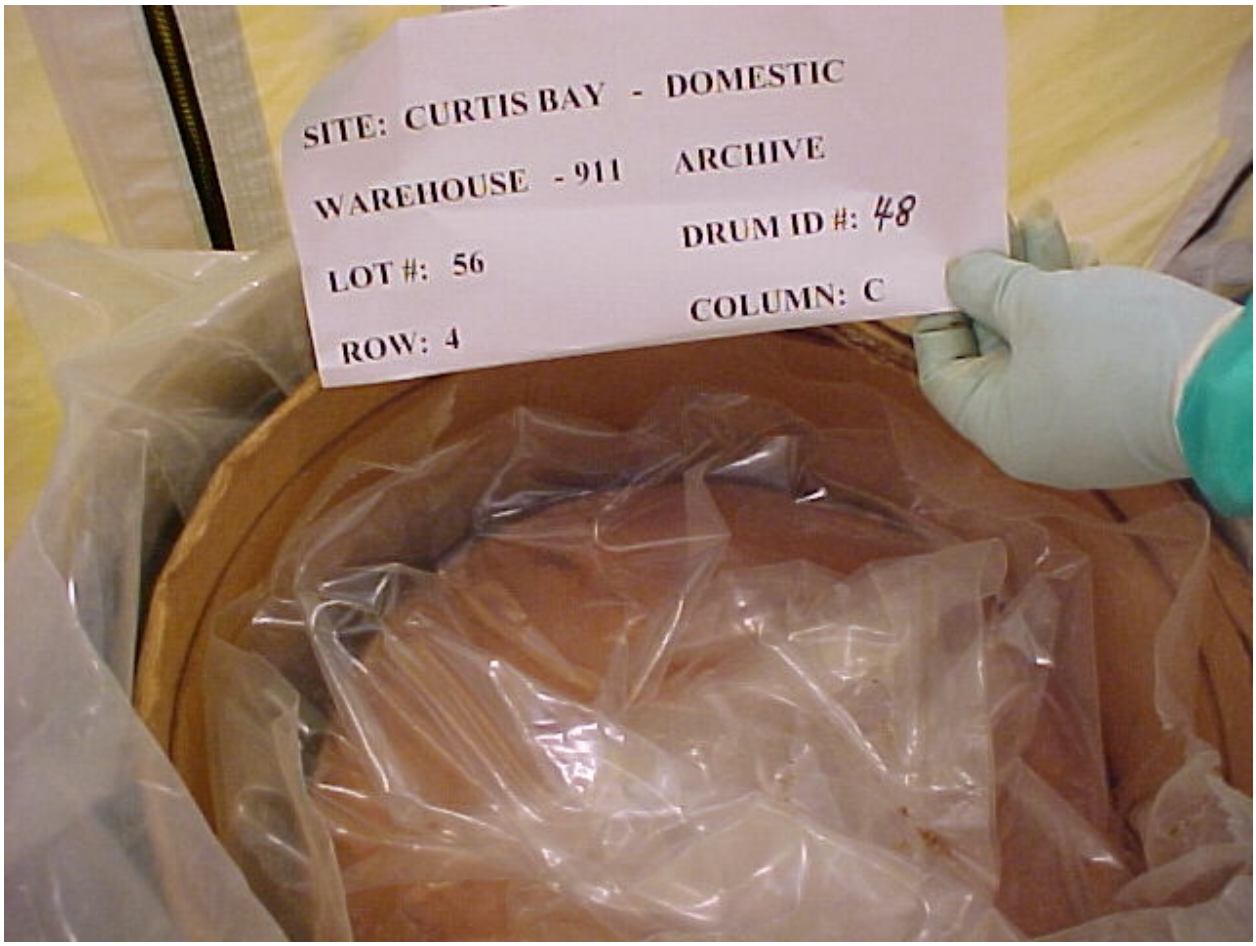
Date	7-1-2002	Time	10:45

Other Information

Photo No. 6 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

3rd poly liner/bag – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

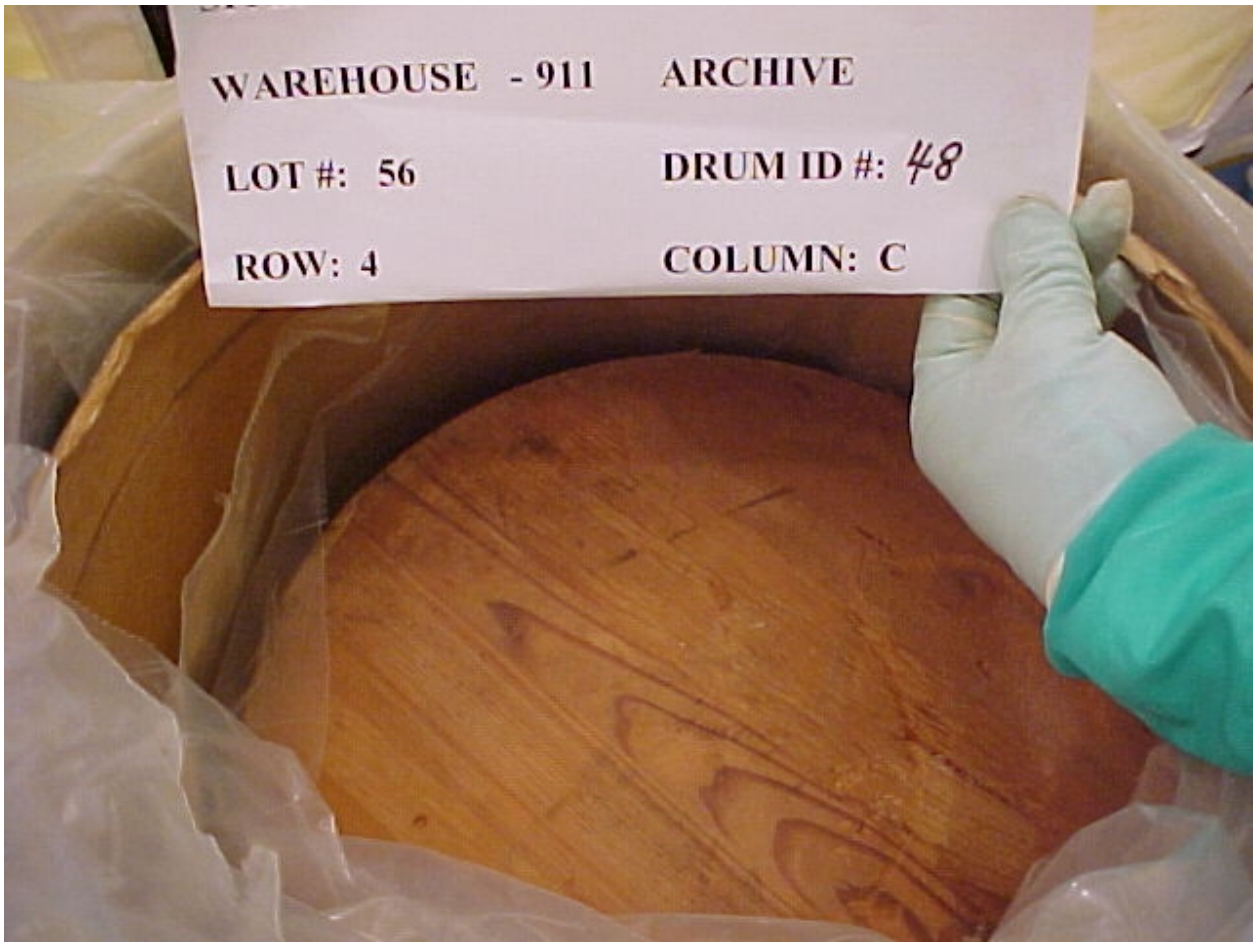
Date	7-1-2002	Time	10:45

Other Information

Photo No. 7 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

Wooden lid (mounted to interior fiber/lab-pack drum) – good condition (lid protects ThN material)
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:45

Other Information

Photo No. 8 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

Picture shows paper layer covering inner fiber/lab-pack drum broken – paper layer is attached to wooden lid
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:45

Other Information

Photo No. 9 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

4th (final) poly liner/bag (thin film plastic) – good condition (picture shows ThN material following the removal of this liner/bag)
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-1-2002	Time	10:45

Other Information

Photo No. 10 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

Picture shows method utilized to break up ThN material into “chunks” that were placed in 2-liter sample containers
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	56	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	48	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	C

Inspection/Sample Date & Time

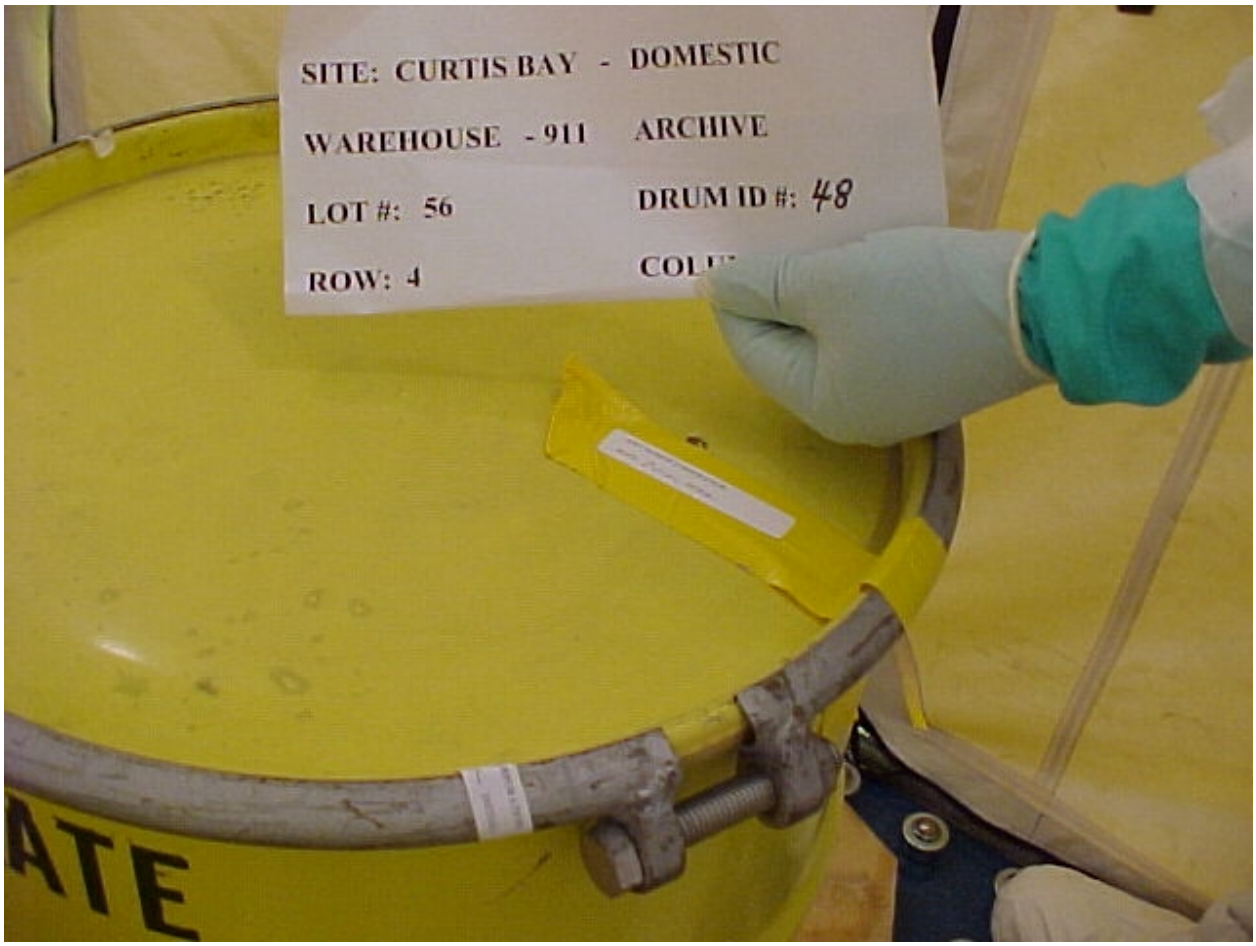
Date	7-1-2002	Time	10:45

Other Information

Photo No. 11 of 11

Dose Rate	Surface	26 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #60 – Drum #285
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 60 Drum ID #: 285 Location: Warehouse 911 – Column A – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 20 mR/hr DR at 1 meter 2.8 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 8.7 ppm NOx 37.2 ppm

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-27-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

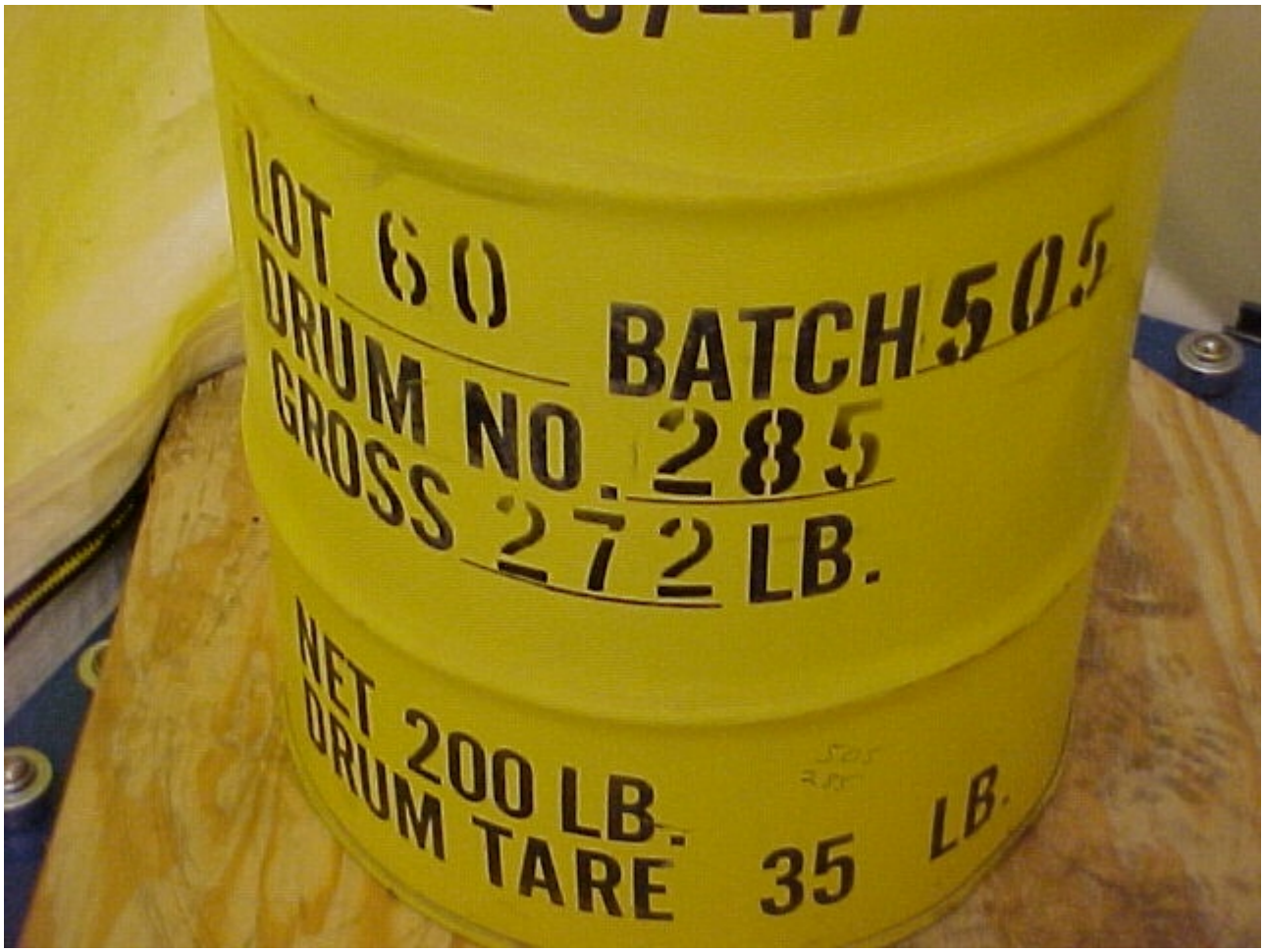
Date	6-27-2002	Time	11:00

Other Information

Photo No. 1 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

30-gal drum – good condition
Gases vented from container when and during drum ring removal



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	11:00

Other Information

Photo No. 2 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Open 30-gal drum – Black plastic drum lid (for drum liner) is visible – good condition
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	11:00

Other Information

Photo No. 3 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

1st poly liner/bag – good condition (opening bag with utility knife)
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

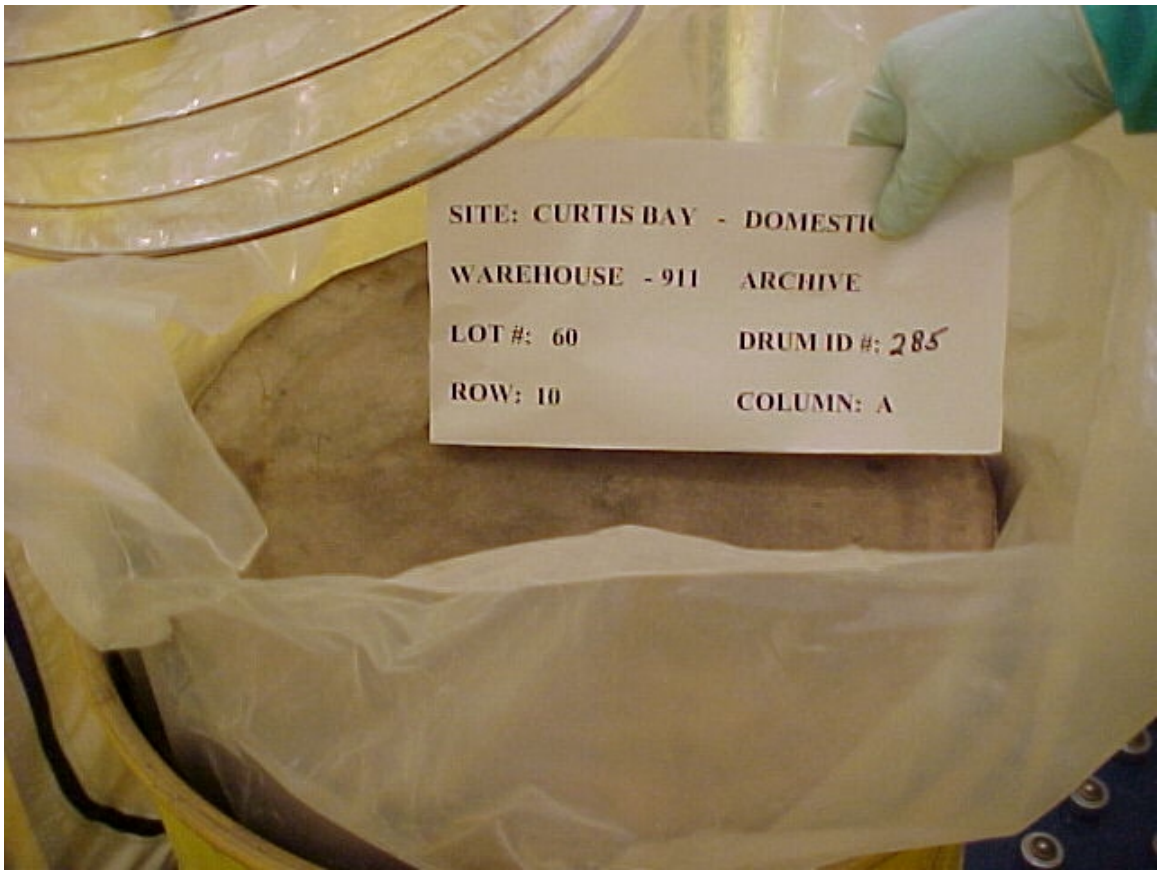
Date	6-27-2002	Time	11:00

Other Information

Photo No. 4 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Picture shows the fiber drum lid (on outermost fiber drum) – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	11:00

Other Information

Photo No. 5 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Fiber drum lid – Lid had to be cut off to complete lid removal
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

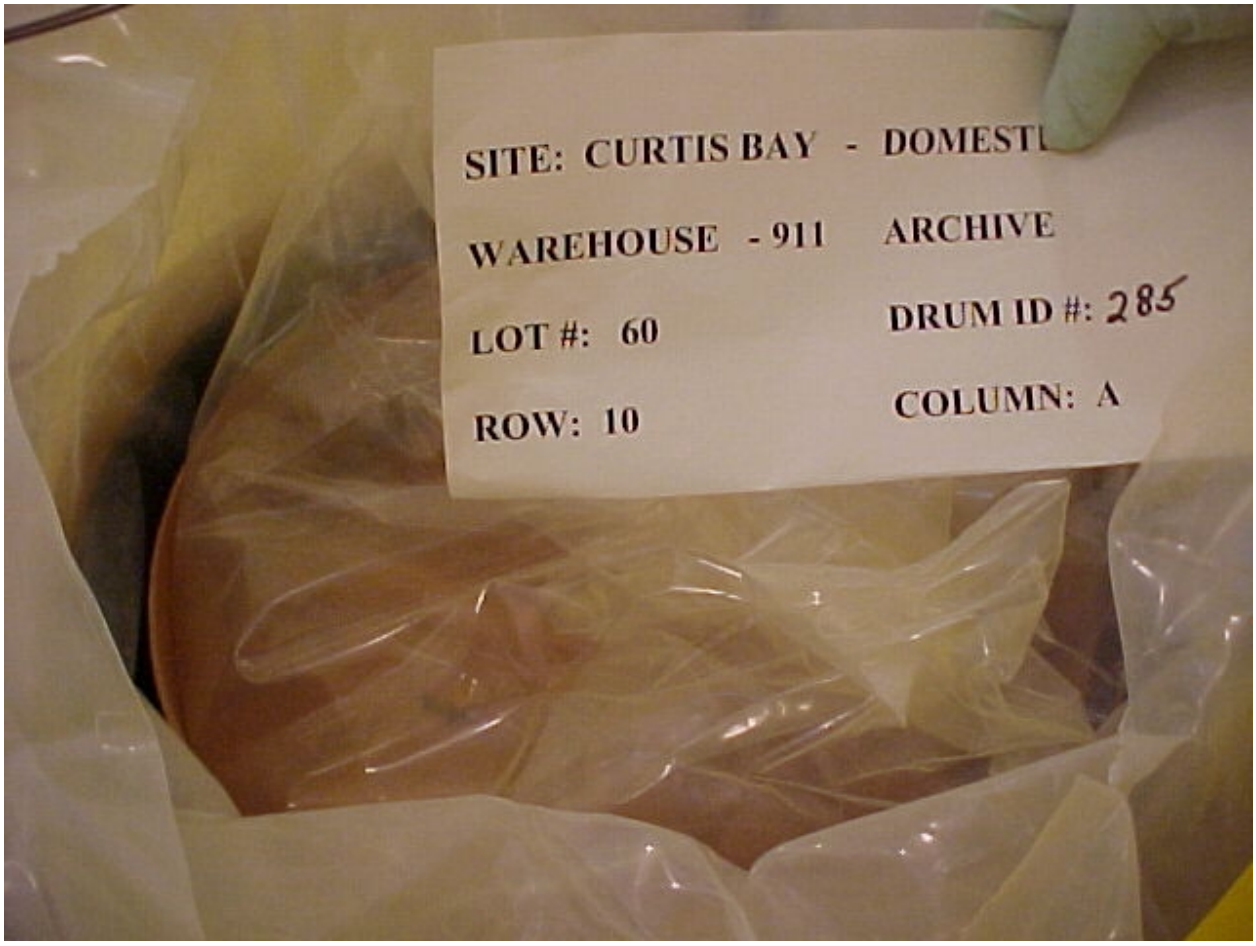
Date	6-27-2002	Time	11:00

Other Information

Photo No. 6 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

2nd poly liner/bag – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

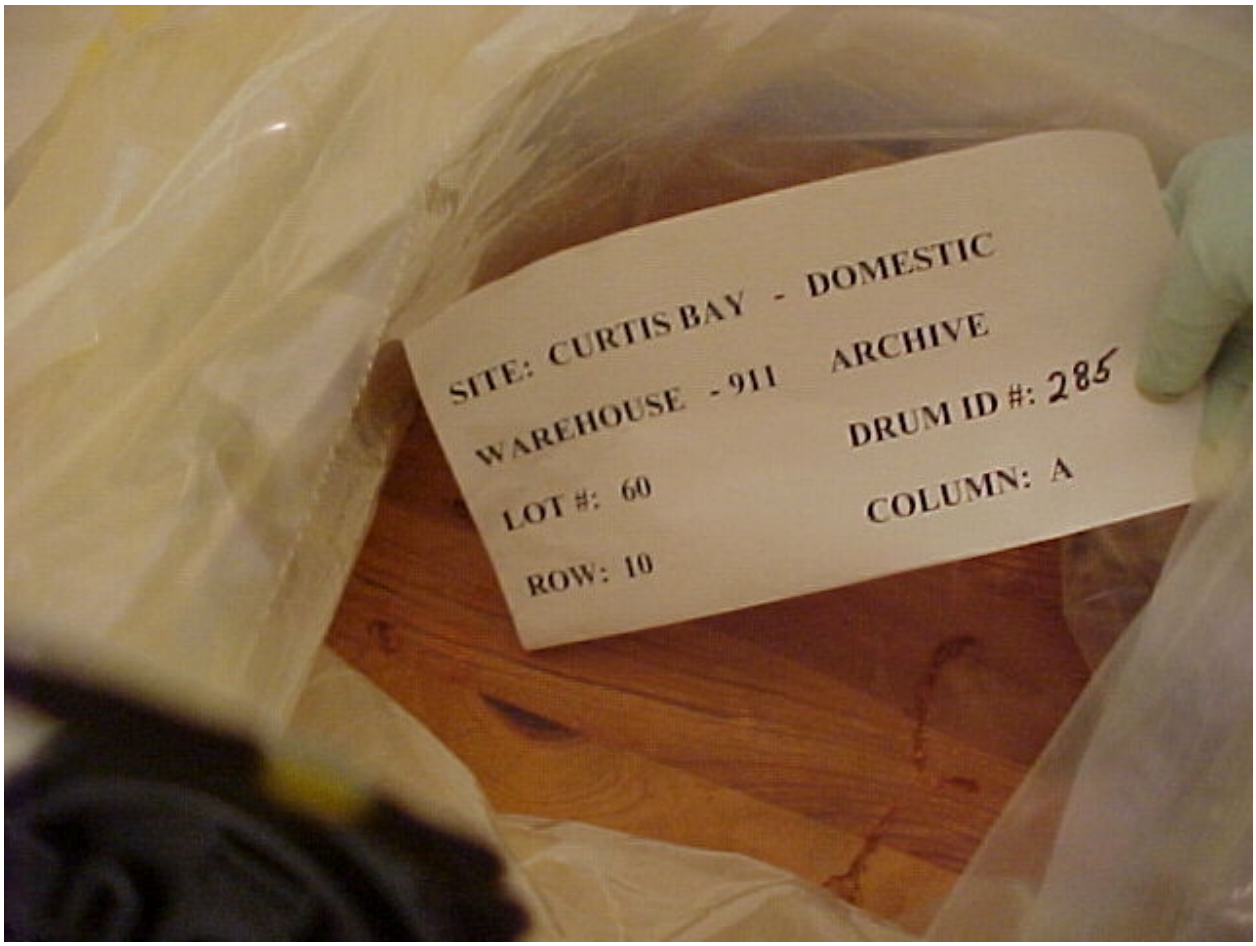
Date	6-27-2002	Time	11:00

Other Information

Photo No. 7 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Wooden lid (mounted on inner fiber/lab-pack drum) good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	11:00

Other Information

Photo No. 8 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Picture shows lab-pack (inner fiber drum) following the removal of the wooden lid
No gases present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

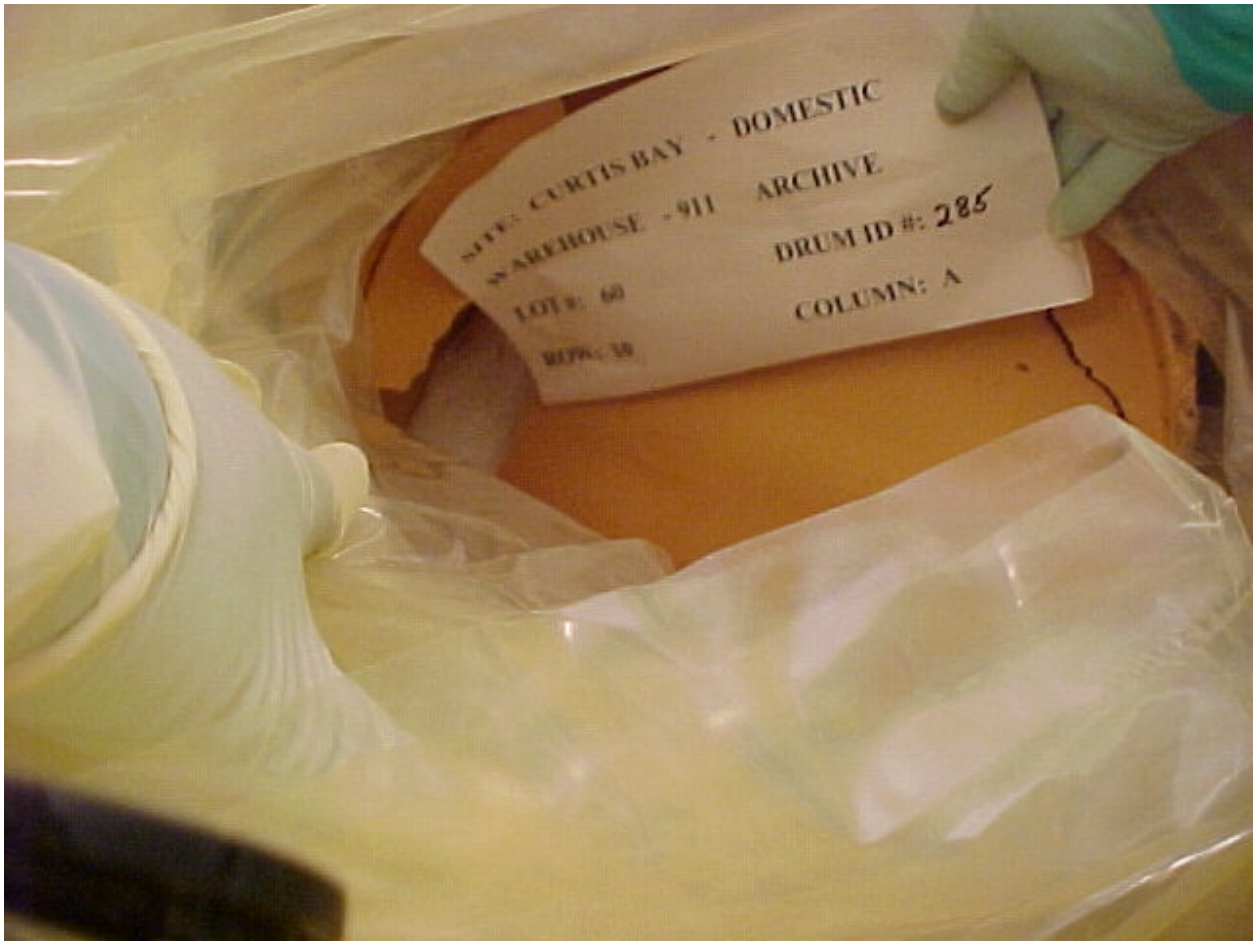
Date	6-27-2002	Time	11:00

Other Information

Photo No. 9 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Picture shows the lab-pack paper layer/lid broken up and partially stuck on the wooden lid
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

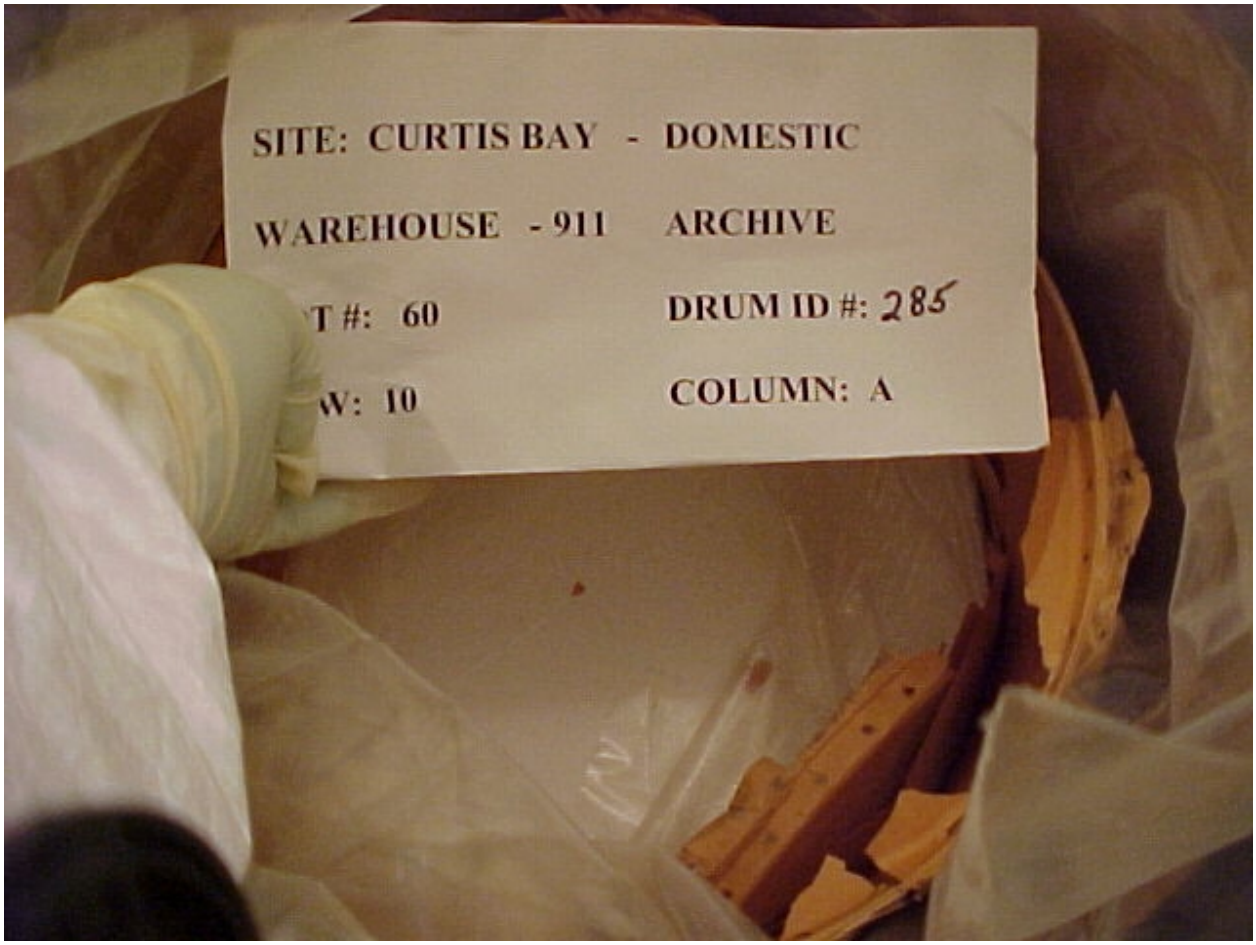
Date	6-27-2002	Time	11:00

Other Information

Photo No. 10 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Picture shows final (4th) poly liner/bag in good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

Date	6-27-2002	Time	11:00

Other Information

Photo No. 11 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Open final plastic bag to access the ThN material – utilizing coring rig to hammer/crack the ThN into chunks for placement into the 2-liter container
Gases present in the drum headspace: NO – 8.7 ppm & NOx – 37.2 ppm

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

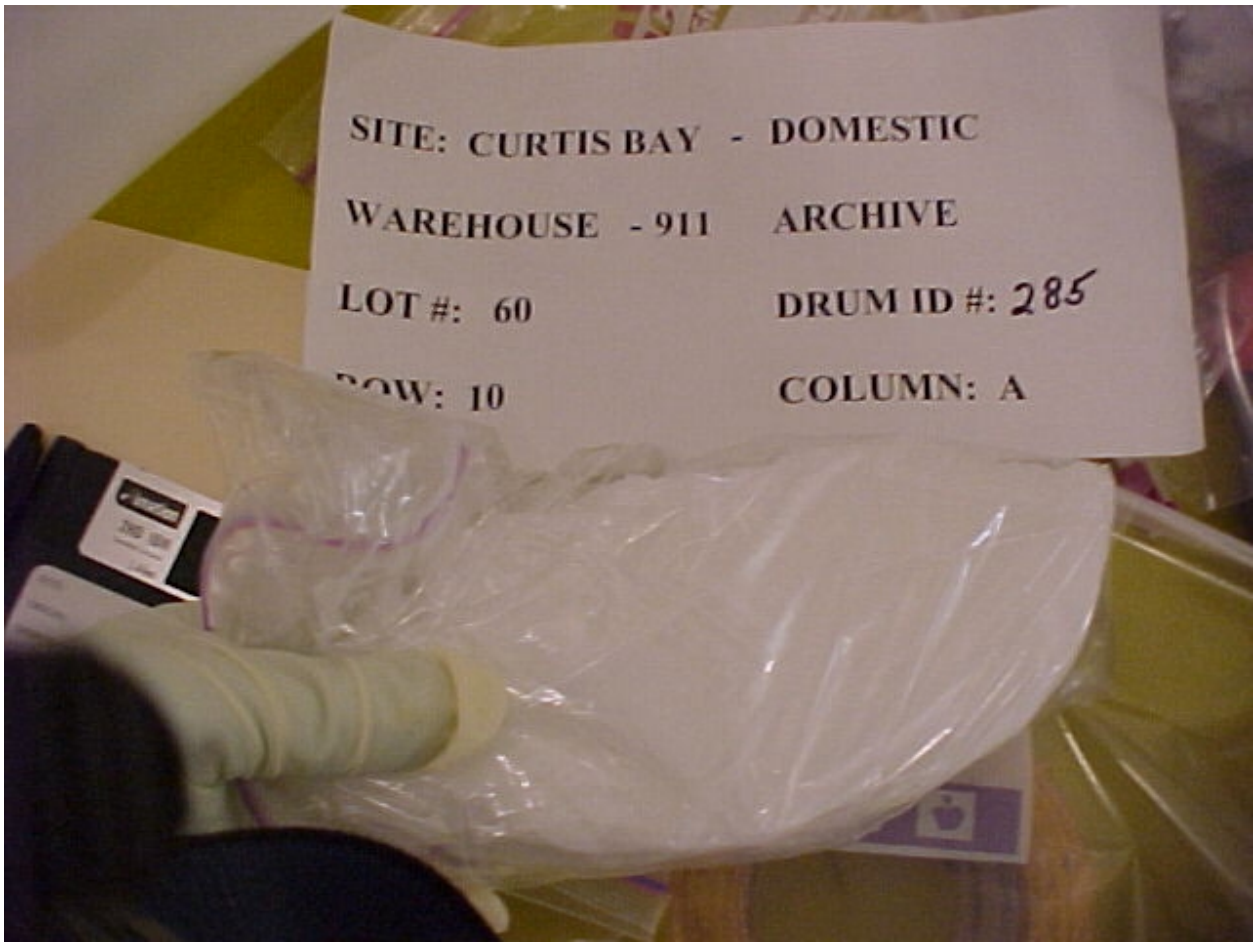
Date	6-27-2002	Time	11:00

Other Information

Photo No. 12 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

The 1st core sample weighed approximately 901 gms.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

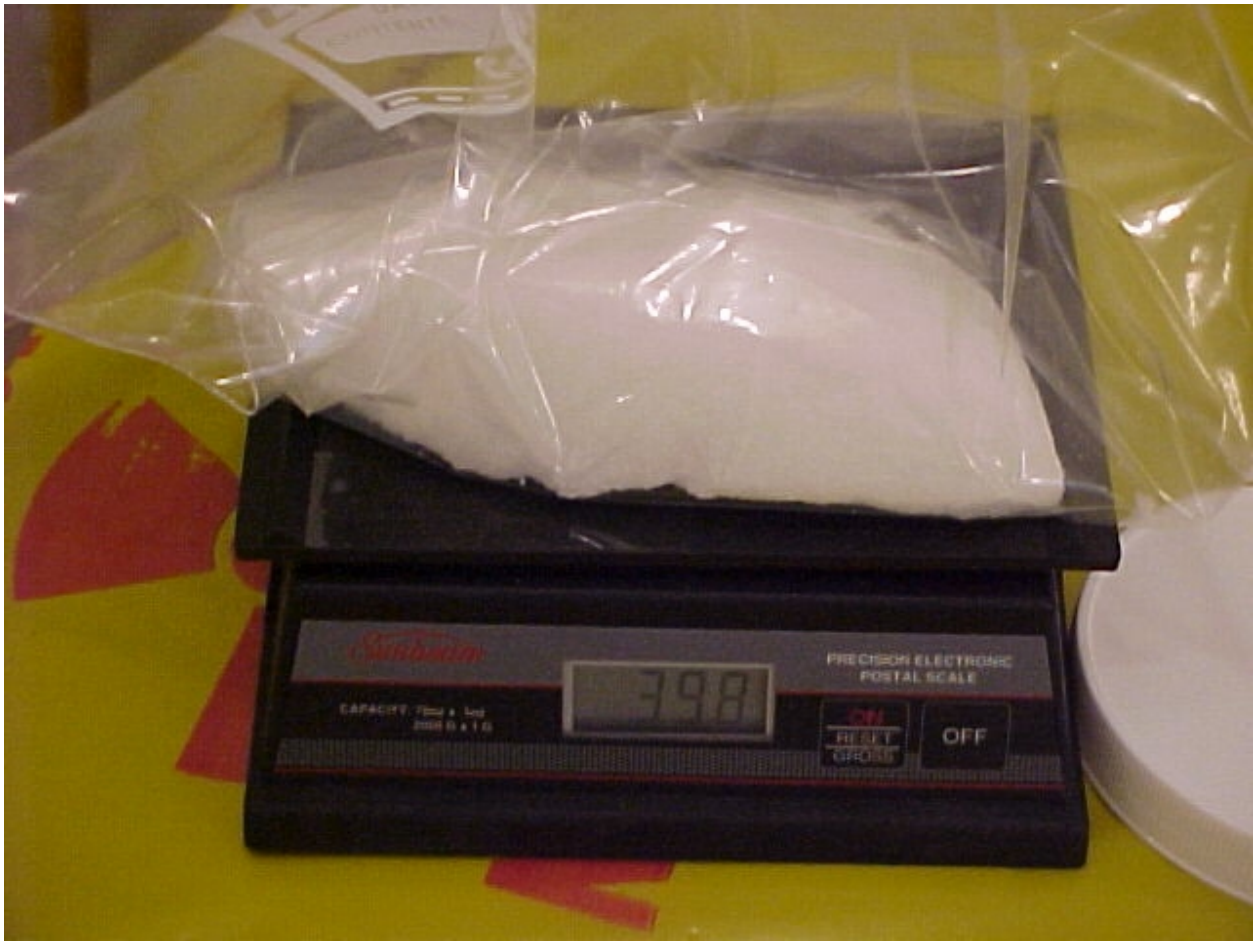
Date	6-27-2002	Time	11:00

Other Information

Photo No. 13 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Weighing 1st sample – 901 gms



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	60	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	285	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	A

Inspection/Sample Date & Time

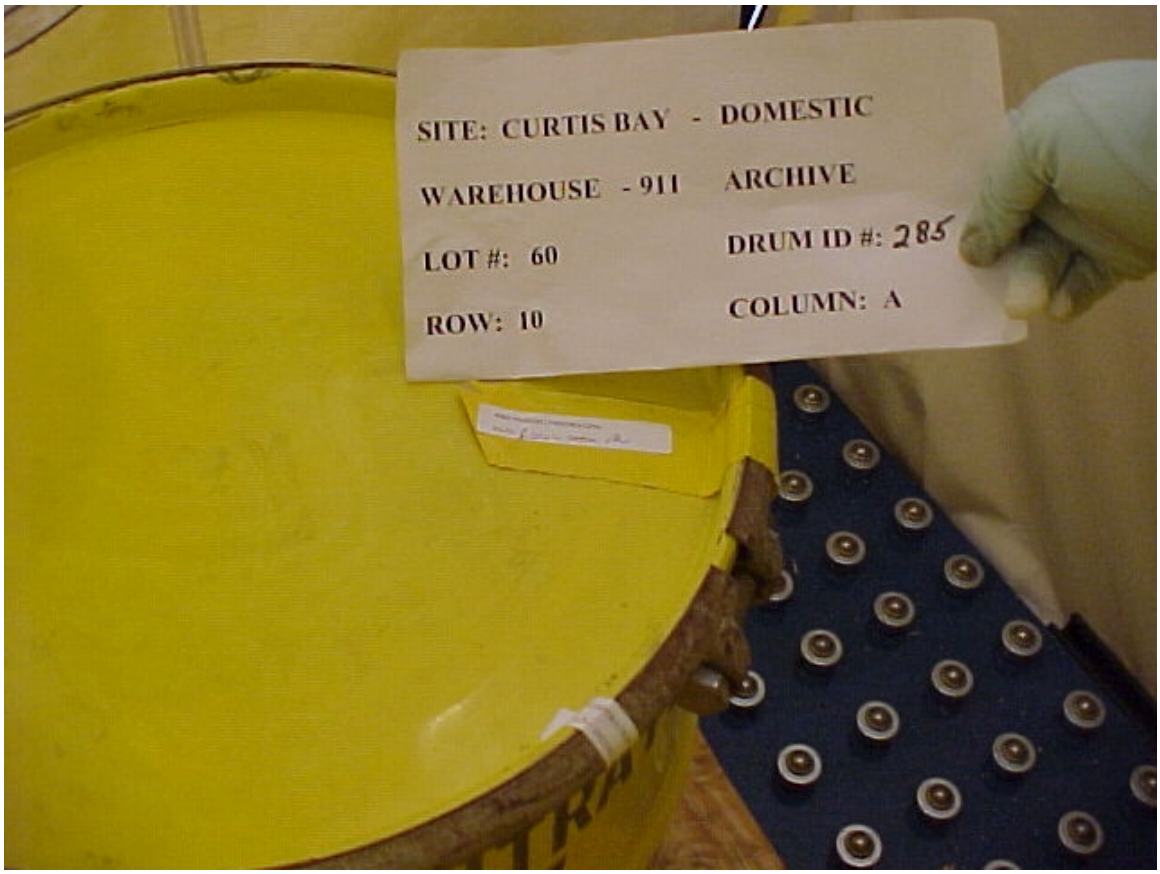
Date	6-27-2002	Time	11:00

Other Information

Photo No. 14 of 14

Dose Rate	Surface	20 mR/hr
	1 meter	2.8 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #64 – Drum #00
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 64 Drum ID #: 00 Location: Warehouse 911 – Column D – Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 3.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 1 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

30-gal drum – good condition
Drum vented gas when initially loosening the bolt on the drum ring.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

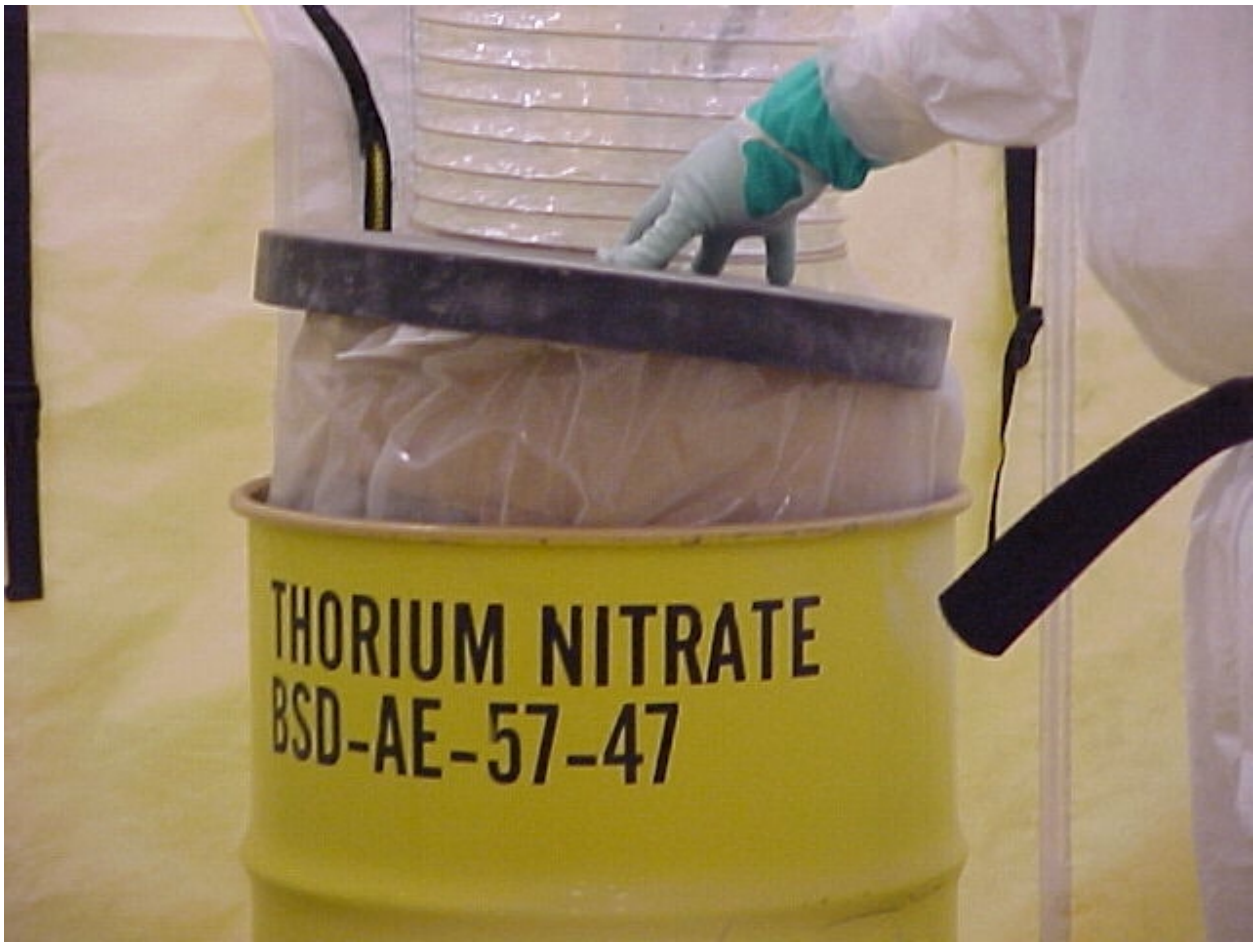
Date	7-1-2002	Time	14:40

Other Information

Photo No. 2 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Black plastic lid (from inner drum liner) – good condition
Pressurized interior packaging raises the lid vertically out of the container.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 3 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

1st poly liner/bag – good condition
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 4 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Fiber drum lid – good condition (Fiber drum typically taped to outermost fiber drum – interior pressure on one of the poly bags caused tape to separate)
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 5 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

2nd poly liner/bag looking on top of the 3rd poly liner/bag
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 6 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Wooden lid (mounted on inner fiber/lab-pack drum) – good condition
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 7 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

The lab-pack paper layer lid pulled off when the wooden lid was removed.
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 8 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

4th poly liner/bag – good condition (thin film plastic)
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 9 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

ThN material – white, solid, monolith, dry
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:40

Other Information

Photo No. 10 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

A picture of the sample after it was broken up with sampling tool to collect “chunk” samples
No gasses present in breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	64	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	7
		Column	D

Inspection/Sample Date & Time

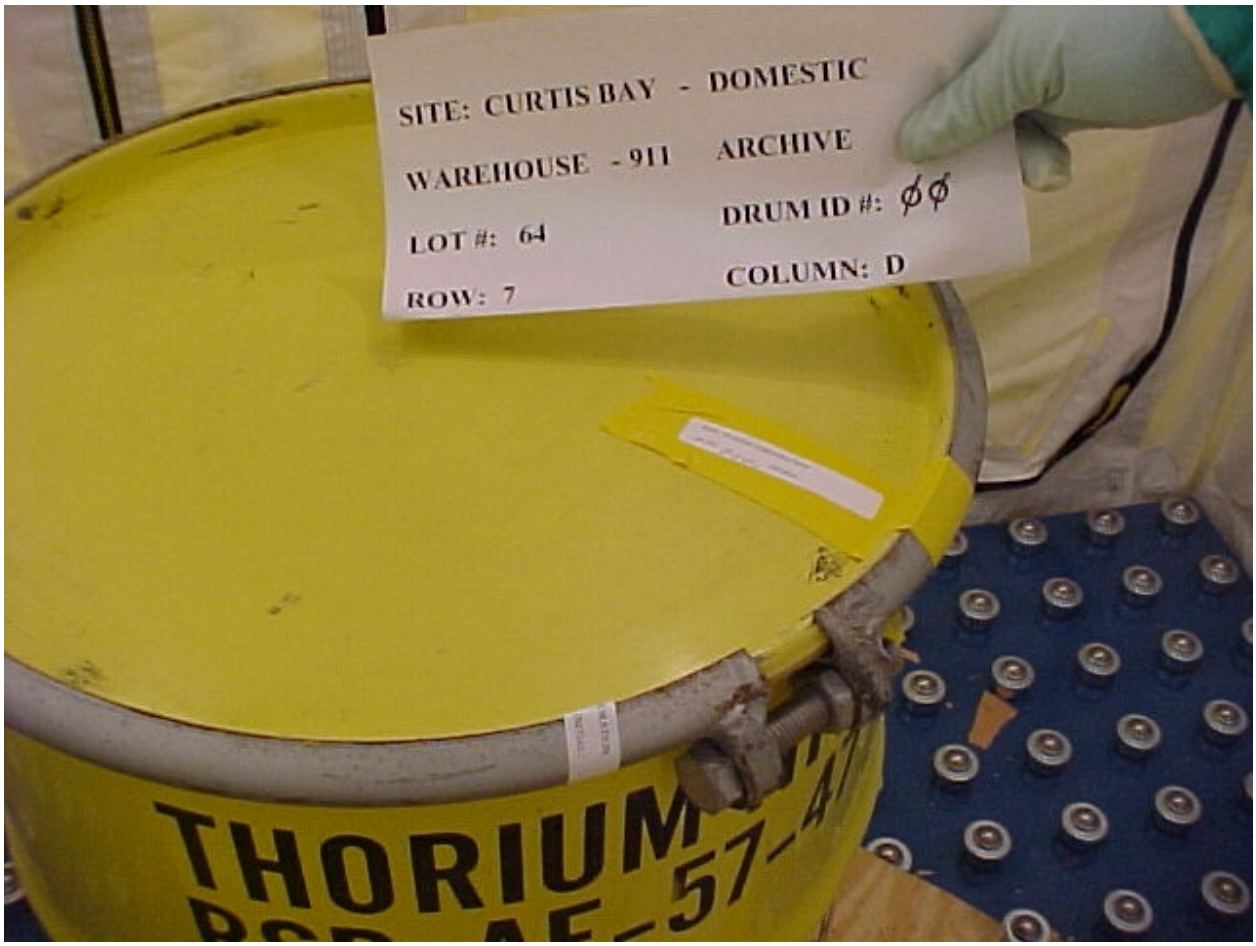
Date	7-1-2002	Time	14:40

Other Information

Photo No. 11 of 11

Dose Rate	Surface	24 mR/hr
	1 meter	3.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #71 – Drum #192
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 71 Drum ID #: 192 Location: Warehouse 911 – Column D – Row 11

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only)*: Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all-inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 6-28-02

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

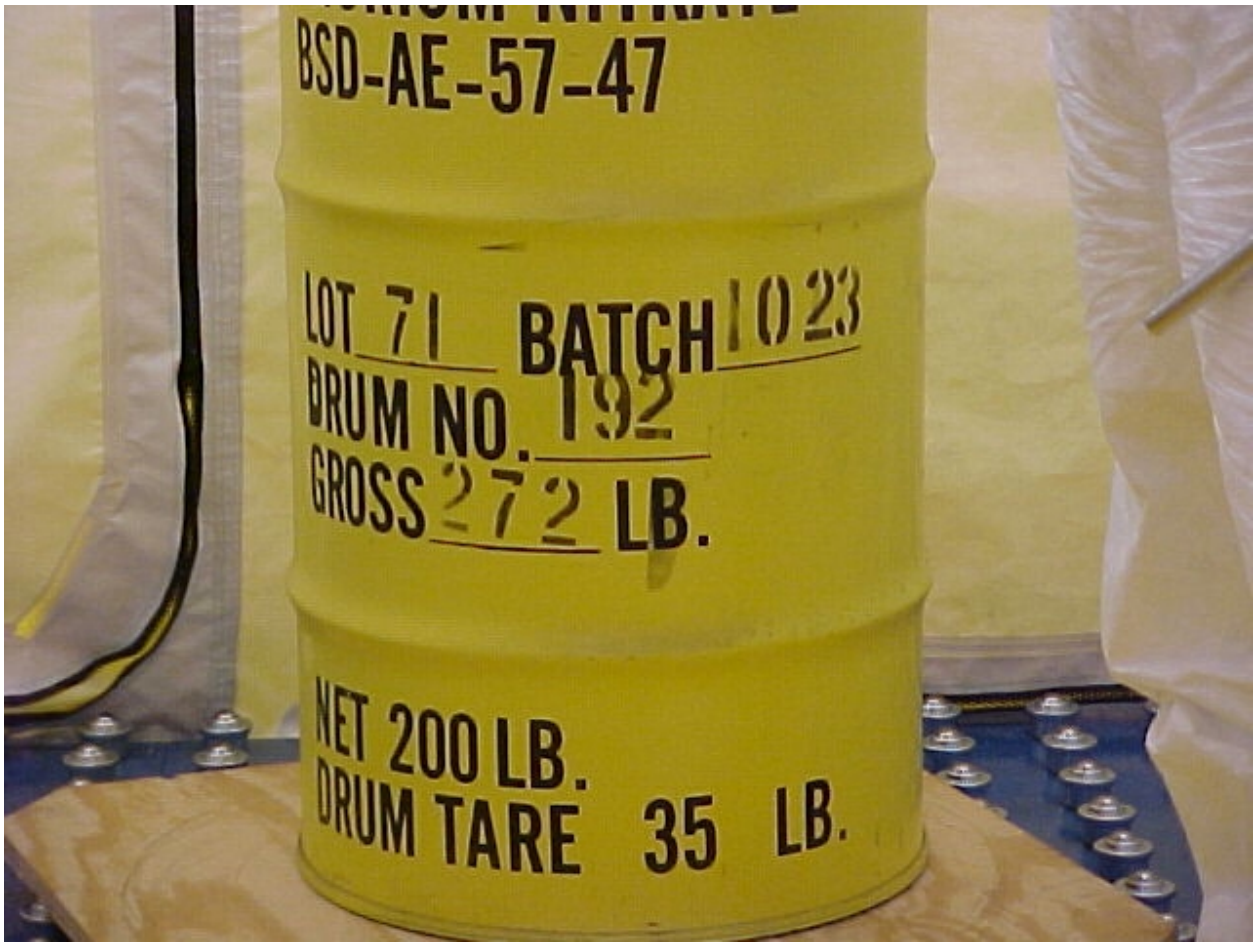
Date	6-28-2002	Time	14:00

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

30-gal drum – good condition
Gases vented from drum when bolt on drum ring was loosened.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:00

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Black plastic lid (from inner drum liner) – raised lid indicates gas pressure buildup in one of the inner packaging layers in the drum – lid – good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:00

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Another picture showing the pressure buildup in the drum – 1st poly liner/bag
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

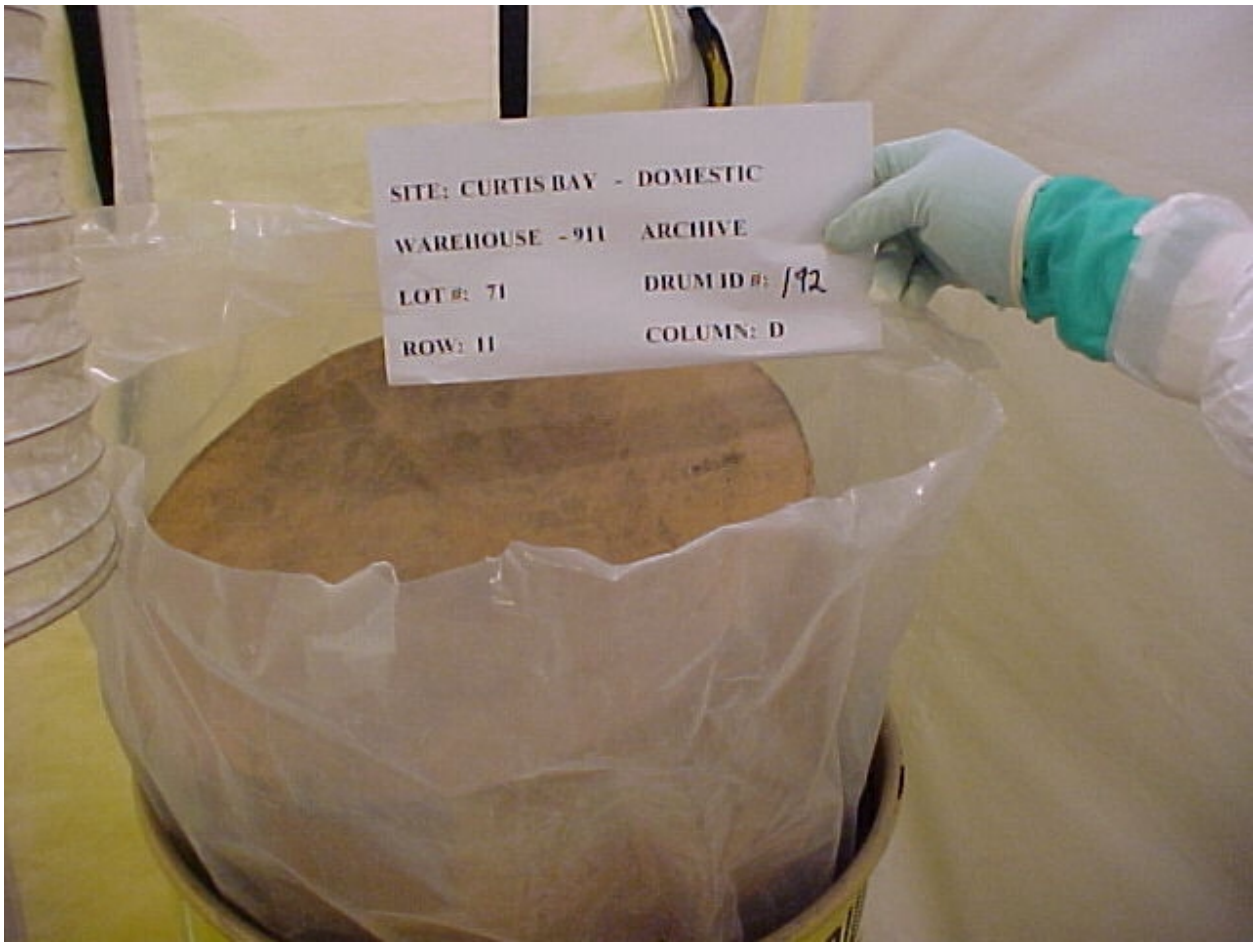
Date	6-28-2002	Time	14:00

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Fiber drum lid (after opening 1st poly liner/bag) – fiber lid good condition
No gases present in breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:00

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

2nd poly liner/bag cut open – 3rd poly liner/bag shows significant pressure buildup – bag in good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:00

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Cut open 3rd liner/bag – good condition – HEPA exhaust evacuated gases that had built up inside of bag.
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:00

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Wooden lid (mounted on inner fiber/lab-pack drum) – good condition
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:00

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

4th poly liner/bag – good condition (picture shows inflated condition of bag)
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

Date	6-28-2002	Time	14:00

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

ThN material – solid form – white – monolith - dry
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	71	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	192	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	11
		Column	D

Inspection/Sample Date & Time

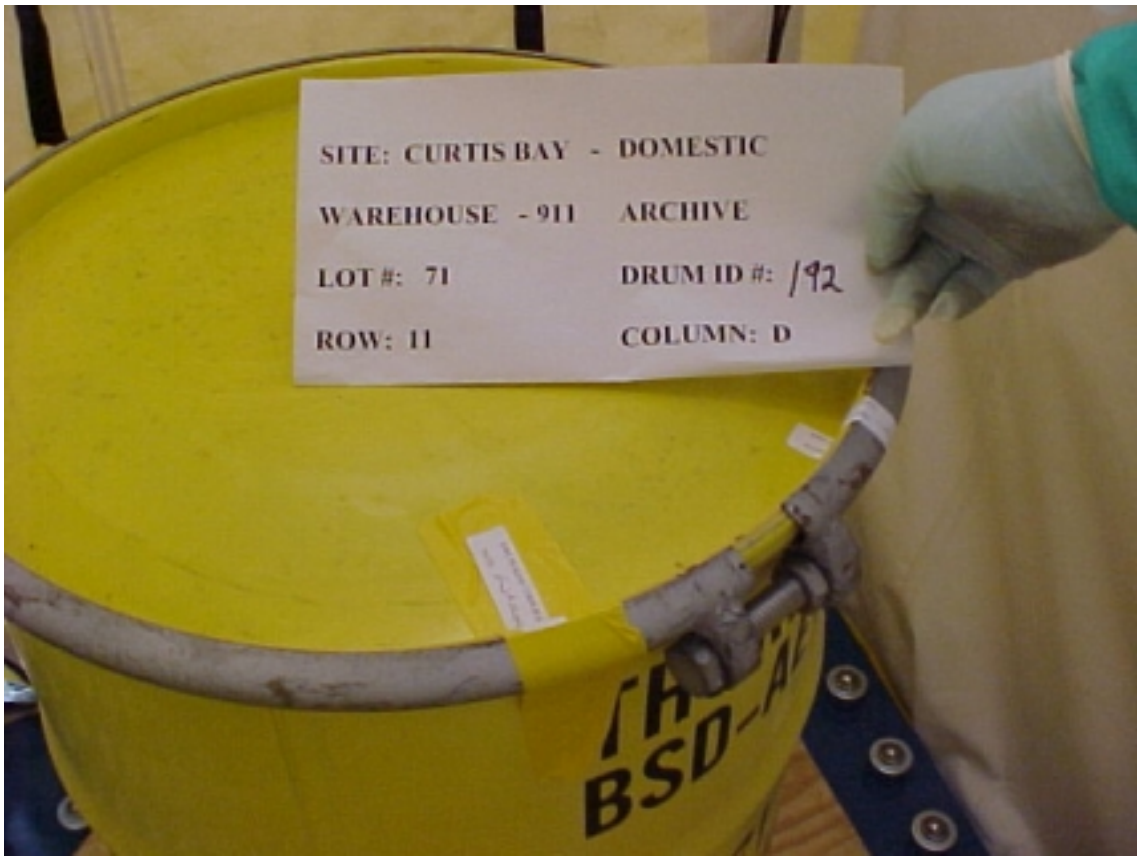
Date	6-28-2002	Time	14:00

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated - Complete



APPENDIX H

CURTIS BAY DEPOT
DRUMS SAMPLED FOR ON-SITE ARCHIVE
(SECOND DRUM OF ARCHIVED SAMPLES)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Curtis Bay Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were placed in storage as archived samples per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were placed into archive storage in Warehouse 913 at the Curtis Bay Depot in Drum ID No. 6990-001-A2 (i.e. the second drum of samples archived at the Curtis Bay Depot). All lots/drums included in this appendix came from Thorium Nitrate materials originating from domestic sources.

The data in this appendix contains visual inspection and applicable sampling data from 30-gal steel drums (MD-1 drums), 40-gal polyethylene drums (MD-4 drums) and drums originating from French and Indian sources (MD-2 drums). A significant percentage of the MD-1 drums contained internal gas pressurization. From the visual inspection of these MD-1 drums, 88.9% of the drums included in this data set at one time contained internal pressure (either via release of gas during the visual inspection or the presence of indentations in the top lid). Lots that had internal gas pressure are indicated with a single asterisk in the following table. French and Indian lots are preceded with either and "F" or "I" designating the specific origin as France or India respectively. Lots containing 40-gal polyethylene drums are designated with two asterisks.

Also included with this table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	16*	230	H-5
2	19**	52	H-17
3	24**	102	H-29
4	25*	25	H-43
5	26*	202	H-55
6	32*	152	H-67
7	47*	204	H-79
8	57*	110	H-91
9	59	241	H-103
10	62*	159	H-115
11	70*	3	H-127
12	F-18	55	H-139
13	I-1	14	H-147
14	I-2	99	H-157
15	I-8	371	H-167
16	I-10	484	H-179

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Curtis Bay Depot
Lot #16 - Drum #230
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 16 Drum ID #: 230 Location: Warehouse 912 – Column A – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.5 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

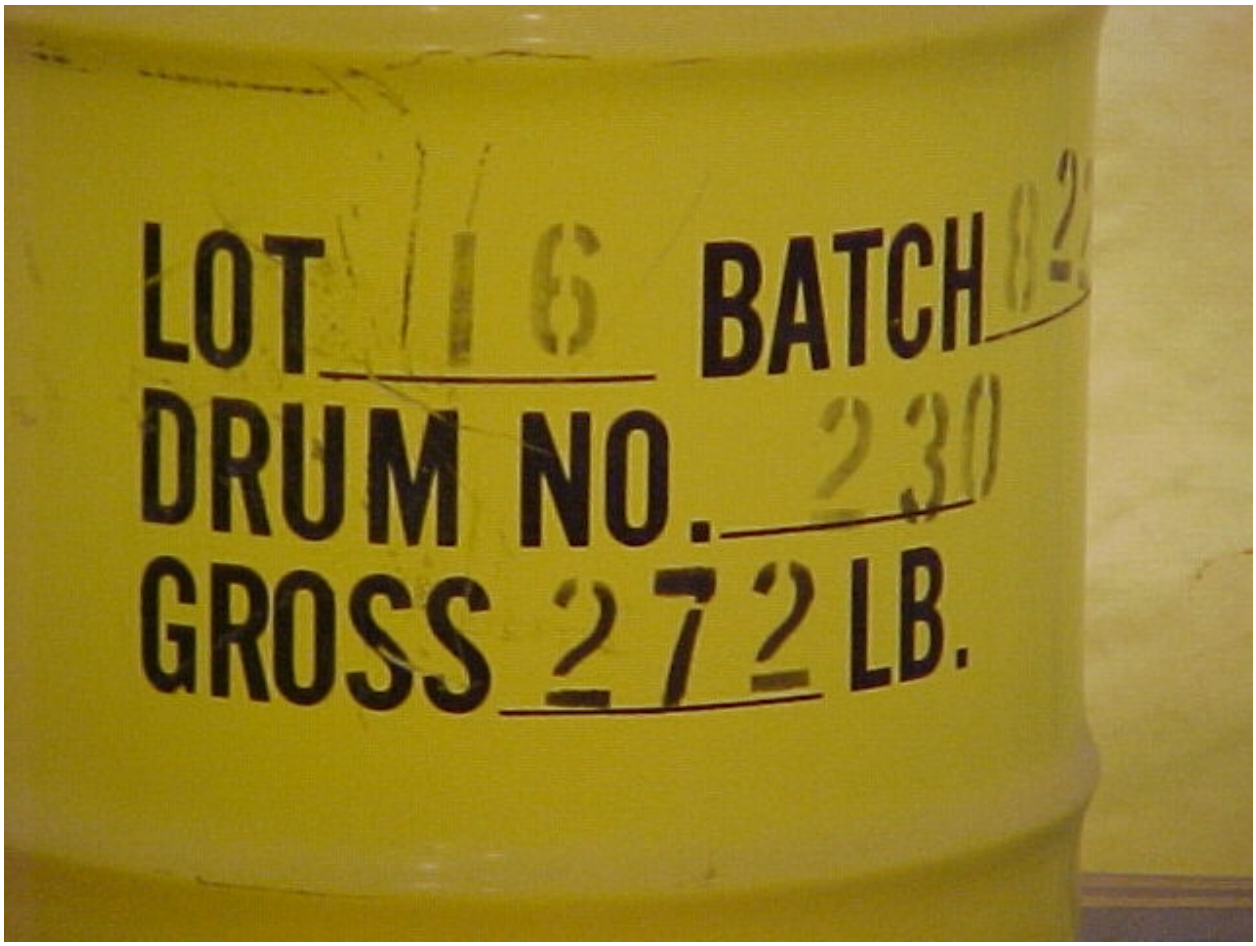
Inspection/Sample Date & Time

Date	7-10-2002	Time	10:10

Other Information

Photo No.	1 of 10		
Dose Rate	Surface	24 mR/hr	
	1 meter	2.5 mR/hr	
Container	30-gallon steel drum	Container Condition	good

Drum released pressure as bolt on drum ring was loosened – prior to complete removal of the drum ring, the drum lid pushed through the center of the ring springing off the drum 1' to 2' vertically. Utilized remote extension on air ratchet to loosen bolt to provide safe distance between operator and drum lid.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:10

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Black plastic lid – good condition (lid fits around drum liner)
Pressure built up inside of the container raises the poly liner/bag vertically out of the drum
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

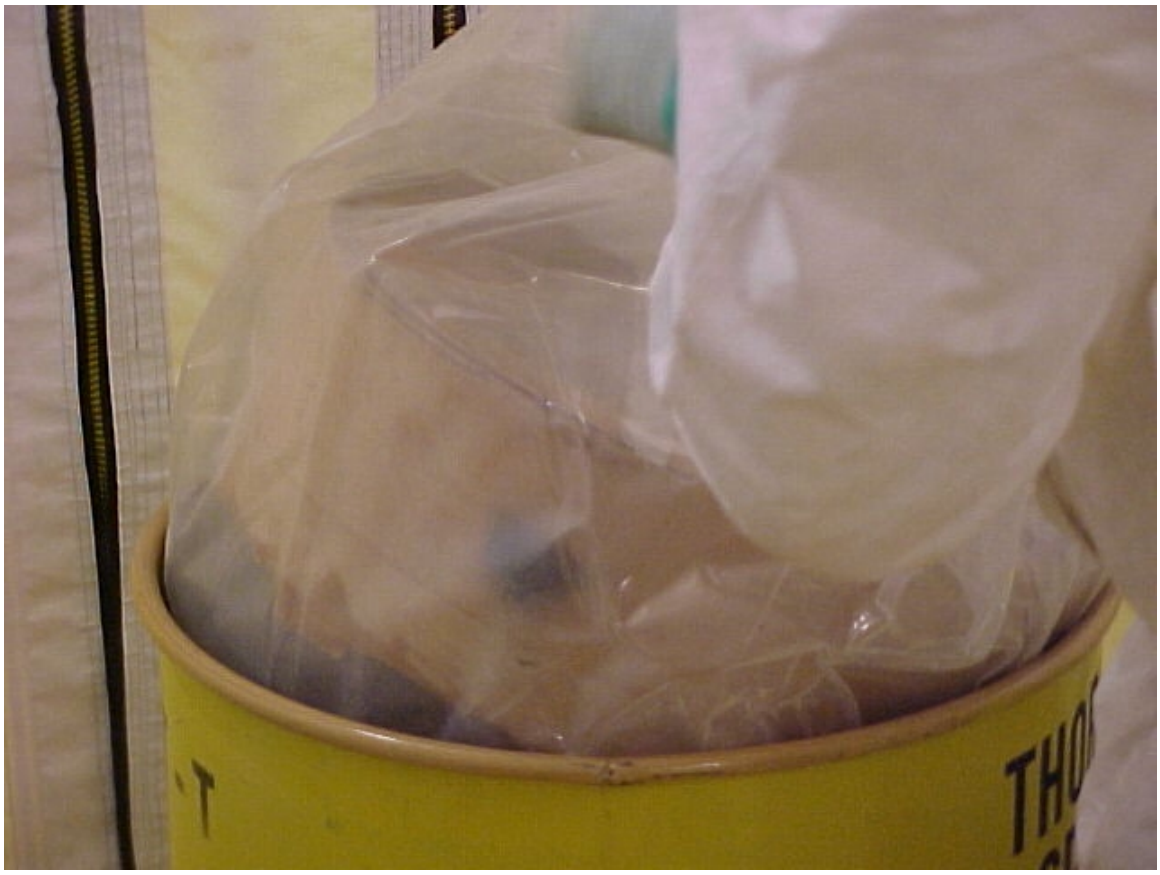
Date	7-10-2002	Time	10:10

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside of the container raises the poly liner/bag vertically out of the drum
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

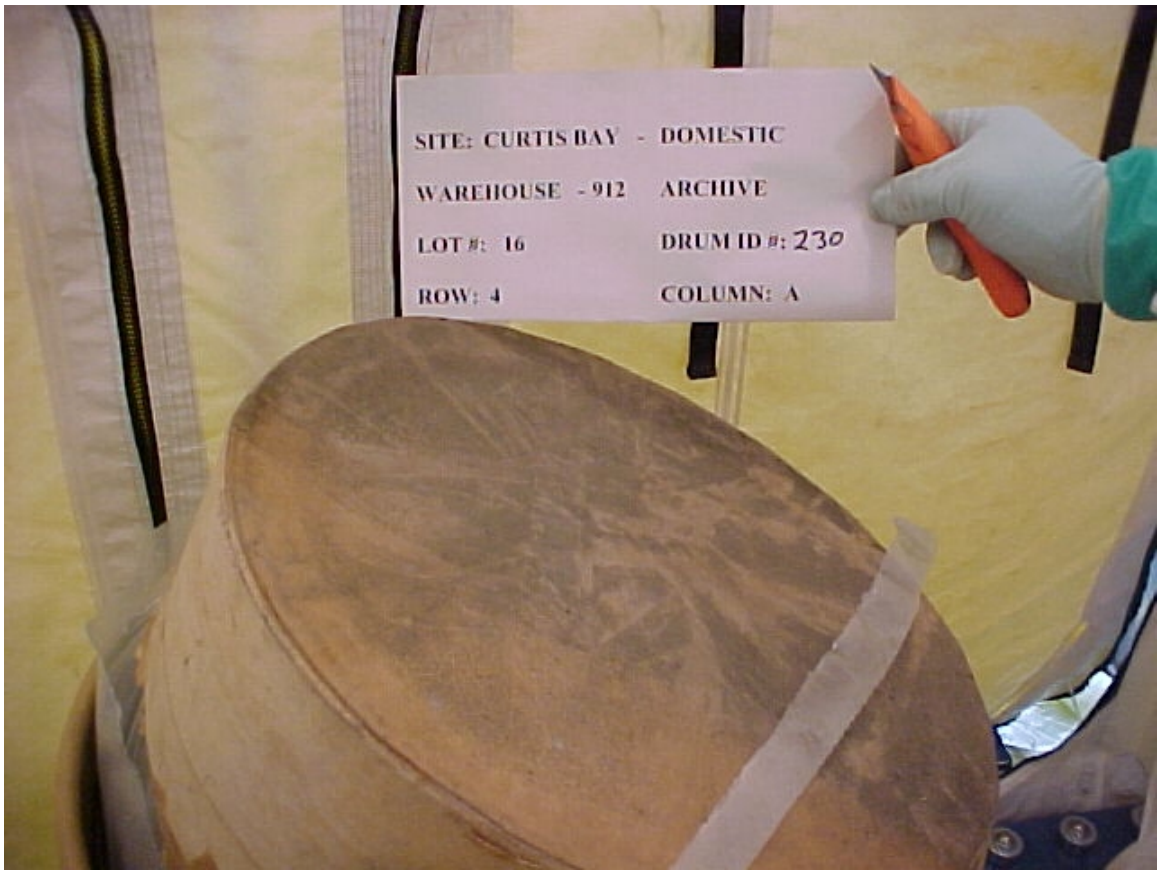
Date	7-10-2002	Time	10:10

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Fiber drum lid (on outermost fiber drum) – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:10

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:10

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

3rd poly liner/bag – good condition
Opened poly liner/bag – no gases in breathing zone
Gases in headspace – LEL – 4.6% LEL – NO - +50 ppm – NOx - +50 ppm
Drum vented – all gases evacuated through HEPA exhaust

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:10

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Wooden lid (on inner lab-pack/fiber drum) – good condition
Drum vented – all gases evacuated through HEPA exhaust
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:10

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

4th poly liner/bag (thin film plastic) – good condition (inflated condition of bag delineates gas buildup from the ThN material)
Drum vented – all gases evacuated through HEPA exhaust
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:10

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Opened inner poly liner/bag – no gases in breathing zone
Gases present in drum headspace – LEL-4.6% LEL NO - +50 ppm NOx - +50mm
Drum vented – all gases evacuated through HEPA exhaust
ThN material – monolith – solid – white - dry

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	16	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	230	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	4
		Column	A

Inspection/Sample Date & Time

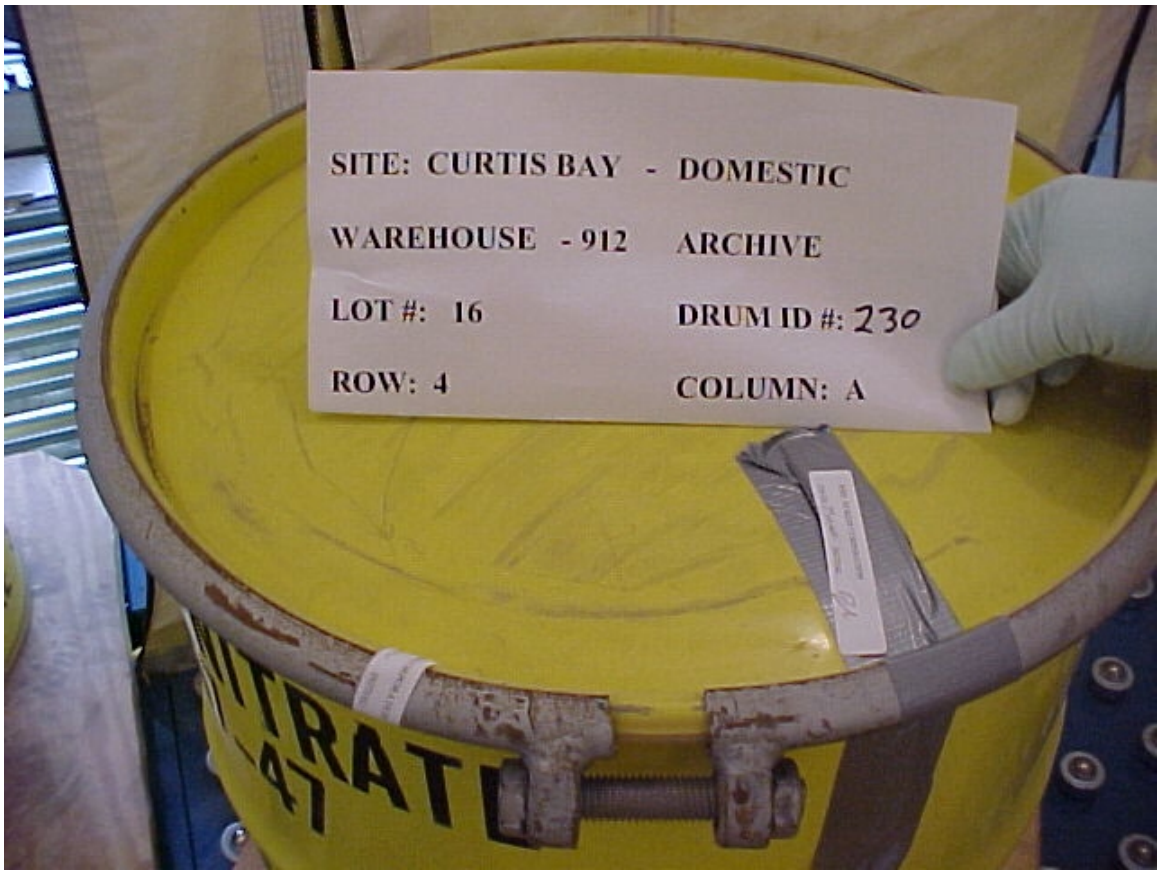
Date	7-10-2002	Time	10:10

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #19 - Drum #52
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 19 Drum ID #: 52 Location: Warehouse 912 – Column D – Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 40-gal poly drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (not measured) NO NA NOx NA

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

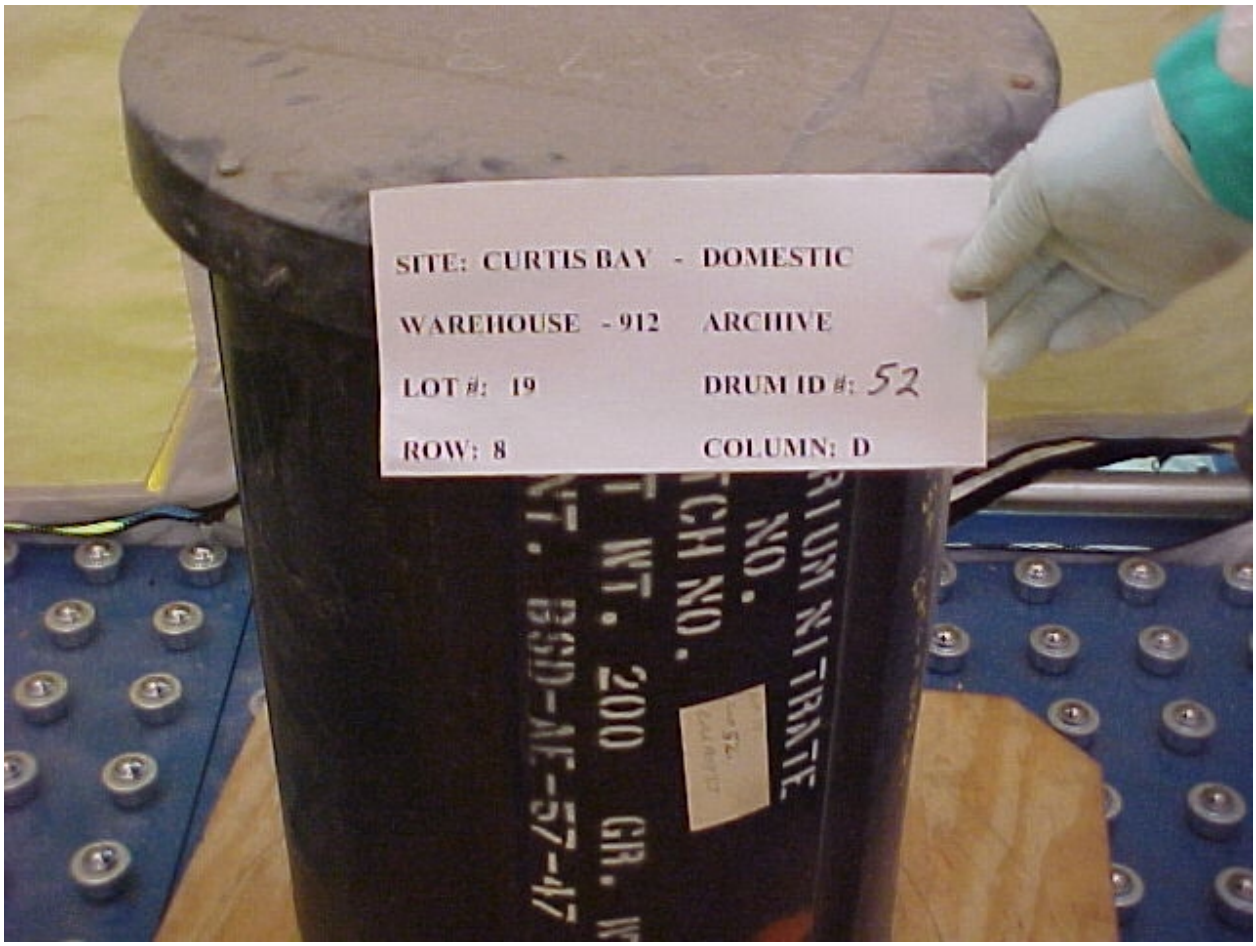
Date	7-10-2002	Time	14:30

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

40-gal polyethylene container – good condition
Container did not vent any gases during opening operations
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

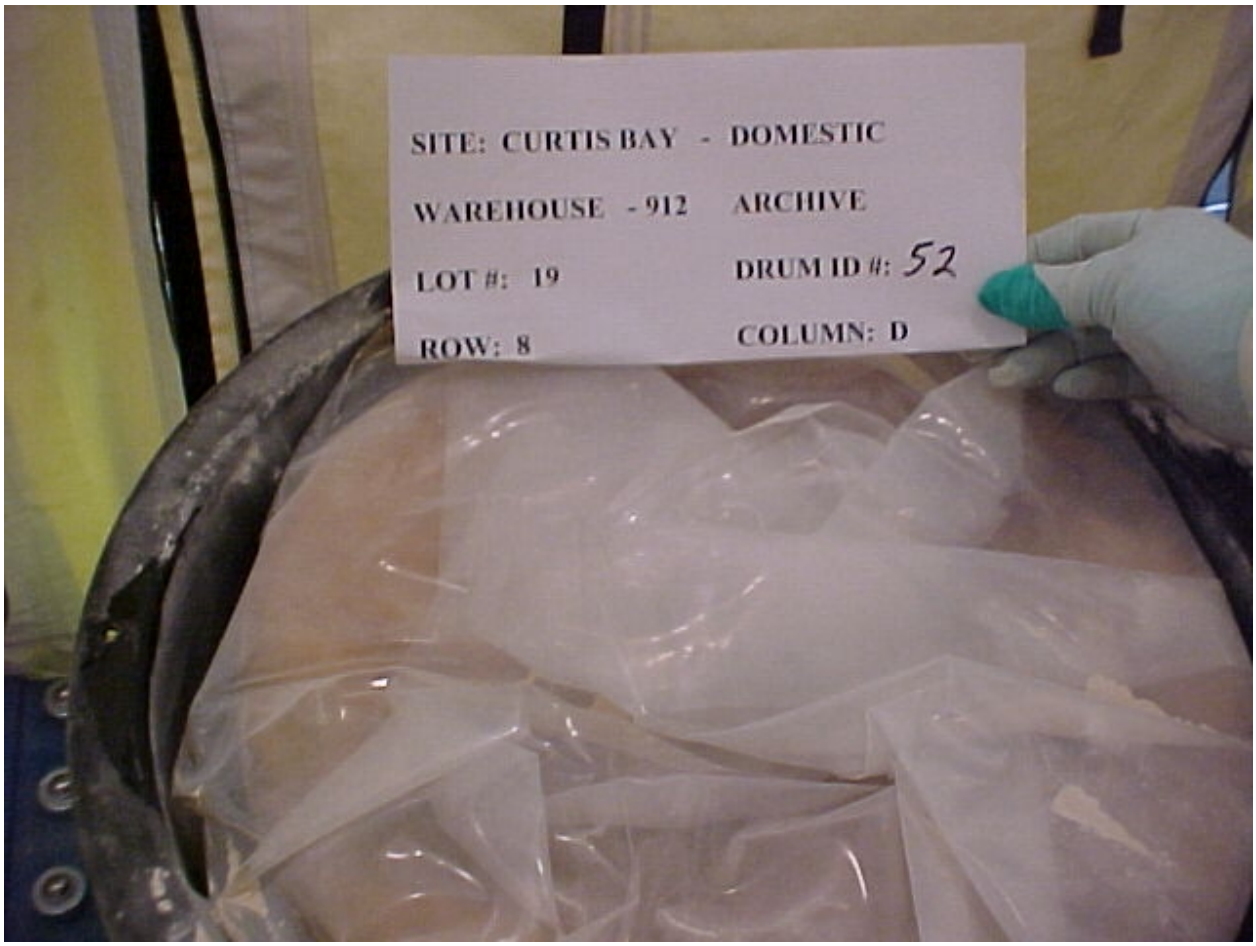
Date	7-10-2002	Time	14:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

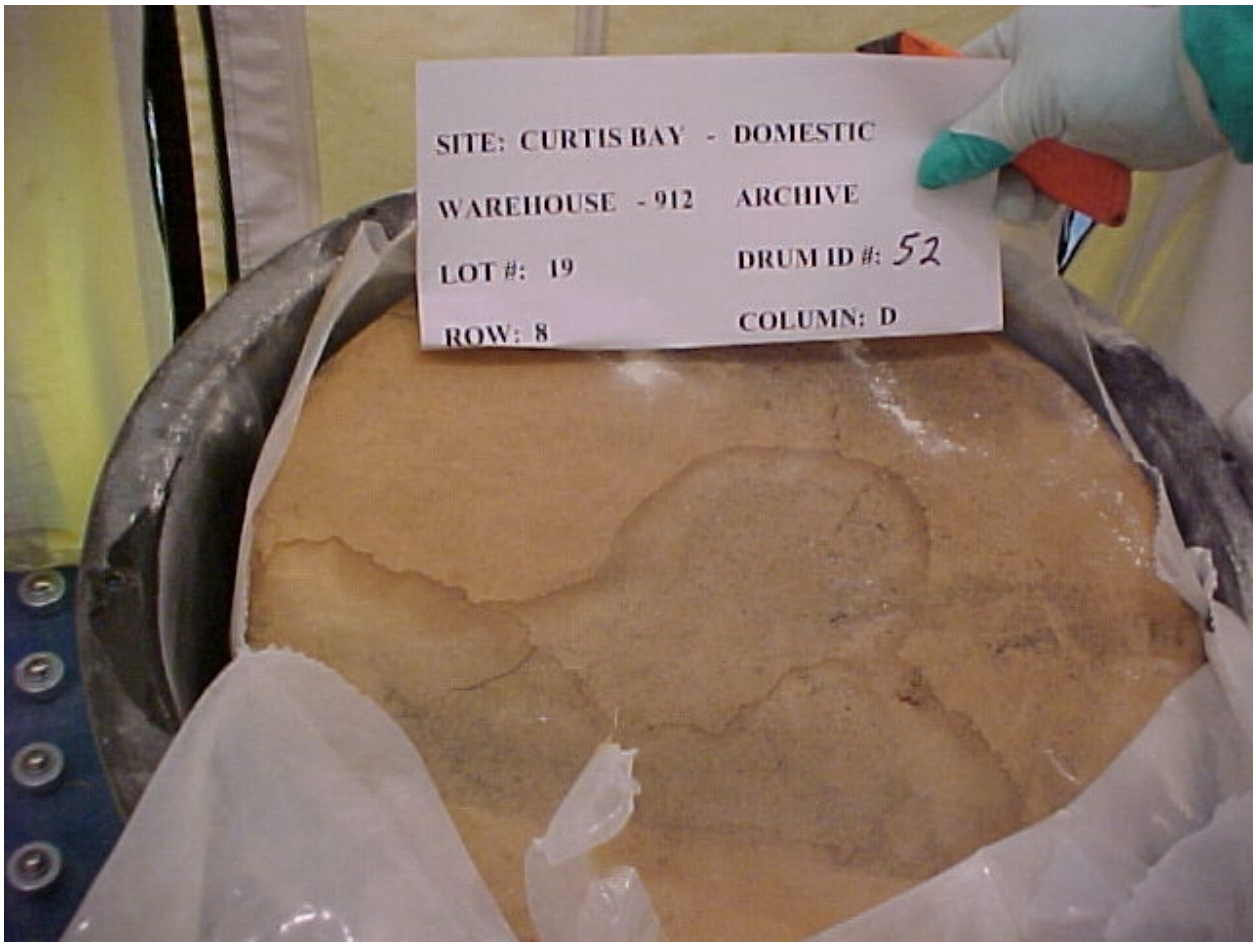
Date	7-10-2002	Time	14:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Fiber lid (from outermost fiber drum inside of container) – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

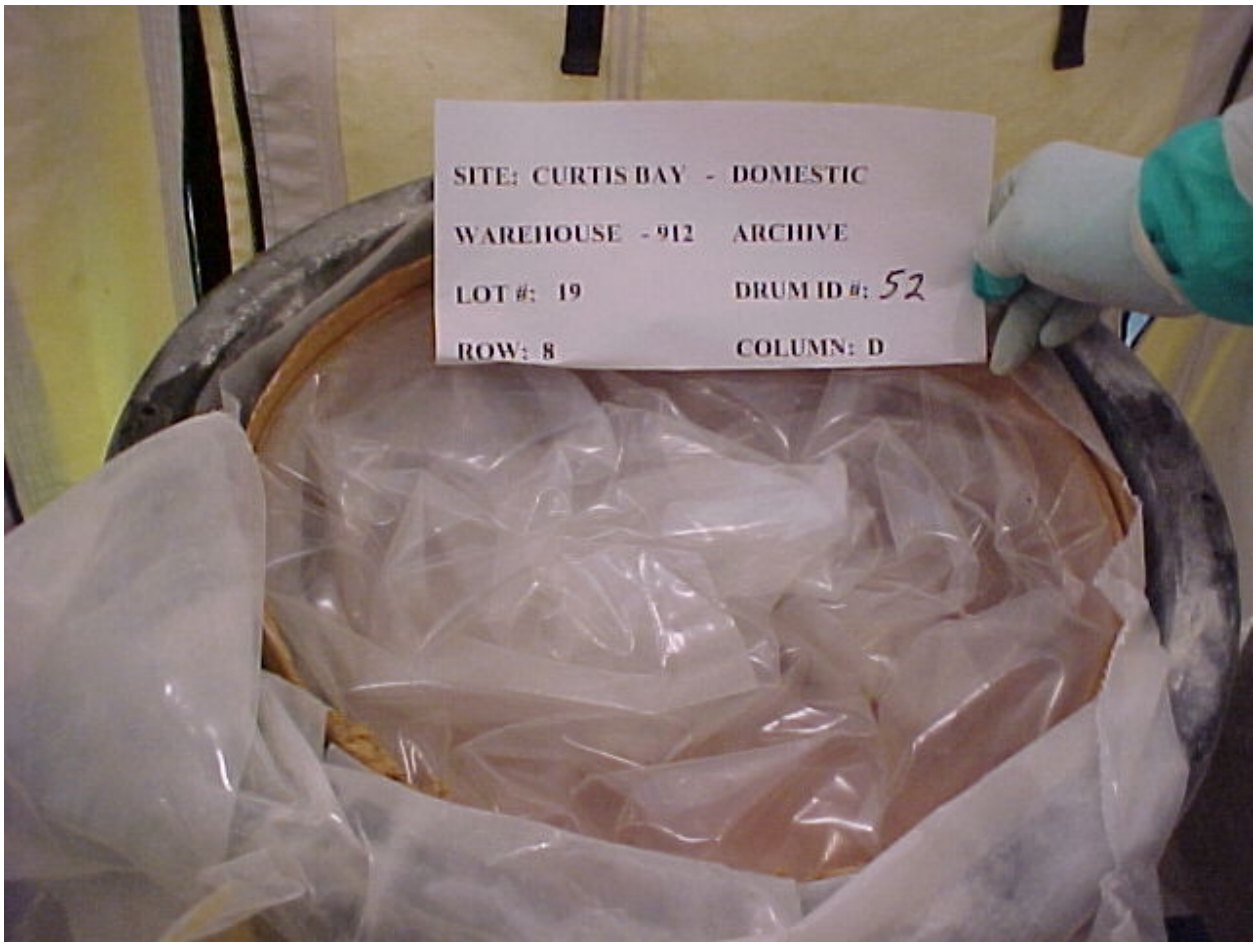
Date	7-10-2002	Time	14:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

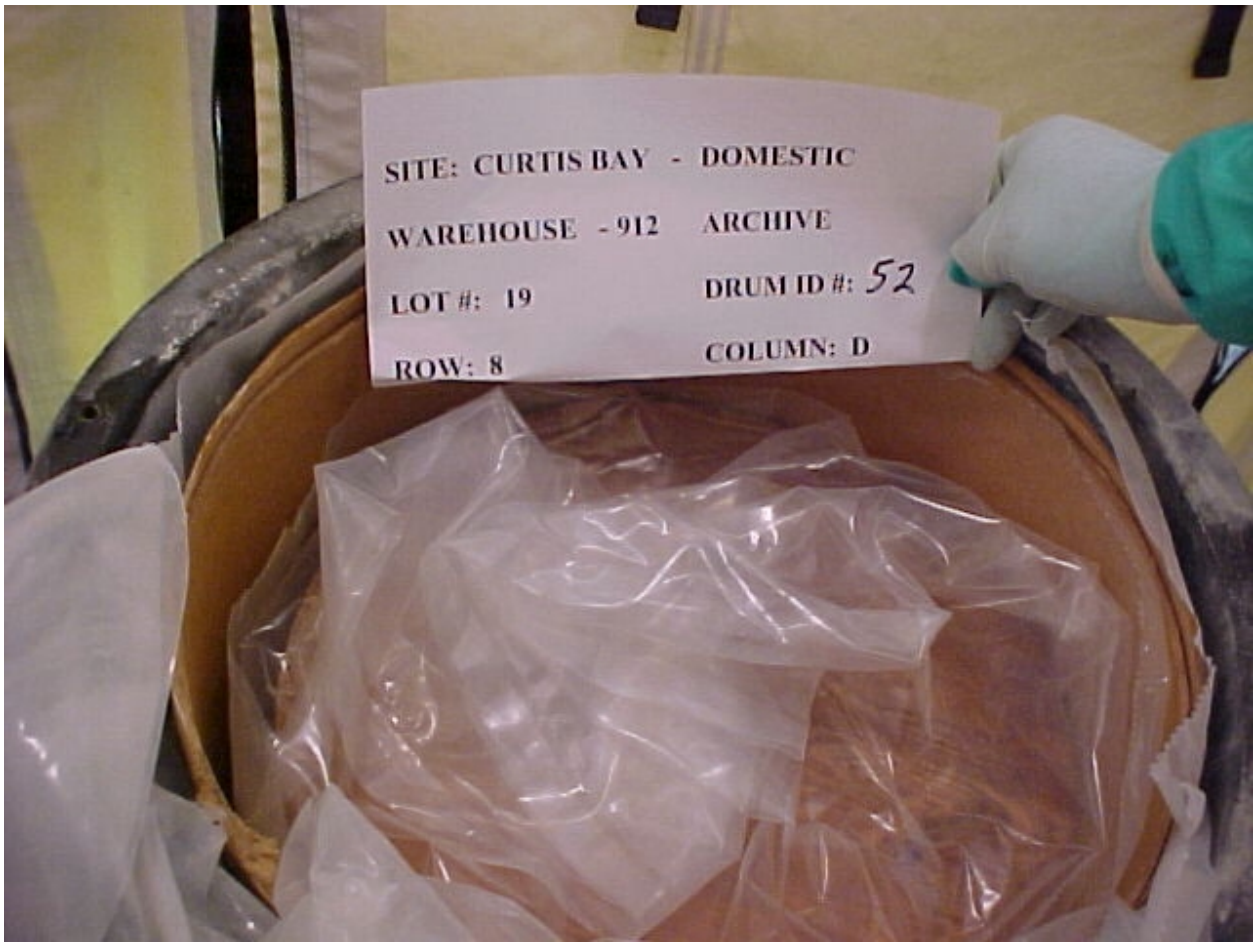
Date	7-10-2002	Time	14:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

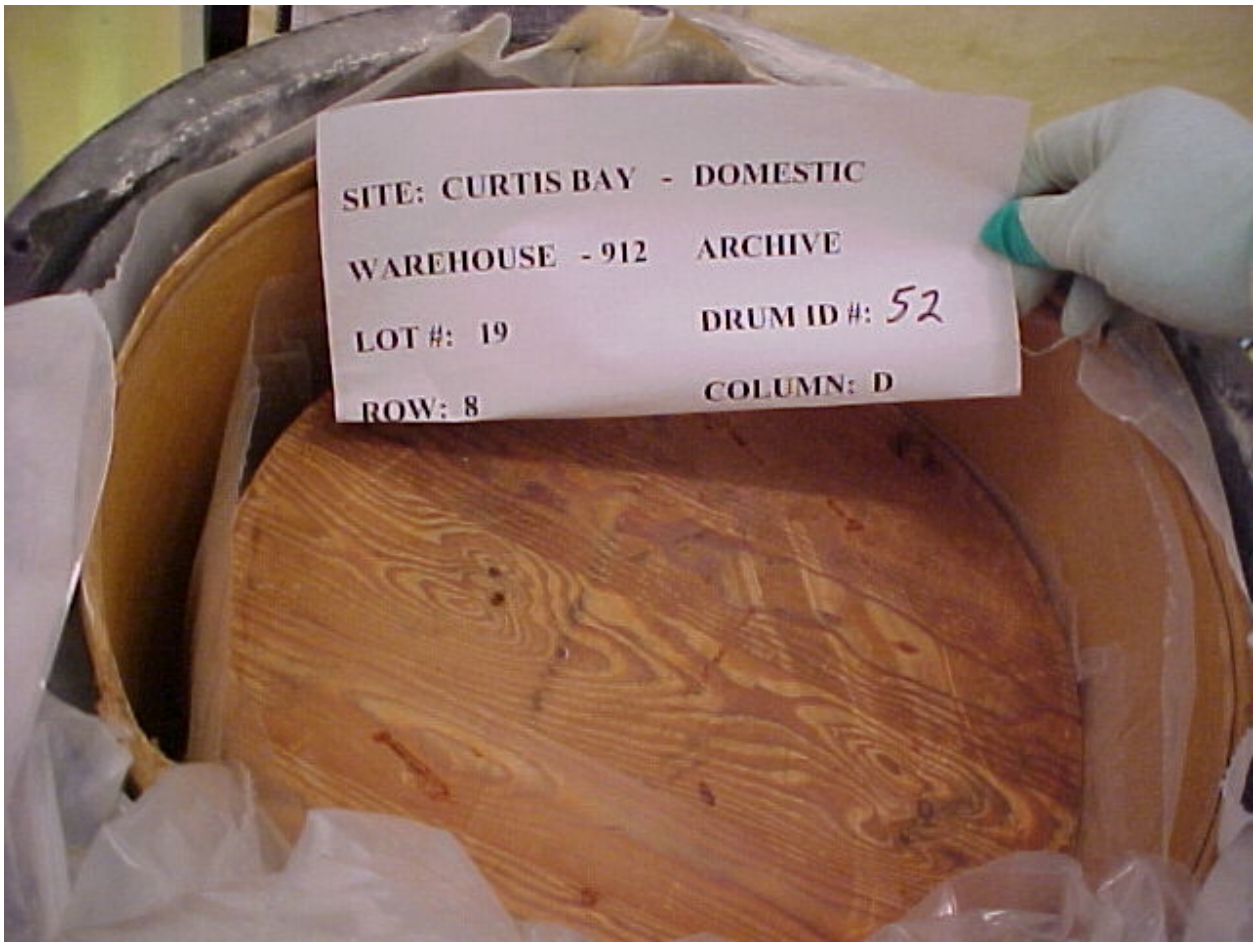
Date	7-10-2002	Time	14:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Wooden lid (mounted to innermost lab-pack/fiber drum) – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	14:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Paper layer lid on lab-pack underneath the wooden lid typically tears upon wooden lid removal
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	14:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	14:30

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

ThN material – solid – dry – white - monolith
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	19	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	52	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	8
		Column	D

Inspection/Sample Date & Time

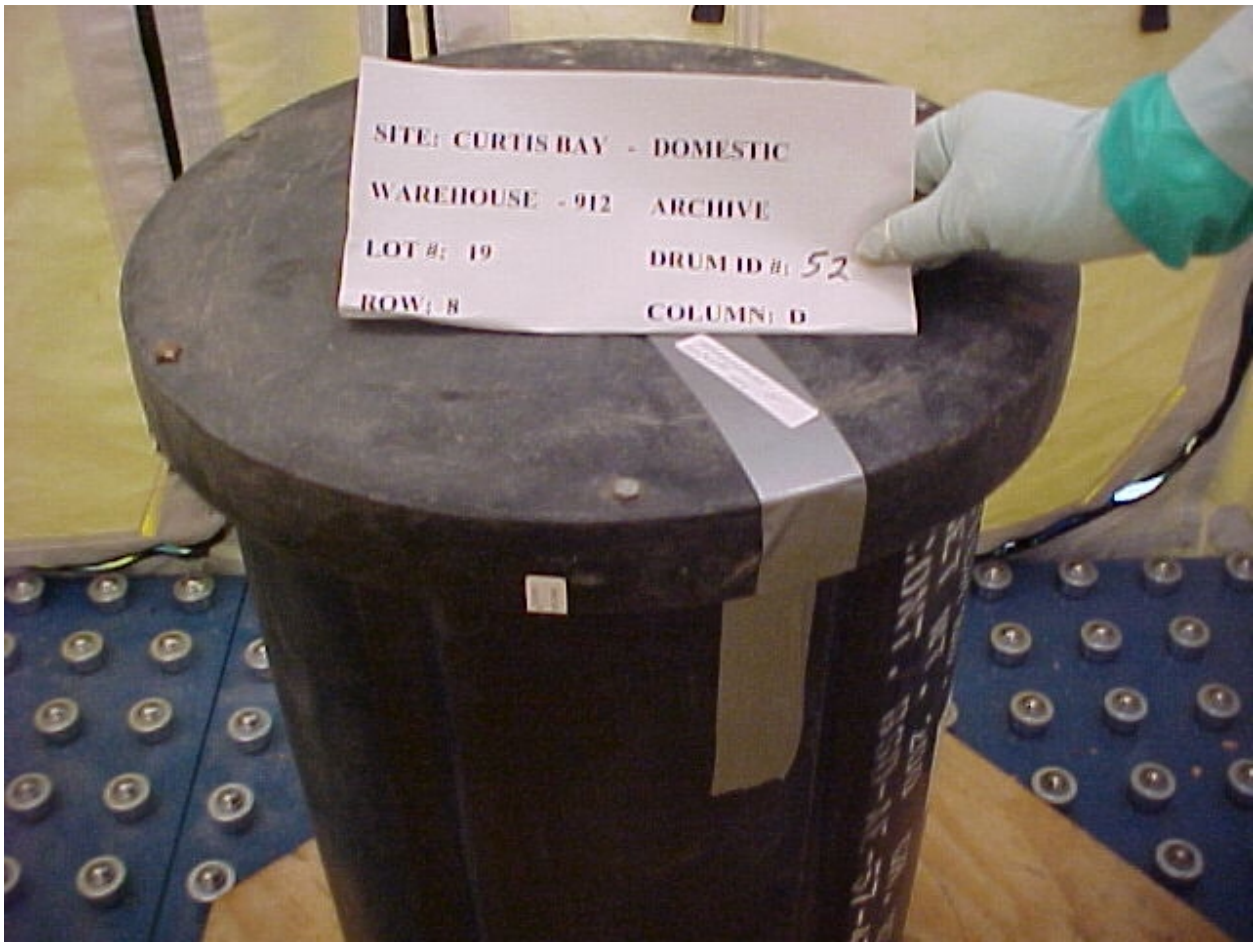
Date	7-10-2002	Time	14:30

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #24 - Drum #102
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 24 Drum ID #: 102 Location: Warehouse 912 – Column D – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 40-gal poly drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.1 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	14:00

Other Information

Photo No. 1 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

40-gal polyethylene container – good condition
No gases vented from container during lid removal operations

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

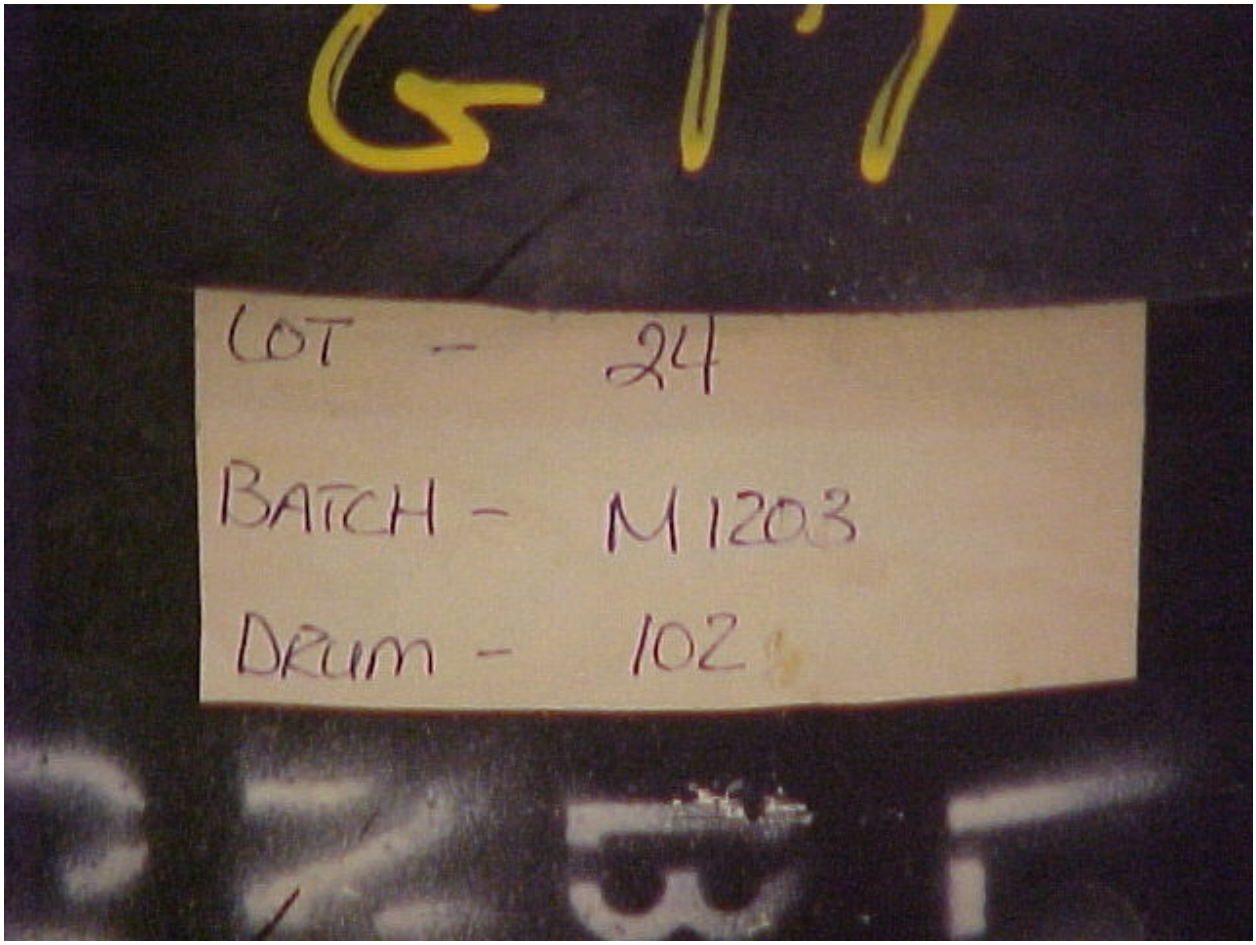
Date	7-10-2002	Time	14:00

Other Information

Photo No. 2 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

Close-up of the Lot & Drum ID Numbers



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

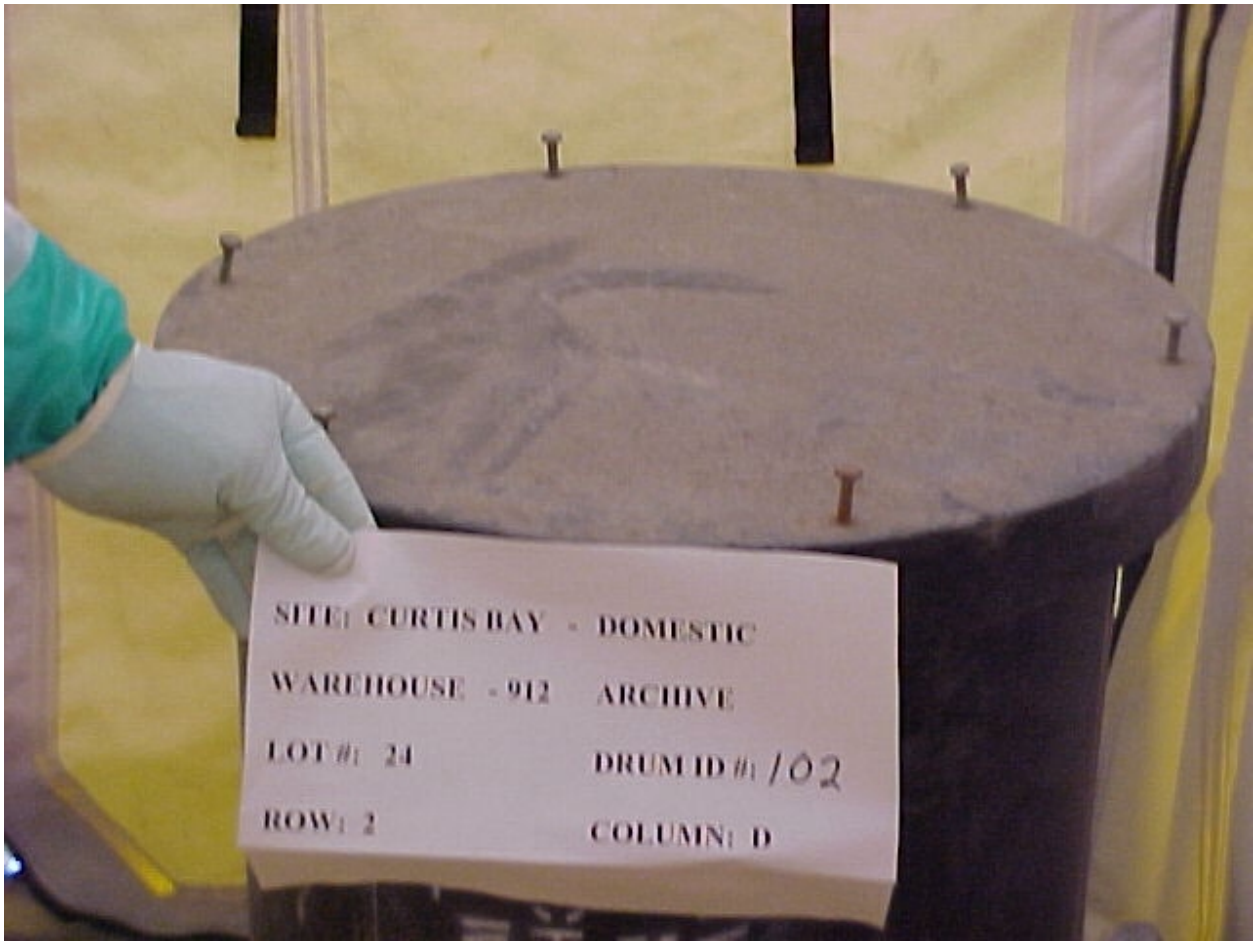
Date	7-10-2002	Time	14:00

Other Information

Photo No. 3 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

This picture shows were the drum lid bolts are placed with respect to the lid.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

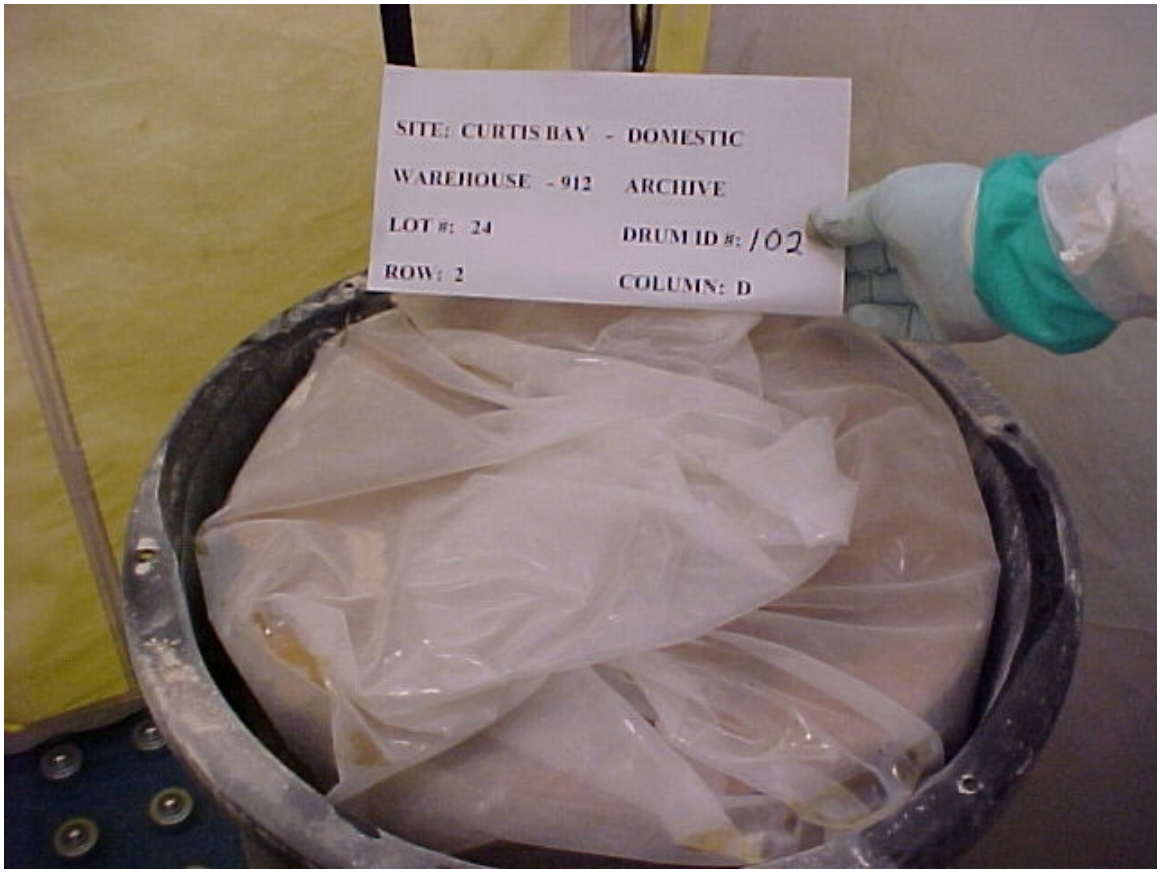
Date	7-10-2002	Time	14:00

Other Information

Photo No. 4 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

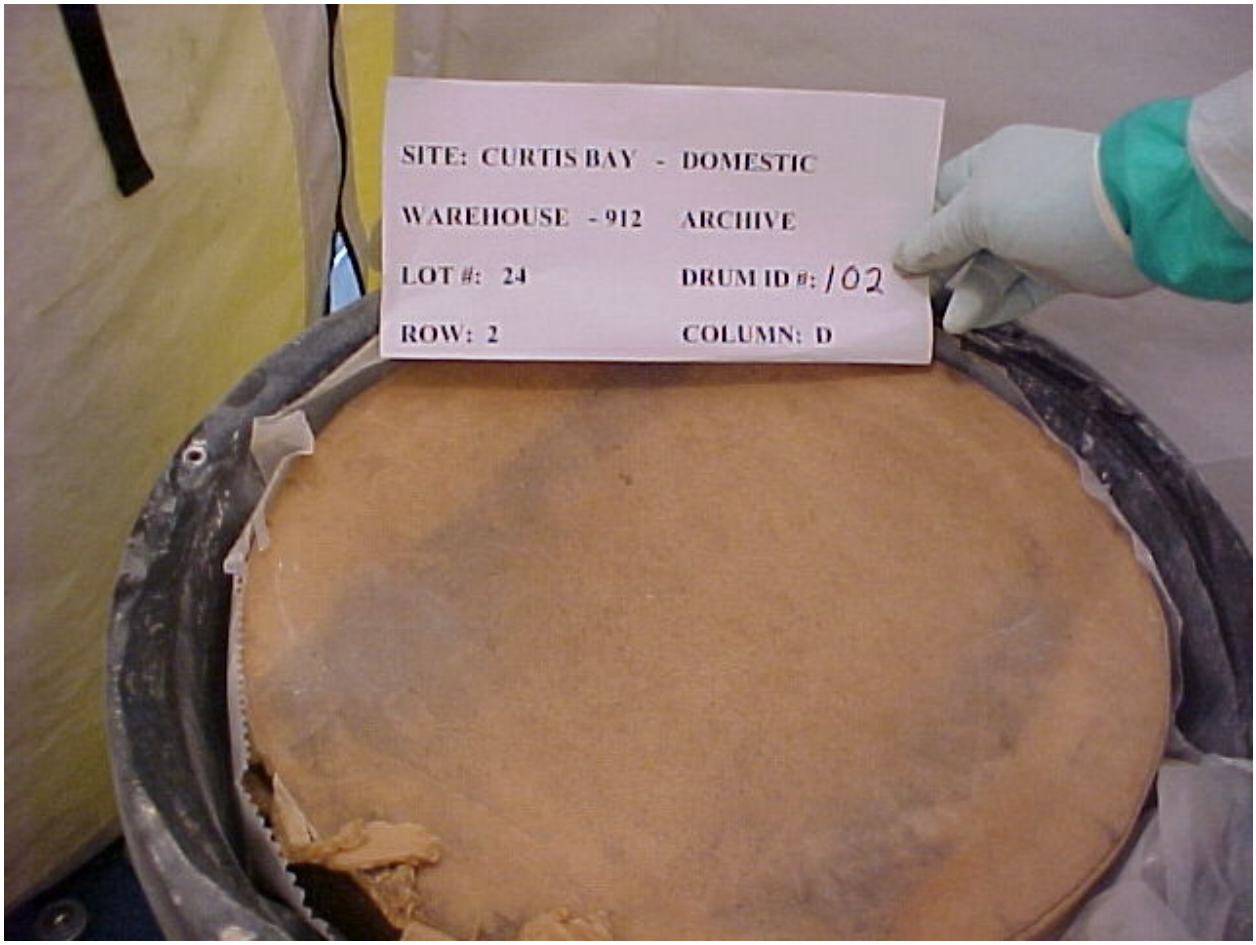
Date	7-10-2002	Time	14:00

Other Information

Photo No. 5 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

Fiber drum lid (attached to outermost fiber drum with a tape seal) – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

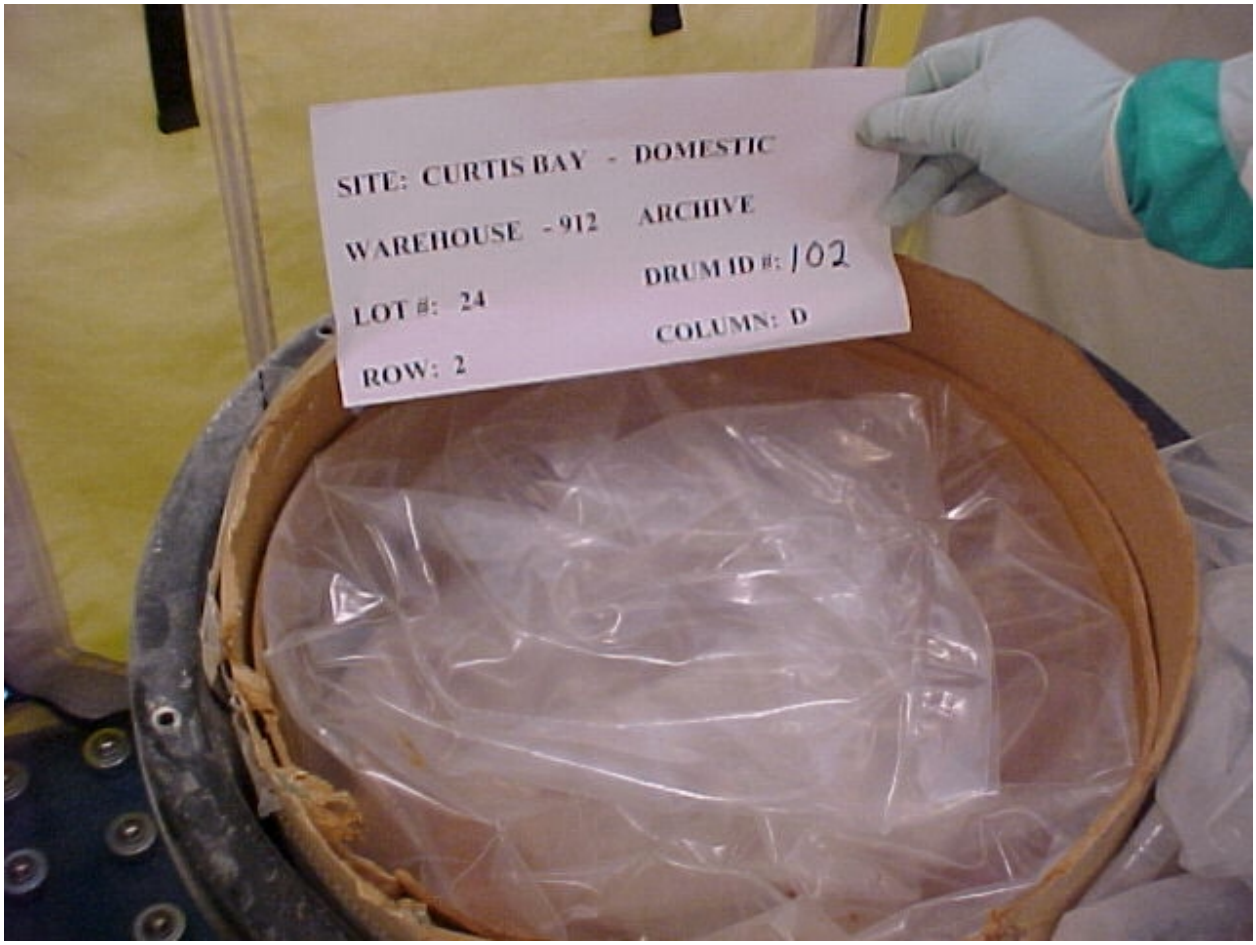
Date	7-10-2002	Time	14:00

Other Information

Photo No. 6 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

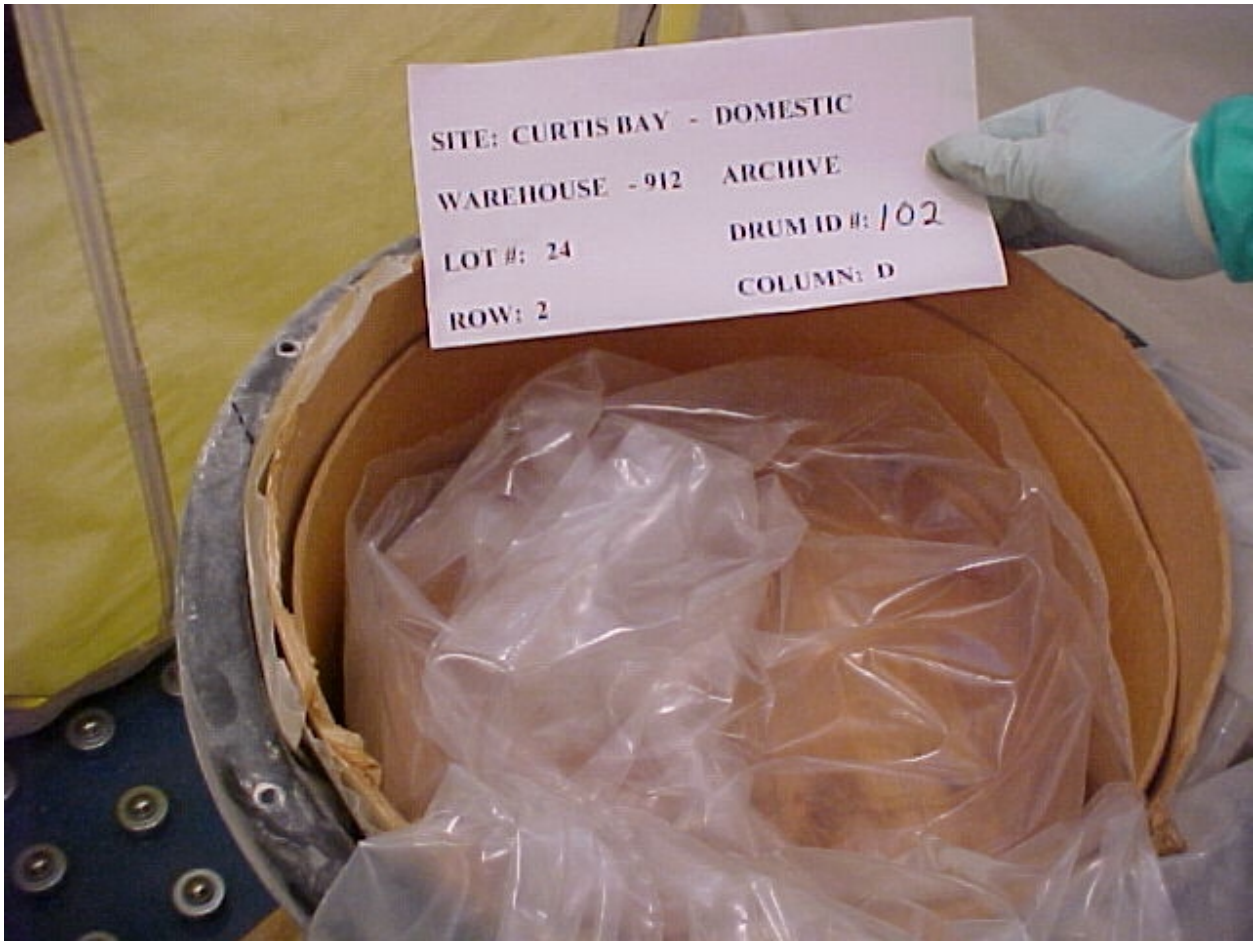
Date	7-10-2002	Time	14:00

Other Information

Photo No. 7 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

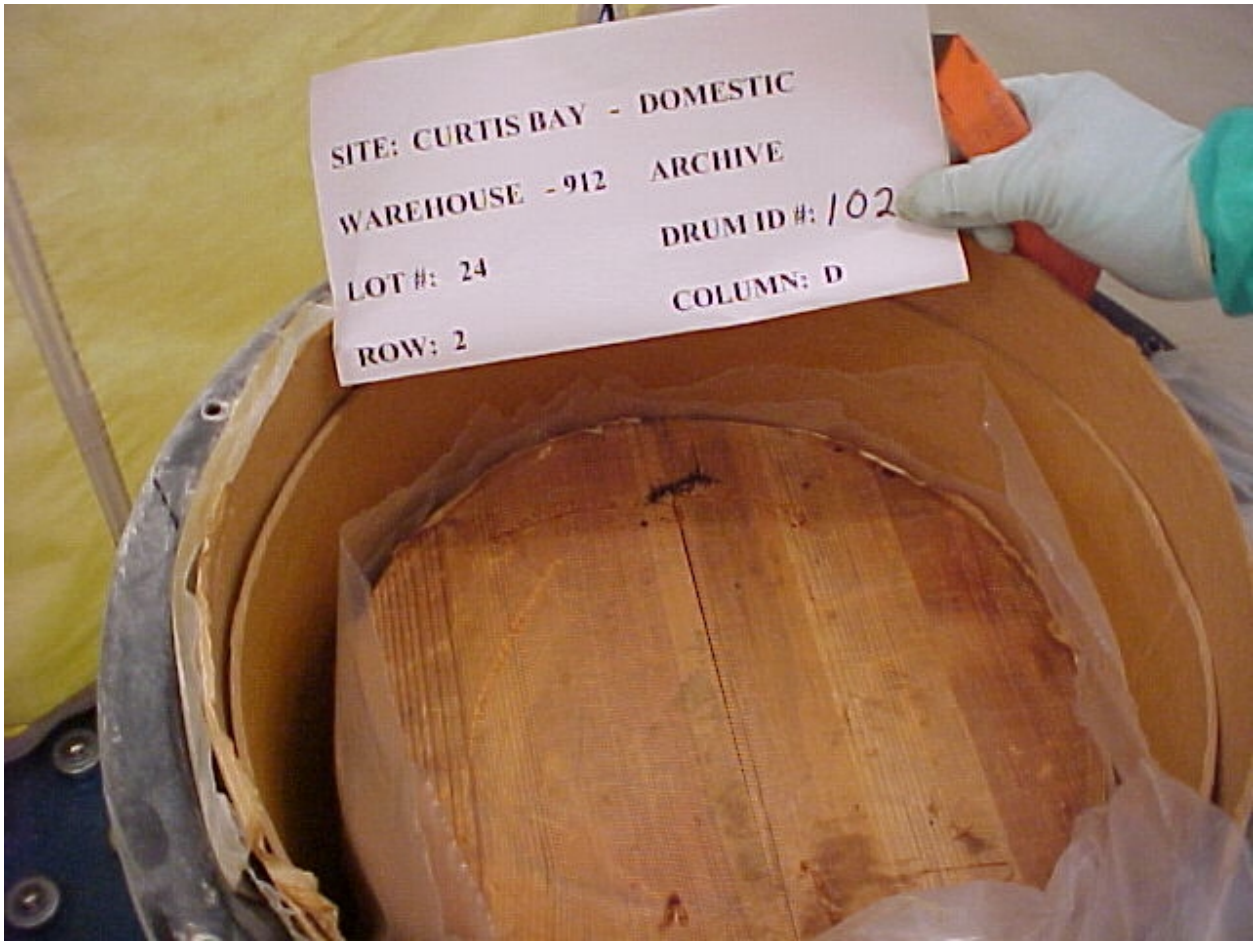
Date	7-10-2002	Time	14:00

Other Information

Photo No. 8 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

Wooden lid (mounted on innermost lab-pack/fiber drum) – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	14:00

Other Information

Photo No. 9 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

This picture shows the lab-pack/fiber drum container with the “paper layer” lid torn away from the top opening.
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	14:00

Other Information

Photo No. 10 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

4th poly liner/bag (thin film plastic) – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-10-2002	Time	14:00

Other Information

Photo No. 11 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

Thorium is solid, dry, monolithic in structure and white
Gases present in headspace above ThN – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
All gases removed with HEPA exhaust to 0% & 0 ppm levels
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	24	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	102	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	2
		Column	D

Inspection/Sample Date & Time

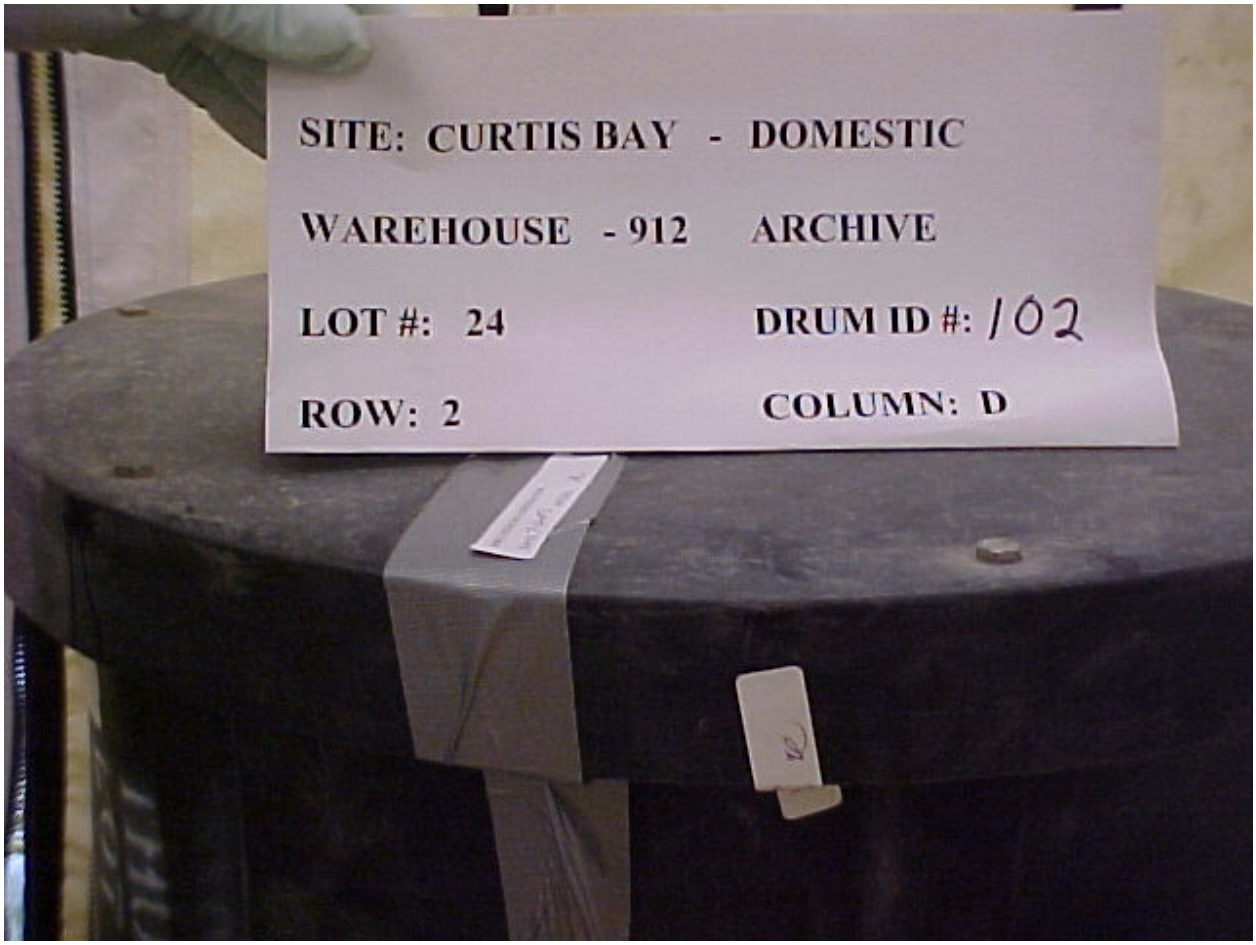
Date	7-10-2002	Time	14:00

Other Information

Photo No. 12 of 12

Dose Rate	Surface	22 mR/hr
	1 meter	2.1 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #25 - Drum #25
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 25 Drum ID #: 25 Location: Warehouse 911 – Column D – Row 9

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-01-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

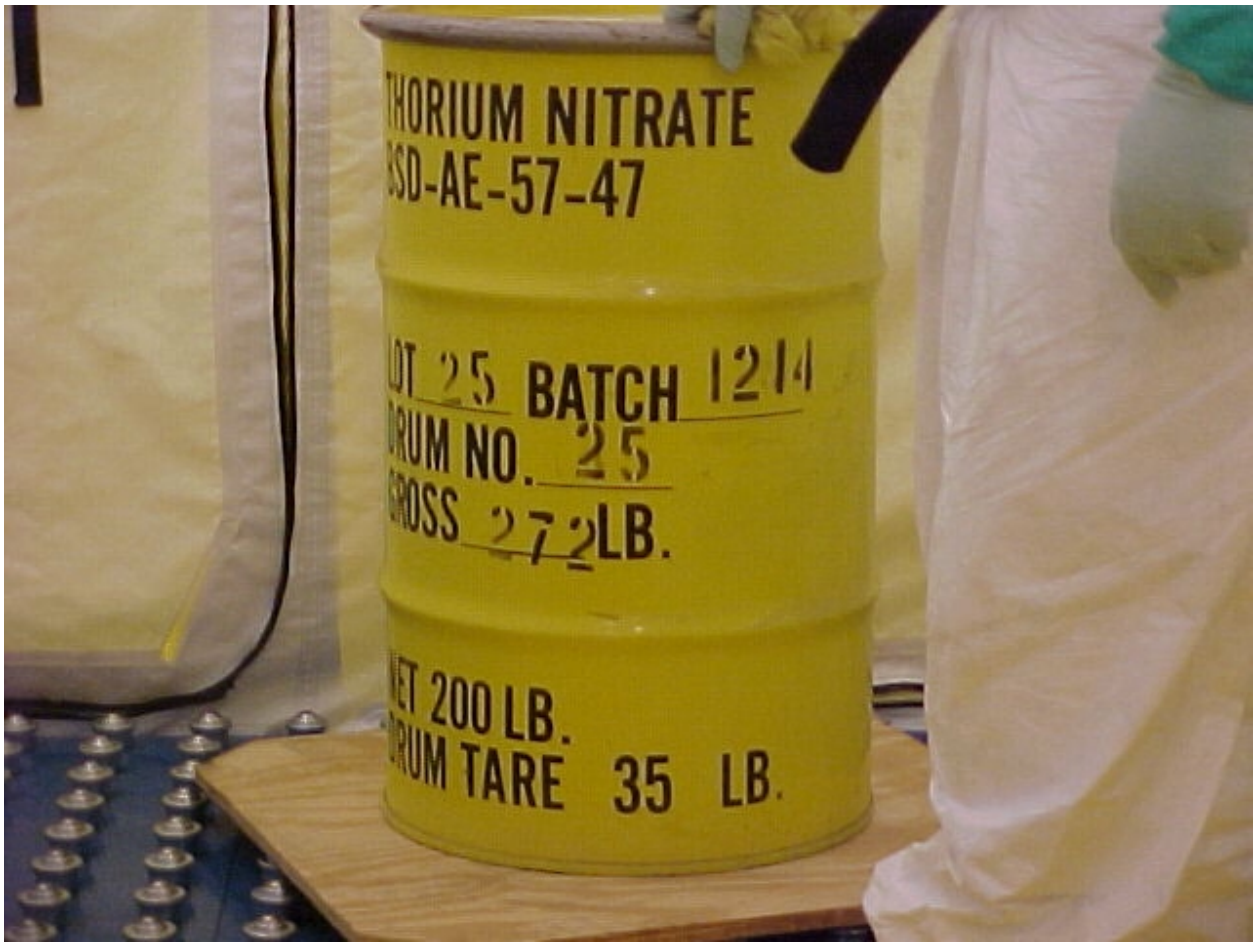
Date	7-1-2002	Time	14:55

Other Information

Photo No. 1 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

30-gal metal drum container – good condition
Gases vented from drum during lid removal operations



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:55

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

This picture shows the pressure inside of the drum that has lifted the plastic lid vertically out of the drum. No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

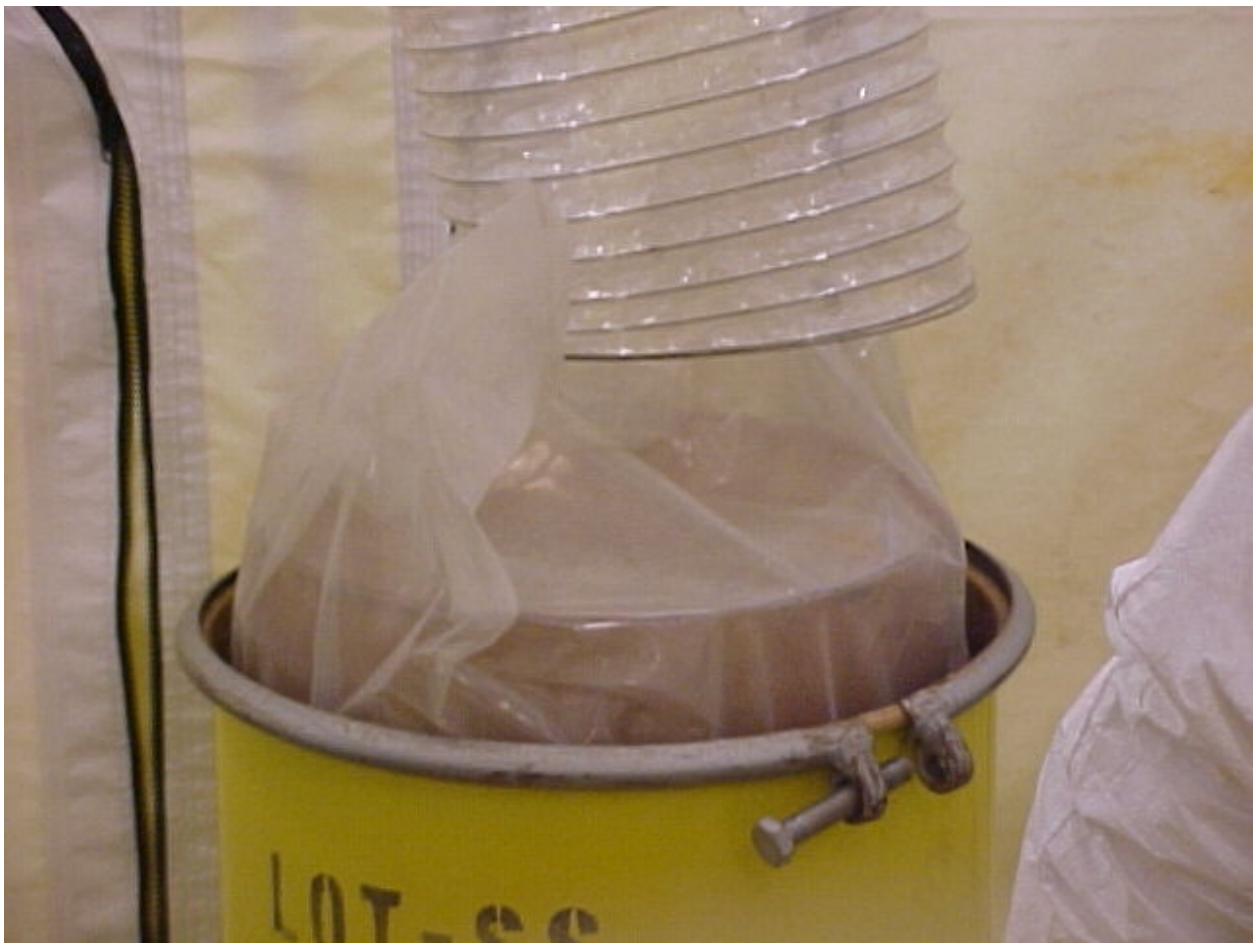
Date	7-1-2002	Time	14:55

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

This picture shows the pressure inside of the drum that has lifted the plastic bag vertically out of the drum.
1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:55

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Opening the 1st poly bag shows the fiber drum lid raised but in good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:55

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Picture still shows inflated condition of bags indicating internal pressure buildup inside of this bag.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

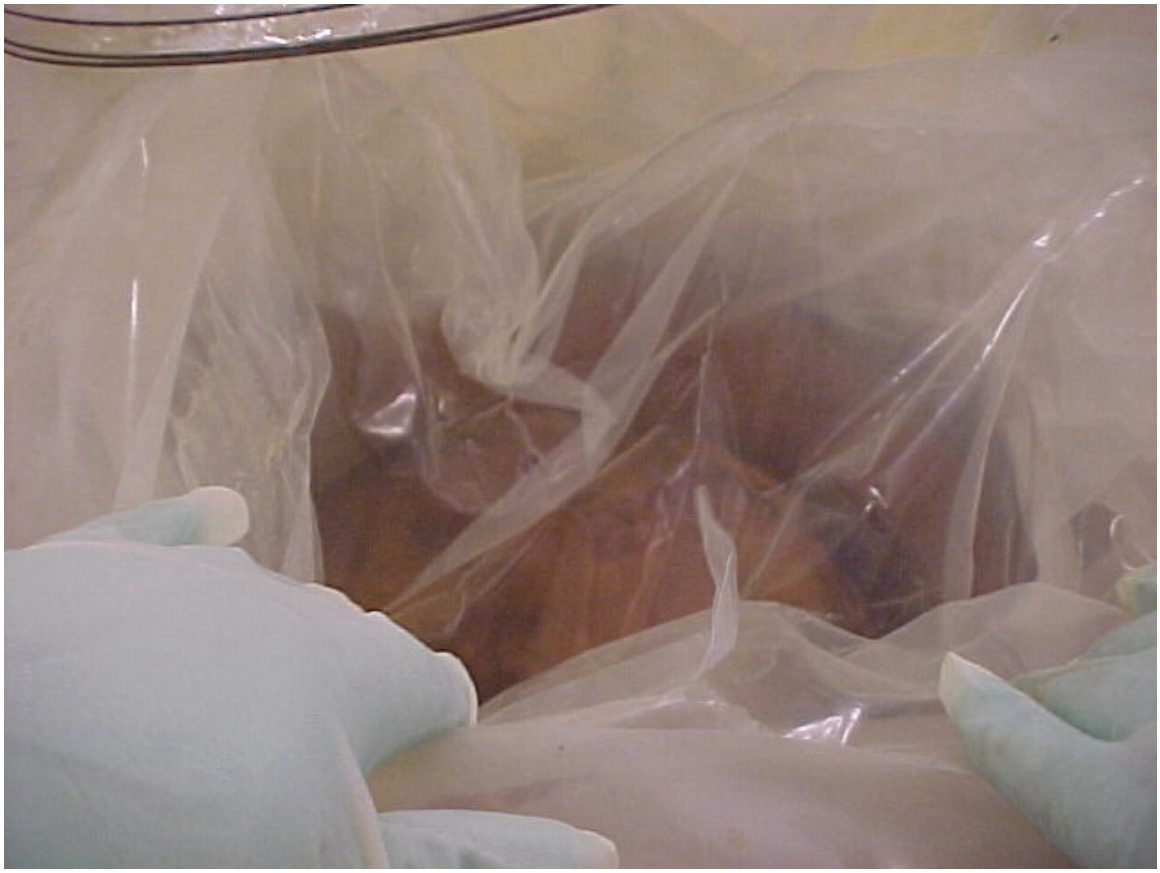
Date	7-1-2002	Time	14:55

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:55

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Wooden lid (mounted to inner lab-pack/fiber drum) – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:55

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag (final bag – thin film plastic) – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

Date	7-1-2002	Time	14:55

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

ThN material – solid – dry – white – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	25	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	25	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	9
		Column	D

Inspection/Sample Date & Time

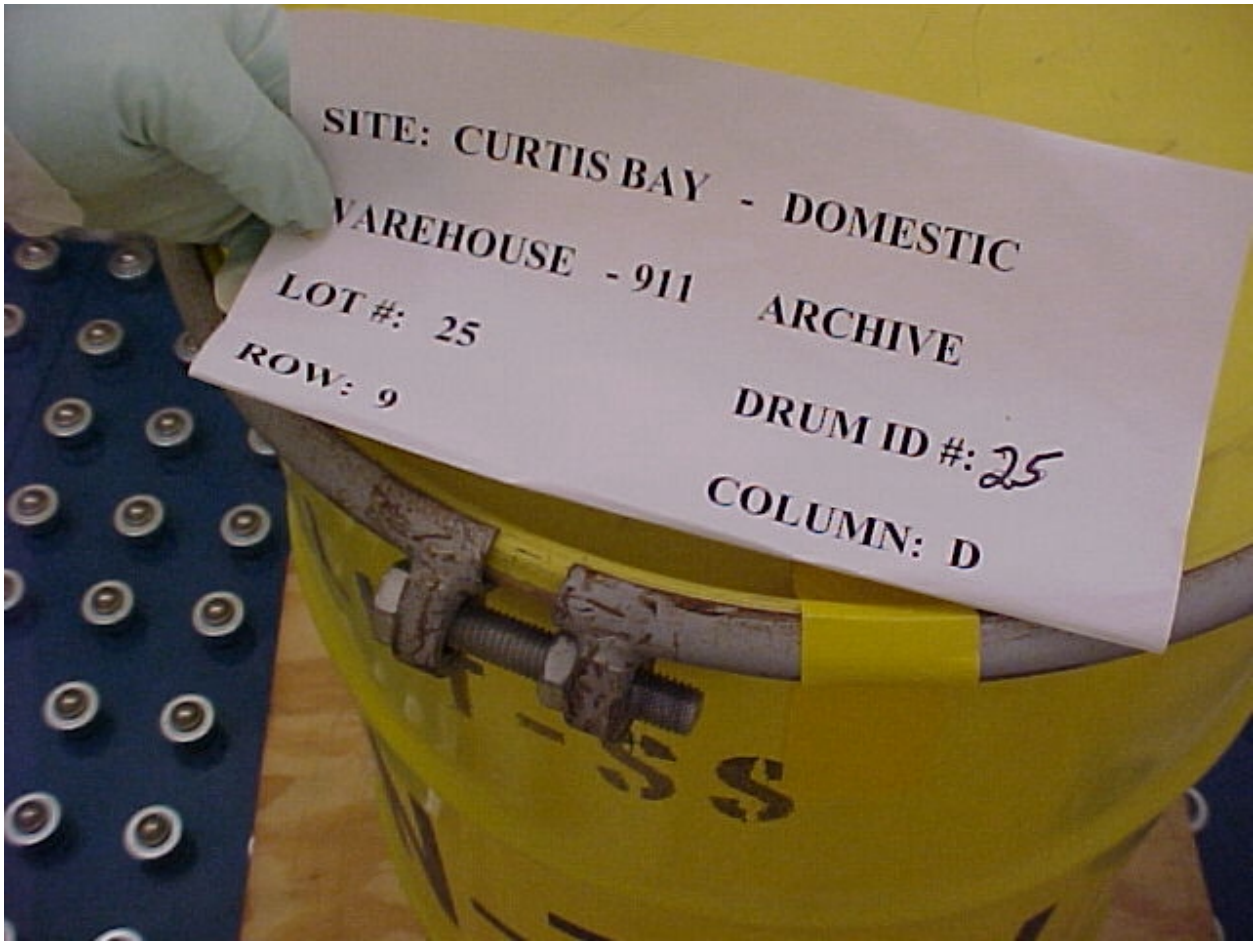
Date	7-1-2002	Time	14:55

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete
No gases present in the breathing zone.



Curtis Bay Depot
Lot #26 - Drum #202
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 26 Drum ID #: 202 Location: Warehouse 912 – Column D – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 5.2% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

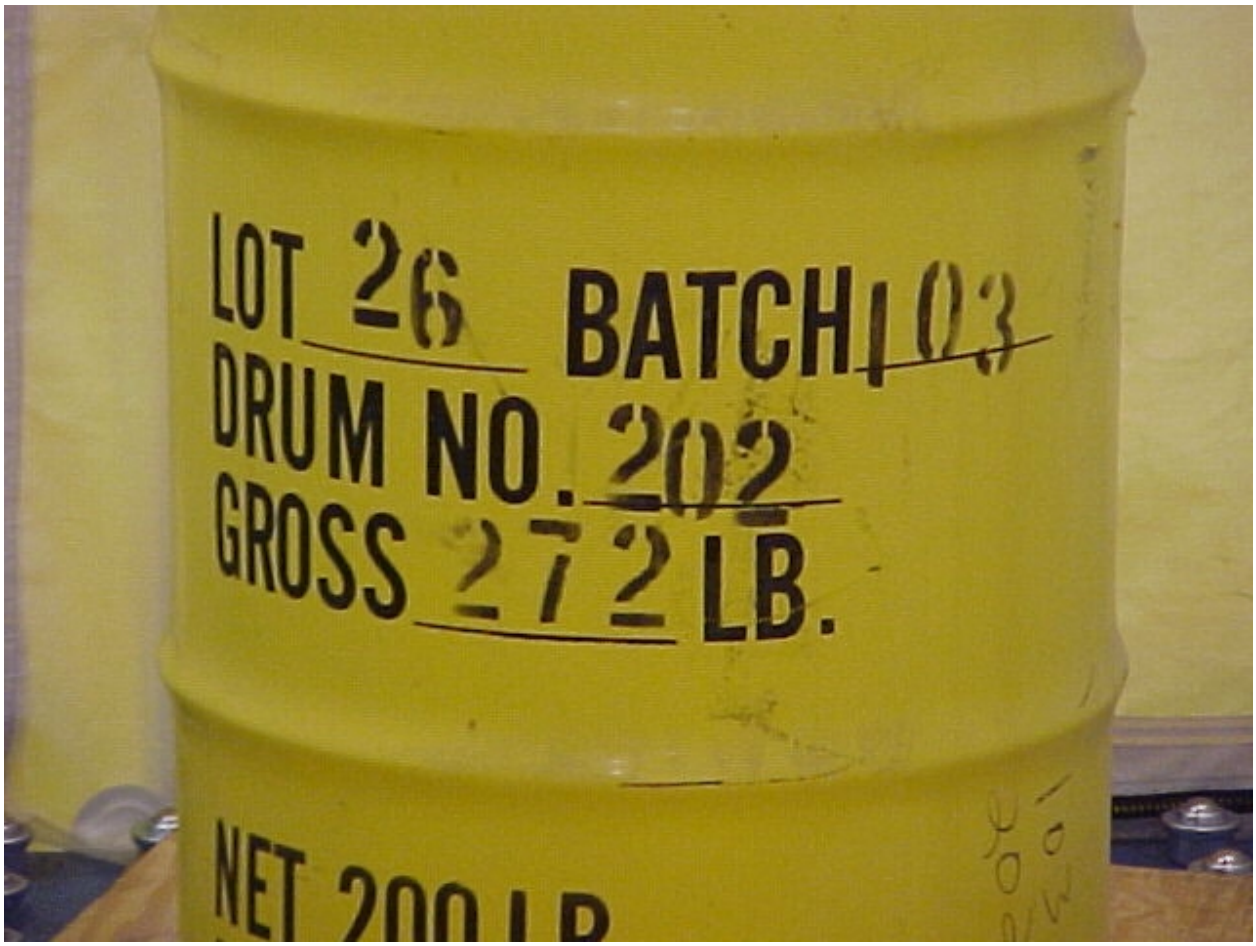
Date	7-9-2002	Time	13:30

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

30-gal drum – good condition
Gases vented from drum during drum lid removal operations.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Black plastic lid – good condition
Pressure buildup internal to this packaging layer has resulted in this layer being pushed out of the container vertically.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

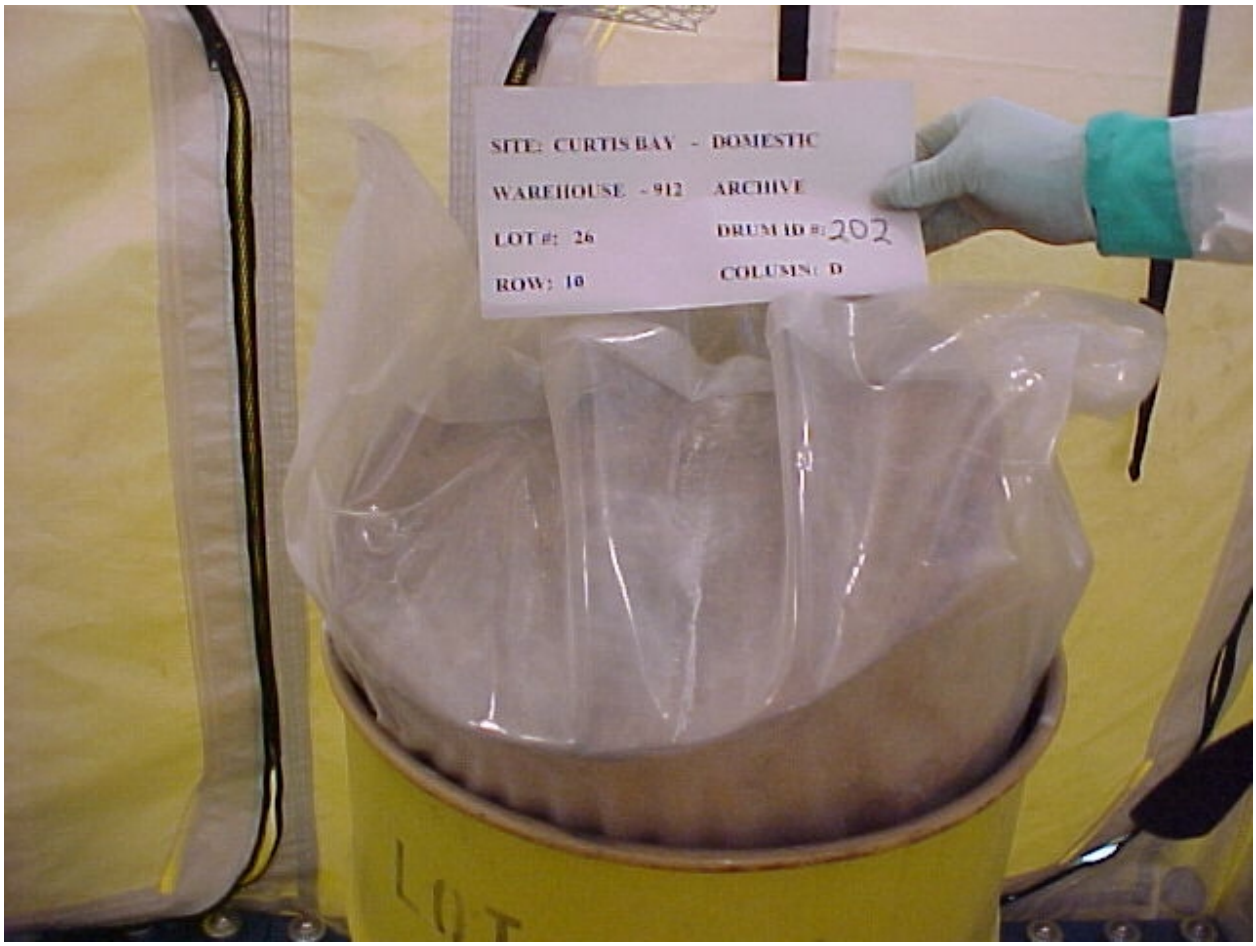
Date	7-9-2002	Time	13:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

1st poly liner/bag – good condition
Pressure buildup internal to this packaging layer has resulted in this layer being pushed out of the container vertically.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

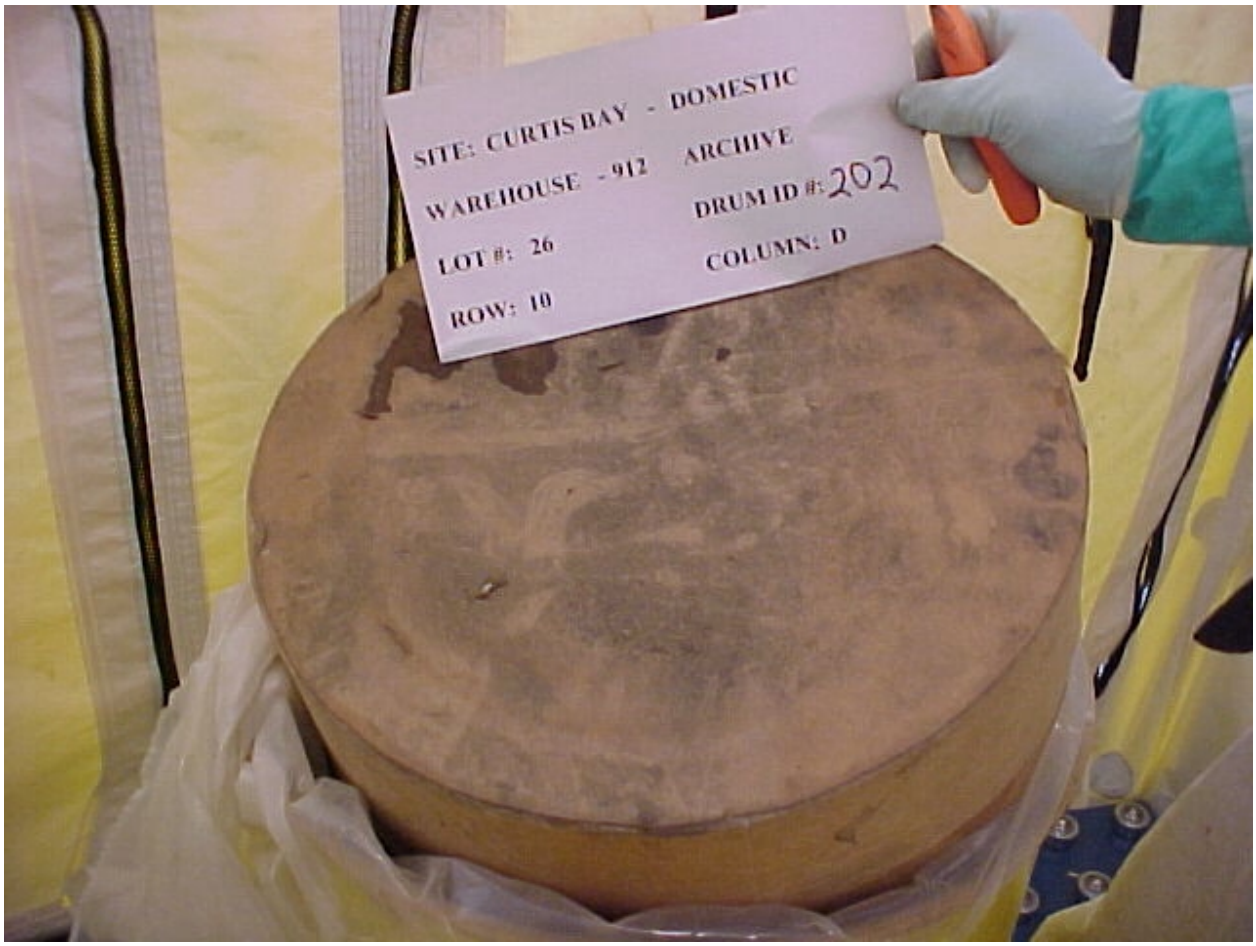
Date	7-9-2002	Time	13:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Fiber drum lid (mounted on outermost fiber drum inside of the container) – good condition
Pressure buildup internal to this packaging layer has resulted in this layer being pushed out of the container vertically.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

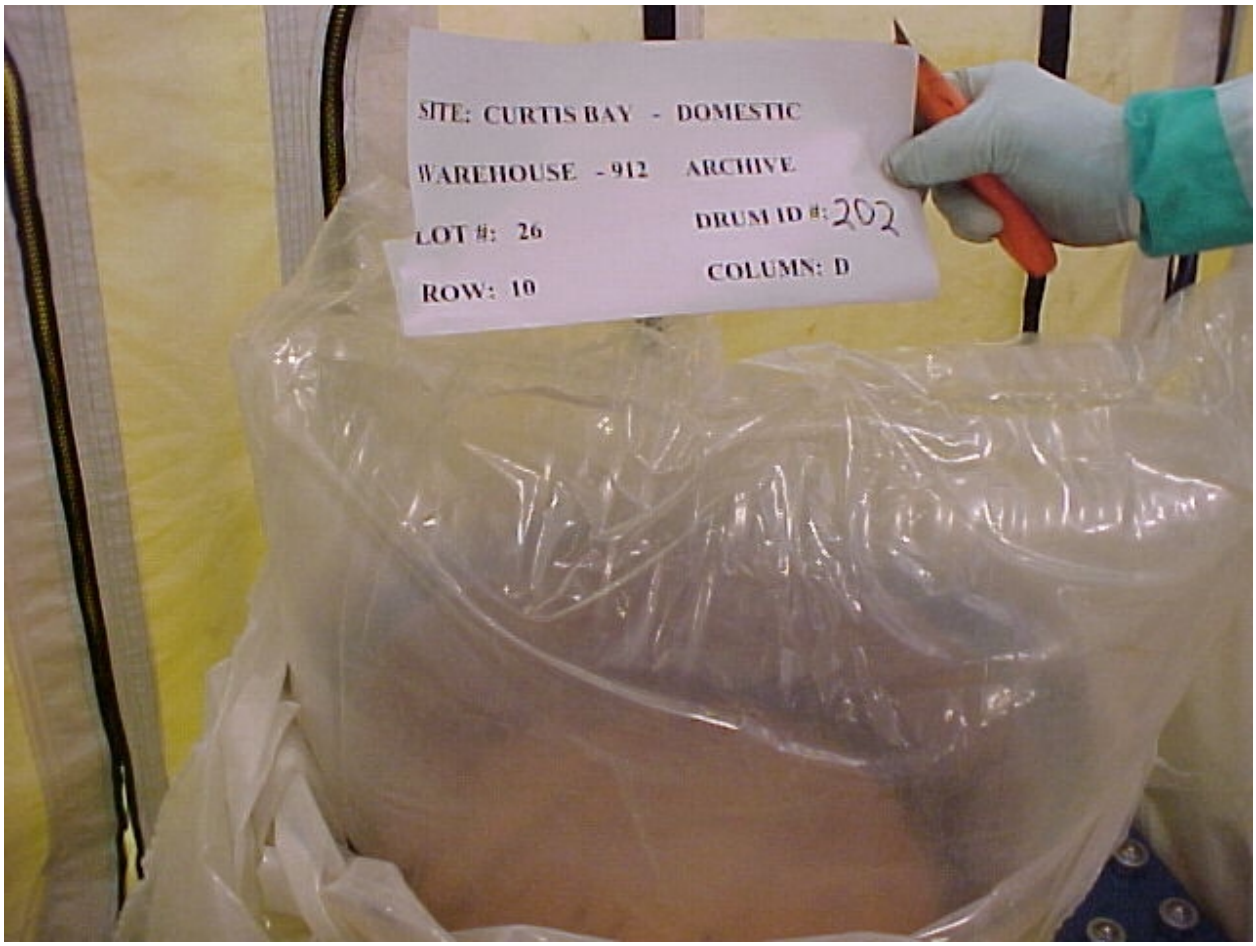
Date	7-9-2002	Time	13:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

2nd poly liner/bag – good condition
Pressure buildup internal to this packaging layer has resulted in this layer being pushed out of the container vertically.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

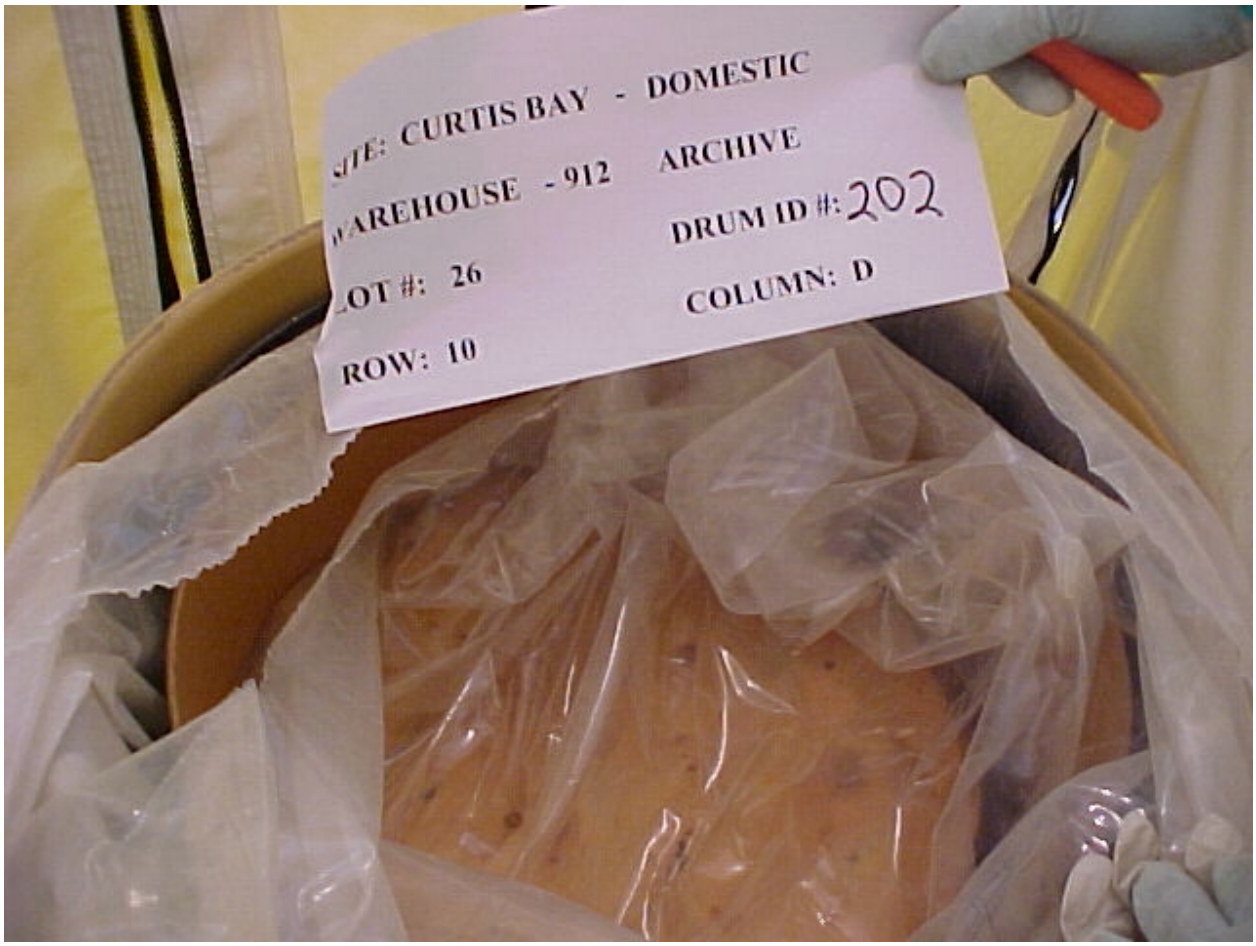
Date	7-9-2002	Time	13:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

3rd poly liner/bag – good condition
Pressure buildup internal to this packaging layer has resulted in this layer being pushed out of the container vertically.
Opened poly bag - No gases present in the breathing zone.
Gases in headspace of bag – CH4 – 5.2% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented – all gases dissipated via HEPA exhaust.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Wooden lid – good condition (mounted on inner lab-pack/fiber drum)
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

4th poly liner/bag – good condition
Inflated condition of bag shows gas generation from ThN material
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:30

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

ThN material – monolith – white – solid - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	26	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	202	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	D

Inspection/Sample Date & Time

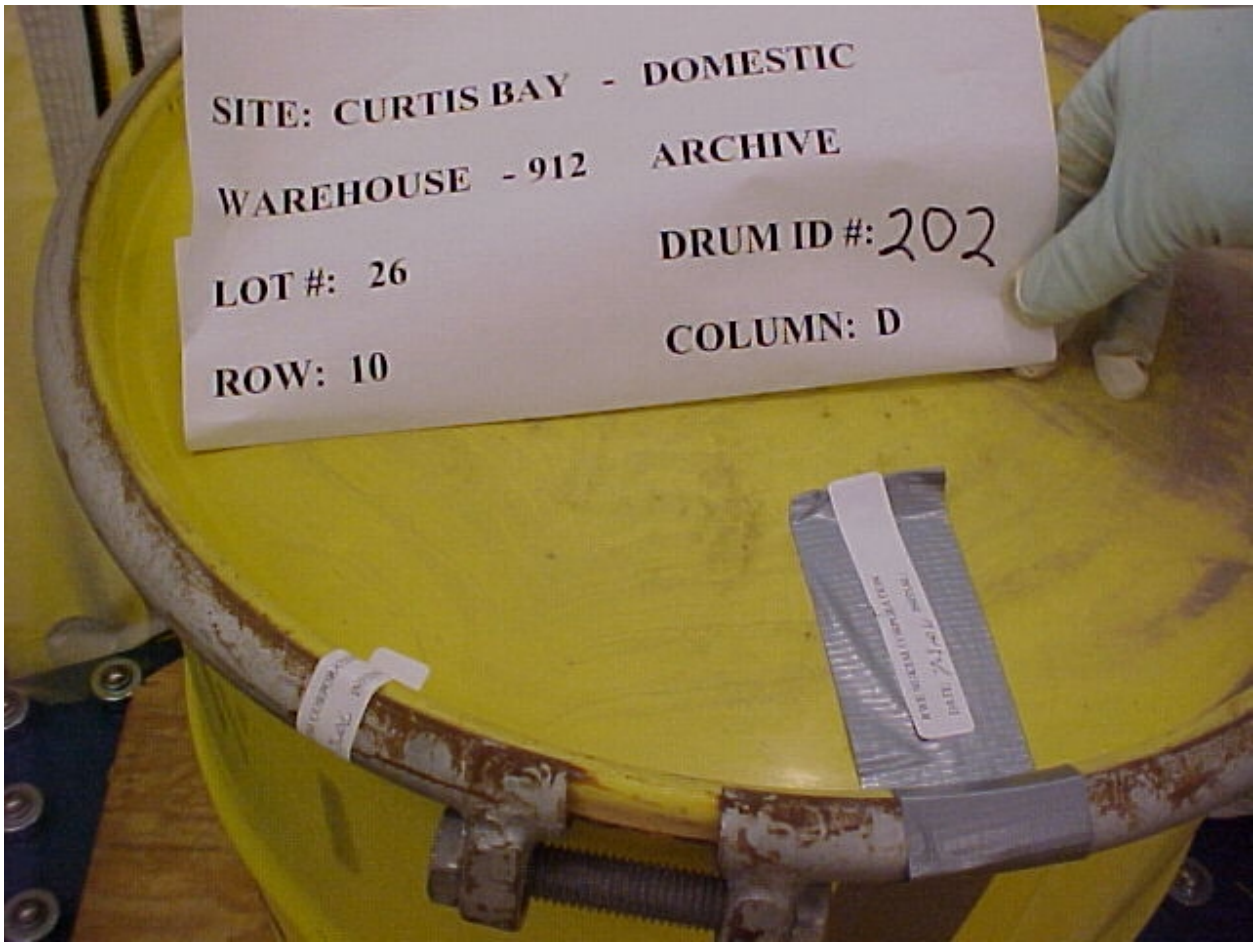
Date	7-9-2002	Time	13:30

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.2 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #32 – Drum #152
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 32 Drum ID #: 152 Location: Warehouse 912 – Column C – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container (no wooden lid)
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 8 Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #8: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-09-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

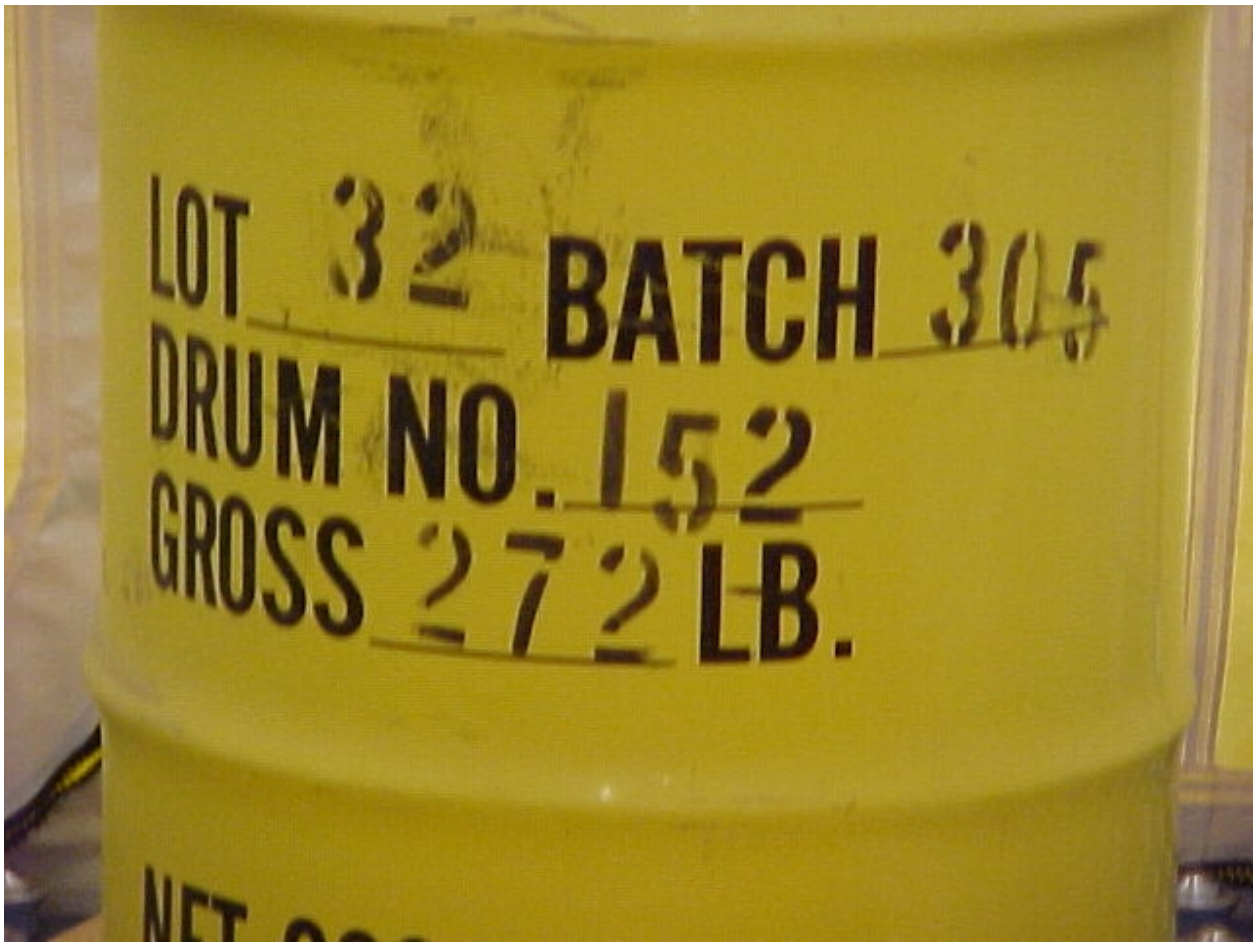
Date	7-9-2002	Time	13:50

Other Information

Photo No. 1 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

30-gal drum – drum lid had a significant "kink" (drum pressurization sign)
Gases vented from drum during drum lid removal operations.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

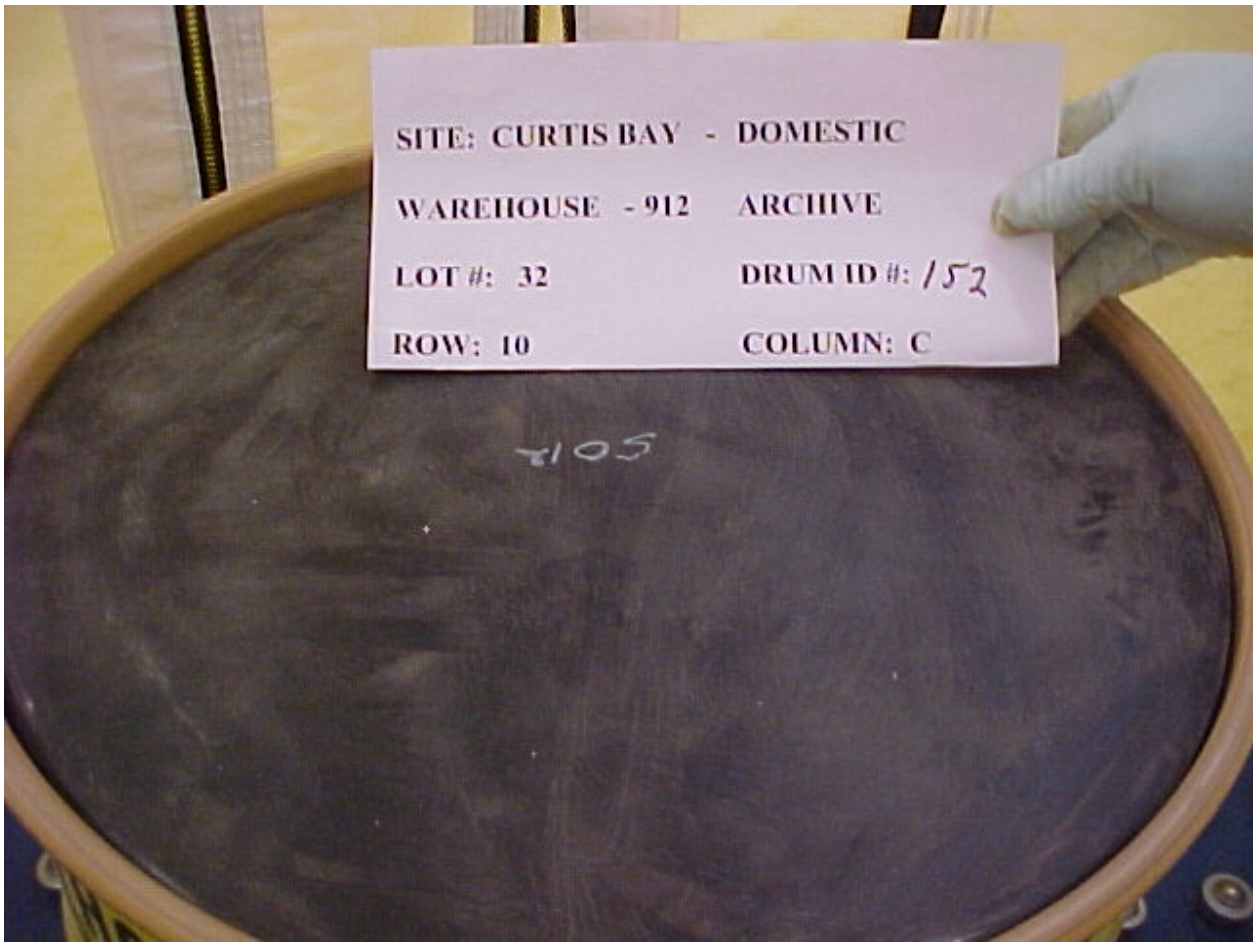
Date	7-9-2002	Time	13:50

Other Information

Photo No. 2 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Black plastic lid – good condition (mounted on inner rigid drum liner)
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

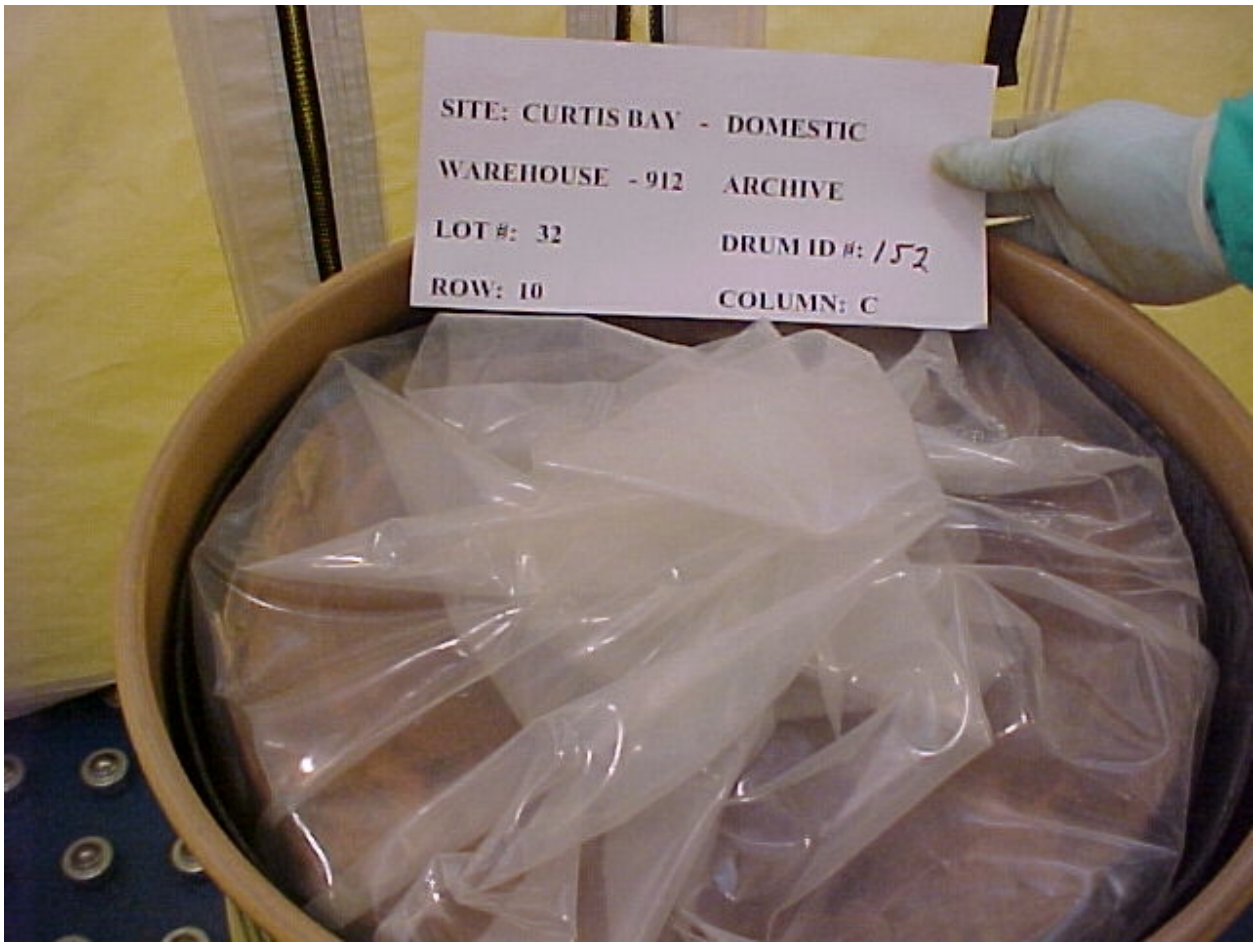
Date	7-9-2002	Time	13:50

Other Information

Photo No. 3 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

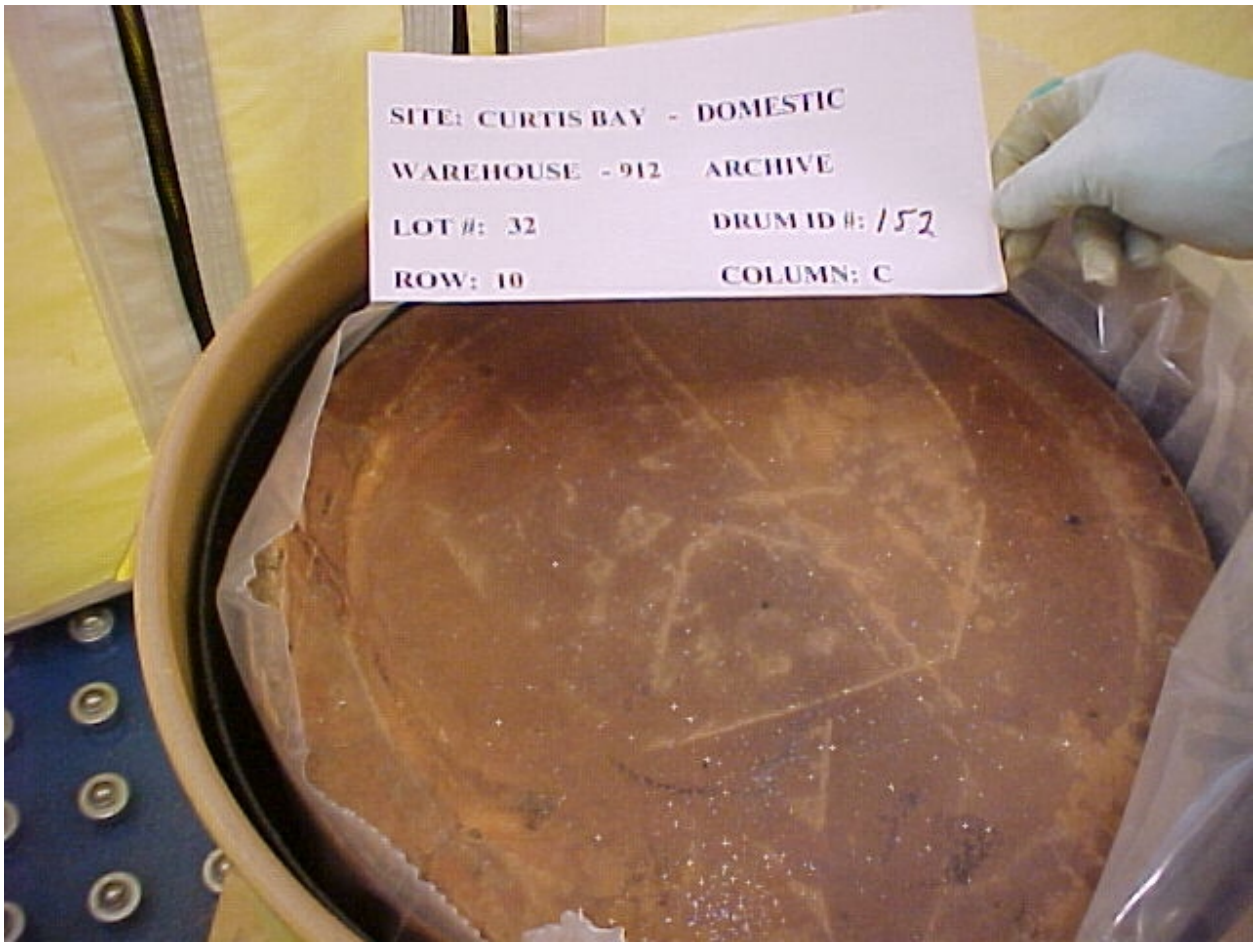
Date	7-9-2002	Time	13:50

Other Information

Photo No. 4 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

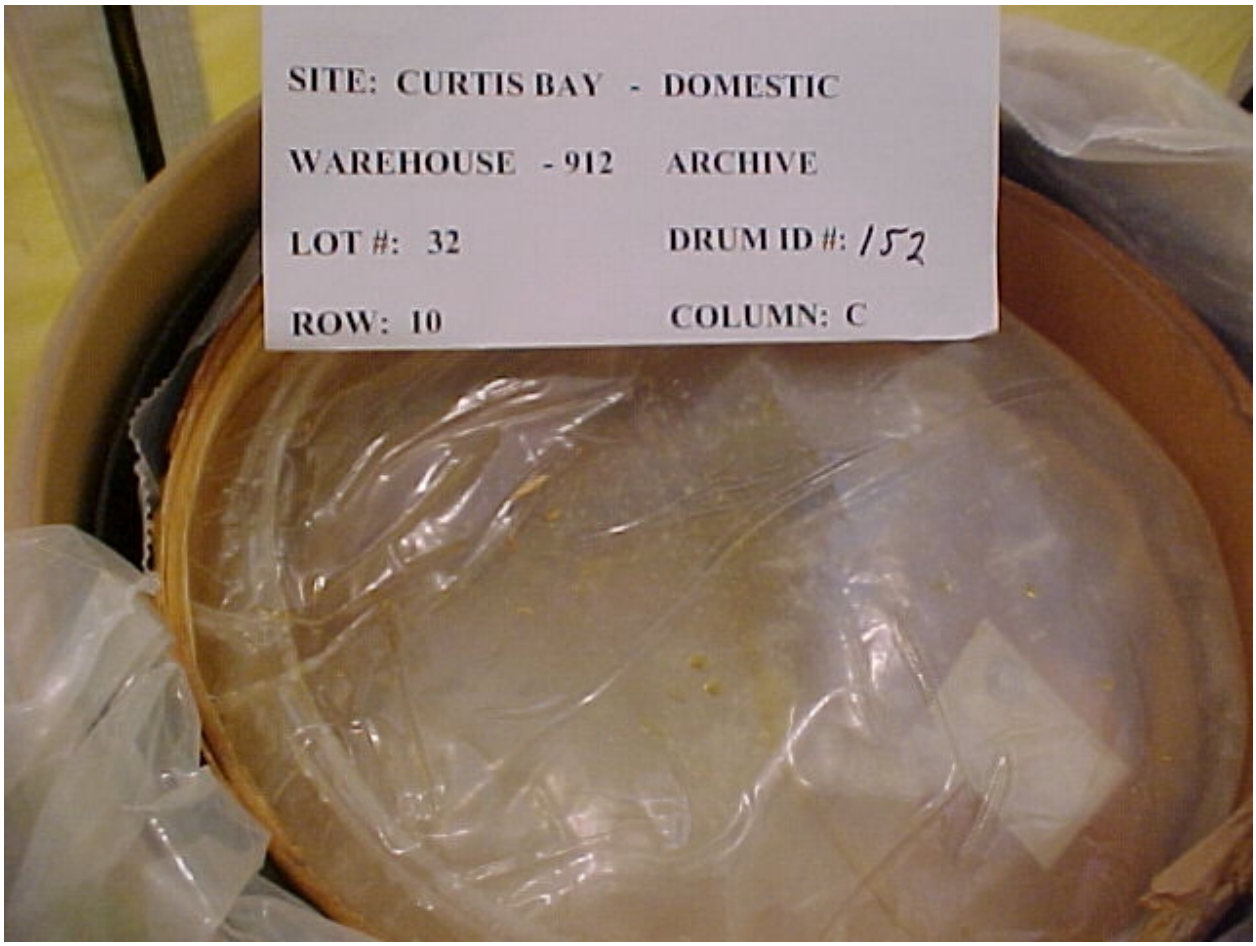
Date	7-9-2002	Time	13:50

Other Information

Photo No. 5 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

2nd poly liner/bag – good condition
Pressure built up inside container raises the poly liner/bag.
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

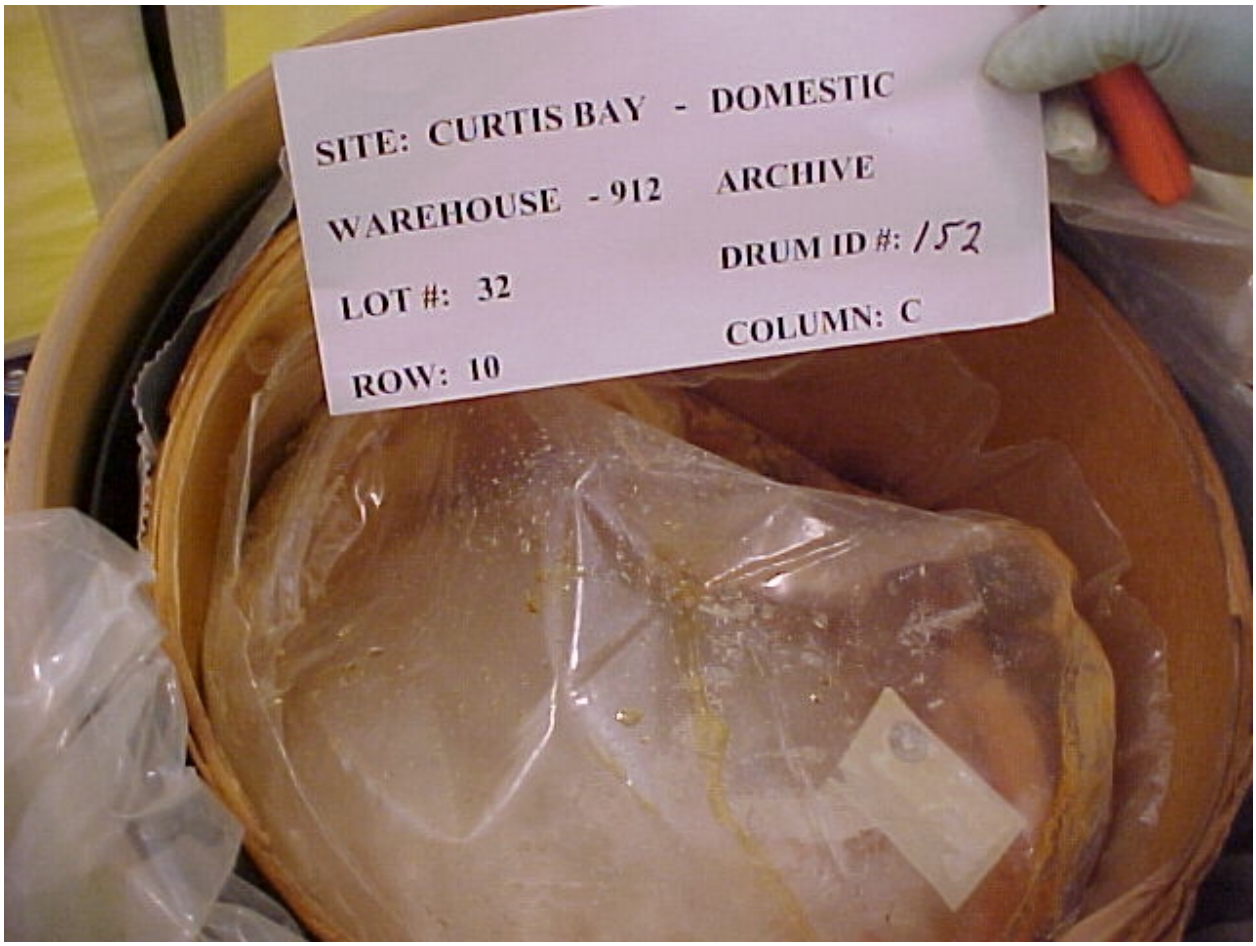
Date	7-9-2002	Time	13:50

Other Information

Photo No. 6 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

3rd poly liner/bag – hole in bag & damp inside the bag
No wooden lid on the inner fiber/lab-pack drum
Pressure built up inside container raises the poly liner/bag.
Opened poly liner/bag - No gases present in the breathing zone
Gases present in bag's headspace – CH4 – 4.6% LEL - NO – +50 ppm - NOx - +50 ppm
Drum vented – gases dissipated out of containment tent via HEPA blower



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:50

Other Information

Photo No. 7 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

4th poly liner/bag – good condition (thin film plastic lining)
The lab-pack/fiber drum is badly damaged and damp.
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:50

Other Information

Photo No. 8 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

ThN material – monolith – white – solid - dry
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	32	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	152	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	C

Inspection/Sample Date & Time

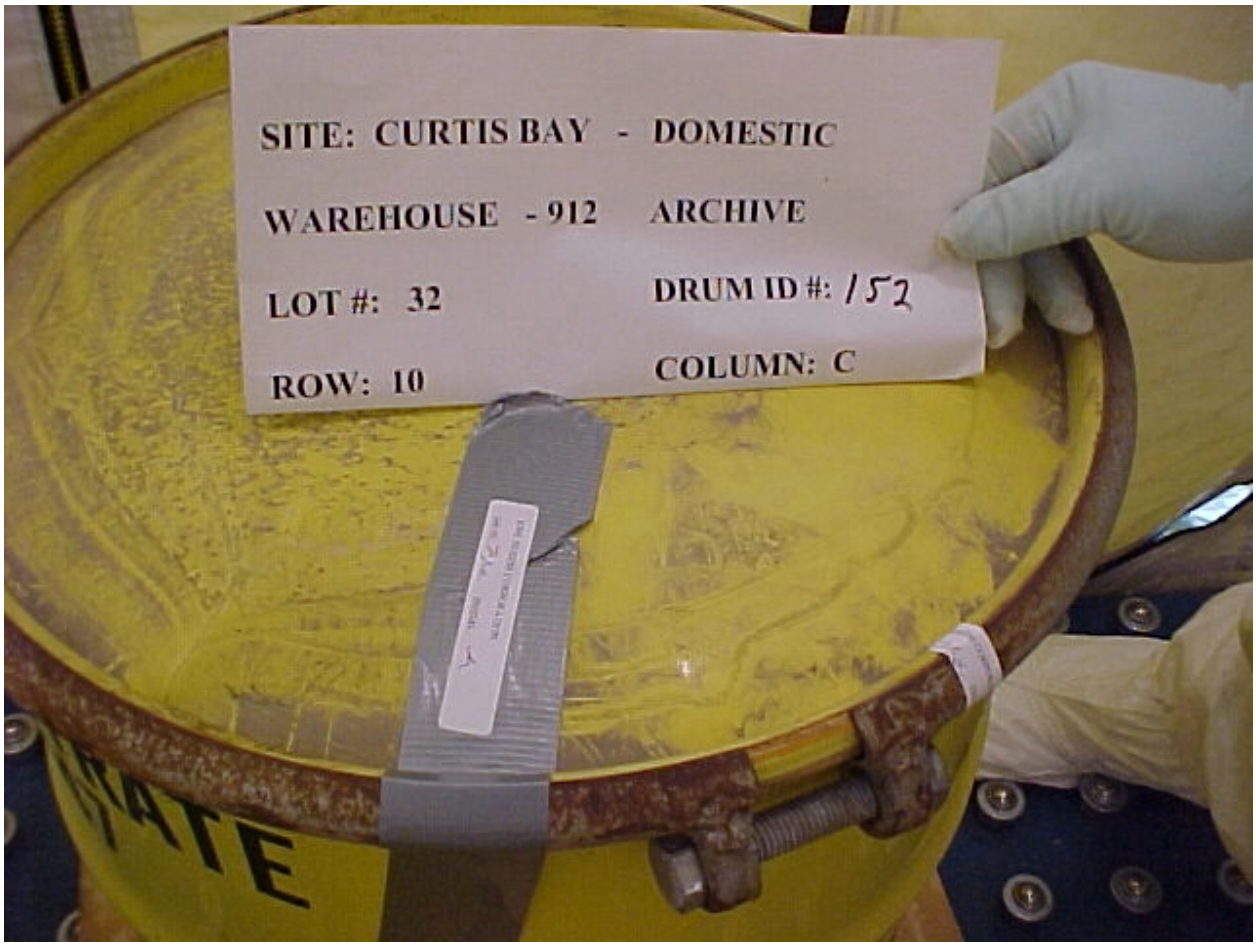
Date	7-9-2002	Time	13:50

Other Information

Photo No. 9 of 9

Dose Rate	Surface	24 mR/hr
	1 meter	3.2 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #47 - Drum #204
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 47 Drum ID #: 204 Location: Warehouse 912 – Column E – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 1.7 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

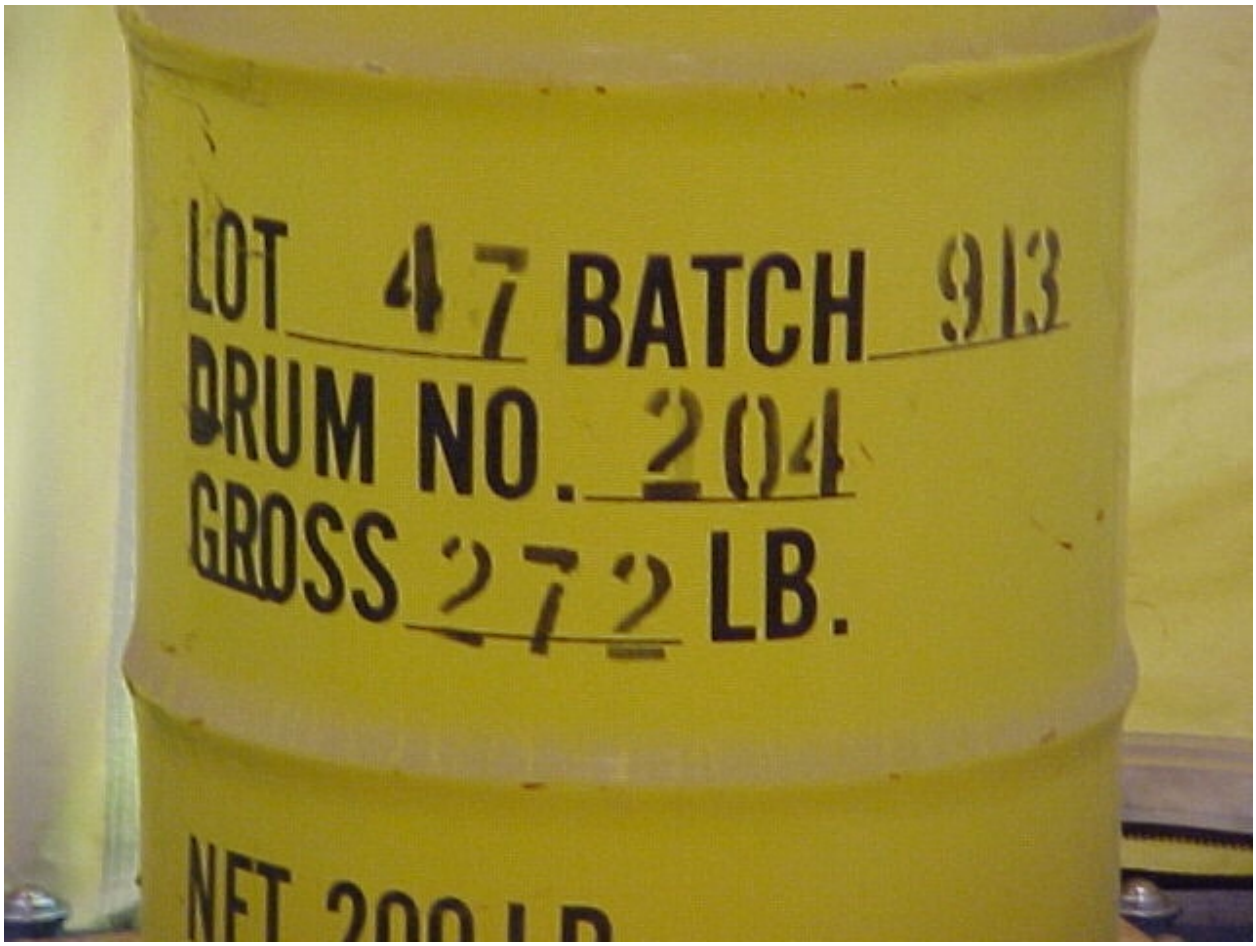
Date	7-9-2002	Time	13:00

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

30-gal metal drum – good condition
Gases vented from drum during drum lid removal operations



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

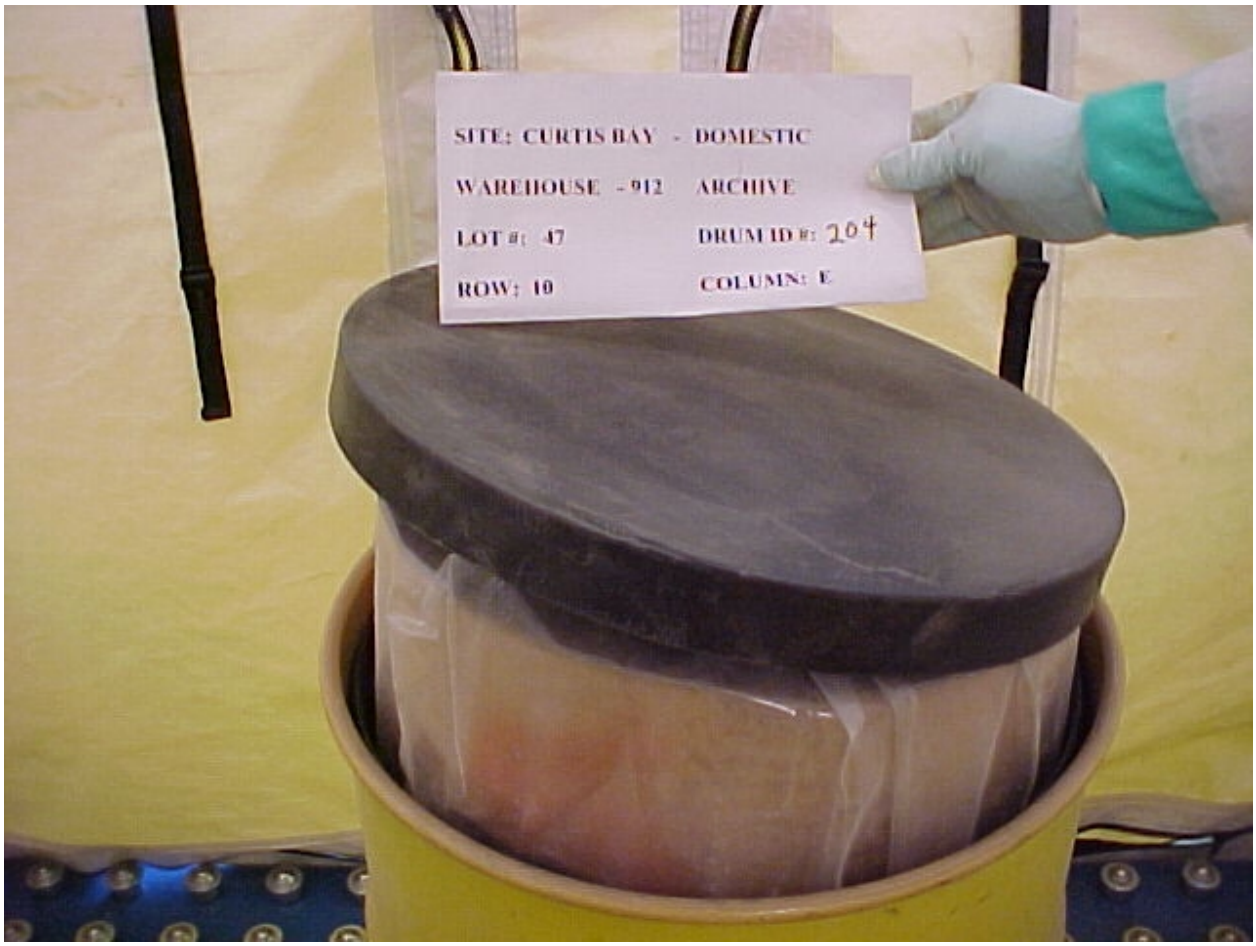
Date	7-9-2002	Time	13:00

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

Black plastic lid – good condition
Pressure buildup internal to this packaging layer raises this layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

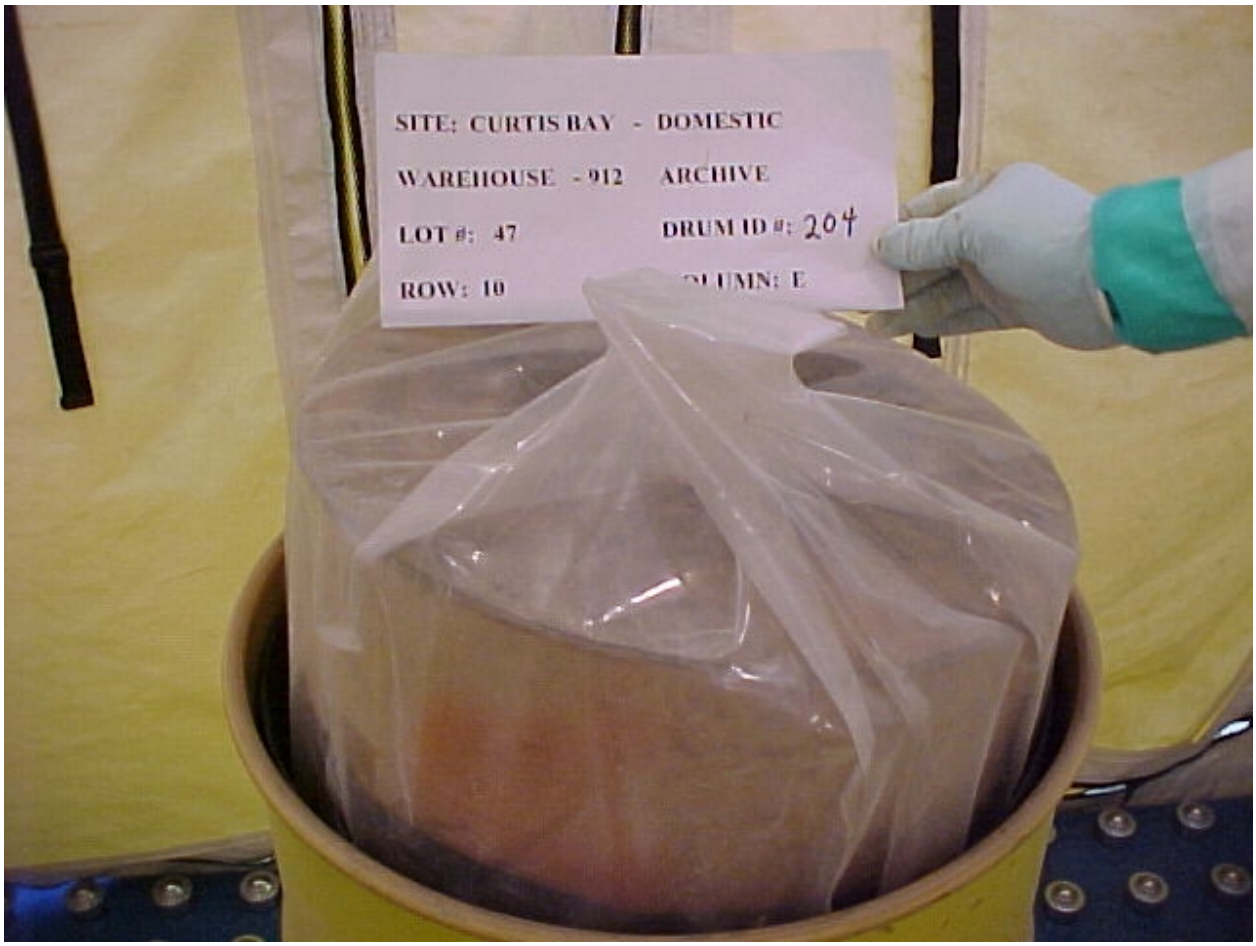
Date	7-9-2002	Time	13:00

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

1st poly liner/bag – good condition
Pressure buildup internal to this packaging layer raises this layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

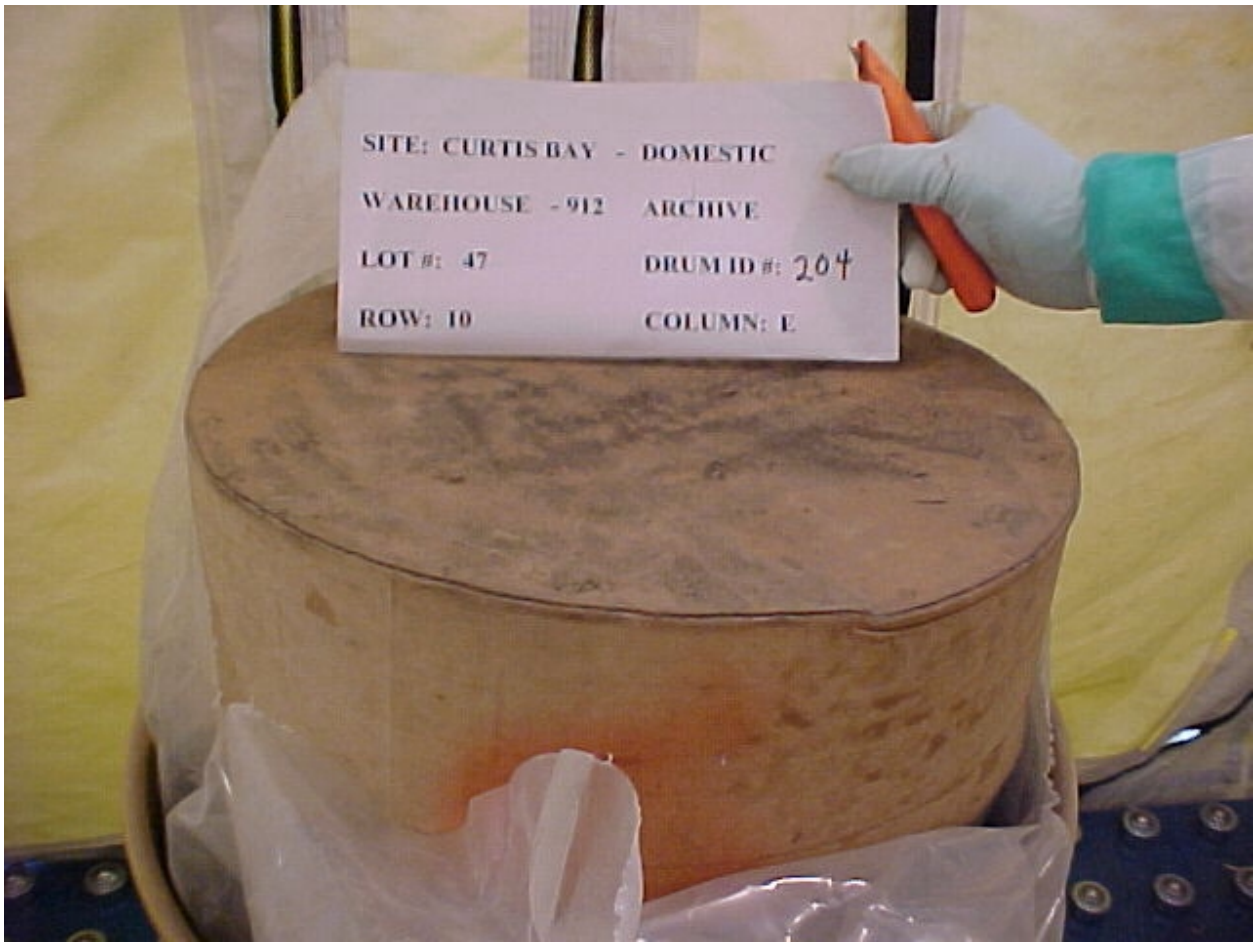
Date	7-9-2002	Time	13:00

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

Fiber lid (from outermost fiber drum internal to container) – good condition
Pressure buildup internal to this packaging layer raises this layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

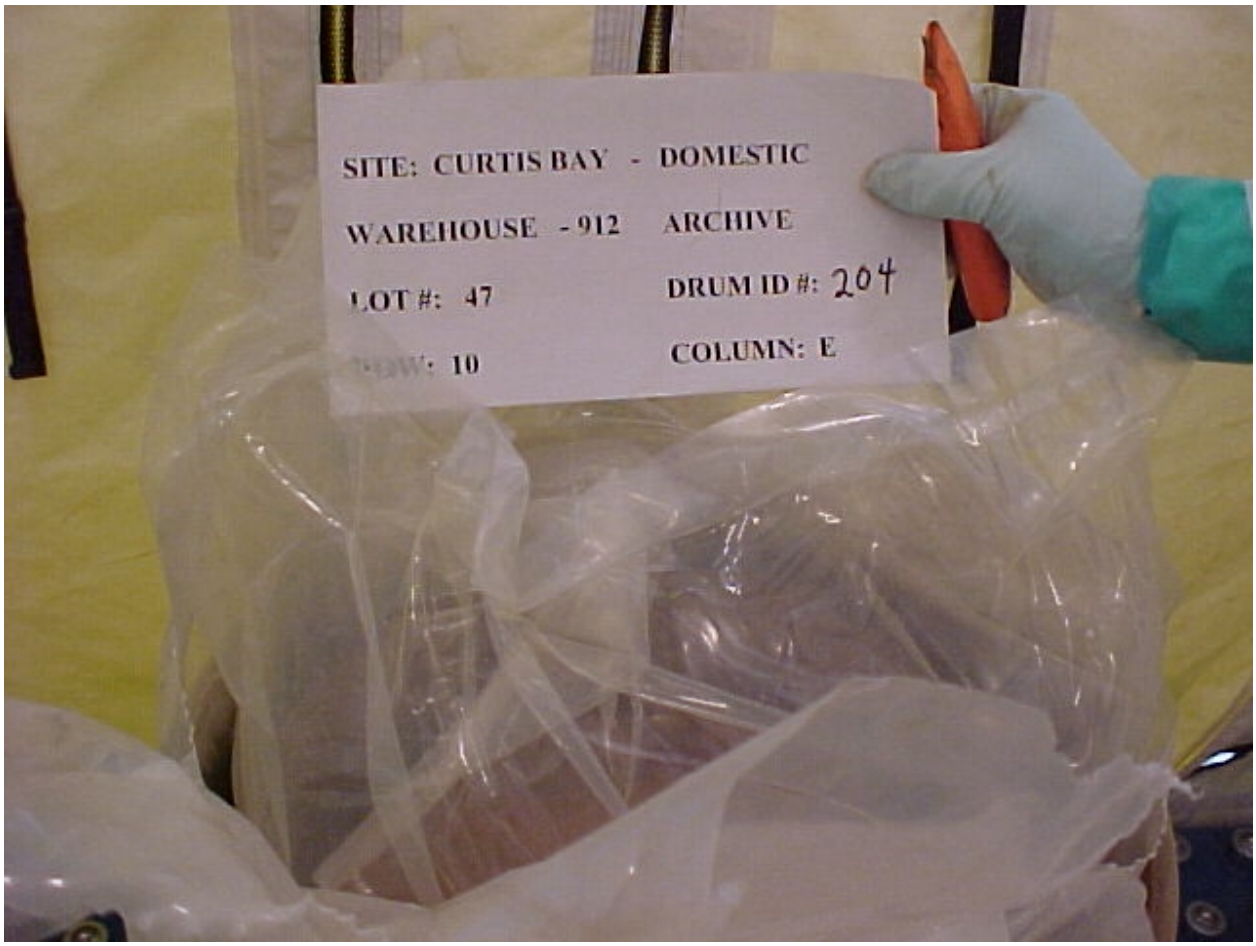
Date	7-9-2002	Time	13:00

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

2nd poly liner/bag – good condition
Pressure buildup internal to this packaging layer raises this layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

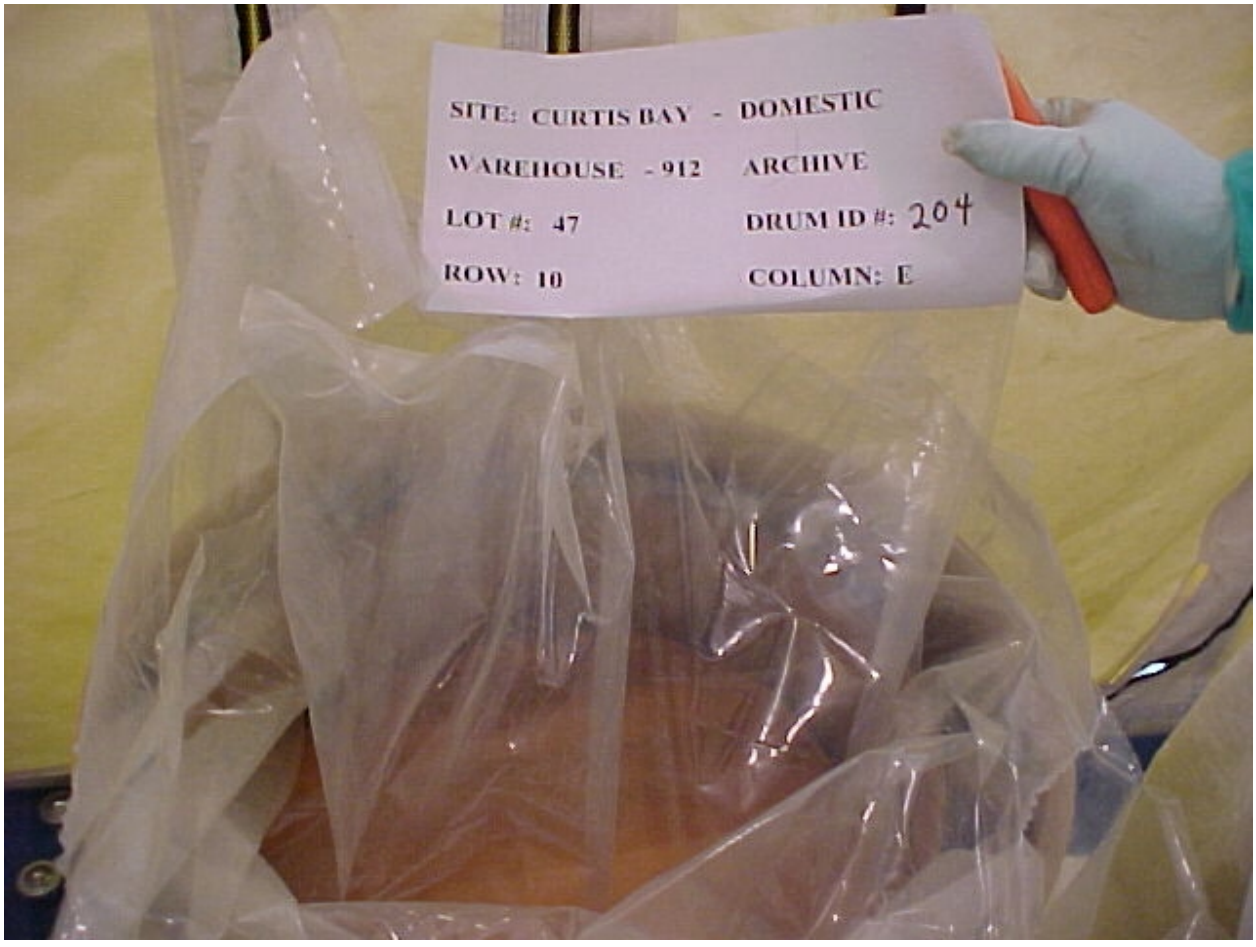
Date	7-9-2002	Time	13:00

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

3rd poly liner/bag – good condition
Pressure buildup internal to this packaging layer raises this layer vertically out of the container.
Opened poly liner/bag - No gases present in the breathing zone.
Gases in poly bag headspace – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
Gases exhausted utilizing HEPA blower.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:00

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

Wooden lid (mounted on innermost fiber/lab-pack drum) – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:00

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

Lab-pack (paper layer) lid broke apart after (or during) wooden lid removal
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

Date	7-9-2002	Time	13:00

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

ThN material – solid – monolith – white - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	47	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	204	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	E

Inspection/Sample Date & Time

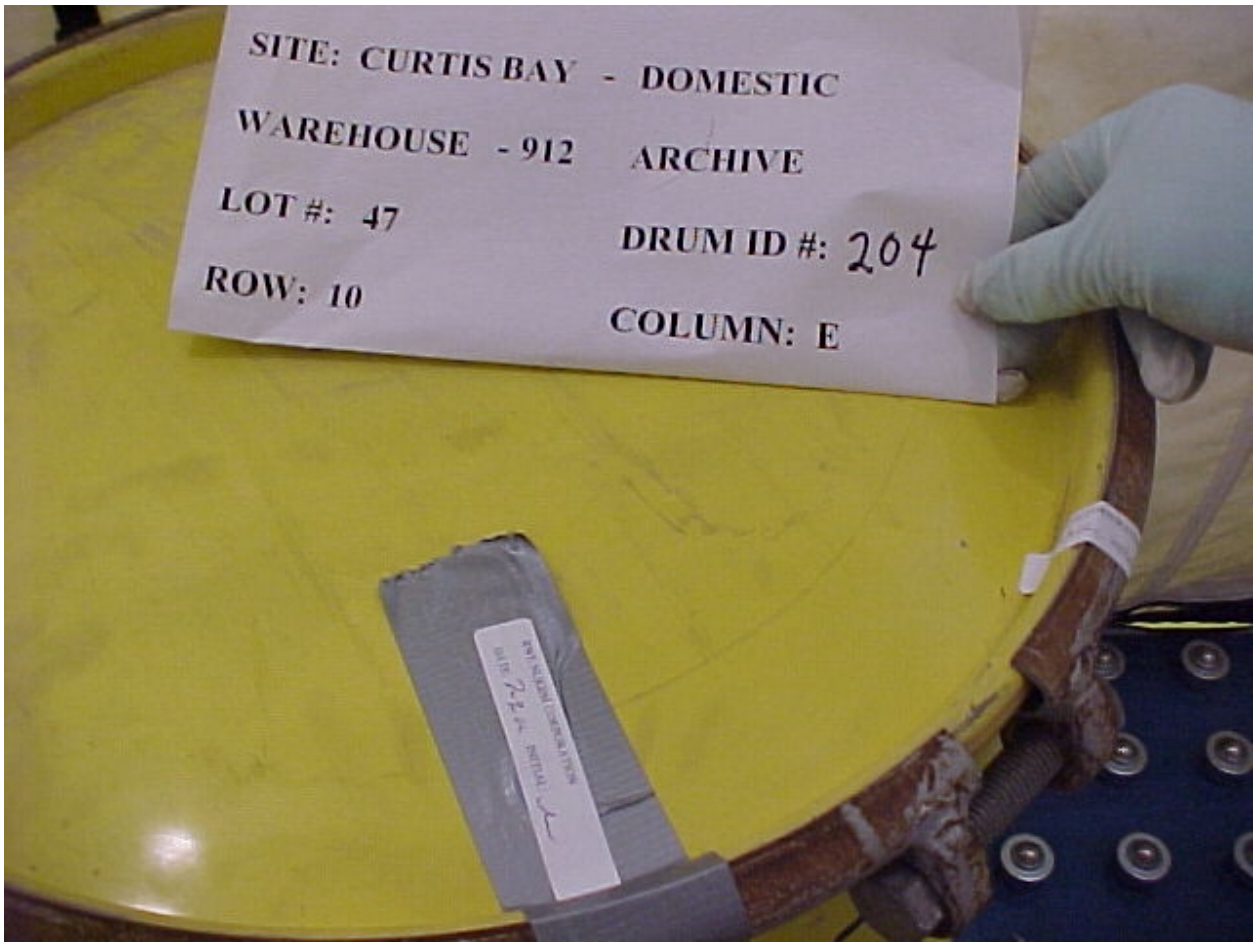
Date	7-9-2002	Time	13:00

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	1.7 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #57 - Drum #110
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 57 Drum ID #: 110 Location: Warehouse 912 – Column A – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 NA (did not measure) NO NA NOx NA

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

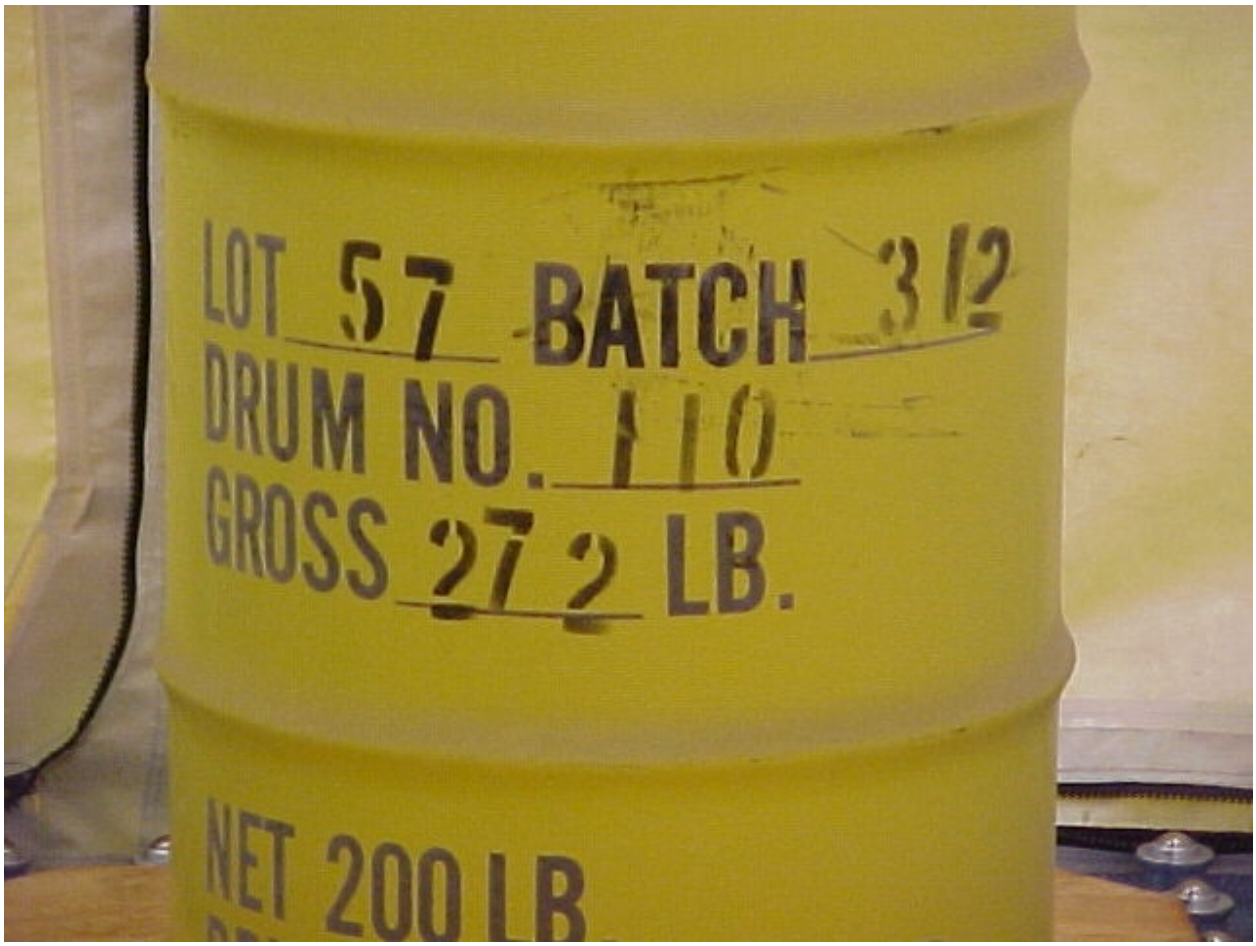
Date	7-10-2002	Time	09:15

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

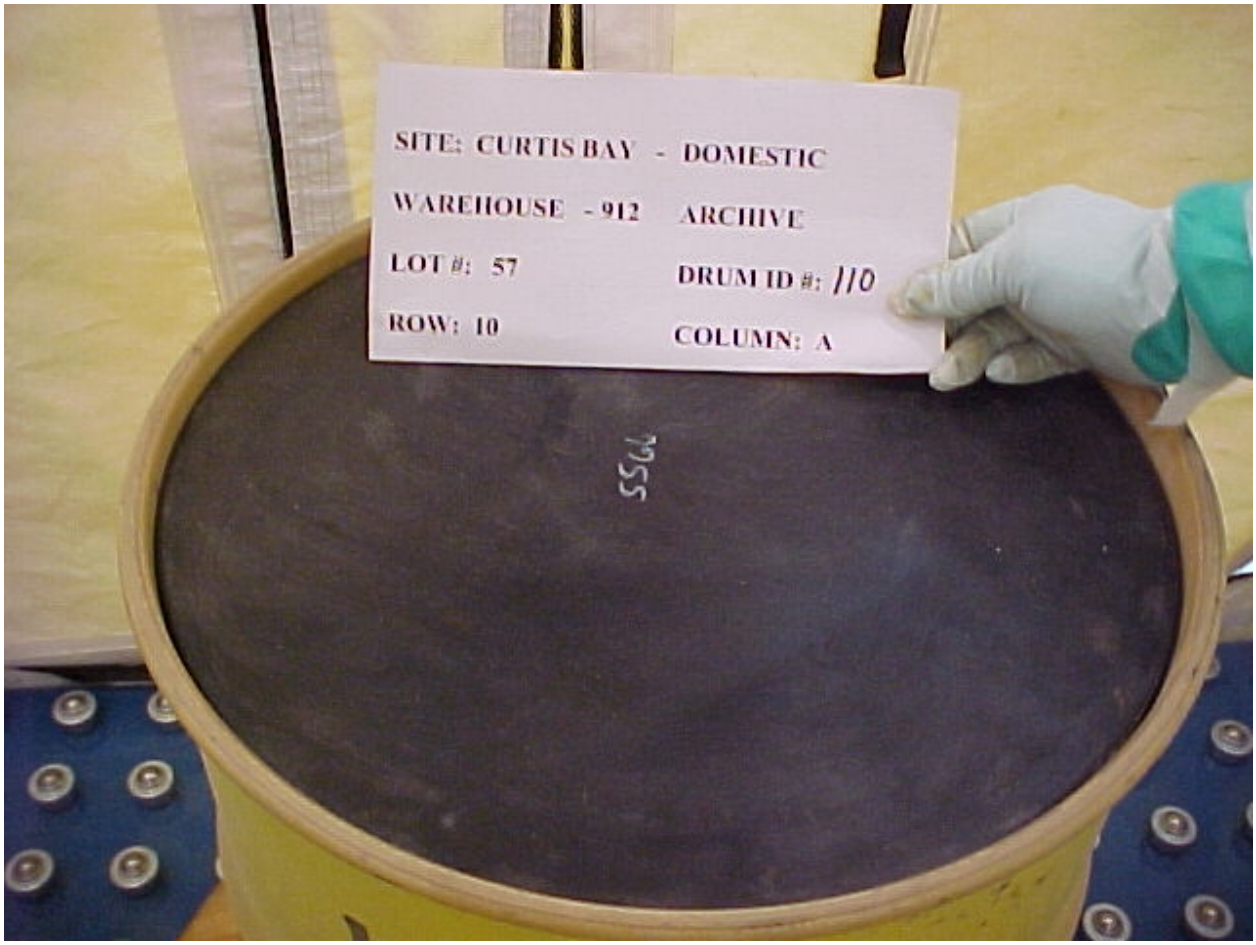
Date	7-10-2002	Time	09:15

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

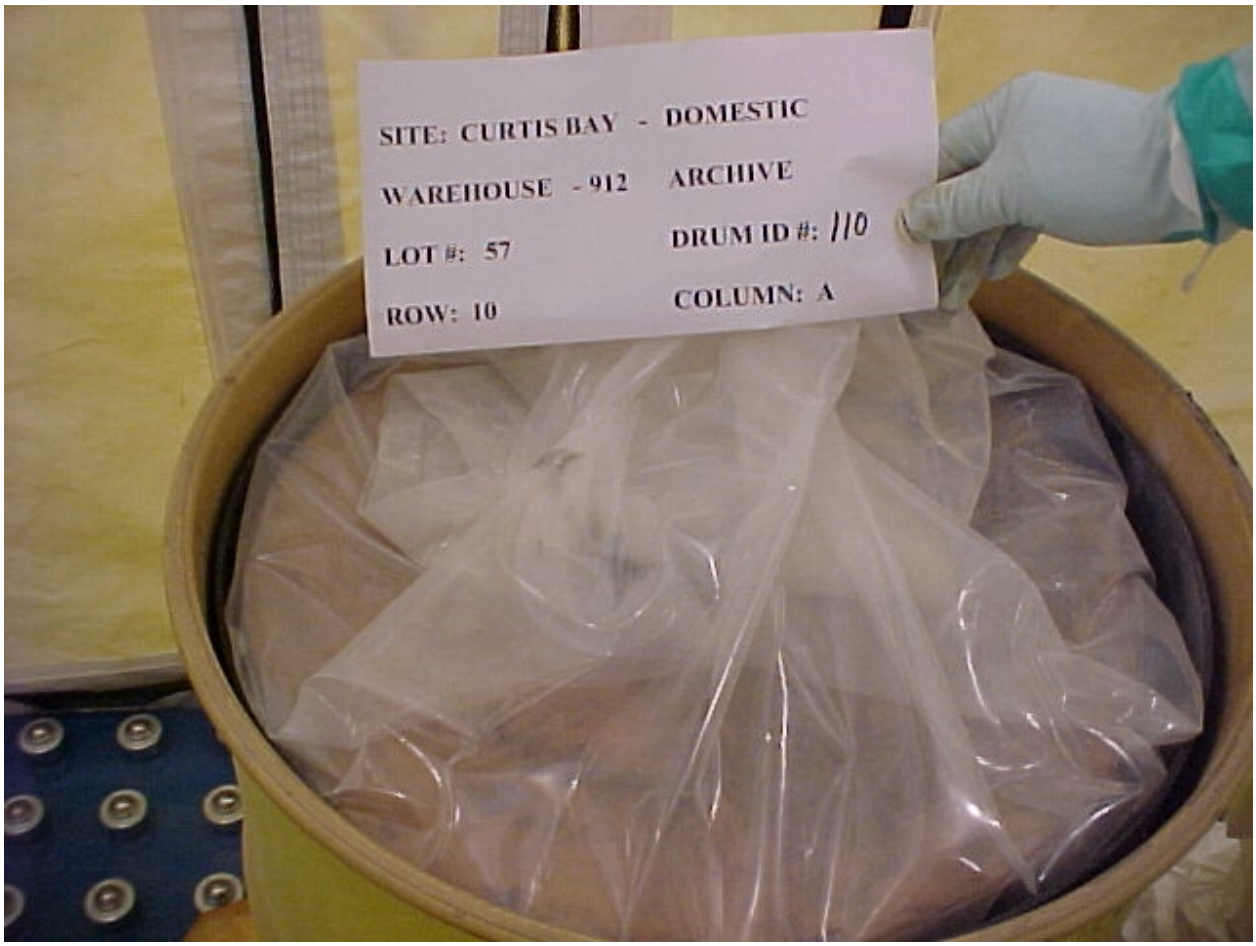
Date	7-10-2002	Time	09:15

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

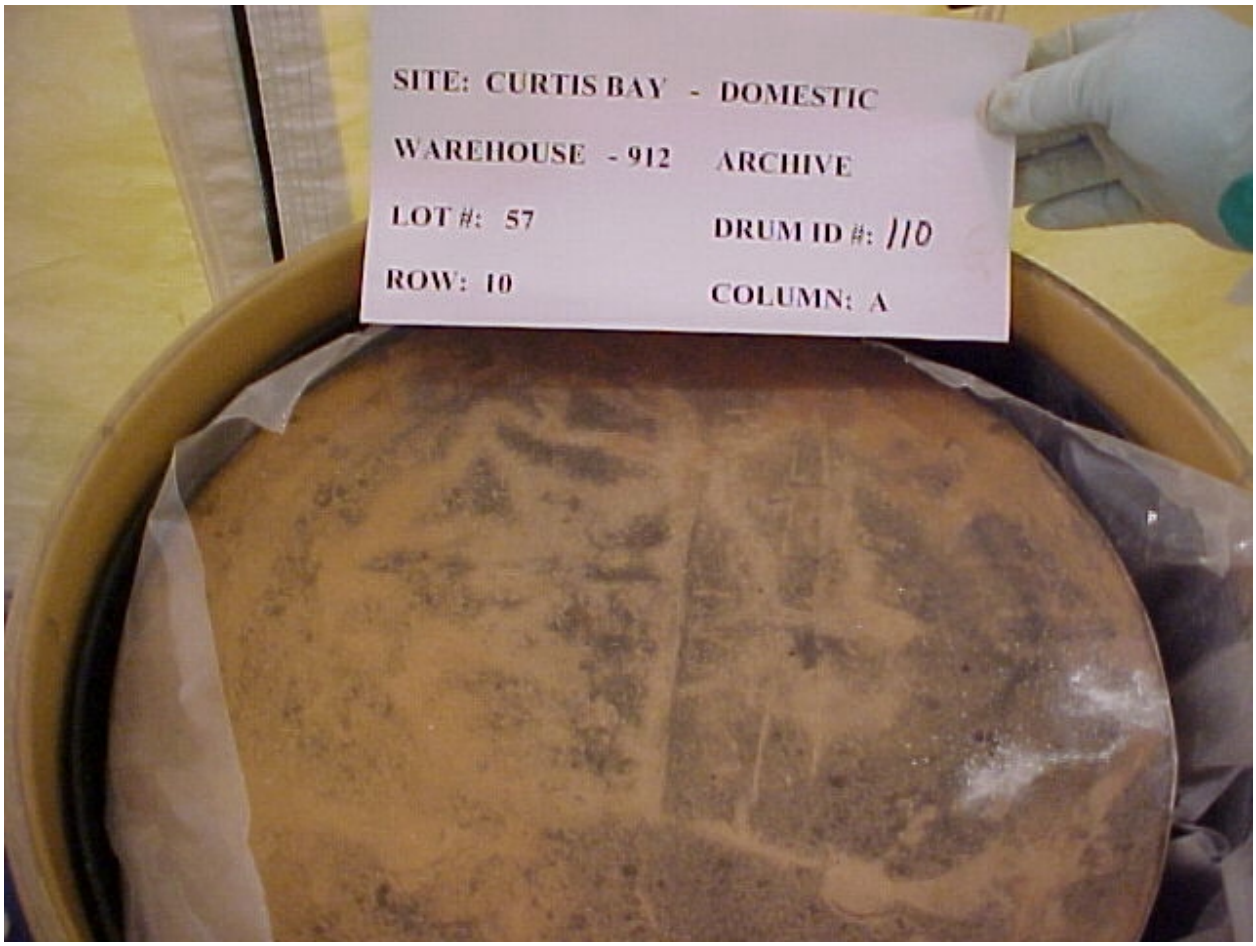
Date	7-10-2002	Time	09:15

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:15

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

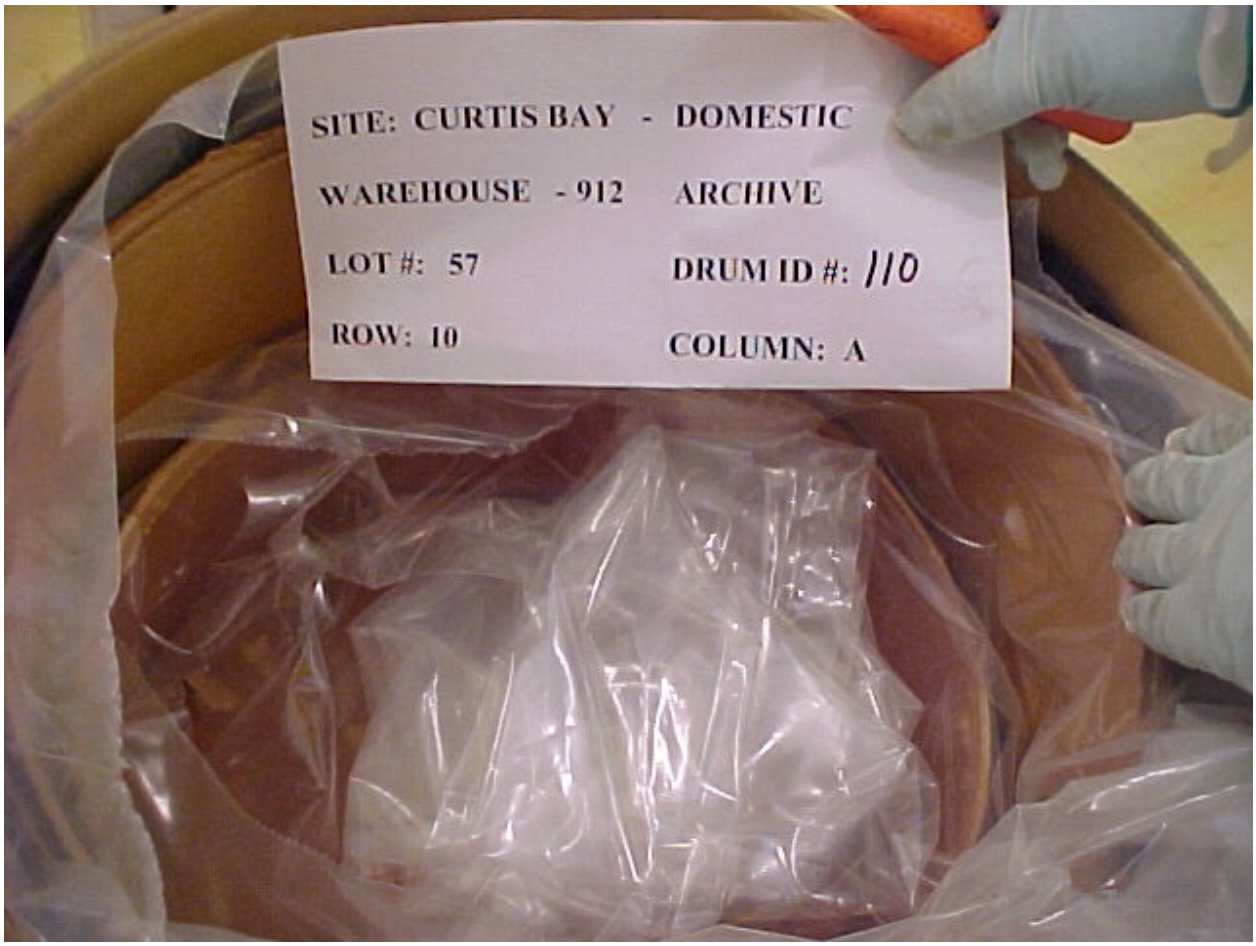
Date	7-10-2002	Time	09:15

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:15

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid (mounted on innermost fiber drum) – good condition
No gases present in the breathing zone.

SITE: CURTIS BAY - Sampling & Visual Inspection

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:15

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	09:15

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – white – solid – monolith - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	57	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	110	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	10
		Column	A

Inspection/Sample Date & Time

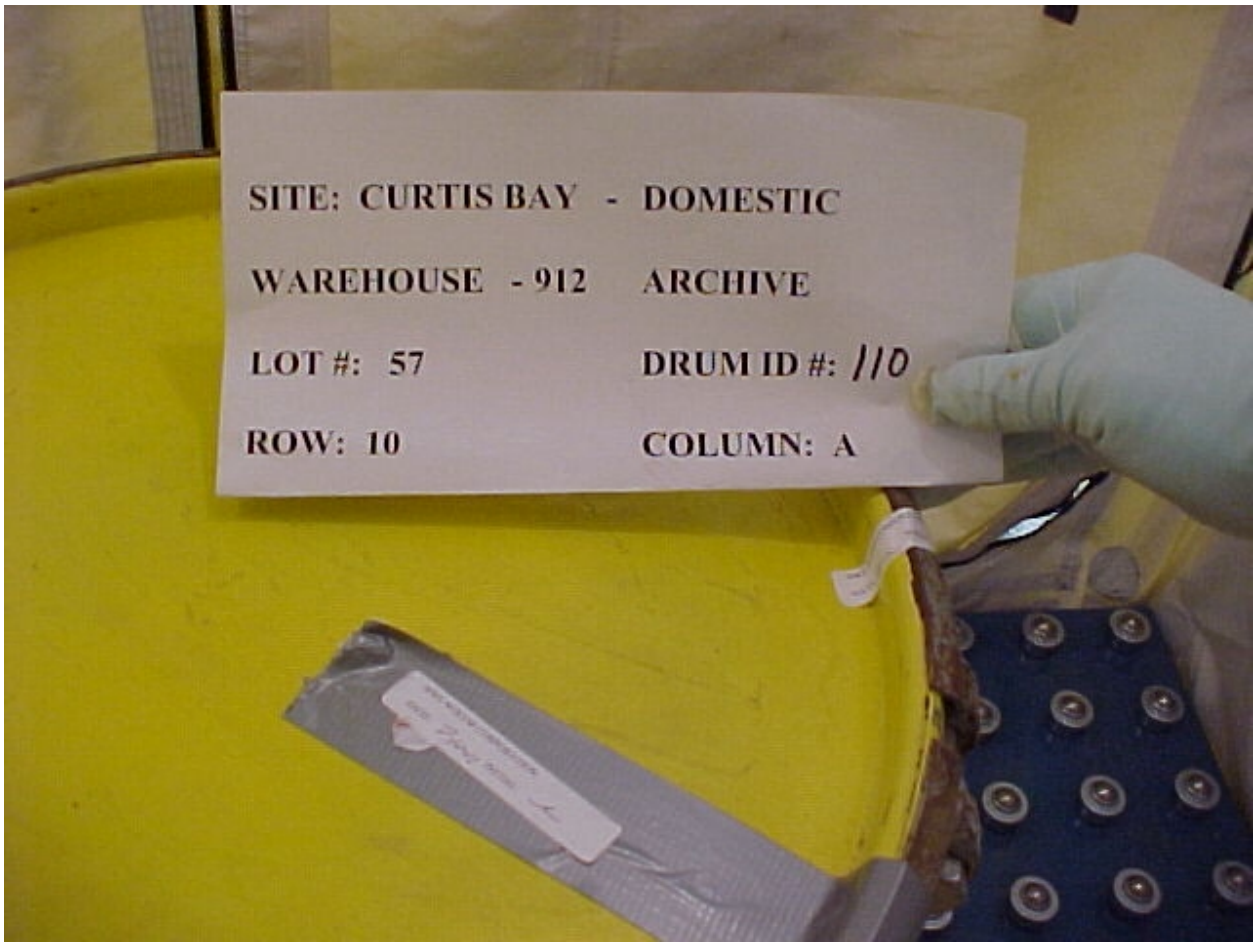
Date	7-10-2002	Time	09:15

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #59 - Drum #241
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 59 Drum ID #: 241 Location: Warehouse 912 – Column B – Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 6.0% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

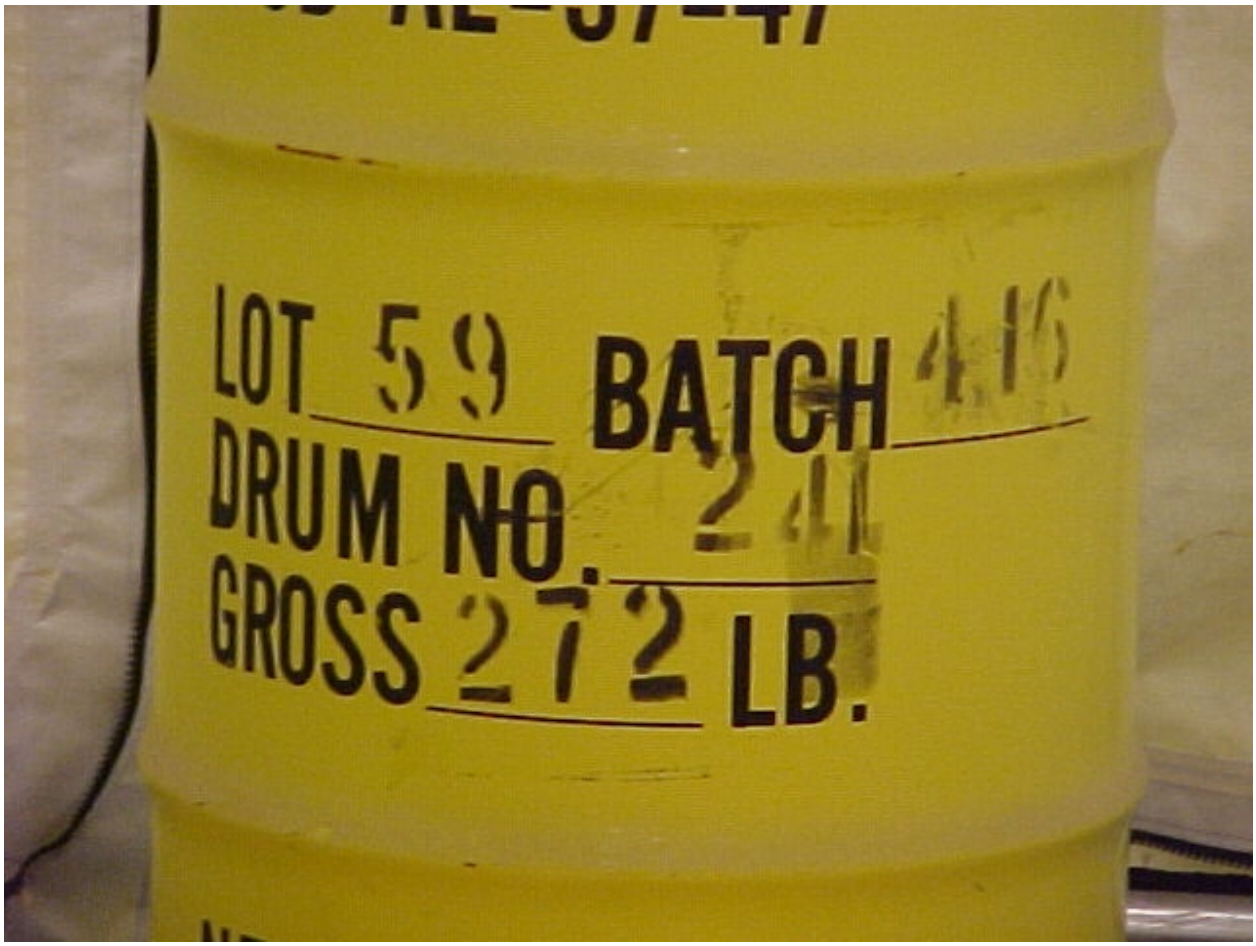
Date	7-10-2002	Time	10:40

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
Gases vented from drum during lid removal operations



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

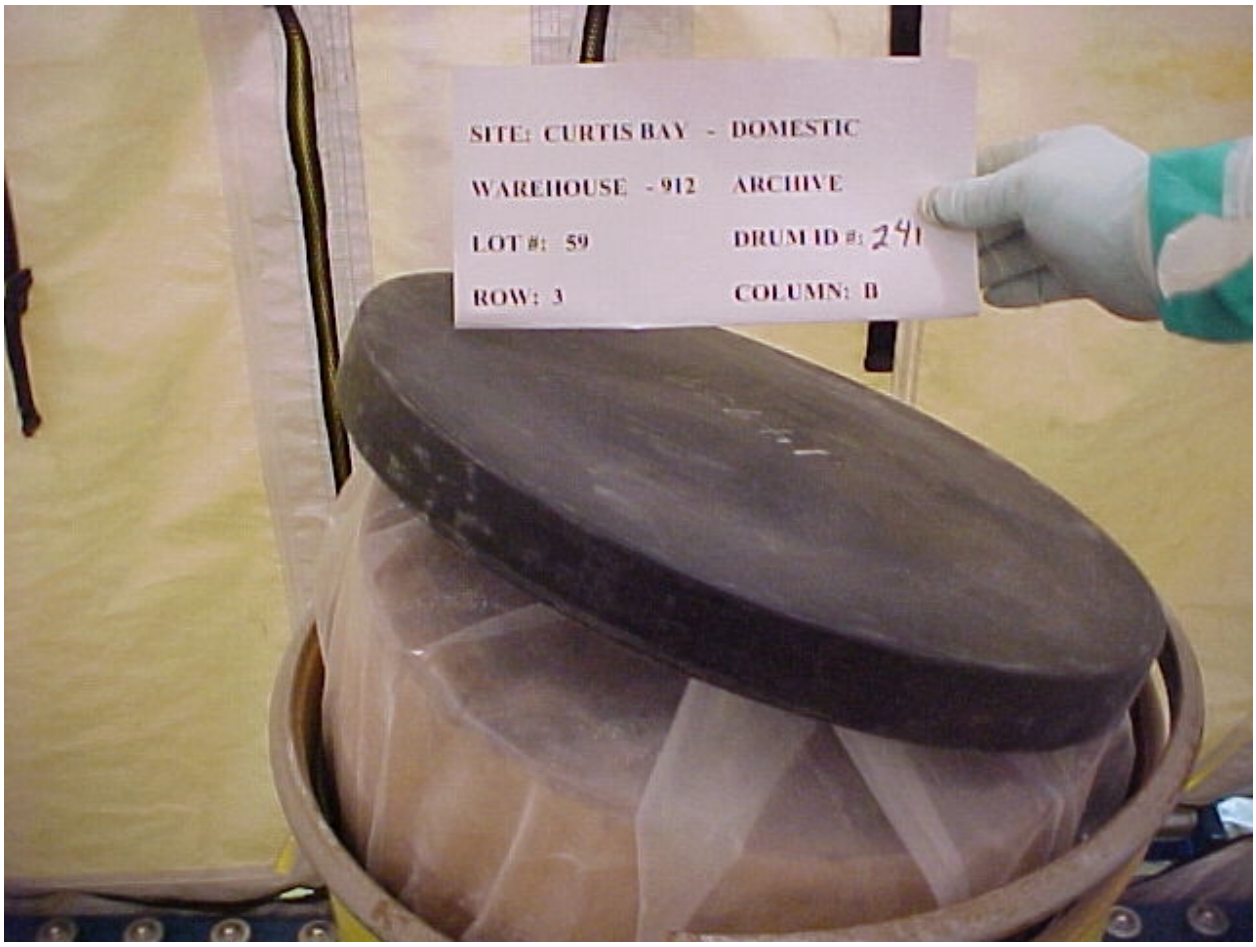
Date	7-10-2002	Time	10:40

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:40

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

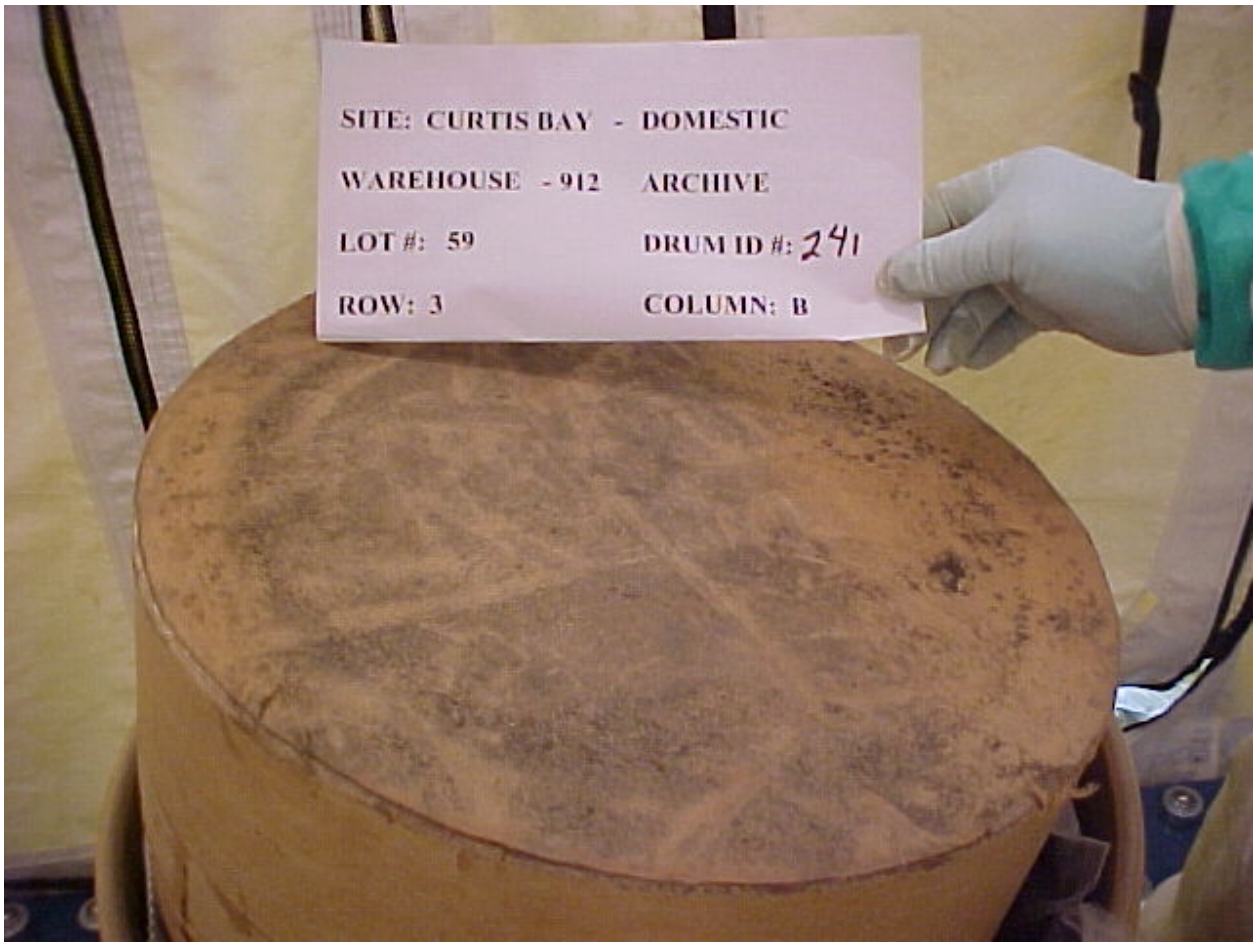
Date	7-10-2002	Time	10:40

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:40

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
Opened poly bag - No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

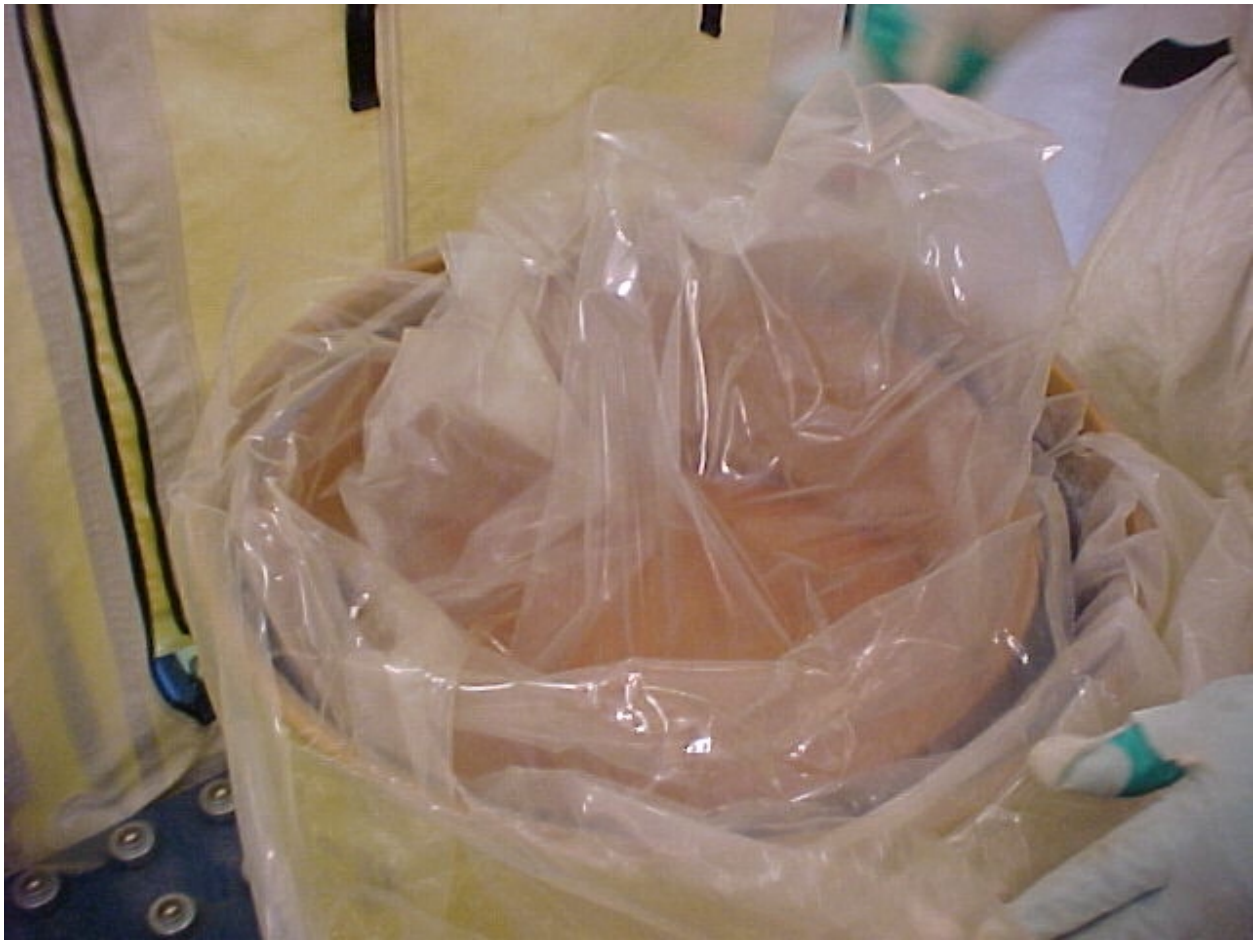
Date	7-10-2002	Time	10:40

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
Opened poly liner/bag - No gases present in the breathing zone
Gases present in poly bag headspace – CH4 – 6.0% LEL - NO - +50 ppm - NOx - +50 ppm
Drum dissipated to 0% / 0 ppm utilizing HEPA exhaust



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:40

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:40

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition (picture shows inflated condition of bag)
Opened poly liner/bag - No gases present in the breathing zone
Gases present in poly bag headspace – CH4 – 6.0% LEL - NO - +50 ppm - NOx - +50 ppm
Drum dissipated to 0% / 0 ppm utilizing HEPA exhaust

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:40

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – white – dry – solid – monolith
No gases present in breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	59	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	241	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	3
		Column	B

Inspection/Sample Date & Time

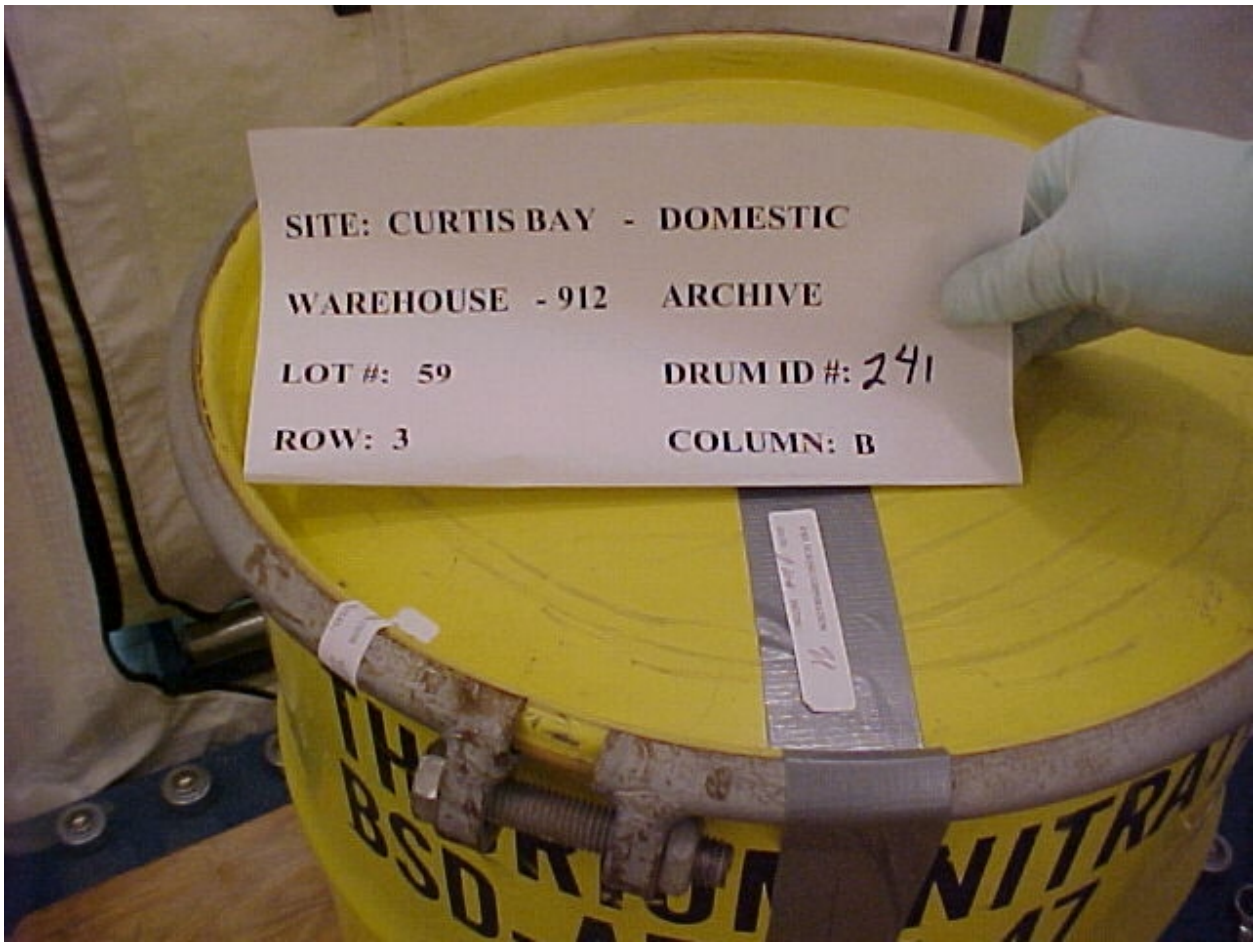
Date	7-10-2002	Time	10:40

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #62 - Drum #159
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 62 Drum ID #: 159 Location: Warehouse 912 – Column B – Row 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.2% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

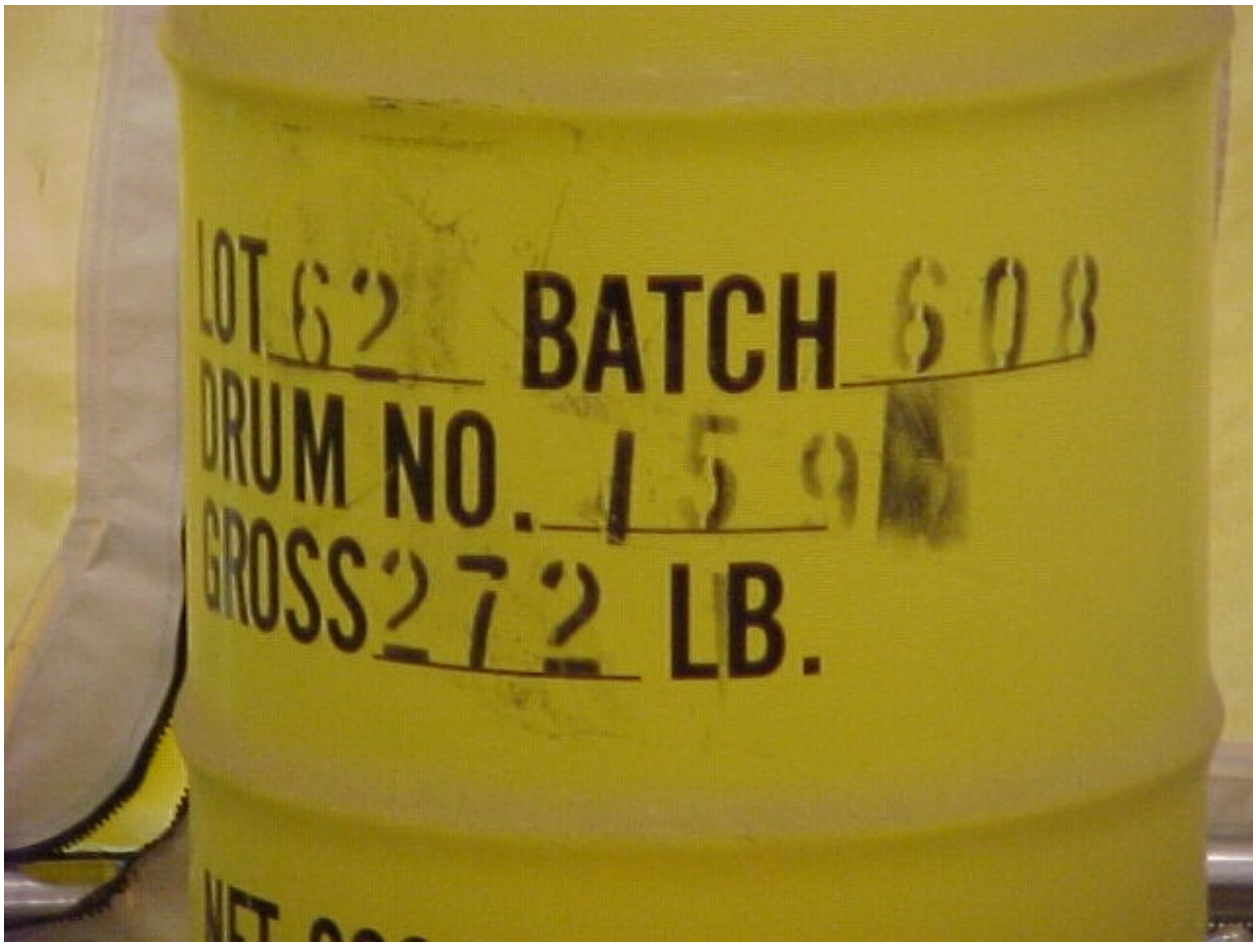
Date	7-10-2002	Time	10:15

Other Information

Photo No. 1 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
Drum vented gases during lid removal operations



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

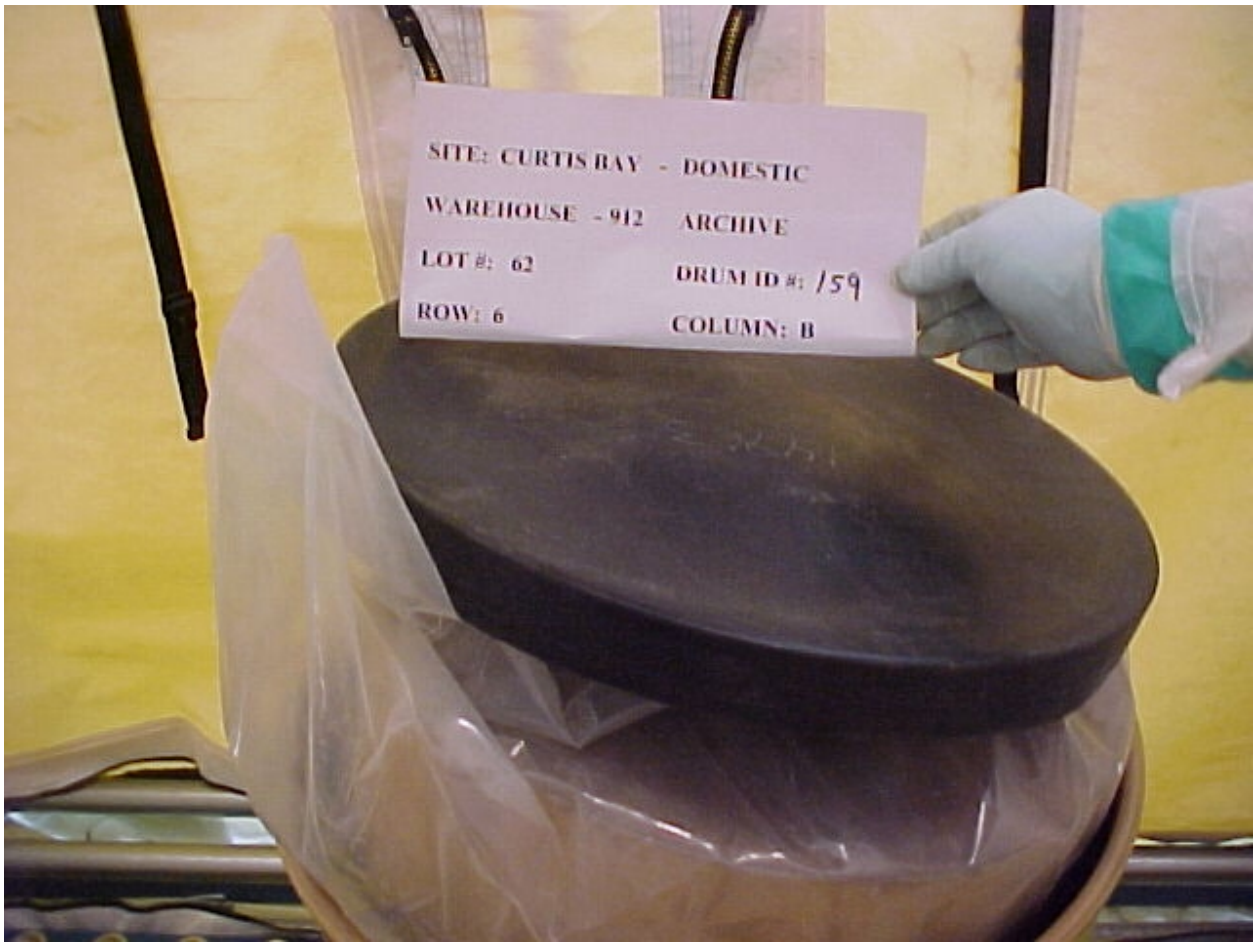
Date	7-10-2002	Time	10:15

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid (mounted on inner rigid drum liner) – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

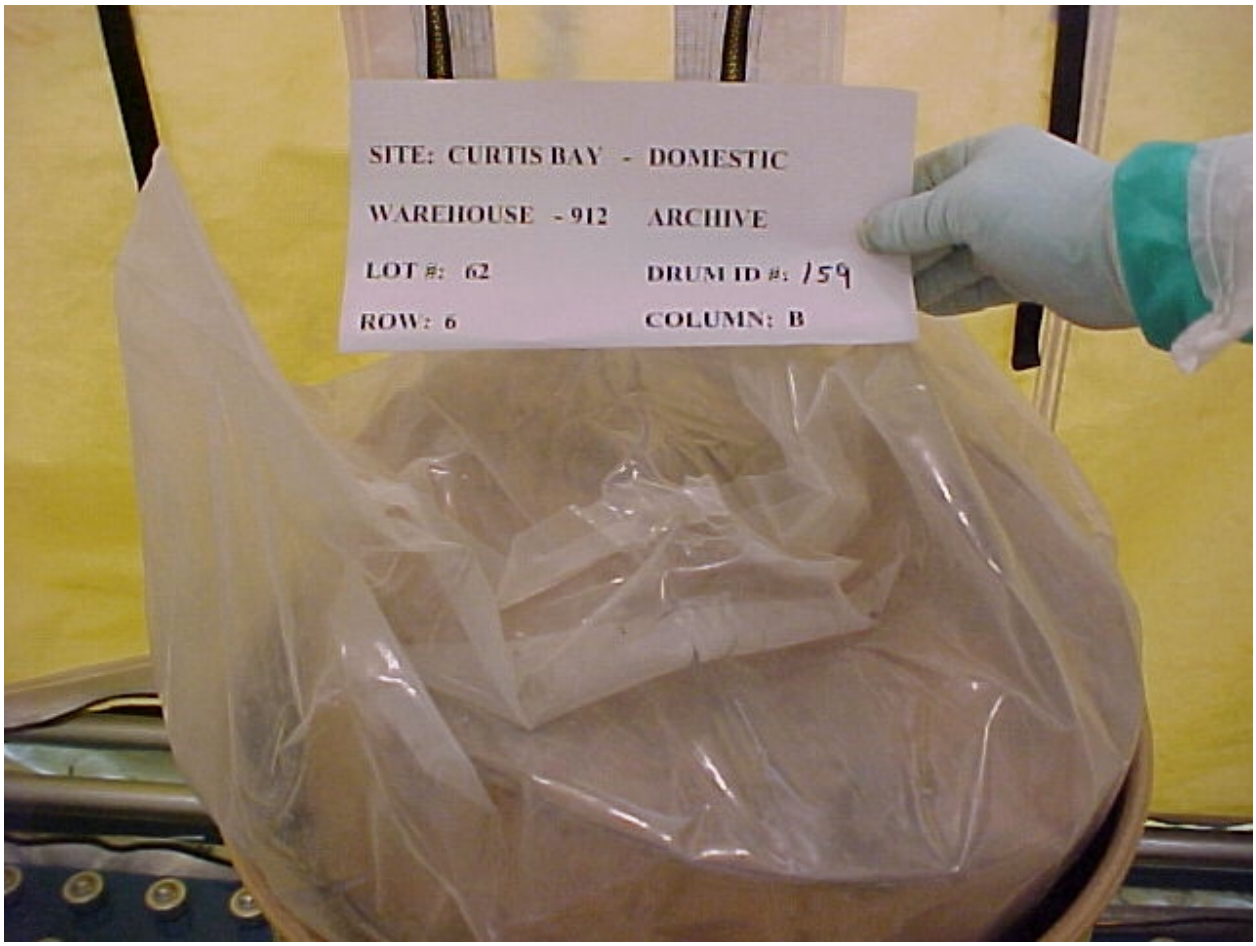
Date	7-10-2002	Time	10:15

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

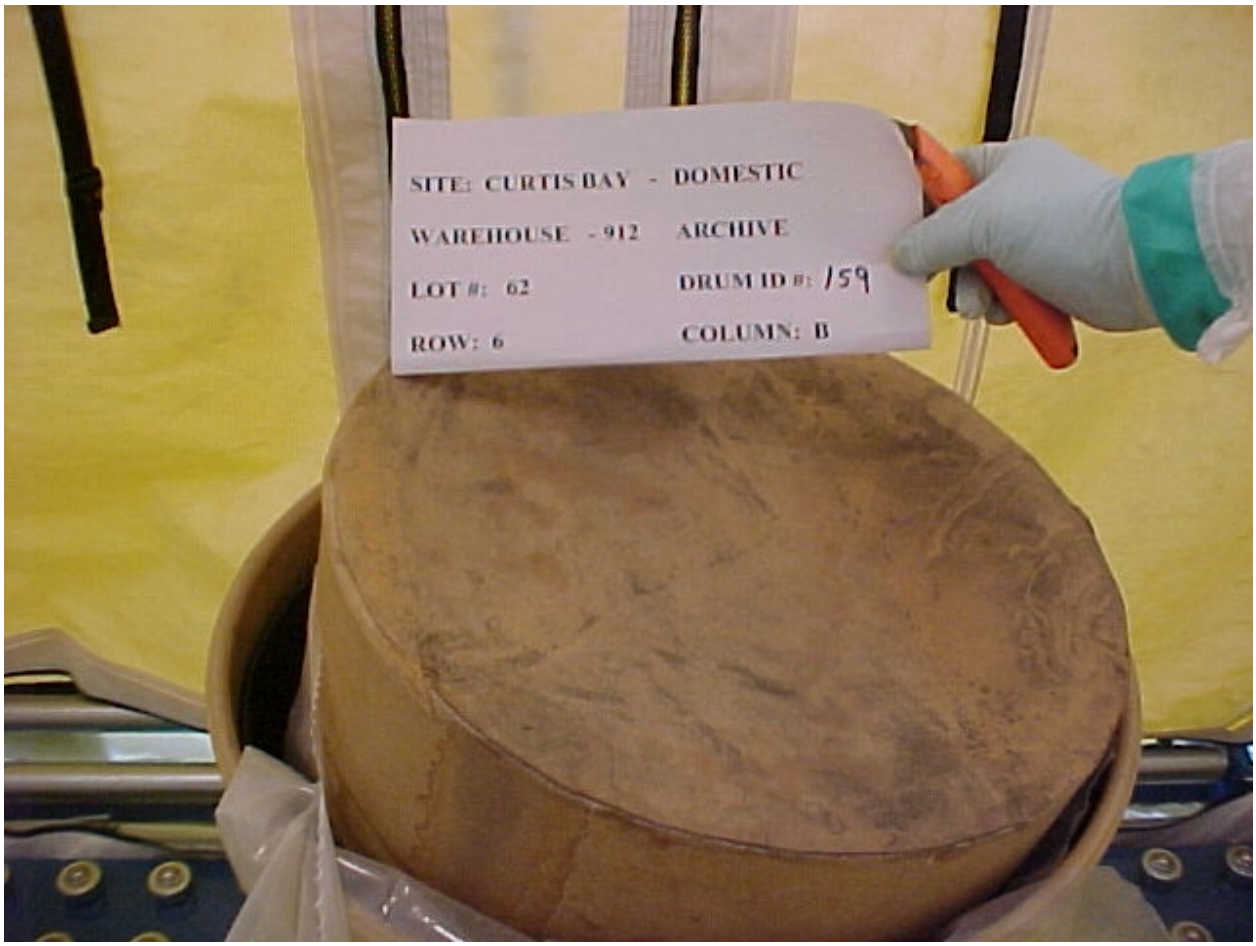
Date	7-10-2002	Time	10:15

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

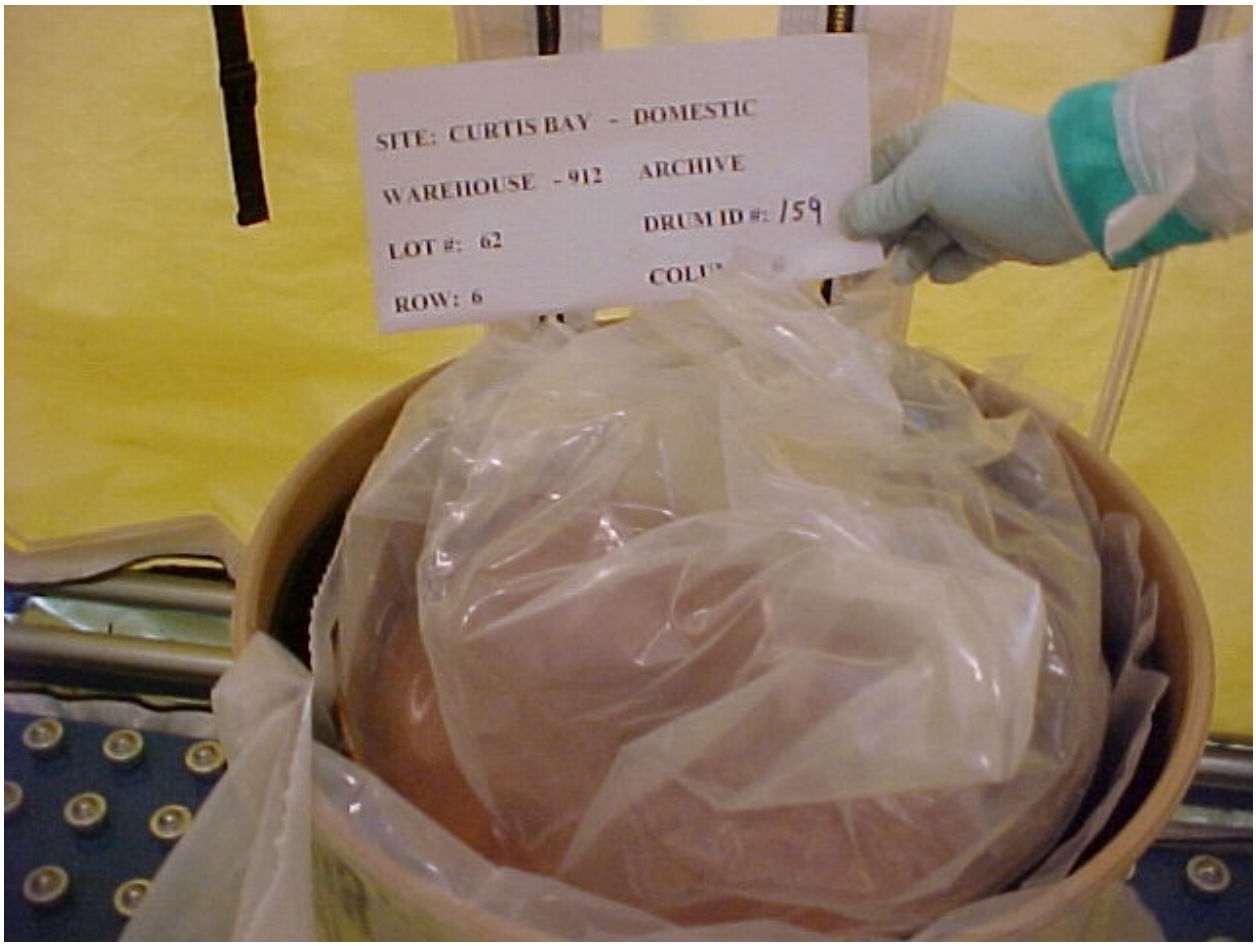
Date	7-10-2002	Time	10:15

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:15

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
Open poly bag – no gases present in the breathing zone.
Gases in bag's headspace – CH4 – 4.2% LEL - NO - +50 ppm - NOx - +50 ppm
All gases in headspace were dissipated utilizing HEPA exhaust

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:15

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:15

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition (inflated condition of bag shows gas generation from the ThN material)
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:15

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

ThN material – white – solid – monolith - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	62	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	6
		Column	B

Inspection/Sample Date & Time

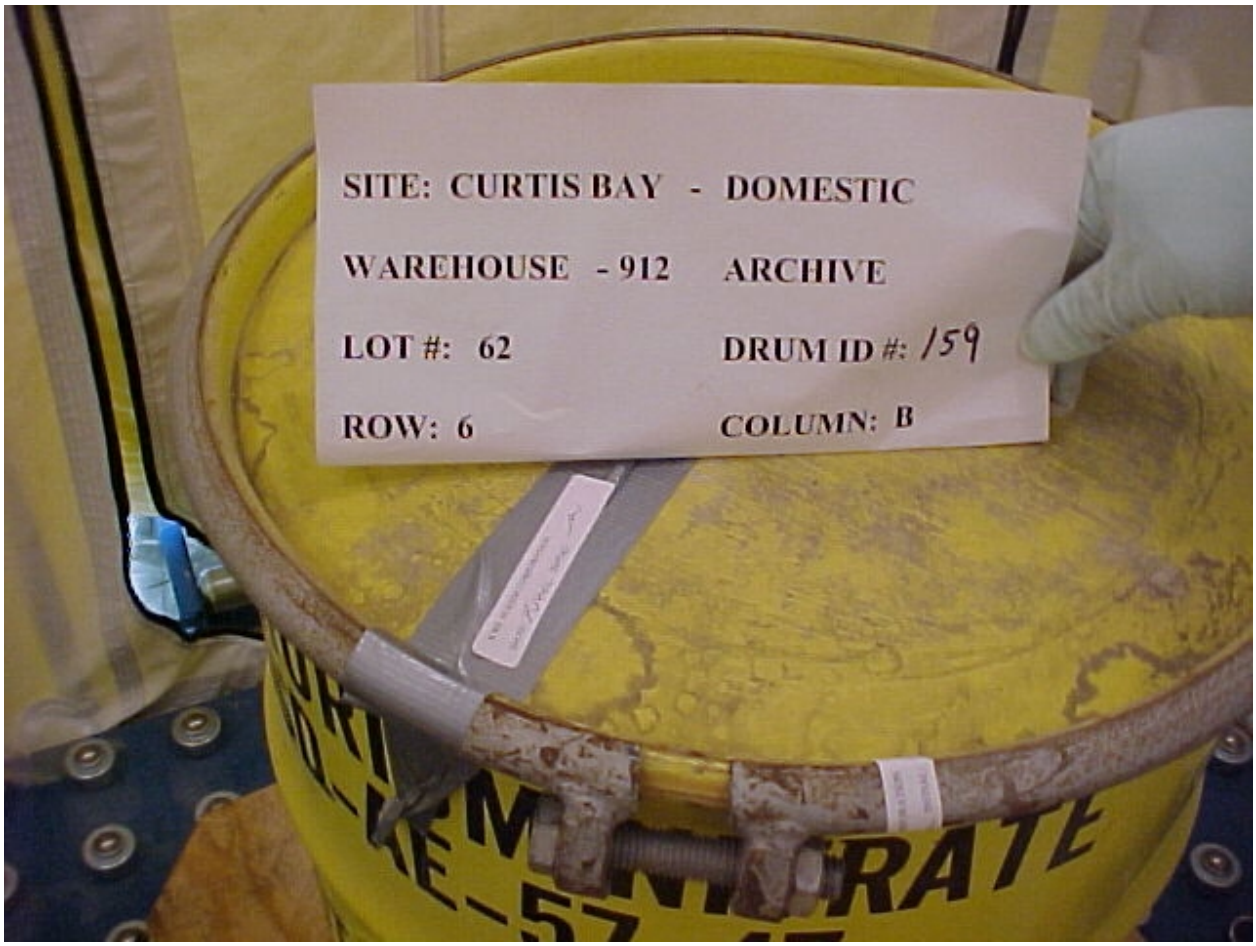
Date	7-10-2002	Time	10:15

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #70 – Drum #3
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 70 Drum ID #: 3 Location: Warehouse 912 – Column A – Row 7

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 2.5 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

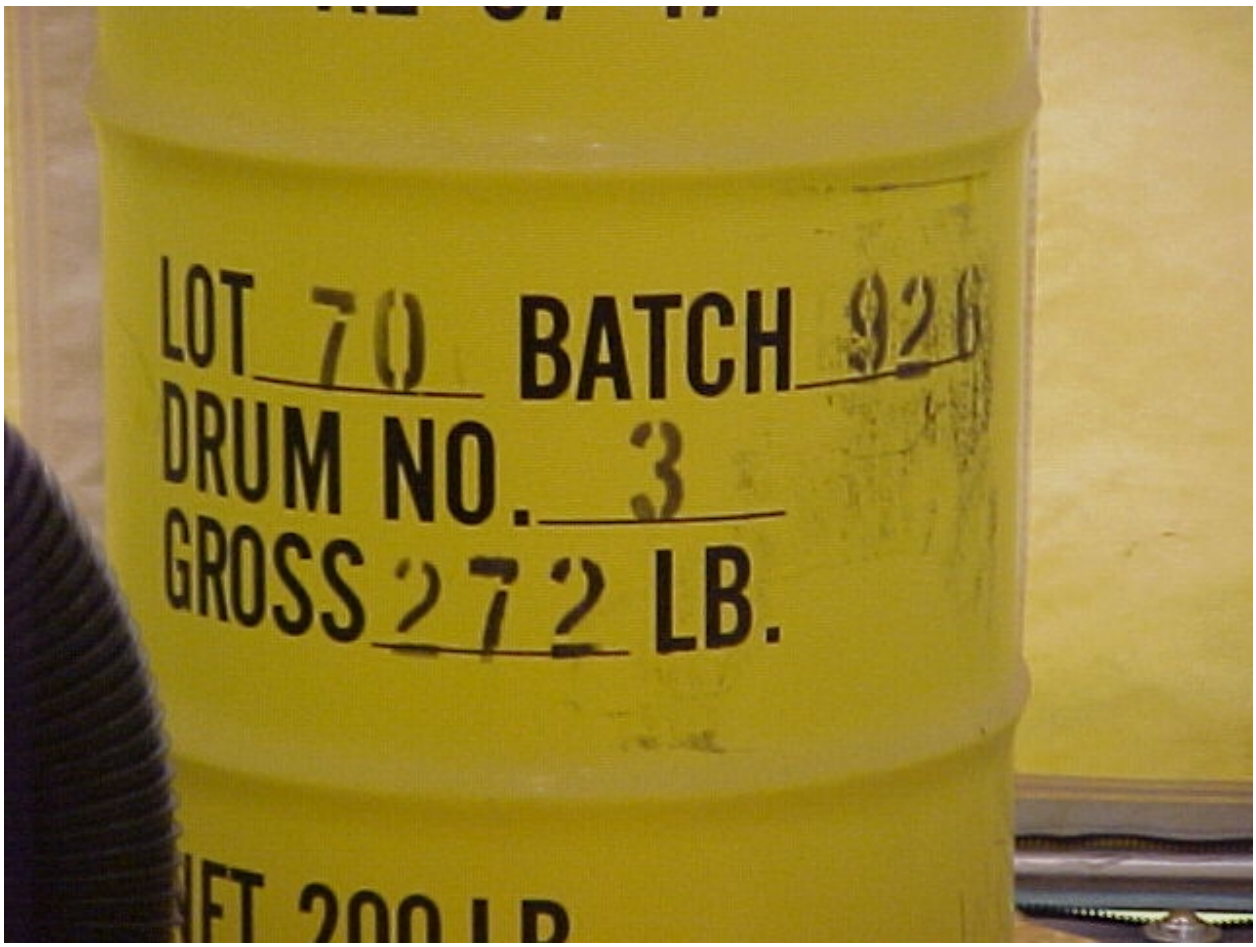
Date	7-10-2002	Time	10:00

Other Information

Photo No. 1 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

30-gal drum – good condition
Drum vented gases during lid removal operations.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

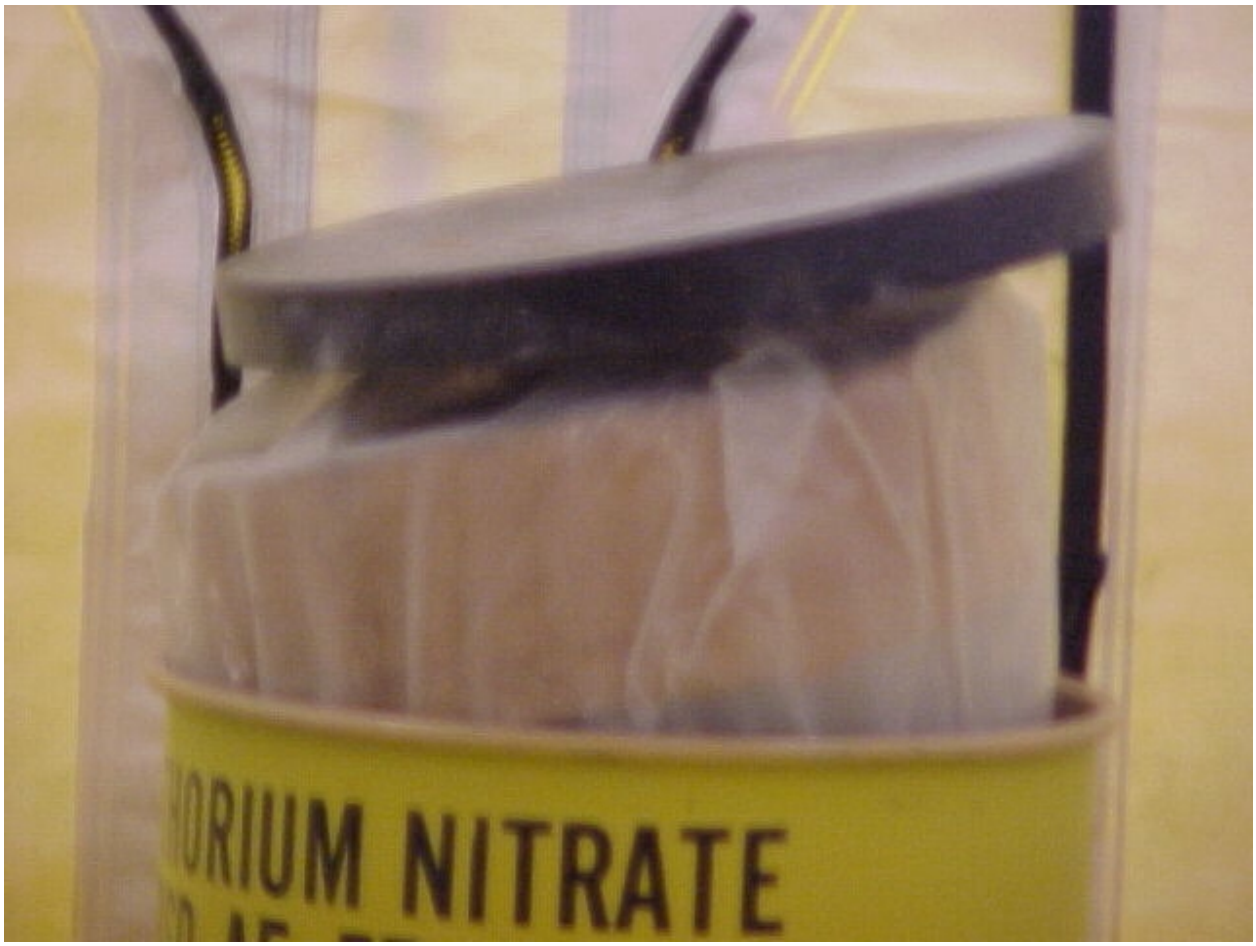
Date	7-10-2002	Time	10:00

Other Information

Photo No. 2 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Black plastic lid – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

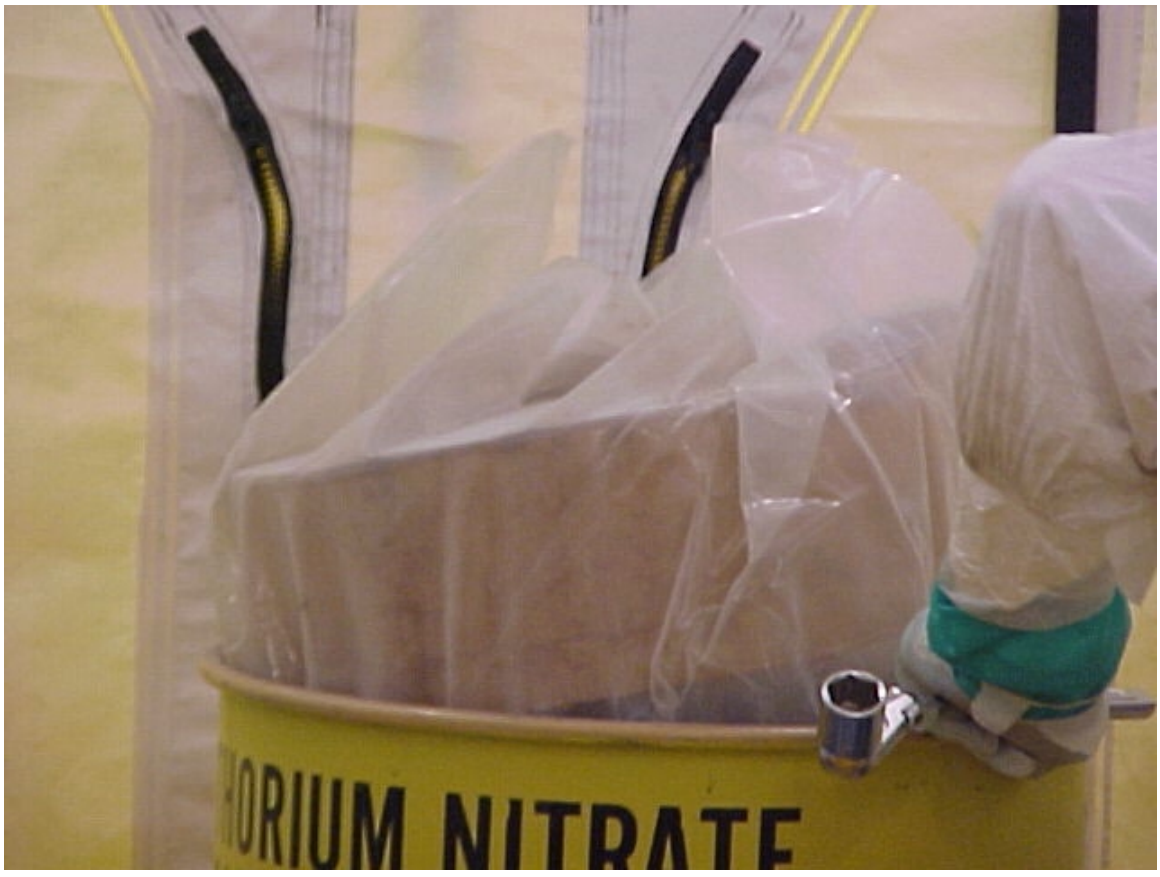
Date	7-10-2002	Time	10:00

Other Information

Photo No. 3 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

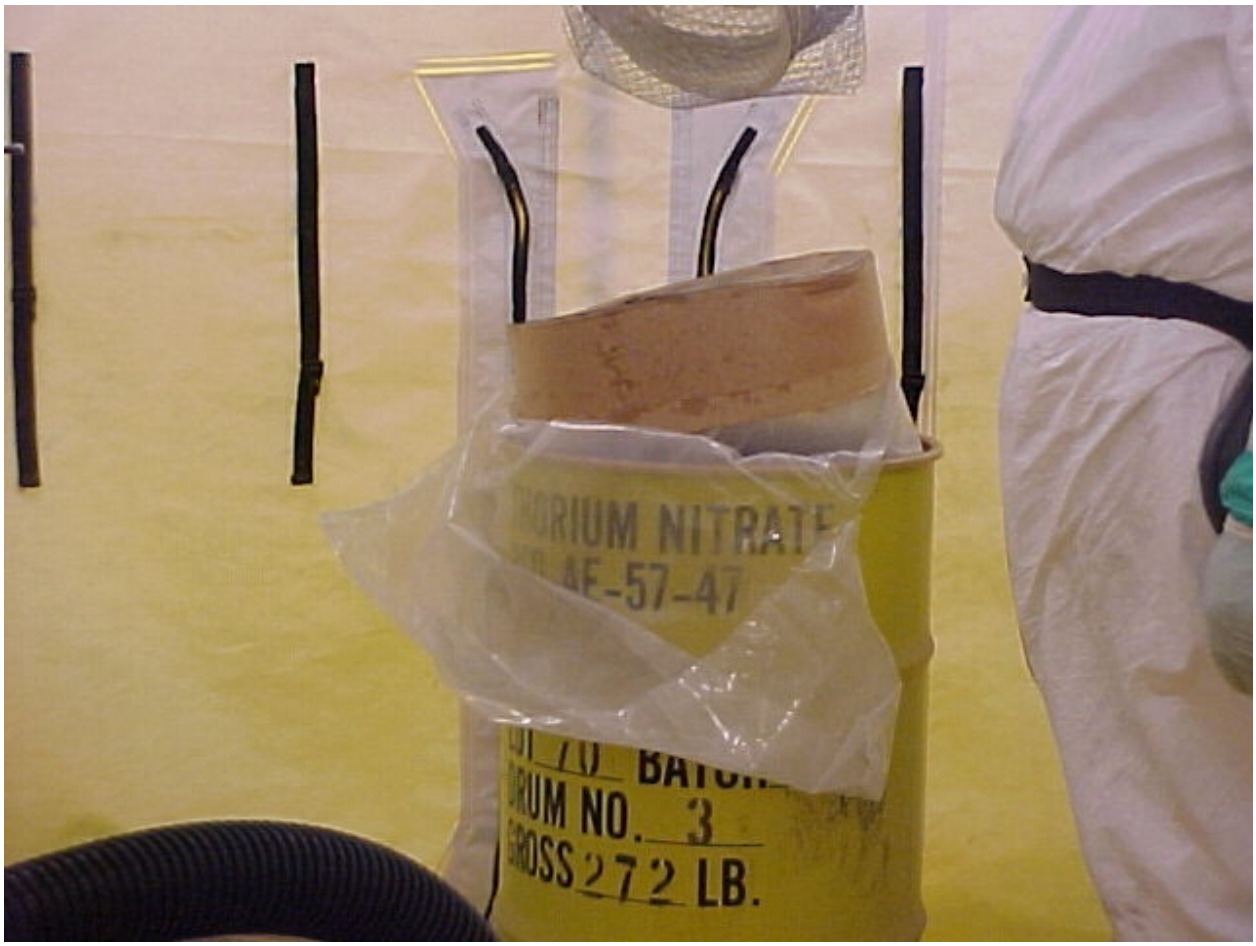
Date	7-10-2002	Time	10:00

Other Information

Photo No. 4 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Fiber drum lid – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:00

Other Information

Photo No. 5 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:00

Other Information

Photo No. 6 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

3rd poly liner/bag – good condition
Pressure buildup inside of packaging layer raises packaging layer vertically out of container.
Opened poly bag - No gases present in the breathing zone.
Gases in headspace – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented – all gases dissipated via HEPA exhaust.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:00

Other Information

Photo No. 7 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:00

Other Information

Photo No. 8 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

4th poly liner/bag – good condition (inflated condition of bag shows gas generation from ThN material)
Opened poly bag - No gases present in the breathing zone.
Gases in headspace – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented – all gases dissipated via HEPA exhaust.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

Date	7-10-2002	Time	10:00

Other Information

Photo No. 9 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

ThN material – white – solid – monolith - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	70	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	3	Disposition	Archive

Physical Location of Drum

Warehouse	912	Row	7
		Column	A

Inspection/Sample Date & Time

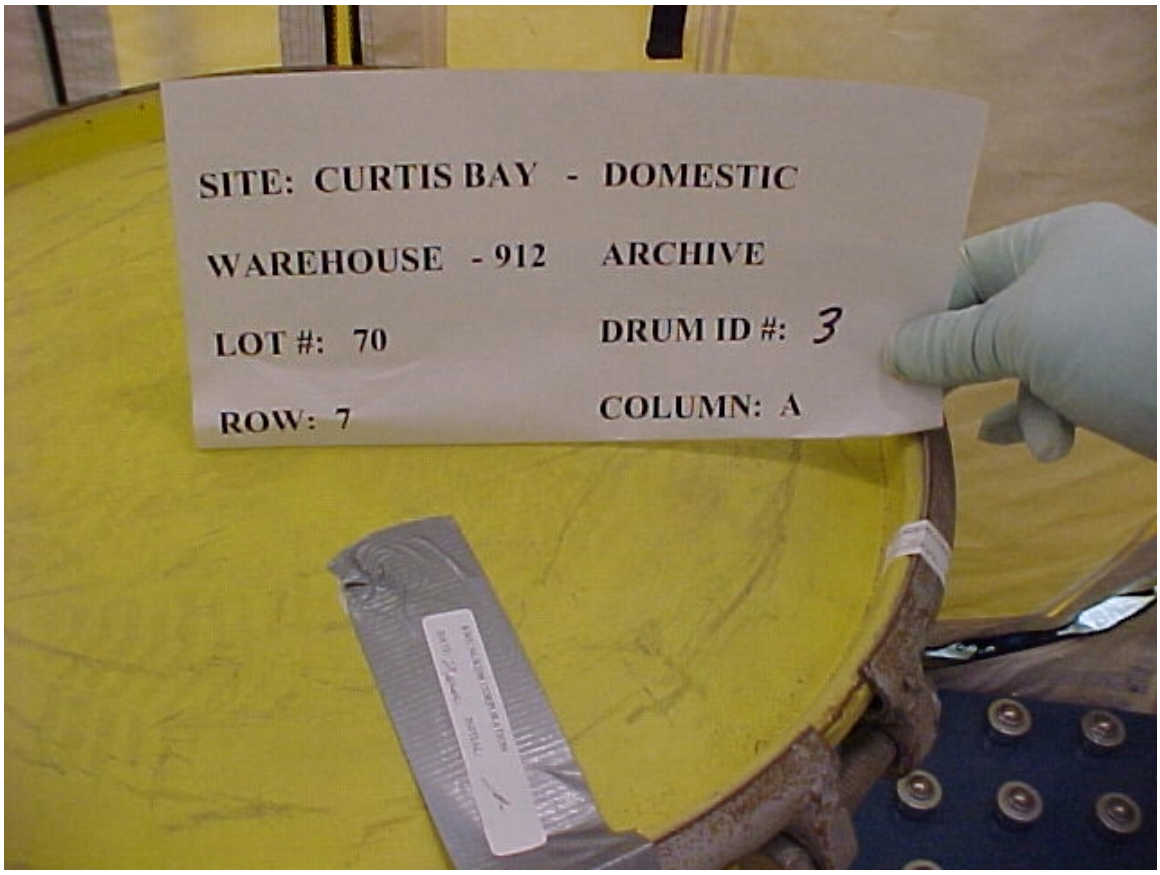
Date	7-10-2002	Time	10:00

Other Information

Photo No. 10 of 10

Dose Rate	Surface	24 mR/hr
	1 meter	2.5 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #F-18 – Drum #55
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: F-18 Drum ID #: 55 Location: Warehouse 911 - Column F - Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 42mR/hr DR at 1 meter 4.0mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 3Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Powder
Color: white
Particle Size: Mostly Powder
Dryness: Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-02

General Information

Site	Curtis Bay		
ThN Origin	France		
Lot No.	F-18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	55	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

Inspection/Sample Date & Time

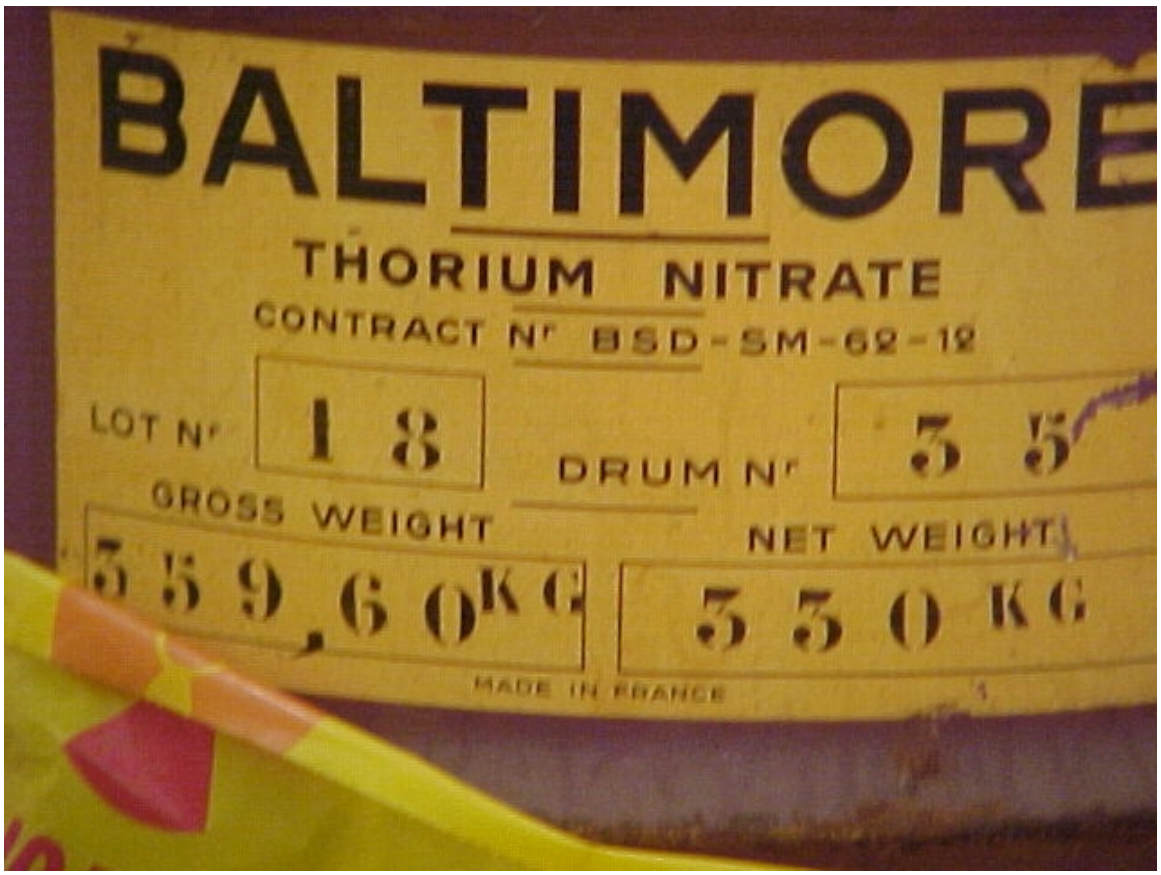
Date	7-3-2002	Time	10:30

Other Information

Photo No. 1 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

French (purple) 55-gal drum – fair condition – extensive surface rust on drum
No gases present in the breathing zone.
Wrapped drum in yellow poly bags prior to movement due to external contamination.



General Information

Site	Curtis Bay		
ThN Origin	France		
Lot No.	F-18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	55	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

Inspection/Sample Date & Time

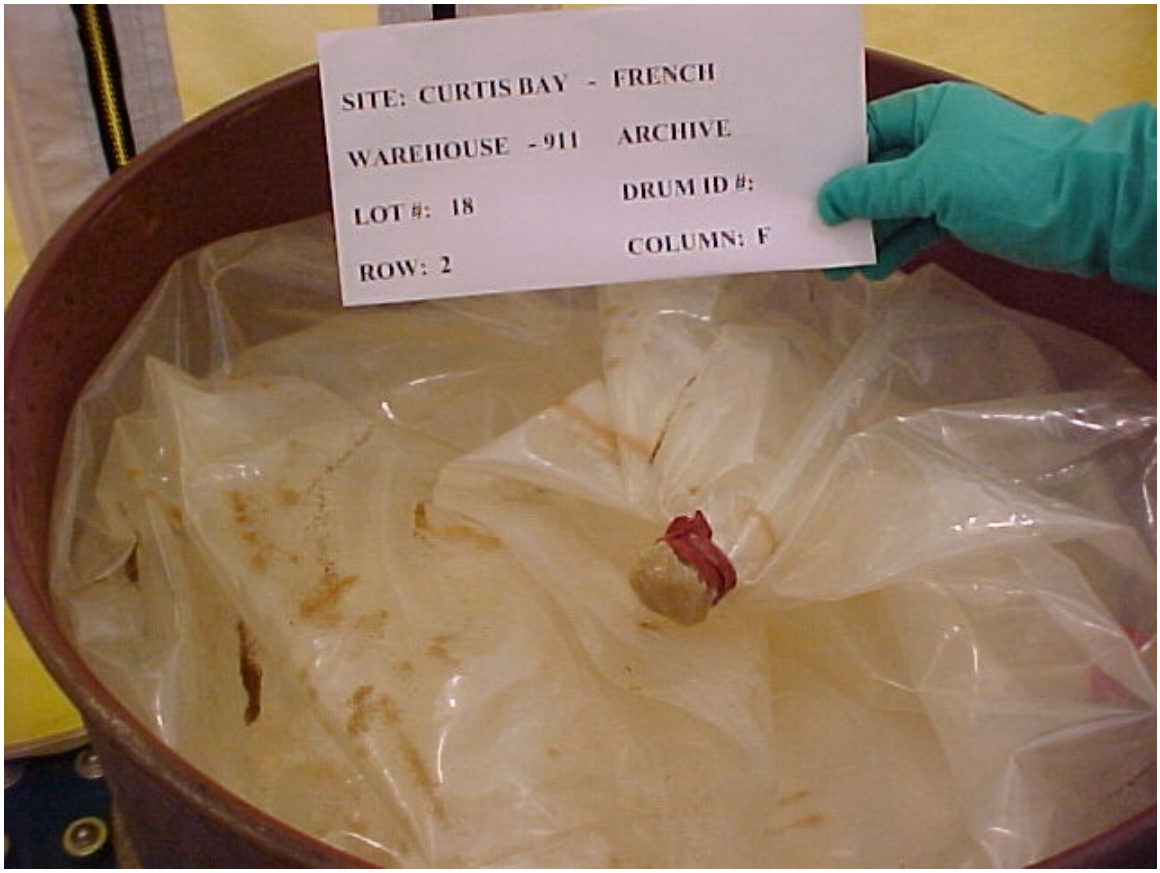
Date	7-3-2002	Time	10:30

Other Information

Photo No. 2 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	France		
Lot No.	F-18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	55	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

Inspection/Sample Date & Time

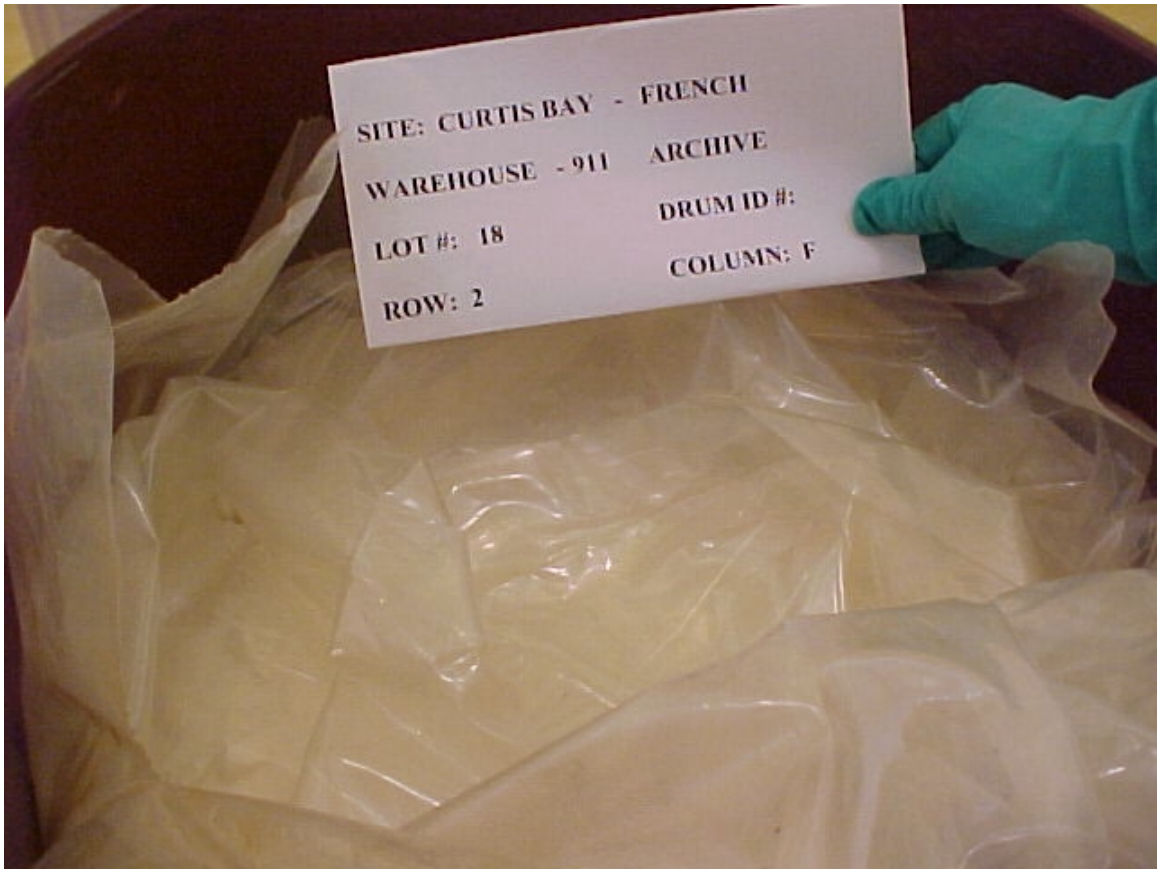
Date	7-3-2002	Time	10:30

Other Information

Photo No. 3 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	France		
Lot No.	F-18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	55	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

Inspection/Sample Date & Time

Date	7-3-2002	Time	10:30

Other Information

Photo No. 4 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

French ThN material – powder form – some chunky pieces – dry – white
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	France		
Lot No.	F-18	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	55	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	2
		Column	F

Inspection/Sample Date & Time

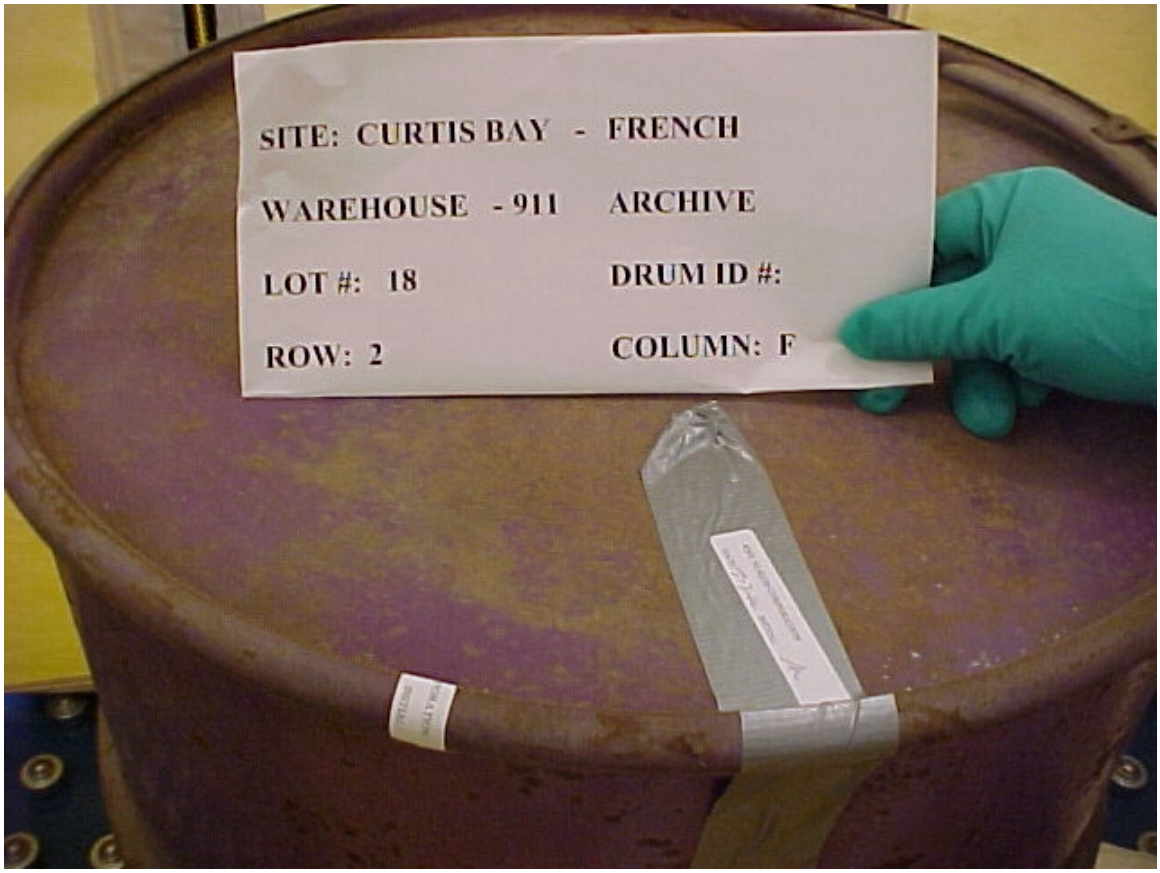
Date	7-3-2002	Time	10:30

Other Information

Photo No. 5 of 5

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #I-1 – Drum #14
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-1 Drum ID #: 14 Location: Warehouse 911 – Column E – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 44 mR/hr DR at 1 meter 4.0 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard & Shredded paper for packaging
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th poly liner/bag
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

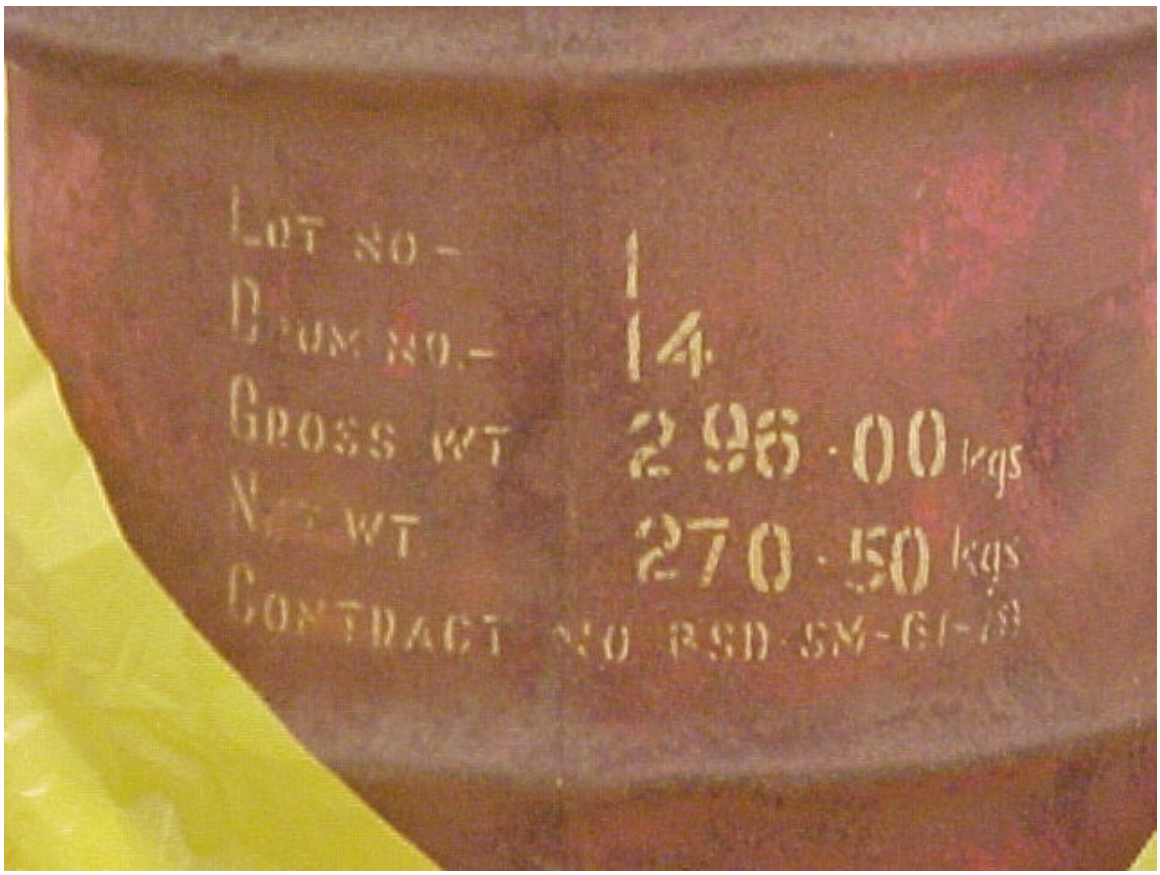
Date	7-2-2002	Time	13:50

Other Information

Photo No. 1 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

Indian (red) 55-gal drum – fair condition – extensive surface rust on drum
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

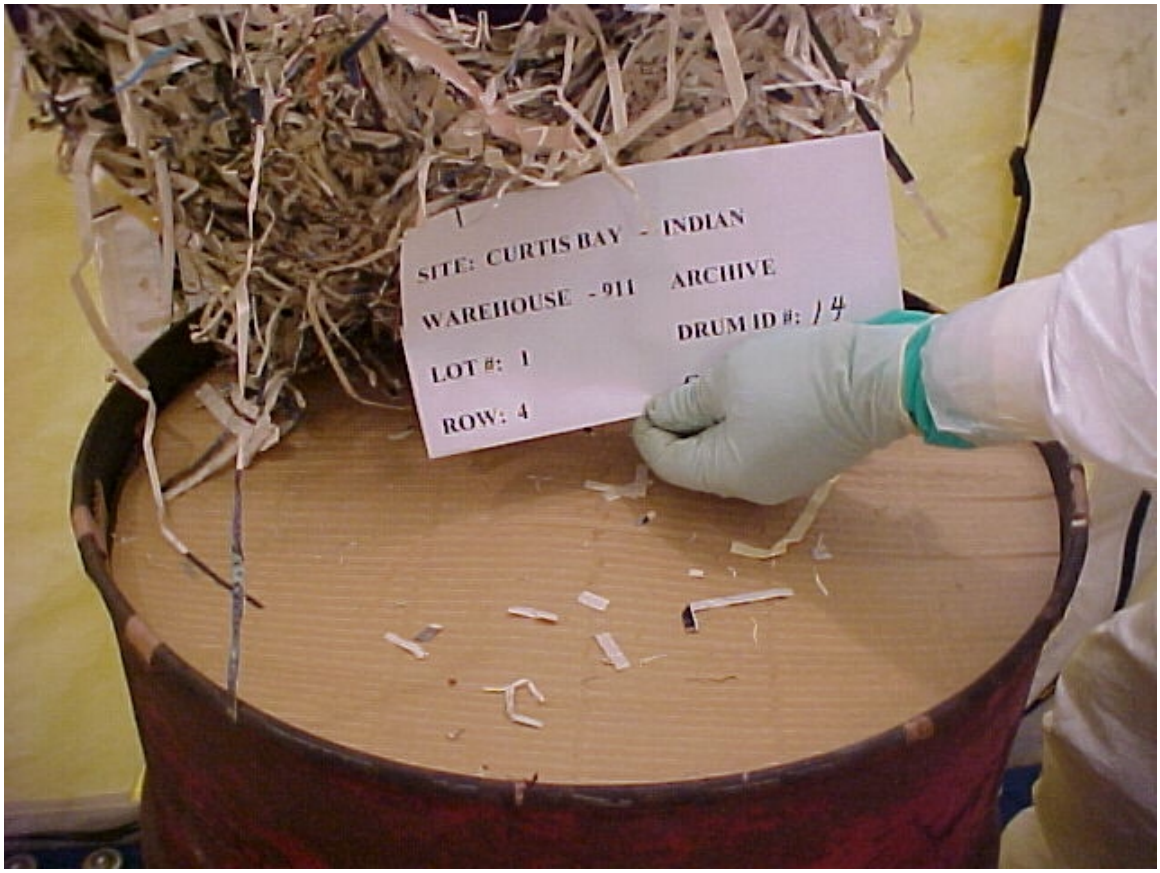
Date	7-2-2002	Time	13:50

Other Information

Photo No. 2 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

Shredded paper for storage – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

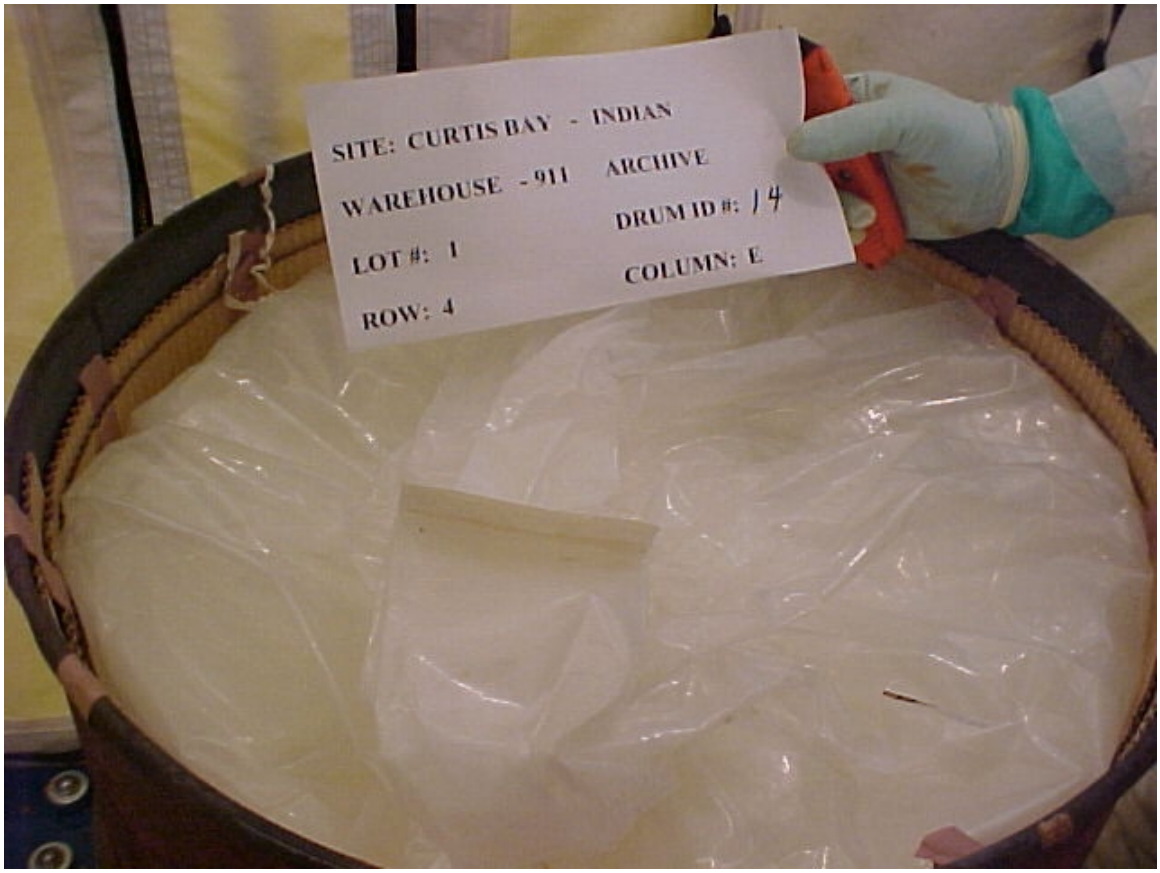
Date	7-2-2002	Time	13:50

Other Information

Photo No. 3 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

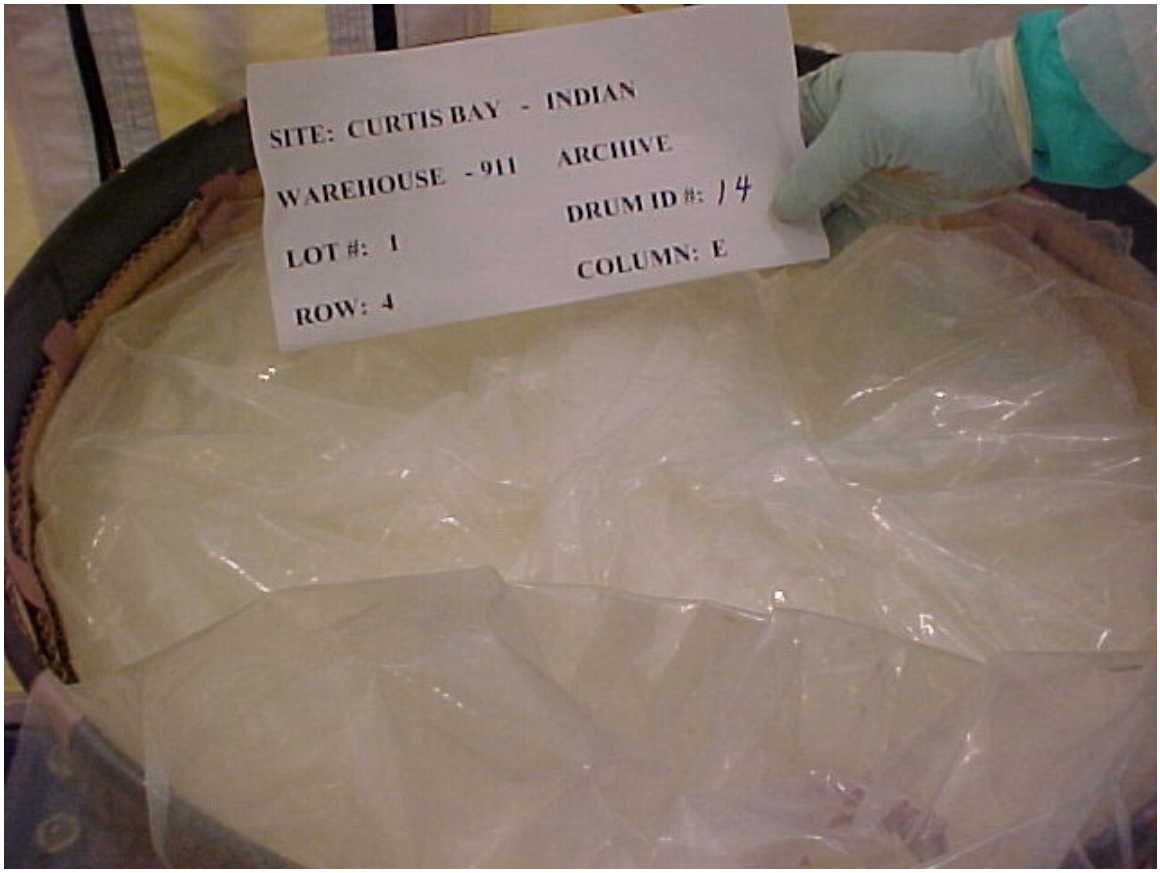
Date	7-2-2002	Time	13:50

Other Information

Photo No. 4 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

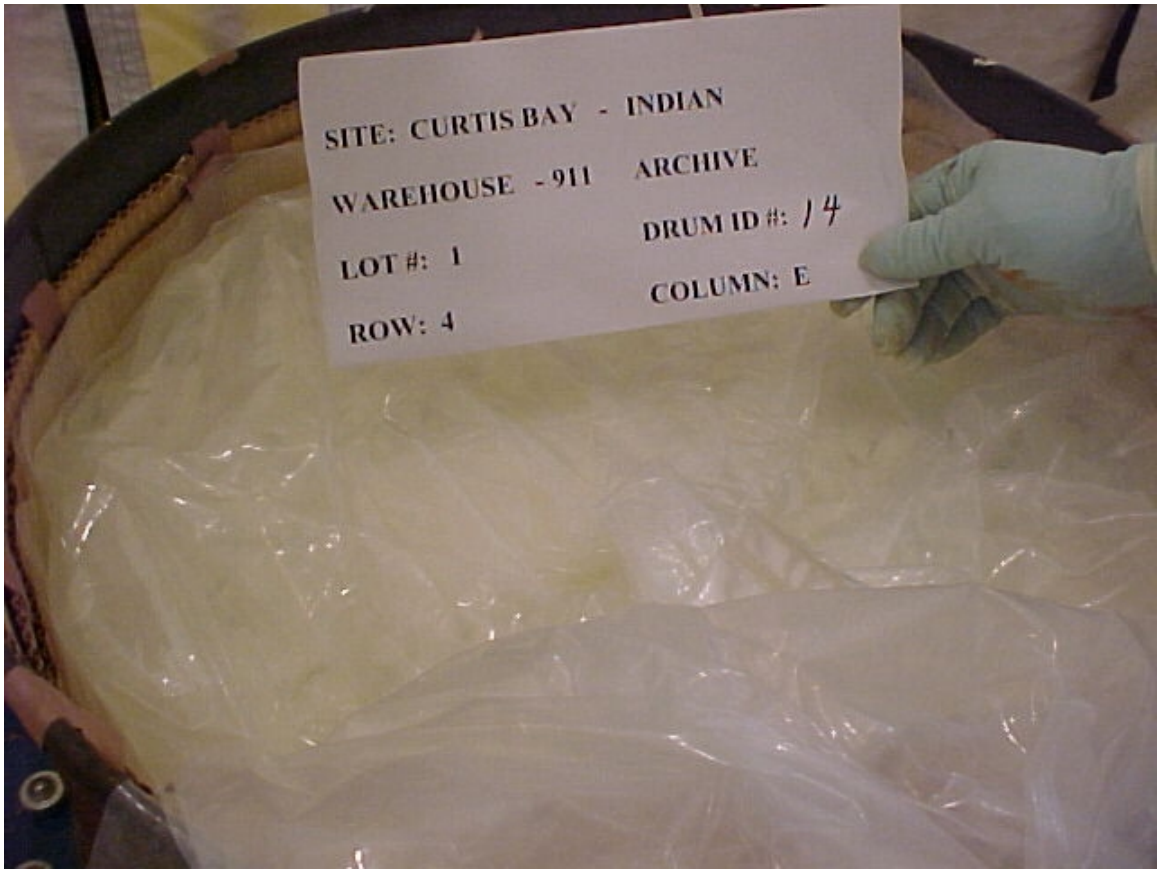
Date	7-2-2002	Time	13:50

Other Information

Photo No. 5 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

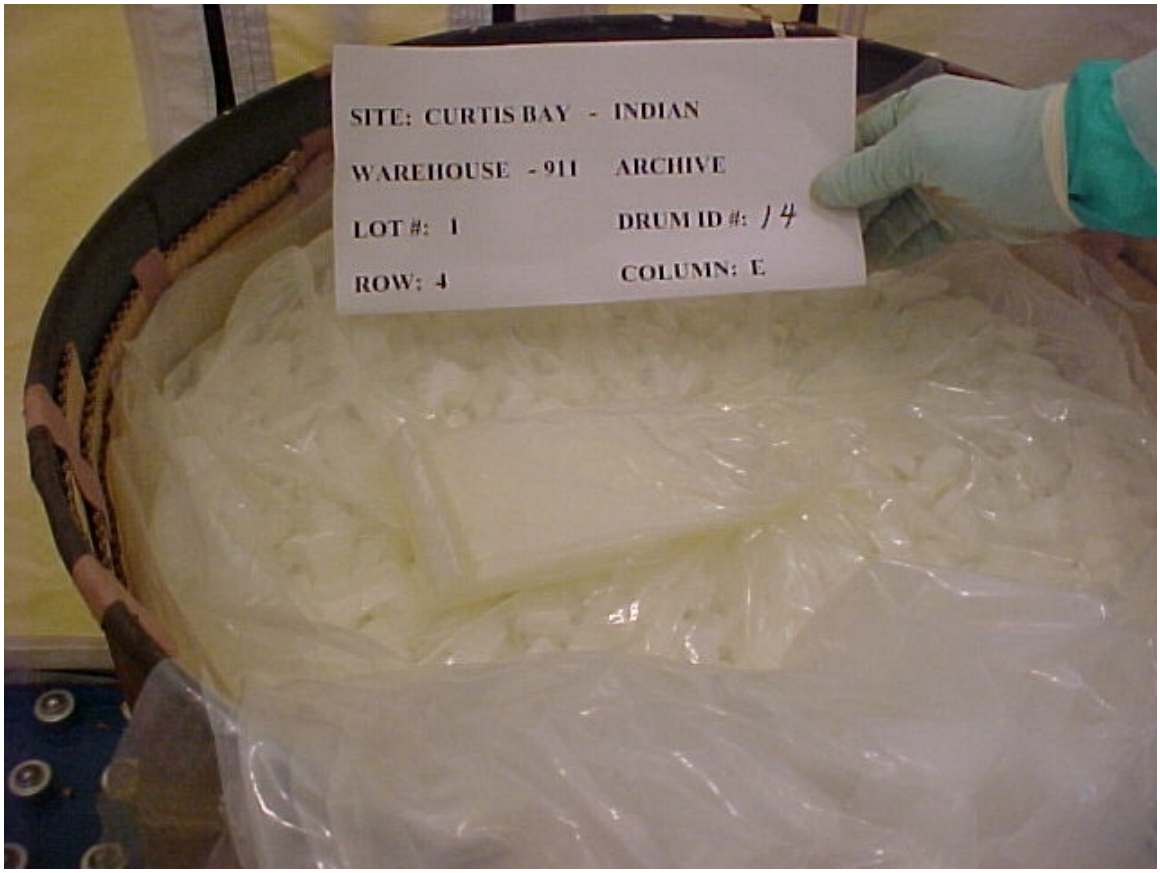
Date	7-2-2002	Time	13:50

Other Information

Photo No. 6 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

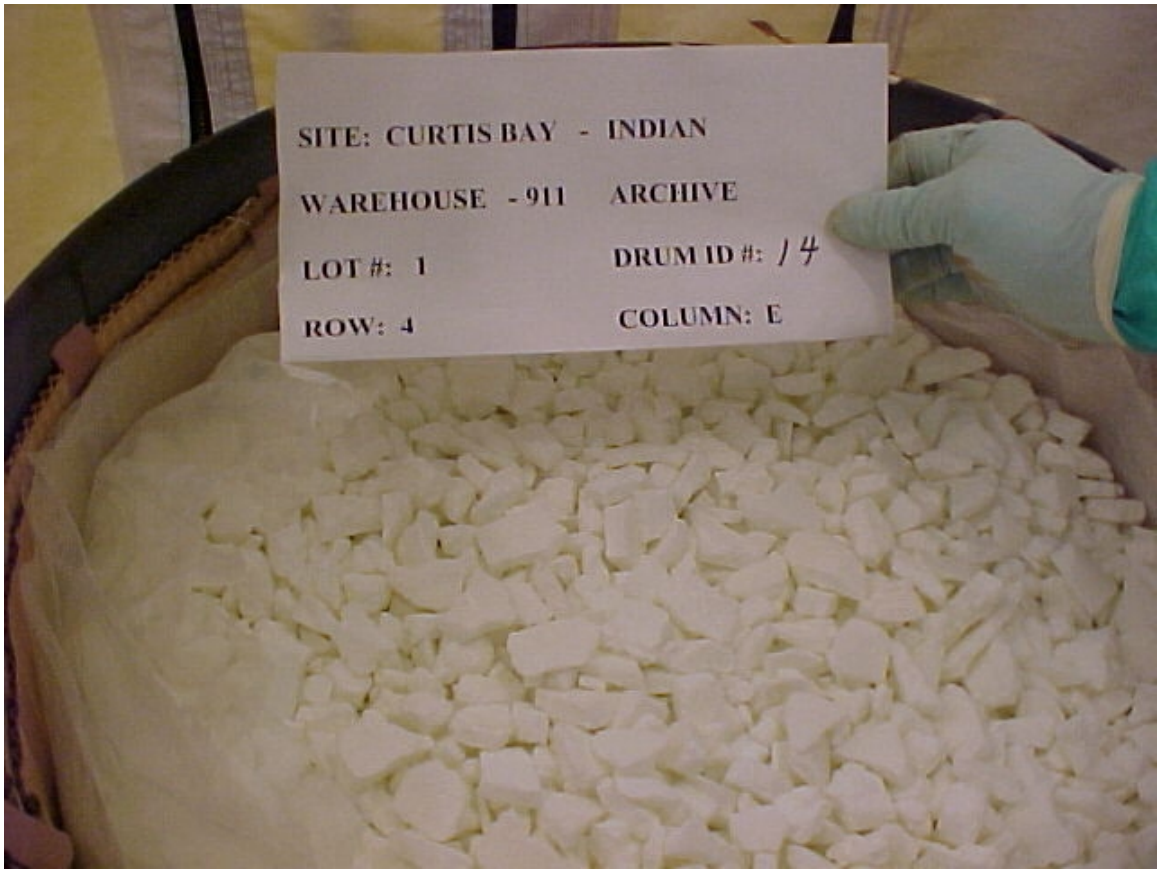
Date	7-2-2002	Time	13:50

Other Information

Photo No. 7 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

ThN material – Indian – cubes / chunks - dry
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	14	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	4
		Column	E

Inspection/Sample Date & Time

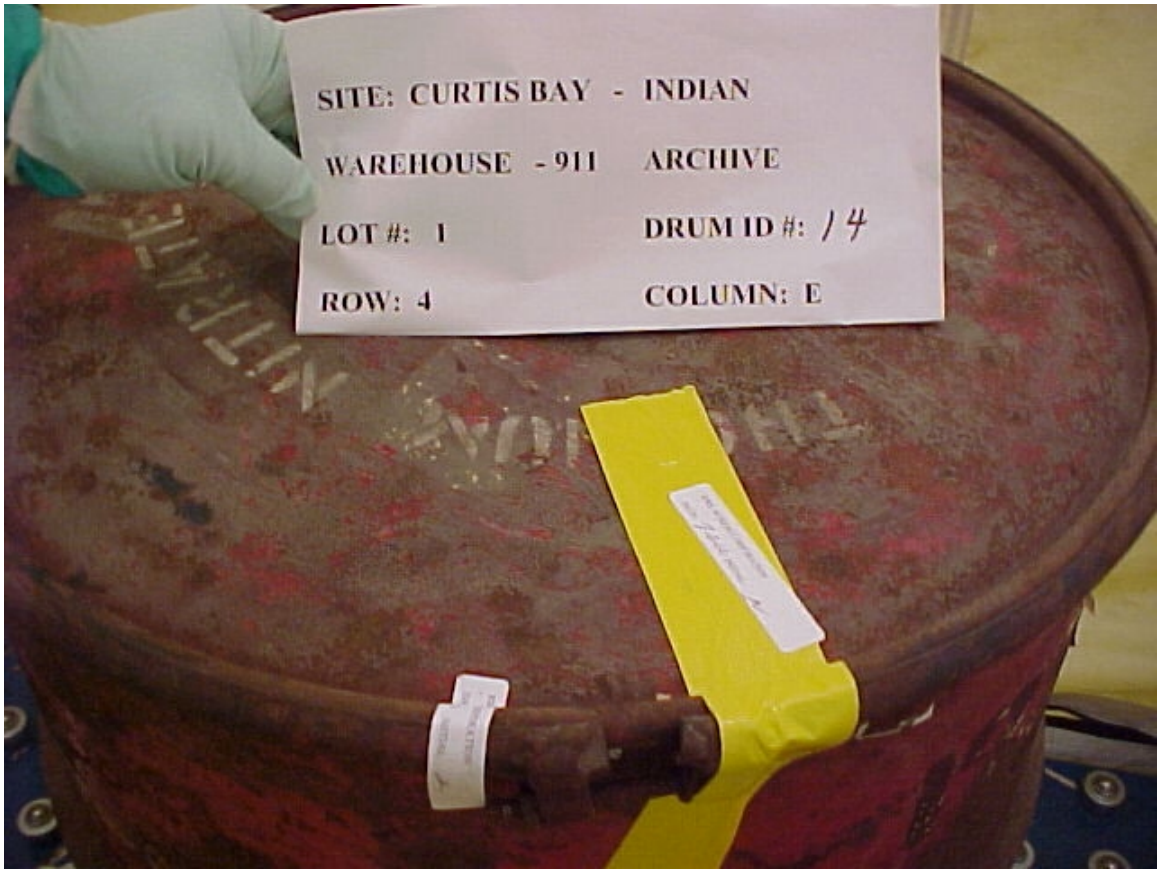
Date	7-2-2002	Time	13:50

Other Information

Photo No. 8 of 8

Dose Rate	Surface	44 mR/hr
	1 meter	5.0 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #I-2 – Drum #99
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-2 Drum ID #: 99 Location: Warehouse 911 – Column E – Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 42 mR/hr DR at 1 meter 4.6 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard & Shredded paper for packaging
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #5: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-03-2002

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	99	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	E

Inspection/Sample Date & Time

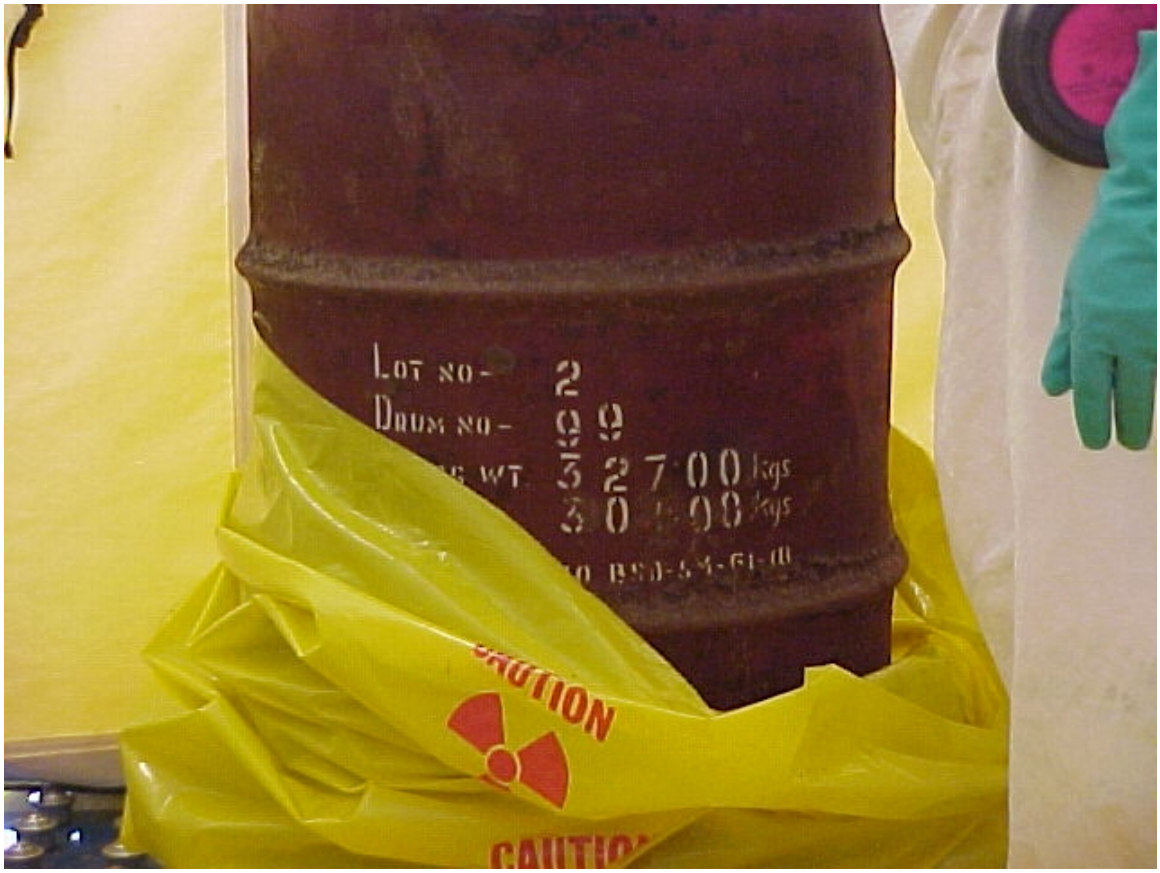
Date	7-3-2002	Time	11:00

Other Information

Photo No. 1 of 7

Dose Rate	Surface	42 mR/hr
	1 meter	4.6 mR/hr

Indian (red) 55-gal drum – fair condition – extensive surface rust on drum
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	99	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	E

Inspection/Sample Date & Time

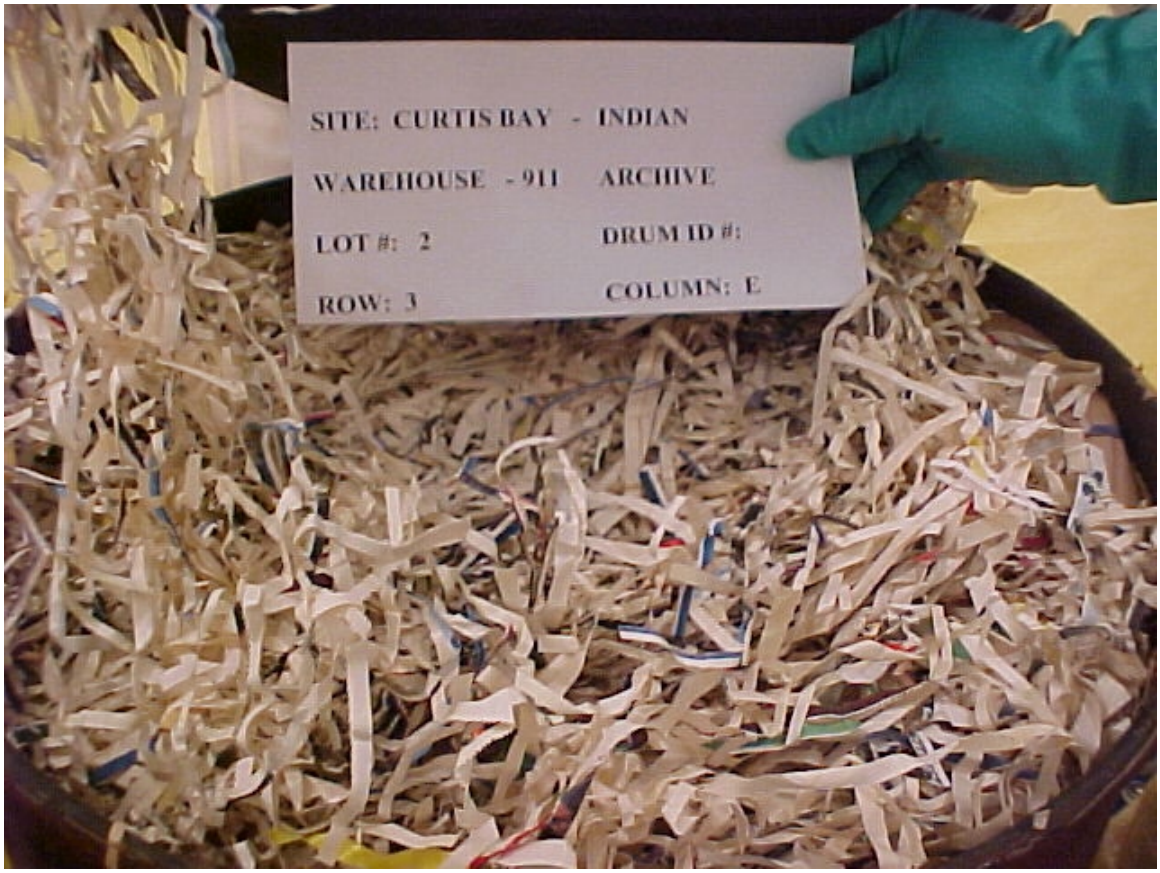
Date	7-3-2002	Time	11:00

Other Information

Photo No. 2 of 7

Dose Rate	Surface	42 mR/hr
	1 meter	4.6 mR/hr

Shredded paper for packaging – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	99	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	E

Inspection/Sample Date & Time

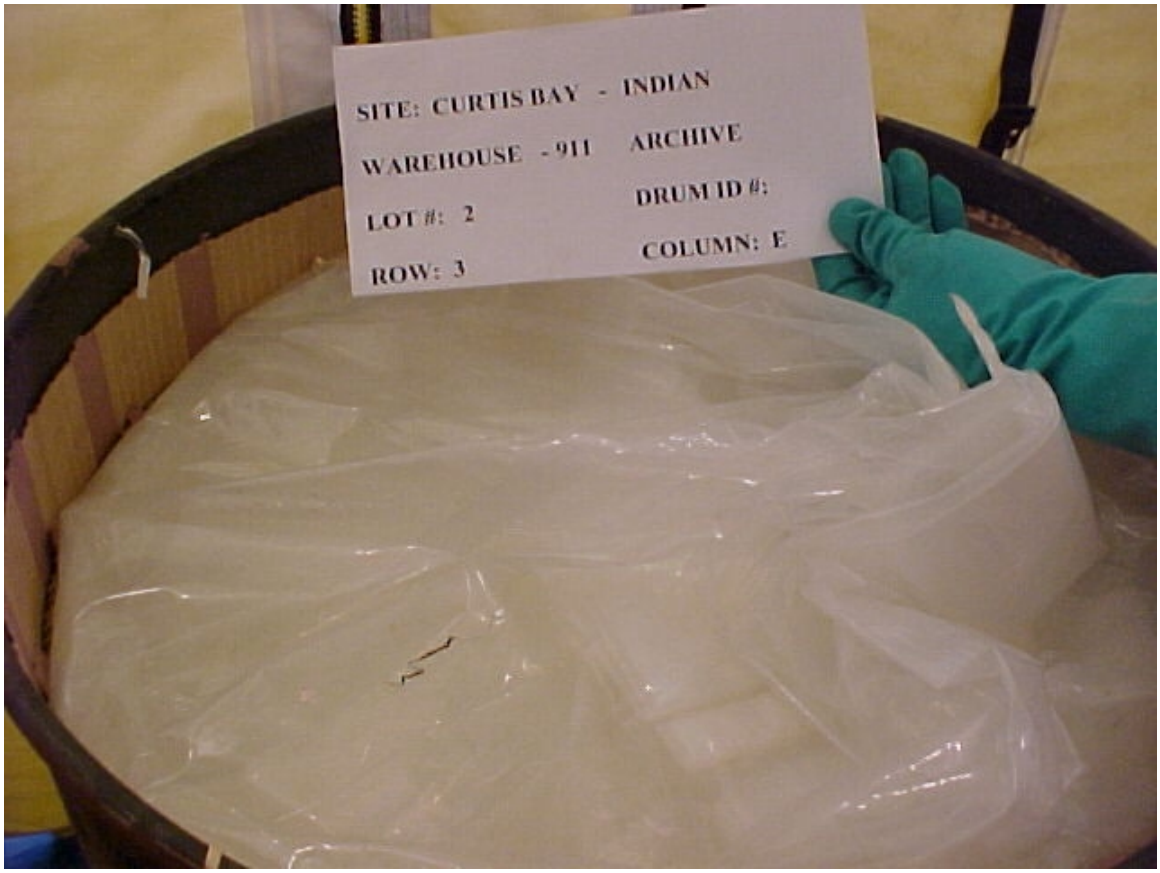
Date	7-3-2002	Time	11:00

Other Information

Photo No. 3 of 7

Dose Rate	Surface	42 mR/hr
	1 meter	4.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	99	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	E

Inspection/Sample Date & Time

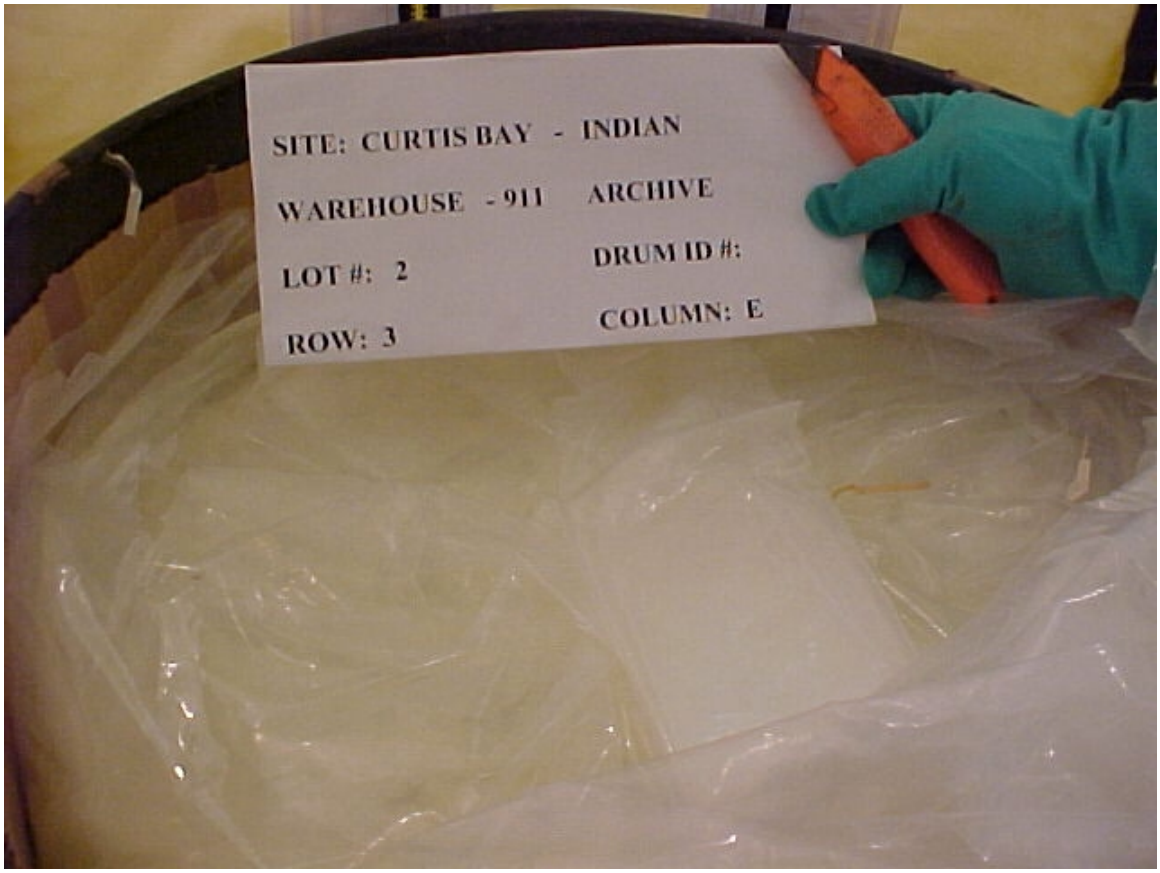
Date	7-3-2002	Time	11:00

Other Information

Photo No. 4 of 7

Dose Rate	Surface	42 mR/hr
	1 meter	4.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	99	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	E

Inspection/Sample Date & Time

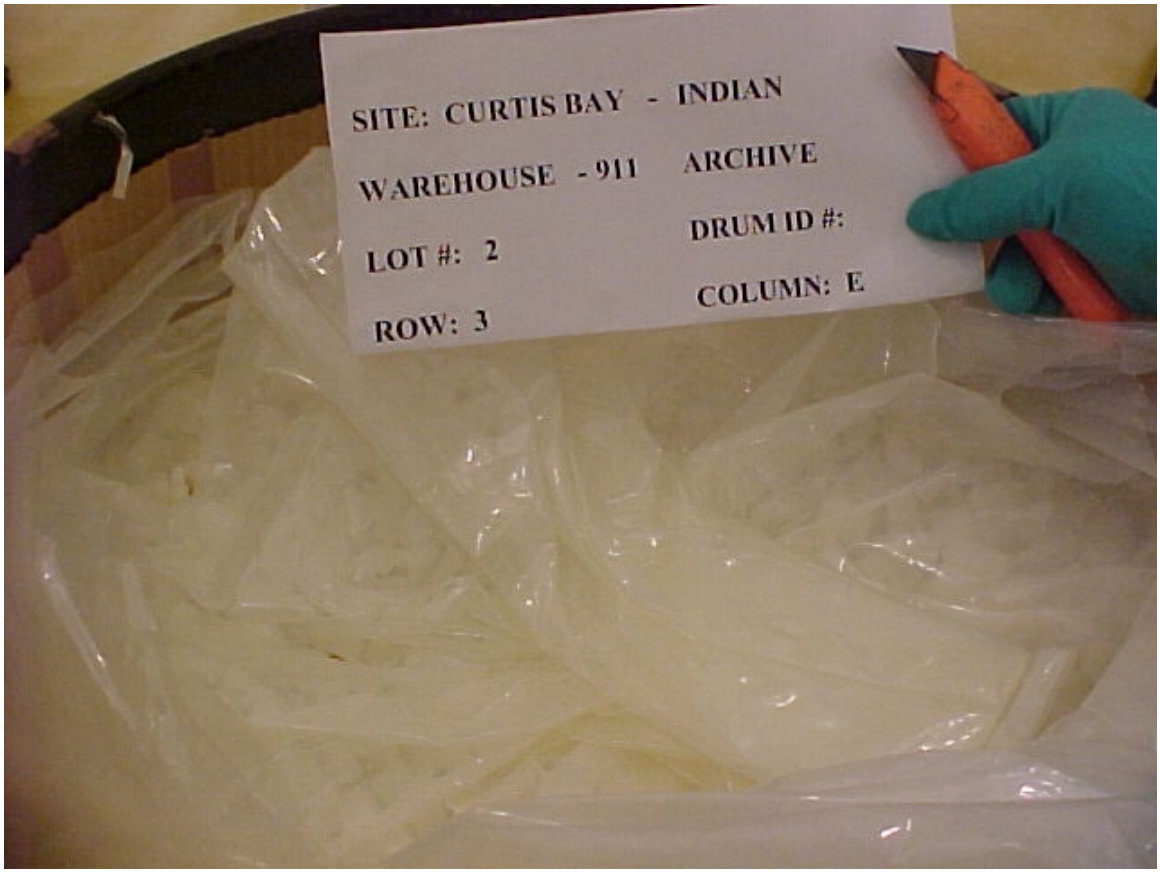
Date	7-3-2002	Time	11:00

Other Information

Photo No. 5 of 7

Dose Rate	Surface	42 mR/hr
	1 meter	4.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	99	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	E

Inspection/Sample Date & Time

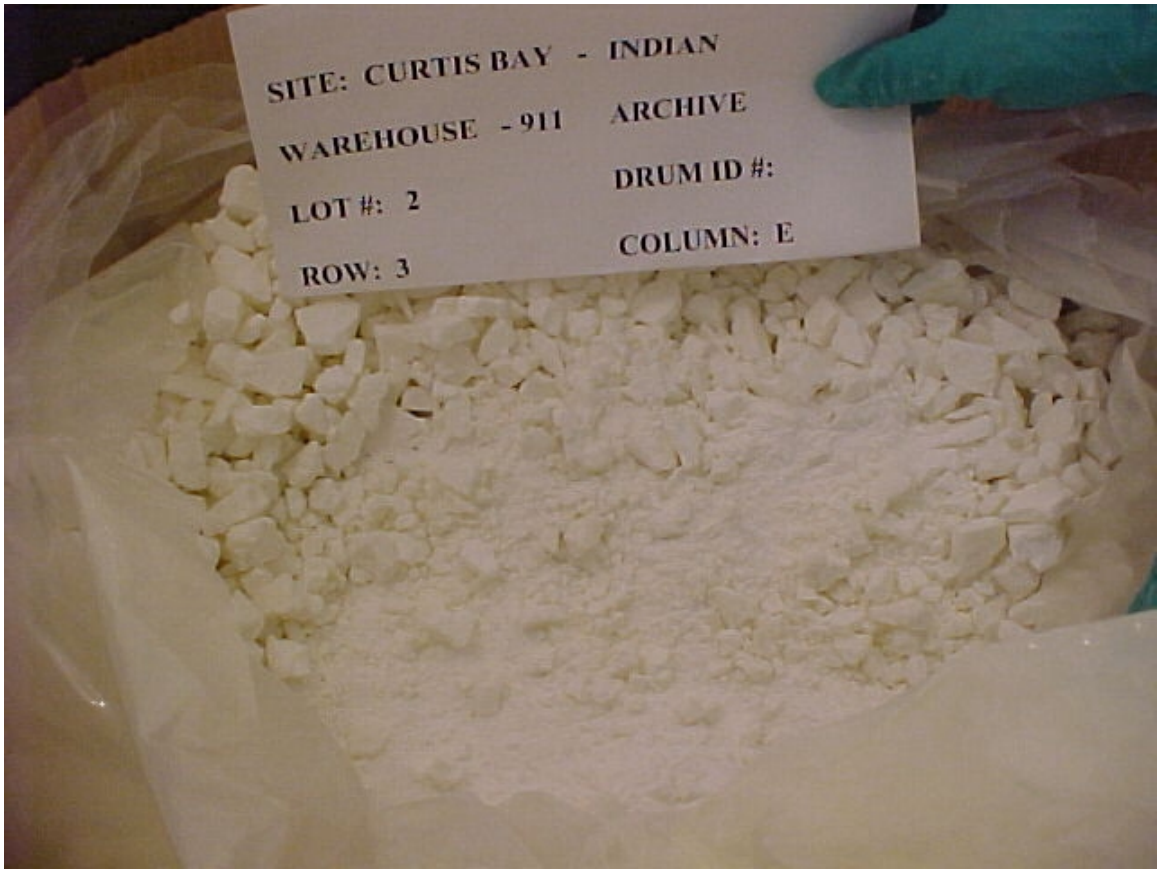
Date	7-3-2002	Time	11:00

Other Information

Photo No. 6 of 7

Dose Rate	Surface	42 mR/hr
	1 meter	4.6 mR/hr

Closeup of ThN material – white – dry – solid – cubes / chunks
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-2	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	99	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	E

Inspection/Sample Date & Time

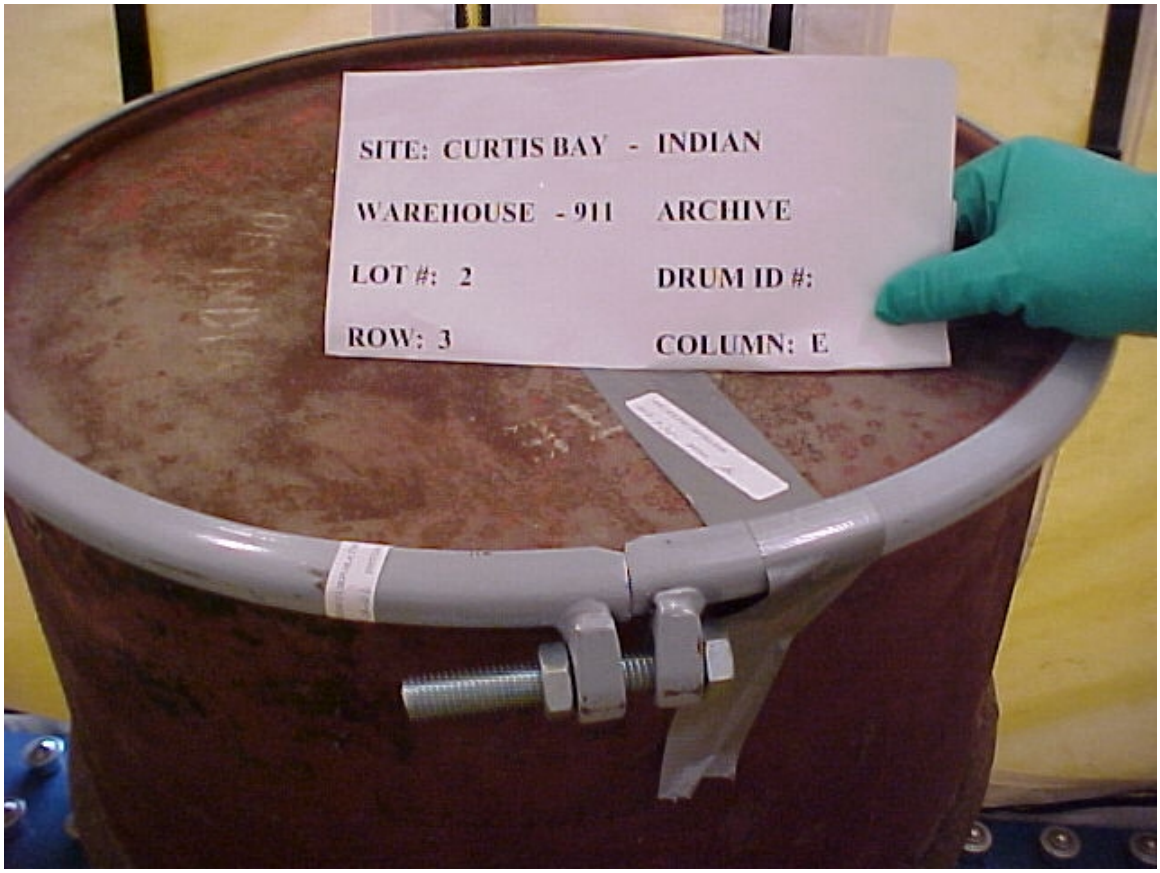
Date	7-3-2002	Time	11:00

Other Information

Photo No. 7 of 7

Dose Rate	Surface	42 mR/hr
	1 meter	4.6 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #I-8 – Drum #371
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-8 Drum ID #: 371 Location: Warehouse 911 – Column F – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 42 mR/hr DR at 1 meter 4.5 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard & Shredded paper for packaging
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #5: ☐ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 1 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

55-gal drum – fair condition – extensive surface rust on drum

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

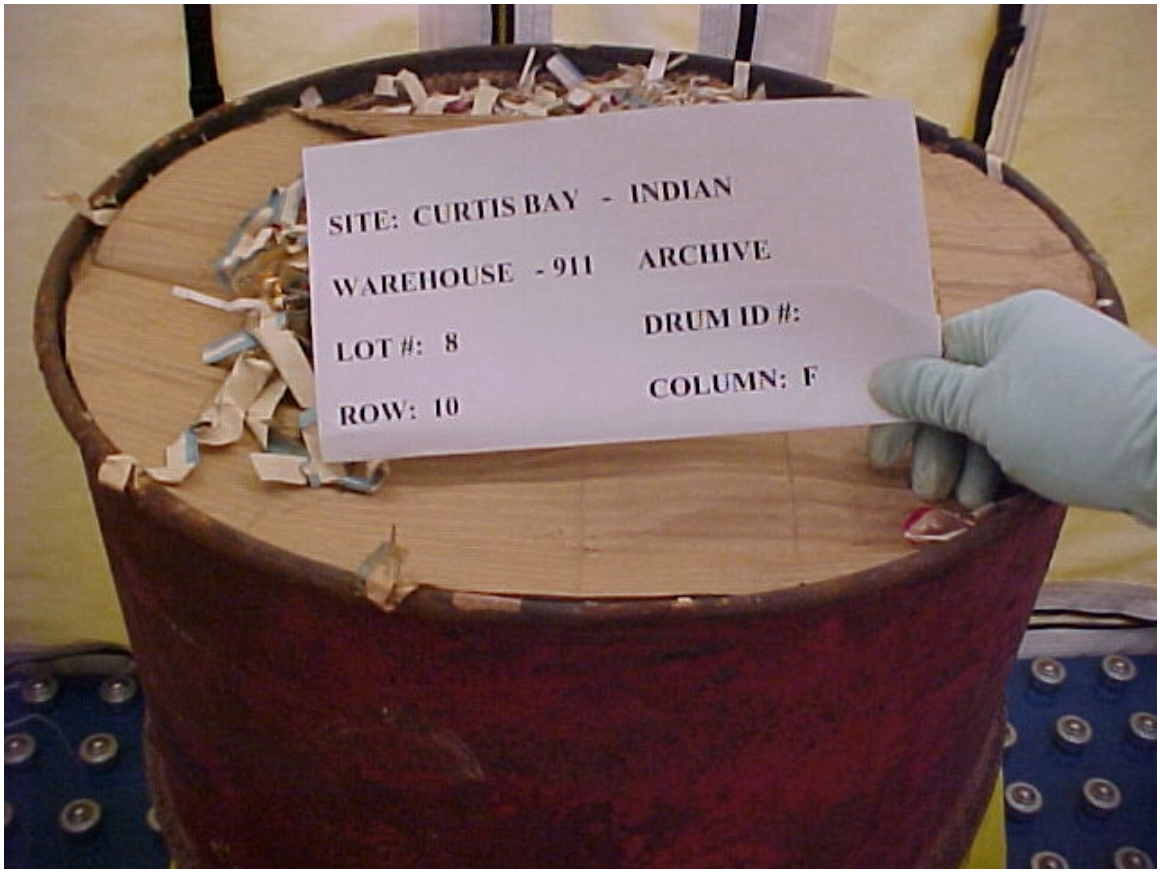
Date	7-2-2002	Time	9:10

Other Information

Photo No. 2 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

Cover / Shredded paper – good condition
No gases present in breathing zone



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 3 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

Another picture of shredded paper inside of drum
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 4 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 5 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 6 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 7 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

ThN material – Indian – dry – white – cubes / chunks
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 8 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

Indian ThN material in bag being weighed on scales
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	9:10

Other Information

Photo No. 9 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

Closeup of ThN material cubes/chunks in the drum
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	371	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	10
		Column	F

Inspection/Sample Date & Time

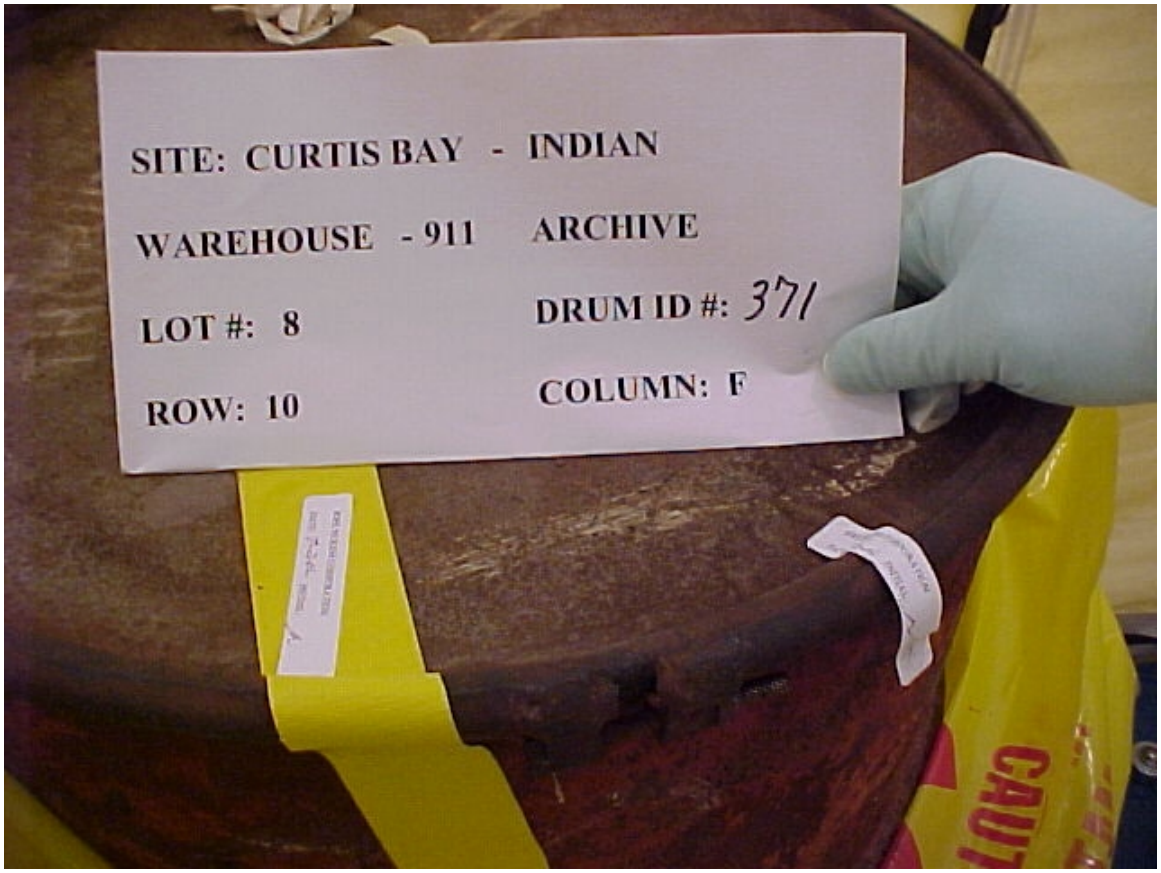
Date	7-2-2002	Time	9:10

Other Information

Photo No. 10 of 10

Dose Rate	Surface	42 mR/hr
	1 meter	4.5 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #I-10 – Drum #484
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: I-10 Drum ID #: 484 Location: Warehouse 911 – Column F – Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 55-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): fair
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall thickness of Outer Container *(French and Indian Drums only):* 0.1565 Units: in
Rad Measurements at the time of opening: DR at Surface 42 mR/hr DR at 1 meter 4.0 mR/hr dpm/300cm^2 ext. contamination
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard & Shredded paper for packaging
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd poly liner/bag
Inner Container # 3Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd poly liner/bag
Inner Container # 4Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th poly liner/bag
Inner Container # 5Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): cubes
Color: white
Particle Size: Gravel Shape
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-02-02

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

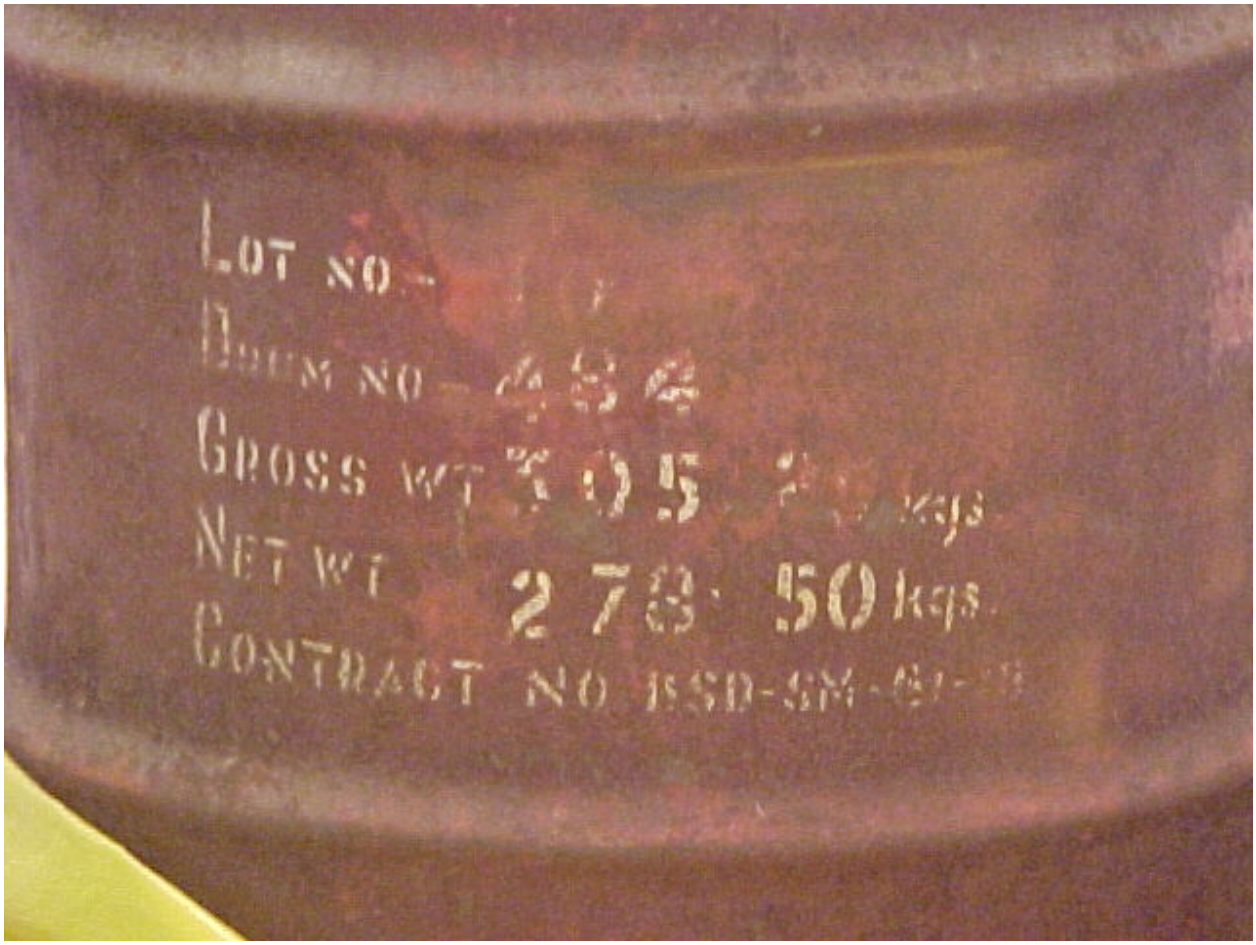
Date	7-2-2002	Time	09:35

Other Information

Photo No. 1 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

55-gal drum – fair condition – exterior rust on drum surface
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

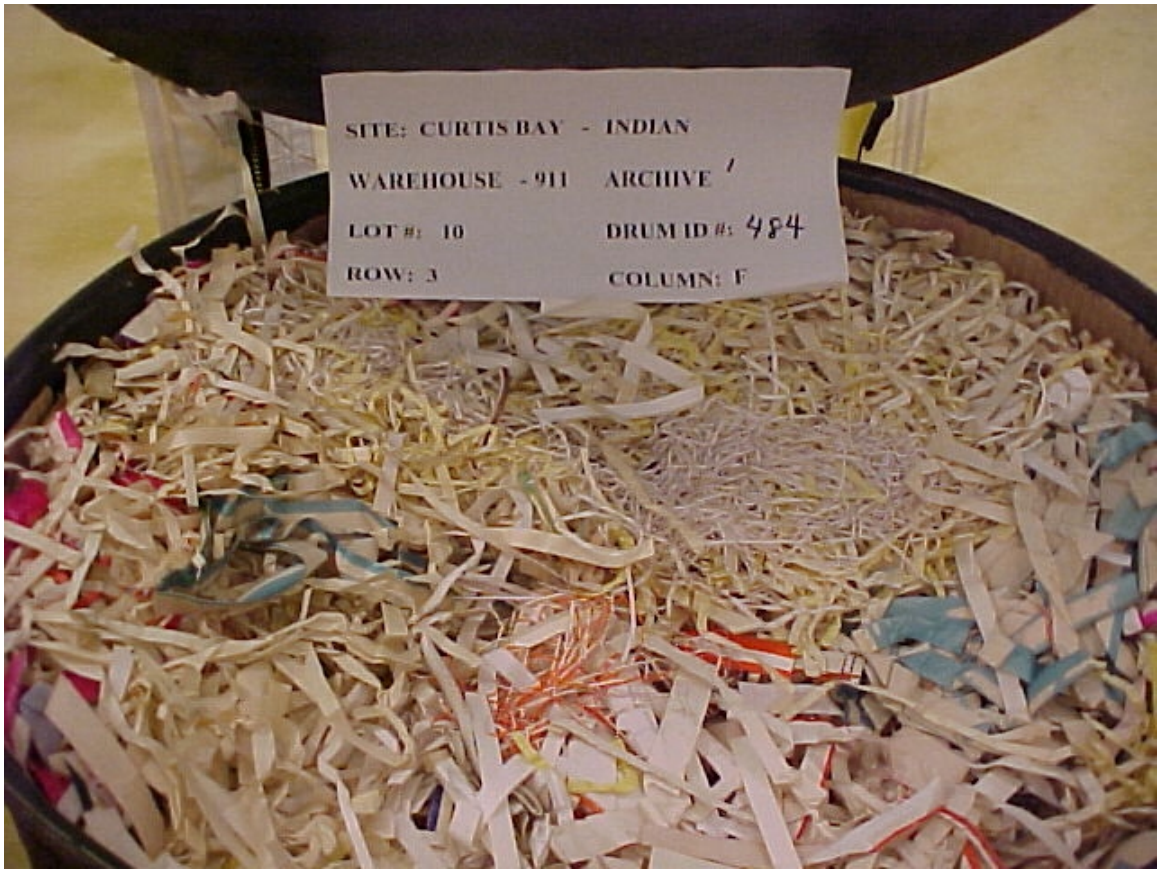
Date	7-2-2002	Time	09:35

Other Information

Photo No. 2 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

Shredded paper packaging in top of drum
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

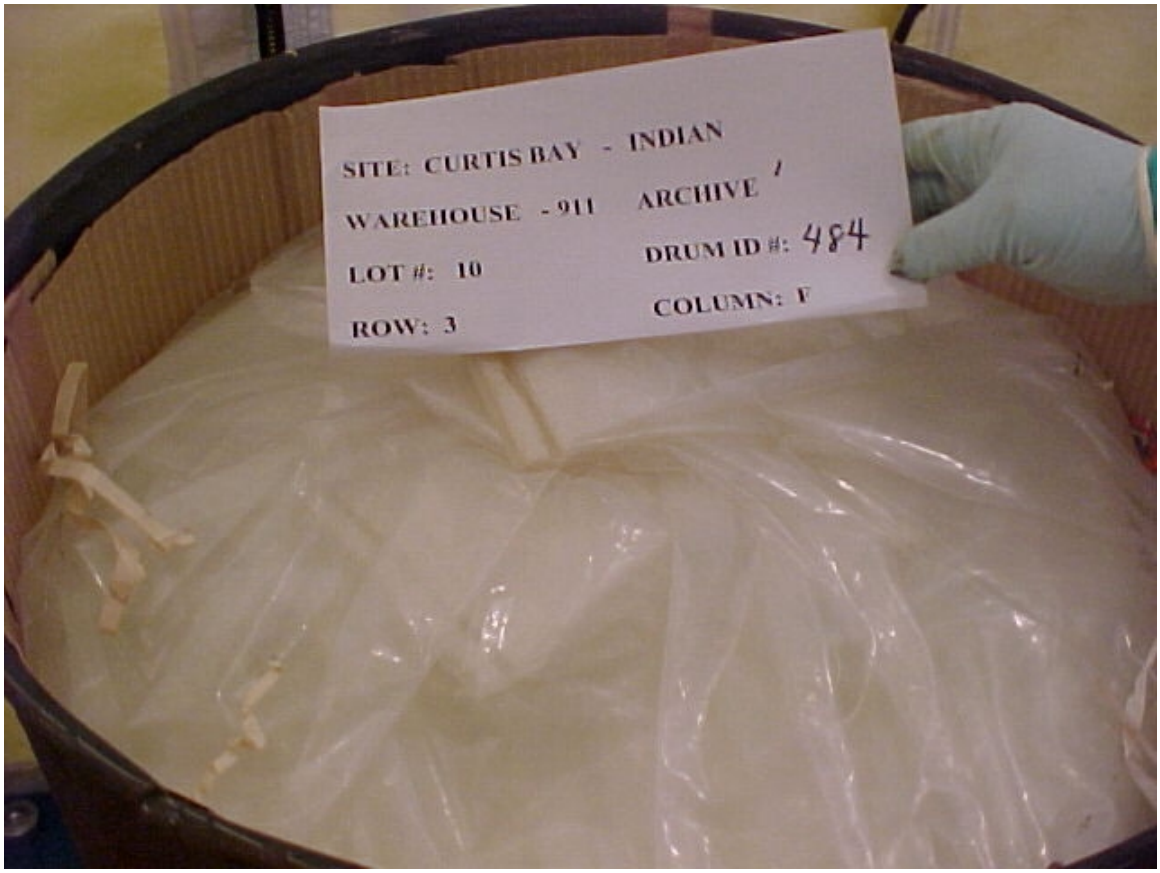
Date	7-2-2002	Time	09:35

Other Information

Photo No. 3 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

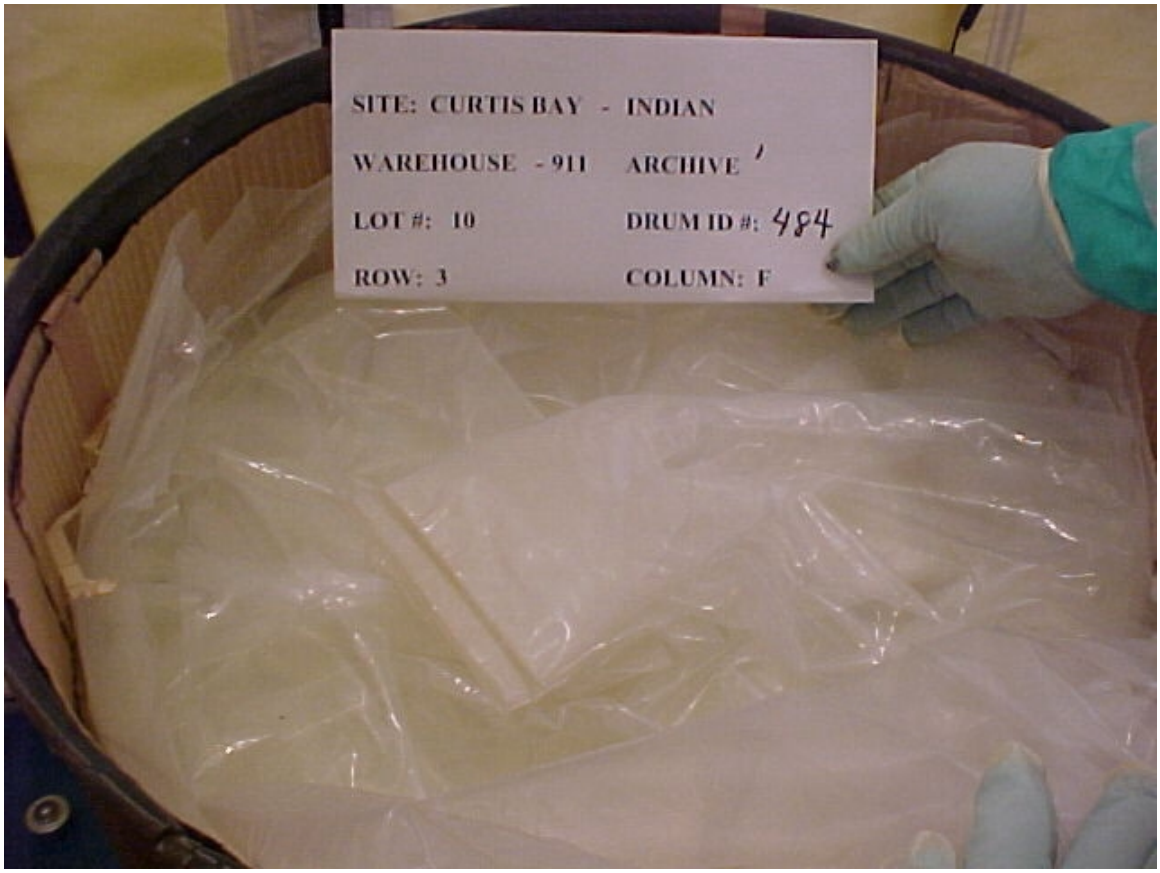
Date	7-2-2002	Time	09:35

Other Information

Photo No. 4 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

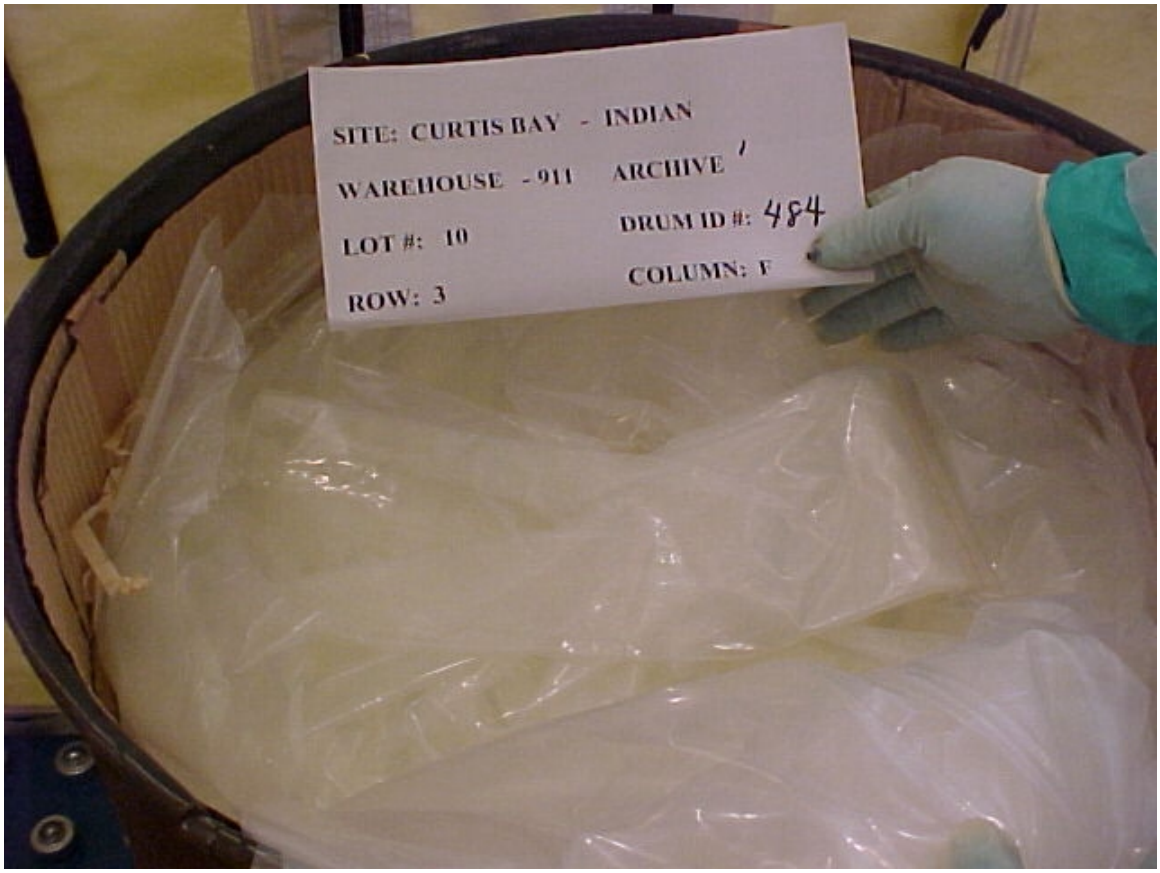
Date	7-2-2002	Time	09:35

Other Information

Photo No. 5 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

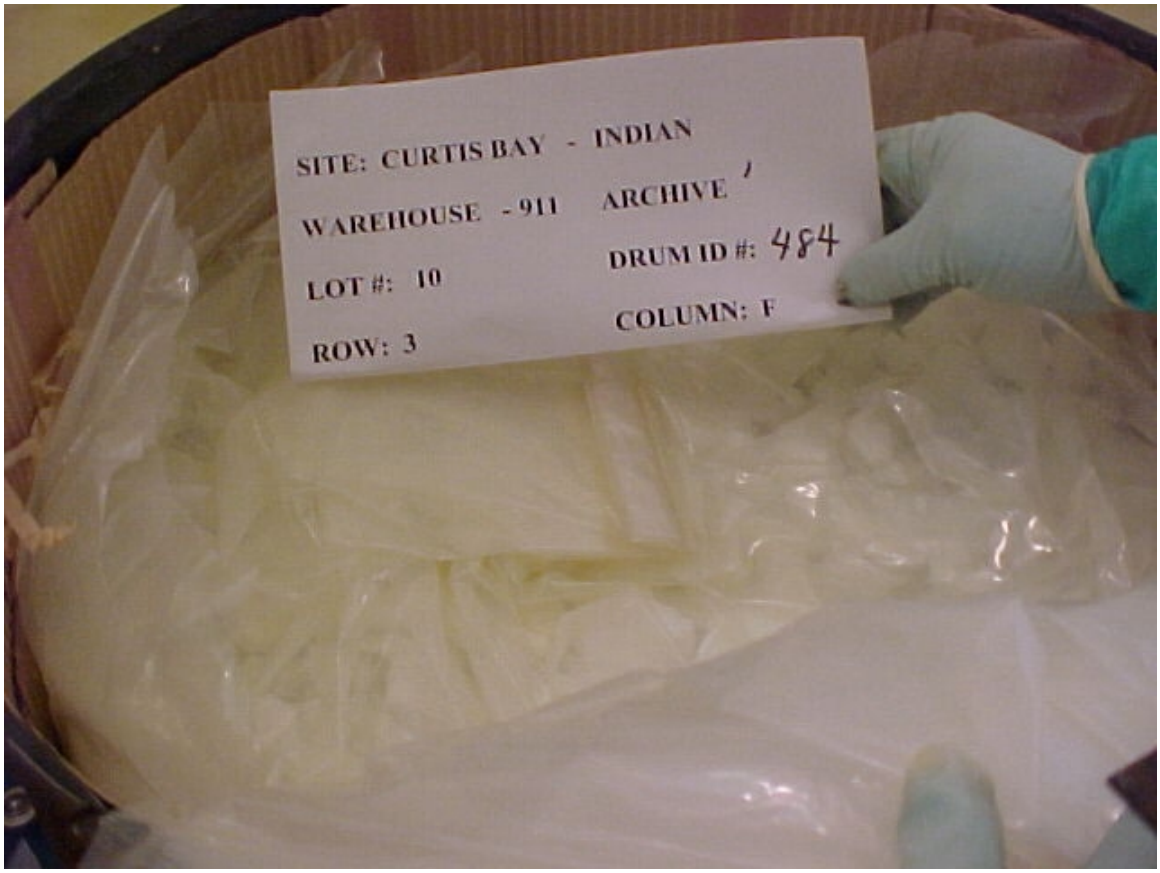
Date	7-2-2002	Time	09:35

Other Information

Photo No. 6 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

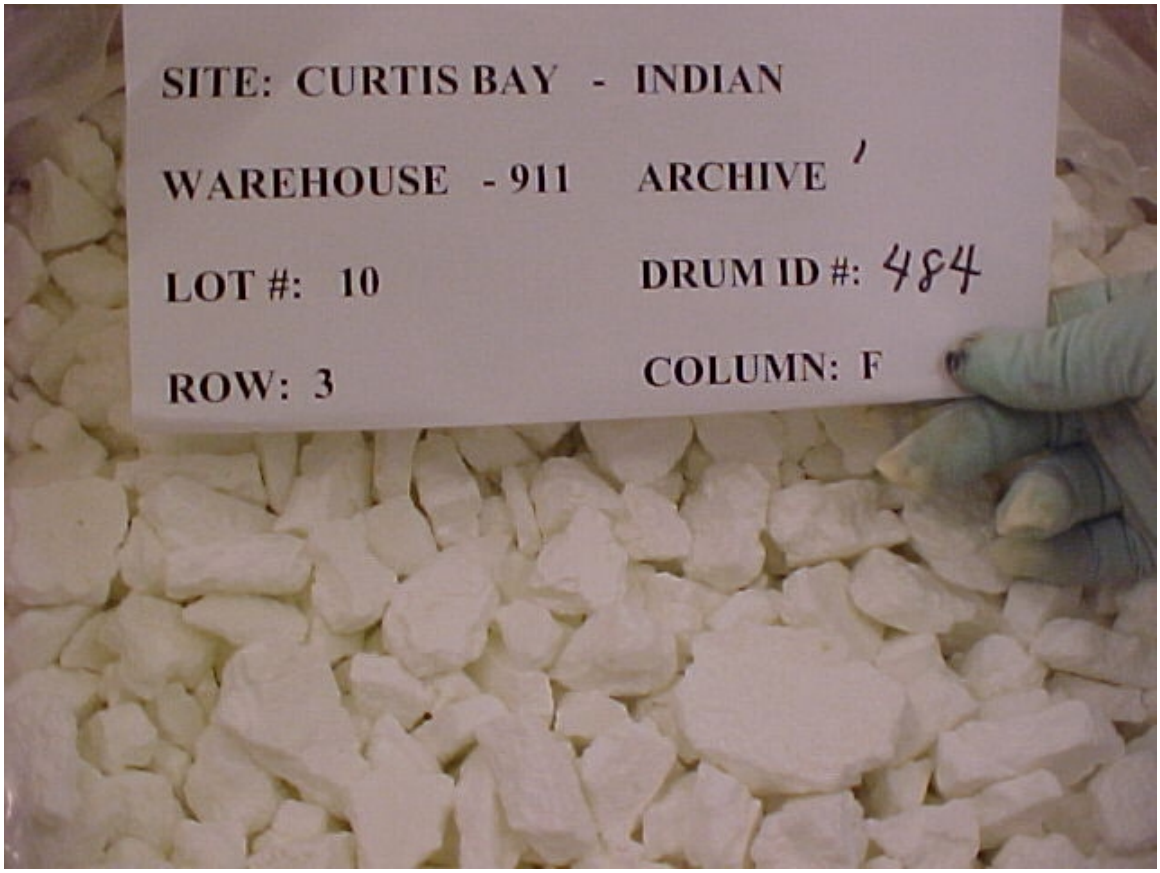
Date	7-2-2002	Time	09:35

Other Information

Photo No. 7 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

ThN material – Indian – cubes / chunks – solid - white
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

Date	7-2-2002	Time	09:35

Other Information

Photo No. 8 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

Closeup of ThN material while the material is being weighed in sample bag.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	India		
Lot No.	I-10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	484	Disposition	Archive

Physical Location of Drum

Warehouse	911	Row	3
		Column	F

Inspection/Sample Date & Time

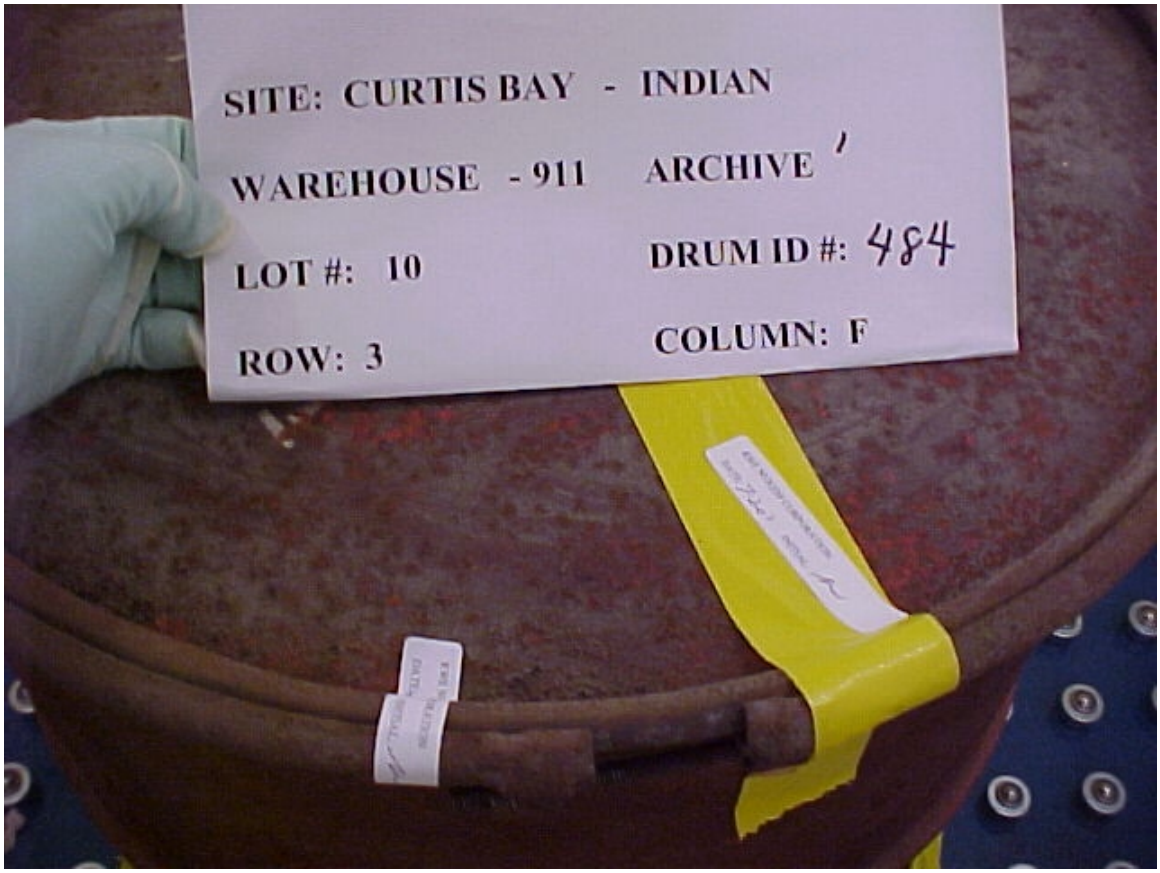
Date	7-2-2002	Time	09:35

Other Information

Photo No. 9 of 9

Dose Rate	Surface	42 mR/hr
	1 meter	4.0 mR/hr

Sealed & dated – Complete



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APPENDIX I

CURTIS BAY DEPOT
DRUMS SAMPLED FOR ON-SITE ARCHIVE
(THIRD DRUM OF ARCHIVED SAMPLES)

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The following table provides a list of drum lots and drum identification numbers that were inspected and sampled at the Curtis Bay Depot as part of the Thorium Nitrate Drum Sampling Project. The lots and drums included in this appendix were placed in storage as archived samples per the contract terms. The drum inspection and sampling data are arranged in a chronological order based on the "Lot" identification number.

Each set of drum inspection and sampling data includes the Container Inspection Checklist and a set of photographs showing each layer of the container package required to reach the thorium nitrate material in addition to photographs showing the sampled material. Comments are provided with each photograph that describe the condition of the specific layer and/or specific conditions encountered with the packaging layer (e.g. dose rates, condition of steel drum, poly liners, etc.).

The samples from the lots/drums included in this appendix were placed into archive storage in Warehouse 913 at the Curtis Bay Depot in Drum ID No. 6990-001-A3 [i.e. the third (and last) drum of samples archived at the Curtis Bay Depot]. All lots/drums included in this appendix came from Thorium Nitrate materials originating from domestic sources.

The data in this appendix contain visual inspection and applicable sampling data from the remaining 30-gal steel drum (MD-1 drums) lots. A significant percentage of the MD-1 drums contained internal gas pressurization. From the visual inspection of these MD-1 drums, 56.3% of the drums included in this data set at one time contained internal pressure (either via release of gas during the visual inspection or the presence of indentations in the top lid). Lots that had internal gas pressure are indicated with a single asterisk in the following table.

Also included with this table is the page number of the starting page in this appendix for the visual inspection and sampling data for the specific lot/drum.

No.	Lot ID No.	Drum ID No.	Page No.
1	1*	111	I-5
2	4	142	I-17
3	5*	111	I-29
4	6	175	I-41
5	7*	59	I-53
6	8*	127	I-65
7	9*	24	I-79
8	10	135	I-93
9	13*	124	I-105
10	21*	83	I-119
11	23*	200	I-131
12	27	159	I-145
13	31	00	I-159
14	33*	149	I-169
15	46	24	I-183
16	63	5	I-197

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Curtis Bay Depot
Lot #1 - Drum #111
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 1 Drum ID #: 111 Location: Warehouse 913 – Column F – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☐ Yes (include Drum ID in photo) ☒ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☐ Yes (include Drum ID in photo) ☒ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

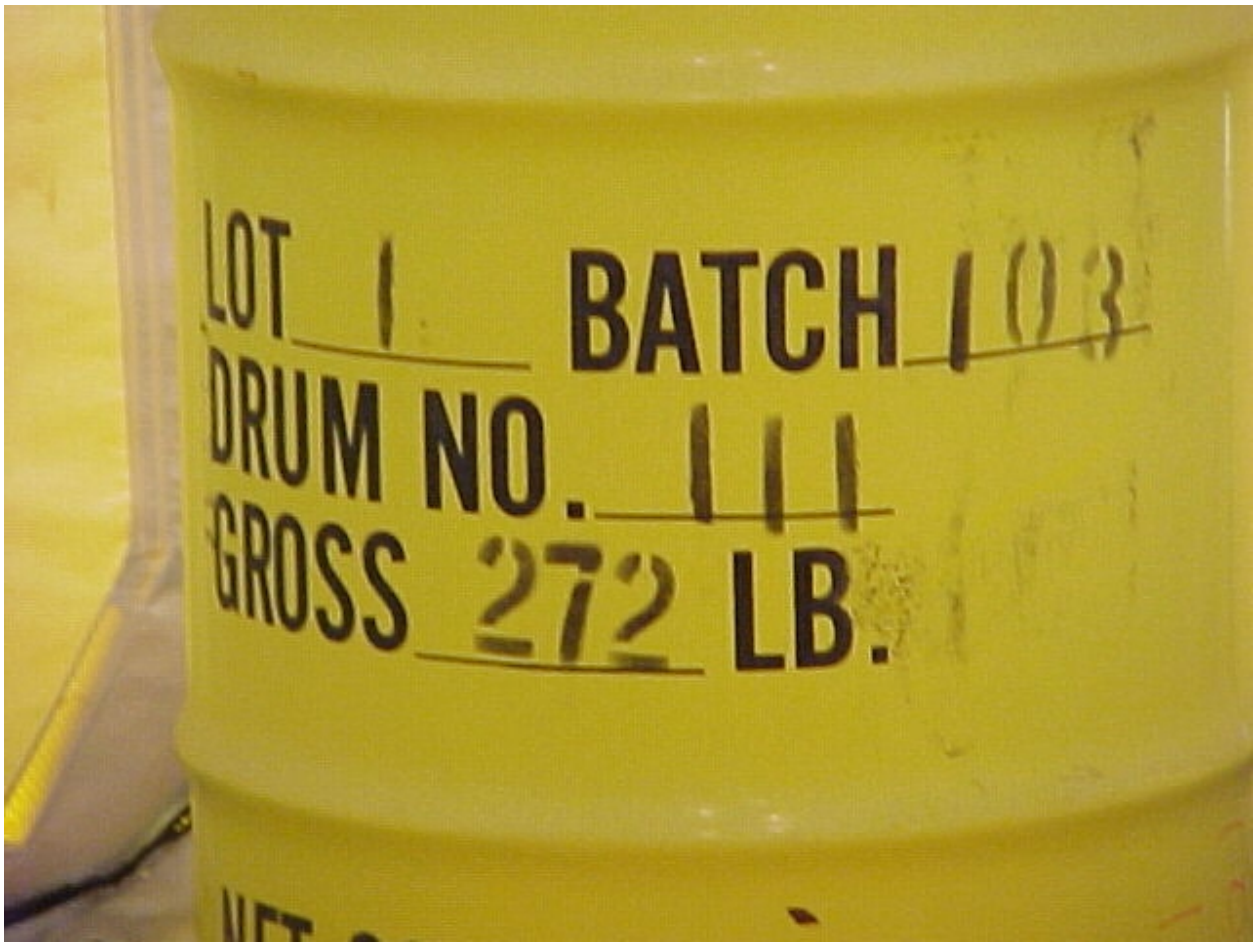
Date	7-12-2002	Time	08:15

Other Information

Photo No. 1 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
Gases vented from drum during bolt ring removal operations
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

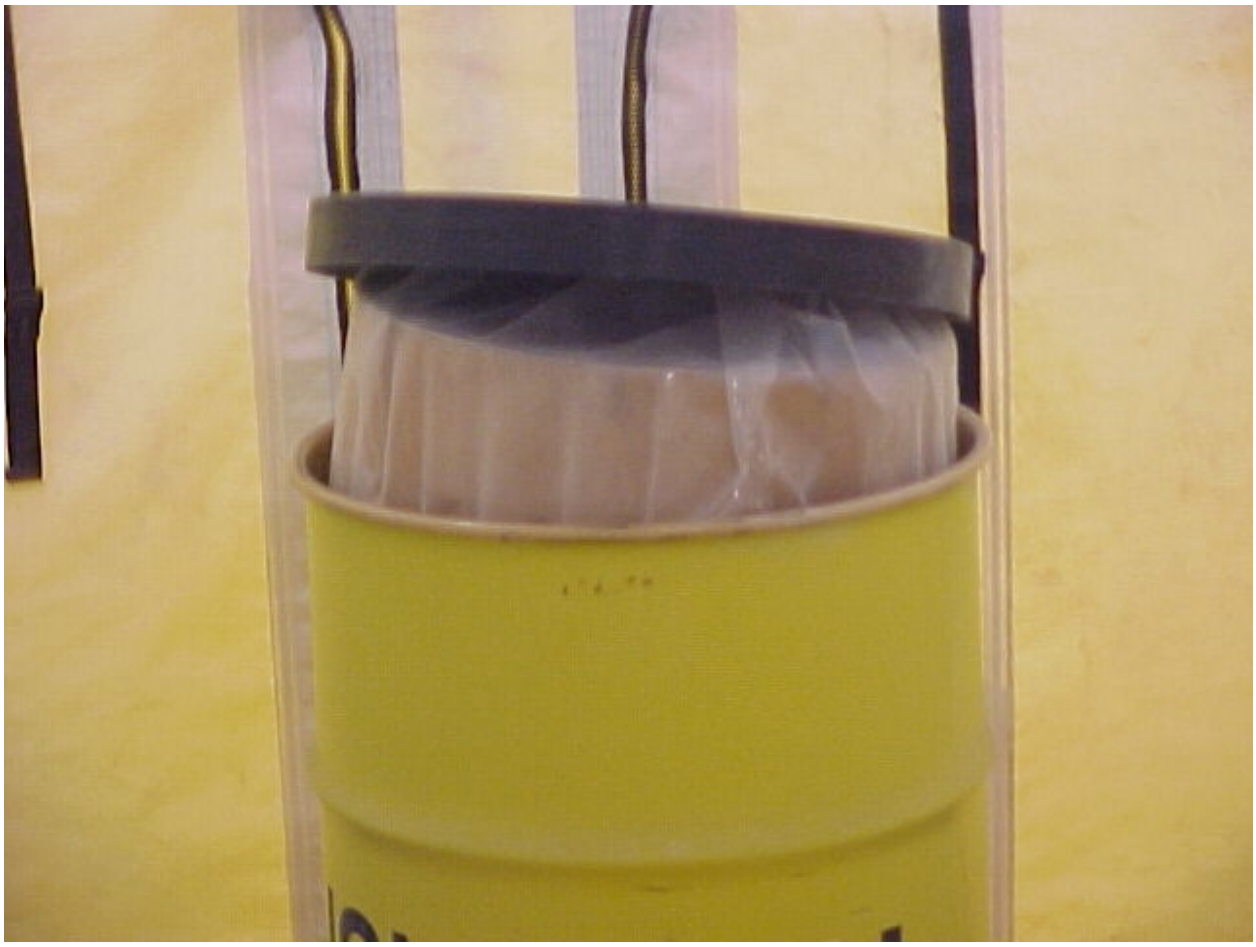
Date	7-12-2002	Time	08:15

Other Information

Photo No. 2 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid (mounted on inner rigid drum liner) – good condition
Pressure buildup inside the packaging layers results in this packaging layer rising vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:15

Other Information

Photo No. 3 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside the packaging layers results in this packaging layer rising vertically out of the container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:15

Other Information

Photo No. 4 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid (fiber drum is outermost fiber drum inside of the 30-gal metal drum) – good condition
Pressure buildup inside the packaging layers results in this packaging layer rising vertically out of the container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:15

Other Information

Photo No. 5 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid (mounted on inner fiber/lab-pack drum) – good condition
Picture shows where this wooden lid has slid down inside of this inner fiber/lab-pack drum vs. remaining on the lip of the fiber drum shown in the picture. Picture also shows where we have cut through the 2nd & 3rd poly liner/bags.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:15

Other Information

Photo No. 6 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber/Lab-pack drum lid – fair condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:15

Other Information

Photo No. 7 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	08:15

Other Information

Photo No. 8 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	1	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	F

Inspection/Sample Date & Time

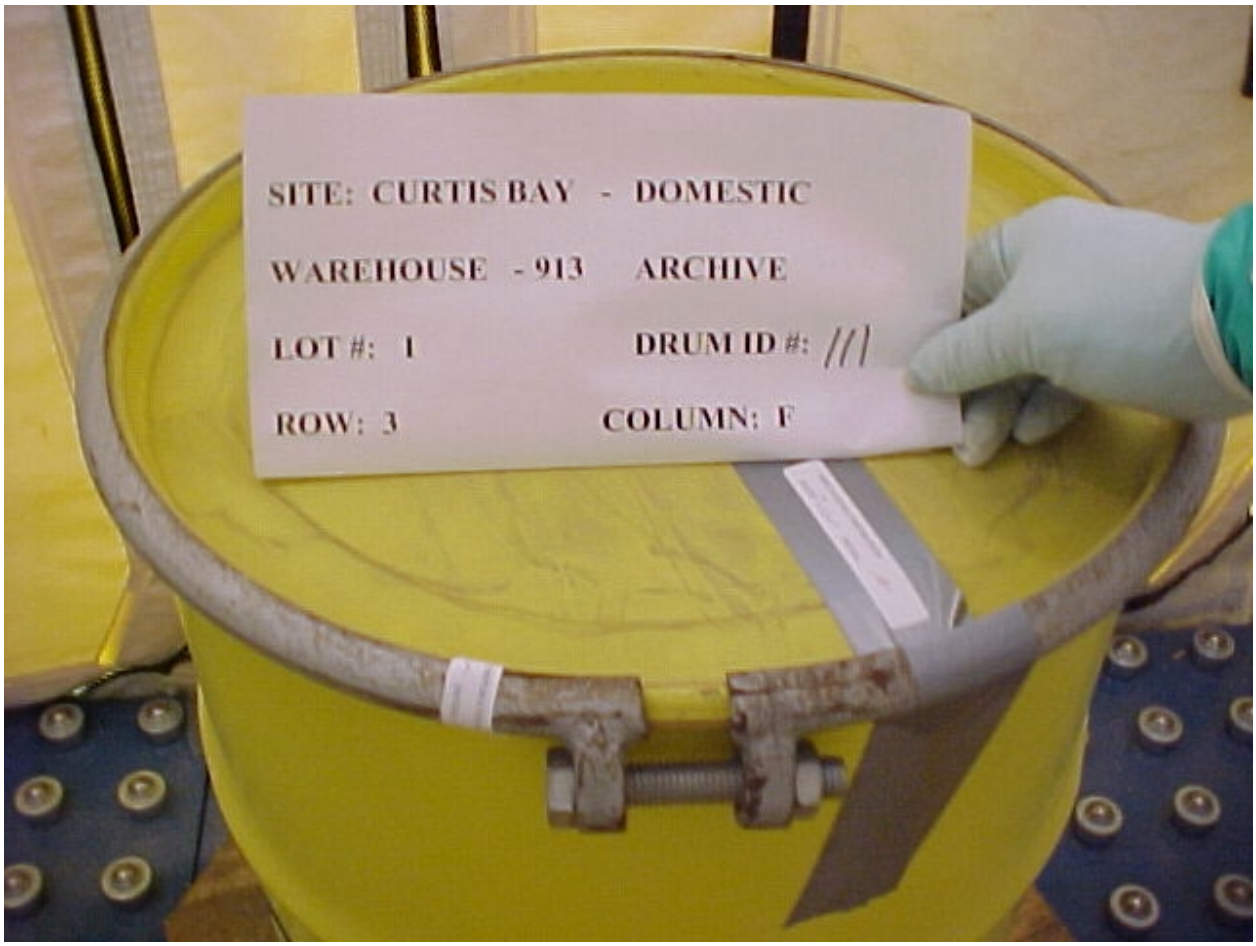
Date	7-12-2002	Time	08:15

Other Information

Photo No. 9 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #4 - Drum #142
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 4 Drum ID #: 142 Location: Warehouse 913 – Column B – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

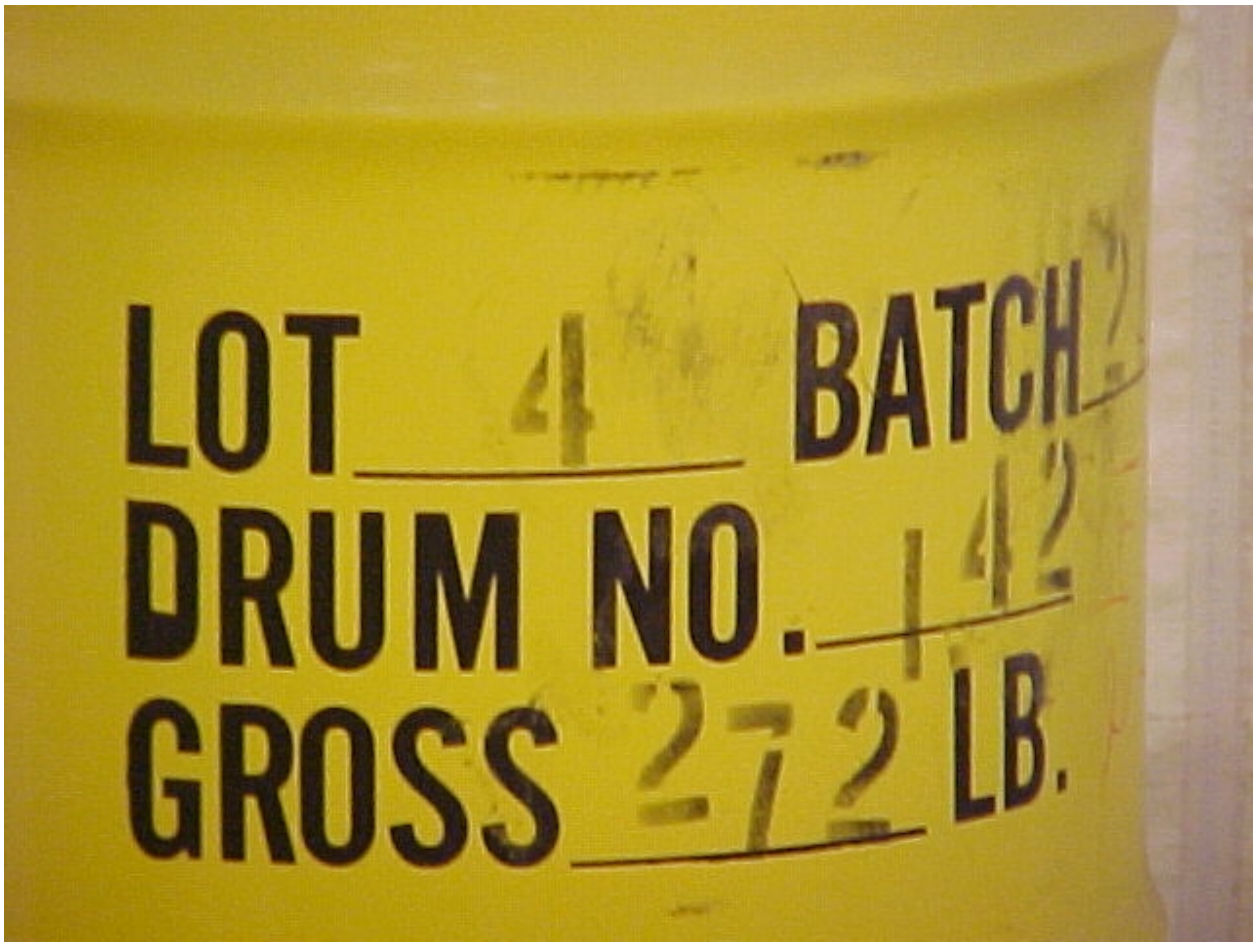
Date	7-12-2002	Time	14:30

Other Information

Photo No. 1 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

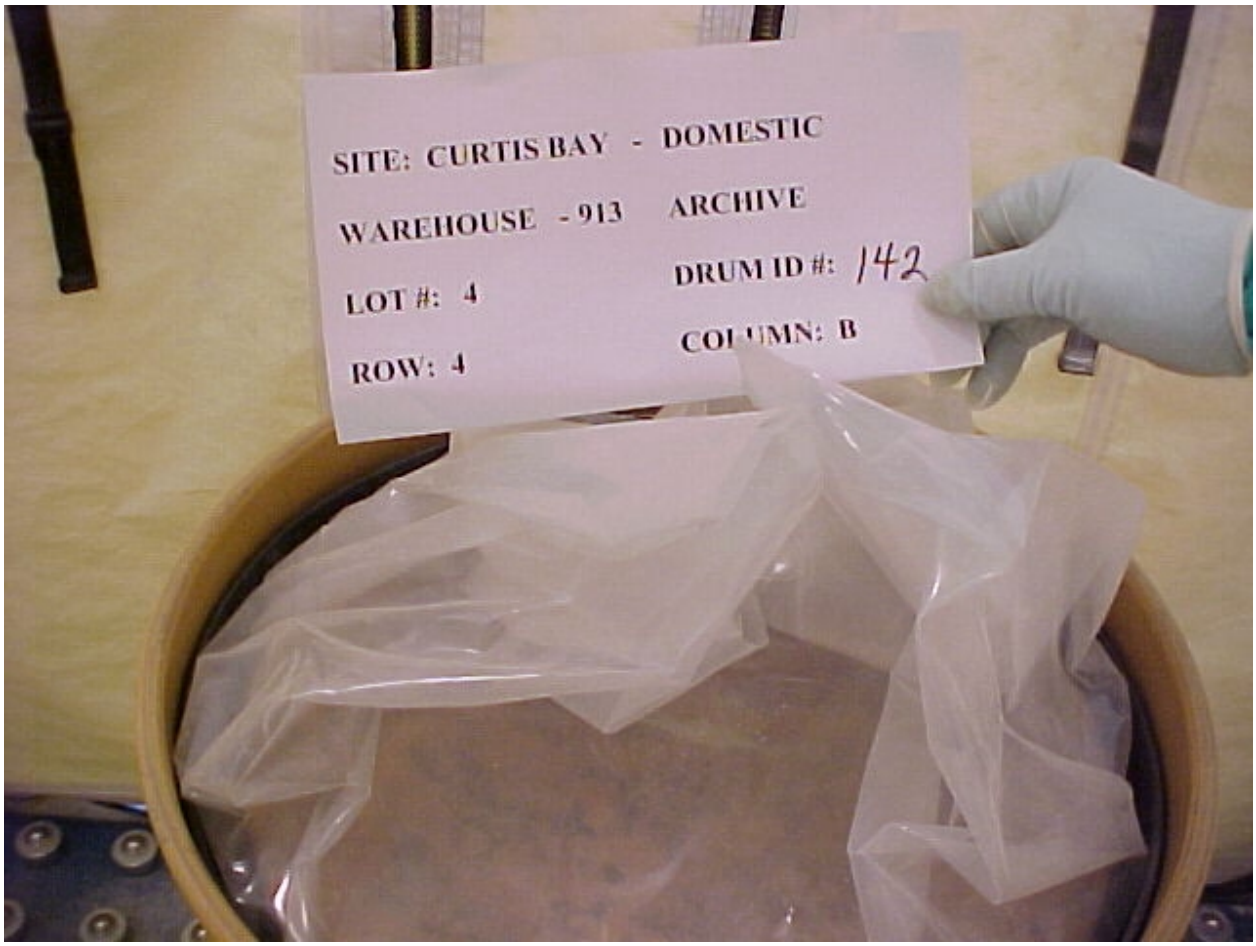
Date	7-12-2002	Time	14:30

Other Information

Photo No. 2 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

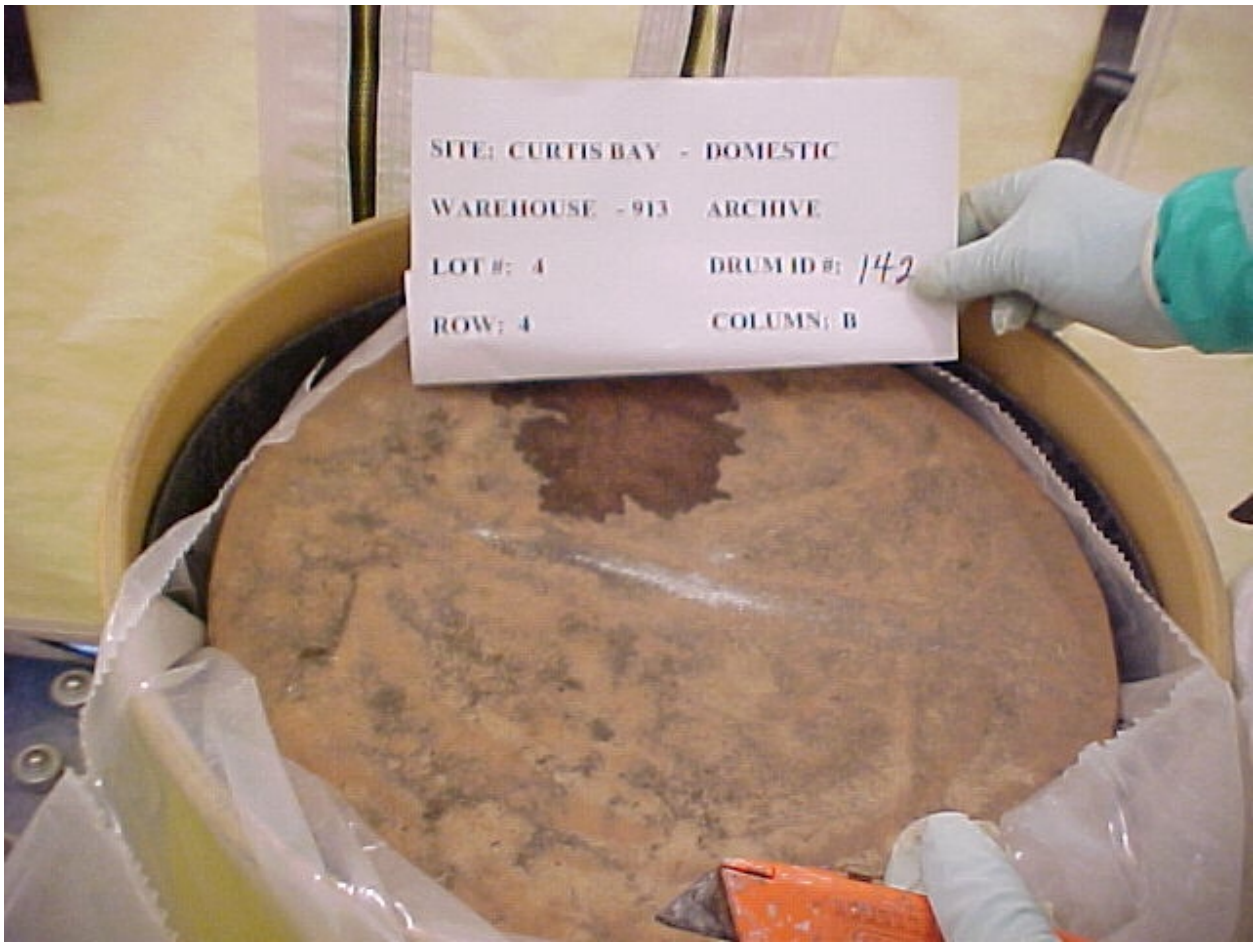
Date	7-12-2002	Time	14:30

Other Information

Photo No. 3 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

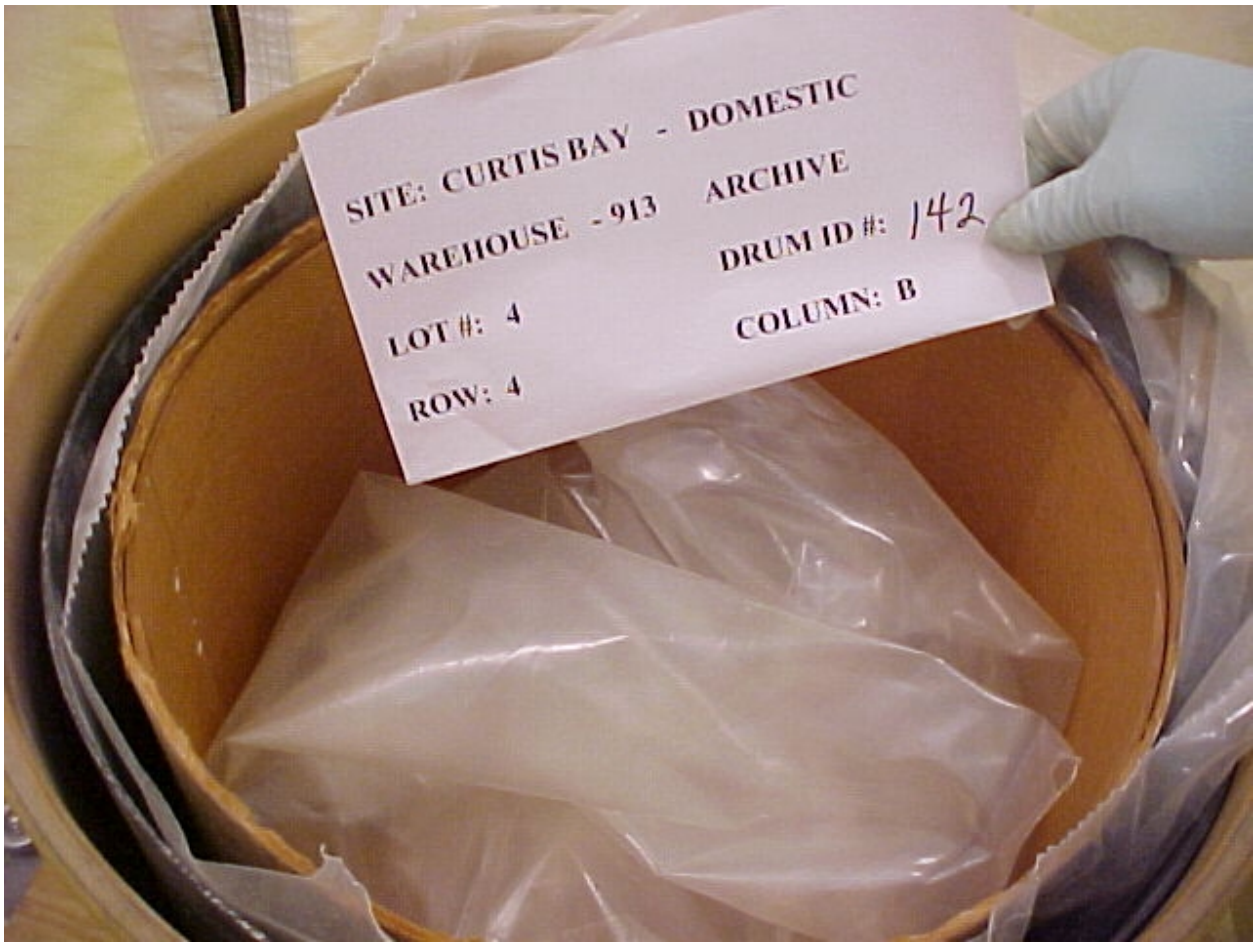
Date	7-12-2002	Time	14:30

Other Information

Photo No. 4 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:30

Other Information

Photo No. 5 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:30

Other Information

Photo No. 6 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:30

Other Information

Photo No. 7 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:30

Other Information

Photo No. 8 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	4	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	142	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	B

Inspection/Sample Date & Time

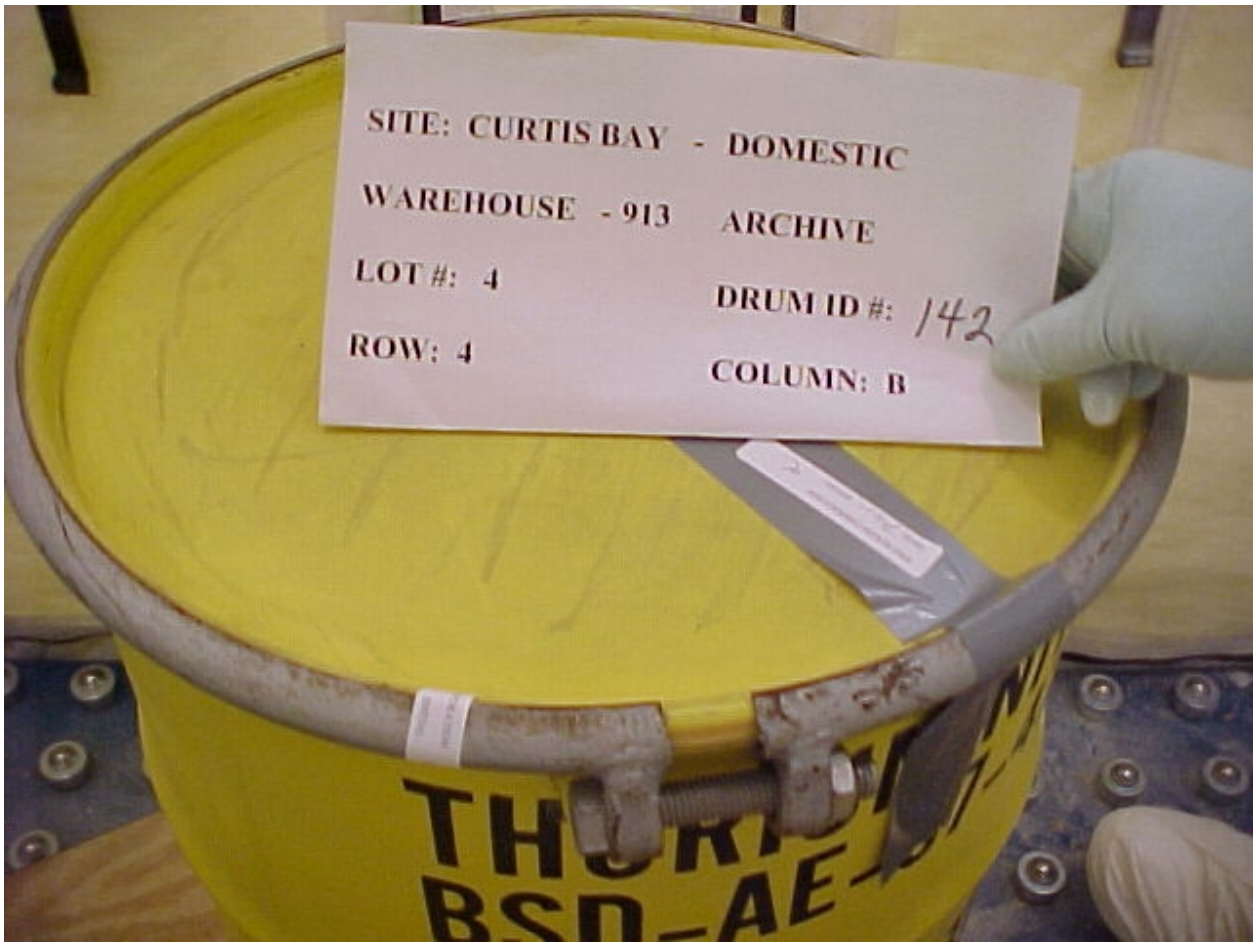
Date	7-12-2002	Time	14:30

Other Information

Photo No. 9 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #5 - Drum #111
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 5 Drum ID #: 111 Location: Warehouse 913 – Column F – Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

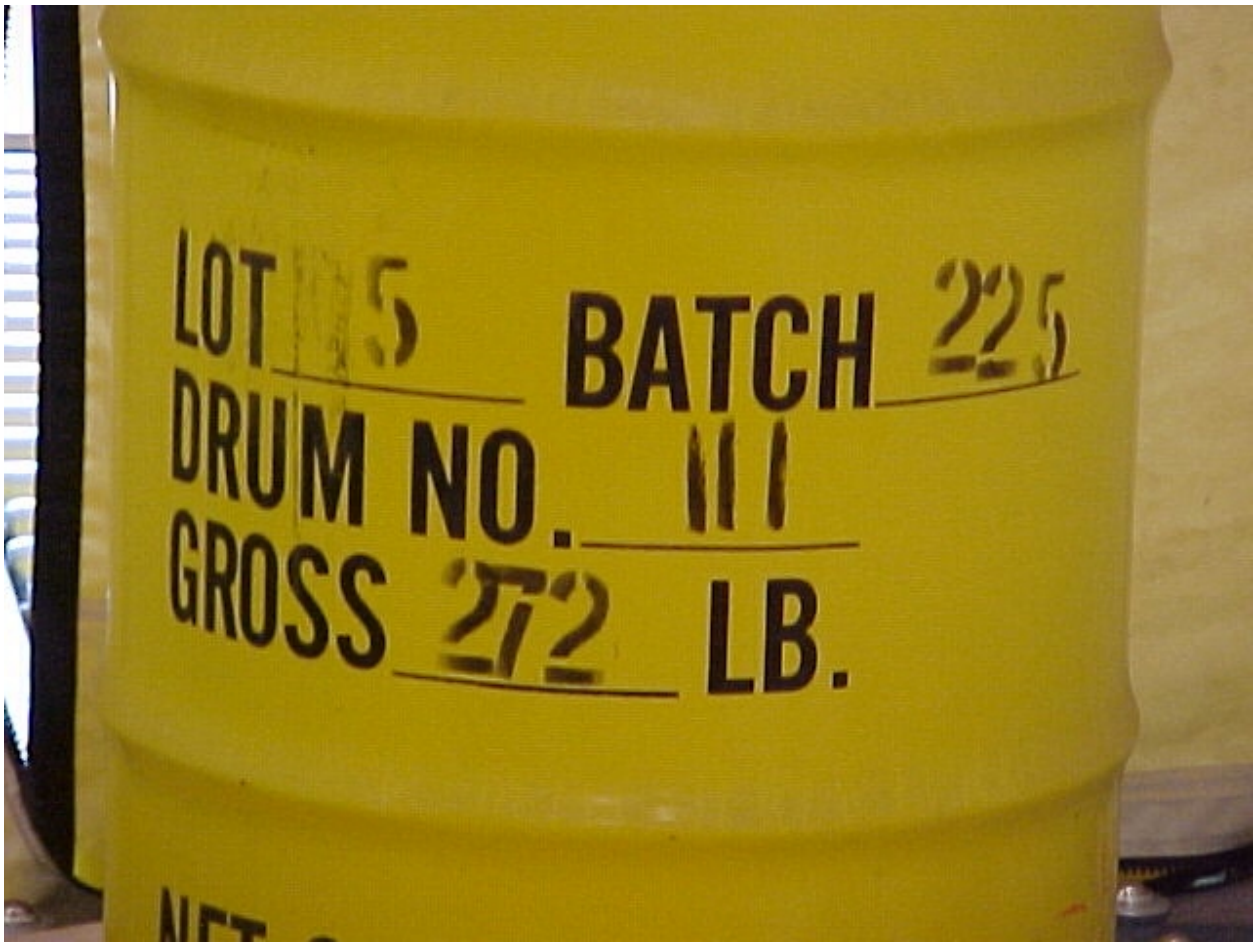
Date	7-12-2002	Time	13:45

Other Information

Photo No. 1 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
Drum vented gases during drum ring removal operations (drum did not have any pressure buildup internal to the container)



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

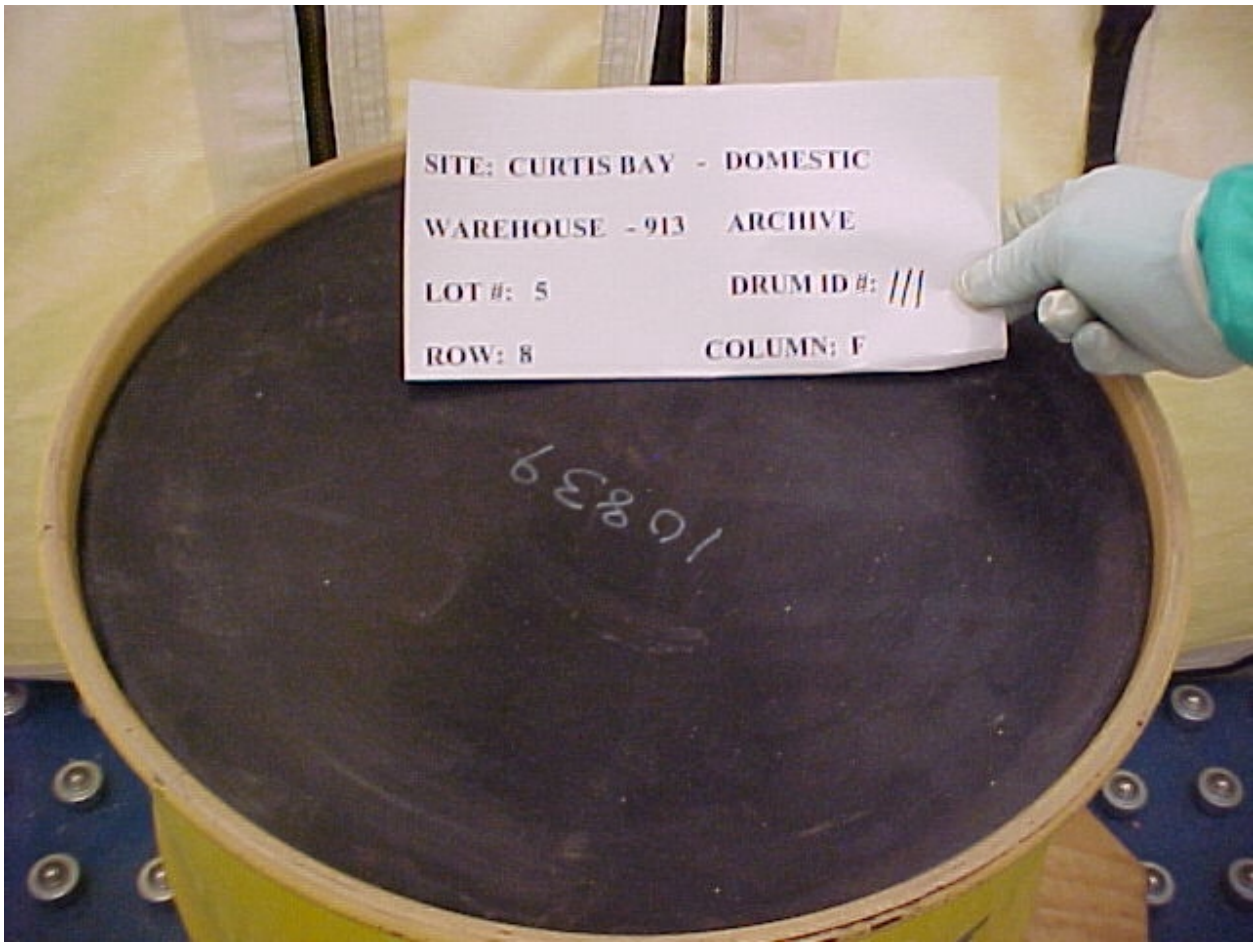
Date	7-12-2002	Time	13:45

Other Information

Photo No. 2 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	13:45

Other Information

Photo No. 3 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

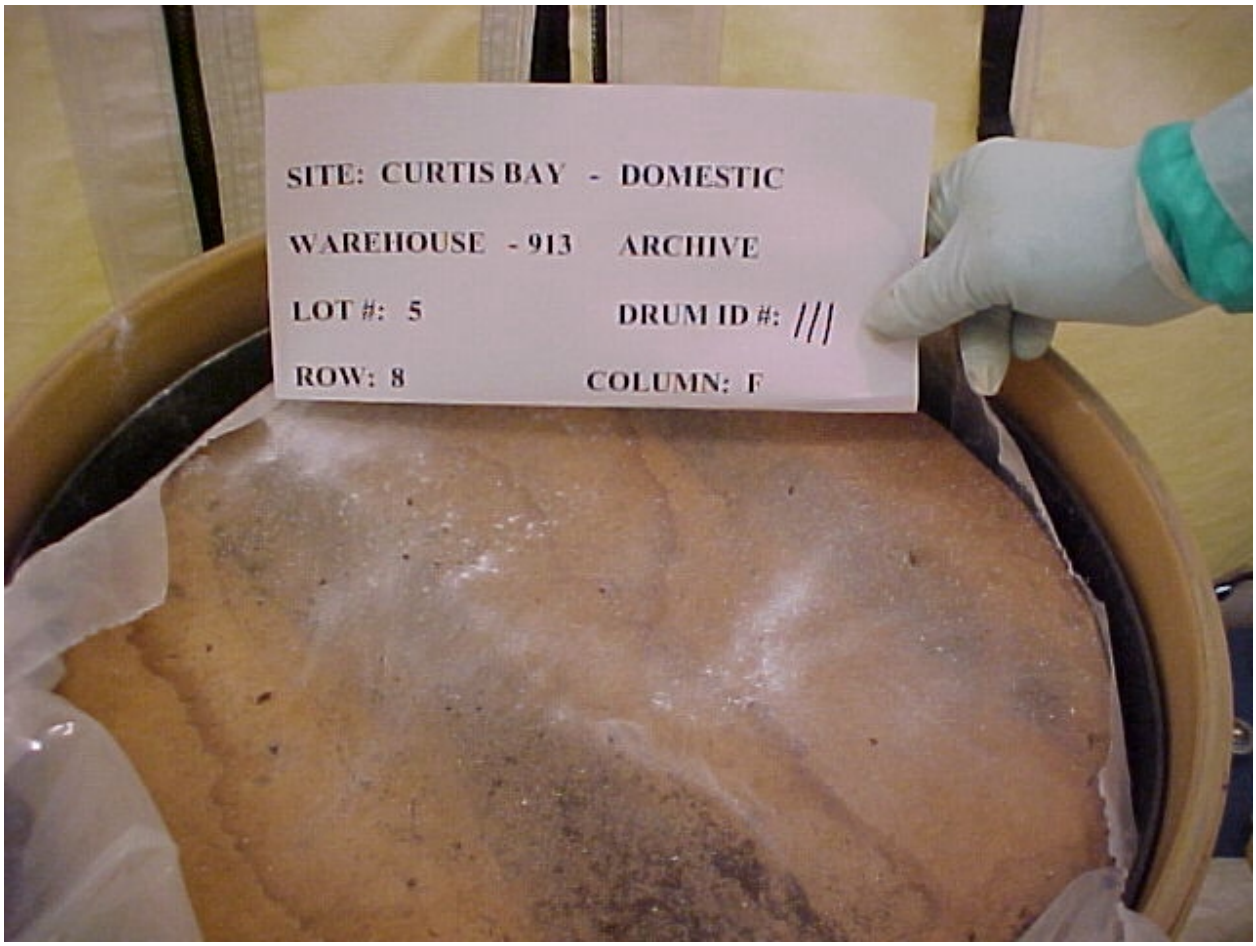
Date	7-12-2002	Time	13:45

Other Information

Photo No. 4 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid (outermost fiber drum) – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

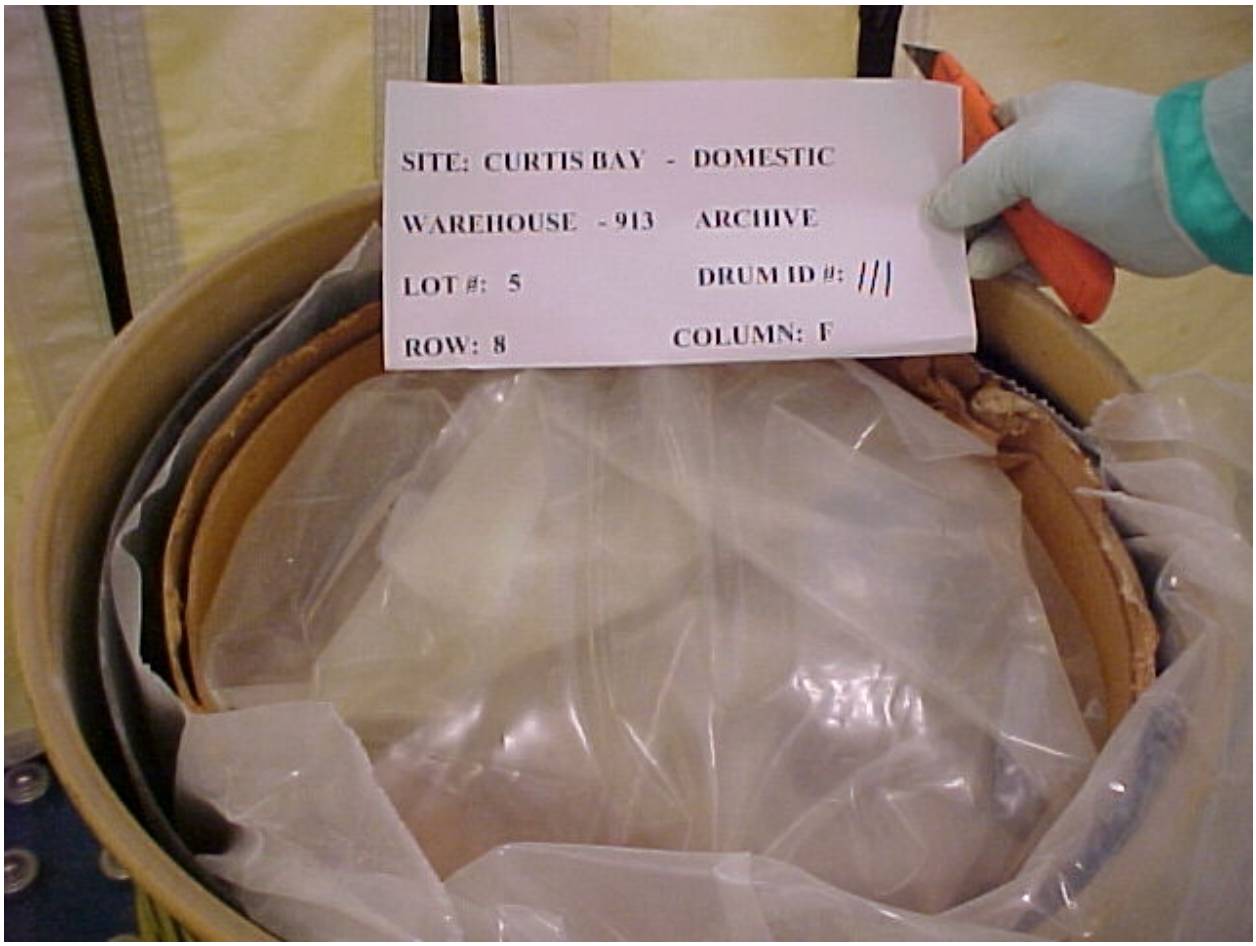
Date	7-12-2002	Time	13:45

Other Information

Photo No. 5 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

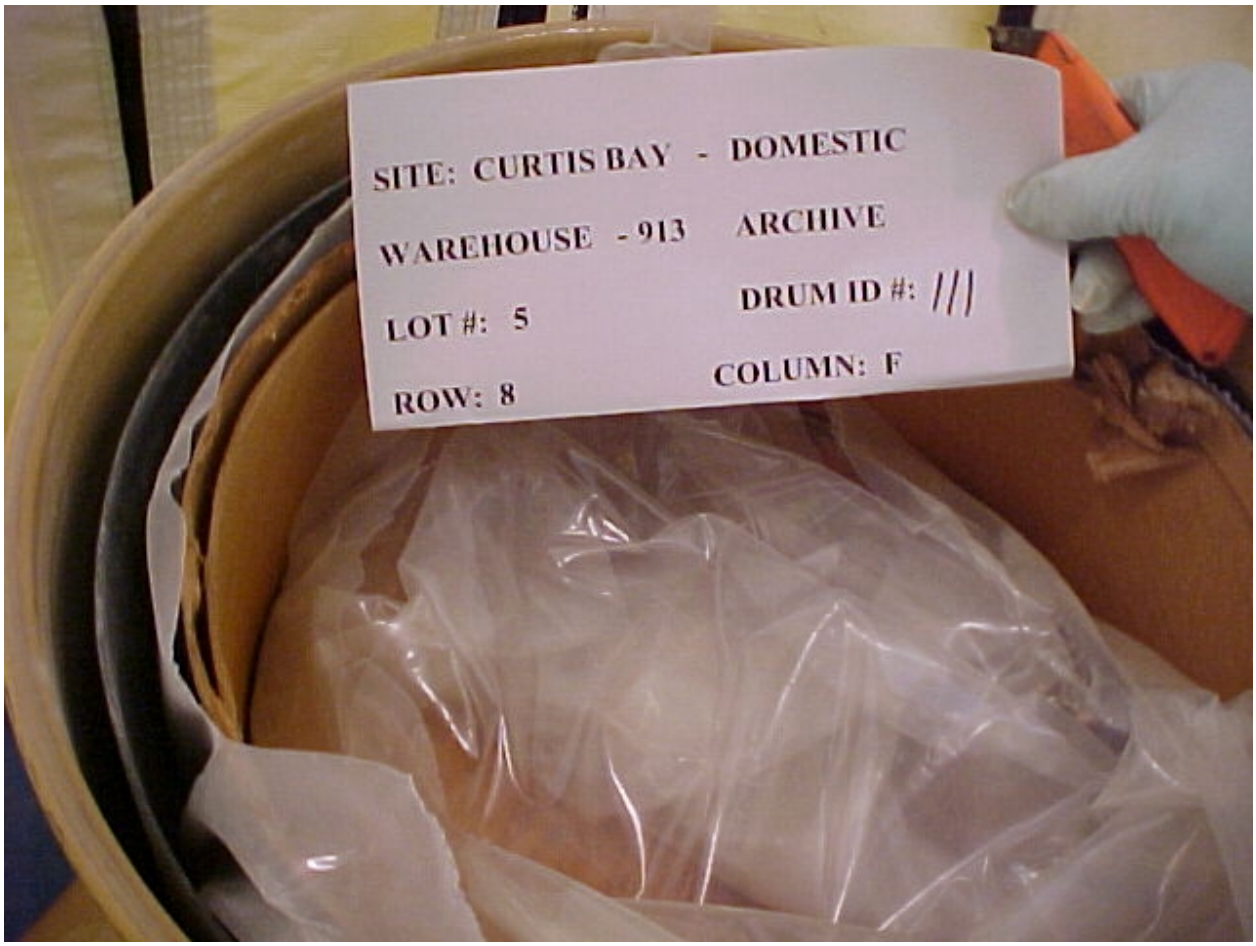
Date	7-12-2002	Time	13:45

Other Information

Photo No. 6 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	13:45

Other Information

Photo No. 7 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

Date	7-12-2002	Time	13:45

Other Information

Photo No. 8 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition – photo also shows interior walls of inner lab-pack/fiber drum.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	5	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	111	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	F

Inspection/Sample Date & Time

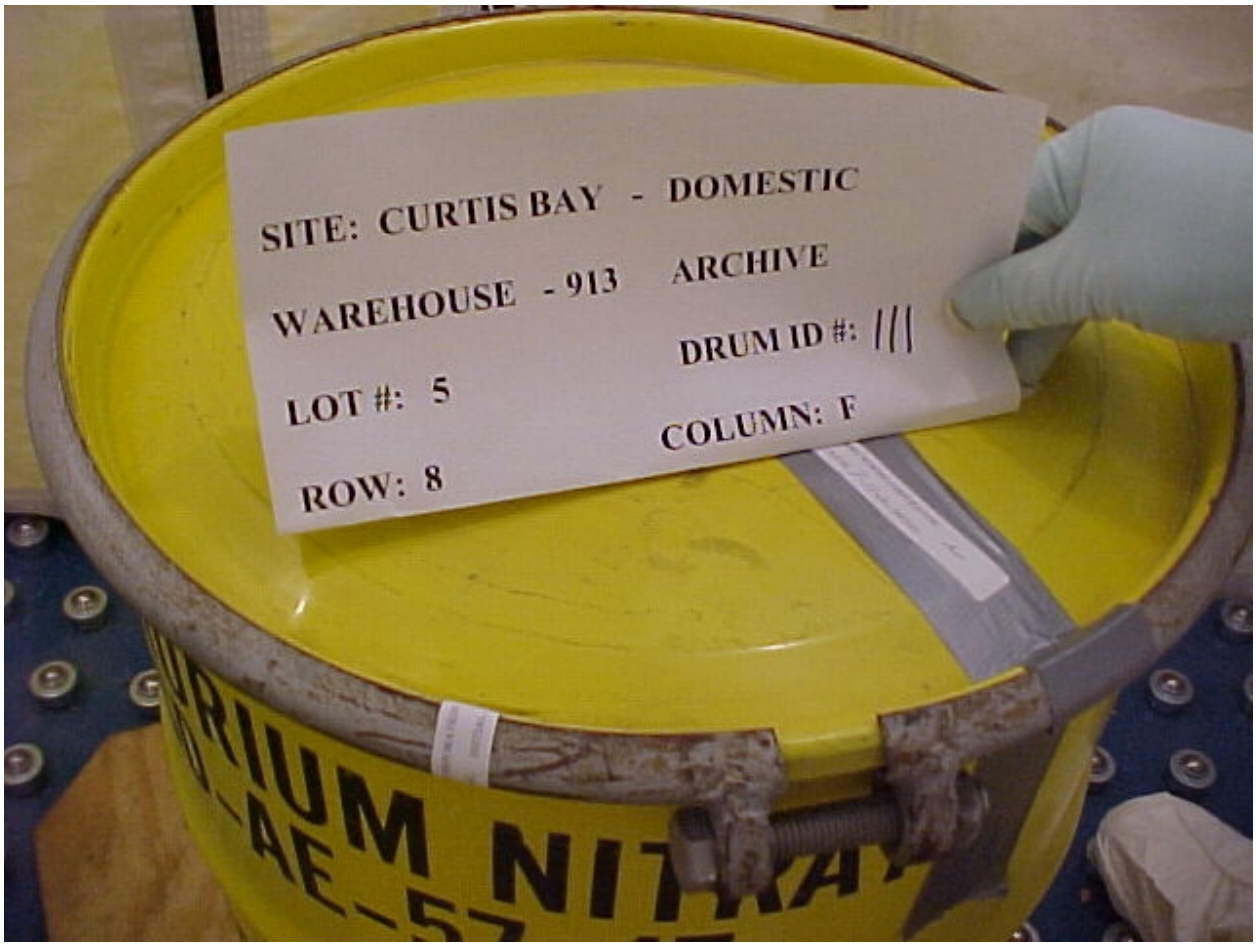
Date	7-12-2002	Time	13:45

Other Information

Photo No. 9 of 9

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #6 - Drum #175
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 6 Drum ID #: 175 Location: Warehouse 913 – Column D – Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☐ Yes (include Drum ID in photo) ☒ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☐ Yes (include Drum ID in photo) ☒ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:00

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal metal drum – Picture did not take

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:00

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

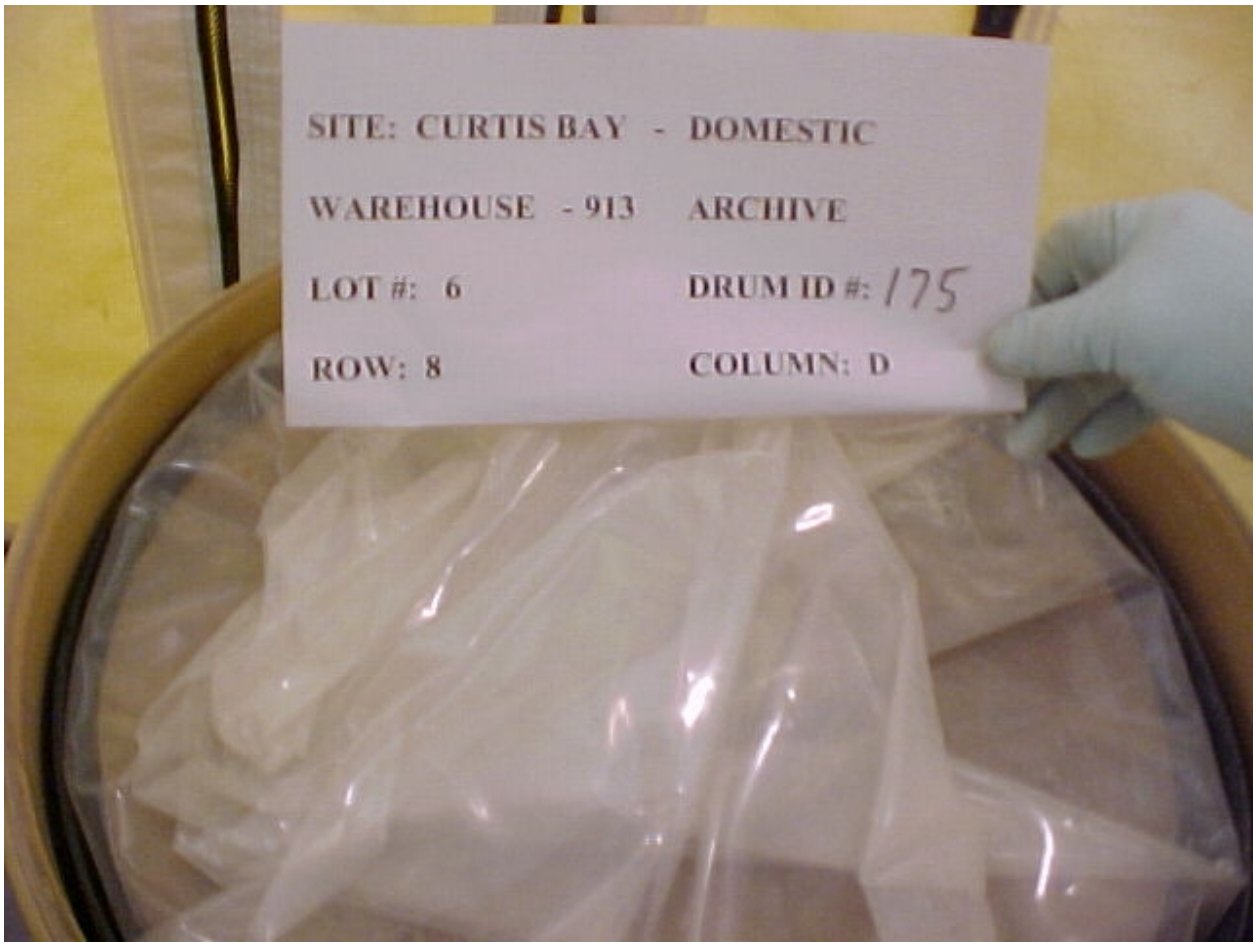
Date	7-12-2002	Time	10:00

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:00

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – Picture did not take
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

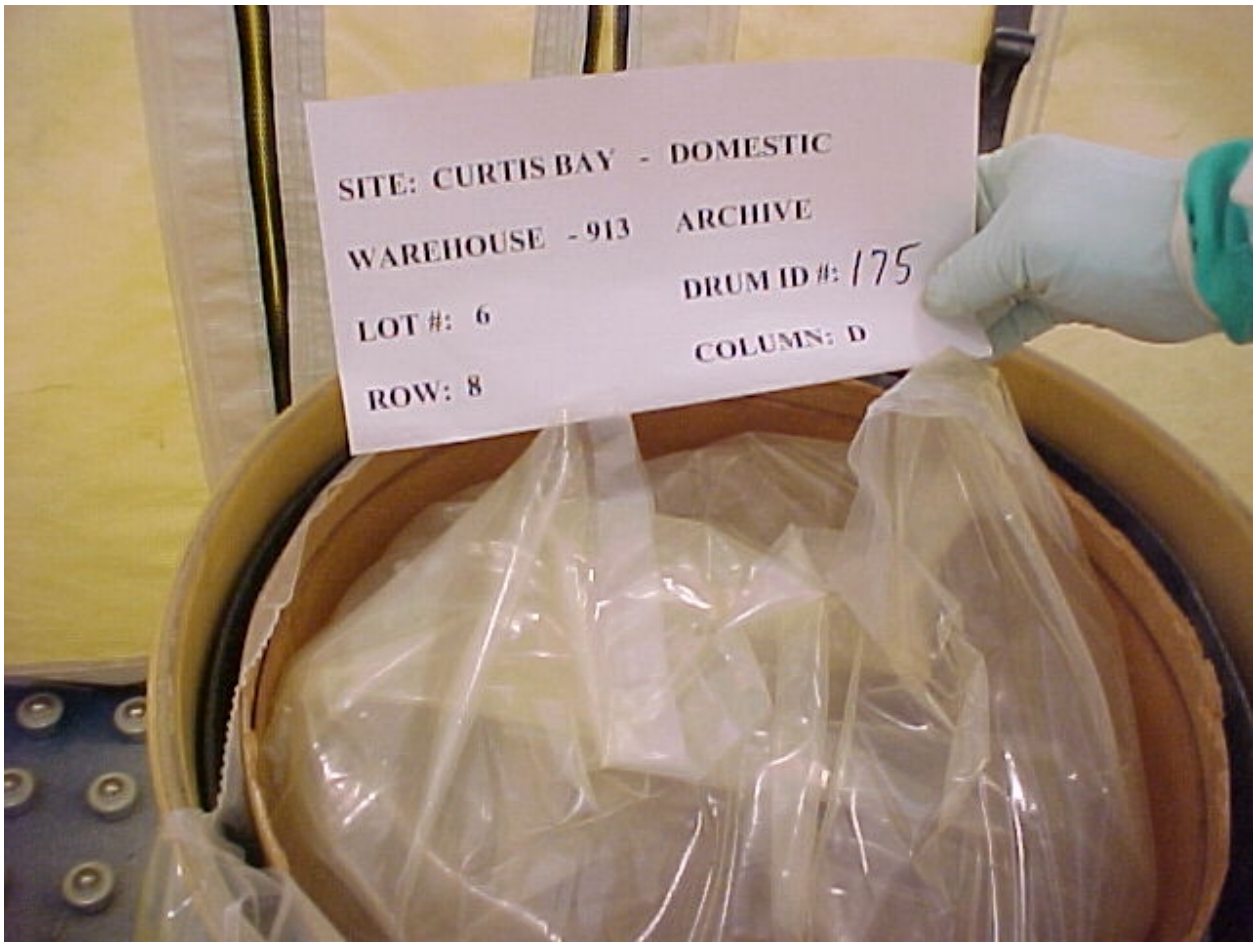
Date	7-12-2002	Time	10:00

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:00

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:00

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:00

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:00

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	6	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	175	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	D

Inspection/Sample Date & Time

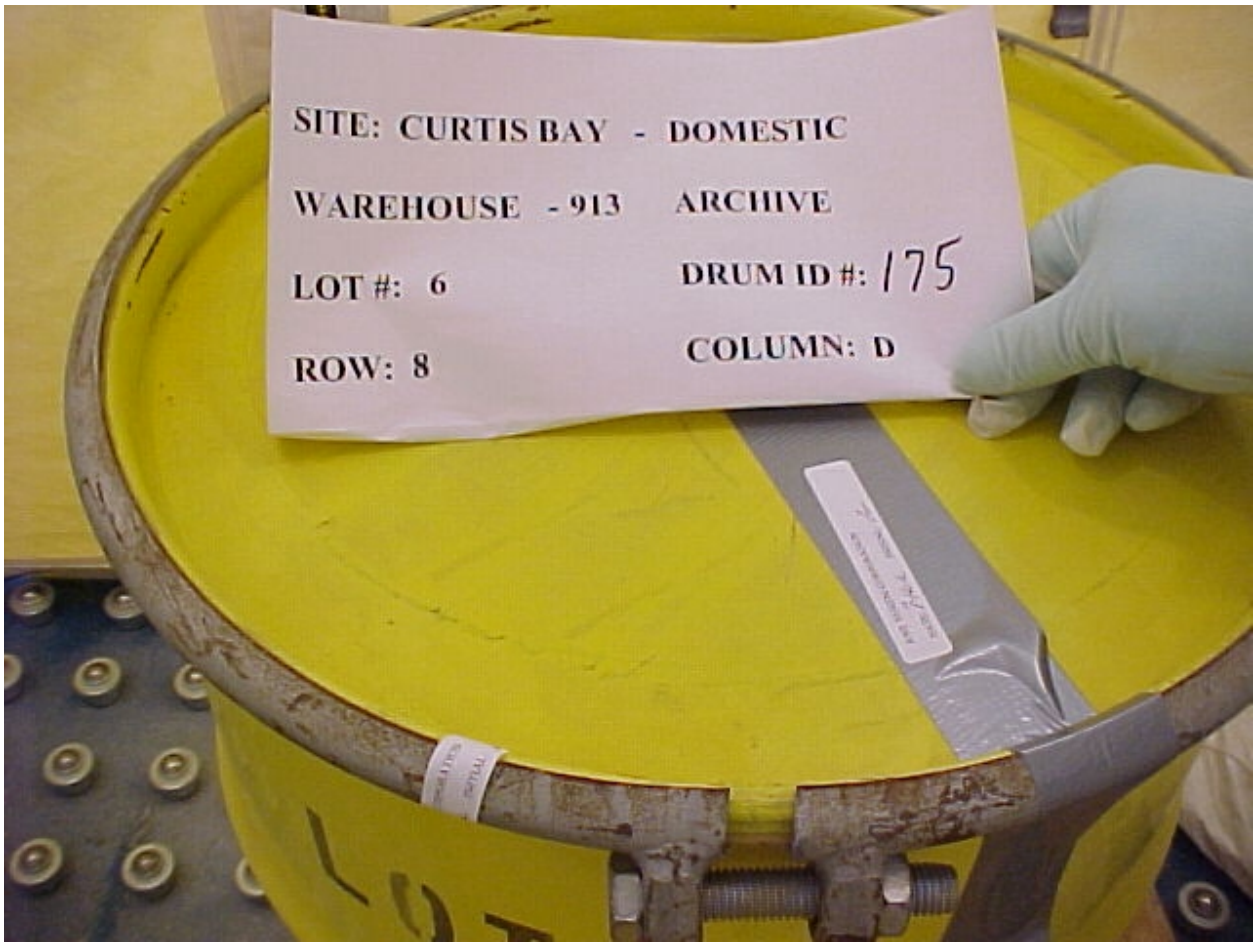
Date	7-12-2002	Time	10:00

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated – Complete



Curtis Bay Depot
Lot #7 - Drum #59
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 7 Drum ID #: 59 Location: Warehouse 913 – Column E – Row 1

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

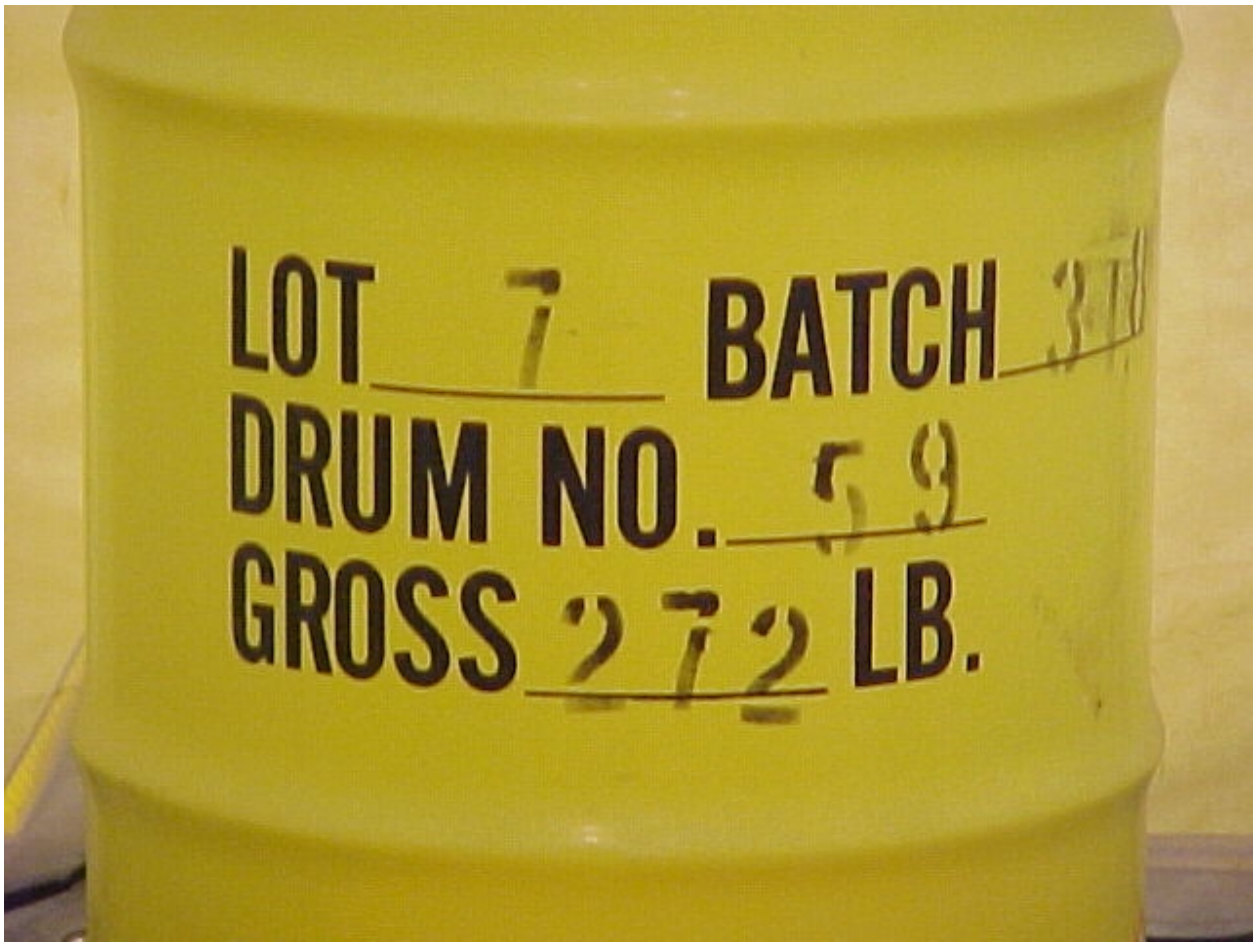
Date	7-12-2002	Time	09:15

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
Drum vented gases during drum ring removal operations – although there was not internal pressure buildup internal to the container.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

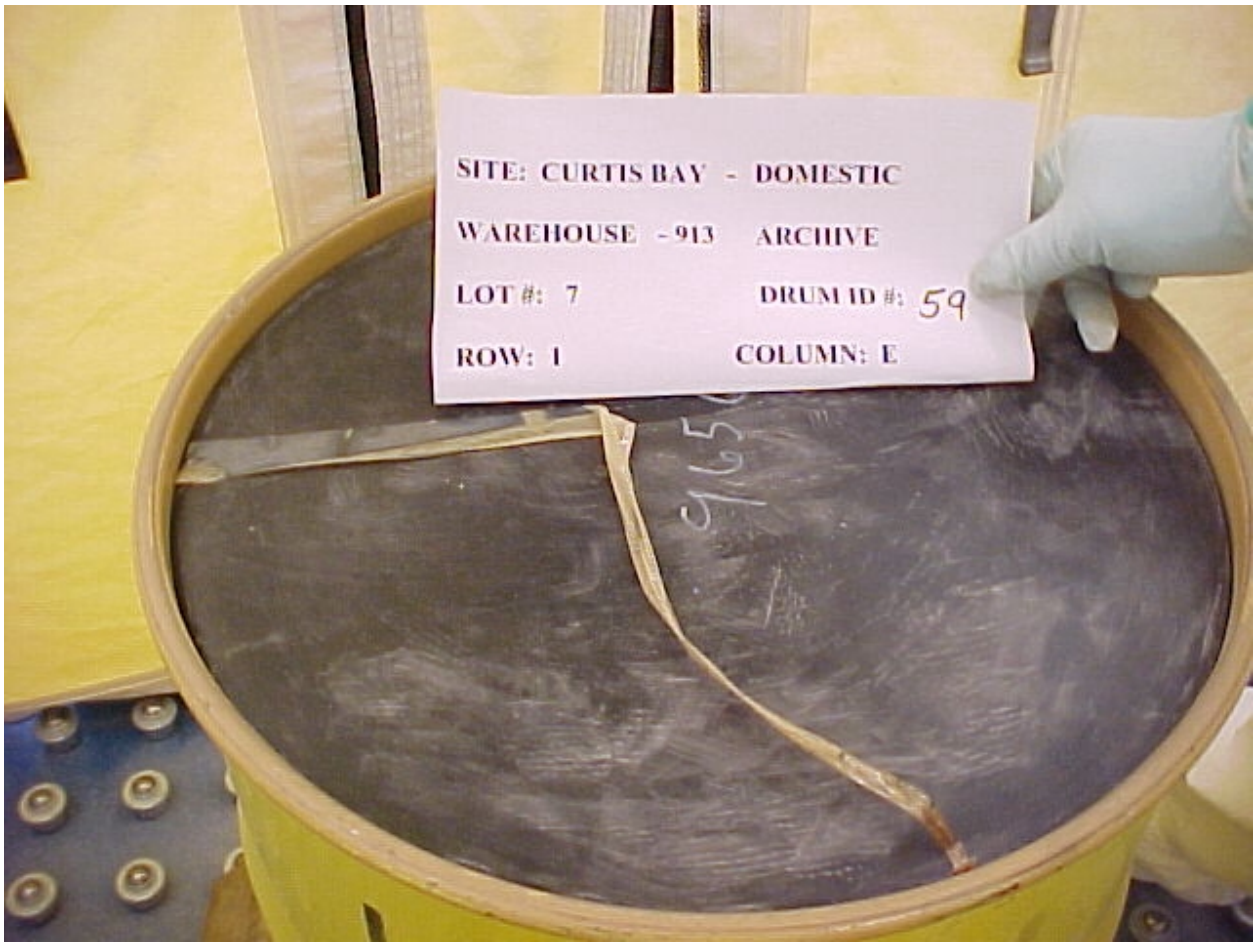
Date	7-12-2002	Time	09:15

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

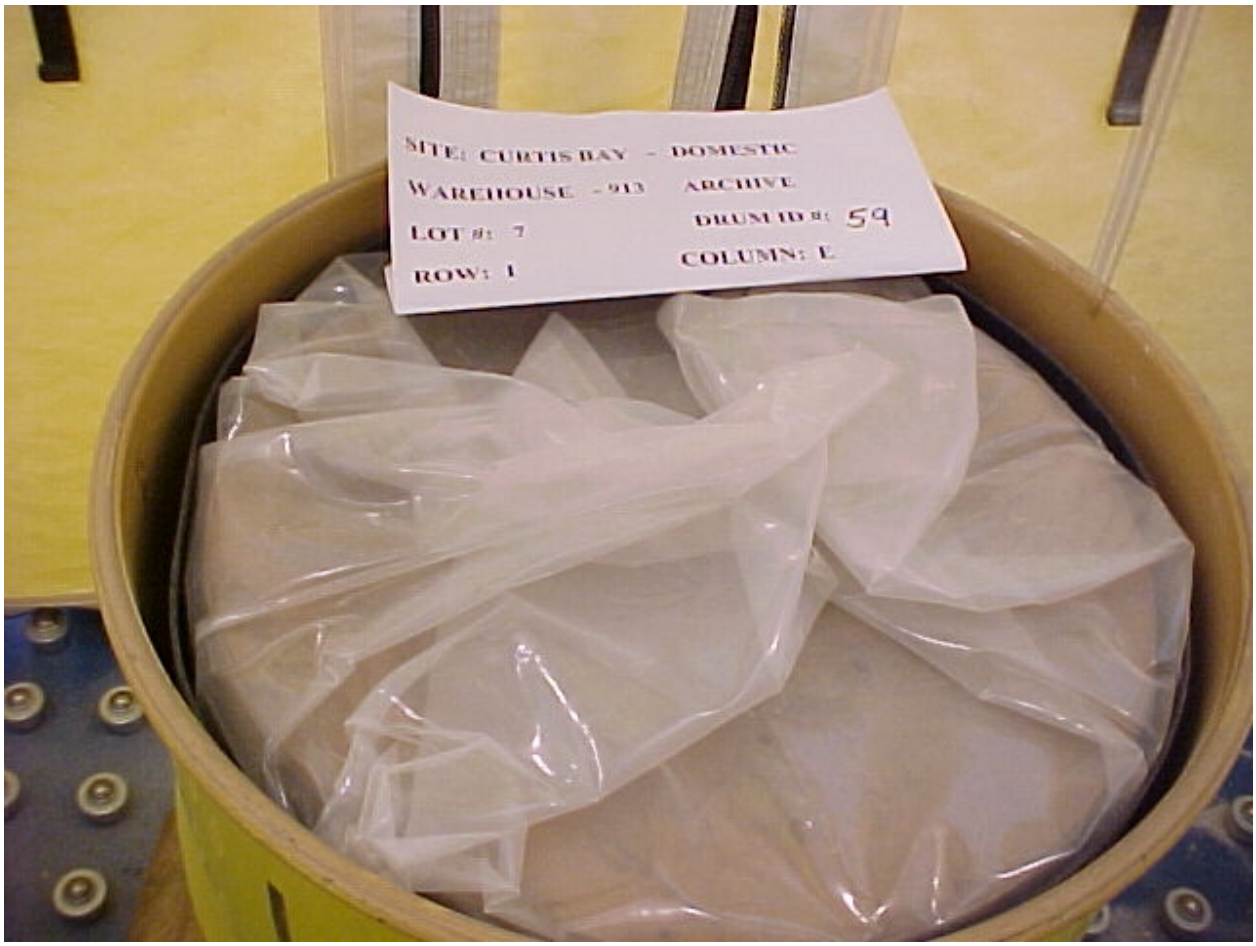
Date	7-12-2002	Time	09:15

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

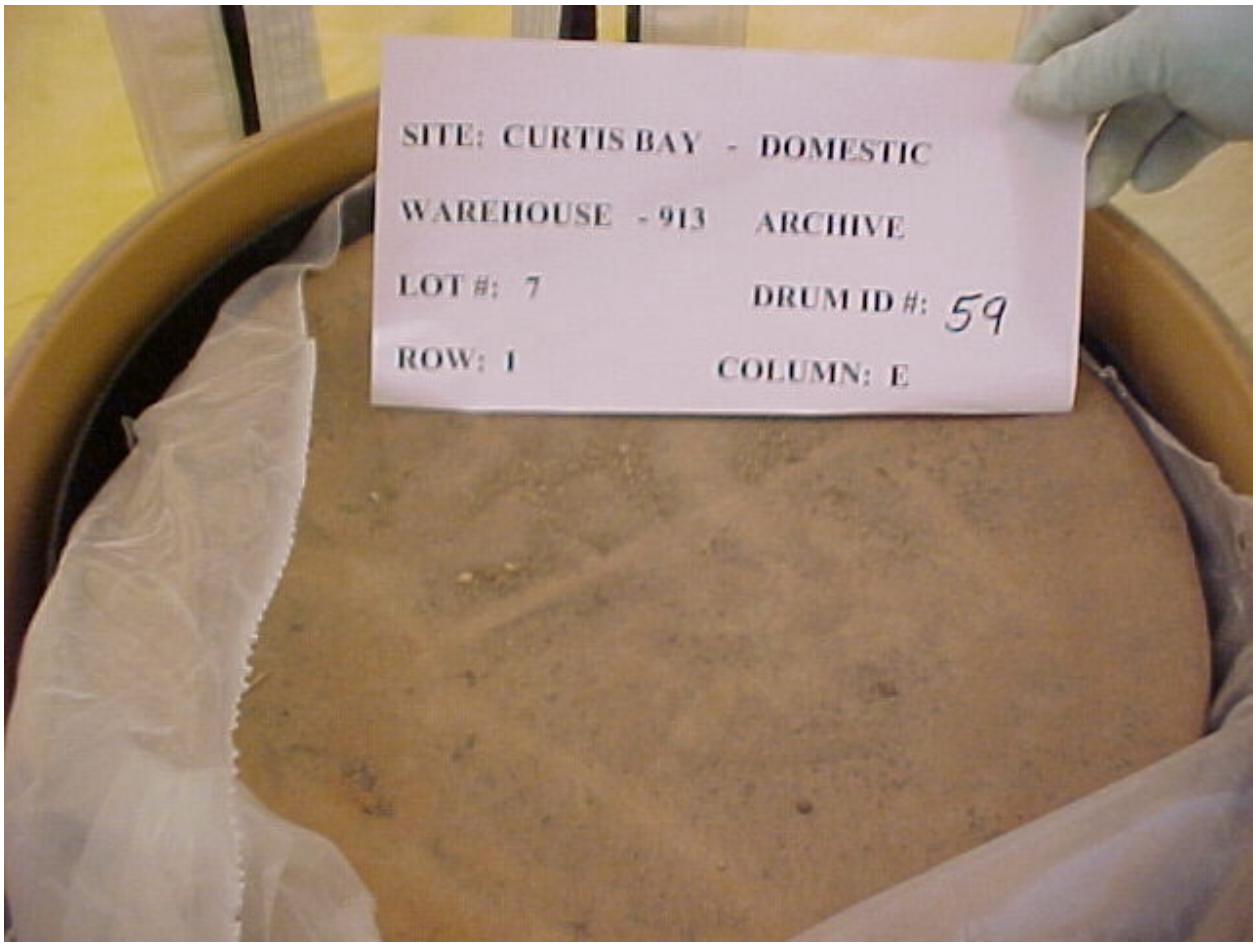
Date	7-12-2002	Time	09:15

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

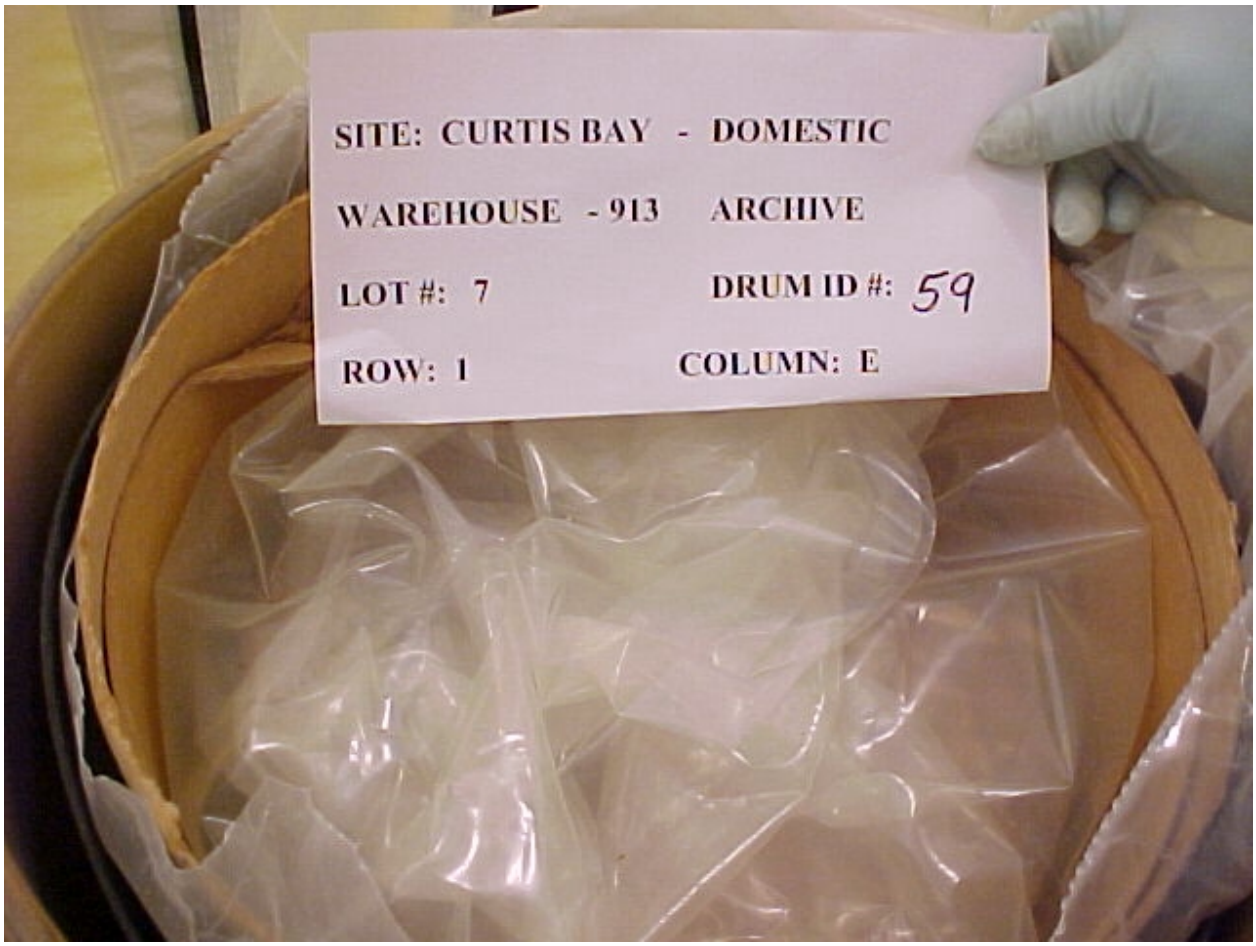
Date	7-12-2002	Time	09:15

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

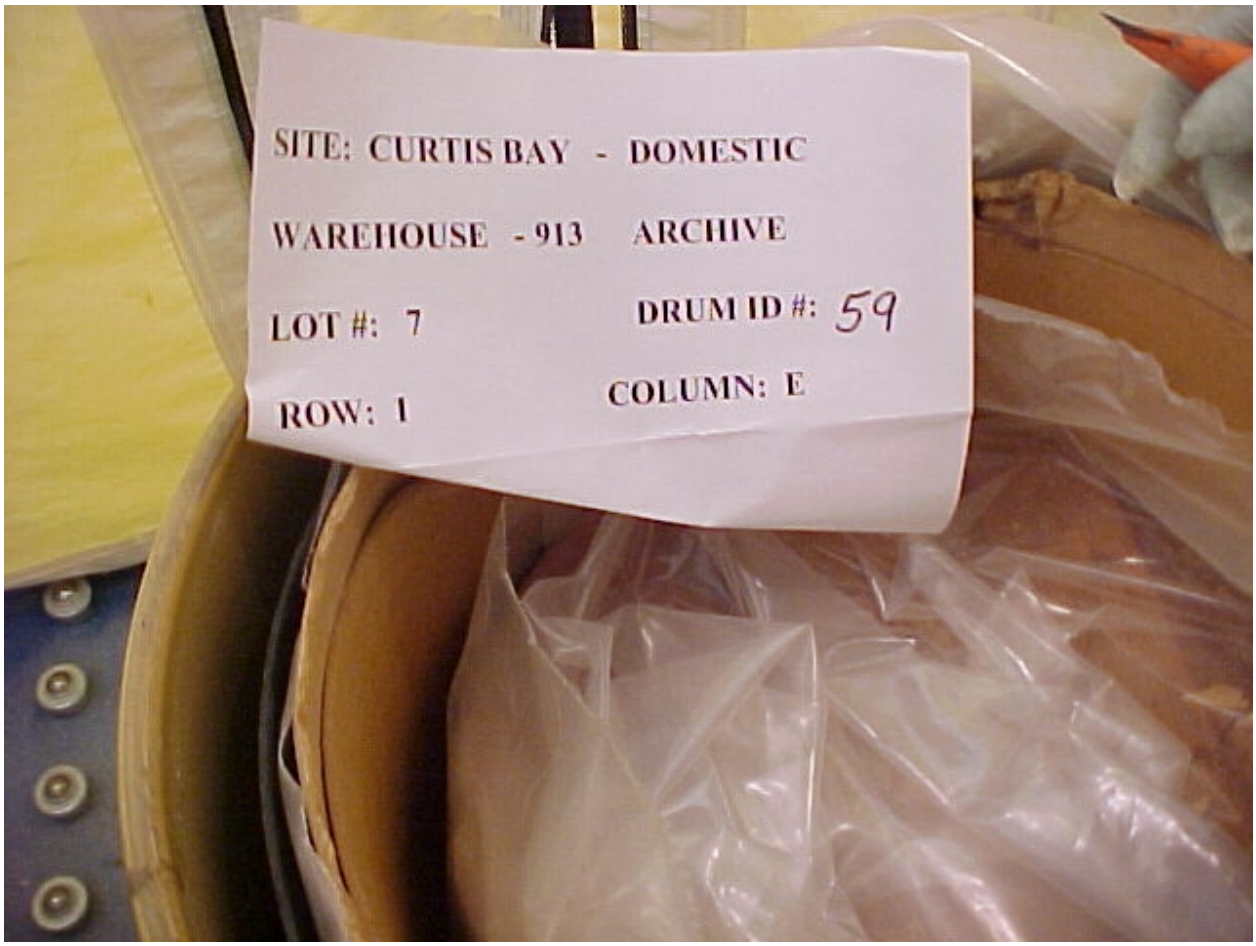
Date	7-12-2002	Time	09:15

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:15

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:15

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:15

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	7	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	59	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	1
		Column	E

Inspection/Sample Date & Time

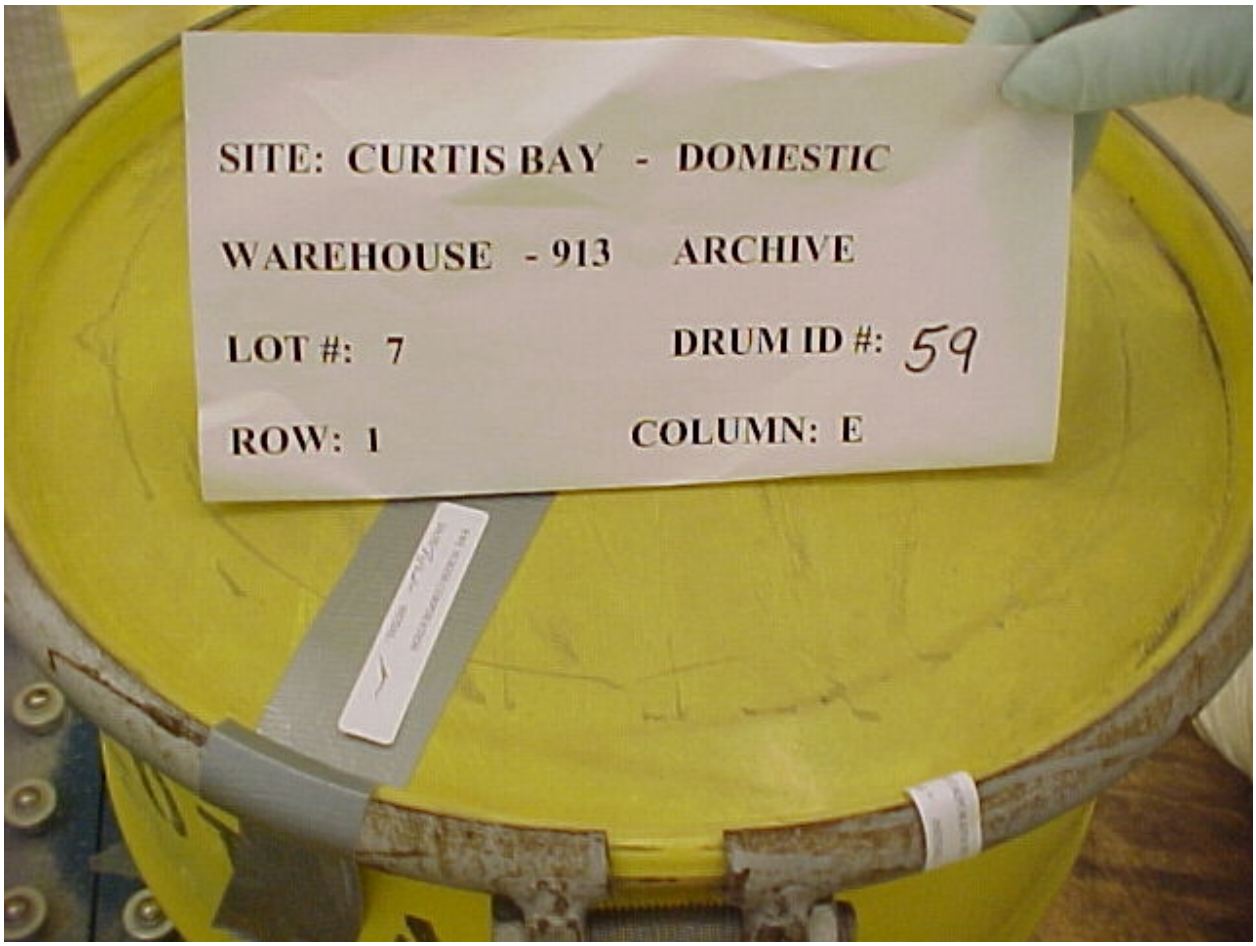
Date	7-12-2002	Time	09:15

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #8 - Drum #127
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 8 Drum ID #: 127 Location: Warehouse 913 – Column D – Row 6

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 5.0% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

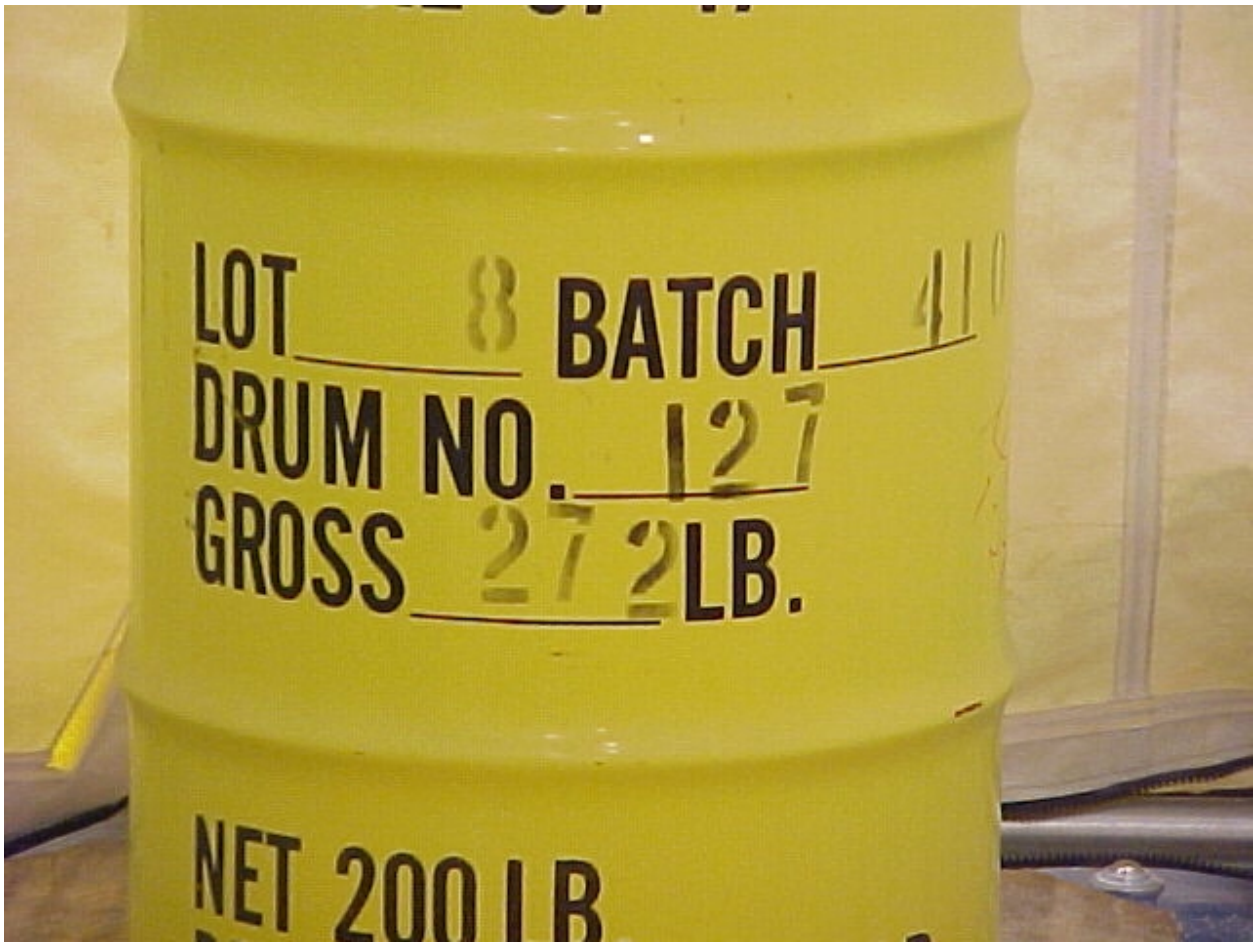
Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No.	1 of 11	
Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
Pressure buildup inside of container results in this packaging layer rising vertically out of the container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

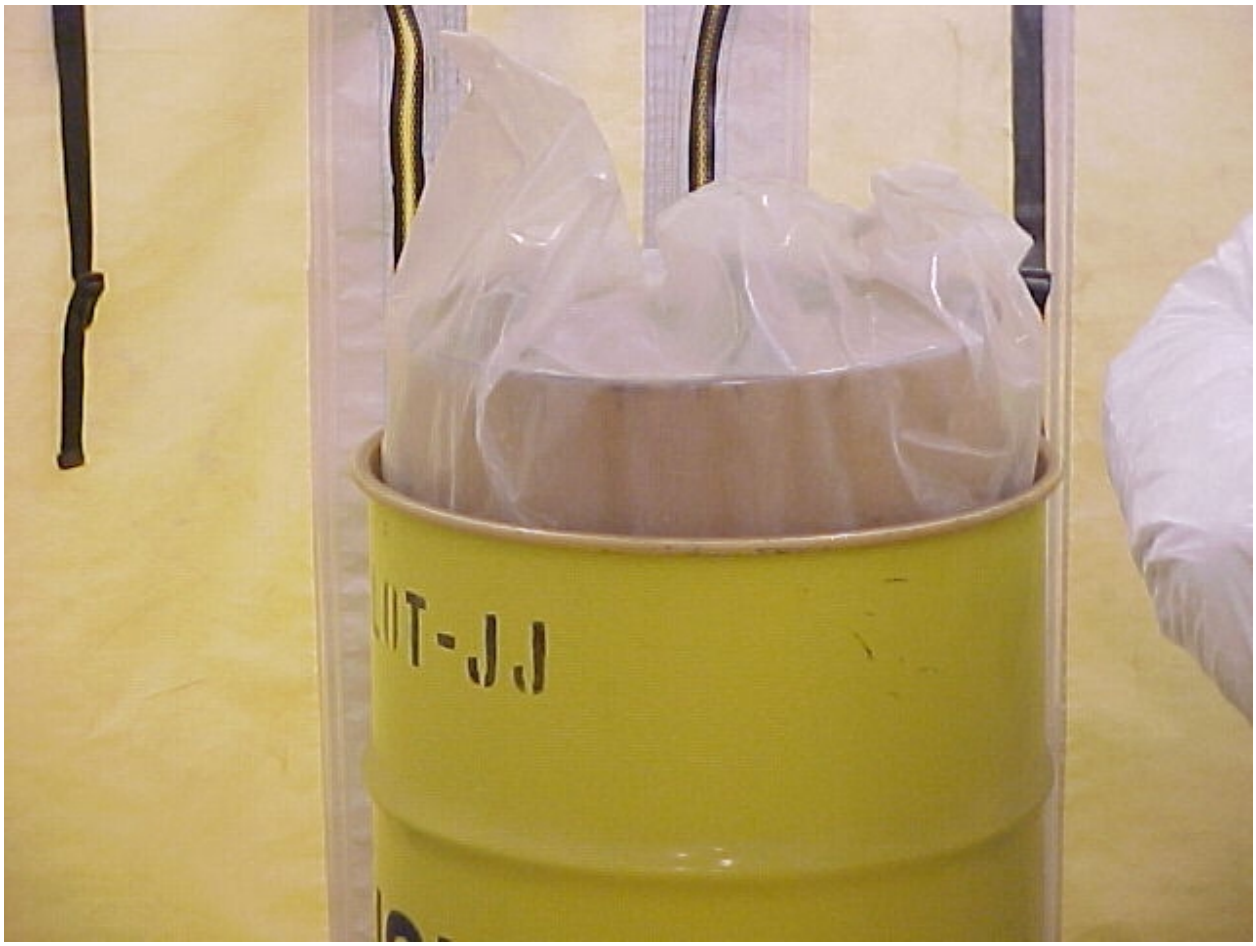
Date	7-12-2002	Time	10:15

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside of container results in this packaging layer rising vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

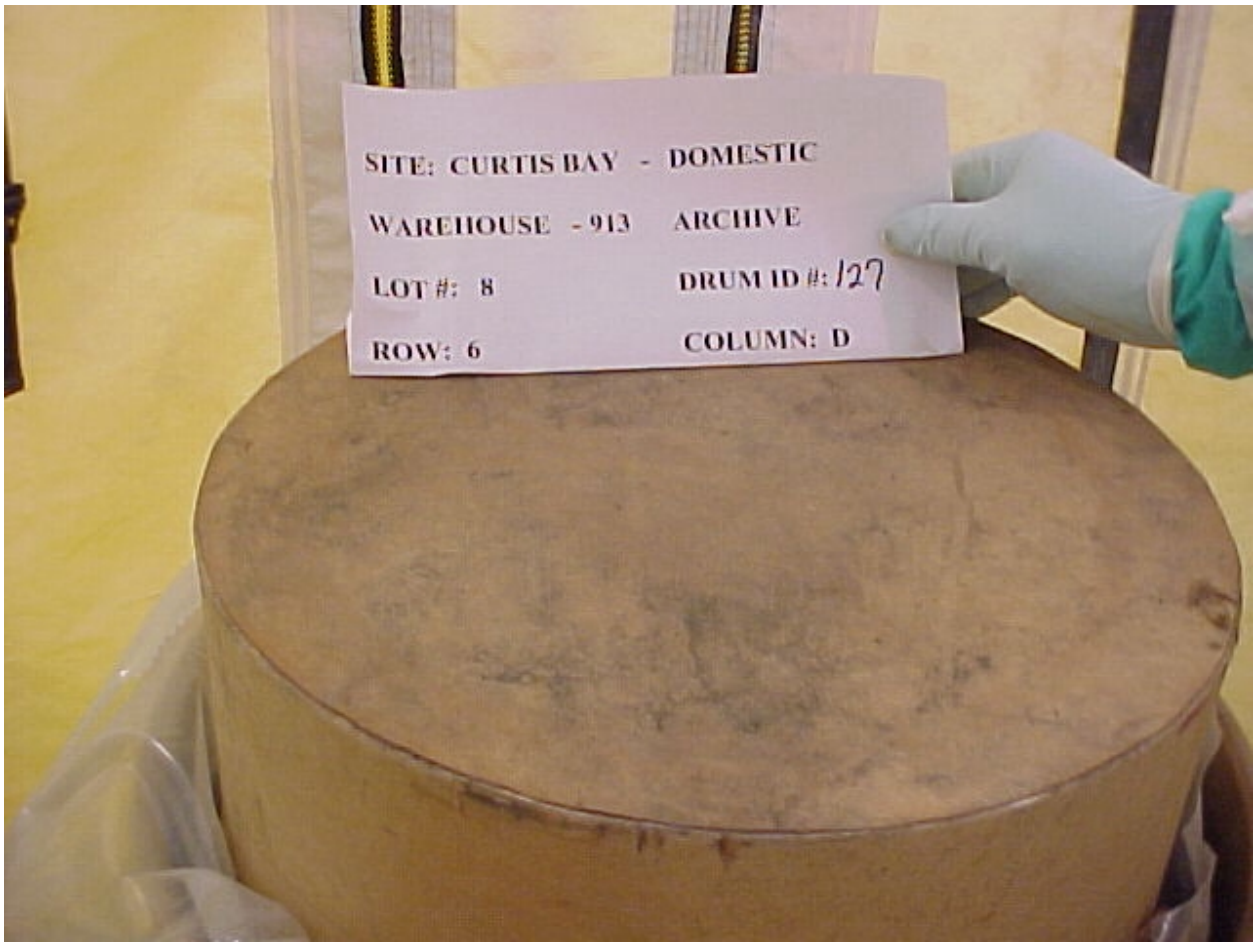
Date	7-12-2002	Time	10:15

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
Pressure buildup inside of container results in this packaging layer rising vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside of container results in this packaging layer rising vertically out of the container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
Pressure buildup inside of container results in this packaging layer rising vertically out of the container.
Opened poly bag - No gases present in the breathing zone.
Gases present in bag headspace – CH4 – 5.0% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented with HEPA exhaust – all gases dissipated to 0% LEL and/or 0 ppm

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Lab-pack container lid – fair condition – paper layer typically tears off of container when the wooden lid is removed.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	8	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	127	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	6
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:15

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete

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Curtis Bay Depot
Lot #9 - Drum #24
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 9 Drum ID #: 24 Location: Warehouse 913 – Column D – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site Curtis Bay
ThN Origin Domestic
Lot No. 9
Drum ID No. 24

Inspection/Sample Visual Inspection & Sampling
Disposition Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse 913

Row 4
Column D

Inspection/Sample Date & Time

Date 7-12-2002

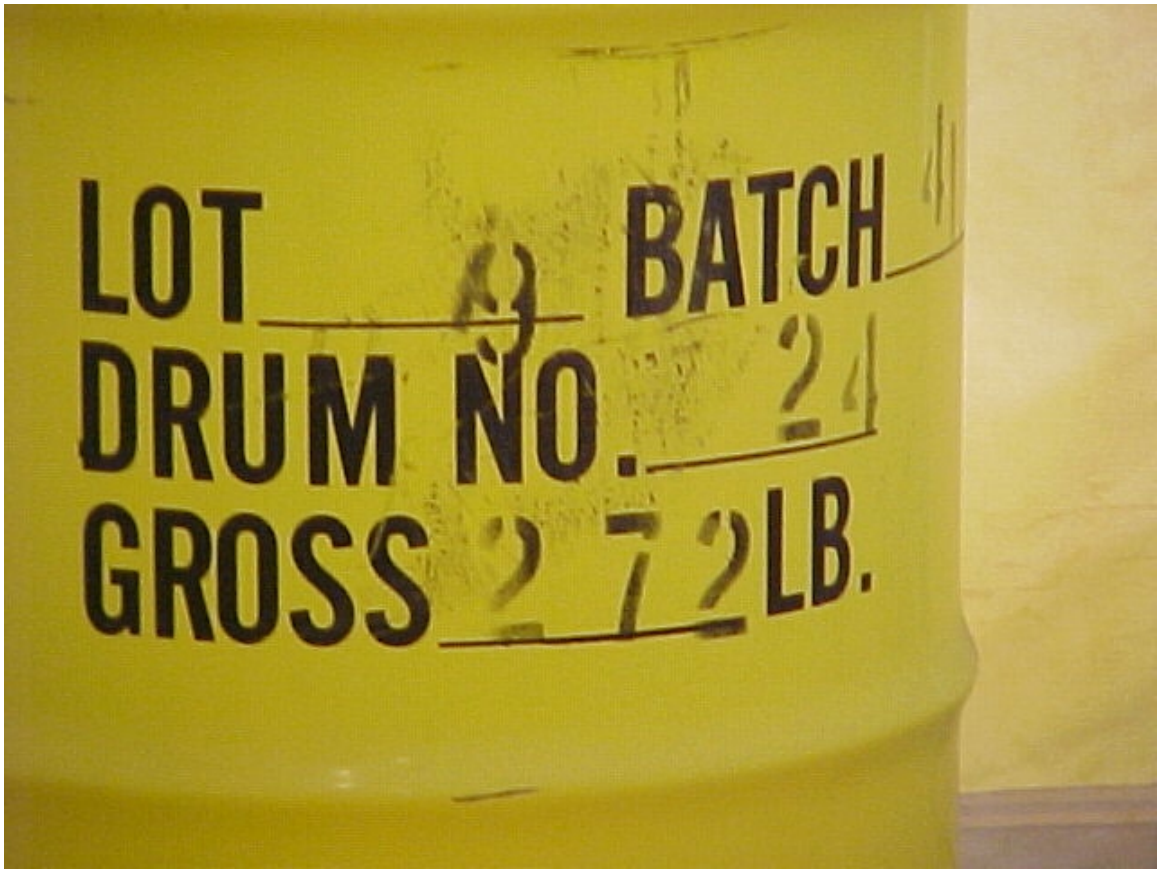
Time 10:45

Other Information

Photo No. 1 of 11

Dose Rate Surface 22 mR/hr
1 meter 2.0 mR/hr

30-gal drum – good condition



General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 9
Drum ID No.: 24
Inspection/Sample: Visual Inspection & Sampling
Disposition: Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse: 913
Row: 4
Column: D

Inspection/Sample Date & Time

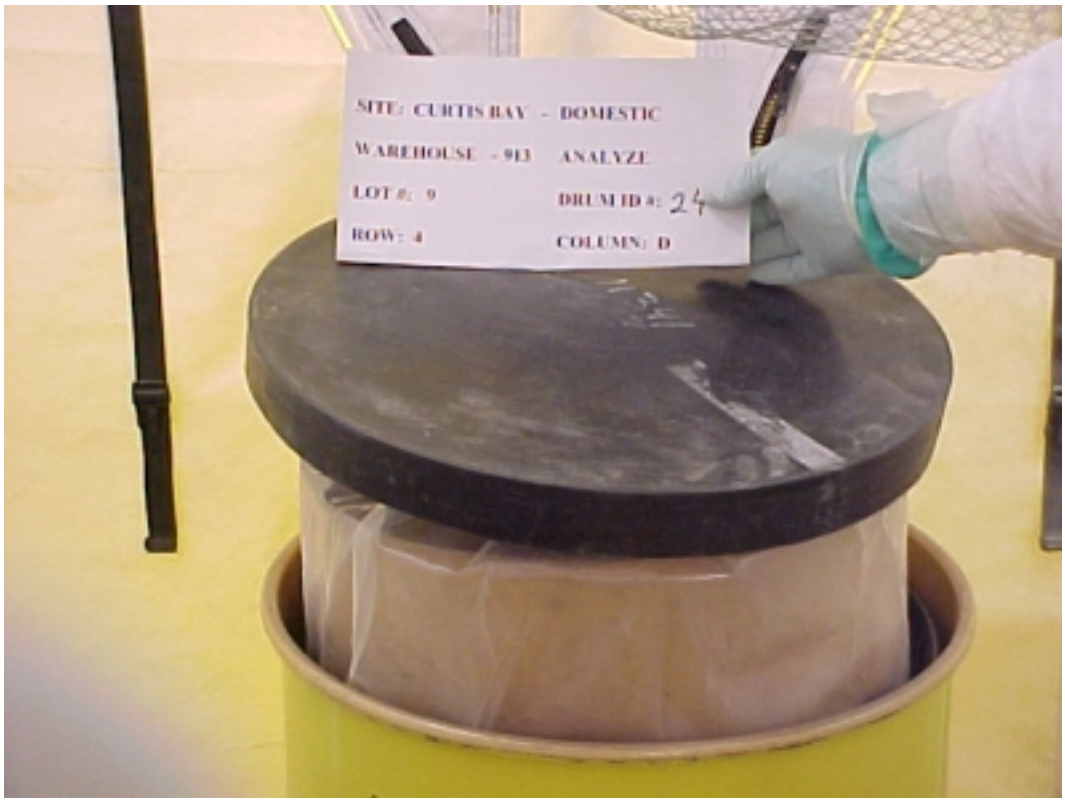
Date: 7-12-2002
Time: 10:45

Other Information

Photo No.: 2 of 11

Dose Rate: Surface 22 mR/hr
1 meter 2.0 mR/hr

Black plastic lid – good condition
Pressure buildup inside the container results in raising this packaging layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	9	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse	913	Row	4
		Column	D

Inspection/Sample Date & Time

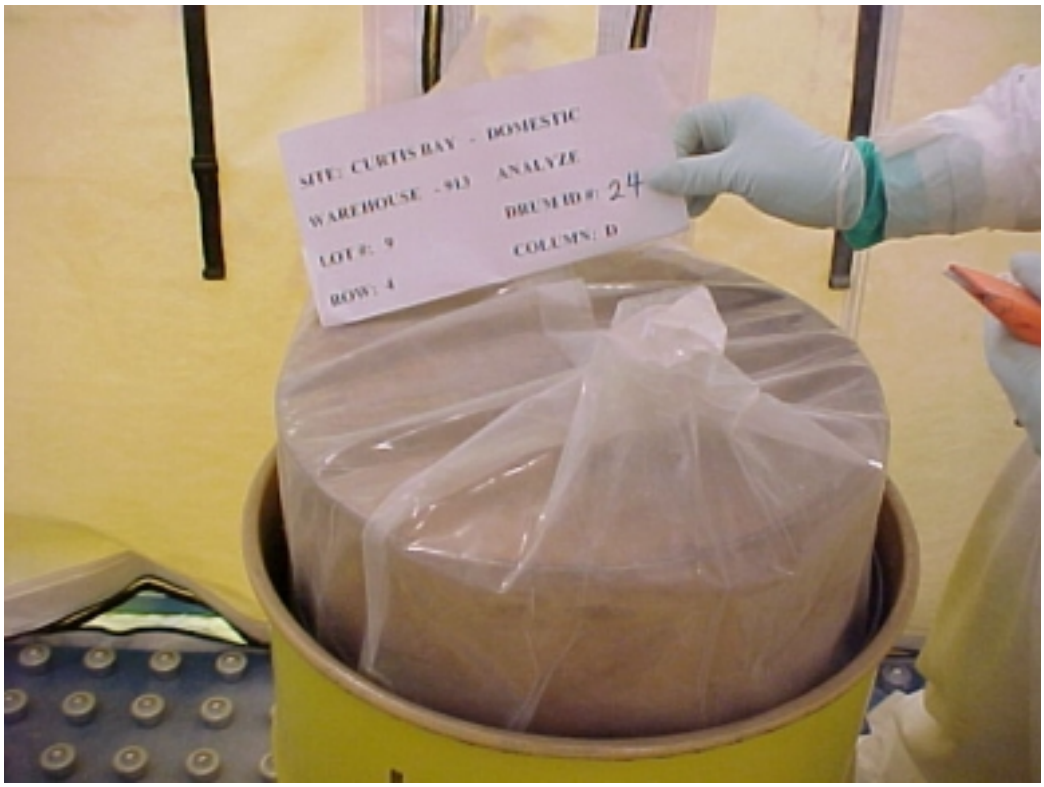
Date	7-12-2002	Time	10:45

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside the container results in raising this packaging layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 9
Drum ID No.: 24
Inspection/Sample: Visual Inspection & Sampling
Disposition: Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse: 913
Row: 4
Column: D

Inspection/Sample Date & Time

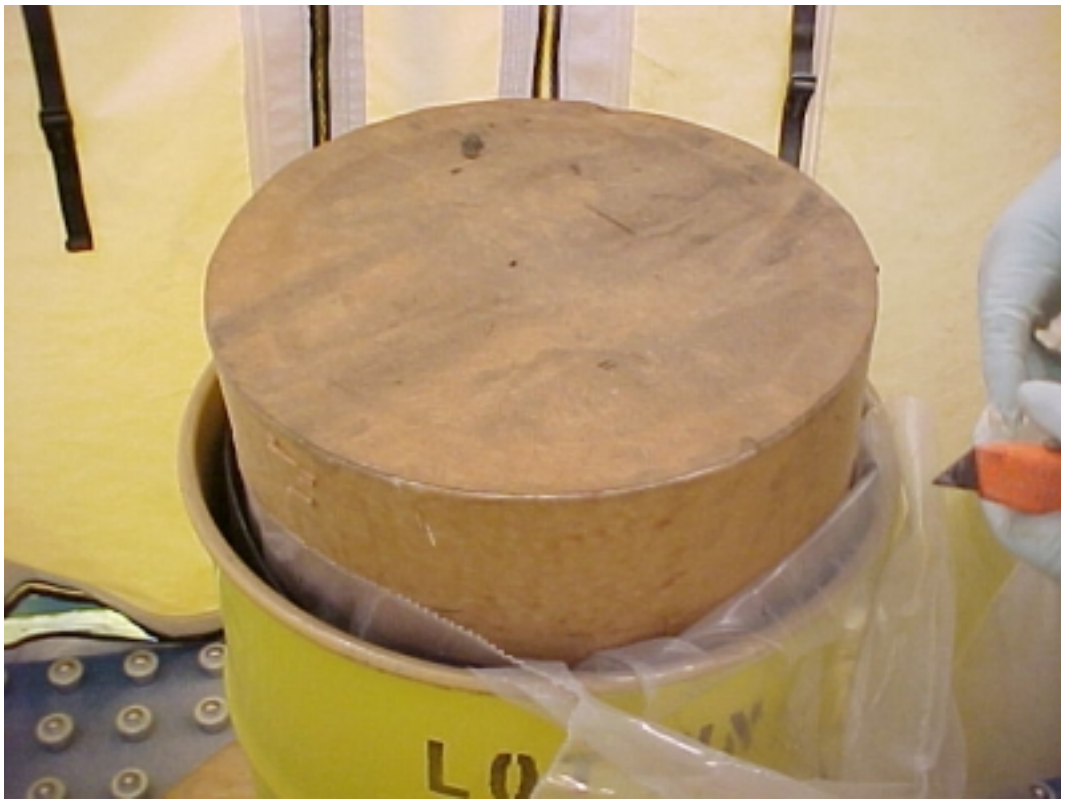
Date: 7-12-2002
Time: 10:45

Other Information

Photo No.: 4 of 11

Dose Rate: Surface 22 mR/hr
1 meter 2.0 mR/hr

Fiber drum lid – good condition
Pressure buildup inside the container results in raising this packaging layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site Curtis Bay
ThN Origin Domestic
Lot No. 9
Drum ID No. 24

Inspection/Sample Visual Inspection & Sampling
Disposition Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse 913
Row 4
Column D

Inspection/Sample Date & Time

Date 7-12-2002
Time 10:45

Other Information

Photo No. 5 of 11

Dose Rate Surface 22 mR/hr
1 meter 2.0 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside the container results in raising this packaging layer vertically out of the container.
No gases present in the breathing zone.

General Information

Site Curtis Bay
ThN Origin Domestic
Lot No. 9
Drum ID No. 24

Inspection/Sample Visual Inspection & Sampling
Disposition Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse 913
Row 4
Column D

Inspection/Sample Date & Time

Date 7-12-2002
Time 10:45

Other Information

Photo No. 6 of 11

Dose Rate Surface 22 mR/hr
1 meter 2.0 mR/hr

3rd poly liner/bag – good condition
Pressure buildup inside the container results in raising this packaging layer vertically out of the container.
Opened poly liner/bag - No gases present in the breathing zone.
Gases in headspace – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented via HEPA exhaust – All gases dissipated to 0.0% and/or 0 ppm

General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 9
Drum ID No.: 24

Inspection/Sample: Visual Inspection & Sampling
Disposition: Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse: 913

Row: 4
Column: D

Inspection/Sample Date & Time

Date: 7-12-2002

Time: 10:45

Other Information

Photo No.: 7 of 11

Dose Rate: Surface 22 mR/hr
1 meter 2.0 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 9
Drum ID No.: 24

Inspection/Sample: Visual Inspection & Sampling
Disposition: Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse: 913

Row: 4
Column: D

Inspection/Sample Date & Time

Date: 7-12-2002

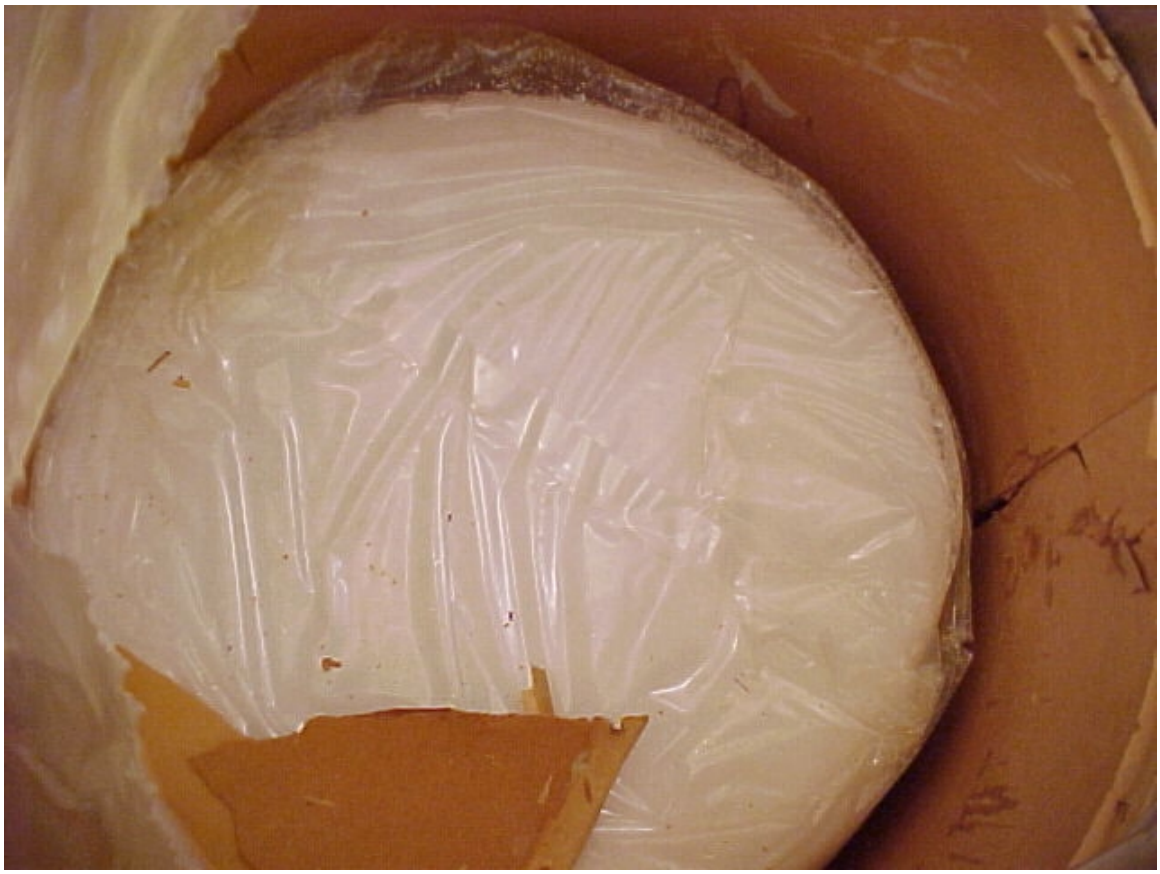
Time: 10:45

Other Information

Photo No.: 8 of 11

Dose Rate: Surface 22 mR/hr
1 meter 2.0 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site Curtis Bay
ThN Origin Domestic
Lot No. 9
Drum ID No. 24

Inspection/Sample Visual Inspection & Sampling
Disposition Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse 913
Row 4
Column D

Inspection/Sample Date & Time

Date 7-12-2002
Time 10:45

Other Information

Photo No. 9 of 11

Dose Rate Surface 22 mR/hr
1 meter 2.0 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site Curtis Bay
ThN Origin Domestic
Lot No. 9
Drum ID No. 24

Inspection/Sample Visual Inspection & Sampling
Disposition Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse 913
Row 4
Column D

Inspection/Sample Date & Time

Date 7-12-2002
Time 10:45

Other Information

Photo No. 10 of 11

Dose Rate Surface 22 mR/hr
1 meter 2.0 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 9
Drum ID No.: 24
Inspection/Sample: Visual Inspection & Sampling
Disposition: Archive
Drum was to be analyzed but a labeling issue on the outer Rubbermaid overpack container for the samples resulted in placing the samples from this drum into an archive storage drum (6990-001-A3)

Physical Location of Drum

Warehouse: 913
Row: 4
Column: D

Inspection/Sample Date & Time

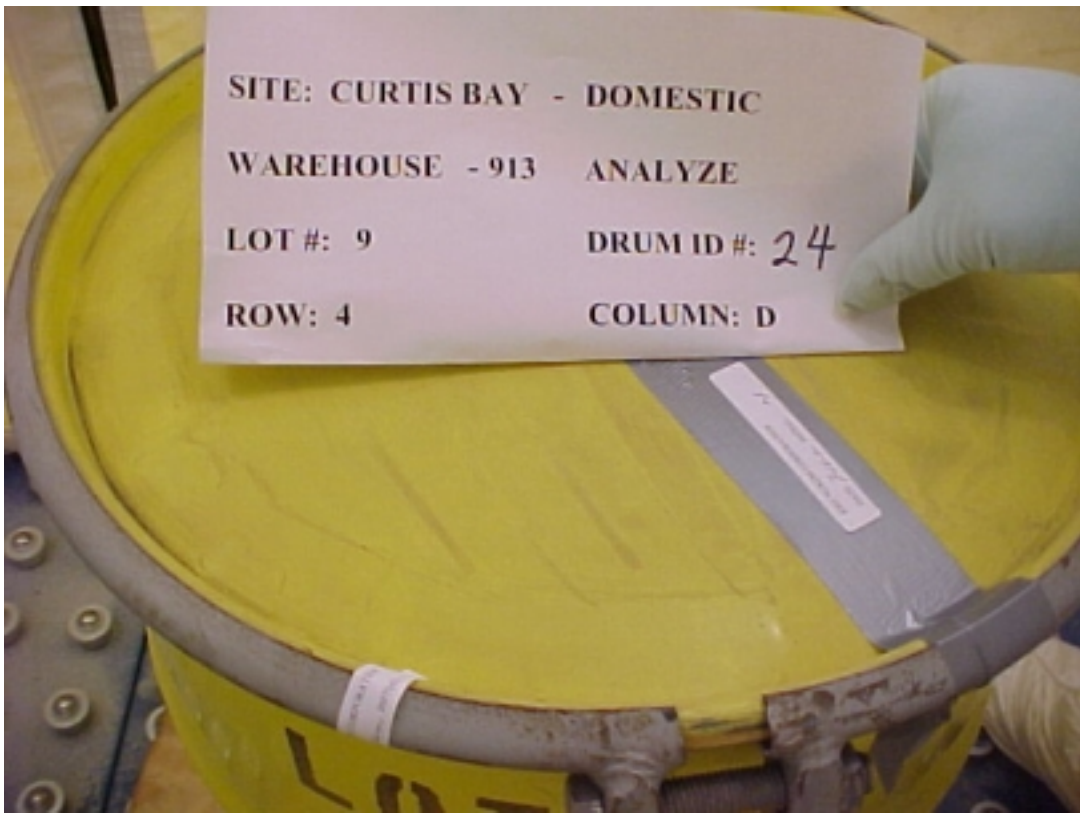
Date: 7-12-2002
Time: 10:45

Other Information

Photo No.: 11 of 11

Dose Rate: Surface 22 mR/hr
1 meter 2.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #10 - Drum #135
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 10 Drum ID #: 135 Location: Warehouse 913 – Column D – Row 2

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

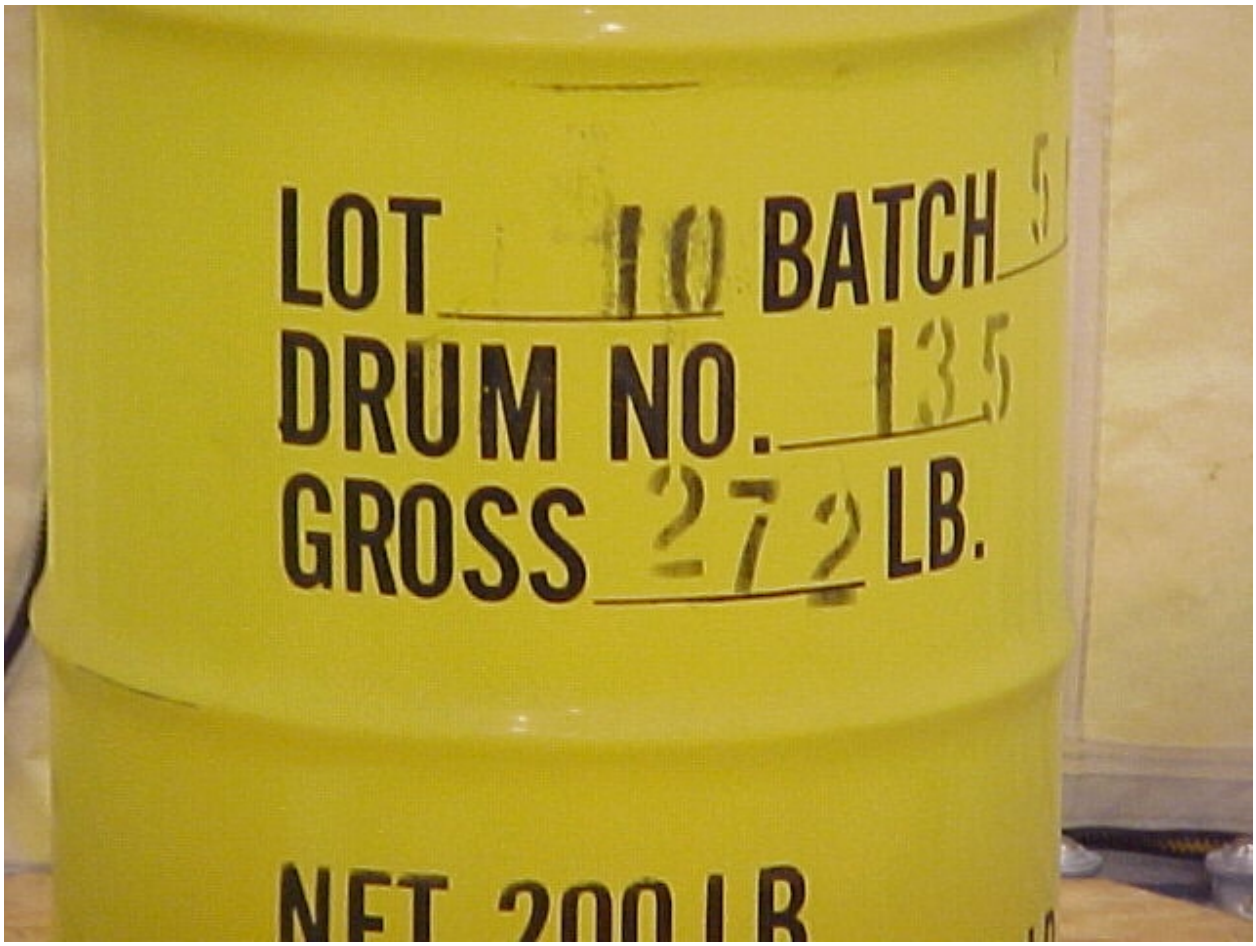
Date	7-12-2002	Time	09:30

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

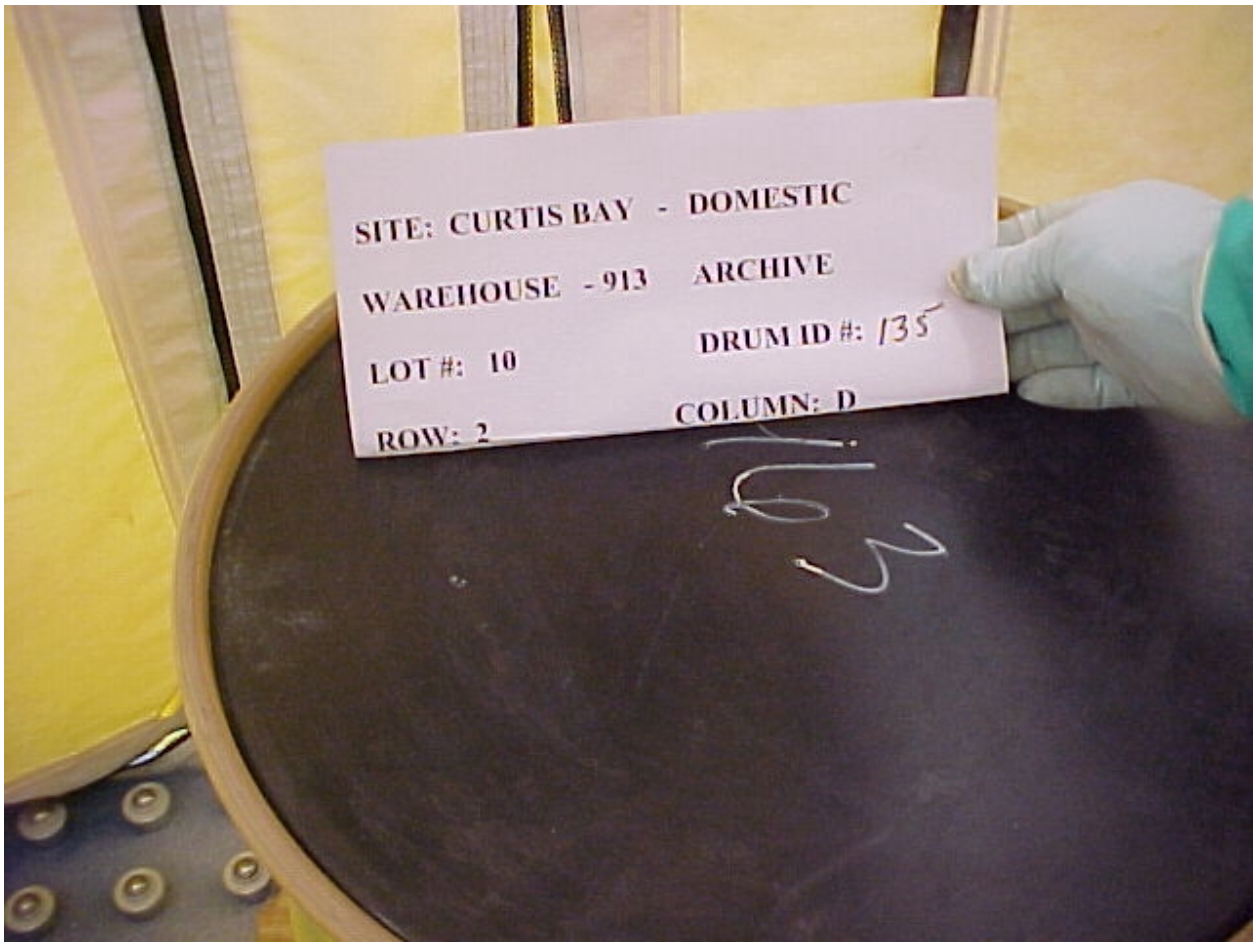
Date	7-12-2002	Time	09:30

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:30

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

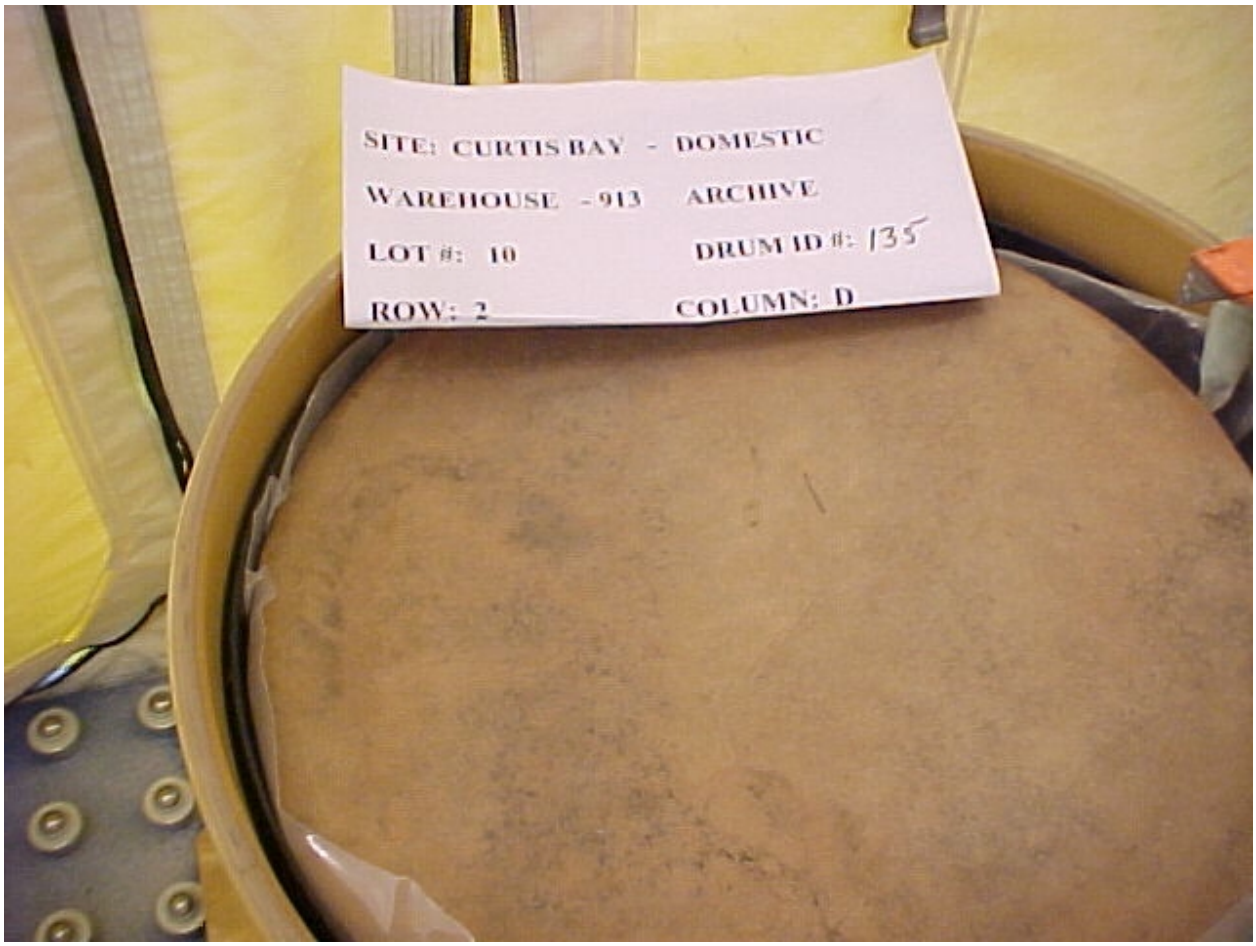
Date	7-12-2002	Time	09:30

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:30

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:30

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:30

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:30

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition (photo shows inside of inner fiber drum – lab-pack container)
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	09:30

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	10	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	135	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	2
		Column	D

Inspection/Sample Date & Time

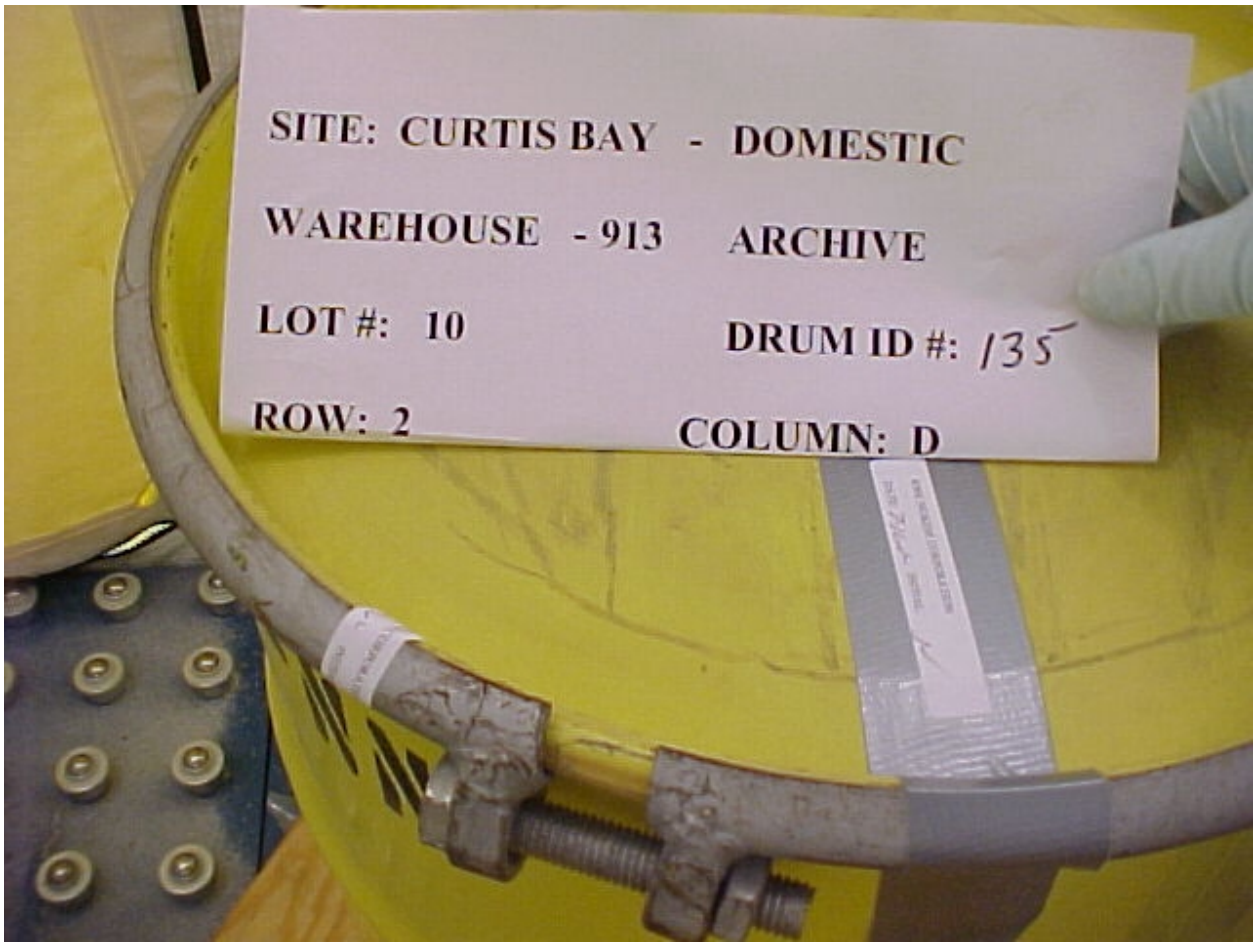
Date	7-12-2002	Time	09:30

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #13 - Drum #124
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 13 Drum ID #: 124 Location: Warehouse 913 – Column E – Row 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-11-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

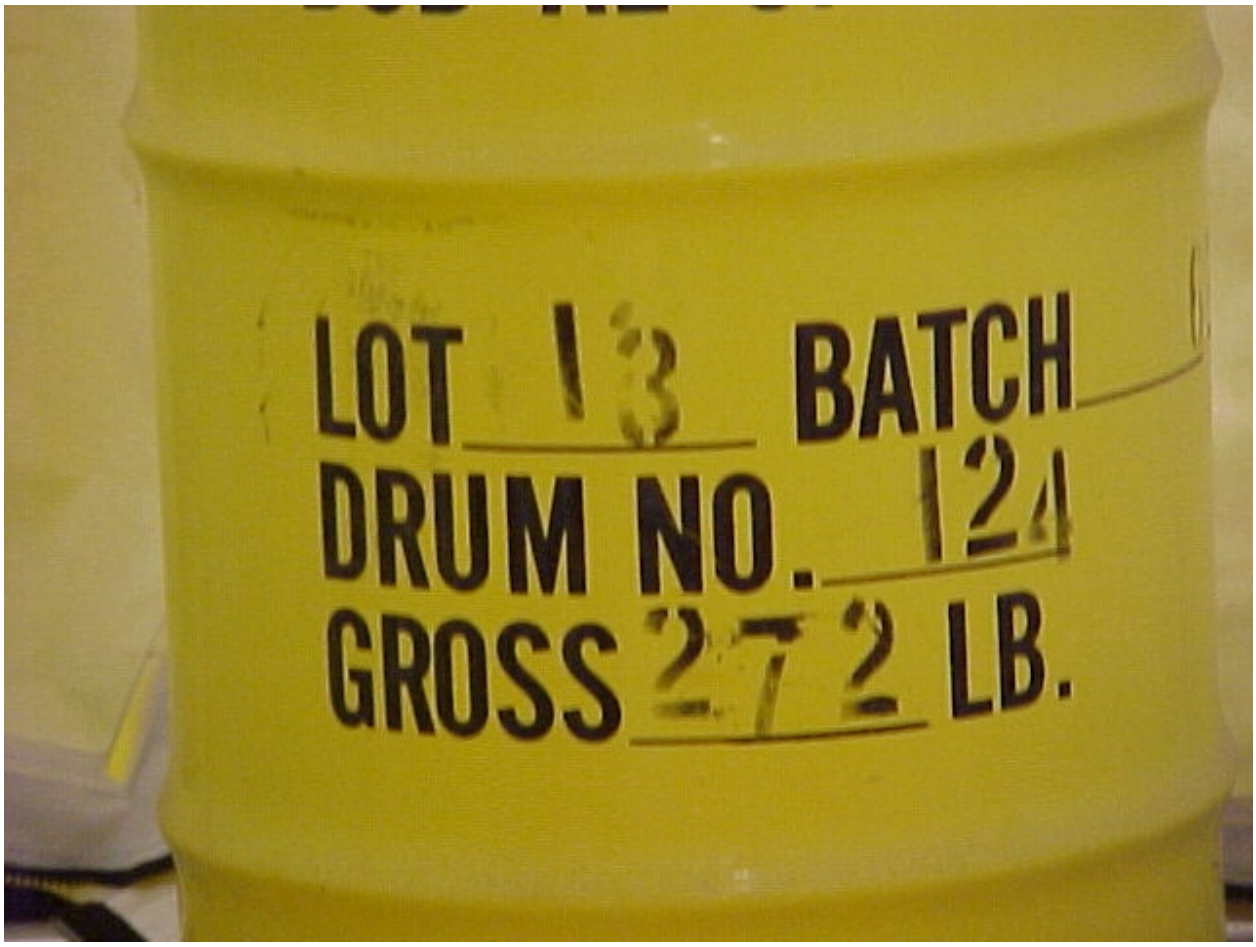
Date	7-11-2002	Time	14:30

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

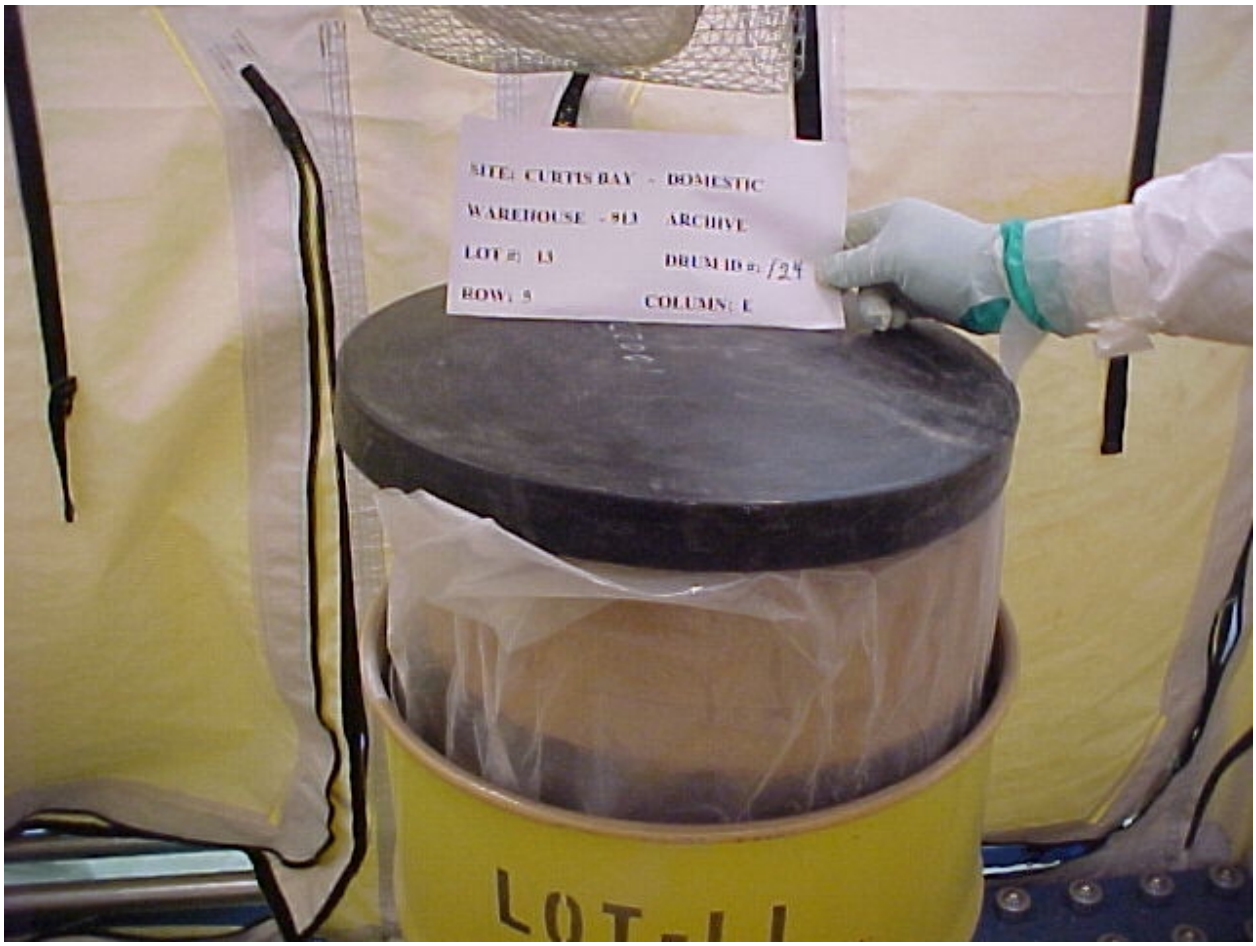
Date	7-11-2002	Time	14:30

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
Pressure buildup inside of the container results in this packaging layer rising out of the container
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

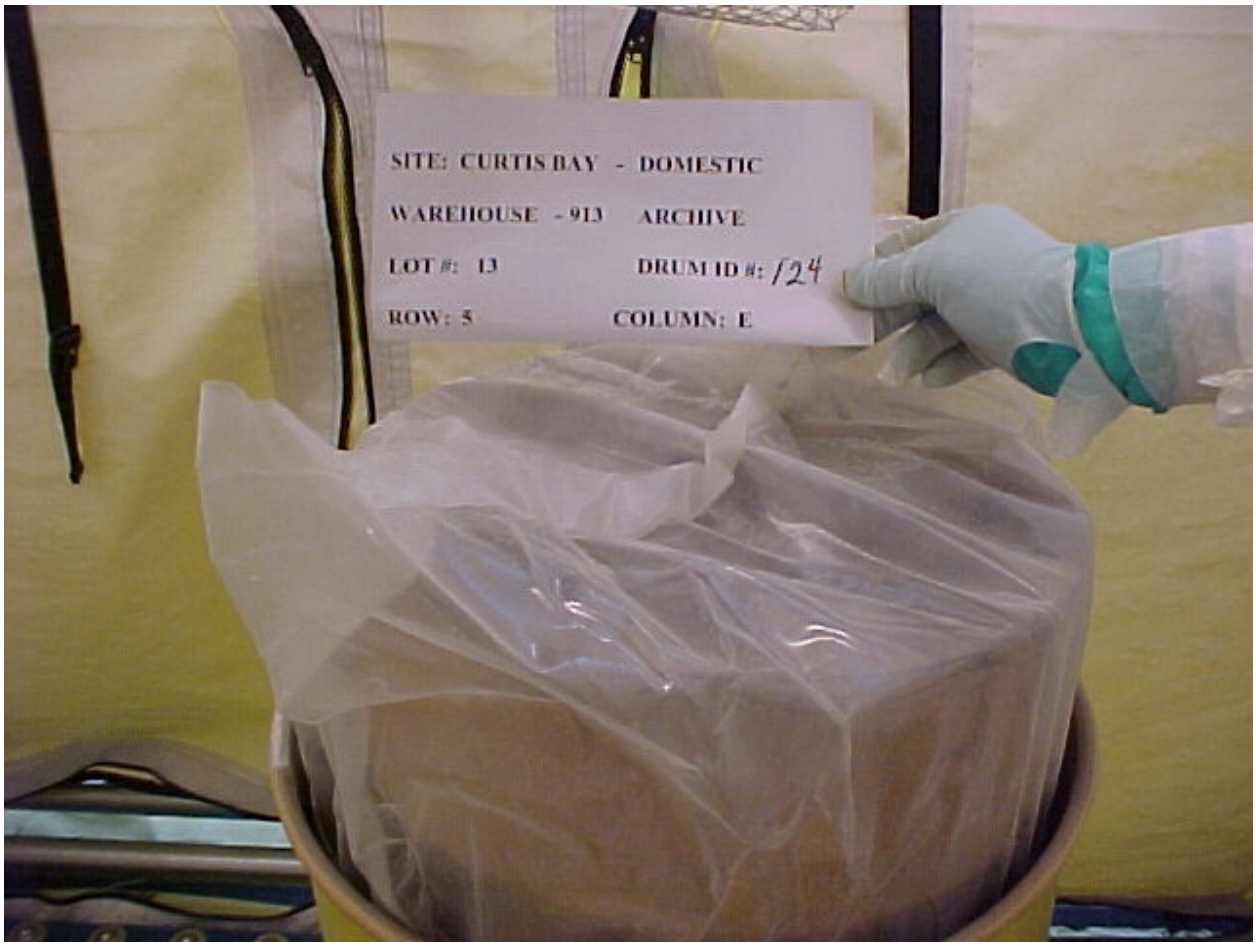
Date	7-11-2002	Time	14:30

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside of the container results in this packaging layer rising out of the container
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:30

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
Pressure buildup inside of the container results in this packaging layer rising out of the container
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

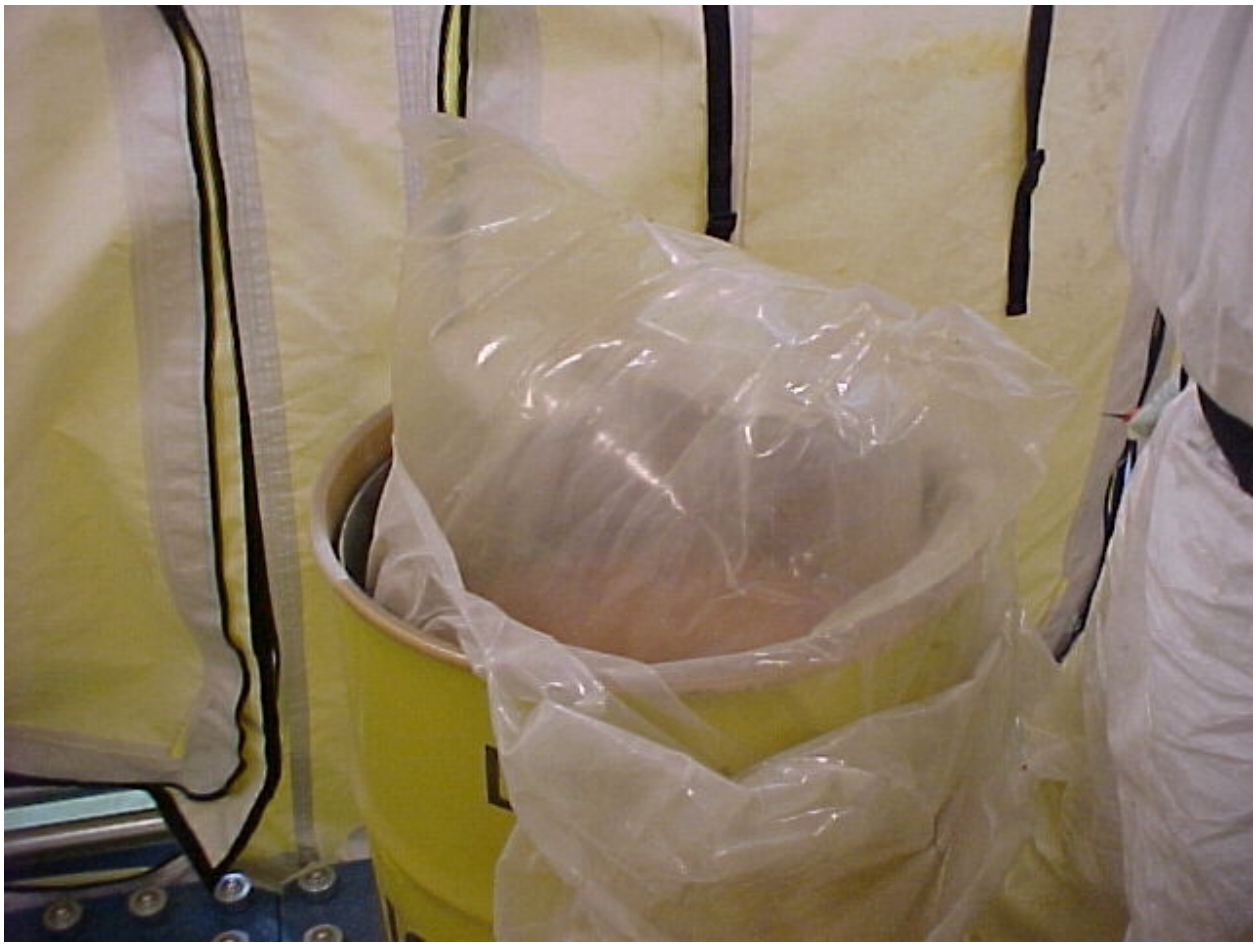
Date	7-11-2002	Time	14:30

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside of the container results in this packaging layer rising out of the container
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:30

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
Pressure buildup inside of the container results in this packaging layer rising out of the container
Opened poly liner/bag - No gases present in the breathing zone.
Gases present in bag's headspace – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented with HEPA exhaust blower – all gases dissipated to 0% LEL and/or 0 ppm

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:30

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:30

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Lab-pack (inner fiber drum) lid (paper layer) shown in this photo is under the wooden lid
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:30

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
Pressure buildup inside of the container results in this packaging layer rising out of the container
Opened poly bag - No gases present in the breathing zone.
Gases in headspace – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented with HEPA exhaust dissipating the gases to 0% LEL and/or 0 ppm

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:30

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	13	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	124	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	E

Inspection/Sample Date & Time

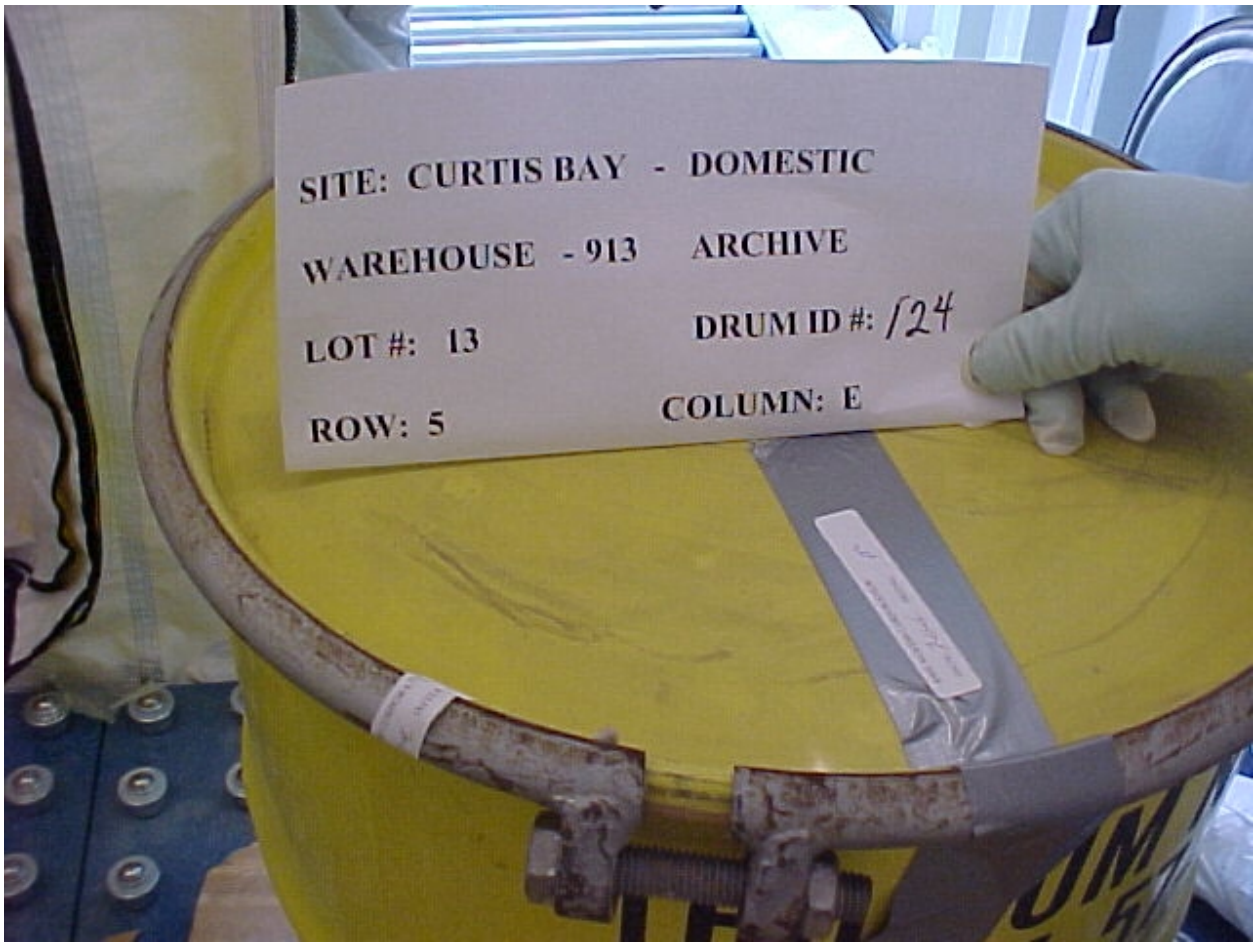
Date	7-11-2002	Time	14:30

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #21 - Drum #83
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 21 Drum ID #: 83 Location: Warehouse 913 – Column E – Row 9

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.2% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-11-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

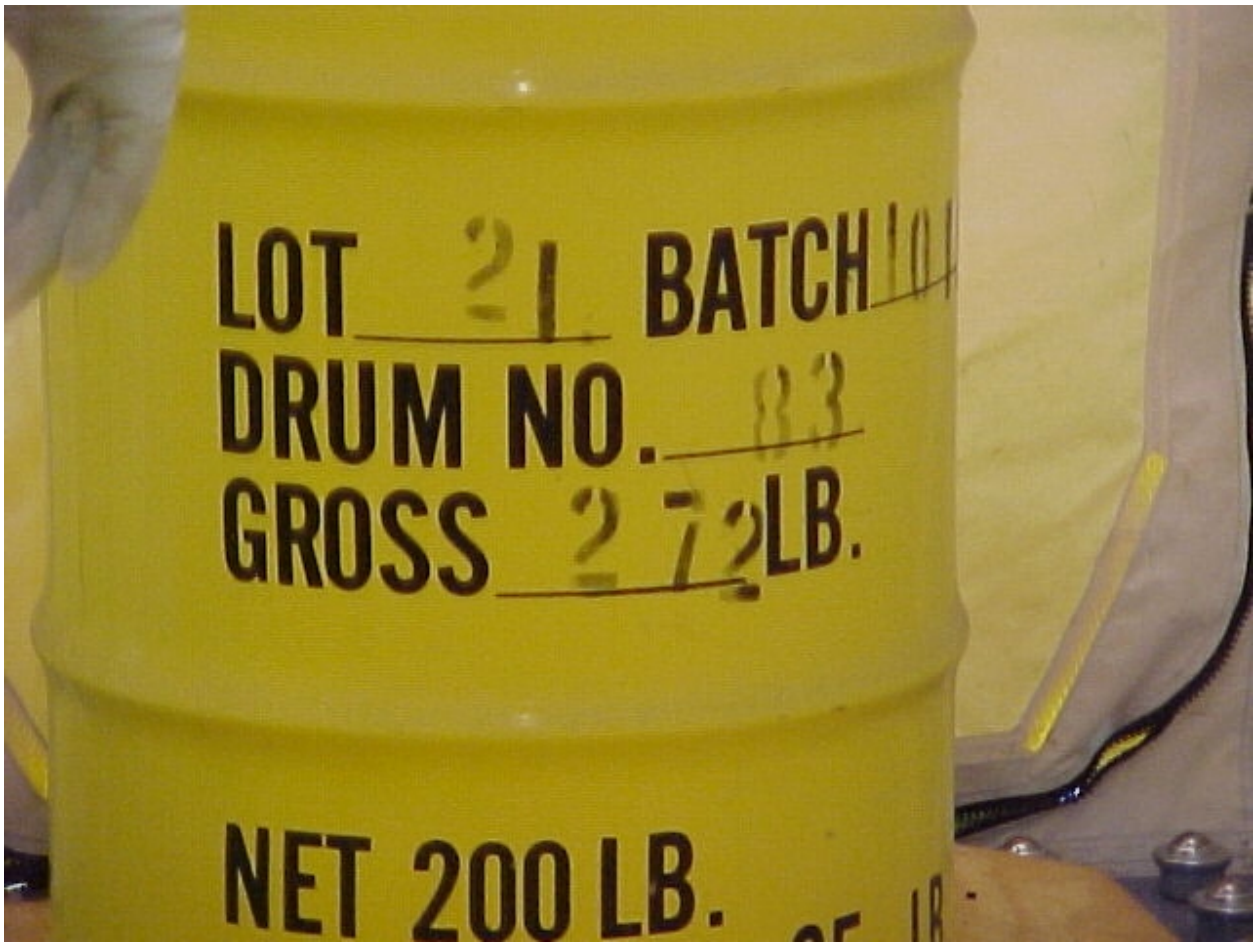
Date	7-11-2002	Time	14:45

Other Information

Photo No. 1 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 2 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
Pressure buildup internal to the container results in this packaging layer rising out of the container
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 3 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup internal to the container results in this packaging layer rising out of the container
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 4 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
Pressure buildup internal to the container results in this packaging layer rising out of the container
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 5 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup internal to the container results in this packaging layer rising out of the container
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 6 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
Pressure buildup internal to the container results in this packaging layer rising out of the container
Opened poly liner/bag - No gases present in the breathing zone.
Gases in headspace – CH4 – 4.1% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented with HEPA exhaust to 0% LEL and 0 ppm respectively

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 7 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 8 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition (inflated bag delineates gas generation from ThN material)
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

Date	7-11-2002	Time	14:45

Other Information

Photo No. 9 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	21	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	83	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	E

Inspection/Sample Date & Time

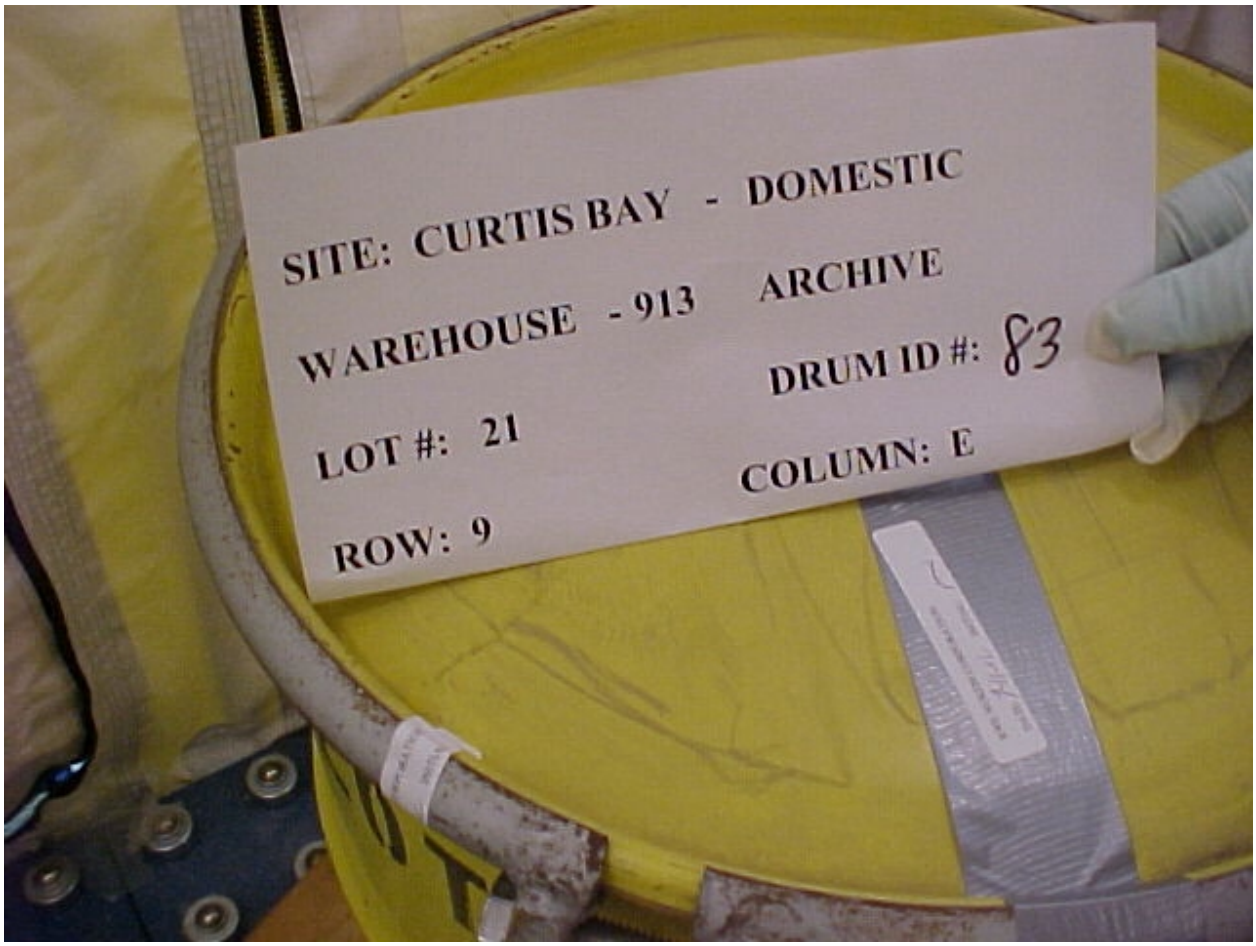
Date	7-11-2002	Time	14:45

Other Information

Photo No. 10 of 10

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #23 - Drum #200
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 23 Drum ID #: 200 Location: Warehouse 913 – Column D – Row 10

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.6% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

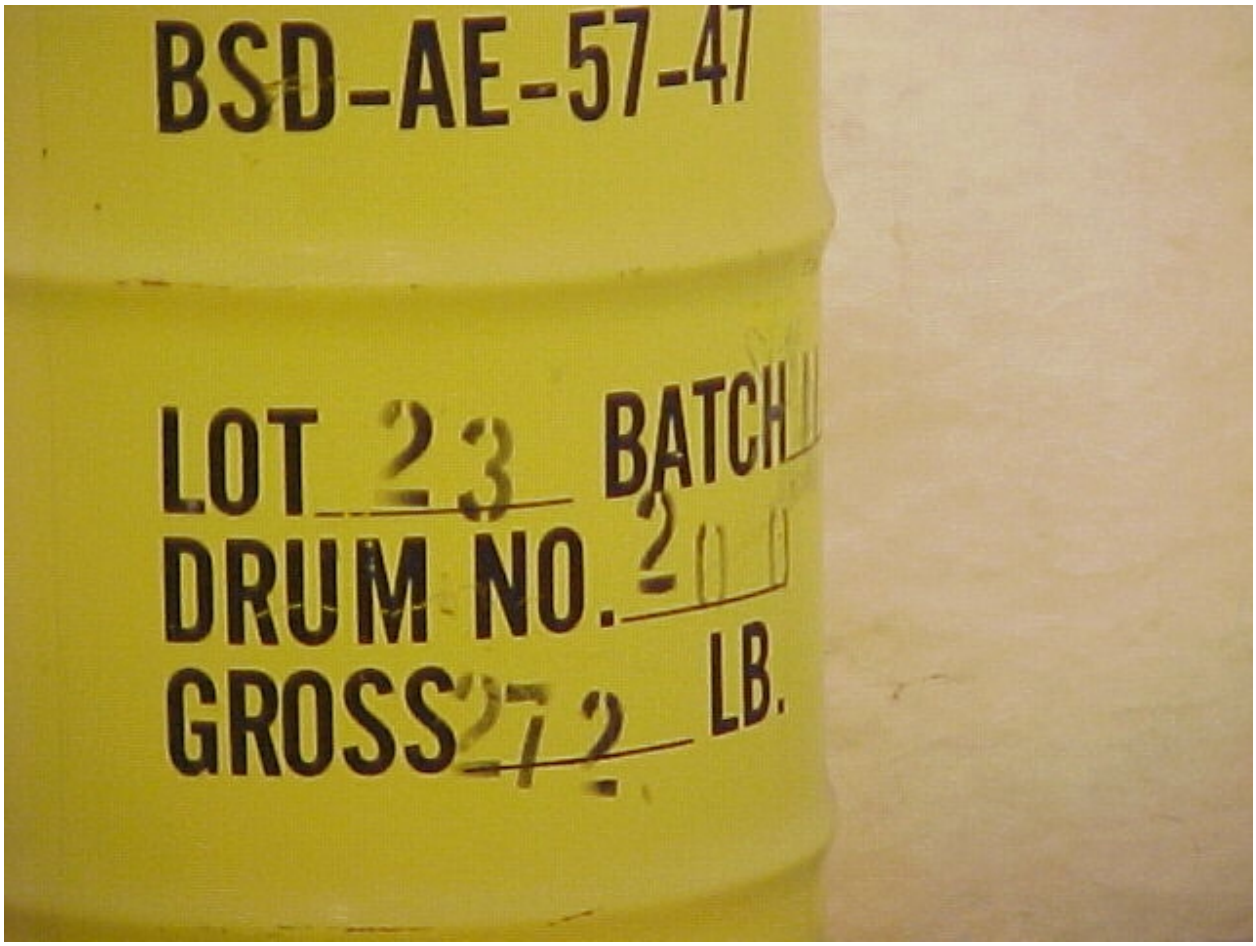
Date	7-12-2002	Time	10:30

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

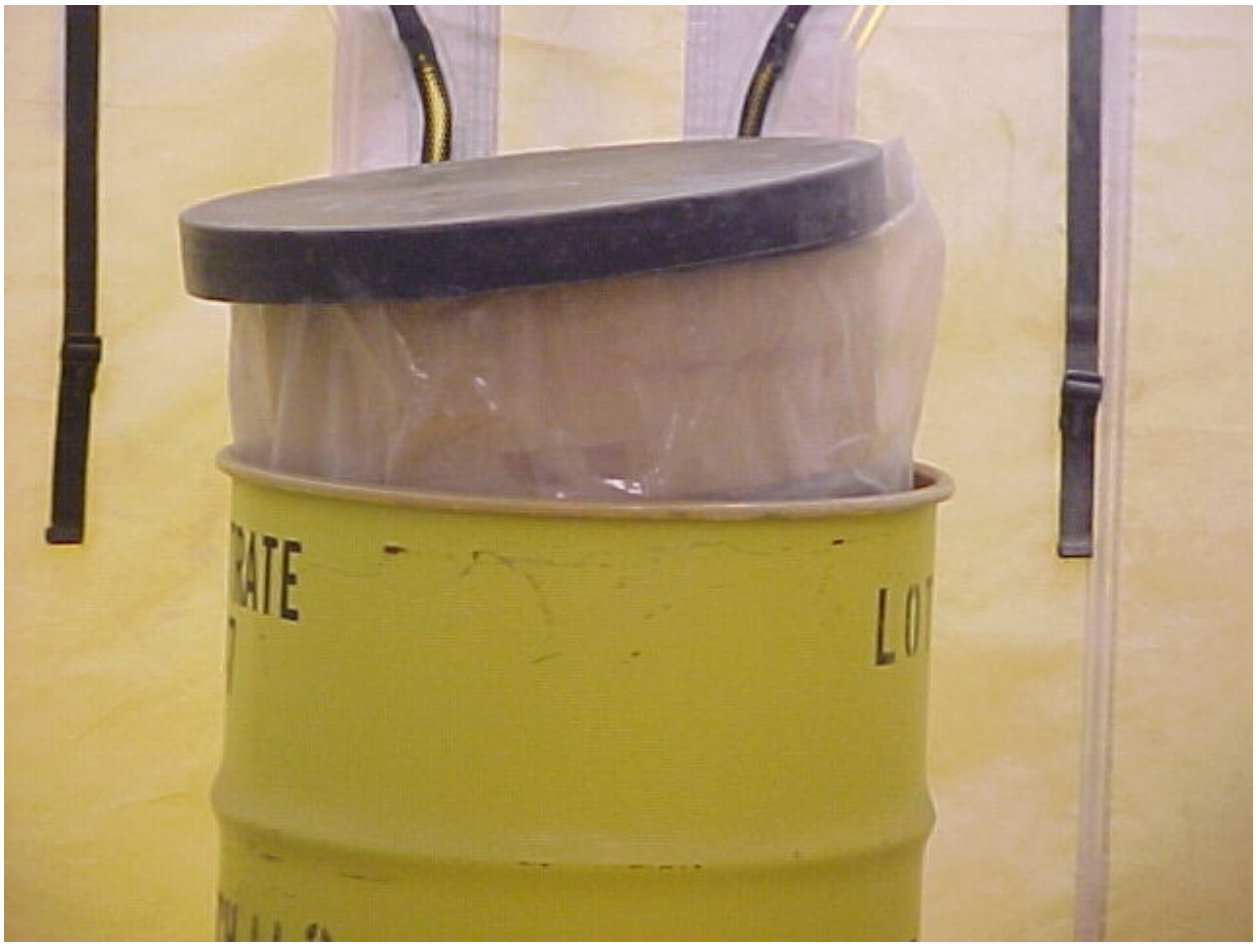
Date	7-12-2002	Time	10:30

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
Pressure buildup inside of the container results in raising this layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

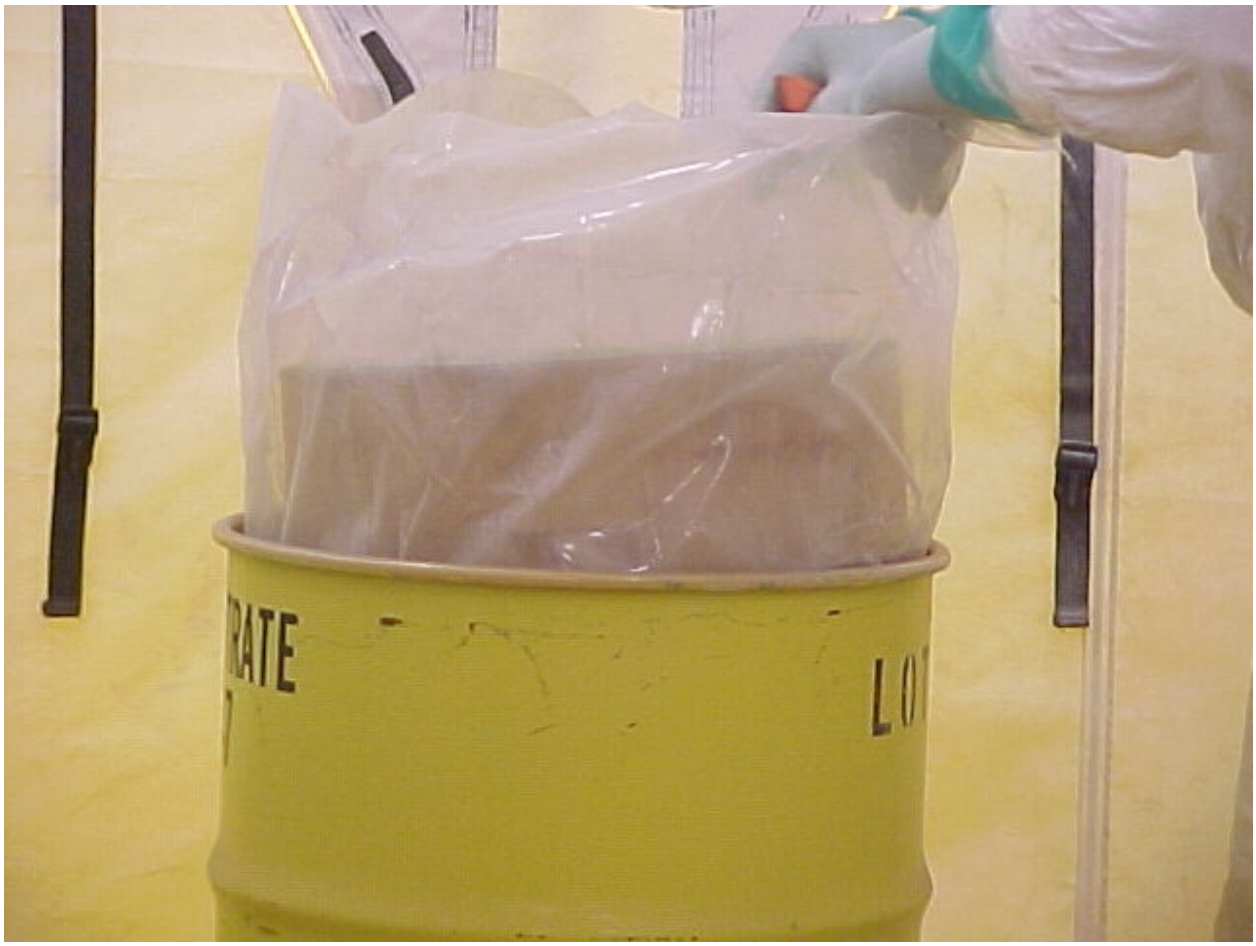
Date	7-12-2002	Time	10:30

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside of the container results in raising this layer vertically out of the container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:30

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber lid (on outermost fiber drum inside of the 30-gal drum) – good condition
Pressure buildup inside of the container results in raising this layer vertically out of the container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:30

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup internal to container results in raising this layer vertically out of the container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

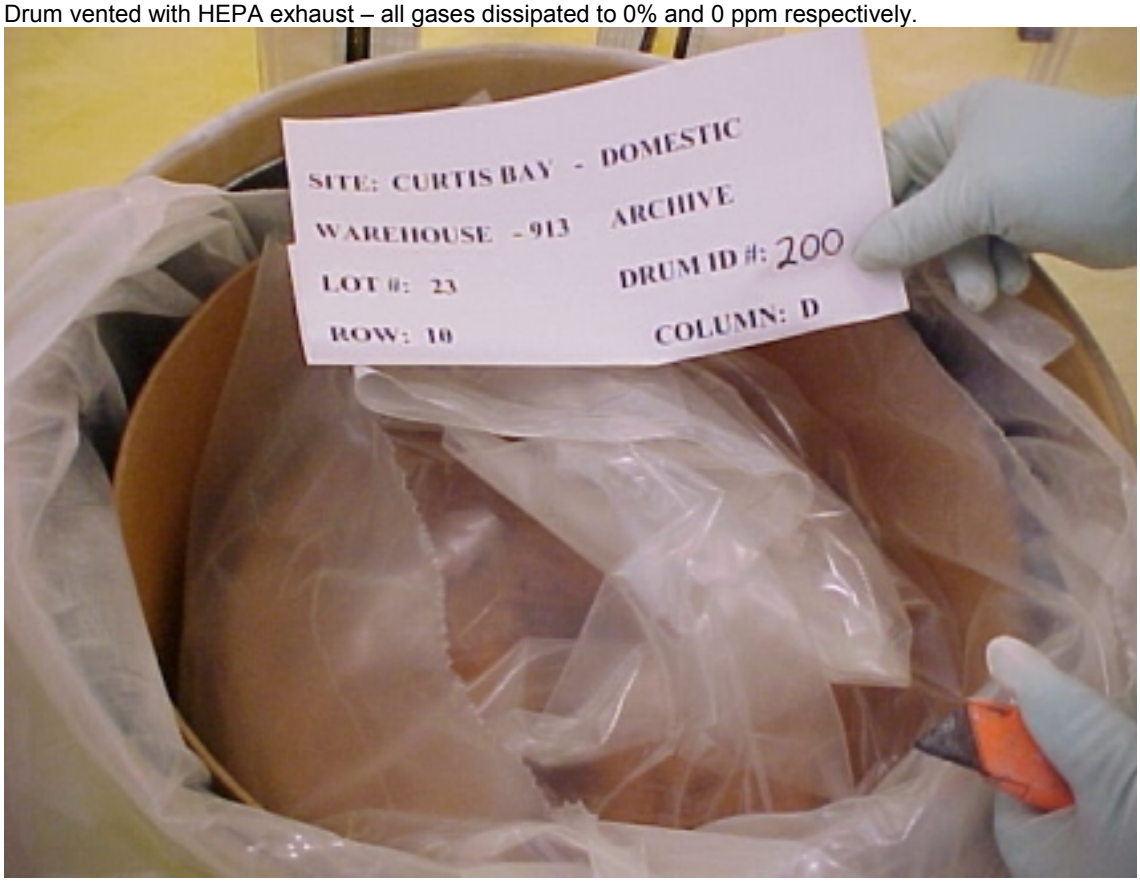
Date	7-12-2002	Time	10:30

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
Pressure buildup internal to container results in raising this layer vertically out of the container.
Opened poly liner/bag – no gases present in the breathing zone
Gases in headspace – CH4 – 4.6% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented with HEPA exhaust – all gases dissipated to 0% and 0 ppm respectively.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:30

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid (mounted on lab-pack/fiber drum container) – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

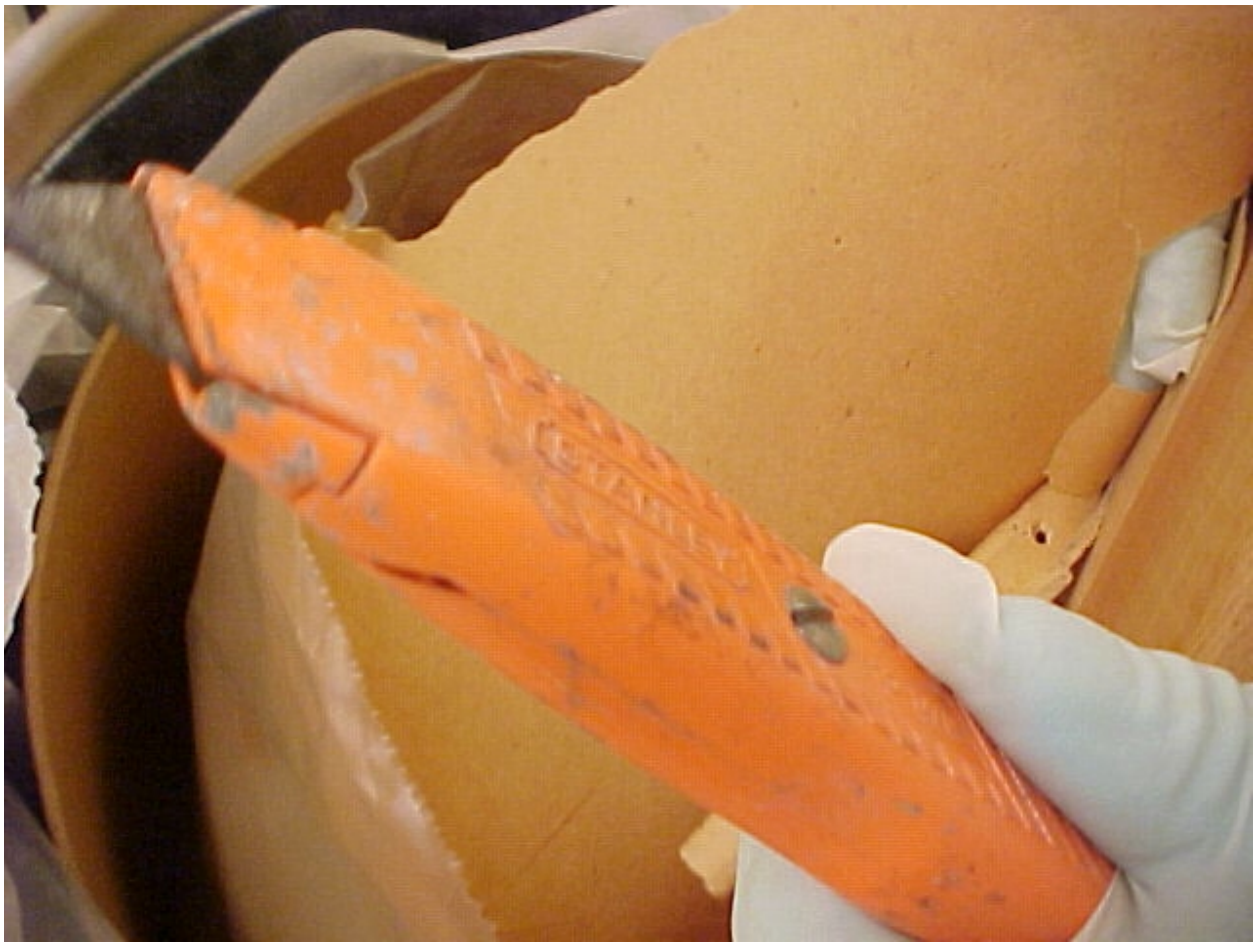
Date	7-12-2002	Time	10:30

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Lab-pack container lid (paper layer below wooden lid)
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

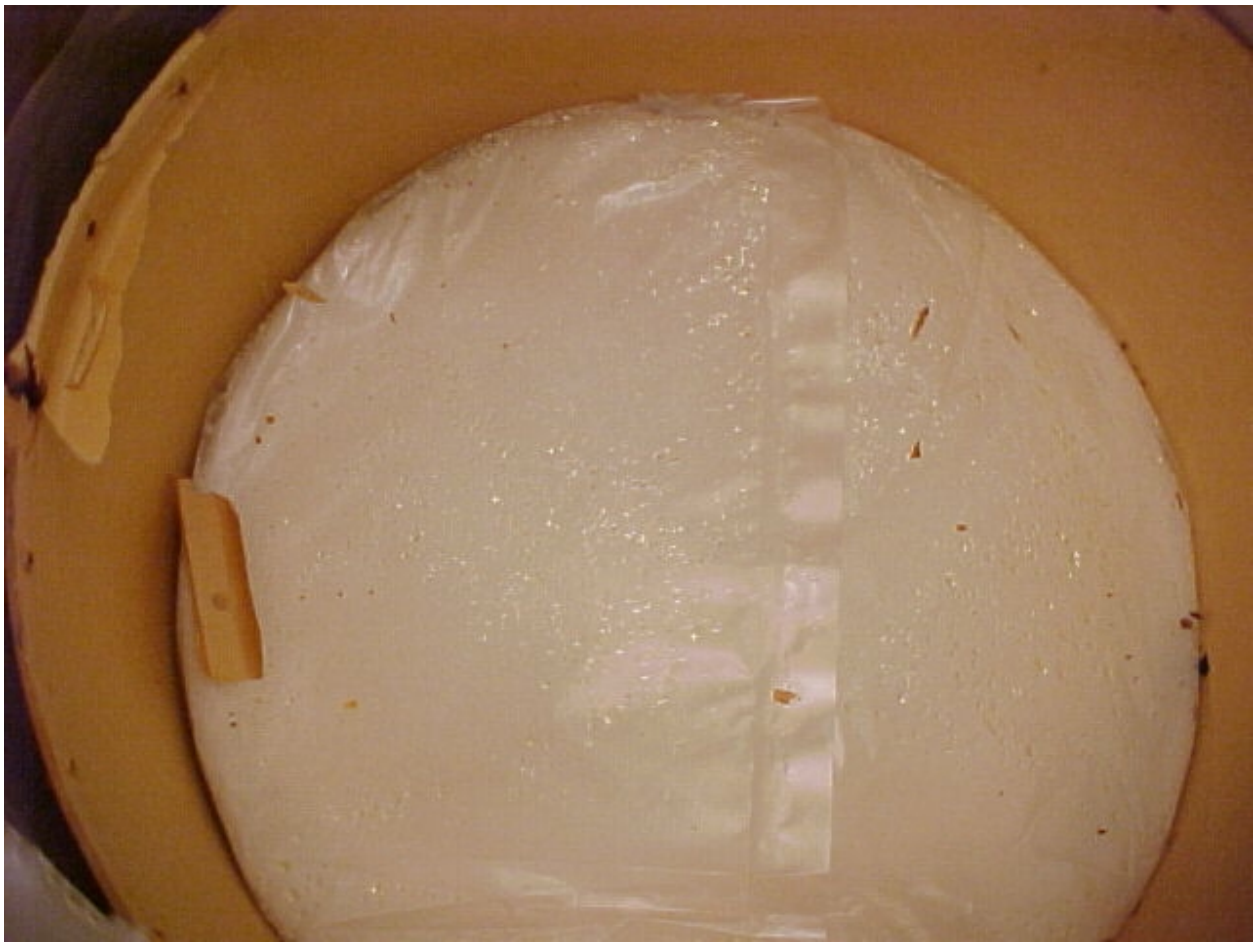
Date	7-12-2002	Time	10:30

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition (inflated bag indicates gas generation from ThN material)
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

Date	7-12-2002	Time	10:30

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	23	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	200	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	10
		Column	D

Inspection/Sample Date & Time

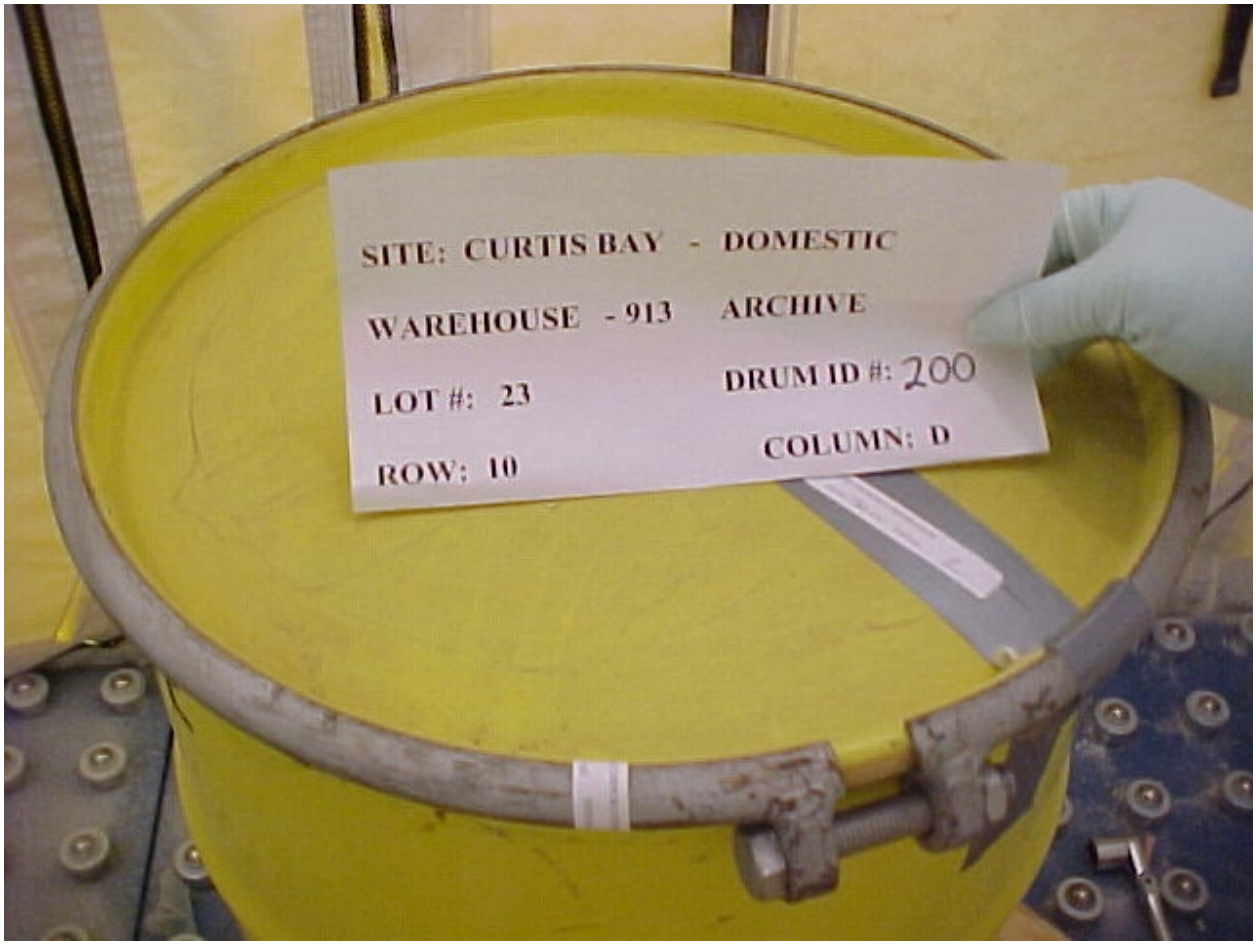
Date	7-12-2002	Time	10:30

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #27 - Drum #159
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 27 Drum ID #: 159 Location: Warehouse 913 – Column C – Row 4

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

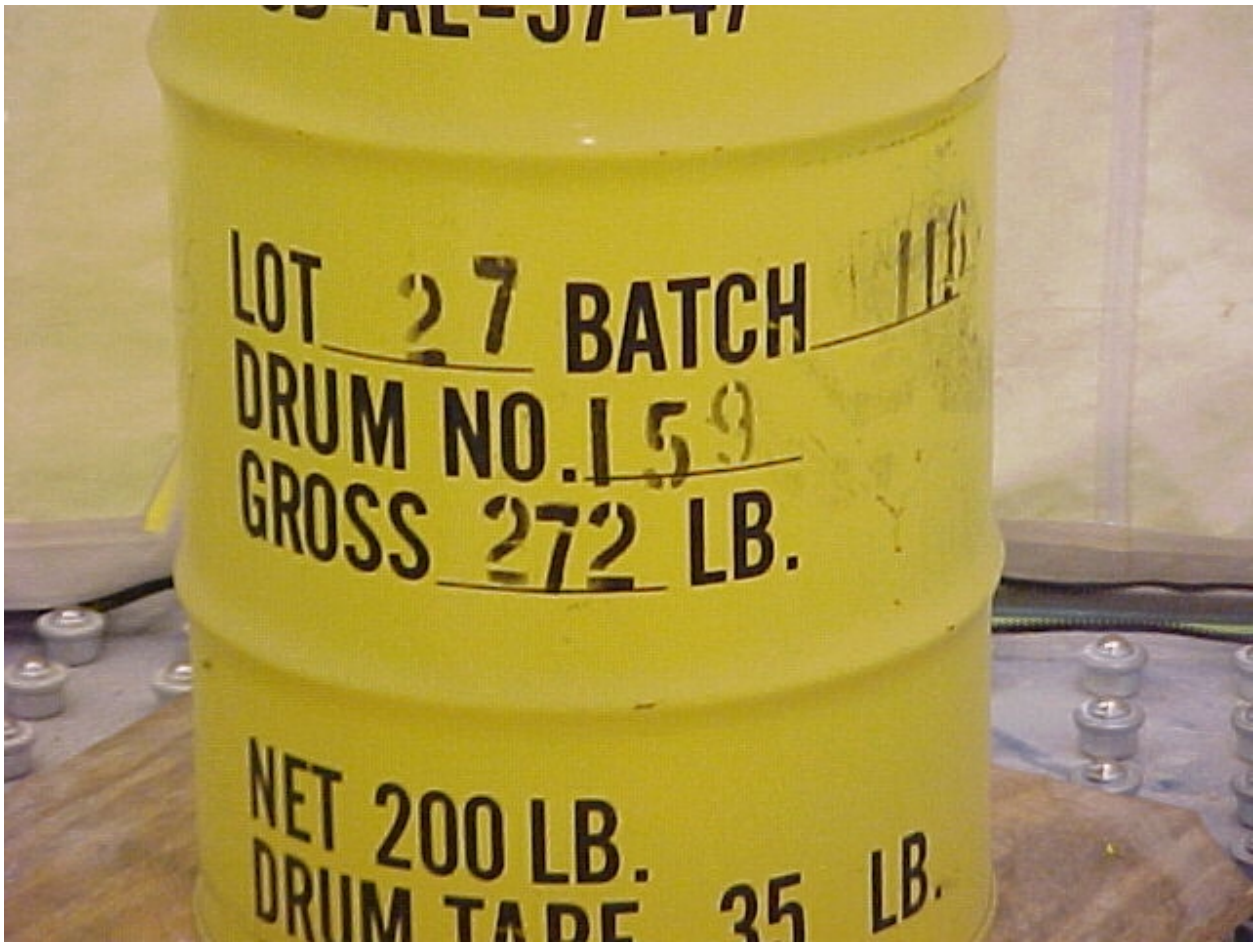
Date	7-12-2002	Time	14:00

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:00

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

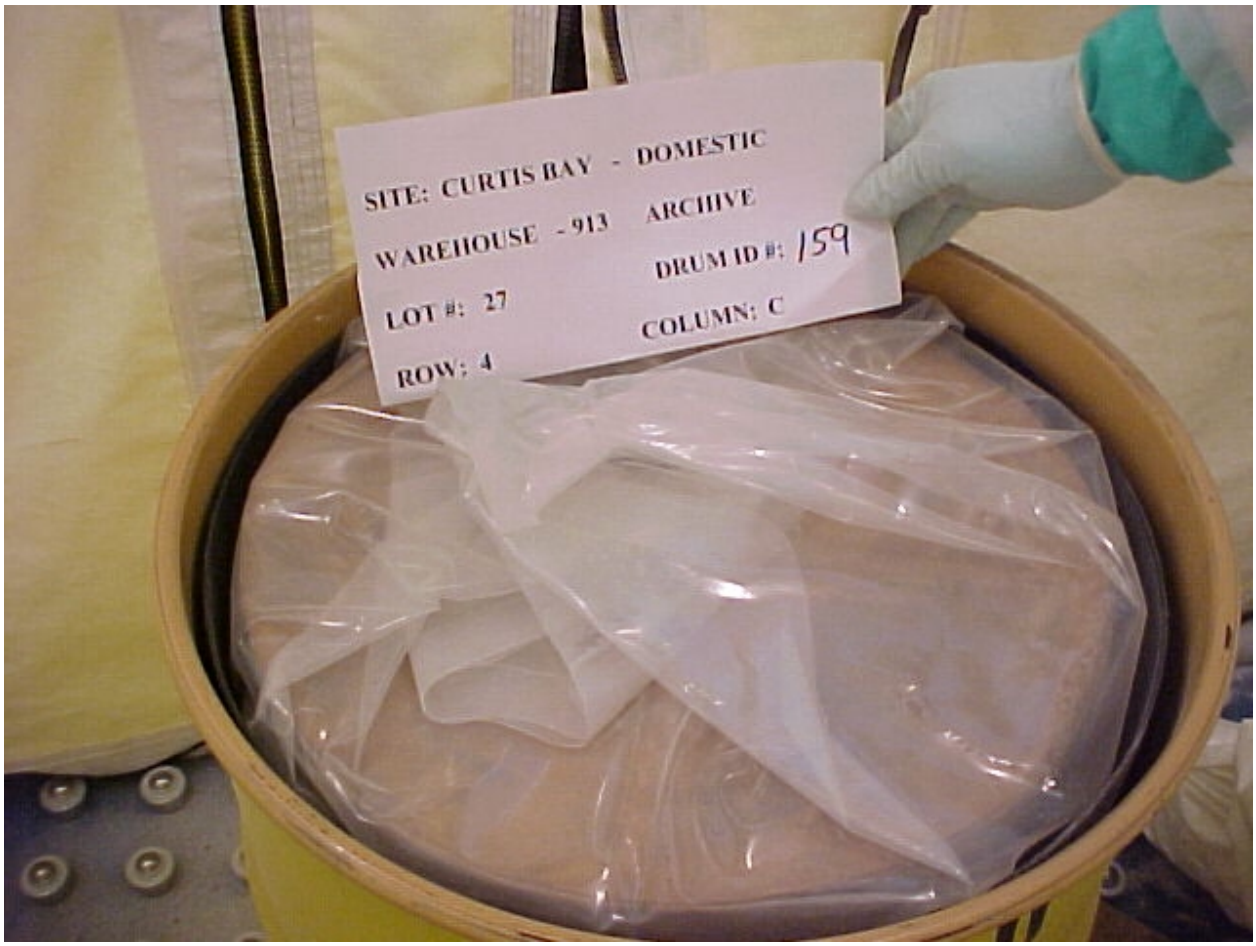
Date	7-12-2002	Time	14:00

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

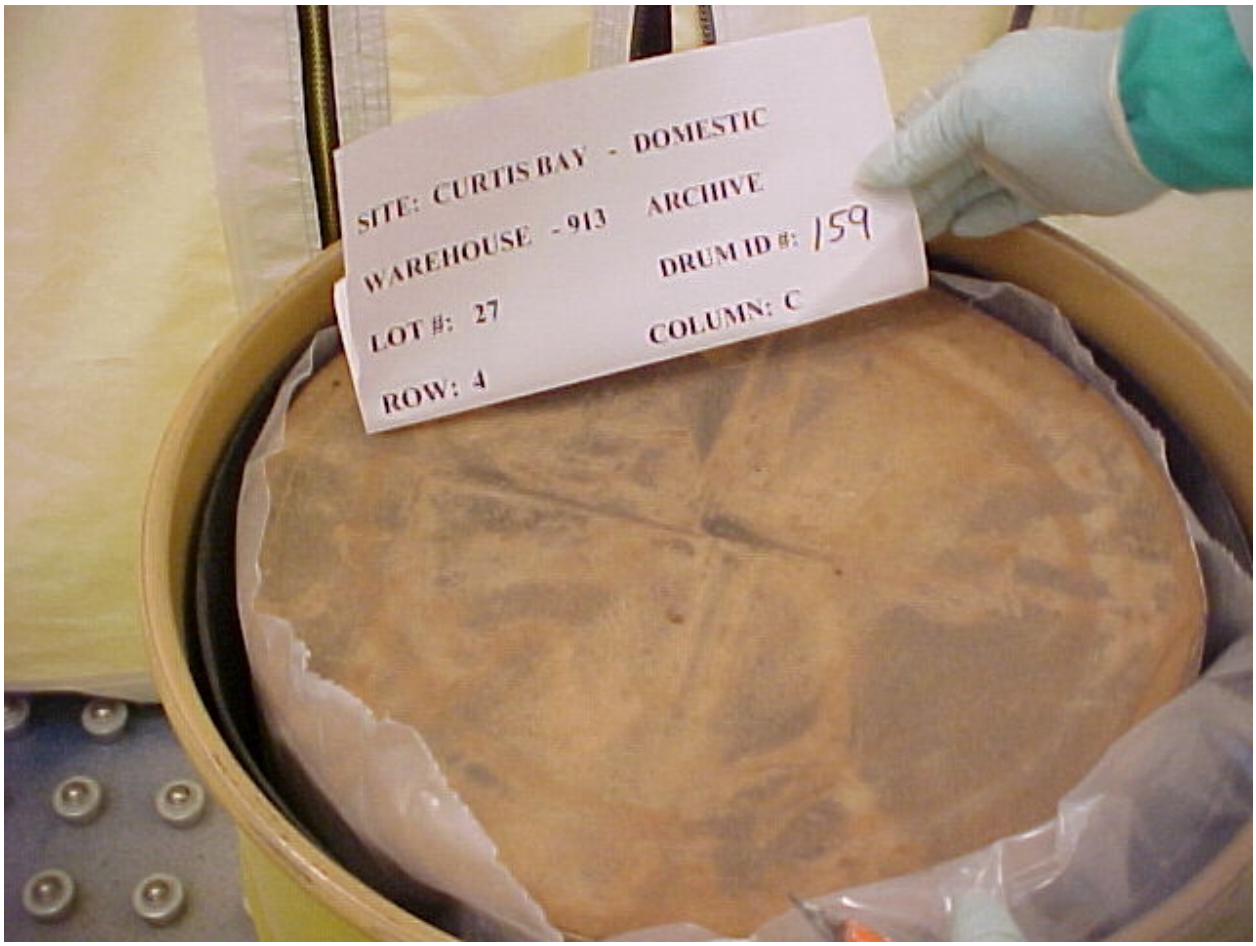
Date	7-12-2002	Time	14:00

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid (on outermost fiber drum inside of 30-gal drum) – good condition
No gases present in breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

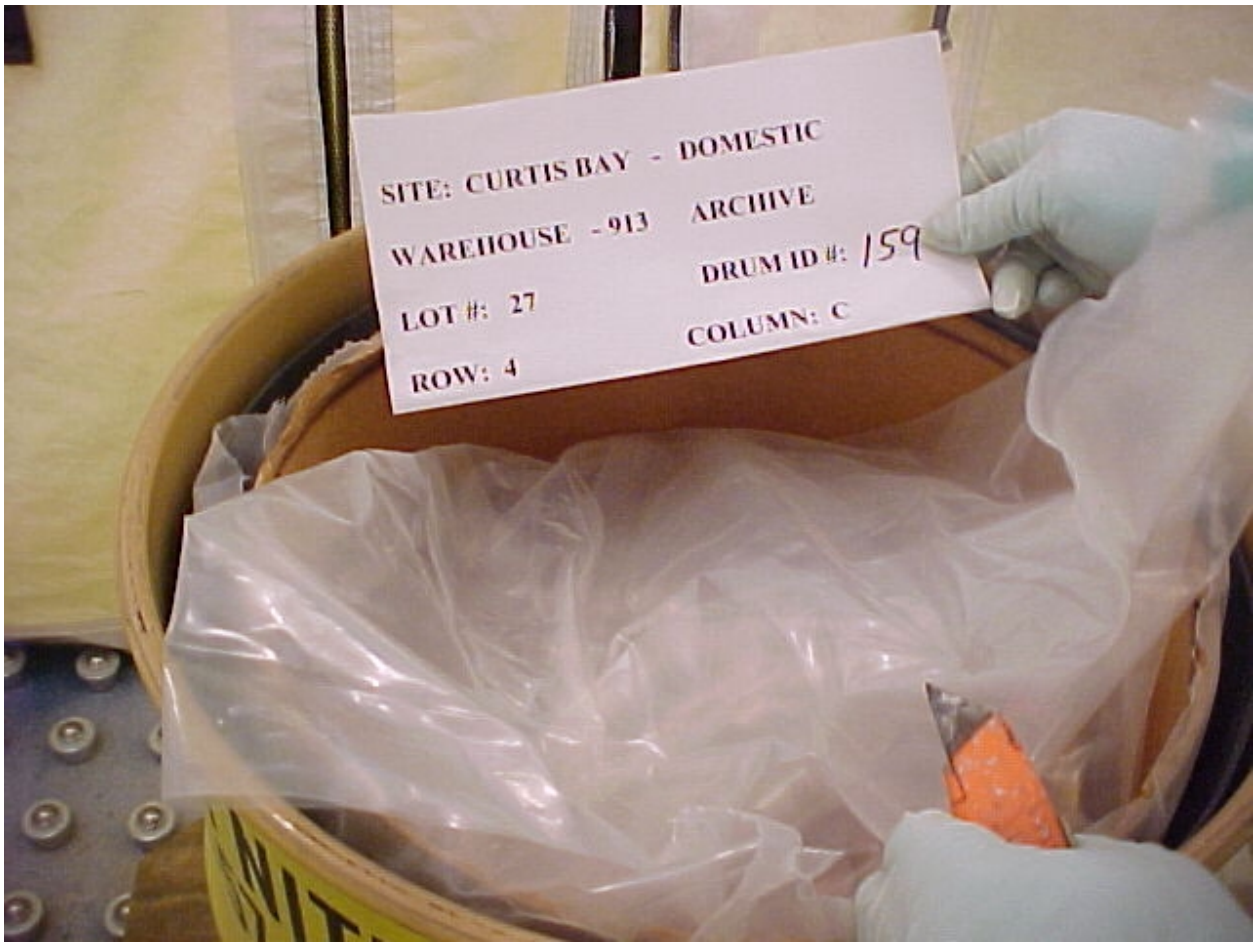
Date	7-12-2002	Time	14:00

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

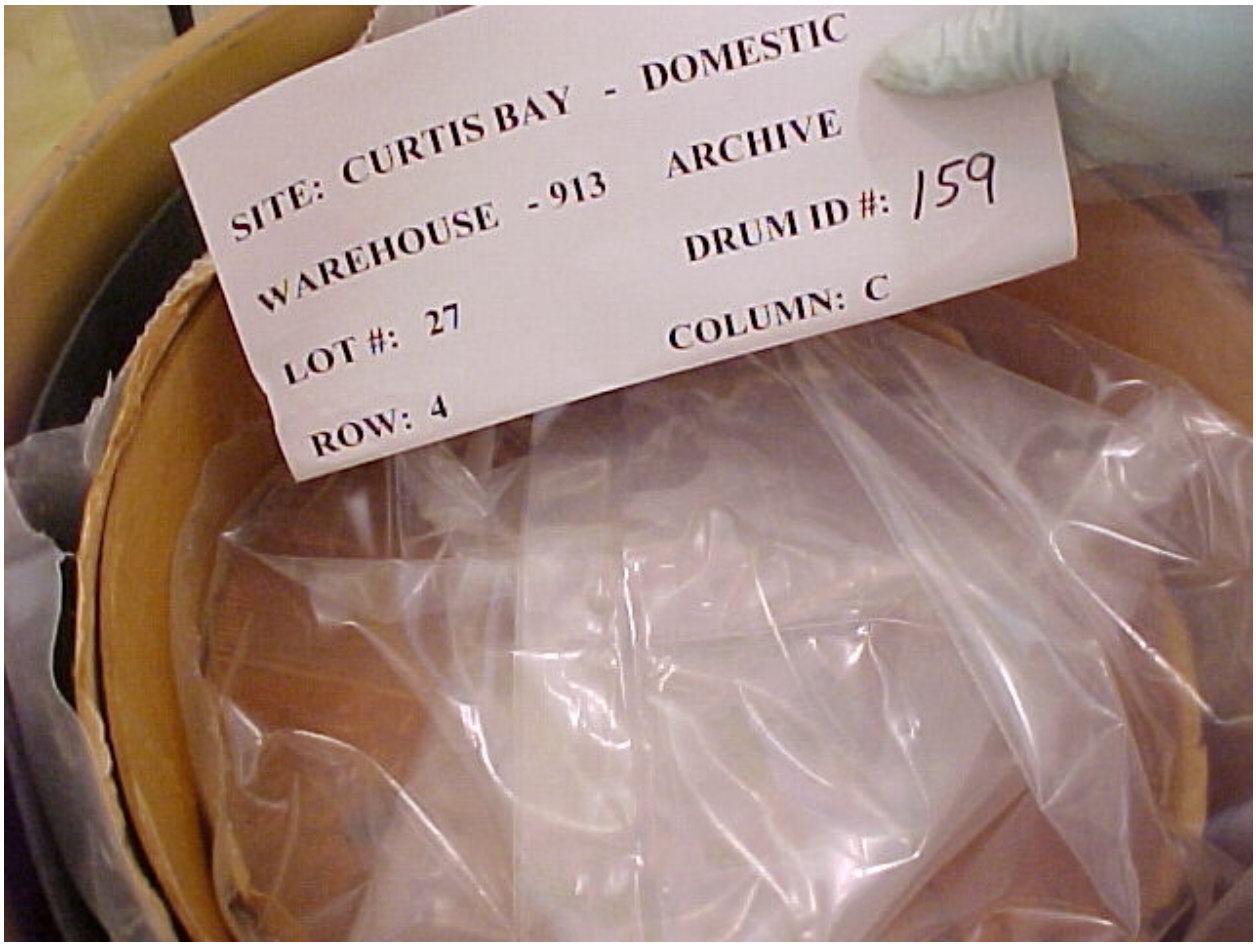
Date	7-12-2002	Time	14:00

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:00

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:00

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Lab-pack paper layer lid – broken upon removal of wooden lid
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:00

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:00

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	27	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	159	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	4
		Column	C

Inspection/Sample Date & Time

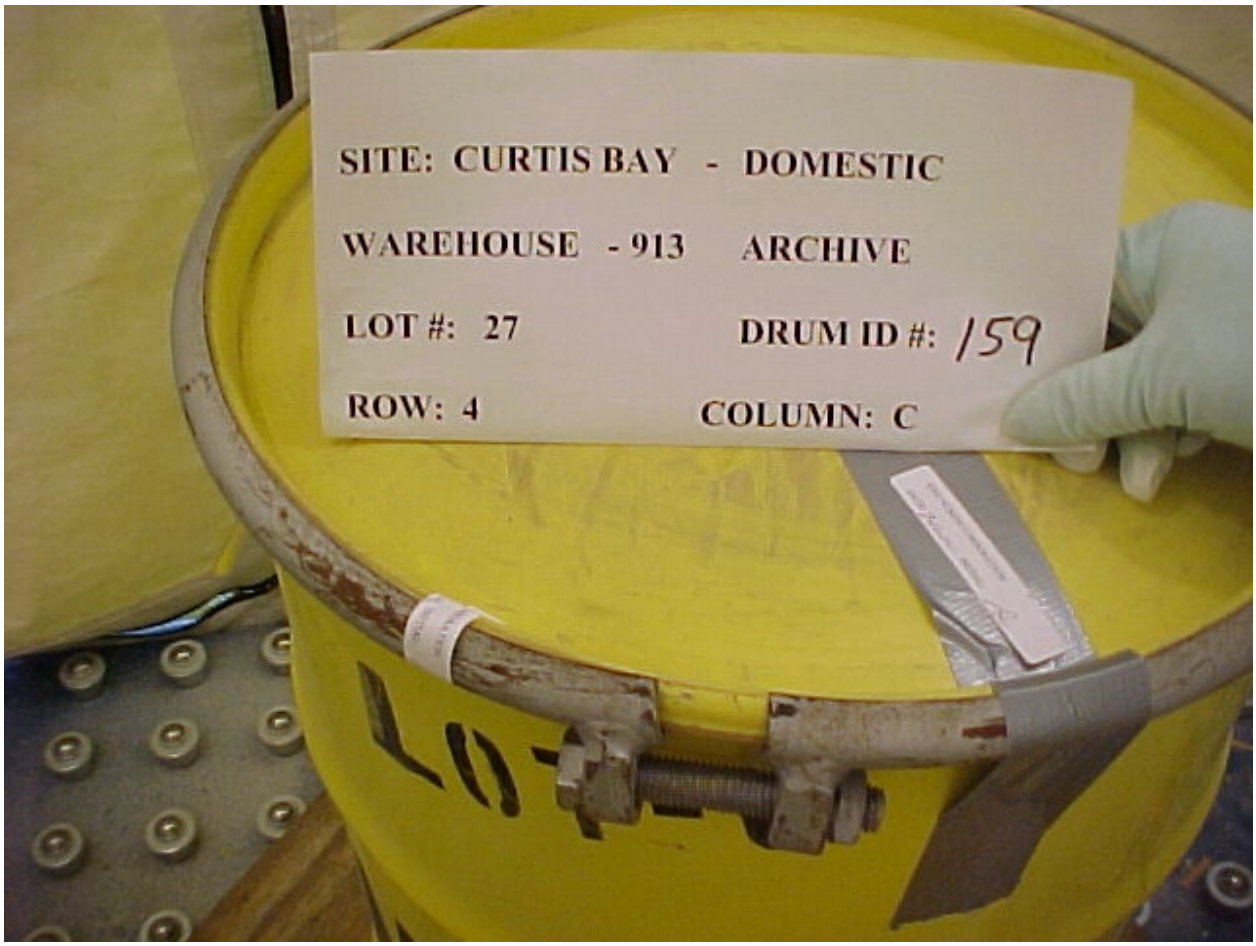
Date	7-12-2002	Time	14:00

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated – Complete



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Curtis Bay Depot
Lot #31 - Drum #00
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 31 Drum ID #: 00 Location: Warehouse 913 – Column C – Row 9

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Lab-pack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

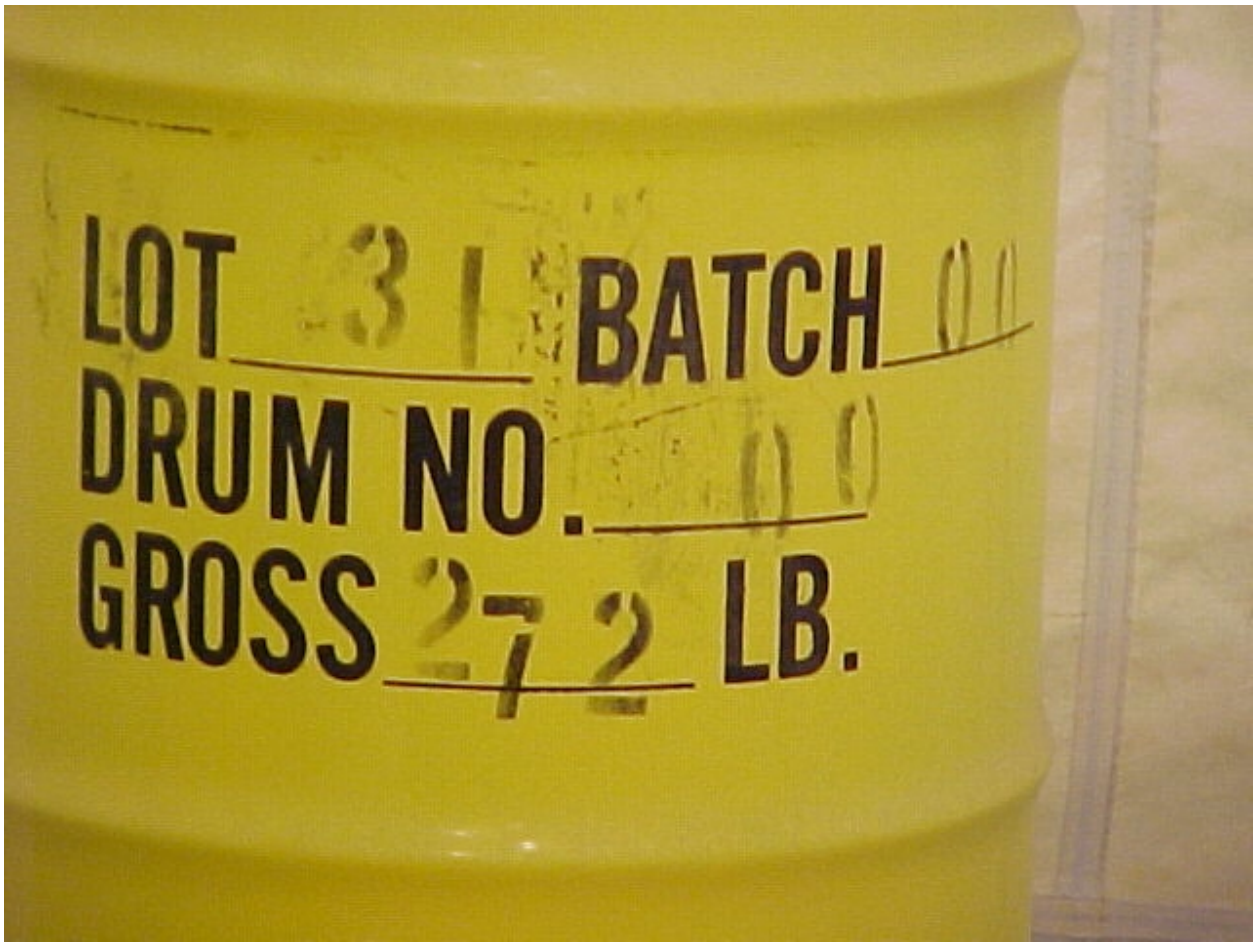
Date	7-12-2002	Time	11:00

Other Information

Photo No. 1 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

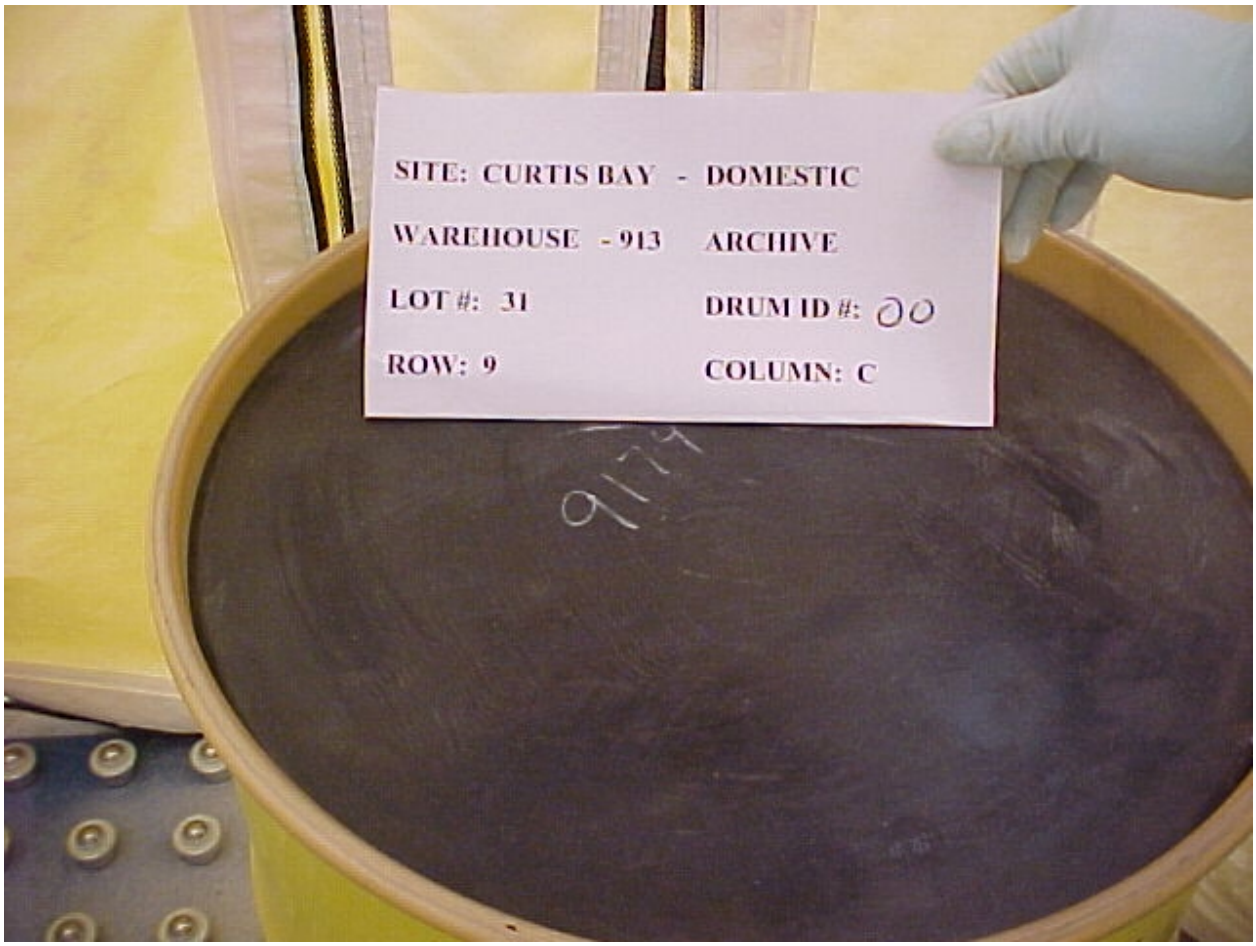
Date	7-12-2002	Time	11:00

Other Information

Photo No. 2 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

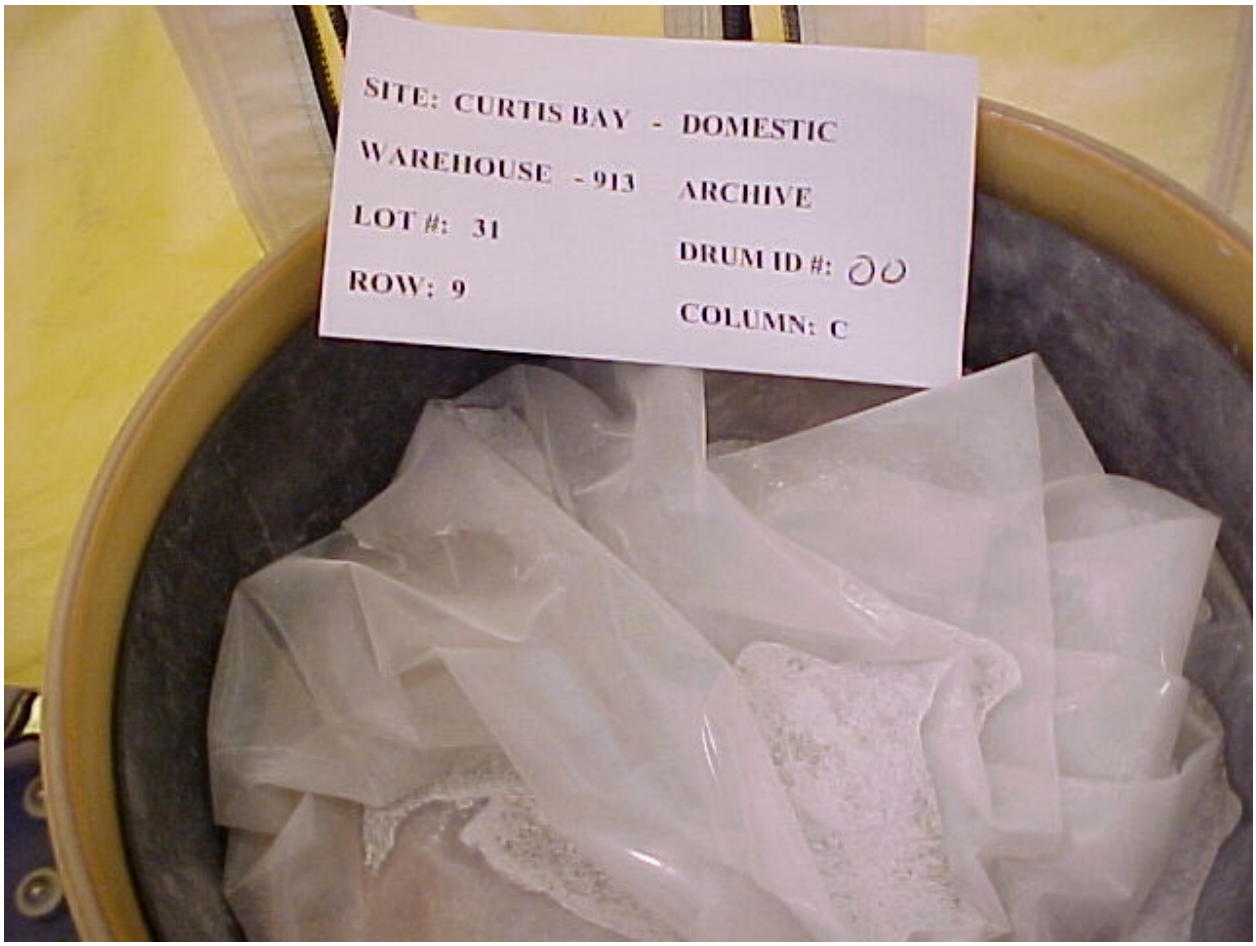
Date	7-12-2002	Time	11:00

Other Information

Photo No. 3 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:00

Other Information

Photo No. 4 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:00

Other Information

Photo No. 5 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
This bag was not heat sealed like the other bags encountered in MD-1 drums.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:00

Other Information

Photo No. 6 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.
There is no internal fiber drum in this container (i.e. no wooden lid or 4th poly liner/bag).

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:00

Other Information

Photo No. 7 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	31	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	00	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	9
		Column	C

Inspection/Sample Date & Time

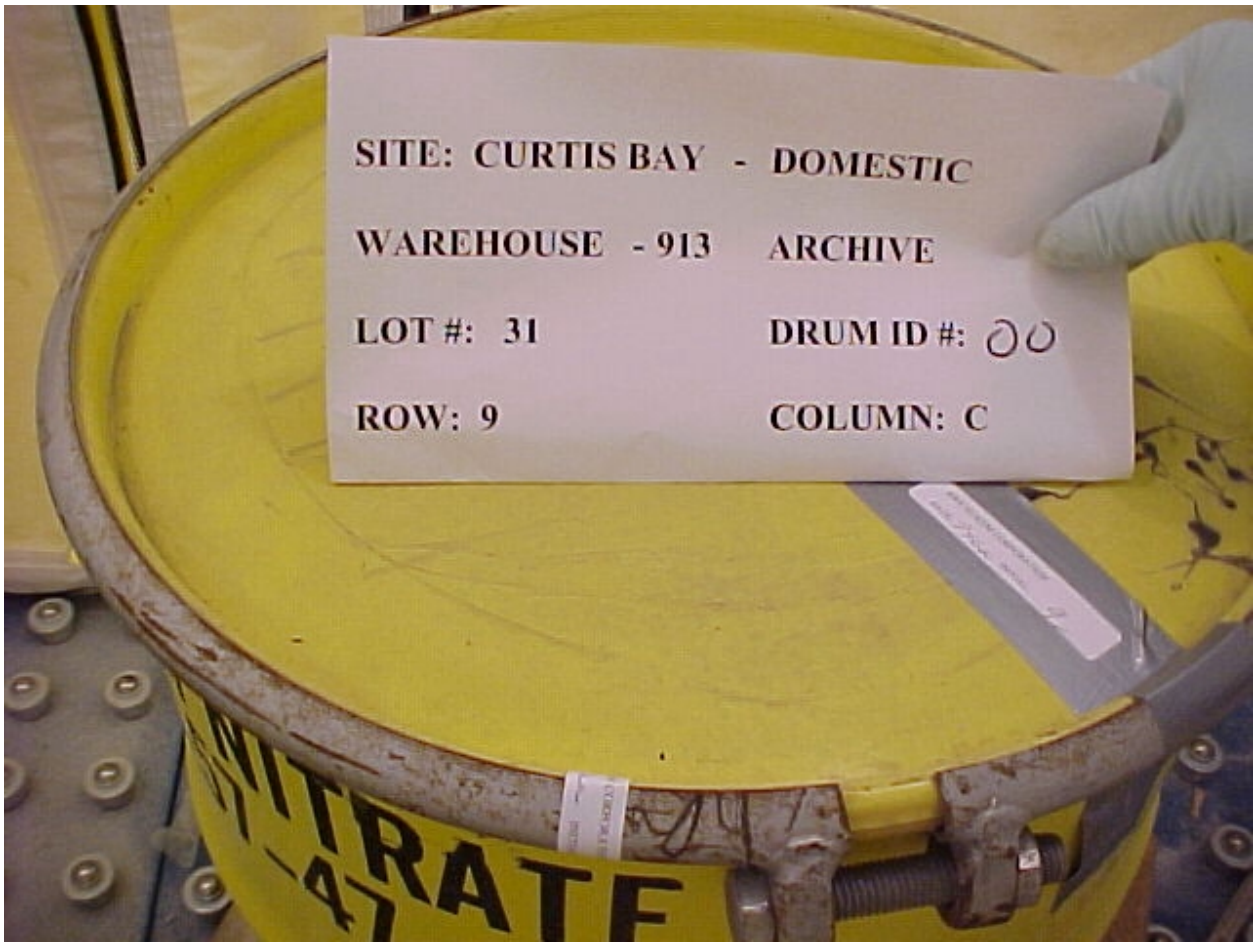
Date	7-12-2002	Time	11:00

Other Information

Photo No. 8 of 8

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



Curtis Bay Depot
Lot #33 - Drum #149
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 33 Drum ID #: 149 Location: Warehouse 913 – Column C – Row 8

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 4.1% LEL NO +50 ppm NOx +50 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

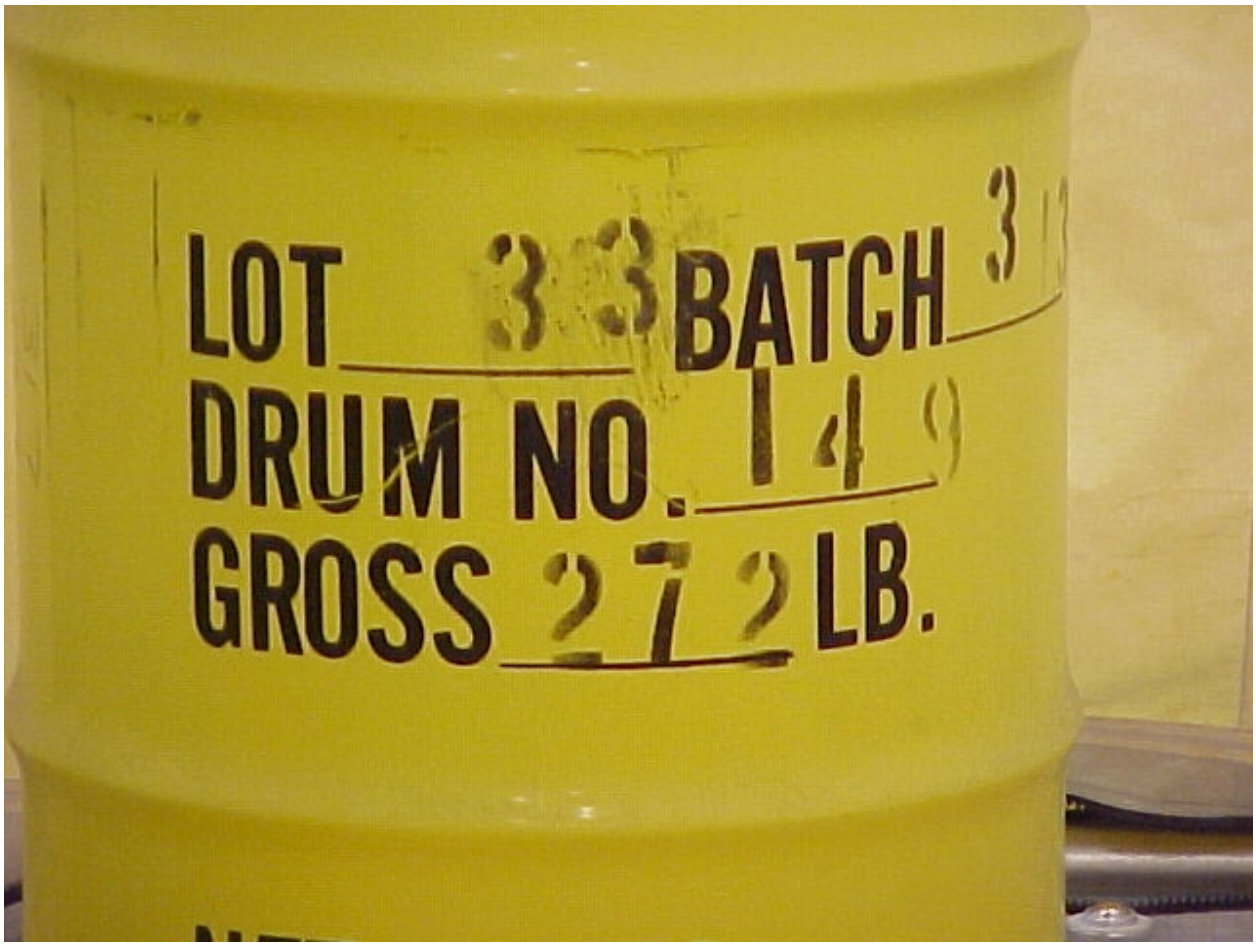
Date	7-12-2002	Time	11:15

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

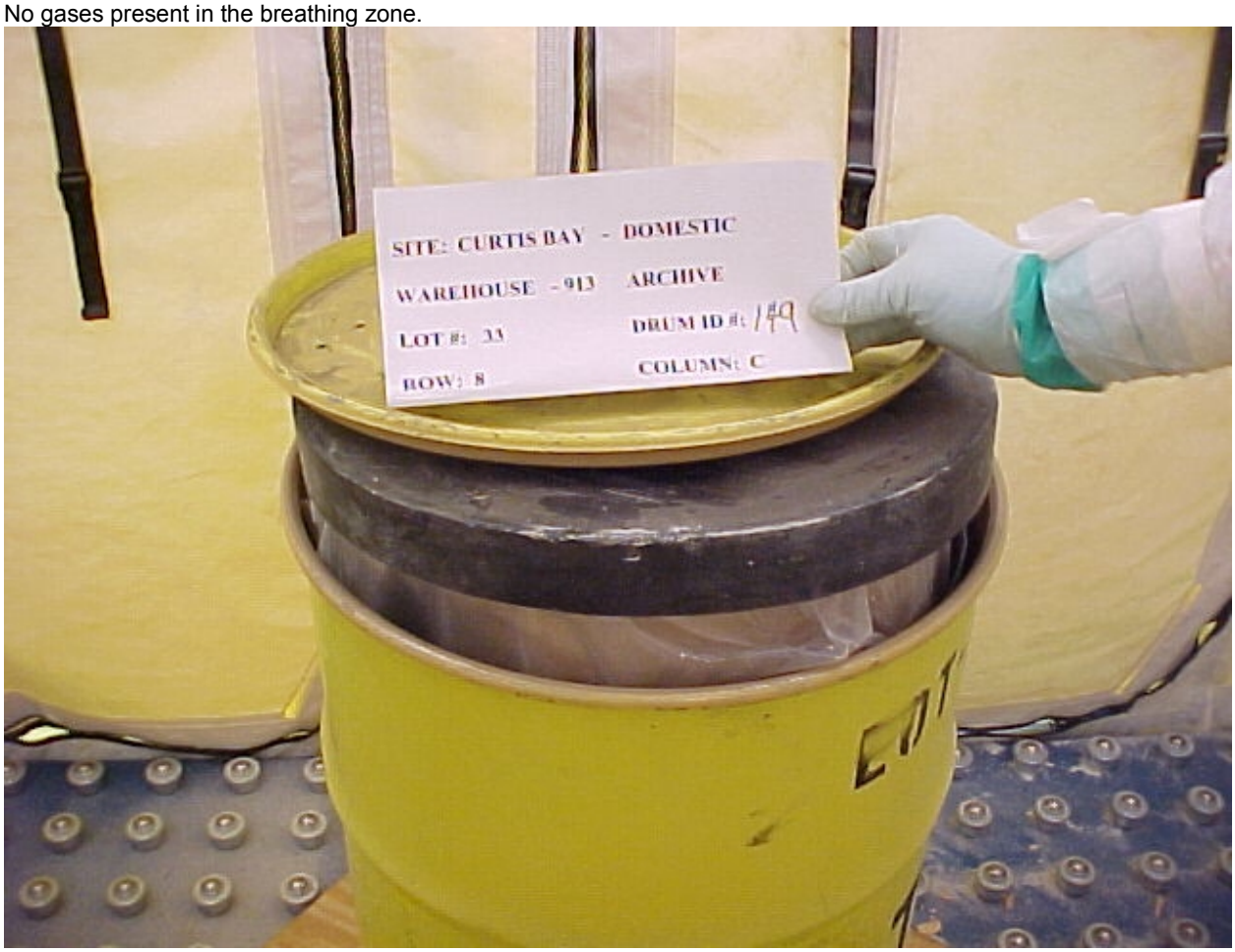
Date	7-12-2002	Time	11:15

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
Pressure buildup inside container results in raising this layer vertically out of container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

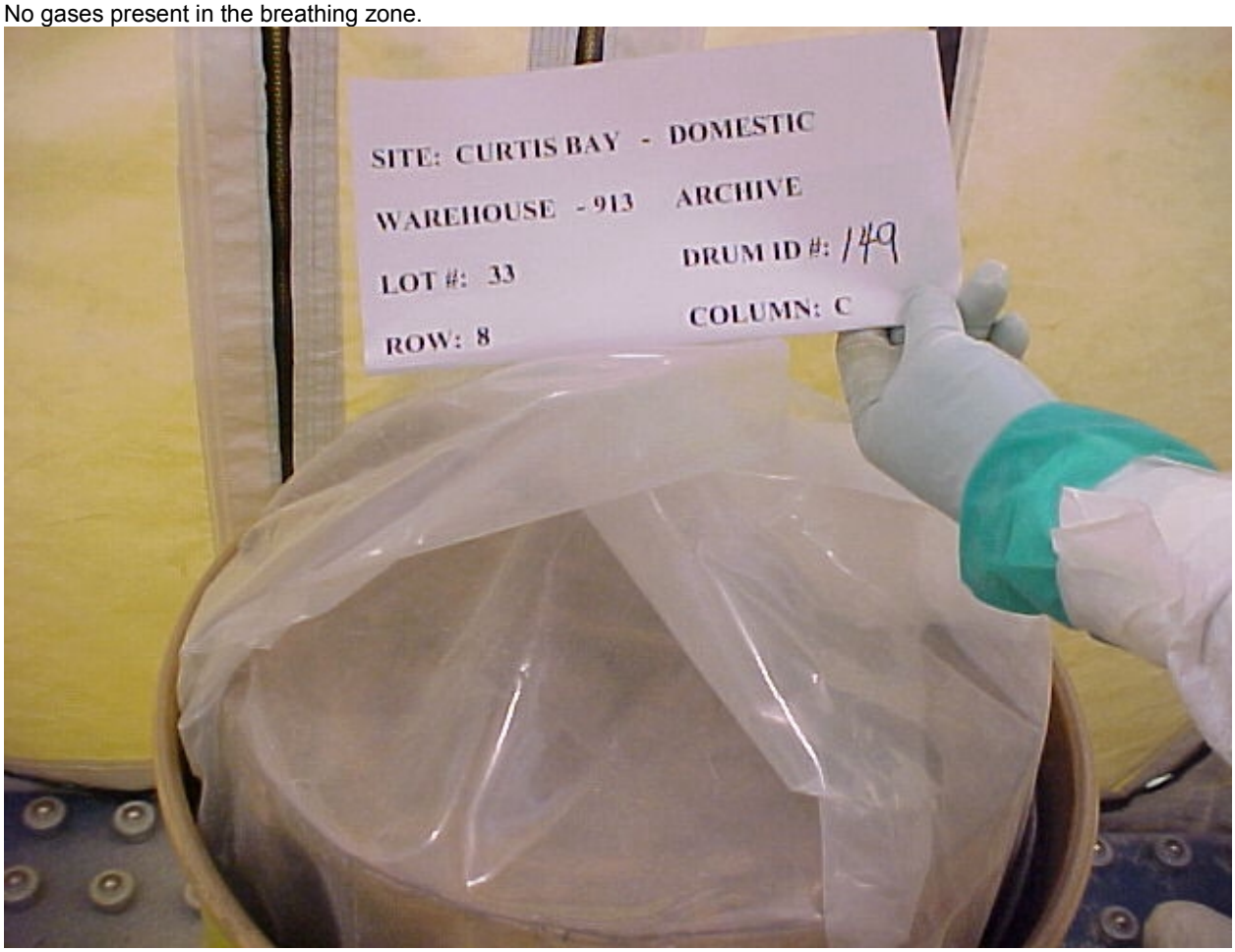
Date	7-12-2002	Time	11:15

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
Pressure buildup inside container results in raising this layer vertically out of container.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:15

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber lid – good condition
Pressure buildup inside container results in raising this layer vertically out of container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:15

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
Pressure buildup inside container results in raising this layer vertically out of container.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

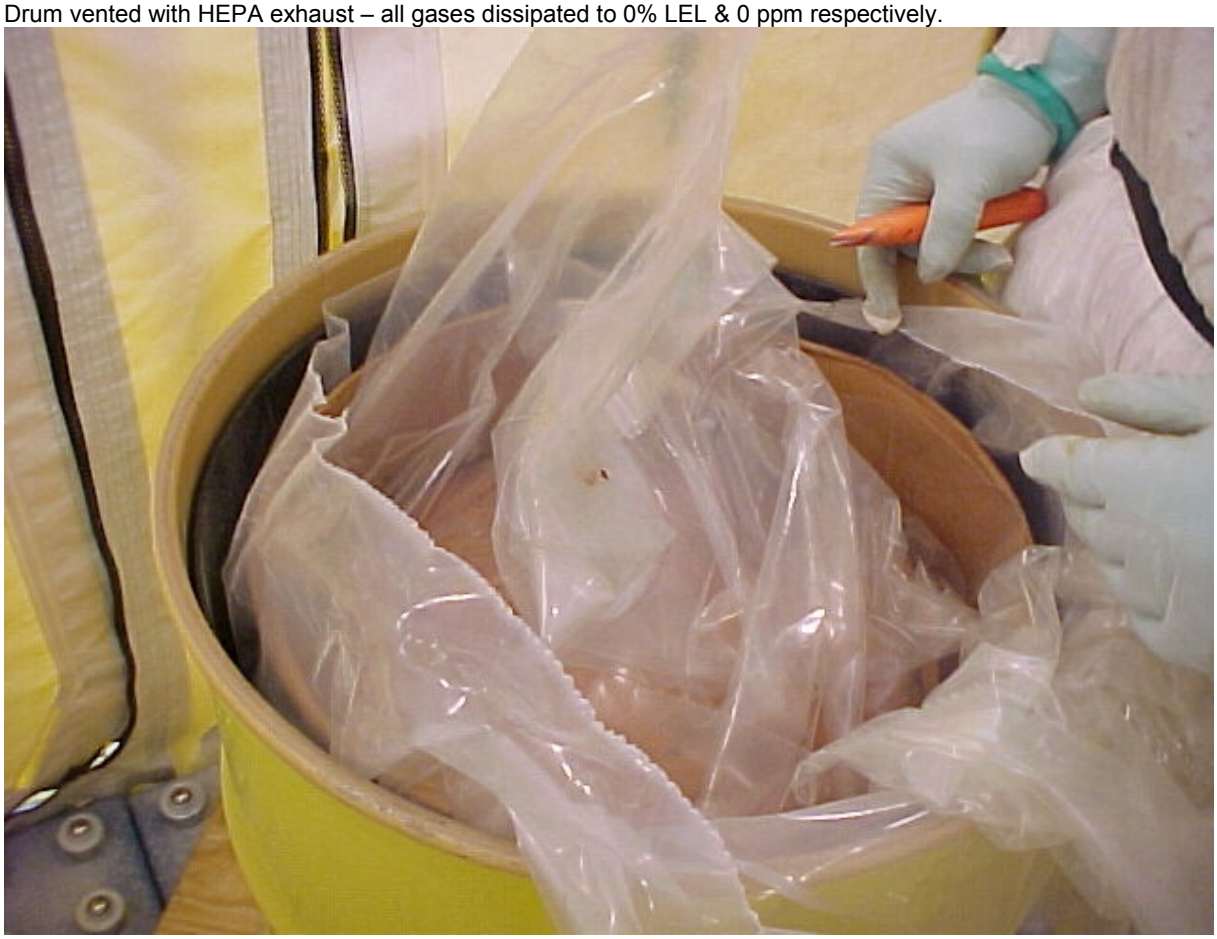
Date	7-12-2002	Time	11:15

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
Pressure buildup inside container results in raising this layer vertically out of container.
Opened poly liner/bag - No gases present in the breathing zone.
Gases in headspace – CH4 – 4.1% LEL - NO - +50 ppm - NOx - +50 ppm
Drum vented with HEPA exhaust – all gases dissipated to 0% LEL & 0 ppm respectively.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:15

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:15

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Lab-pack lid shown in this photo – essentially a thin paper layer that is underneath wooden lid – paper layer typically breaks up upon removal of the wooden lid.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:15

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition (inflated bag shows where gas is being generated from the ThN material)
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:15

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	33	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	149	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	8
		Column	C

Inspection/Sample Date & Time

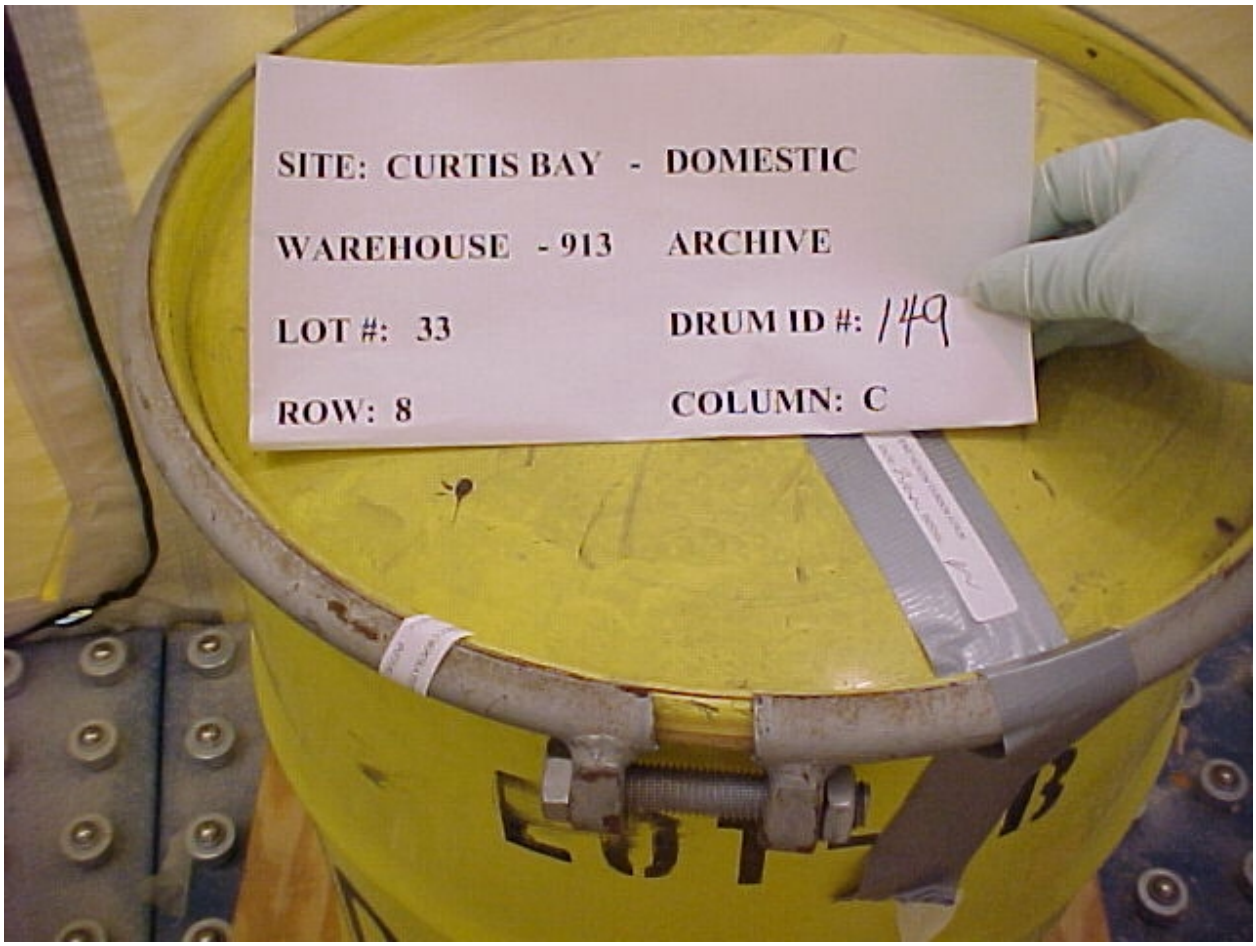
Date	7-12-2002	Time	11:15

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #46 - Drum #24
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 46 Drum ID #: 24 Location: Warehouse 913 – Column B – Row 3

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.0 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

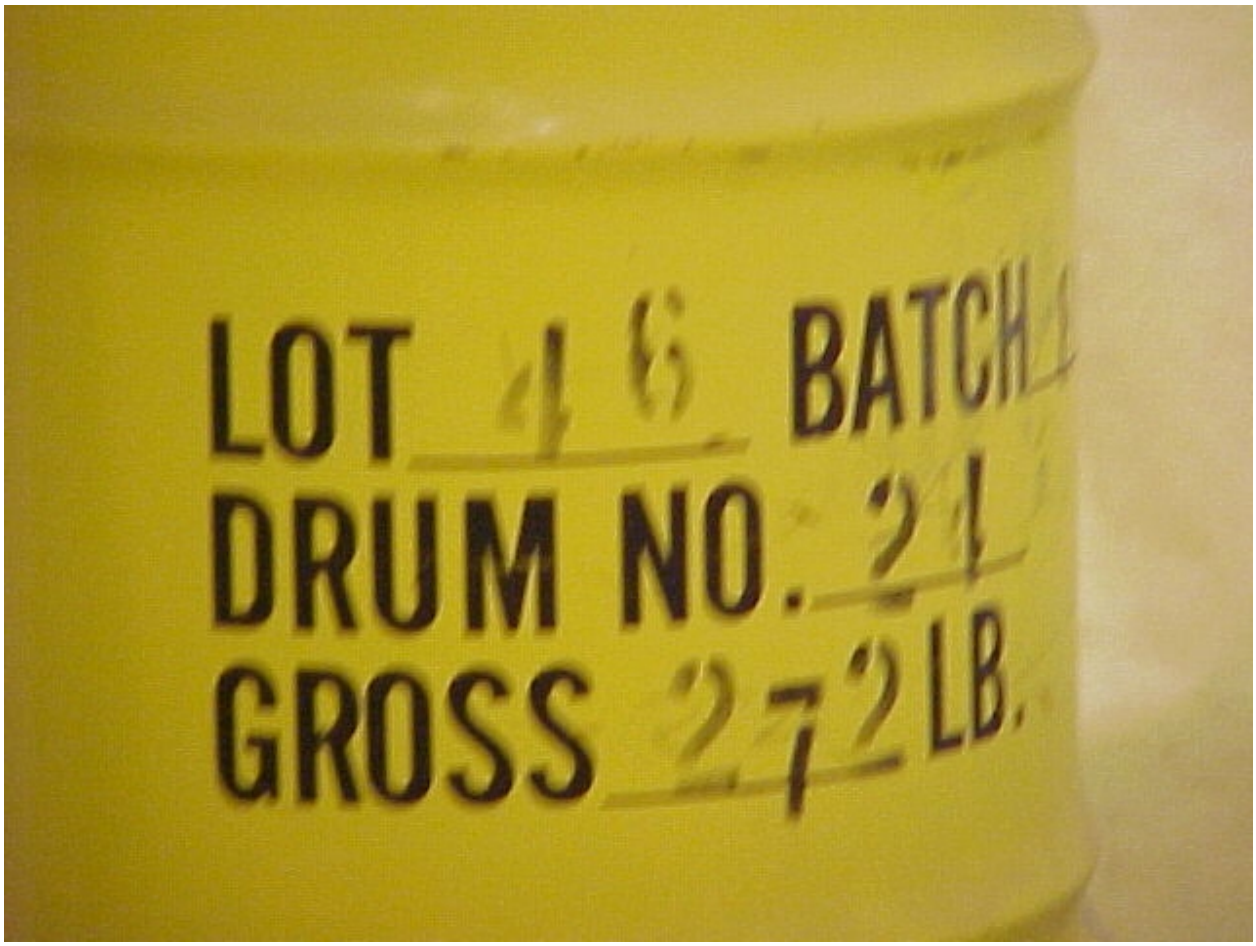
Date	7-12-2002	Time	14:45

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

30-gal drum – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

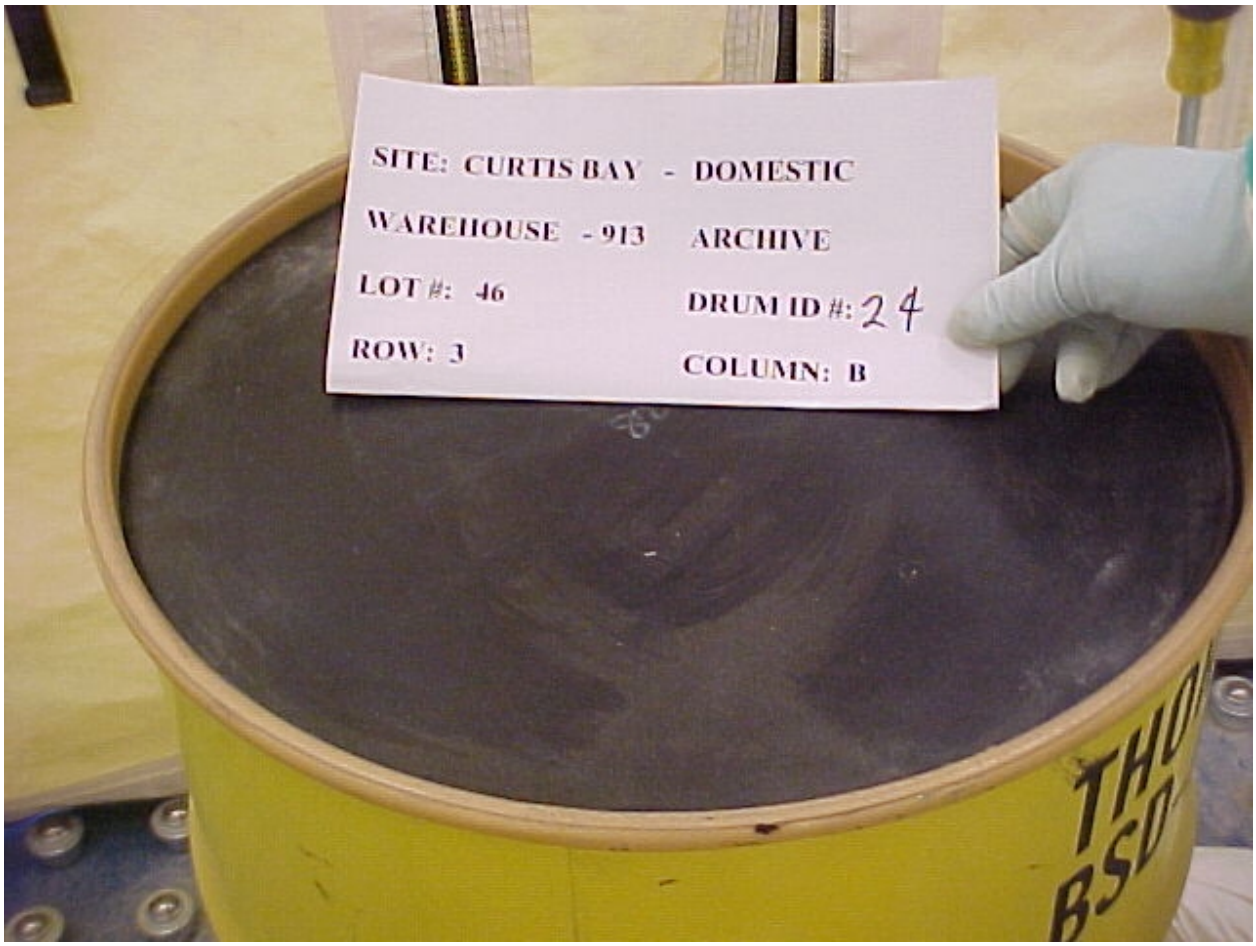
Date	7-12-2002	Time	14:45

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

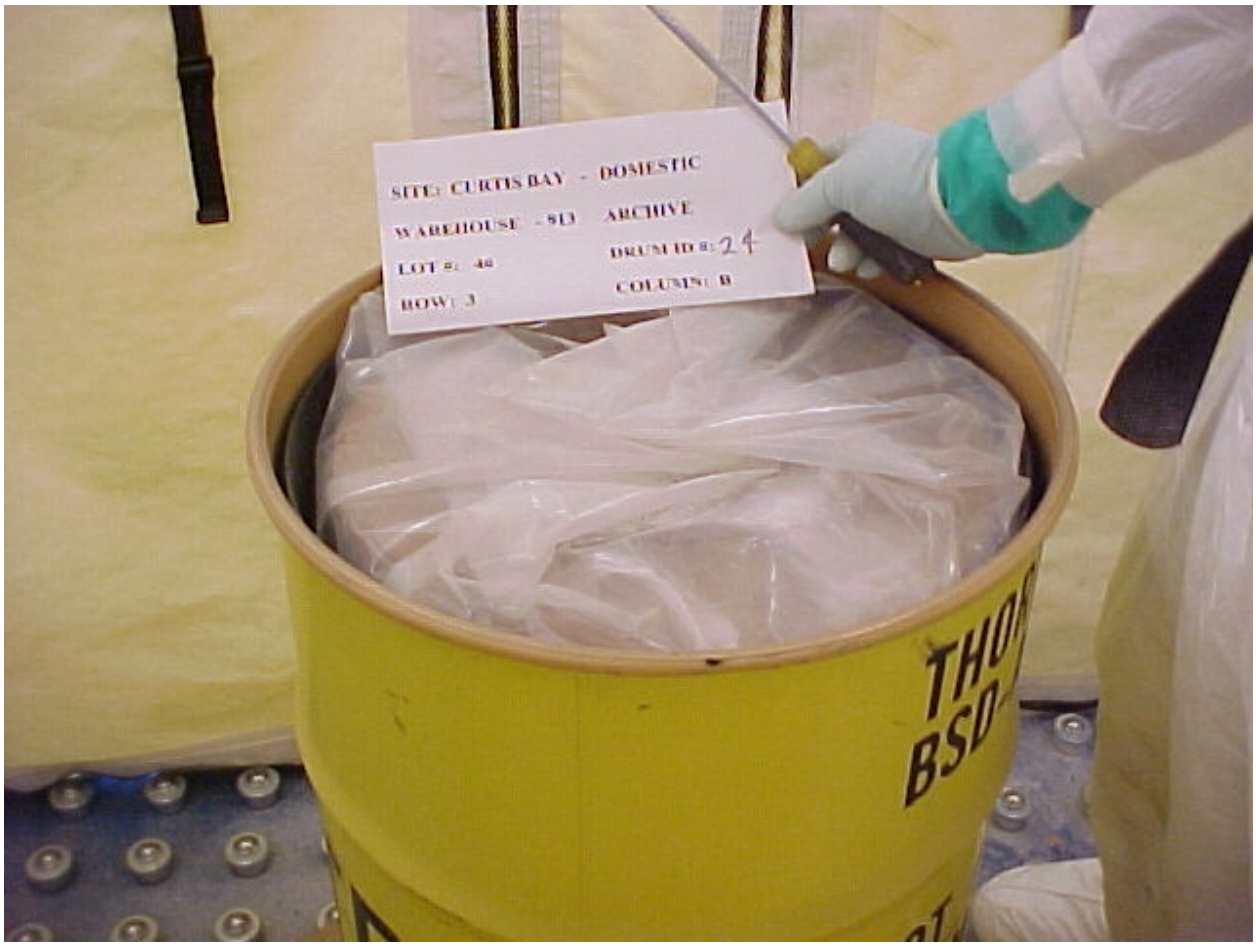
Date	7-12-2002	Time	14:45

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

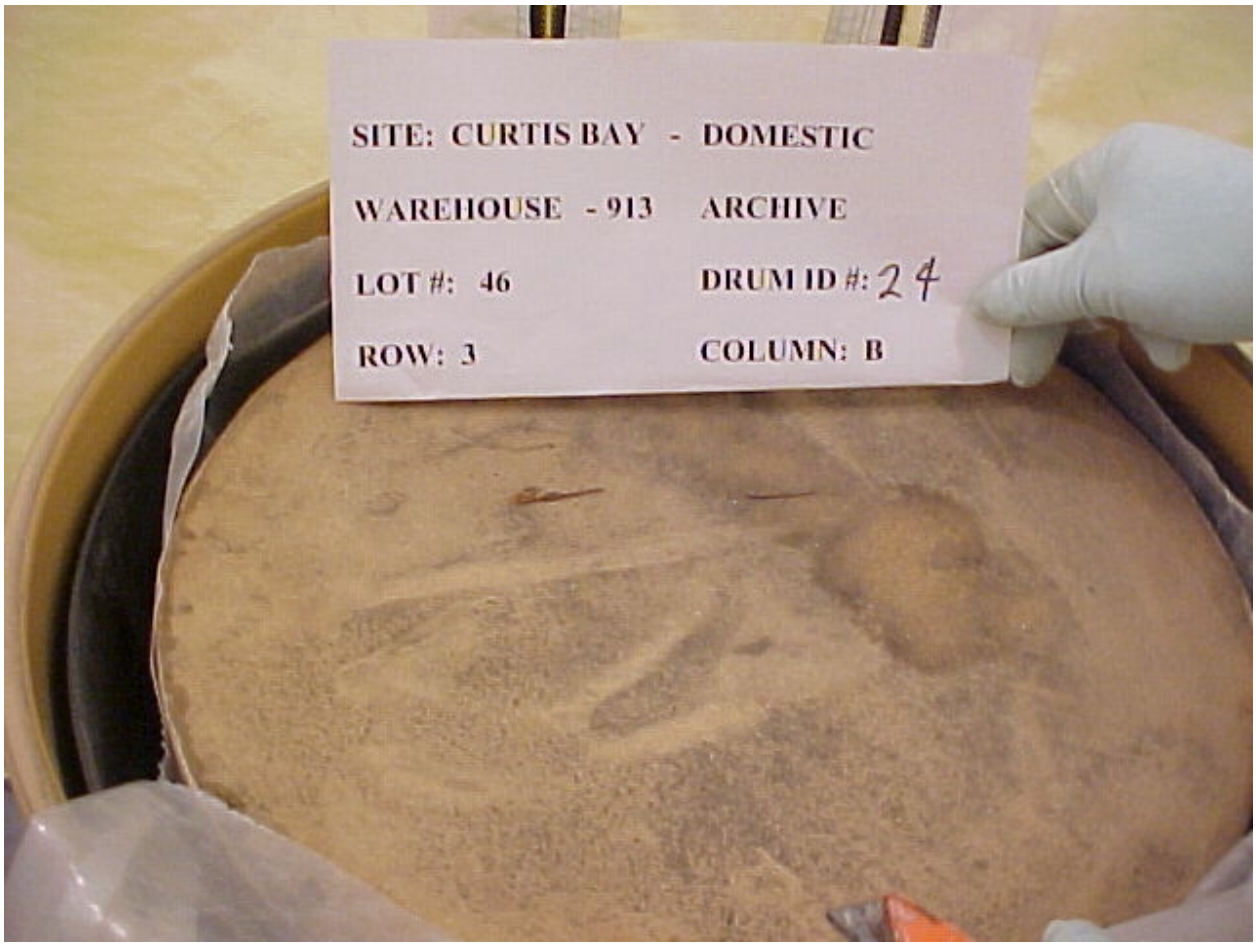
Date	7-12-2002	Time	14:45

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

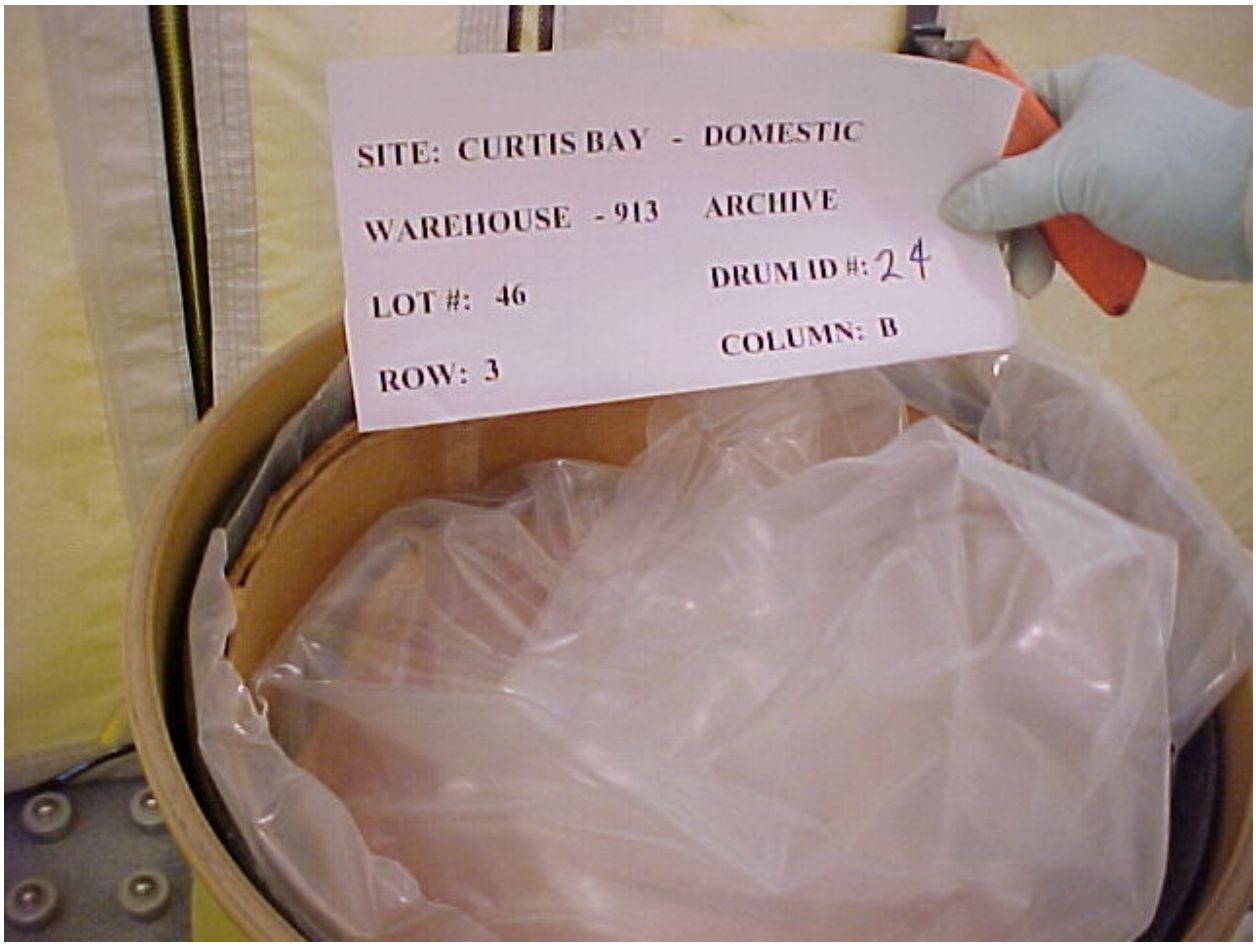
Date	7-12-2002	Time	14:45

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:45

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:45

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Wooden lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:45

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Lab-pack (inner fiber drum) paper layer lid – fair condition – typically breaks apart upon removal of the wooden lid.
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:45

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

Date	7-12-2002	Time	14:45

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

ThN material – monolith – white – solid - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	46	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	24	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	3
		Column	B

Inspection/Sample Date & Time

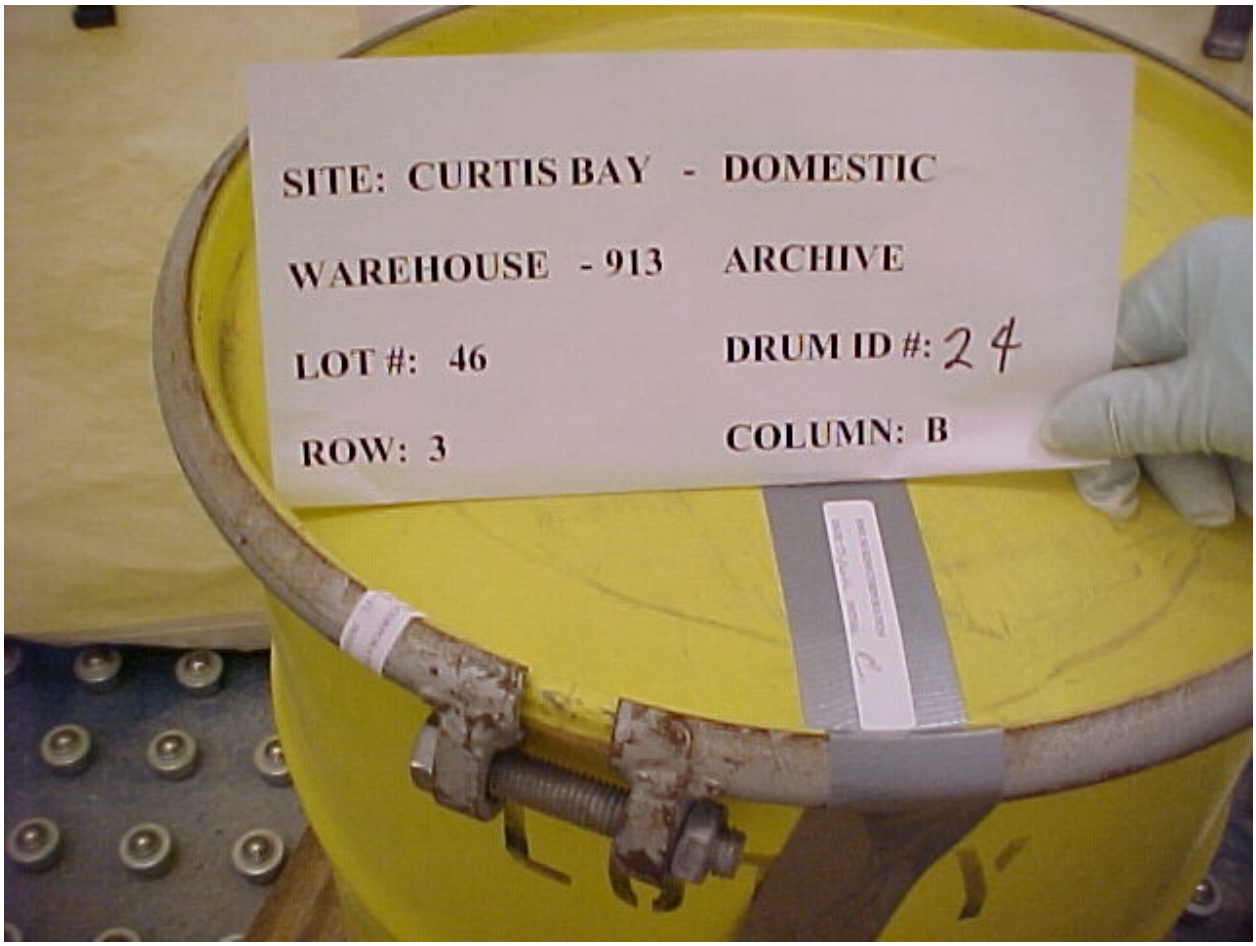
Date	7-12-2002	Time	14:45

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.0 mR/hr

Sealed & dated - Complete



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Curtis Bay Depot
Lot #63 - Drum #5
Inspect, Sample & Archive

CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: ~~Hammond~~ or Curtis Bay *(circle one)*

Lot #: 63 Drum ID #: 5 Location: Warehouse 913 – Column C – Row 5

Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.): 30-gal drum
Outer Container Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Outer Container: ☒ Yes (include Drum ID in photo) ☐ No
Drum Wall Thickness of Outer Container *(French and Indian Drums only):* Not Applicable Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm^2 <20 α & <200βγ
Headspace Gas Measurements CH4 0.0% LEL NO 0 ppm NOx 0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damaged or intact.

Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 30-gal Black Rigid Poly Drum Liner w/ Top
Inner Container # 1 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #1: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st Poly liner/bag
Inner Container # 2 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #2: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Cardboard/Fiber Drum Container
Inner Container # 3 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #3: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 2nd Poly liner/bag
Inner Container # 4 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #4: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd Poly liner/bg
Inner Container # 5 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #5: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Wooden lid
Inner Container # 6 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #6: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Labpack container
Inner Container # 7 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #7: ☒ Yes (include Drum ID in photo) ☐ No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bag (thin film)
Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good
Photo Taken of Inner Container #8: ☒ Yes (include Drum ID in photo) ☐ No

CONTENTS INFORMATION

Matrix (i.e. monolith, powder, cubes, etc.): Monolith
Color: white
Particle Size: Monolith
Dryness: Very Dry
Moisture or Liquids Present: None
Are there contents inside the container other than Thorium Nitrate ☐ Yes ☒ No If yes, describe

TID placed on container after inspection? (Check Box): ☒ Yes ☐ No TID #(s): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

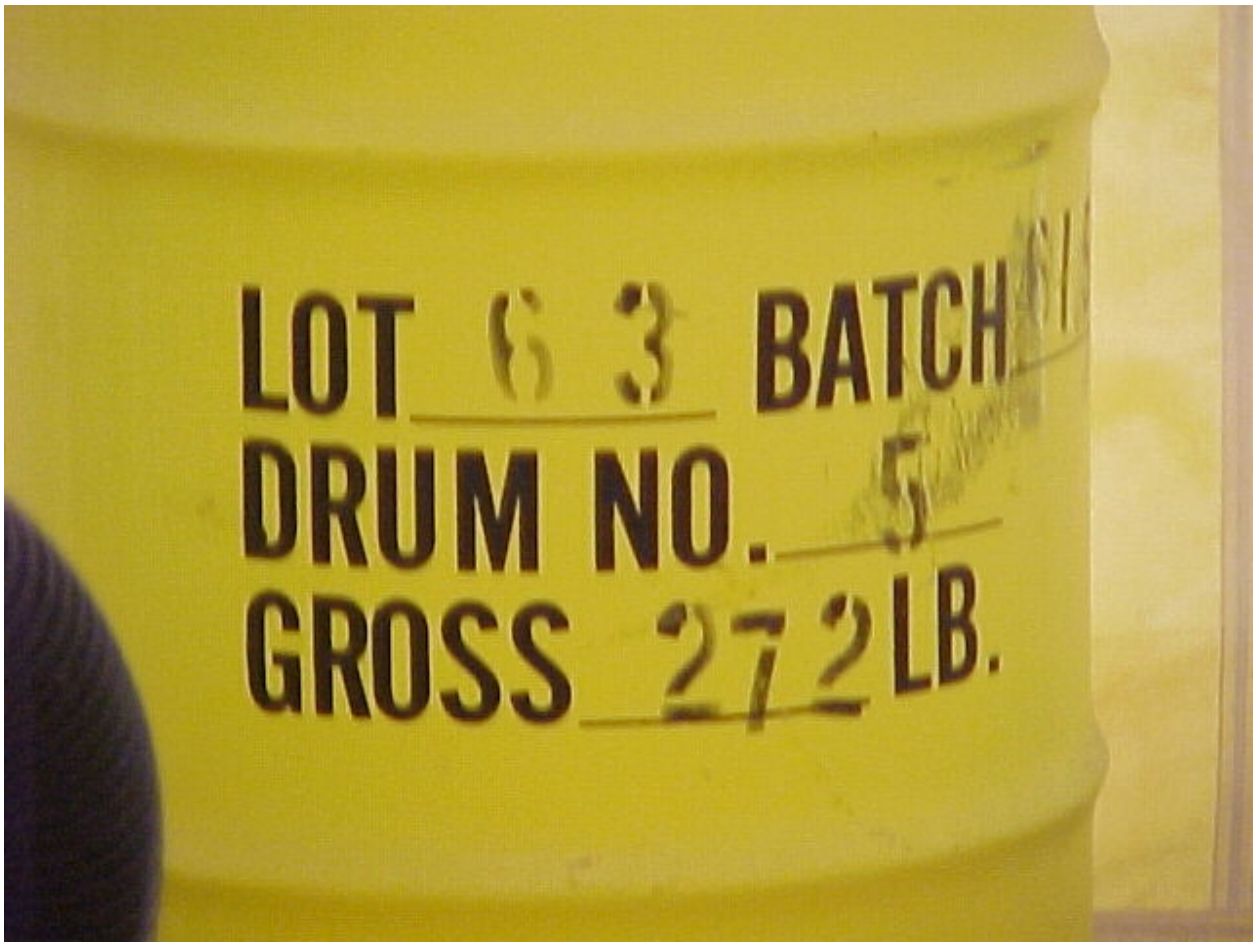
Date	7-12-2002	Time	11:30

Other Information

Photo No. 1 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

30-gal drum – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

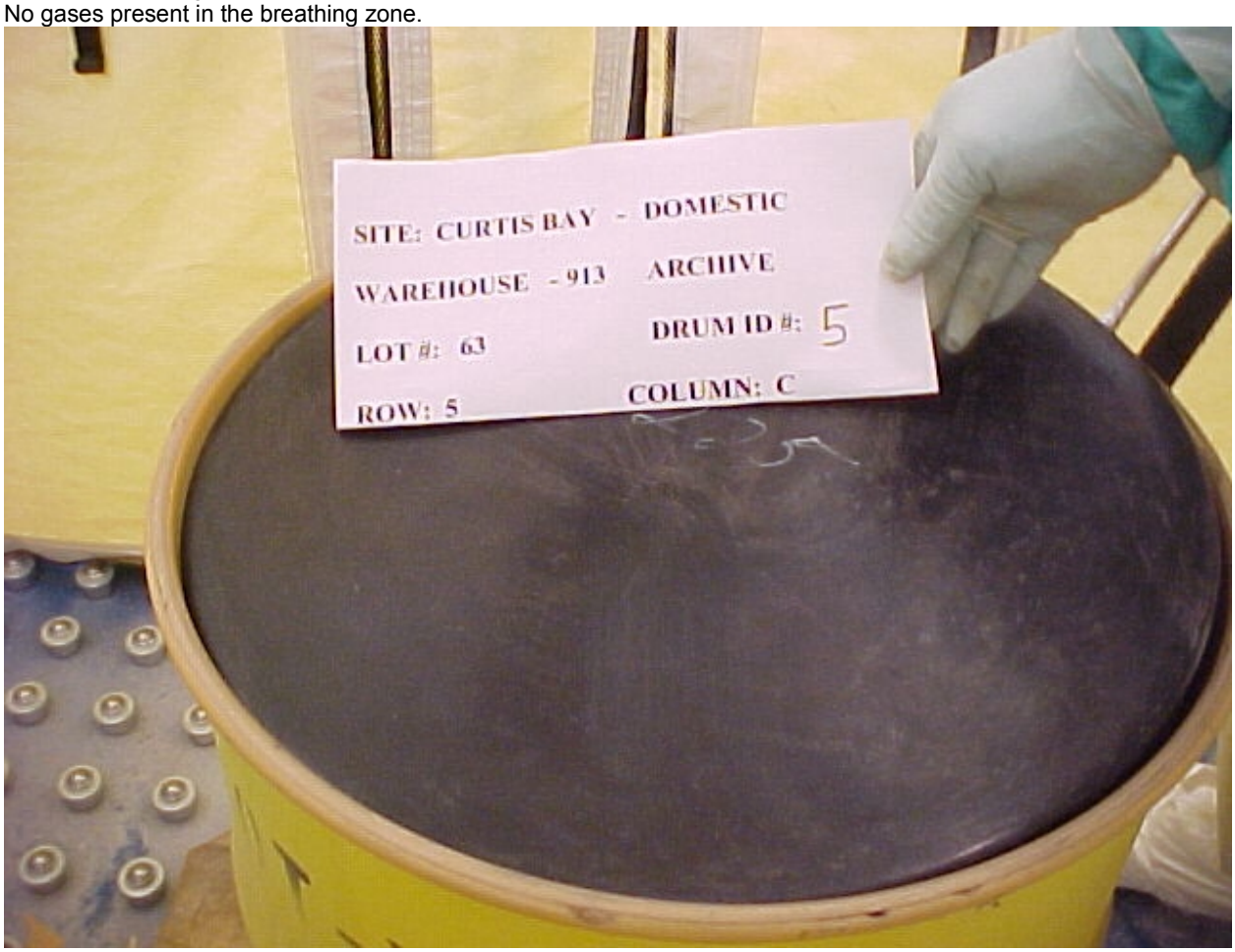
Date	7-12-2002	Time	11:30

Other Information

Photo No. 2 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Black plastic lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

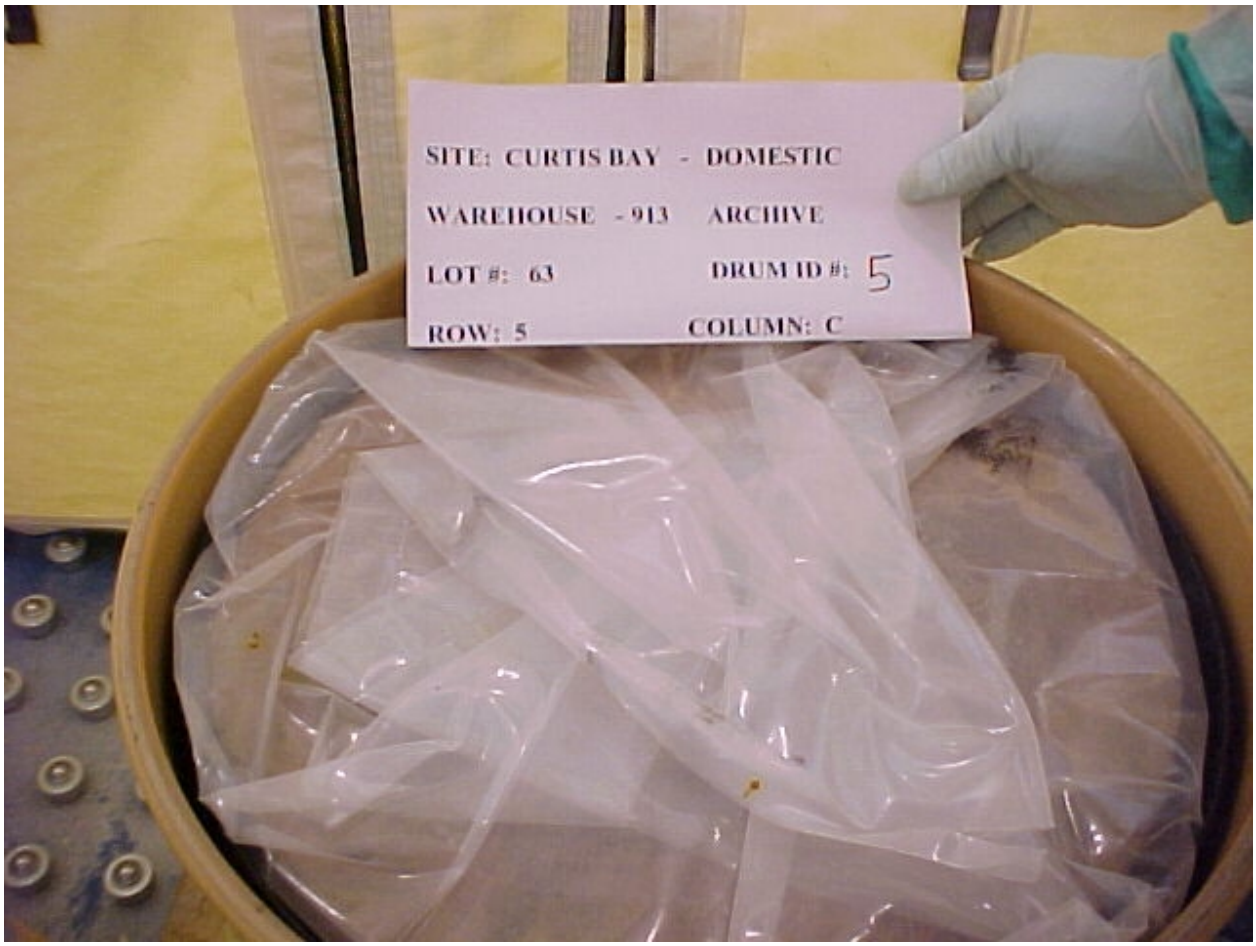
Date	7-12-2002	Time	11:30

Other Information

Photo No. 3 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

1st poly liner/bag – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

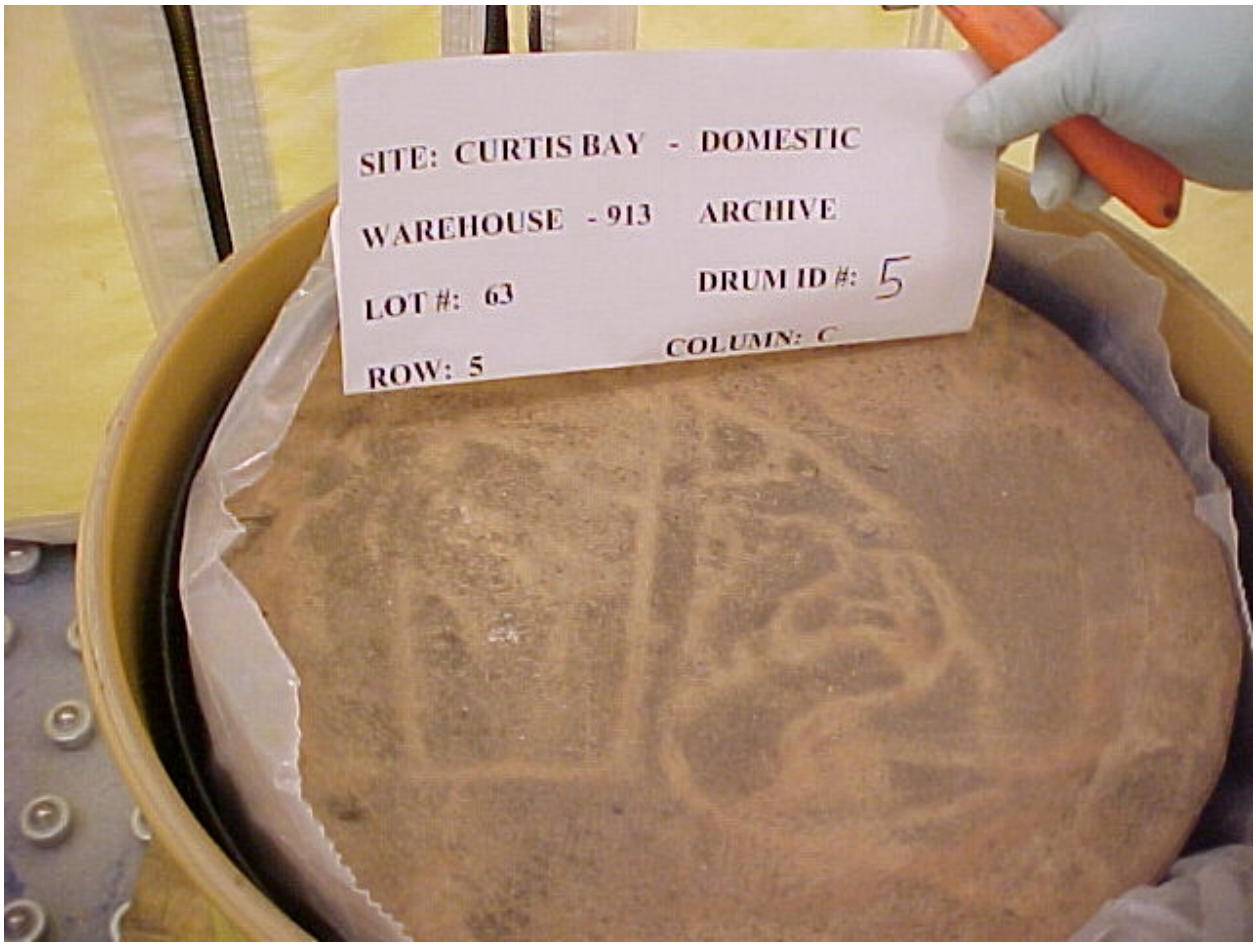
Date	7-12-2002	Time	11:30

Other Information

Photo No. 4 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 5 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

2nd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 6 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

3rd poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 7 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Fiber drum lid – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

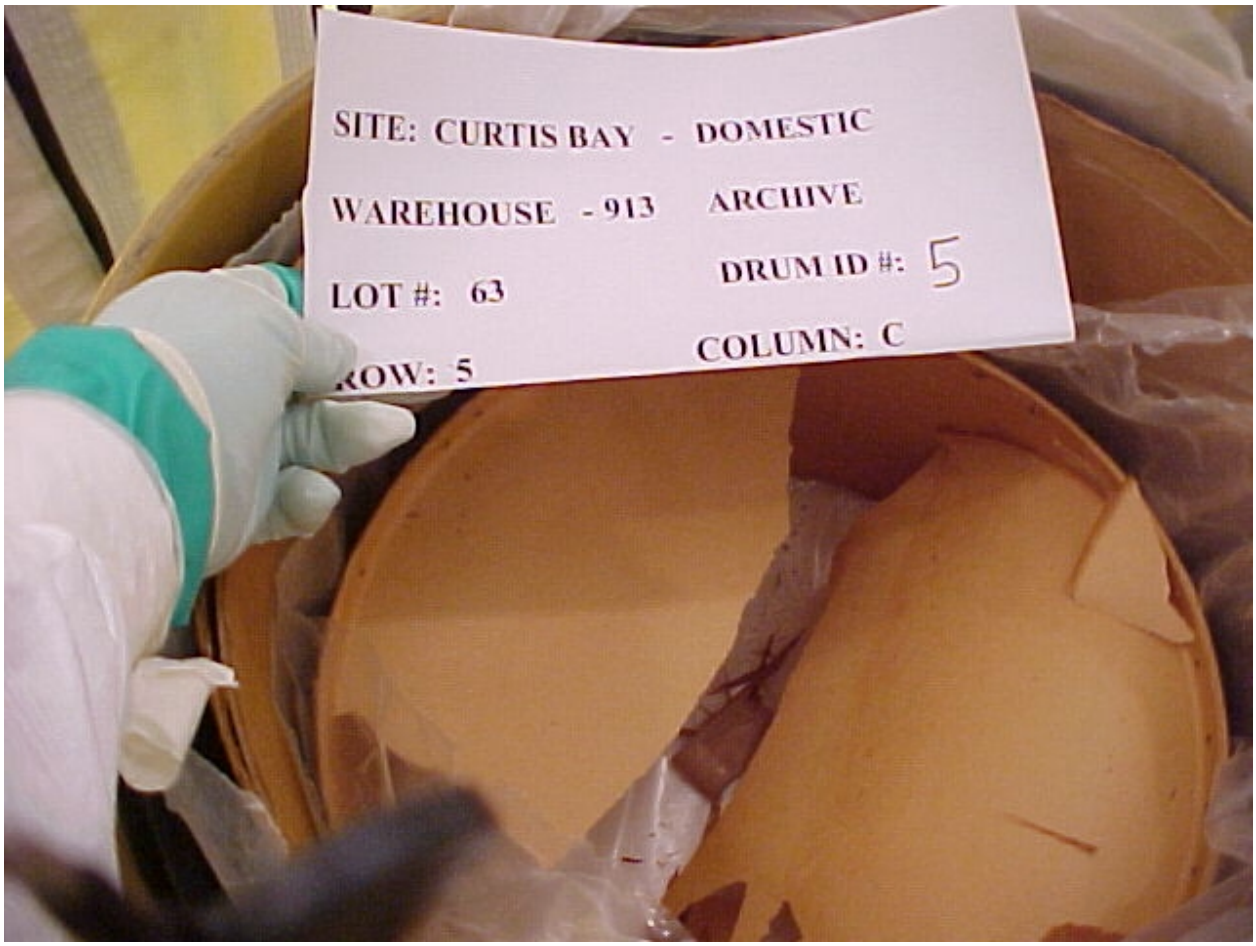
Date	7-12-2002	Time	11:30

Other Information

Photo No. 8 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Lab-pack paper layer lid – broken upon removal of the wooden lid.
No gases present in the breathing zone.



General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 9 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

4th poly liner/bag – good condition
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

Date	7-12-2002	Time	11:30

Other Information

Photo No. 10 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

ThN material – monolith – white – solid - dry
No gases present in the breathing zone.

General Information

Site	Curtis Bay		
ThN Origin	Domestic		
Lot No.	63	Inspection/Sample	Visual Inspection & Sampling
Drum ID No.	5	Disposition	Archive

Physical Location of Drum

Warehouse	913	Row	5
		Column	C

Inspection/Sample Date & Time

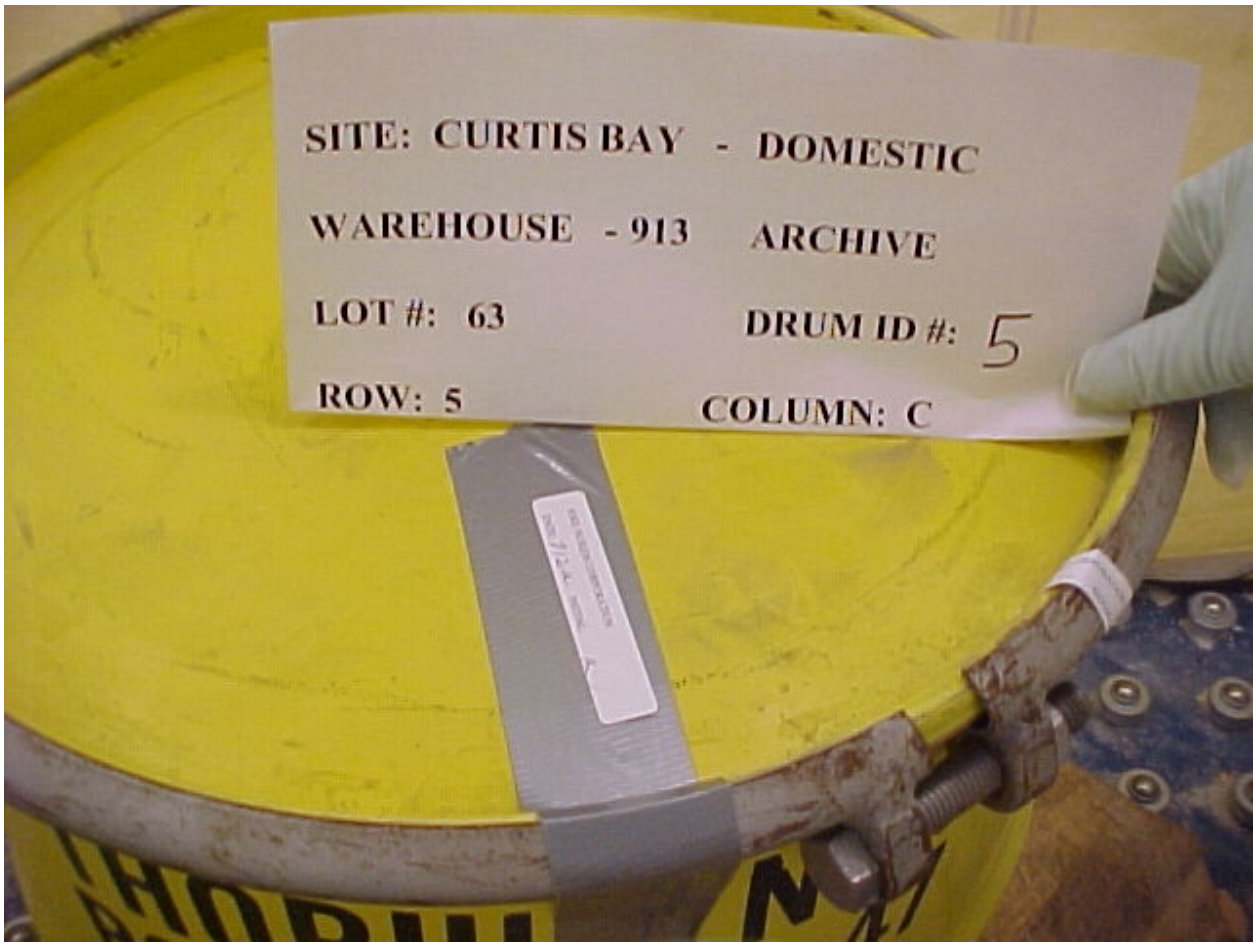
Date	7-12-2002	Time	11:30

Other Information

Photo No. 11 of 11

Dose Rate	Surface	22 mR/hr
	1 meter	2.6 mR/hr

Sealed & dated - Complete



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APPENDIX J

SAMPLE SHIPPING DOCUMENTATION

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This appendix contains the sample shipping documentation for each set of samples that were shipped from the Hammond and Curtis Bay Depots to UT-Battelle's off-site laboratory.

The following table provides a breakdown of each set of shipping documents by the shipment number. The shipment numbers are delineated on the "Shipper's Declaration for Dangerous Goods" as delineated under the "Shipper's Reference Number" block. Essentially the shipping number was the project number (6990-001) followed by a sequential number (starting with 001) for the project.

The shipping numbers for the samples skip from 6990-001-001 to 6990-001-003. Shipment 6990-001-002 was the shipping number used to transport the radioactive sampling equipment from the Hammond Depot to the Curtis Bay Depot and is not included in this appendix since it was not a shipment of samples to the off-site laboratory.

Due to regulatory requirements, a DOE/NRC Form 741 was utilized to ship the Indian and French samples to the off-site laboratory. The 741 forms for the shipments of Indian and French samples to the laboratory are also included in this appendix. Upon return of these samples to the Curtis Bay Depot, DLA/DMSA personnel will need to acknowledge their return on the 741 form to be provided by the laboratory to the NMMSS Project that is managed by NAC International in Norcross, GA for the USNRC.

The contact that was utilized by RWE NUKEM for the two shipments requiring a 741 form are delineated below:

Ms. Beverly Jones
770-662-8110 x148
NAC International
3930 E. Jones Bridge Road
Attn: NMMSS Project
Norcross, GA 30092

Since these shipments were forwarded to the off-site laboratory via Federal Express, the shipments were regulated under the International Air Transport Association (IATA) Dangerous Goods Regulations. Specifically Section 10 of the IATA Dangerous Goods Regulations (DGR) provides the specific requirements for radioactive shipments including listing subsidiary risks for the thorium nitrate samples.

The isotopes listed on the "Shipper's Declaration for Dangerous Goods" forms were based on utilizing the rules listed under 49 CFR 173.433. Section 10.8.3.9.2(a) of the Dangerous Goods Regulations denotes to list the most "restrictive" isotopes, but they do not provide a methodology for determining which isotopes are the most restrictive. Therefore, the Department of Transportation's (DOT) guidance was utilized to determine the most restrictive isotopes.

The DOT guidance also denoted in 49 CFR 173.419 that oxidizing Class 7 materials had to be shipped in DOT Specification 7A packages and the maximum quantity if shipping by air could not exceed 11.3 kg. Four manufacturers of thorium nitrate designated via their MSDS or via phone call that thorium nitrate would fall under either Packing Group II or III. Since the subsidiary risk for thorium nitrate (UN1479) delineated maximum quantities for packages for both Packing Groups II and III, the limit was based on the more conservative value (i.e. Packing Group II maximum quantity per package – 25 kg). Therefore, since the shipments were being made under the IATA Dangerous Goods Regulations, it was determined that the quantity of thorium nitrate material would not exceed 25 kg. The Dangerous Goods Regulations also allowed the samples to be packaged in an Industrial Package Type 2 (since samples met applicable LSA-II calculations).

Both the type of package and quantity limits were discussed with DOT Headquarters personnel in the radiological division. The DOT personnel agreed that the limit of 25 kg under IATA was acceptable for each package of thorium nitrate samples. The DOT personnel requested that the samples be packaged in a Type A package vs. an IP-2 package (as per IATA DGR). Based on these discussions, we selected a Type A package for packaging each set of samples.

The following table provides each shipment number including the starting page number in this appendix for each set of shipment documentation. The table also delineates the quantity of thorium nitrate material in each package along with the specific drum lots included in each package. French and Indian lots are identified with an "F" or "I" respectively prior to the lot number to more readily identify the source of the material. All other lots are from domestic sources.

The sample from a drum from Lot 9 at the Curtis Bay Depot was also supposed to be shipped to the off-site laboratory for analyses. The overpack container for this 2-liter sample container was mislabeled and this sample was placed in an drum of archived samples that are in storage in warehouse 913 at Curtis Bay. UT-Battelle personnel made a decision that this sample would not require the applicable analyses based on the results of the other domestic samples.

Shipment No.	Lot Number	Page No.
6990-001-001 *Hammond Depot* *1st Sample Shipment* *8 Drum Lots* *10.088 kg*	8	J-5
	10	
	23	
	29	
	30	
	38	
	47	
	48	
6990-001-003 *Curtis Bay Depot* *2nd Sample Shipment* *10 Drum Lots* *11.759 kg* *(includes 741 form)*	I-3	J-7
	I-4	
	I-5	
	I-6	
	I-7	
	I-9	
	I-11	
	I-12	
	I-13	
	I-14	
6990-001-004 *Curtis Bay Depot* *3rd Sample Shipment* *13 Drum Lots* *15.408 kg* *(includes 741 form)*	F-1	J-11
	F-2	
	F-3	
	F-4	
	F-6	
	F-9	
	F-10	
	F-11	
	F-13	
	F-14	
	F-16	
	F-17	
	F-19	
6990-001-005 *Curtis Bay Depot* *4th Sample Shipment* *12 Drum Lots* *14.936 kg*	17	J-15
	18	
	22	
	28	
	29	
	30	
	36	
	37	
	45	
	48	
	61	
	65	
6990-001-006 *Curtis Bay Depot* *5th Sample Shipment* *10 Drum Lots* *11.935 kg*	2	J-17
	3	
	11	
	12	
	14	
	15	
	20	
	44	
	52	
	58	

Shipment No. 6990-001-001
(First Sample Shipment)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper

DLA - Hammond Depot
3200 Sheffield Avenue
Hammond, IN 46327-1001
219-937-5383

Air Waybill No. 835674245646

Page 1 of 1 Pages

Shipper's Reference Number (optional) 6990-001-001

Consignee

Southwest Research Institute
Attn: John P. Hageman
6220 Culebra Road
San Antonio, TX 78238
210-522-2633

FedEx Federal Express

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non applicable)*

PASSENGER AIRCRAFT ~~AIRCRAFT~~ ~~AIRCRAFT~~ ~~ONLY~~ | CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination:

Shipment type: *(delete non-applicable)*

~~NON-RADIOACTIVE~~ | RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping name, Class or Division, UN Number or Identification Number, Packing Group (if required), and all other required information

Radioactive material, Type A package, 7, UN2915, II, 5.1//

Th228, Th230, Solid/Nitrate - Radioactive Material - 10.088kg Thorium Nitrate, 1 (one) x Type A Package, 1.13E+02 MBq - All Packed in ONE~~II~~//

II-Yellow, TI: 0.3, 60.2 cm Diameter x 87 cm Height

Additional Handling Information NA

ERG Nos: 163 (UN2915), 162 (UN2976 - Domestic DOT), 140 (UN1477 - Subsidiary Risk)

Emergency Telephone Number CHEMTREC - 800/424-9300 **CHECK ONE:** ☒ ICAO/IATA ☐ 49 CFR

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

Name/Title of Signatory

Frank J. Falgier, QA Specialist

Place and Date

Hammond Depot, Hammond, IN - 6/12/2002

Signature (see warning above)

Emergency Telephone Number (Required for US Origin or Destination Shipments)

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

Shipment No. 6990-001-003
(Second Sample Shipment)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper

DLA - Curtis Bay Depot
710 E. Ordnance Road
Baltimore, MD 21226-1742
(0) 410-962-2346

Air Waybill No. 835674245624

Page 1 of 1 Pages

Shipper's Reference Number (optional) 6990-001-003

Consignee

Southwest Research Institute
Attn: John P. Hageman
6220 Culebra Road
San Antonio, TX 78238
(0) 210-522-2633

FedEx Federal Express

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non applicable)*

~~PASSENGER AND CARGO AIRCRAFT~~ CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination:

Shipment type: *(delete non-applicable)*

~~NON-RADIOACTIVE~~ RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping name, Class or Division, UN Number or Identification Number, Packing Group (if required), and all other required information

Radioactive material, Type A package, 7, UN2915, II, 5.1

Th228, Th230, Solid/Nitrate - Radioactive Material - 11.759 kg Thorium Nitrate, 1 (one) x Type A Package, 1.319E+02 MBq - All Packed in One//

II-Yellow, TI: 0.4, 60.2 cm Diameter x 87 cm Height

Additional Handling Information

ERG Nos.: 163 (UN2915), 162 (UN2976 - Domestic DOT), 140 (UN1477-Subsidiary Rk)

Emergency Telephone Number CHEMTREC - (800)424-9300 **CHECK ONE:** ☒ ICAO/IATA ☐ 49 CFR

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

Name/Title of Signatory Allen Bixler
QA Specialist

Place and Date Curtis Bay Depot
Baltimore, MD - 7/10/2002

Signature (see warning above)

Emergency Telephone Number (Required for US Origin or Destination Shipments)
CHEMTREC - (800)424-9300

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

DOE/NRC FORM 741 U. S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION
NUCLEAR MATERIAL TRANSACTION REPORT

(7-80) Previous editions are obsolete
MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150, Public Laws 83-703, 93-438, 95-91

1. SHIPPER'S RIS	2. RECEIVER'S RIS	3. TRANSACTION NO.	4. CORRECTION NO.	5. PROCESS CODE	7. ACTION CODE		COPIES
YQK	YFZ	000001		SHIPPER A RECEIVER	A	1 2	

9.A. NAME/ADDRESS OF SHIPPER	B. LIC NO.	10.A. NAME/ADDRESS OF RECEIVER	B. LIC. NO.	11. NO. OF DATA LINES 1	12. NATURE OF TRANS.	3	
Defense Logistics Agency / Stockpile Curtis Bay Depot 710 E. Ordnance Road Baltimore, MD 21226-1742		SOUTHWEST RESEARCH INSTITUTE 6220 CULEBRA RD. SAN ANTONIO, TX 78232		13. A. SHIPPED FOR ACCT OF B. RIS	14. A. SHIPPED TO ACCT OF B. RIS	4 5 6 7 8 9	

15. TRANSFER AUTHORITY - CONTRACT, NRC DRAFT, OR ORDER NUMBER 1	16. EXPORT OR IMPORT TRANSFERS: A. LICENSE NO. B. U.S. PORT EXIT/ENTRY

17. MATERIAL TYPE AND DESCRIPTION	18. TRANS. PROFILE		19. PACKAGE ID		20. ACTION DATE			
	CARR. ID	TRANS POINT	MODEL NO.	NUMBER		MONTH	DAY	YEAR
	1				A. SHIPMENT	7	10	2002
	2				B. SHIPPER'S CORRECTION			
21. MISCELLANEOUS	3				C. RECEIPT			
	4				D. RECEIVER'S MEASUREMENT			
	5				E. RECEIVER'S CORRECTION			
B. CONCISE NOTE ATTACHED YES NO X C. CONCISE NOTE ATTACHED YES NO X	22. TOTAL GROSS WEIGHT 110				23. TOTAL VOLUME 0			

18. U.S.C., SECTION 1001; ACT OF JUNE 25, 1948; 62 STAT. 749; MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

DOE/NRC FORM 741 U. S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION
NUCLEAR MATERIAL TRANSACTION REPORT

(7-80) Previous editions are obsolete
MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150, Public Laws 83-703, 93-438, 95-91

TRANSFER SERIES			
SHP RIS YQK	RCV RIS YPZ	TRANS NO. 000001	CORR NO.

LN NO A.	TYP OF INV CHG B.	IDENTIFICATION (BATCH NAME) C.	NO. OF ITEMS D.	PROJECT NUMBER E.	MT F.	COMP CODE G.	P C H	O C I	COUNTRY CONTROL NUMBER J.	K M P K.	MEAS. IDENT. L. 1 B	2 CMP	3 M	ELEMENT WEIGHT O.	ELEMENT LOE P.	WEIGHT % ISOTOPE Q.	ISOTOPE WEIGHT R.	ISOTOPE LOE S.	B A C K	R E F E R
1			1		88	771		H	IN000000					5.00	0	0.0000	0.00	0		

24. SHIPPER'S DATA 7/10/02

SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED Allen R. Byler

18. U.S.C., SECTION 1001; ACT OF JUNE 25, 1948; 62 STAT. 749; MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

[25. RECEIVER'S DATA
[
[
[Signature of Authorized Official and Date Signed

Shipment No. 6990-001-004
(Third Sample Shipment)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper
DLA - Curtis Bay Depot
710 E. Ordnance Road
Baltimore, MD 21226-1742
(0) 410-962-2346

Air Waybill No. 835674245613
Page 1 of 1 Pages
Shipper's Reference Number (optional) 6990-001-004

Consignee
Southwest Research Institute
Attn: John P. Hageman
6220 Culebra Road
San Antonio, TX 78238
(0) 210-522-2633

FedEx Federal Express

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non applicable)*
PASSENGER AIRCRAFT ~~CARGO AIRCRAFT ONLY~~

Airport of Departure

Airport of Destination:

Shipment type: *(delete non-applicable)*
~~NON-RADIOACTIVE~~ RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping name, Class or Division, UN Number or Identification Number, Packing Group (if required), and all other required information

Radioactive material, Type A package, 7, UN2915, II, 5.1//

Th228, Th230, Solid/Nitrate - Radioactive material - 15.408 kg Thorium Nitrate, 1 (one) x Type A Package, 1.728E+02 MBq - All Packaged In One//

II-Yellow, TI: 0.6, 60.2 cm Diameter x 87 cm Height

Additional Handling Information
ERG Nos.: 163(UN2915),162(UN2976-Domestic DOT),140(UN1477-Subsidiary Risk)

Emergency Telephone Number CHEMTREC - 800-424-9300 CHECK ONE: ☒ ICAO/IATA ☐ 49 CFR

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

Name/Title of Signatory Allen Bixler
QA Specialist

Place and Date Curtis Bay Depot
Baltimore, MD - 7/10/2002

Signature (see warning above)

Emergency Telephone Number (Required for US Origin or Destination Shipments)
CHEMTREC - 800-424-9300

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

M-142(1) 140491 11/96 ERC

DOE/NRC FORM 741 U. S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION

NUCLEAR MATERIAL TRANSACTION REPORT

(7-80) Previous editions are obsolete

MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150, Public Laws 83-703, 93-438, 95-91

1. SHIPPER'S RIS	2. RECEIVER'S RIS	3. TRANSACTION NO.	4. CORRECTION NO.	5. PROCESS CODE	7. ACTION CODE		COPIES
YQK	YFZ	000002		SHIPPER A	A	1	
				RECEIVER		2	

9.A. NAME/ADDRESS OF SHIPPER	B. LIC NO.	10.A. NAME/ADDRESS OF RECEIVER	B. LIC. NO.	11. NO. OF DATA LINES 1	12. NATURE OF TRANS.	3	
Defense Logistics Agency / Stockpile Curtis Bay Depot 710 E. Ordnance Road Baltimore, MD 21226-1742		SOUTHWEST RESEARCH INSTITUTE 6220 CULEBRA RD. SAN ANTONIO, TX 78232		13. A. SHIPPED FOR ACCT OF B. RIS	14. A. SHIPPED TO ACCT OF B. RIS	4 5 6 7 8 9	

15. TRANSFER AUTHORITY - CONTRACT, NM DRAFT, OR ORDER NUMBER 1	16. EXPORT OR IMPORT TRANSFERS: A. LICENSE NO. B. U.S. PORT EXIT/ENTRY

17. MATERIAL TYPE AND DESCRIPTION	18. TRANS. PROFILE		19. PACKAGE ID		20. ACTION DATE			
		CARR. ID	TRANS POINT	MODEL NO.	NUMBER		MONTH	DAY	YEAR
	1					A. SHIPMENT	7	10	2002
	2					B. SHIPPER'S CORRECTION			
21. MISCELLANEOUS	3					C. RECEIPT			
	4					D. RECEIVER'S MEASUREMENT			
	5					E. RECEIVER'S CORRECTION			
B. CONCISE NOTE ATTACHED YES NO X C. CONCISE NOTE ATTACHED YES NO X	22. TOTAL GROSS WEIGHT 117				23. TOTAL VOLUME 0				

18. U.S.C., SECTION 1001; ACT OF JUNE 25, 1948; 62 STAT. 749; MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

DOE/NRC FORM 741 U. S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION
NUCLEAR MATERIAL TRANSACTION REPORT

(7-80) Previous editions are obsolete
MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150, Public Laws 83-703, 93-438, 95-91

TRANSFER SERIES			
SHP RIS YQK	RCV RIS YPZ	TRANS NO. 000002	CORR NO.

LN NO	TYP OF INV CHG	IDENTIFICATION (BATCH NAME)	NO. OF ITEMS	PROJECT NUMBER	MT	COMP CODE	P C	O C	COUNTRY CONTROL NUMBER	K M P	MEAS. IDENT. L.	ELEMENT	WEIGHT % ISOTOPE	ISOTOPE	BAC KER
											1 B	2 CMP	3 M	WEIGHT O.	LOE P.	Q.	WEIGHT R.	LOE S.	
A.	B.	C.	D.	E.	F.	G.	H	I	J.	K.									
1			1		88	771		H	FR000000					6.00	0	0.0000	0.00	0	

24. SHIPPER'S DATA 7/10/02

SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED Allen R. Byrd

18. U.S.C., SECTION 1001; ACT OF JUNE 25, 1948; 62 STAT. 749; MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

[RECEIVER'S DATA
[
[
[Signature of Authorized Official and Date Signed

Shipment No. 6990-001-005
(Fourth Sample Shipment)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper
DLA - Curtis Bay Depot
710 E. Ordnance Road
Baltimore, MD 21226-1742
(O) 410-962-2345

Air Waybill No. 835674245120
Page 1 of 1 Pages
Shipper's Reference Number (optional) 6990-001-005

Consignee
Southwest Research Institute
Attn: John P. Hageman
6220 Culebra Road
San Antonio, TX 78238
(O) 210-522-2633

FedEx Federal Express

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non applicable)*
[redacted] CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination:

Shipment type: *(delete non-applicable)*
[redacted] RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping name, Class or Division, UN Number or Identification Number, Packing Group (if required), and all other required information

Radioactive material, Type A package, 7, UN2915, II, 5.1//

Th228, Th230, Solid/Nitrate - Radioactive material - 14.936 kg Thorium Nitrate, 1 (one) x Type A Package, 1.675E+02 MBq - All Packed in One//

II-Yellow, II: 0.5, 60.2 cm Diameter x 87 cm Height

Additional Handling Information
ERG Nos.:163(UN2915),162(UN2975-Domestic DOT),140(UN1477-Subsidiary Risk)

Emergency Telephone Number CHEMTREC - 800-424-9300 **CHECK ONE:** ☒ ICAO/IATA ☐ 49 CFR

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

Name/Title of Signatory Allen Bixler
QA Specialist

Place and Date Curtis Bay Depot
Baltimore, MD - 7/10/2002

Signature *(see warning above)*

Emergency Telephone Number (Required for US Origin or Destination Shipments)
CHEMTREC - 800-424-9300

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

M-1421C 146491 11/98 SRC

Shipment No. 6990-001-006
(Fifth Sample Shipment)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper
DLA-Curtis Bay Depot
710 E. Ordnanae Road
Baltimore, MD 21226-1742
(0) 410-962-2346

Air Waybill No. 835674245110

Page 1 of 1 Pages

Shipper's Reference Number (optional) 6990-001-006

Consignee
Southwest Research Institute
Attn: John P. Hageman
6220 Culebra Road
San Antonio, TX 78238
(0) 210-522-2633

FedEx
Federal Express

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non applicable)*

CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination:

Shipment type: *(delete non-applicable)* RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping name, Class or Division, UN Number or Identification Number, Packing Group (if required), and all other required information

Radioactive material, Type A package, 7, UN2915, II, 5.1//

Th228, Th230, Solid/Nitrate - Radioactive material - 11.935 kg Thorium Nitrate, 1 (one) x Type A package, 1.339E+02 MBq - All Packed in One//

II- Yellow, TI: 0.5, 60.2 cm Diameter x 87 cm Height

Additional Handling Information

ERG Nos.: 163(UN2915),162(UN2976-Domestic DOT), 140(UN1477-Subsidiary Risk)

Emergency Telephone Number CHENTREC - 800-424-9300

CHECK ONE: ☒ ICAO/IATA ☐ 49 CFR

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

Name/Title of Signatory Allen Bixler
QA Specialist

Place and Date Curtis Bay Depot
Baltimore, MD - 7/15/2002

Signature *(see warning above)* Allen R Bixler

Emergency Telephone Number (Required for US Origin or Destination Shipments)
CHENTREC - 800-424-9300

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

M-1421C 148491 11/98 SRO

APPENDIX K

CHAIN OF CUSTODY AND SAMPLE ANALYSES REQUEST FORMS

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This appendix contains the "Sample Data, Request and Chain of Custody Forms" for each sample taken from drums of thorium nitrate at the Hammond and Curtis Bay Depots. The enclosed data forms are segregated based on the shipment number to the UT-Battelle's off-site laboratory or the archive drum in which samples were placed.

The following table provides a breakdown of each set of data sheets by shipment number or archive drum number. The data in the table also identifies the specific lot and drum numbers included under each shipment number or archive drum number. The table also identifies the starting page number for each set of data sheets for the respective shipment or archive drum numbers. The forms for each data set are arranged by lot number in chronological order.

One of drums of archived samples contains samples of thorium nitrate from domestic, French and Indian sources. The data forms for this drum are arranged in chronological order by source (Domestic, French then Indian). Each subset of forms is arranged by lot numbers.

Shipment No. or Archive Drum No.	Lot Number	Page No.	Shipment No. or Archive Drum No.	Lot Number	Page No.
6990-001-001	8	K-5	6990-001-A1	34	K-67
	10			35	
Hammond Depot	23		*Curtis Bay Depot*	38	
1st Sample Shipment	29		*1st Archived Drum*	39	
8 Drum Lots	30		*14 Lots*	40	
	38			41	
	47			42	
	48			43	
6990-001-003	I-3	K-15		50	
	I-4			51	
Curtis Bay Depot	I-5			56	
2nd Sample Shipment	I-6			60	
10 Drum Lots	I-7			64	
	I-9			71	
	I-11		6990-001-A2	16	K-83
	I-12			19	
	I-13		*Curtis Bay Depot*	24	
	I-14		*2nd Archived Drum*	25	
6990-001-004	F-1	K-27	*16 Lots*	26	
	F-2			32	
Curtis Bay Depot	F-3			47	
3rd Sample Shipment	F-4			57	
13 Drum Lots	F-6			59	
	F-9			62	
	F-10			70	
	F-11			F-18	
	F-13			I-1	
	F-14			I-2	
	F-16			I-8	
	F-17			I-10	
	F-19				

Shipment No. or Archive Drum No.	Lot Number	Page No.	Shipment No. or Archive Drum No.	Lot Number	Page No.
6990-001-005	17	K-41	6990-001-A3	1	K-101
	18			4	
Curtis Bay Depot	22		*Curtis Bay Depot*	5	
4th Sample Shipment	28		*3rd Archived Drum*	6	
12 Drum Lots	29		*16 Drum Lots*	7	
	30			8	
	36			9	
	37			10	
	45			13	
	48			21	
	61			23	
	65			27	
6990-001-006	2	K-55		31	
	3			33	
Curtis Bay Depot	11			46	
5th Sample Shipment	12			63	
10 Drum Lots	14				
	15				
	20				
	44				
	52				
	58				

Shipment No. 6990-001-001
(1st Sample Shipment)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page 1 of 1

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grms)	Sample Container Gross Wt (grs)	ThN Material Net Wt (grs)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HD0807061-2002	6-7-02 @ 10:30 AM	1 x 2-liter HDPE	18	8	130*	1557	1427	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	for TC	6-7-02 / 1030	6-10-02 / 1610
PM / Broker	Stan Hodges		6-10-02 / 1610	6-12-02 / 1200
Fedex	Airbill No. 835674243646		6-12-02 / 1200	
RSO	John P. Hageman	John P Hageman	6-13-02 / 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HD10300061-2002	6-10-02 @ 9:30 AM	1 x 2-liter HDPE	46	10	118*	1867	1749	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any padding materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-10-02 / 0930	6-10-02 / 1610
PM / Broker	Stan Hodges		6-10-02 / 1610	6-12-02 / 1200
Fedex	Airbill No. 831674245646		6-12-02 / 1200	
RSO	John P. Hogeman		6-13-02 / 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hegeman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-3633 (F) 210-523-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HD2307061-2002	6-7-02 @ 1130	1 x 2-liter HDPE	42	23	130*	1252	1122	Monolith	Tota. Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium. (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-10-02 / 0930	6-10-02 / 1610
PM / Broker	Stac Hodges		6-10-02 / 1610	6-12-02 /
Fedex	Airbill No. 815674245646		6-12-02 /	
RSO	John P. Hageman	John P Hageman	6-13-02 / 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page_1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HD1907061-2002	6-7-02 @ 1400	1 x 2-liter HDPE	4	29	130*	1277	1147	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	SO for TC	6-10-02 / 0930	6-10-02 / 1610
PM / Broker	Stan Hodges		6-10-02 / 1610	6-12-02 / 1200
Fedex	Airbill No. 835674245646		6-12-02 / 1200	
RSO	John P. Hageman	John P. Hageman	6-13-02 / 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5728 (jph@swri.org)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HD9007061-2002	6-7-02 @ 1300	1 x 2-liter HDPE	6	30	130*	1170	1040	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tracy Cunningham		6-10-02 / 0930	6-10-02 / 1610
PM / Broker	Stan Hodges		6-10-02 / 1610	6-12-02 / 1200
Fedex	Airbill No. 815674245646		6-12-02 / 1200	
RSO	John P. Hagaman		6-12-02 / 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagaman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5920 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (g/m)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HD3810051-2002	6-10-02 @ 12:30 PM	1 x 2-liter HDPE	25	38	114*	1205	1091	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistant with HPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-10-02 / 0930	6-10-02 / 1610
PM / Broker	Stan Hodges		6-10-02 / 1610	6-12-02 /
Fedex	Airbill No. 835674245646		6-12-02 /	
RSO	John P. Hageman		6-13-02 / 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page 1 of 1

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HDM4710061-2002	6-10-02 @ 11:30 AM	1 x 2-liter HDPE	6	47	315*	1600	1445	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Dolidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-10-02 / 0930	6-10-02 / 1610
FM / Broker	Stan Hodges		6-10-02 / 1610	6-12-02 / 1200
Fedex	Airbill No. 835674245545		6-12-02 / 1200	
RSO	John Hageman	John P. Hageman	6/13/02 / 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
HD4310061-2001	6-10-02 @ 1030 AM	1 x 2-liter HDPE	40	48	116*	1163	1027	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SGAC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be constant with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-10-02 / 0930	6-10-02 / 1610
FM / Broker	Stan Hodges		6-10-02 / 1610	6-12-02 / [illegible]
Fedex	Airbill No. 853674245645		6-12-02 / [illegible]	
RSO	John P. Hagaman		6/13/02 1400	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagaman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-3720 (jph@swri.org)

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Shipment No. 6990-001-003
(2nd Sample Shipment)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD3020712002	07-02-02 10:50	1 – 2 Liter Container	149	3	121	1149	1028	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471); Oxidizer Test (Method UN STSG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-2-02 1645	7-2-02 1645
FM / Broker	Stan Hodges		07/02/02	07/02/02 1300
Fedex	Airbill No. 835674245624		07/03/02 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jhh@swri.org)

Page_1_of_1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm.)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CM03071202	07-03-02 10:15	1 – 2 Liter Container	206	4	121	1276	1155	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium: (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
* Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7/22/02 1030	7/22/02 1030
PM / Broker	Stan Hodges		07/23/02 1055	07/23/02 1300
Fedex	Airbill No. 853674245024		07/24/02 1130	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI5030712002	07-03-02 09:25	1 – 2 Liter Container	251	5	121	1354	1233	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method]	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-3-02 /0:55	7-3-02 /0:55
PM / Broker	Stan Hodges		020704 /1055	020710 /1300
Fedex	Airbill No. 833674245621		020710 /1300	

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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI6030712002	07-03-02 08:45	1 – 2 Liter Container	300	6	121	1507	1386	Cubes	Total Metals / Mercury (Methods SW846-5020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-3-02 /0955	7-3-02 /0955
PM / Broker	Stan Hodges		020709 /1055	020710 /1300
Fedex	Airbill No. 835674245624		020710 /1300	

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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)*	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI703071200 2	07-03-02 1600	1 – 2 Liter Container	358	7	121	1209	1088	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UNST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-3-02 1615	7-3-02 1615
PM / Broker	Stan Hodges		07/03/02 1655	07/03/02 1800
Fedex	Airbill No. 853674245624.		07/10/02 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI9030712002	07-03-02 09:15	1 – 2 Liter Container	780	9	121	1254	1133	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Terry Cunningham		7-2-02 / 10:55	7-2-02 / 10:55
PM / Broker	Stan Hodges		020704 / 1055	020710 / 1300
Fedex	Airbill No. 835674245624		020704 / 1300	

Laboratory Name & Address:
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Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s):	Holding Time (days)
CH11020712202	07-02-02 10:50	1 – 2 Liter Container	537	11	121	1412	1291	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals);

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		2-7-02 10:55	2-7-02 13:00
PM / Broker	Stan Hodges		020702 1055	020702 1300
Fedex	Airbill No. 835674242824		020702 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI120207120002	07-02-02 9:50 *	1 – 2 Liter Container	589	12	121	1178	1057	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing material's inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham – SIGNATURE ON FILE	7/9/02 - 1055	7/9/02 - 1055
PM / Broker	Stan Hodges		020709 - 1055	020710 - 1300
Fedex	Airbill No. 835674245624		020710 - 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

* MODIFIED C of C FORM TO DESIGNATE CORRECT SAMPLE TIME

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI13020712002	07-02-02 10:05 *	1 – 2 Liter Container	637	13	121	1169	1048	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - Signature on File	7/9/02 - 1055	7/9/02 - 1055
PM / Broker	Stan Hodges		020709 · 1055	020710 · 1300
Fedex	Airbill No. 835674245624		020710 · 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

* CHANGED TIME TO REFLECT CORRECT SAMPLE TIME - CNG TIME ON SAMPLE LABEL TO REFLECT THIS TIME

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI14030712002	07-02-02 11:15	1 – 2 Liter Container	714	14	121	1461	1340	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. CUNNINGHAM - SIGNATURE ON FILE	7/9/02 1055	7/9/02 - 1055
PM / Broker	Stan Hodges	[signature]	7/9/02 1055	070710 · 1300
Fedex	Airbill No. 835674245624	[signature]	070710 · 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

* CHGED SAMPLE DATE/TIME TO REFLECT CORRECT SAMPLE DATE/TIME ON LABEL.

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Shipment No. 6990-001-004
(3rd Sample Shipment)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF10807120002	07-08-02 13:45 #	1 – 2 Liter Container	52	1	121	1604	1483	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T Cunningham SIGNATURE ON FILE	7-10-02 /0730	7-10-02 /0730
PM / Broker	Stan Hodges	[signature]	020710 /0730	020710 /1300
Fedex	Airbill No. 835674245613	[signature]	020710 /1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

CHANGED SAMPLE TIME TO REFLECT CORRECT SAMPLE TIME ON LABEL

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF20807120002	07-08-02 13:20	1 – 2 Liter Container	49	2	121	1482	1353	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 / 0730	7-10-02 / 0730
PM / Broker	Stan Hodges		020710 / 0730	020710 / 1300
Fedex	Airbill No. 835674245613		020710 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF3080712002	07-08-02 14:15	1 – 2 Liter Container	95	3	121	1235	1114	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 0730	7-30-02/0730
PM / Broker	Stan Hodges		080102/0730	080102/1300
Fedex	Airbill No. 835678245613		080102/1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF40807120002	07-08-02 14:00	1 – 2 Liter Container	29	4	121	1207	1086	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 / 0730	7-10-02 / 0730
PM / Broker	Stan Hodges		020710 / 0730	020710 / 1300
Fedex	Airbill No. 853567424613		020710 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF6030712002	07-08-02 13:45	1 – 2 Liter Container	100	6	122	1141	1019	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7/30/02 / 0730	7/30/02 / 0230
PM / Broker	Stan Hodges		020710 / 0730	020710 / 1300
Fedex	Airbill No. 835674245613		020710 / 1300	

Laboratory Name & Address:
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Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)*	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF060607120002	07-06-02 12:30	1 – 2 Liter Container	51	9	122	1218	1096	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method TN ST/SG/AC.10/11.Rev 3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7/2/02 1230	7/2/02 1730
PM / Broker	Stan Hodges		07/03/02 0730	07/04/02 1300
Fedex	Airbill No. 835674245613.		07/04/02 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Methods)	Holding Time (days)
CF100207I2002	07-02-02 11:40	1 – 2 Liter Container	94	10	121	1186	1065	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham – SIGNATURE ON FILE	7-10-02 / 0730	7-10-02 / 0730
PM / Broker	Stan Hodges		7-10-02 / 0730	7-10-02 / 1300
Fedex	Airbill No. 835674245613		7/10/02 · 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF110207120002	07-02-02 09:40 *	1 – 2 Liter Container	42	11	121	1255	1134	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - SIGNATURE ON FILE	7-10-02 / 0730	7-10-02 / 0730
PM / Broker	Stan Hodges	S. Hodges	020710 / 0730	020710 / 1300
Fedex	Airbill No. 835674245613	S. Hodges	020710 / 1300	

Laboratory Name & Address:
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* CHANGED TIME TO REFLECT TIME ON SAMPLE LABEL

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF13080712003	07-08-02 12:45	1 – 2 Liter Container	137	13	122	1266	1144	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		07/08/02 1230	07/08/02 1300
PM / Broker	Stan Hodges		07/08/02 1330	07/10/02 1300
Fedex	Airbill No. 855074845613		07/10/02 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF14030712002	07-03-02 09:55	1 – 2 Liter Container	78	14	121	1249	1128	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham – SIGNATURE ON FILE	7/10-02 / 0730	7/10-02 / 0730
PM / Broker	Stan Hodges	[signature]	020710 / 0730	020710 / 1300
Fedex	Airbill No. 835674245613	[signature]	020710 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

* CHANGED TIME TO REFLECT TIME ON SAMPLE LABEL

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF150807120002	07-08-02 14:50	1 – 2 Liter Container	57	16	122	1481	1359	Powder	Total Metals / Mercury (Methods SW846-6020, -7471); Oxidizer Test (Method UN STSG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy -- to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-8-02 / 0730	7-8-02 @ 1300
PM / Broker	Stan Hodges		08/10/02 10:30	08/10/02 13:00
Fedex	Airbill No. 853074245613		08/10/02 13:00	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78233 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF 708072002	07-08-02 13:10	1 – 2 Liter Container	6	17	121	1308	1187	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7/10/02 / 0730	7/10/02 / 0730
PM / Broker	Stan Hodges		020710 / 0730	020710 / 1300
Fedex	Airbill No. 835674245613.		020710 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)*	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF19080712002	07-08-02 15:00	1 – 2 Liter Container	58	19	121	1371	1250	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC 10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-Aug-02 / 0750	7-Aug-02 / 0730
PM / Broker	Stan Hedges		020710 / 0730	020710 / 1300
Fedex	Airbill No. 853674245643		020710 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-3633 (F) 210-522-5720 (jph@swri.org)

Shipment No. 6990-001-005
(4th Sample Shipment)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)*	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD17100712002	07-10-02 11:00	1 – 2 Liter Container	108	17	122	1321	1199	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 / 1100	7-15-02 / 0845
PM / Broker	Stan Hodges		071502 / 0845	071502 / 1300
Fedex	Airbill No. 835674245120		071502 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD180907120002	07-09-02 * 14:10	1 – 2 Liter Container	212	18	122	1164	1042	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham SIGNATURE ON FILE	7.9.02 / 14:10	7.15.02/0845
PM / Broker	Stan Hodges	[signature]	020715 / 0845	020715/1300
Fedex	Airbill No. 835607424 5120	[signature]	020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2533 (F) 210-522-5720 (jph@swri.org)

* CHANGED DATE TO REFLECT PROPER DATE PER SAMPLE LABEL

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm.)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD22100712002	07-10-02 13:30	1 – 2 Liter Container	8	22	121	1382	1261	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 1330	7-15-02 0845
PM / Broker	Stan Hodges		071015 0845	071015 1300
Fedex	Airbill No. 835674245120		071015 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2533 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containees	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD280107120002	07-01-02 12:30	1 – 2 Liter Container	240	28	120	1354	1234	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham for SIGNATURE ON FILE	7-1-02 / 1230	7-15-02/0845
PM / Broker	Stan Hodges		7-15-02/0845	020715/1300
Fedex	Airbill No. 835674245210		020715/1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

If CHANGED TIME TO REFLECT PROPER SAMPLING TIME

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD290907I2002	07-09-02 ✓ 14:45	1 – 2 Liter Container	30	29	122	1341	1219	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471); Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	23 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Terry Cunningham	T. Cunningham SIGNATURE ON FILE	7-9-02 / 14:10	07-15-02 / 0845
PM / Broker	Stan Hodges	[signature]	020715 / 0845	020715 / 1300
Fedex	Airbill No. 835674245120	[signature]	020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John F. Hageman, 5220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

✓ CHANGED DATE TO REFLECT MORE DATE ON SAMPLE LABEL

Thorium Nitrate Drum Sampling Project Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD302806122002	06-28-02 * 11:40	1 – 2 Liter Container	171	30	130	1522	933 459 1392	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11 Rev 3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham – SIGNATURE ON FILE	6-28-02 / 11:40	7-15-02 / 0845
PM / Broker	Stan Hodges	[signature]	020715 / 0845	020715 / 1300
Fedex	Airbill No. 835674245120	[signature]	020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

* MODIFIED TIME TO REFLECT TIME ON SAMPLE LABEL

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD360107I2002	07-01-02 11:40	1 – 2 Liter Container	267	36	122	1504	1382	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-01-02 / 11:40	7-15-02 / 0845
PM / Broker	Stan Hodges		020715 / 0845	020715 / 1300
Fedex	Airbill No. 8356 7124 5120		020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagemar, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2635 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grms)*	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
ORNL100712002	07-10-02 09:30	1 – 2 Liter Container	19	37	121	1294	1173	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weigh: includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 / 0930	7-15-02 / 0845
PM / Broker	Stan Hodges		070715 / 0845	070715 / 1300
Fedex	Airbill No. 835674245120		070815 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Methods)	Holding Time (days)
CD4328061202	06-28-02 09:30	1 – 2 Liter Container	105	45	325	1479	1559	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 0930	7-1-02 0845
PM / Broker	Stan Hodges		07/01/02 1045	07/01/02 1300
Fedex	Airbill No. 835674245120		07/01/02 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD482706120002	06-27-02 14:45	1 – 2 Liter Container	119	48	122	1614	1492	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-27-02 / 1445	7-15-02 / 0845
PM / Broker	Stan Hodges		070715 / 0845	070715 / 1300
Fedex	Airbill No. 835674215120		070715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grms)	Sample Container Gross Wt (grm)	ThN Material Net Wt (grm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD610907121002	07-09-02 ¥ 14:15	1 – 2 Liter Container	86	61	122	1251	1129	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11 Rev 3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - Signature on File	7-9-02 / 14:15	7-15-02/0845
PM / Broker	Stan Hodges	[signature]	7-15-02/0845	020715/1300
Fedex	Airbill No. 835607424120	[signature]	020715/1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagemar, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

¥ CHANGED DATE/TIME TO REFLECT DATA ON SAMPLE LOG & SPREADSHEETS

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD55D93712002	07-09-02 † 14:30	1 – 2 Liter Container	107	65	122	1176	1054	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test [Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - SIGNATURE ON FILE	7-9-02/14:30	7-15-02/0845
PM / Broker	Stan Hodges	[signature]	7-15-02/0845	020715/1300
Fedex	Airbill No. 835674245210	[signature]	020715/1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagenar, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

† CHANGED DATE TO REFLECT DATE DESIGNATED ON SAMPLE LABEL & SPREADSHEET

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Shipment No. 6990-001-006
(5th Sample Shipment)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)*	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Methods)	Holding Time (days)
CD021207712902	07-12-02 08:00	1 – 2 Liter Container	78	2	121	1270	1149	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UNI ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 0845	7-12-02 / 0845
PM / Broker	Stan Hodges		12/12/02 / 1345	12/12/02 / 1300
Fedex	Airbill No. 855518742455110		12/12/02 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John F. Hagemann, 5220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD031107T2002	07-11-02 14:00	1 – 2 Liter Container	57	3	121	1258	1137	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-11-02 / 1400	7-15-02 / 0845
FM / Broker	Stan Hodges		020715 / 0845	020715 / 1300
Fedex	Airbill No. 835674245110		020715 / 1302	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD111107120002	07-11-02 14:15	1 – 2 Liter Container	248	11	121	1126	1005	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-15-02 1545	7-15-02 1645
PM / Broker	Stan Hodges		07/15/02 1645	07/15/02 1700
Fedex	Airbill No. 835674245110		07/15/02 1730	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagenian, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD12-20712002	07-12-02 0900	1 – 2 Liter Container	136	12	121	1803	1682	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 0900	7-15-02 0845
PM / Broker	Stan Hodges		07/15/02 1645	07/15/02 1500
Fedex	Airbill No. 835671245110		07/15/02 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagenmaier, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD14120712002	07-12-02* 11:30	1 – 2 Liter Container	123	14	121	1341	1220	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - Signature on file	7-12-02 / 1130	7-15-02 / 0845
PM / Broker	Stan Hodges	[signature]	7-15-02 / 0845	020715 / 1300
Fedex	Airbill No. 835674245110	[signature]	020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

* CHANGED DATE TO REFLECT PROPER DATE ON LABEL

Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)*	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD: 5110712002	07-11-02 15:00	1 – 2 Liter Container	239	15	121	1163	1042	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-11-02 / 1500	7-15-02 / 0845
PM / Broker	Stan Hodges		072015 / 0845	072015 / 1300
Fedex	Airbill No. 835674248510.		072015 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD20103712002	07-10-02 1045	1 – 2 Liter Container	11	20	121	1345	1224	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-15-02 / 0845	7-15-02 / 0845
PM / Broker	Stan Hodges		020715 / 0845	020715 / 1300
Fedex	Airbill No.	835674245110	020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2533 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD441207120002	07-12-02 15:00	1 – 2 Liter Container	182	44	121	1157	1036	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1500	7-15-02 / 0845
PM / Broker	Stan Hodges		020715 / 0845	020715 / 1300
Fedex	Airbill No. 855674245110		020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2533 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containees	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD52102712002	07-10-02 0945	1 – 2 Liter Container	194	52	122	1476	1354	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-2-02 / 0945	7-15-02 / 0845
PM / Broker	Stan Hodges		020715 / 0845	020715 / 1300
Fedex	Airbill No. 835674245110.		020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
~~SD58807120007~~ SD58120711002	07-12-02 14:15	1 – 2 Liter Container	97	53	121	1209	1088	Monolith	Total Metals / Mercury (Methods SW846–6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02/1415	7-15-02/0845
PM / Broker	Stan Hodges		072015/0845	072015/1300
Fedex	Airbill No. 835674245110		072015/1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

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Archive Drum No. 6990-001-A1
(1st Drum of Archived Samples)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)*	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD34010712002	07-01-02 11:15	1 – 2 Liter Container	80	34	120	1375	1255	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-2-02 / 1115	7-15-02 / 1010
PM / Broker	Stan Hodges		020715 / 1010	020715 / 1300
Bldg. 913	Drum # 6490-001-11		020715 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD35280612002	06-28-02 10:30	1 – 2 Liter Container	203	35	129	1589	937 523 1460	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 / 1000	7-15-02 / 1010
PM / Broker	Stan Hodges		020715 / 1010	020715 / 1300
Fedex 913	Drum # 16940-001-11		020715 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collector, Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD38010712002	07-01-02 11:55	1 – 2 Liter Container	75	38	121	1165	1044	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-01-02 / 11:55	7-5-02 / 1010
PM / Broker	Stan Hodges		020715 / 1010	020715 / 1300
DENN GAMOOD!-AI	WAREHOUSE 913 STAN HODGES		020715 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD56010712002	07-01-02 ~~10:45~~ 10:00	1 – 2 Liter Container	6	39	122	1523	1401	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-01-02 / 1045	7-15-02 / 1010
PM / Broker	Stan Hodges		072015 / 1010	072015 / 1300
Bldg 913	Drum # 6010-001-11		072015 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD400107I2002	07-01-02 11:35	1 – 2 Liter Container	35	40	119	1250	1131	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-01-02 / 1135	7/1/02 / 1010
PM / Booker	Stan Hodges		07/01/02 / 1010	07/01/02 / 1300
Bldg 913	Drum # 1990-001-A1		07/01/02 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD41270612002	06-27-02 12:30	1 – 2 Liter Container	142	41	123	1183	1060	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 / 1230	7-15-02 / 1010
PM / Broker	Stan Hodges		6/07/15 / 1010	6/07/15 / 1300
Bldg. 913	Drum # 1990-001-A1		6/07/15 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grns)	Sample Container Gross Wt (grn)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD42280612002	06-28-02 09:00	1 – 2 Liter Container	154	42	122	1349	1227	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 / 0900	7/5/02 / 1010
PM / Broker	Stan Hodges		020715 / 1010	020715 / 1300
Bldg 913	Drum # 6990-001-A1		020715 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD432806120002	06-28-02 11:00	1 – 2 Liter Container	179	43	120	1199	1079	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 / 1100	7-1-02 / 1010
PM / Broker	Stan Hodges		070115 / 1010	070115 / 1300
Bldg 913	Drm # 6490-001-11		070115 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD502806120002	06-28-02 11:15	1 – 2 Liter Container	3	50	113	1450	1337	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3] Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 / 1115	7-15-02 / 1012
PM / Broker	Stan Hodges		070115 / 1010	070115 / 1300
BLDG 913	Drum # 6990-01-A1		070115 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD51280612002	06-28-02 14:40	1 – 2 Liter Container	155	51	119	1172	1053	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 / 1440	7-15-02 / 1010
PM / Broker	Stan Hodges		020715 / 1010	020715 / 1300
Drum # 6490-001-A1	WAREHOUSE 9113		020715 / 1300	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD560107.2002	07-01-02 10:45	1 – 2 Liter Container	48	56	122	1523	1401	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody, Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-9-02 / 1045	7-9-02 / 1045
PM / Broker	Stan Hodges		07/15 / 1010	07/15 / 1300
Bldg 913	[illegible] 07/15/02 -11		07/15 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grns)*	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD602706512002	05-27-02 11:00	1 – 2 Liter Container	285	60	119	1402	893 390 1283	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-27-02 / 1120	7-15-02 / 1010
FM / Broker	Stan Hodges		070715 / 1010	070715 / 1300
Bldg 913	Drum # HRD-001-21		070715 / 1300	

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Page _1_ of _1_

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD64C1C7E2002	07-01-02 1420	1 – 2 Liter Container	60	64	120	1185	1055	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471); Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7/1/02 1420	7/1/02 1620
PM / Broker	Stan Hodges		7/1/02 1620	7/2/02 1300
[illegible] 913	[illegible]		7/2/02 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD712806120012	06-28-02 14:00	1 – 2 Liter Container	192	71	122	1222	1100	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		6-28-02 / 1400	7-15-02 / 1010
PM / Broker	Stan Hodges		020715 / 1010	020715 / 1300
BLDG 913	Drum # 6490-001-11		020715 / 1300	

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Archive Drum No. 6990-001-A2
(2nd Drum of Archived Samples)

Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD16100712002	07-10-02 ~~1020~~ 1010	1 – 2 Liter Container	230	16	122	1260	1138	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 / 1030	7-15-02 / 0930
PM / Broker	Stan Hodges		07/15 / 0930	07/15 / 1330
BLDG 913	Drum # 6490-001-12		07/15 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD19100712002	07-10-02 14:30	1 – 2 Liter Container	52	19	121	1209	1088	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - SIGNATURE ON FILE	7-10-02 / 1430	7-15-02 / 0930
PM / Broker	Stan Hodges	[signature]	020715 / 0930	020715 / 1330
Bldg 913	Drum # 6490-001-A2	[signature]	020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD2410071202	07-10-02 14:00	1 – 2 Liter Container	102	24	121	1447	1326	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham SIGNATURE ON FILE	7-10-02 / 1400	7-15-02 / 0930
PM / Broker	Stan Hodges	[signature]	020715 / 0930	020715 / 1330
BLDG 913	Demo # 6990-001-12	[signature]	020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD25010712002	07-01-02 14:55	1 – 2 Liter Container	25	25	120	1148	1028	Monolith	Total Metals / Mercury (Methods SW846-5020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-01-02 1455	7-1-02 0930
PM / Broker	Stan Hodges		070115 0930	070115 1330
BLDG 913	DEM # 06-00-001-12		070115 1330	

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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD25090712002	07-09-02 13:30	1 – 2 Liter Container	202	26	121	1157	1036	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN STYSG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - SIGNATURE ON FILE	7-9-02 / 1330	7-15-02 / 0930
PM / Broker	Stan Hodges		020715 / 0930	020715 / 1330
Bldg 913	Drum # 6990-001-12		020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)*	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD320907I2002	07-09-02 13:50	1 – 2 Liter Container	152	32	121	1153	1031	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham – Signature on File	7-9-02 / 1350	7-15-02 / 0430
PM / Broker	Stan Hodges	S.M. Hodges	7-15-02 / 0930	020715 / 1330
Bldg 913	Drum # 6990-001-12	S.M. Hodges	020715 / 1330	

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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD47050712002	07-09-02 13:00	1 – 2 Liter Container	204	47	121	1328	1207	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham - SIGNATURE ON FILE	7-9-02 / 1300	7-15-02 / 0920
PM / Broker	Stan Hodges	S Hodges	020715 / 0930	020715 / 1330
BIDG 913	Drum #6990-001-12	S Hodges	020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)*	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD571007120002	07-10-02 09:15	1 – 2 Liter Container	110	57	122	1244	1122	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 / 0915	7-15-02 / 0930
PM / Broker	Stan Hodges		071502 / 0930	071502 / 1330
BLDG 913	Drum # 6990-001-12		071502 / 1330	

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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page 1 of 1

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CES91407120002	07-10-32 10:40	1 – 2 Liter Container	241	59	122	1149	1027	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)
*Tare weight includes any packing materials inside of the sample container with the ThN material.										

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-32 / 1040	7-10-32 / 0730
PM / Broker	Stan Hodges		07/07/15 / 0930	07/07/15 / 1330
Bob's UPS Driver #42			07/07/15 / 1350	

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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD621007120002	07-10-02 10:15	1 – 2 Liter Container	159	62	121	1264	1143	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample containes with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1015	7-15-02 / 0930
PM / Broker	Stan Hodges		020715 / 0930	020715 / 1330
BLDG 913	Drum # 6990-001-12		020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (grms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD701007120C2	07-10-02 10 00	1 – 2 Liter Container	3	70	121	1132	1011	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-10-02 / 1000	7-10-02 / 0930
PM / Broker	Stan Hodges		020715 / 0930	020715 / 1330
B&D 913	DNN # 16490-001-12		020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)*	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CF18030712002	07-03-02 10:30	1 – 2 Liter Container	55	18	121	1232	1111	Powder	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	[signature]	7-03-02 / 1030	7-15-02 / 0930
PM / Broker	Stan Hodges	[signature]	020715 / 0930	020715 / 1330
BLDG 913	DRUM #1,990-001-AZ	[signature]	020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CH1020712002	07-02-02 13:50	1 – 2 Liter Container	14	1	121	1222	1101	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7.2.02 / 1015	7-2-02 / 1015
PM / Broker	Stan Hodges		020715 / 1025	020715 / 1330
~~FedEx~~ BDD 913 WJ	~~Airbill No.~~ 790466600001-12		020715 / 1330	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI20307I2002	05-03-02 11:00	1 – 2 Liter Container	99	2	121	1576	1355	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham Signature on File	7-3-02 /1100	7/3-02 /1055
PM / Broker	Stan Hodges		070302 /1055	070302 /1350
Bldg 913	Dawn # 6960-201-A2		070302 /1350	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI8020712002	07-02-02 09:10	1 – 2 Liter Container	371	8	121	1255	1134	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-9-02 / 1055	7-9-02 / 10:55
PM / Broker	Stan Hodges		020709 / 1055	020709 / 1300
BLDG 913 Fedex	Airbill No. 856794045624 Drum # CA40-001-A2		020709 / 1300	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CI100207I2002	07-02-02 ~~09:36~~ 09:35	1 – 2 Liter Container	484	10	121	1181	1060	Cubes	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-9-02 / 10:15	7-9-02 / 10:15
PM / Broker	Stan Hodges		020704 / 1055	020715 / 1330
BIDG 913 Fedex [illegible]	~~Airbill No.~~ LC Dkt # 6990 2004 12		020715 / 1330	

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (F) 210-522-5720 (jph@swri.org)

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Archive Drum No. 6990-001-A3
(3rd Drum of Archived Samples)

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD01120712002	07-12-02 08:15	1 – 2 Liter Container	111	1	121	1406	1285	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 0815	7-12-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
BLDG 913	Drum # 6840-001-A3		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD04120712002	07-12-02 14:30	1 – 2 Liter Container	142	4	121	1176	1055	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1430	7-12-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
Bldg 913	Drum # 6490-001-13		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD051207120002	07-12-02 1345	1 – 2 Liter Container	111	5	121	1285	1137	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1345	7-15-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
BLDG 913	6490-001-13		020715 / 1400	

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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD06120712002	07-12-02 10:00	1 – 2 Liter Container	175	6	121	1309	1188	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1000	7-15-02 / 1120
PM / Broker	Stan Hodges		7/15/02 / 1120	7/15/02/1400
Bldg 913	DRUM # 6490-001-A3		7/15/02 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)*	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD07120712D02	07-12-02 09:15	1 – 2 Liter Container	59	7	121	1426	1305	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-15-02 / 0915	7-15-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
BLDG 913	PROJ # 6490-001-A3		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)*	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD08120712002	07-12-02 10:15	1 – 2 Liter Container	127	8	121	1305	1184	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1015	7-15-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
BLDG 913	Dmm # 6660.001.A3		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD09123712002	07-12-02 10:45	1 – 2 Liter Container	24	9	121	1193	1072	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1245	7-12-02 / 1320
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
BLDG 913	6690-001-A3 (DOM #)		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)*	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD101207I2002	07-12-02 09:30	1 – 2 Liter Container	135	10	121	1685	1564	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02/0930	7-15-02/1120
PM / Broker	Stan Hodges		020715/1120	020715/1400
Bldg 913	Drum # 6990-001-13		020715/1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)*	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD13110712002	07-11-02 14:30	1 – 2 Liter Container	124	13	122	1352	1230	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-11-02 / 1430	7-12-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
Bldg 913	6490-001-A3		020715 / 1460	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD211107122002	07-11-02 14:45	1 – 2 Liter Container	83	21	121	1421	1300	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev 3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham	T. Cunningham / SIGNATURE ON FILE	7-11-02 / 1445	7-15-02 / 1120
PM / Broker	Stan Hodges	[signature]	020715 / 1120	020715 / 1400
BLDG 913	DRUM # 6490-001-13	[signature]	020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD231207I2002	07-12-02 10:30	1 – 2 Liter Container	200	23	121	1361	1240	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1030	7-12-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
BLDG 913	Drum # 6890-001-13		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD211207120002 11	07-12-02 14:00	1 – 2 Liter Container	159	27	121	1477	1356	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11/Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1400	7-15-02 / 1120
PM / Broker	Stan Hodges		07/07/15 / 1120	07/07/15 / 1400
BLDG 913	DRUM # 6990-001-13		07/07/15 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD311207I2002	07-12-02 11:00	1 – 2 Liter Container	00	31	121	1221	1100	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1100	7-12-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
Bldg 913	Drum # 6490-001-13		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD331207120002	07-12-02 11:15	1 – 2 Liter Container	149	33	121	1244	1123	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1115	7-15-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1400
Bldg 9/3	Drum # 6490-001-13		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Page _1_ of _1_

Sample Data, Request & Chain of Custody Form

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD46120712002	07-12-02 14:45	1 – 2 Liter Container	24	46	121	1330	1209	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1475	7-15-02 / 1120
PM / Broker	Stan Hodges		020715 / 1120	020715 / 1450
BLDG 913	DRUM # 6540-001-13		020715 / 1400	

Laboratory Name & Address:
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Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

Page _1_ of _1_

Sample ID No.	Sample Collection Date / Time	Sample Container Type and No. of Containers	Drum ID No.	Lot ID No.	Sample Container Tare Wt (gms)	Sample Container Gross Wt (gm)	ThN Material Net Wt (gm)	Sample Matrix	Requested Analyses & Analytical Method(s)	Holding Time (days)
CD631207120002	07-12-02 11:30	1 – 2 Liter Container	5	63	121	1145	1024	Monolith	Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)	28 days (Hg) 180 days (other metals)

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

Position	Printed Name	Signature	Receipt Date/Time	Release Date/Time
Sample Coordinator	Tony Cunningham		7-12-02 / 1130	7-15-02 / 1125
PM / Broker	Stan Hodges		070315 / 1120	070315 / 1400
BLDG 913	DRUM # 6990-001-13		070315 / 1400	

Laboratory Name & Address:
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APPENDIX L

RADIOLOGICAL DOCUMENTATION

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This appendix contains the radiological documentation for the Thorium Nitrate Drum Sampling Project:

- Radiation Work Permits at Hammond and Curtis Bay Depots
- Contamination and Radiation Surveys of the 100W Warehouse at Hammond Depot and Warehouses 911, 912 and 913 at the Curtis Bay Depot
- Air Sample Count Record for both Hammond and Curtis Bay
- Drum Survey Results for individual drums that were sampled at both Depots

Although not included in this appendix, RWE NUKEM is maintaining copies of the following radiological documentation in their project files.

- Individual Radioactive Airborne Contamination Survey Reports (the summary of these reports are included on the Air Sample Count Records included in this appendix)
- Daily Instrument Response Checks for the Radiological Instrumentation used for daily contamination and radiation surveys
- Calibration and Certification Records for the Radiological Instrumentation used to perform surveys for the project
- Equipment Release Surveys
- Characterization Surveys of Equipment/Containment Tent

The following table provides the location of each set of records included in this appendix along with a brief description of each record.

Record	Description	Page
Radiation Work Permits	Includes 2 RWPs from both the Hammond and Curtis Bay Depots. One RWP essentially covered drum retrieval from the warehouse and the other RWP covered the actual inspection and sampling operations. Total recorded dose on the RWPs (based on self-reading personal dosimeter readings) is 1,338 mR. RWE NUKEM personnel received a total dose of 1,202 mR.	L-5
Contamination and Radiation Surveys of Warehouses	Contains the initial radiation and contamination surveys of the 100W warehouse at Hammond and warehouses 911, 912 and 913 at the Curtis Bay Depot. The survey results show both contamination and direct reading radiation results in the warehouses. Based on the contamination surveys of the warehouses at the Curtis Bay Depot, a fixative agent was applied to the floor to fix loose surface contamination in the aisle-ways of the warehouses where RWE NUKEM utilized a forklift for drum movement.	L-11
Air Sample Count Records	These records contain the summary results of the individual air sample count records. The majority of the results include recounts following the initial count due to the presence of short lived particulate present in the warehouse from the decay of thoron and radon gases	L-31
Drum Survey Records	These same readings are included in the data sheets for each drum inspected. The records include individual radiation readings and contamination surveys for each drum. The drums from French and Indian sources were all externally contaminated. The drums were bagged with “yellow” bags to contain the loose surface contamination during movement. The drums were placed back in storage still bagged. The exterior of each bag was labeled with the drum’s lot and identification number. These drum survey records also indicate the specific warehouse location for each drum at the Curtis Bay Depot.	L-37

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Radiation Work Permits

RADIATION SAFETY PROCEDURE

Minor Change Number: By: Date: / /	CONTROL OF RADIOLOGICAL WORK	No. RSP-012 Rev. No. 001 Date: 02/21/00 Page: 10 of 13

ATTACHMENT 1
RADIATION WORK PERMIT

Permit No: HAMMOND BAY-001	Type: ☐ Job Specific ☐ Extended ☒ Routine
Expiration Date: 6/12/02	IEM Project No.: 2002006..04

Description and Location of Work: GENERAL WORK IN WAREHOUSE, MOVING DRUMS, ☐ See Work Plan
SURVEYS, ETC. OPENING OF DRUMS NOT PERMITTED ON THIS RWP

SURVEY INFORMATION

General Area Exposure Rates (mR/hr): <5 MR/HR	☒ See Map
Maximum Accessible Exposure Rates (mR/hr): <80 MR/HR @ CONTACT WITH PALLETS	☒ See Map
Removable Contamination (dpm/100 cm²): <20 DPM α, <1000 DPM β, γ	☒ See Map

ALARA REVIEW

Estimated Total Dose (Maximum Individual): ☐ TBD Attached <50 MREM	Actual Total Dose (Maximum Individual):
Pre-job Briefing by: ROBB MERKEL	Post-job Briefing by:
Dose Reduction Techniques to be Employed: MOVING IDENTIFIED DRUMS TO A LOW DOSE STAGING AREA	

DOSIMETRY REQUIREMENTS

☒ TLD/Film Badge	☒ Finger Ring	☒ SRPD	☐ BZA	☐ Alarming Dosimeter
☐ Stay-Time Estimate:	☐ Other (Specify): ☒ FINGER RING & SRPD REQUIRED WHEN HANDLING DRUMS			

PROTECTIVE EQUIPMENT

☐ Coveralls	☐ Lab Coat	☐ Hood	☐ Rubber Gloves	☐ Booties
☐ Rubbers	☐ Respirator	☐ Taped Seams	☒ HP Coverage	☐ Stationary Air Sampler
☒ Pre-job Bioassay	☒ Post-job Bioassay	☐ Special Briefing in:		
Other Precautions and Special Instructions:				

Authorized by (signature of RSO): R. Merkel	Date: 6/3/02
Authorized by (signature of CHP): R. Merkel for BILL THOMAS	Date:
Terminated by (signature of RSO): R. Merkel	Date: 6/11/02

RADIATION SAFETY PROCEDURE

Minor Change Number: By: Date: / /	CONTROL OF RADIOLOGICAL WORK	No. RSP-012 Rev. No. 001 Date: 02/21/00 Page: 10 of 13

ATTACHMENT 1
RADIATION WORK PERMIT

Permit No: HAMMOND DEPOT-002	Type: X Job Specific ☐ Extended ☐ Routine
Expiration Date: 6/12/02	IEM Project No.: 2002006.04

Description and Location of Work: INSPECTION AND SAMPLING DRUMS AND HOUSE KEEPING INSIDE CONTAMINATION AREAS. X See Work Plan

SURVEY INFORMATION

General Area Exposure Rates (mR/hr): <20 mR/HR BEHIND Pb SHIELD (ESTIMATE)	☐ See Map
Maximum Accessible Exposure Rates (mR/hr): <40 mR/HR @ CONTACT WITH DRUM	☐ See Map
Removable Contamination (dpm/100 cm²): TO BE DETERMINED	☐ See Map

ALARA REVIEW

Estimated Total Dose (Maximum Individual): ☐ TBD Attached <250 BASED ON ESTIMATE OF A TOTAL OF 11 HRS. OF SAMPLING IN A 20 MR/HR FIELD	Actual Total Dose (Maximum Individual):
Pre-job Briefing by: ROBB MERKEL	Post-job Briefing by:
Dose Reduction Techniques to be Employed: Pb BLANKETS, EXTENSION TOOLS TO BE USED	

DOSIMETRY REQUIREMENTS

X TLD/Film Badge	X Finger Ring	X SRPD	☐ BZA	☐ Alarming Dosimeter
☐ Stay-Time Estimate:	☐ Other (Specify):			

PROTECTIVE EQUIPMENT

X Coveralls	☐ Lab Coat	X Hood	X Rubber Gloves	X Booties
X Rubbers	X Respirator PAPR	X Taped Seams	☐ HP Coverage	X Stationary Air Sampler
X Pre-job Bioassay	☐ Post-job Bioassay	☐ Special Briefing in:		
Other Precautions and Special Instructions:				

Authorized by (signature of RSO): ROBB MERKEL / R. Merkel	Date: 6/4/02
Authorized by (signature of CHP): R. Merkel FOR BILL THOMAS	Date: 6/4/02
Terminated by (signature of RSO): R. Merkel	Date: 6/11/02

RADIATION SAFETY PROCEDURE

Minor Change Number: By: Date: / /	CONTROL OF RADIOLOGICAL WORK	No. RSP-012 Rev. No. 001 Date: 02/21/00 Page: 10 of 13

ATTACHMENT 1
RADIATION WORK PERMIT

Permit No: CURTIS BAY -001	Type: ☒ Job Specific ☐ Extended ☐ Routine
Expiration Date: 7/31/02	IEM Project No.: 2002006.04

Description and Location of Work: SAMPLING, INSPECTION AND DECON OF DRUMS INSIDE CONTAINMENT TENT ☐ See Work Plan

SURVEY INFORMATION

General Area Exposure Rates (mR/hr): <10	☒ See Map BASED ON DRUM SURVEYS
Maximum Accessible Exposure Rates (mR/hr): <50	☒ See Map BASED ON DRUM SURVEYS
Removable Contamination (dpm/100 cm²): EXTERNAL: <200 ~~dpm/100cm²~~ α, <1000 dpm/100cm² β,γ EXCEPT FOR FRENCH AND INDIAN INTERNAL CONTAMINATION WILL BE VERY HIGH INSIDE INNER PACKAGE	☐ See Map

ALARA REVIEW

Estimated Total Dose (Maximum Individual): <300 mRem ☐ TBD Attached	Actual Total Dose (Maximum Individual):
Pre-job Briefing by:	Post-job Briefing by:
Dose Reduction Techniques to be Employed: LONG HANDLED TOOLS, LEAD SHIELDING, ROTATION OF TECHS / SAMPLERS AND THE USE OF HEPA VENTILLATION	

DOSIMETRY REQUIREMENTS

☒ TLD/Film Badge	☒ Finger Ring	☒ SRPD	☐ BZA	☐ Alarming Dosimeter
☐ Stay-Time Estimate:	☐ Other (Specify):			

PROTECTIVE EQUIPMENT

☒ Coveralls	☐ Lab Coat	☒ Hood	☒ Rubber Gloves	☒ Booties 2 PAIR
☐ Rubbers	☒ Respirator	☒ Taped Seams	☒ HP Coverage	☒ Stationary Air Sampler
☒ Pre-job Bioassay	☒ Post-job Bioassay	☐ Special Briefing in:		
Other Precautions and Special Instructions:				

Authorized by (signature of RSO): R. Merkel	Date: 6/26/12
Authorized by (signature of CHP):	Date:
Terminated by (signature of RSO): R. Merkel	Date: 7/19/02

RADIATION SAFETY PROCEDURE

Minor Change Number: By: Date: / /	CONTROL OF RADIOLOGICAL WORK	No. RSP-012 Rev. No. 001 Date: 02/21/00 Page: 10 of 13

ATTACHMENT 1
RADIATION WORK PERMIT

Permit No: CURTIS BAY-002	Type: X Job Specific ☐ Extended ☐ Routine
Expiration Date: 8/1/02	IEM Project No.: 2002006.04

Description and Location of Work: ENTRY INTO WAREHOUSES, HANDLING DRUMS, DECON of DRUMS, SURVEYS, ETC. * NO DRUMS TO BE OPENED ON THIS RWP* ☐ See Work Plan

SURVEY INFORMATION

General Area Exposure Rates (mR/hr): TO 80 mR/HR @ 30cm FROM DRUMS, WALKWAYS = 45 mR/HR	X See Map
Maximum Accessible Exposure Rates (mR/hr): 120 MR/HR @ CONTACT WITH DRUMS ON PALET	X See Map
Removable Contamination (dpm/100 cm²): <250 DPM/100CM² α, <1000 DPM/100CM² β, γ	☐ See Map

ALARA REVIEW

Estimated Total Dose (Maximum Individual): 400 ☐ TBD Attached	Actual Total Dose (Maximum Individual):
Pre-job Briefing by: R. MERKEL	Post-job Briefing by:
Dose Reduction Techniques to be Employed: EXTENSION TOOLS, STAGING of EQUIP, MINIMIZING TIMES of EXPOSURE	

DOSIMETRY REQUIREMENTS

X TLD/Film Badge	X Finger Ring	X SRPD	☐ BZA	☐ Alarming Dosimeter
☐ Stay-Time Estimate:	X Other (Specify): FINGER RING ONLY REQUIRED WHEN HANDLING DRUMS			

PROTECTIVE EQUIPMENT

X Coveralls TYVEK	☐ Lab Coat	X Hood	X Rubber Gloves	X Booties
☐ Rubbers	☐ Respirator	X Taped Seams	X HP Coverage	X Stationary Air Sampler
☐ Pre-job Bioassay	X Post-job Bioassay	☐ Special Briefing in:		
Other Precautions and Special Instructions: DRESS REQ. MAY BE MODIFIED AT DISCRETION OF H.P.				

Authorized by (signature of RSO): ROB MERKEL / R. Merkel	Date: 6/21/02
Authorized by (signature of CHP):	Date:
Terminated by (signature of RSO): R. Merkel	Date: 7/19/02

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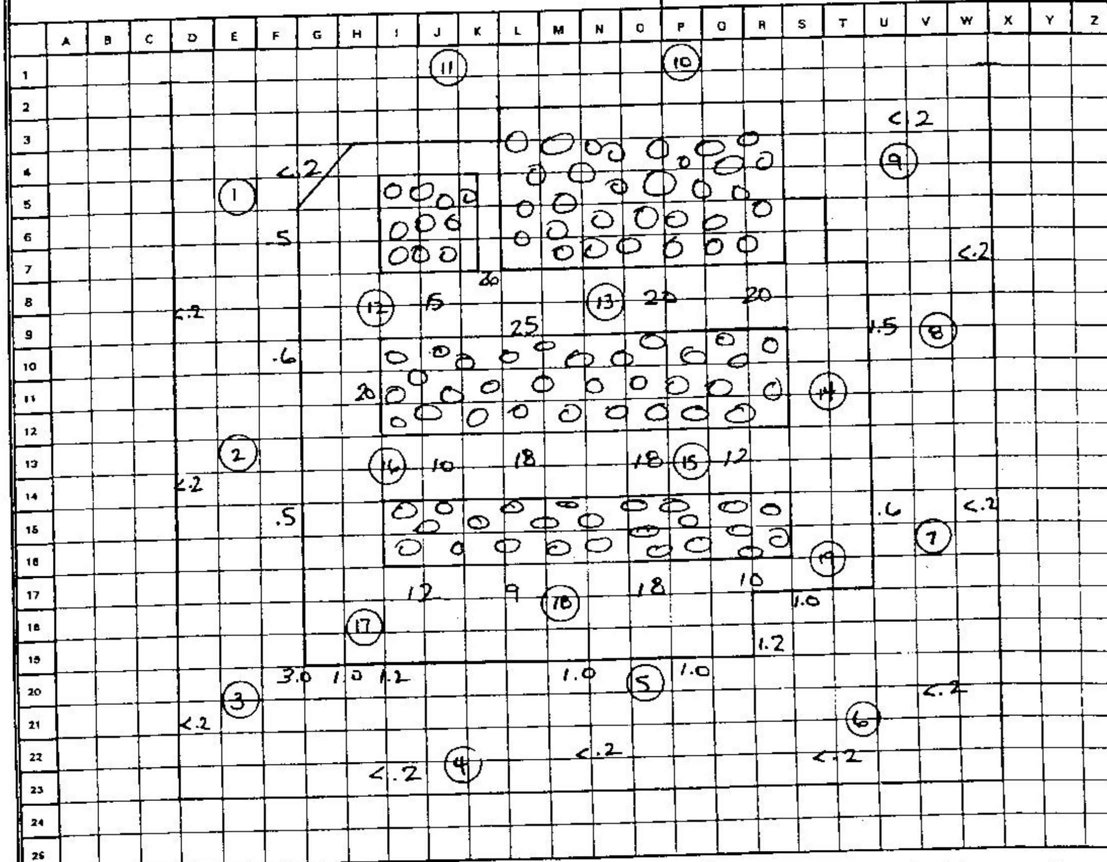
Contamination and Radiation Surveys of Warehouses

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number ____________ Page ______ of ______

Instrument/SN: RO-2 # 5985	Calibration Due: 11/10/02	Site Name: HAMMOND DEPOT — Date: — Time:
Instrument/SN 2929 #126129	Calibration Due: 4/23/03	Location: INSIDE WAREHOUSE
Instrument/SN	Calibration Due:	Purpose: INITIAL SURVEY
Survey Performed By (Print): ROBB MERKEL		Survey Performed By (Signature): R. Merkel
☑ Battery OK	☑ HV OK ☑ Source Check OK	Grid Dimensions: ______ x ______ ☐ meters ☐ feet ☐ inches ☐ centimeters



Notes: * CONTACT w/ PALLETS WAS UP TO 80 mR/HR, CONTACT w/ PRE-SELECTED DRUM WAS UP TO 40 mR/HR.
* ALL SMEARS WERE < 5 dpm α, < 100 dpm β γ

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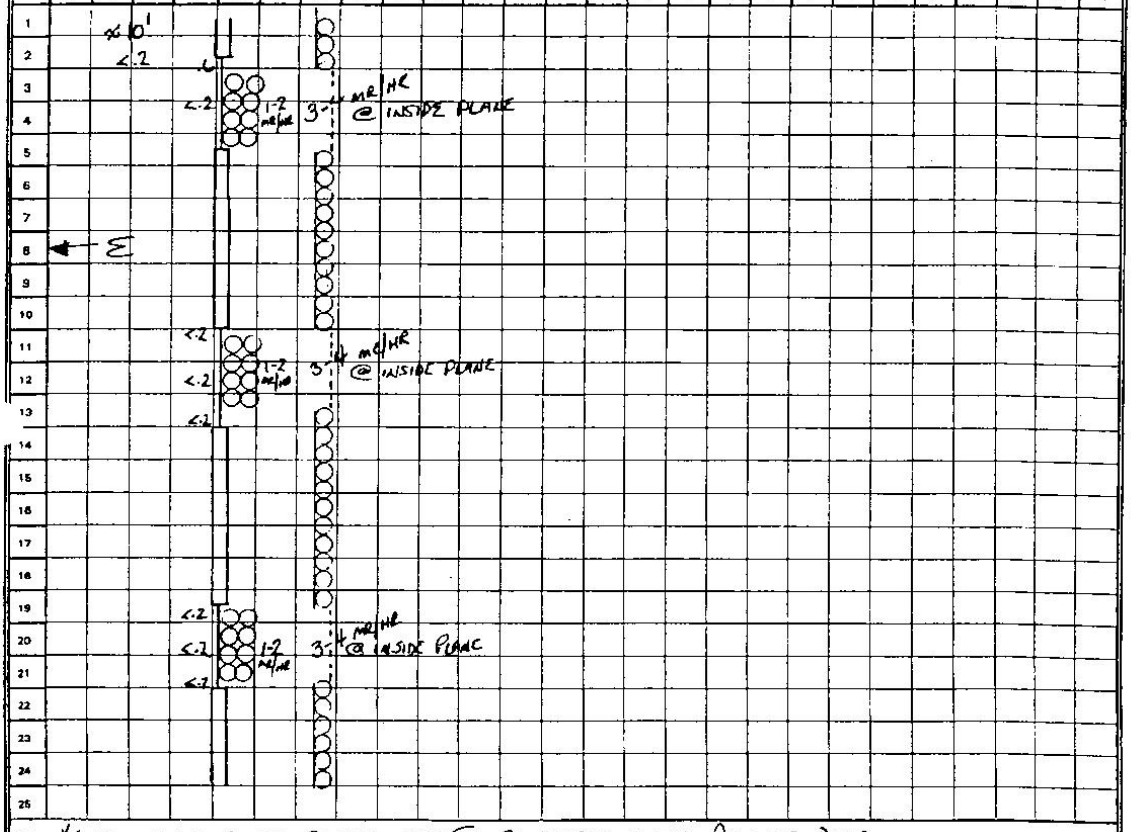
INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number_____ Page _____ of _____

Instrument/SN: RO-2 #5985	Calibration Due: 11/10/02	Site Name: HAMMOND DEPOT	Date: / Time:
Instrument/SN	Calibration Due:	Location: EAST SIDE OF BLDG.	
Instrument/SN	Calibration Due:	Purpose: VERIFY DOSE RATES ON EXTERIOR AFTER MOVING SHIELDING	
Survey Performed By (Print): R. MERKEL		Survey Performed By (Signature): R. Merkel	
☑ Battery OK ☑ HV OK ☑ Source Check OK		Grid Dimensions: _____ x _____ ☐ meters ☐ feet ☐ inches ☐ centimeters	



Notes: * EXTERIOR DOSE RATES ARE @ CONTACT WITH ROLL-UP DOOR

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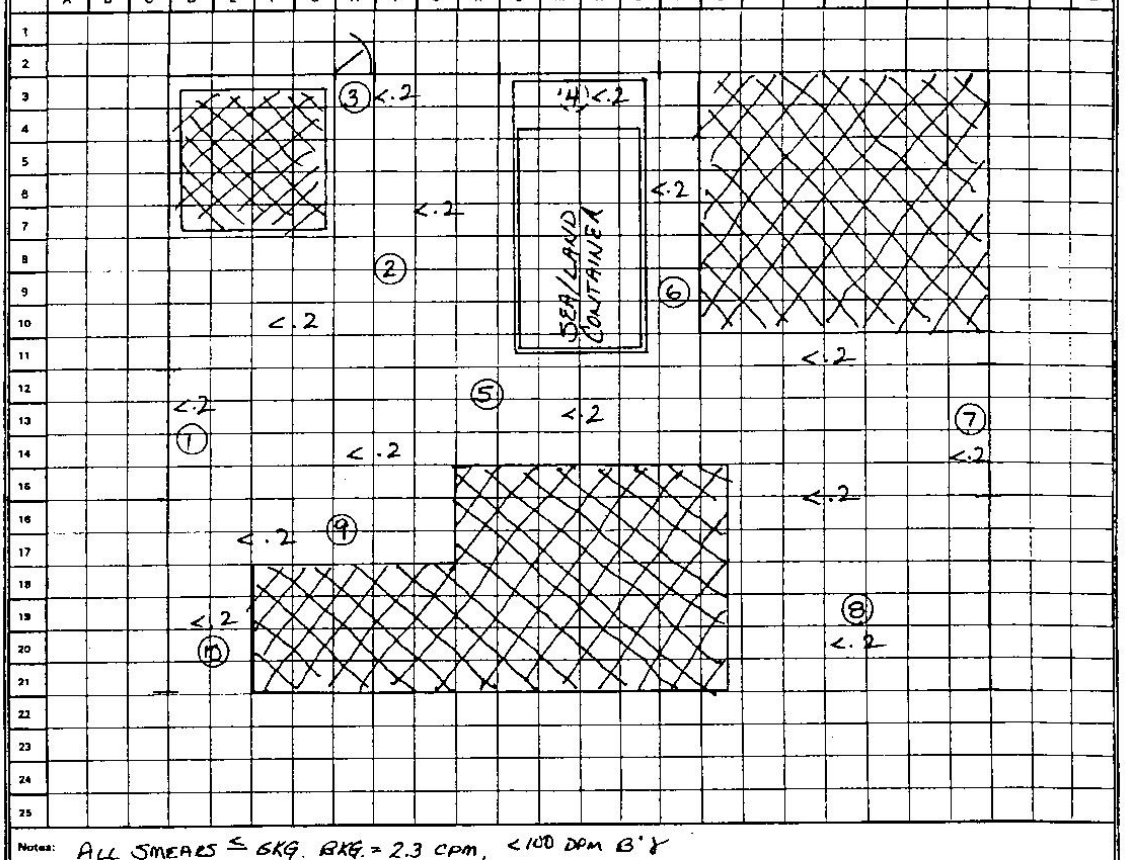
RADIOLOGICAL SURVEY FORM

Survey Number_____ Page _____ of _____

Instrument/SN: RO-2 #5985	Calibration Due: 11/10/02	Site Name: HAMMOND DEPOT	Date: / Time:
Instrument/SN 2929 # 126129	Calibration Due: 4/23/03	Location: INSIDE WAREHOUSE	
Instrument/SN	Calibration Due:	Purpose: INITIAL SURVEY	
Survey Performed By (Print): ROSS MERKEL		Survey Performed By (Signature): R. Merkel	
☑ Battery OK ☑ PHV OK ☑ Source Check OK		Grid Dimensions: _____ x _____ ☐ meters ☐ feet ☐ inches ☐ centimeters	



Notes: ALL SMEARS ≤ BKG. BKG. = 2.3 CPM, <100 DPM B'S

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number _____ Page 1 of 16

Instrument/SN: RO 2/59855	Calibration Due: 11/10/02	Site Name: CURTIS BAY	Date: 2/19/02 Time: 1400
Instrument/SN LUD 2929 #126129	Calibration Due: 4/23/03	Location: BUILDINGS 9-11, 9-12, 9-13	
Instrument/SN N/A	Calibration Due: N/A	Purpose: PRE-JOB CHARACTERIZATION	
Survey Performed By (Print): ROBB MERKEL / KEVIN KOSKO		Survey Performed By (Signature):	
☑ Battery OK ☑ HV OK ☑ Source Check OK		Grid Dimensions: N/A x N/A ☐ meters ☐ feet ☐ inches ☐ centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: PLEASE SEE ATTACHED MAPS

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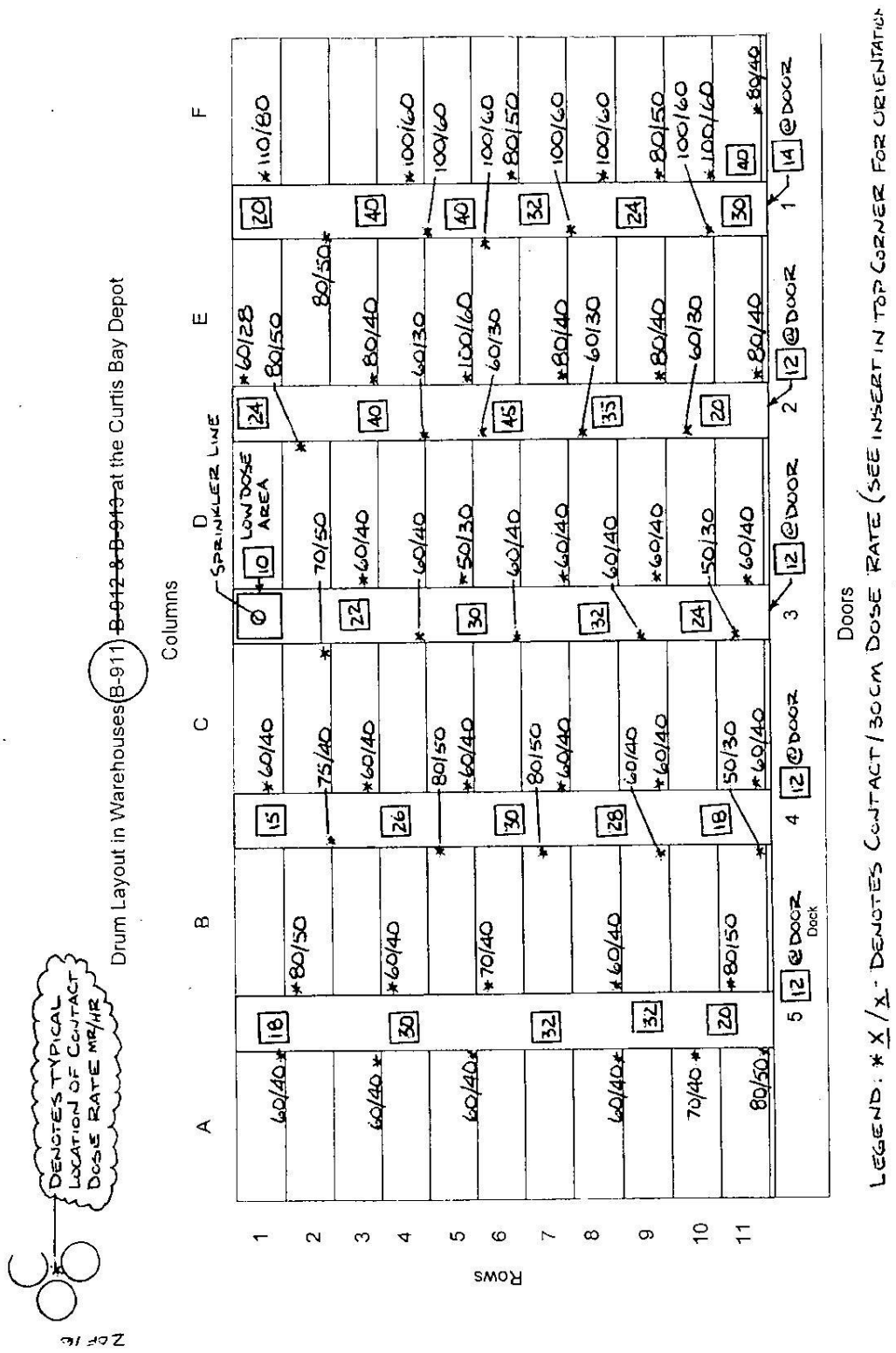
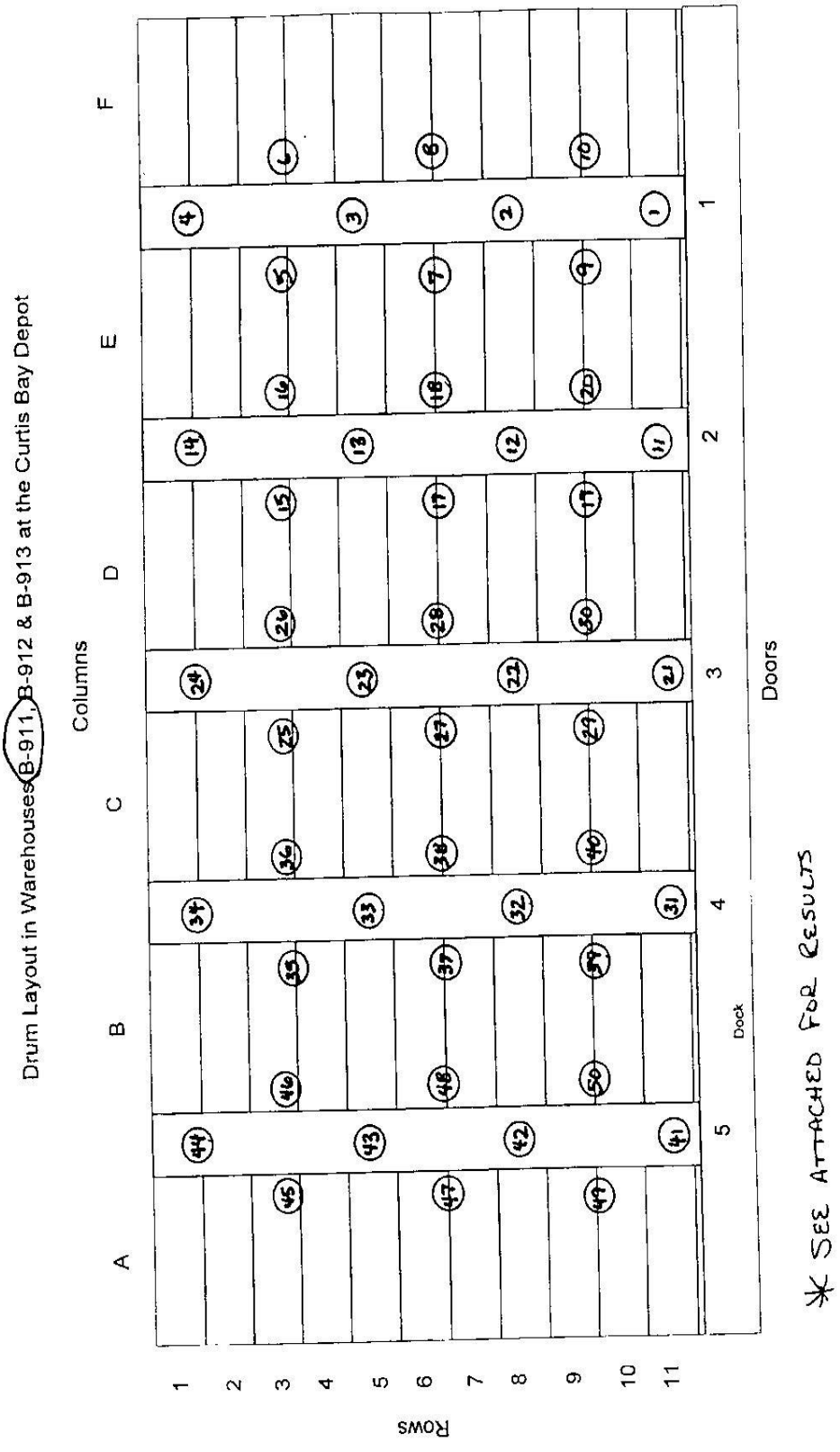

Drum Layout in Warehouses (B-911) B-912 & B-913 at the Curtis Bay Depot
DENOTES TYPICAL LOCATION OF CONTACT DOSE RATE MR/HR
Columns
A
B
C
D
SPRINKLER LINE
LOW DOSE AREA
E
F
Rows
1
2
3
4
5
6
7
8
9
10
11
Doors
@ DOOR
Dock
LEGEND: * X / X - DENOTES CONTACT / 30CM DOSE RATE (SEE INSERT IN TOP CORNER FOR ORIENTATION
- DENOTES G/A DOSE RATE IN MR/HR TAKEN @ WAIST LEVEL


Drum Layout in Warehouses B-911, B-912 & B-913 at the Curtis Bay Depot
Columns
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Doors
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* SEE ATTACHED FOR RESULTS

AUF 16

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d) α	Inst. Efficiency (c/d) β,γ	(1) Avg. Daily Bkg. Rate (cpm) α	(1) Avg. Daily Bkg. Rate (cpm) β,γ	(2) Sample counts α	(2) Sample counts β,γ	(3) Sample count time (min)	(4) Net Sample count rate (2÷3 - 1) cpm α	(4) Net Sample count rate (2÷3 - 1) cpm β,γ	(5) dpm (4 ÷ Eff) α	(5) dpm (4 ÷ Eff) β,γ	MDA α	MDA β,γ
BUILDING -911 #1	6/19/02 1400	6/20/02 1300	LUD 2929 #126129	37	29	.7	136	13	160	1 MIN	12	24	32	83	18	196
2								40	164		39	28	105	97		
3								19	170		18	34	49	117		
4								13	145		12	9	32	31		
5								9	141		8	5	22	17		
6								8	152		7	16	19	55		
7								1	140		.3	4	.8	14		
8								5	143		4	7	11	24		
9								3	145		2	9	5	31		
10								7	143		6	7	16	24		
11								7	148		6	12	16	41		
12								38	178		37	42	100	145		
13								33	153		32	17	86	59		
14								58	174		57	38	154	131		
15								6	142		5	6	14	21		
16								4	136		3	0	8	0		
17								1	134		.3	<MDA	.8	<MDA		
18								2	138		1	2	3	7		
19								3	150		2	4	5	14		

Printed Name: ROBB MERKEL/KEVIN KOSKO	Project No.: 2002006.04	Notes:
Signature: R. Merkel/	Project Location: CURTIS BAY, MD	

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5 of 16

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm	(5) dpm (4 ÷ Effi	MDA
				α B,β α B,β						
BUILDING-911 #20	6/19/02 1400	6/20/02 1300	LUD 2929 #126129	37 29	.7 136	5 152	1 MIN	4 16	11 55	
21						2 141		1 5	3 17	
22						77 191		76 55	205 190	
23						17 146		16 10	43 34	
24						19 170		18 34	49 117	
25						6 158		5 22	14 76	
26						4 149		3 13	8 45	
27						3 132		2 <BKG	5 <MDA	
28						1 142		.3 6	.8 21	
29						3 130		2 <BKG	5 <MDA	
30						4 158		3 22	8 76	
31						1 139		.3 3	.8 10	
32						3 136		2 0	5 0	
33						7 130		6 <BKG	16 <MDA	
34						6 138		5 2	14 7	
35						0 133		0 <BKG	0 <MDA	
36						1 164		.3 28	.8 97	
37						3 120		2 <BKG	5 <MDA	
38						5 148		4 12	11 41	

Printed Name:	Project No.:	Notes:
~~BOB~~ MERKEL / KEVIN KOKO	2002006.04	
Signature:	Project Location: CURTIS BAY, MD	

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6 OF 16

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm	(5) dpm (4 ÷ Eff)	MDA
				α B,γ	α B,γ				α B,γ	α B,γ
BUILDING -911 #39	6/19/02 1400	6/20/02 1300	LUD 2929 #126129	.37 29	.7 136	4 149	1 MIN	3 13	8 45	18 196
40						2 148		1 12	3 41	
41						3 132		2 <BKG	5 <MDA	
42						4 145		3 9	8 31	
43						10 172		9 36	24 124	
44						1 135		.3 <BKG	.8 <MDA	
45						0 164		0 28	0 97	
46						1 153		.3 17	.8 59	
47						3 139		2 3	5 10	
48						2 139		1 3	3 10	
49						1 141		.3 5	.8 17	
50						4 131		3 <BKG	8 <MDA	
		N/A					N/A			

Printed Name:	Project No.:	Notes:
ROD MERKEL / KEVIN KOCKA	2002006.04	
Signature: R. Merkel / [illegible]	Project Location: CURTIS BAY, MD	

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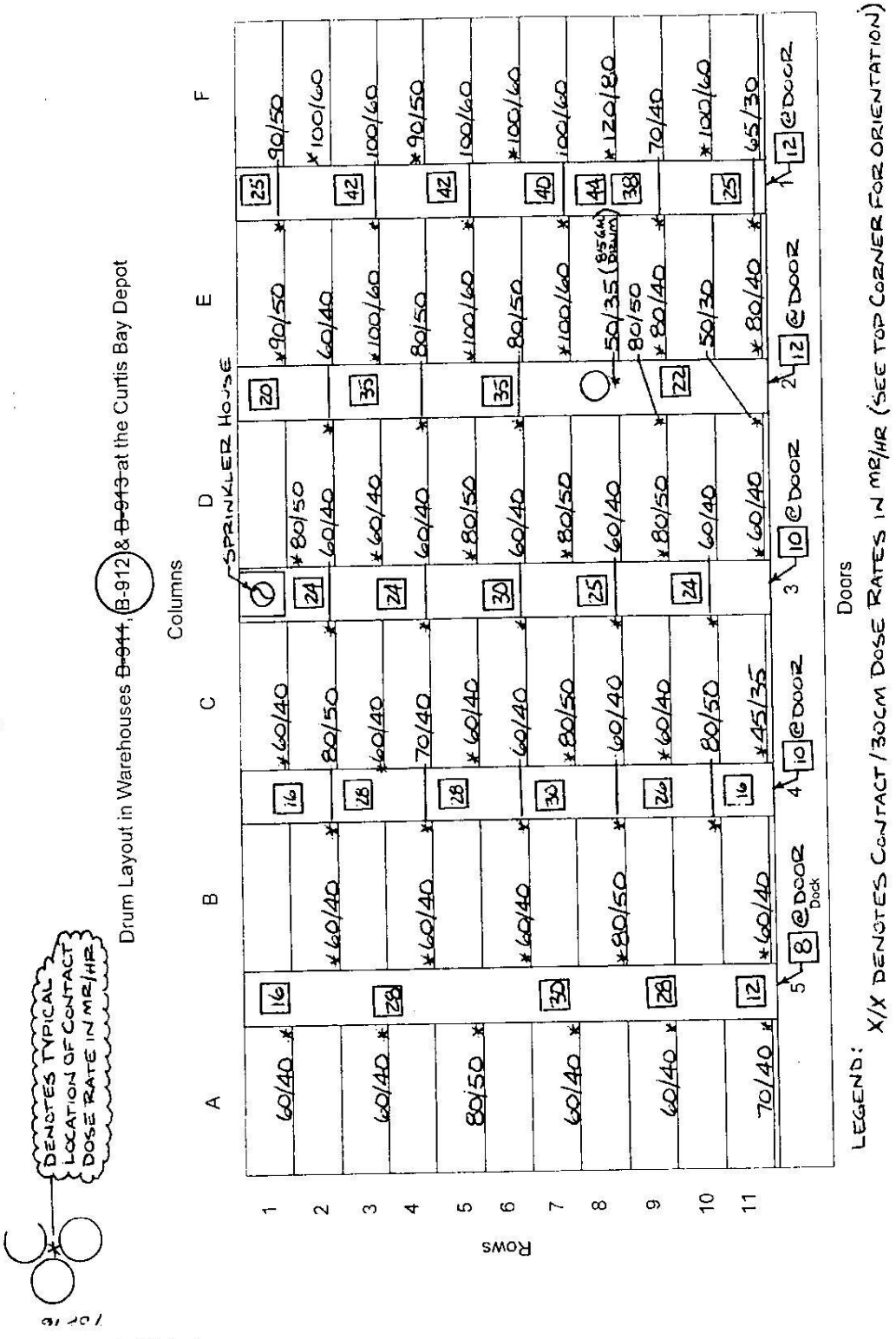
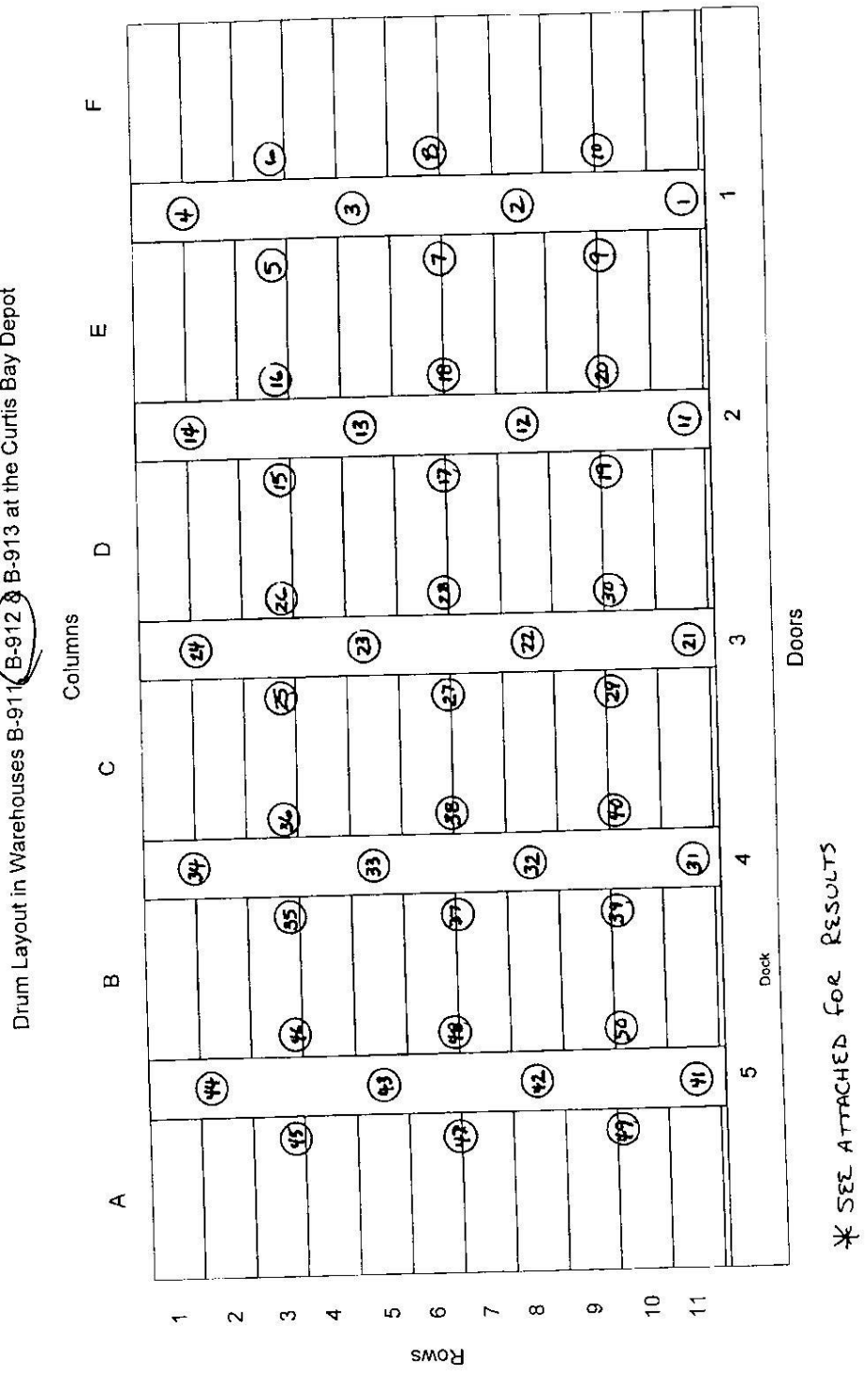

DENOTES TYPICAL LOCATION OF CONTACT DOSE RATE IN MR/HR
Drum Layout in Warehouses B-911, B-912 & B-913 at the Curtis Bay Depot
Columns
A
B
C
D
E
F
SPRINKLER HOUSE
Rows
1
2
3
4
5
6
7
8
9
10
11
Doors
@ DOOR
@ DOOR Dock
LEGEND:
X/X DENOTES CONTACT/30CM DOSE RATES IN MR/HR (SEE TOP CORNER FOR ORIENTATION)
DENOTES G/A DOSE RATE IN MR/HR TAKEN @ WAIST LEVEL


Drum Layout in Warehouses B-911, B-912 & B-913 at the Curtis Bay Depot
Columns
A
B
C
D
E
F
Rows
1
2
3
4
5
6
7
8
9
10
11
Dock
Doors
1
2
3
4
5
* SEE ATTACHED FOR RESULTS

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm	(5) dpm (4 ÷ Eff)	MDA
Building - 9/2 # 1	6/19/02 1400	6/20/02 1300	LUD 2929 #126129	37	29 .7 136	1 124	1 min	.3 <0.8	.8 <mda	18 196
2						3 113		2 <0.8	5 <mda	
3						1 138		.3 2	.8 7	
4						7 150		6 14	16 48	
5						4 141		3 5	8 17	
6						1 150		.3 14	.8 48	
7						3 149		2 13	5 45	
8						4 154		3 18	8 62	
9						4 119		3 <0.8	8 <mda	
10						4 135		3 <0.8	8 <mda	
11						0 136		0 0	0 <mda	
12						4 128		3 <0.8	8 <mda	
13						3 146		2 10	5 34	
14						3 135		2 <0.8	5 <mda	
15						1 130		.3 <0.8	.8 <mda	
16						7 150		6 14	16 48	
17						1 98		.3 <0.8	.8 <mda	
18						1 151		.3 15	.8 52	
19						4 155		3 19	8 66	

Printed Name: Doug Meece / Kevin Kosko
Signature:
Project No.: 2002006.04
Project Location: Curtis Bay, MD
Notes:

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91 of 96

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2÷3 - 1) cpm	(5) dpm (4 ÷ Eff)	MDA
										5% 8.2
Guidance-912 #20	4/19/02 1400	4/20/02 1300	LUD 2929 / 126129	37	7	1	1 min	.3	.8	18 196
						141		<MDA	<MDA	
21						0				
						137		<MDA	<MDA	
22						2		1	3	3
						164		28	97	97
23						5		4	11	31
						145		9	31	
24						2		1	3	100
						165		29	100	
25						2		1	3	<MDA
						109		<MDA	<MDA	
26						1		.3	.8	10
						139		3	10	
27						3		2	5	<MDA
						130		<MDA	<MDA	
28						0		<MDA	<MDA	<MDA
						128		19	66	
29						0		<MDA	<MDA	<MDA
						155		<MDA	<MDA	
30						0		<MDA	3	<MDA
						133		1	<MDA	
31						2		2	5	28
						129		8	28	
32						3		<MDA	<MDA	21
						144		6	21	
33						0		3	8	17
						142		5	17	
34						4		.3	.8	17
						141		5	17	
35						1		.3	.8	3
						141		1	3	
36						1		.3	.8	<MDA
						137		<MDA	<MDA	
37						0		<MDA	<MDA	<MDA
						129		5	17	
38						0		<MDA	<MDA	
						141				

Printed Name: Ross MERKEL / KEVIN KOSKO

Signature: R. Merkel / Kevin Kosko

Project No.: 2002006.04

Project Location: Curtis Bay MD

Notes:

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2÷3 - 1) cpm	(5) dpm (4 ÷ Eff)	MDA
				∝ βγ	∝ βγ	∝ βγ			∝ βγ	∝ βγ
Building - 912 # 37	6/19/02 1400	6/20/02 1300	LUD 2929 126127	37 29	1.7 136	2 114	1 MIN	1 <MDA	3 <MDA	18 196
40						1 120		3 <MDA	8 <MDA	11 206
41		6/21/02 0900		38 29	1.1 151	3 143		3 <MDA	8 <MDA	
42						0 148		<MDA 8	<MDA 28	
43						0 159		<MDA 4	<MDA 11	
44						4 140		<MDA 1	<MDA 3	
45						1 121		<MDA 2	<MDA 5	
46						2 140		<MDA 0	<MDA <MDA	
47						0 135		<MDA 5	<MDA 14	
48						5 135		<MDA 0	<MDA <MDA	
49						0 123		<MDA 1	<MDA 3	
50						1 138		<MDA	<MDA	

Printed Name: Todd Merrell / Kevin Kosko

Signature:

Project No.: 20020004.04

Project Location: Queens Bay, MD

Notes:

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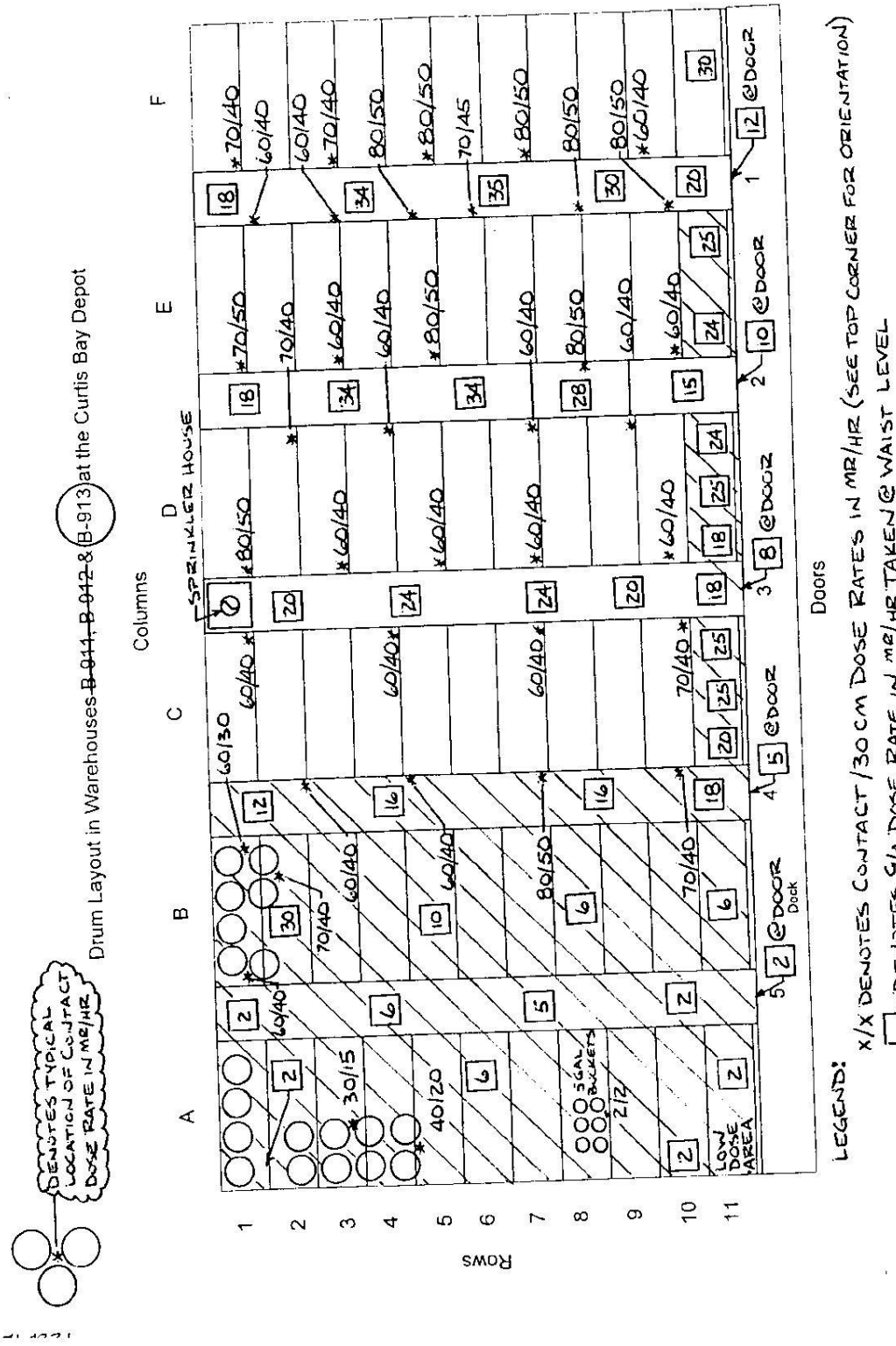
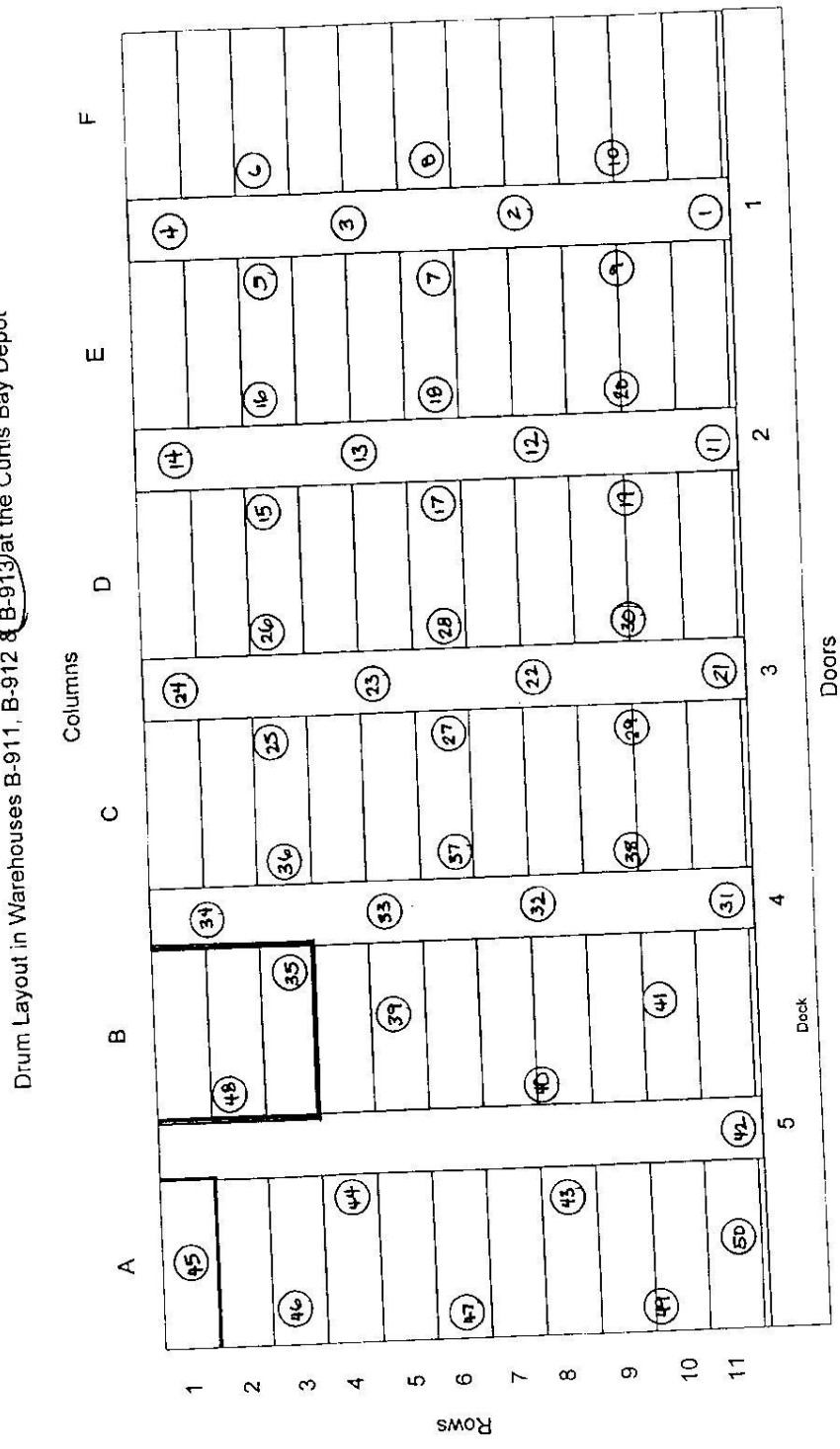

DENOTES TYPICAL LOCATION OF CONTACT DOSE RATE IN MR/HR
Drum Layout in Warehouses B-911, B-912 & B-913 at the Curtis Bay Depot
Columns
A
B
C
D
SPRINKLER HOUSE
E
F
Rows
1
2
3
4
5
6
7
8
9
10
11
Doors
@DOOR
Dock
LOW DOSE AREA
55GAL DRUMS
LEGEND:
X/X DENOTES CONTACT/30 CM DOSE RATES IN MR/HR (SEE TOP CORNER FOR ORIENTATION)
- DENOTES G/A DOSE RATE IN MR/HR TAKEN @ WAIST LEVEL
- DENOTES OPEN FLOOR AREA


Drum Layout in Warehouses B-911, B-912 & B-913 at the Curtis Bay Depot
Columns
A
B
C
D
E
F
Rows
1
2
3
4
5
6
7
8
9
10
11
Doors
1
2
3
4
5
Dock
* SEE ATTACHED FOR RESULTS

1 of 2

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm	(5) dpm (4 ÷ Eff)	MDA
				α / β,γ	α / β,γ	α / β,γ		α / β,γ	α / β,γ	α / β,γ
			LUD 2929	38 / 29	.1 / 151					11 / 206
BUILDING-913 # 1	6/19/02 1400	6/21/02 0900	#126129			0 / 135	1 MIN	<BKG / <BKG	<MDA / <MDA	
2						2 / 152		2 / 1	5 / 3	
3						1 / 146		1 / <BKG	3 / <MDA	
4						0 / 152		<BKG / 1	<MDA / 3	
5						1 / 157		1 / 6	3 / 10	
6						1 / 135		1 / <BKG	3 / <MDA	
7						3 / 136		3 / <BKG	8 / <MDA	
8						1 / 127		1 / <BKG	3 / <MDA	
9						0 / 151		<BKG / 0	<MDA / <MDA	
10						1 / 139		1 / <BKG	3 / <MDA	
11						1 / 133		1 / <BKG	3 / <MDA	
12						0 / 143		<BKG / <BKG	<MDA / <MDA	
13						0 / 134		<BKG / <BKG	<MDA / <MDA	
14						1 / 135		1 / <BKG	3 / <MDA	
15						0 / 123		<BKG / <BKG	<MDA / <MDA	
16						1 / 135		1 / <BKG	3 / <MDA	
17						3 / 155		3 / 4	8 / 14	
18						1 / 135		1 / <BKG	3 / <MDA	
19						2 / 139		2 / <BKG	5 / <MDA	

Printed Name: BOB MERKEL / KEVIN KISKA

Signature: R Merkel / [illegible]

Project No.: 2002006.04

Project Location: CURTIS BAY, MD

Notes:

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm	(5) dpm (4 ÷ Eff)	MDA
Burbank-913 # 20	6/19/02 1400	6/21/02 0900	LUD 2929 #126129	38	29 .1	151	1	133	1 min	1 <MDA 3 <MDA 11 206
21							1	148		1 <MDA 3 <MDA
22							1	134		1 <MDA 3 <MDA
23							0	139		<MDA <MDA <MDA
24							1	143		1 <MDA 3 <MDA
25							0	129		<MDA <MDA <MDA
26							0	153		<MDA 2 <MDA 7
27							0	152		<MDA 1 <MDA 3
28							2	119		2 <MDA 5 <MDA
29							1	128		1 <MDA 3 <MDA
30							1	139		1 <MDA 3 <MDA
31							1	131		1 <MDA 3 <MDA
32							0	130		<MDA <MDA <MDA
33							0	135		<MDA <MDA <MDA
34							1	170		1 19 3 6.6
35							1	134		1 <MDA 3 <MDA
36							1	148		1 <MDA 3 <MDA
37							0	117		<MDA <MDA <MDA
38						3	152			3 1 8 3

Printed Name: Ron Morrell / Kevin Kopko
Signature: R. Morrell / Kevin Kopko
Project No.: 2002006.04
Project Location: Cutts Bay, MD
Notes:

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2÷3 - 1) cpm	(6) dpm (4 ÷ Eff)	MDA
				α β γ	α β γ	α β γ			α β γ	α β γ
BUILDING - 913 * 39	6/19/02 1400	6/21/02 0900	LUD 2929 #124129	38 29	.1 151	0 138	1 min	<MDA <MDA	<MDA <MDA	11 206
40						1 131		1 <MDA	3 <MDA	
41						0 136		<MDA <MDA	<MDA <MDA	
42						1 129		1 <MDA	3 <MDA	
43						2 124		2 <MDA	5 <MDA	
44						1 137		1 <MDA	3 <MDA	
45						18 163		18 12	47 41	
46						2 164		2 13	5 45	
47						0 157		<MDA 6	<MDA 21	
48						1 154		1 3	3 10	
49						1 131		1 <MDA	3 <MDA	
50						2 143		2 <MDA	5 <MDA	

Printed Name: ROB MERKEL / KEVIN KOSKO
Signature: R. Merkel / Kevin Kosko

Project No.: 2002006.04
Project Location: CURTIS BAY, MD

Notes:

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Air Sample Count Records

AIR SAMPL OUNT RECORD

Site/Location: HAMMOND DEPOT	Project No.: 2002006.04
Emission Type (check): ☒α ☒β ☐βγ	Instrument Model/Serial No.: LUD 2929 #126129

Sample Number & Description	Date & Time of Sample Collection	Date and Time of Count	Inst. Eff. (C/D) α	β	BKGD Counts α	β	BKGD Time (min)	BKGD Count Rate (C/min) α	β	Sample Gross Counts α	β	Sample Count Time (min)	Sample Gross Count Rate (C/min) α	β	Net Sample Count Rate (C/min)* α	β	Sample Volume (ml)*	Activity Conc. (μC/ml)*	MDC*
SETTING UP EQUIP.	6/4/02 1350	6/4/02 1400	38	28	6	1520	10 MIN	.6	152	517	762	1 MIN	517	762	516.4	610	1.56^{E7}	α 4.13E-11 β 6.63E-11	α 5.05E-13 β 6.51E-12
RECOUNT	"	6/6/02 0850	38	29	5	1670		.5	167	7	167		7	167	6.5	0	"	α 5.20E-13 β 0.00	α 4.87E-13 β 6.57E-12
INSPECT GEN. WORK	6/5/02 1635	6/6/02 0910	38	29	5	1670		.5	167	129	293		129	293	128.5	126	2.41^{E7}	α 6.65E-12 β 8.56E-12	α 3.16E-13 β 4.25E-12
RECOUNT	"	6/7/02 0840	38	29	7	1790		.7	179	2	174		2	174	1.3	-5	"	α 6.73E-14 β -3.39E-13	α 3.35E-13 β 4.41E-12
SAMPLE TENT	6/5/02 1530	6/5/02 1600	38	29	1	1530		.1	153	587	2408		587	2408	586.9	2255	5.66^{E6}	α 1.29E-10 β 6.51E-10	α 9.21E-13 β 1.73E-11
RECOUNT	"	6/6/02 0840	38	29	5	1670		.5	167	1	150		1	150	.5	-17	"	α 1.10E-13 β -4.91E-12	α 1.34E-12 β 1.80E-11
GENERAL AREA	6/7/02 0830	6/7/02 0845	38	29	7	1790		.7	179	778	1144		778	1144	772.3	965	7.99^{E7}	α 1.21E-11 β 1.97E-11	α 1.01E-13 β 1.32E-12
RECOUNT	"	6/10/02 0755	38	29	8	1730		.8	173	5	195		5	195	4.2	22	"	α 6.56E-14 β 4.50E-13	α 1.07E-13 β 1.30E-12
SAMPLE TENT	6/6/02 1245	6/6/02 1255	38	29	5	1670		.5	167	114	294		114	294	113.5	127	6.51^{E6}	α 2.17E-11 β 3.19E-11	α 1.16E-12 β 1.57E-11
RECOUNT	"	6/7/02 0830	38	29	7	1790		.7	179	9	171		9	171	8.3	-8	"	α 1.58E-12 β -2.01E-12	α 1.24E-12 β 1.63E-11
GENERAL AREA	6/10/02 0745	6/10/02 0750	38	29	8	1730		.8	173	2301	3106		2301	3106	2300.2	2933	2.42^{E8}	α 1.18E-11 β 1.98E-11	α 3.52E-14 β 4.30E-13
RECOUNT	"	6/11/02 0900	38	29	7	1760		.7	176	196	424		196	424	195.3	248	"	α 1.00E-12 β 1.67E-12	α 3.33E-14 β 4.34E-13
SAMPLE TENT	6/7/02 1430	6/7/02 1445	38	29	7	1790		.7	179	191	463		191	463	190.3	284	1.02^{E7}	α 2.32E-11 β 4.55E-11	α 7.90E-13 β 1.04E-11
RECOUNT	"	6/10/02 0800	38	29	5	1670		.5	167	35	182		35	182	34.5	15	"	α 4.22E-12 β 2.40E-12	α 8.37E-13 β 1.02E-11
GENERAL AREA	6/11/02 0830	6/11/02 0845	38	29	7	1760		.7	176	712	1111		712	1111	711.3	935	8.41^{E7}	α 1.05E-11 β 1.82E-11	α 9.38E-14 β 1.25E-12
SAMPLE TENT	6/10/02 1515	6/10/02 1535	38	29	7	1790		.7	179	640	947		640	947	639.3	768	2.07^{E7}	α 3.85E-11 β 6.07E-11	α 4.13E-13 β 5.04E-12
RECOUNT	"	6/11/02 0845	38	29	7	1760		.7	176	176	437		176	437	175.3	261	"	α 1.05E-11 β 2.06E-11	α 3.90E-13 β 5.09E-12

* Net Sample Count Rate = Sample Gross Count Rate - Background Count Rate
* From Attachment 3 of this RSP (Air Sampling Data Sheet)
* Net Sample Count Rate ÷ 2.22 x 10^9 x V x Efficiency

* $MDC = \frac{2.71 + 4.65\sqrt{B_R t}}{t\,\varepsilon\,\eta}$

Health Physics Technician: R. MERKEL

AIR SAMPLE COUNT RECORD

/Location: CURTIS BAY, MD | Project No.: 2002006.04

ission Type (check): ☒α ☒β ☐βγ | Instrument Model/Serial No.: LUD 2929 # 126129

ple Number & cription	Date & Time of Sample Collection	Date and Time of Count	Inst. Eff. (C/D) α	β	BKGD Counts α	β	BKGD Time (min)	BKGD Count Rate (C/min) α	β	Sample Gross Counts α	β	Sample Count Time (min)	Sample Gross Count Rate (C/min) α	β	Net Sample Count Rate (C/min)[a] α	β	Sample Volume (ml)[b]	Activity Conc. (µCi/ml)[c]	MDC[d]
MOVING DRUMS	6/24/02 1530	6/25/02 0710	37	28	6	1420	10 MIN	.6	142	1960	2766	1 MIN	1960	2766	1959.4	2624	2.38 E7	α 1.655 E-10 β 1.87 E-10	α 3.39 E-13 β 4.144 E-12
RECOUNT	"	7/1/02 07:40	38	28	9	1380		.9	138	2	153		2	153	1.1	15	"	α 5.76 E-14 β 1.07 E-12	α 3.79 E-13 β 6.01 E-12
MOVING DRUMS	6/25/02 1450	6/25/02 1452	37	28	6	1420		.6	142	4211	7579		4211	7579	4210.4	7437	2.15 E7	α 2.51 E-10 β 5.85 E-10	α 3.74 E-13 β 4.58 E-12
RECOUNT	"	7/1/02 0740	38	28	9	1380		.9	138	2	138		2	138	1.1	0	"	α 6.37 E-14 β 0.00	α 4.18 E-13 β 6.45 E-12
MOVING DRUMS	6/26/02 1530	6/26/02 1535	37	29	7	1480		.7	148	1426	2752		1426	2752	1425.3	2604	2.80 E7	α 6.51 E-11 β 1.52 E-10	α 3.04 E-13 β 3.44 E-12
RECOUNT	"	7/1/02 0740	38	28	9	1380		.9	138	2	171		2	171	1.1	33	"	α 4.89 E-14 β 1.99 E-12	α 3.21 E-13 β 5.10 E-12
MOVING DRUMS	6/27/02 1500	6/27/02 1530	37	28	4	1460		.4	146	512	1005		512	1005	511.6	859	2.12 E7	α 3.08 E-11 β 6.85 E-11	α 3.35 E-13 β 4.68 E-12
RECOUNT	~~7/2/02~~ "	7/2/02 0730	38	29	5	1420		.5	142	0	150		0	150	-.5	8	"	α -2.93 E-14 β 6.16 E-13	α 3.57 E-13 β 4.46 E-12
SAMPLE TENT	6/27/02 1500	6/27/02 1530	37	28	4	1460		.4	146	176	362		176	362	175.6	216	1.36 E7	α 1.65 E-11 β 2.69 E-11	α 5.23 E-13 β 7.32 E-12
RECOUNT	"	7/2/02 0740	38	29	5	1420		.5	142	0	164		0	164	-0.5	22	"	α -4.58 E-14 β 2.65 E-12	α 5.38 E-13 β 6.77 E-12
MOVING DRUMS	6/28/02 1500	6/28/02 1505	37	29	3	1370		.3	137	1171	2366		1171	2366	1170.7	2229	2.12 E7	α 7.06 E-11 β 1.72 E-10	α 3.12 E-13 β 4.39 E-12
RECOUNT	"	7/8/02 0730	37	29	7	1510		.7	151	0	169		0	169	-0.7	18	"	α -4.22 E-14 β 1.39 E-12	α 4.02 E-13 β 4.59 E-12
SAMPLE TENT	6/28/02 1430	6/28/02 1505	37	29	3	1370		.3	137	230	490		230	490	229.7	353	1.95 E7	α 1.50 E-11 β 2.75 E-11	α 3.40 E-13 β 4.77 E-12
RECOUNT	"	7/8/02 0730	37	29	7	1510		.7	151	8	153		8	153	7.3	2	"	α 4.78 E-13 β 1.67 E-13	α 4.37 E-13 β 4.99 E-12
HI VOL	6/28/02 0815	6/28/02 0950	37	29	3	1370		.3	137	13	174		13	174	12.7	37	7.08 E5	α 2.27 E-11 β 8.54 E-11	α 9.37 E-12 β 1.31 E-10
RECOUNT	"	7/2/02 0745	38	29	5	1420		.5	142	0	127		0	127	-0.5	-15	"	α -8.8 E-13 β -3.46 E-11	α 1.07 E-11 β 1.35 E-10
HI VOL	6/28/02 1235	7/1/02 0845	38	28	9	1380		.9	138	1	148		1	148	.1	10	7.08 E5	α 1.76 E-13 β 2.39 E-11	α 1.27 E-11 β 2.02 E-10
RECOUNT	"	7/2/02 0745	38	29	5	1420		.5	142	0	146		0	146	-0.5	4	"	α -8.81 E-13 β 9.23 E-12	α 1.07 E-11 β 1.33 E-10
							↓					↓							

[a] Net Sample Count Rate = Sample Gross Count Rate - Background Count Rate

[b] From Attachment 3 of this RSP (Air Sampling Data Sheet)

[c] Net Sample Count Rate ÷ 2.22 x 10^6 x V x Efficiency

[d] $MDC = \frac{2.71 + 4.65\sqrt{B_R t}}{t\,eff}$

R MERKEL

AIR SAMPLE COUNT RECORD

Site/Location: CURTIS BAY, MD	Project No.: 2002006.04
Emission Type (check): ☒ α ☒ β ☐ β/γ	Instrument Model/Serial No.: LUD 2929 #126129

Sample Number & Description	Date & Time of Sample Collection	Date and Time of Count	Inst. Eff. (CPS) α	Inst. Eff. (CPS) β	BKGD Counts α	BKGD Counts β	BKGD Time (min)	BKGD Count Rate (C/min) α	BKGD Count Rate (C/min) β	Sample Gross Counts α	Sample Gross Counts β	Sample Count Time (min)	Sample Gross Count Rate (C/min) α	Sample Gross Count Rate (C/min) β	Net Sample Count Rate (C/min)* α	Net Sample Count Rate (C/min)* β	Sample Volume (ml)*	Activity Conc. (µCi/ml)*	MDC*
SAMPLE TENT	7/9/02 1400	7/10/02 1510	38	29	9	1780	10 MIN	.9	178	32	222	1 MIN	32	222	31.1	44	6.80^{E6}	α 5.70^{E-12} β 1.06^{E-11}	α 1.33^{E-12} β 1.55^{E-11}
RECOUNT	11	7/15/02 0800	38	29	6	1730		.6	173	23	205		23	205	22.4	32	11	α 4.11^{E-12} β 7.70^{E-12}	α 1.19^{E-12} β 1.53^{E-11}
MOVING DRUMS	7/10/02 1430	7/10/02 1510	38	29	9	1780		.9	178	1108 2AM	2320		1107.1	2142	2.18^{E7}		α 6.33^{E-11} β 1.61^{E-10}	α 4.13^{E-13} β 4.84^{E-12}
RECOUNT	11	7/16/02 0800	38	29	5	1470		.5	147	1	148		1	148	.5	1	11	α 2.86^{E-14} β 7.50^{E-14}	α 3.48^{E-13} β 4.49^{E-12}
SAMPLE TENT	7/10/02 1430	7/10/02 1520	38	29	9	1780		.9	178	876	1507		876	1507	875.1	1329	1.87^{E7}	α 5.84^{E-11} β 1.16^{E-10}	α 4.82^{E-13} β 5.65^{E-12}
RECOUNT	11	7/17/02 0800	38	28	9	1540		.9	154	26	154		26	154	25.1	0	11	α 1.67^{E-12} β 0.00	α 4.82^{E-13} β 5.47^{E-12}
MOVING DRUMS	7/11/02 1530	7/11/02 1535	38	29	7	1850		.7	185	51	250		51	250	50.3	65	7.65^{E6}	α 8.20^{E-12} β 1.39^{E-11}	α 1.05^{E-12} β 1.40^{E-11}
RECOUNT	11	7/16/02 0800	38	29	5	1470		.5	147	0	157		0	157	-0.5	10	11	α -8.15^{E-14} β 2.14^{E-12}	α 9.92^{E-13} β 1.26^{E-11}
SAMPLE TENT	7/11/02 1510	7/11/02 1535	38	29	7	1850		.7	185	142	356		142	356	141.3	171	5.66^{E6}	α 3.11^{E-11} β 4.93^{E-11}	α 1.42^{E-12} β 1.89^{E-11}
RECOUNT	11	7/16/02 0800	38	29	5	1470		.5	147	23	166		23	166	22.5	19	11	α 4.95^{E-12} β 5.48^{E-12}	α 1.34^{E-12} β 1.70^{E-11}
MOVING DRUMS	7/12/02 1530	7/12/02 1540	38	28	6	1420		.6	142	109	373		109	373	108.4	231	2.38^{E7}	α 5.68^{E-12} β 1.64^{E-11}	α 3.37^{E-13} β 4.14^{E-12}
RECOUNT	11	7/17/02 0800	38	28	9	1540		.9	154	1	146		1	146	.1	-8	11	α 5.24^{E-15} β -5.69^{E-13}	α 3.79^{E-13} β 4.30^{E-12}
SAMPLE TENT	7/12/02 1430	7/12/02 1540	38	28	6	1420		.6	142	365	795		365	795	364.4	653	2.04^{E7}	α 2.22^{E-11} β 5.42^{E-11}	α 3.95^{E-13} β 4.83^{E-12}
RECOUNT	11	7/17/02 0800	38	28	9	1540		.9	154	68	208		68	208	67.1	54	11	α 4.10^{E-12} β 4.48^{E-12}	α 4.42^{E-13} β 5.02^{E-12}
SAMPLE TENT	7/15/02 1400	7/15/02 1430	38	29	6	1730		.6	173	415	901		415	901	414.4	728	1.87^{E7}	α 2.76^{E-11} β 6.37^{E-11}	α 4.31^{E-13} β 5.57^{E-12}
RECOUNT	11	7/16/02 0800	38	29	5	1470		.5	147	231	476		231	476	230.5	329	11	α 1.53^{E-11} β 2.88^{E-11}	α 4.06^{E-13} β 5.17^{E-12}
SAMPLE TENT	7/16/02 1400	7/16/02 1430	38	29	5	1470		.5	147	560	1134		560	1154	559.5	1007	1.70^{E7}	α 4.10^{E-11} β 9.67^{E-11}	α 4.46^{E-13} β 5.69^{E-12}
RECOUNT	11	7/17/02 0800	38	28	9	1540		.9	154	200	453		200	453	199.1	299	11	α 1.46^{E-11} β 2.98^{E-11}	α 5.30^{E-13} β 6.02^{E-12}

* Net Sample Count Rate = Sample Gross Count Rate - Background Count Rate

* From Attachment 3 of this RSP (Air Sampling Data Sheet)

* Net Sample Count Rate ÷ 2.22 x 10^6 x V x Efficiency

* $MDC = \frac{2.71 + 4.65\sqrt{B_R t}}{t\,\varepsilon\,\eta}$

Health Physics Technician: P. MERKEL

AIR SAMPLE COUNT RECORD

Site/Location: CURTIS BAY, MD | Project No.: 2002006.04

Emission Type (check): ☒ α ☒ β ☐ βγ | Instrument Model/Serial No.: LUD 2929 # 126129

Sample Number & Description	Date & Time of Sample Collection	Date and Time of Count	Inst. Eff. (CPD) α	β	BKGD Counts α	β	BKGD Time (min)	BKGD Count Rate (C/min) α	β	Sample Gross Counts α	β	Sample Count Time (min)	Sample Gross Count Rate (C/min) α	β	Net Sample Count Rate (C/min)[a] α	β	Sample Volume (ml)[b]	Activity Conc. (μCi/ml)[c]	MDC[d]
MOVING DRUMS	7/1/02 1500	7/1/02 1505	38	28	9	1380	10 min	.9	138	985	2153	1 min	985	2153	984.1	2015	2.21^{E7}	α 3.56 E-11 β 1.54E-10	α 4.48E-13 β 6.48E-12
RECOUNT	"	7/8/02 0730	37	29	7	1510		.7	151	0	183		0	183	-0.7	32	"	α -4.05 E-14 β 2.37 E-12	α 3.86 E-13 β 4.42 E-12
SAMPLE TENT	7/1/02 1530	7/1/02 1505	38	28	9	1380		.9	138	332	642		332	642	331.1	504	1.70^{E7}	α 2.43 E-11 β 5.02 E-11	α 5.30 E-13 β 8.42 E-12
RECOUNT	"	7/8/02 0730	37	29	7	1510		.7	151	7	151		7	151	6.3	0	"	α 4.74E-13 β 0.00	α 5.02E-13 β 5.74E-12
MOVING DRUMS	7/2/02 1500	7/2/02 1510	38	29	5	1420		.5	142	2397	4502		2397	4502	2396.5	4360	2.21^{E7}	α 1.25E-10 β 3.23 E-10	α 3.43E-13 β 4.29E-12
RECOUNT	"	7/8/02 0730	37	29	7	1510		.7	151	1	152		1	152	.3	1	"	α 1.73 E-14 β 7.40 E-14	α 3.86 E-13 β 4.42 E-12
SAMPLE TENT	7/2/02 1500	7/2/02 1510	38	29	5	1420		.5	142	1000	1830		1000	1830	999.5	1688	2.21^{E7}	α 5.64E-11 β 1.25E-10	α 3.43E-13 β 4.29E-12
RECOUNT	"	7/9/02 0800	38	28	4	1460		.4	146	46	158		46	158	45.6	12	"	α 2.57E-12 β 9.20E-13	α 3.22 E-13 β 4.50 E-12
MOVING DRUMS	7/3/02 1100	7/3/02 1130	38	28	9	1500		.9	150	374	587		374	587	373.1	437	1.01^{E7}	α 4.56E-11 β 7.26E-11	α 8.37E-13 β 9.90E-12
RECOUNT	"	7/10/02 0805	38	29	9	1780		.9	178	0	181		0	181	-0.9	3	"	α -1.10E-13 β 4.81E-13	α 8.83E-13 β 1.09E-11
SAMPLE TENT	7/3/02 1100	7/3/02 1130	38	28	9	1500		.9	150	371	522		371	522	370.1	372	1.02^{E7}	α 4.52 E-11 β 6.78 E-11	α 8.37E-13 β 9.90 E-12
RECOUNT	"	7/10/02 0805	38	29	9	1780		.9	178	17	202		17	202	16.1	24	"	α 1.96 E-12 β 3.85 E-12	α 8.93E-13 β 1.08 E-11
MOVING DRUMS	7/8/02 1515	7/8/02 1530	37	29	7	1510		.7	151	1569	3156		1569	3156	1568.3	3005	2.29^{E7}	α 8.75 E-11 β 2.14E-10	α 3.72E-13 β 4.25 E-12
RECOUNT	"	7/15/02 0800	38	29	6	1730		.6	173	3	202		3	202	2.4	29	"	α 1.30E-13 β 2.07E-12	α 3.51E-13 β 4.54 E-12
SAMPLE TENT	7/8/02 1400	7/8/02 1530	37	29	7	1510		.7	151	116	287		116	287	115.3	136	6.80^{E6}	α 2.17E-11 β 3.27E-11	α 1.24E-12 β 1.43 E-11
RECOUNT	"	7/15/02 0800	38	29	6	1730		.6	173	24	220		24	220	23.4	47	"	α 4.29E-12 β 1.13 E-11	α 1.19 E-12 β 1.53 E-11
MOVING DRUMS	7/9/02 0830	7/9/02 1520	38	28	4	1460		.4	146	1150	2321		1130	2321	1129.4	2175	2.04^{E7}	α 6.91E-11 β 1.81E-10	α 3.49 E-13 β 4.88 E-12
RECOUNT	"	7/15/02 0800	38	29	6	1730		.6	173	3	208		3	208	2.4	35	"	α 1.46 E-13 β 2.81 E-12	α 3.95 E-13 β 5.11 E-12

[a] Net Sample Count Rate = Sample Gross Count Rate - Background Count Rate
[b] From Attachment 3 of this RSP (Air Sampling Data Sheet)
[c] Net Sample Count Rate ÷ 2.22 x 10^6 x V x Efficiency

[d] $MDC = \frac{2.71 + 4.65\sqrt{B_R t}}{t\,\varepsilon\,\eta}$

Health Physics Technician: P Mcovci

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Drum Survey Records

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)		(1) Avg. Daily Bkg. Rate (cpm)		(2) Sample counts		(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm		(5) dpm (4 ÷ Eff) α		MDA α	
LOT 32 DRUM 45	6/5	6/5	LUD 2929 12/6/27	38	29	.1	153	1	157	1 MIN	.9	6	2	20	11	207
28 30	6/5	"		38	29	"	"	3	151		2.9	0	7	0	11	207
20 39	6/6	6/6		38	29	.5	167	4	161		3.9	0	10	0	16	216
45 22	6/6			38	29			1	157		.9	0	2	0		
43 44	6/6			38	29			1	137		.9	0	2	0		
49 2	6/6			38	29			2	158		1.9	0	5	0		
2 49	6/6	"		38	29	"	"	3	170		2.9	3	7	10	"	"
23 42	6/7	6/7		38	29	.7	179	3	177		2.9	18	7	62	17	224
30 6	6/7			38	29			4	184		3.9	5	10	17		
8 18	6/7			38	29			2	179		1.9	0	5	0		
29 4	6/7	"		38	29	"	"	5	159		4.9	0	13	0	"	"
10 46	6/10	6/10		38	29	.8	173	12	181		11.9	8 2σ	31	28	18	220
48 40	6/10			38	29			3	207		2.9	34	7	117		
47 6	6/10			38	29			5	170		4.9	0	13	0		
38 25	6/10	"	"	38	29	"	"	7	142	"	6.9	0	18	0	"	"

Printed Name: R. MERKEL	Project No.: 2002006.04	Notes: ALL LAWS WERE <20 DPM α, <1000 DPM β, γ
Signature: R. Merkel	Project Location: HAMMOND DEPOT	

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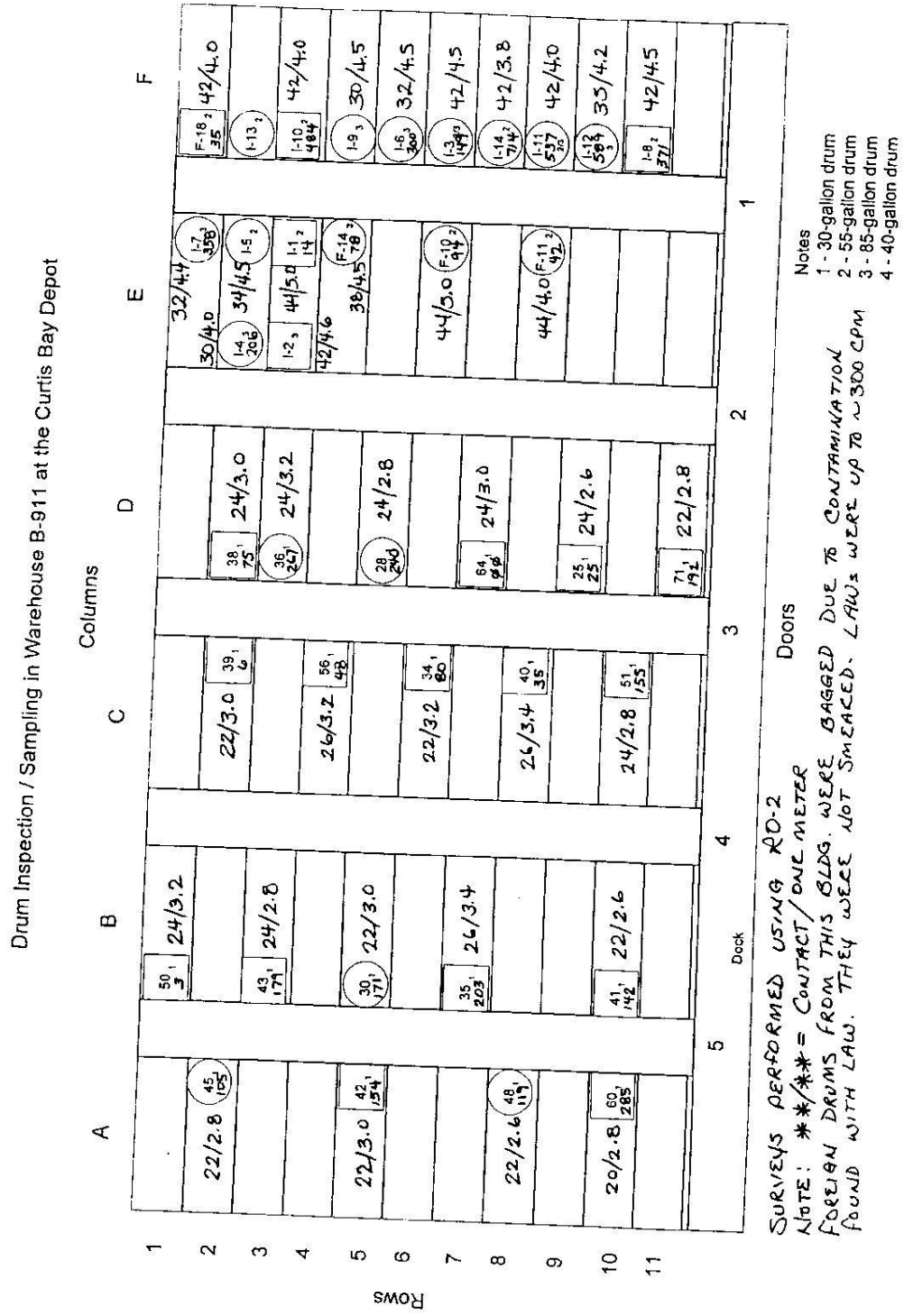
Drum Inspection / Sampling in Warehouse B-911 at the Curtis Bay Depot
Columns
A
B
C
D
E
F
Rows
1
2
3
4
5
6
7
8
9
10
11
Dock
Doors
Surveys performed using RO-2
Note: **/**= Contact/one meter
Foreign drums from this bldg. were bagged due to contamination
found with law. They were not smeared. Laws were up to ~300 cpm
Notes
1 - 30-gallon drum
2 - 55-gallon drum
3 - 85-gallon drum
4 - 40-gallon drum

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)		(1) Avg. Daily Bkg. Rate (cpm)		(2) Sample counts		(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm		(5) dpm (4 ÷ Eff)		MDA	
BLDG. 911 DRUMS				α	β,γ	α	β,γ	α	β,γ		α	β,γ	α	β,γ	α	β,γ
45-105	6/24/02	6/24/02 1430	LUD 2929 126129	38	29	.9	143	0	131	1 MIN	0	0	0	0	18	201
42-154								1	128		.1	0	.26	0		
48-119								0	142		0	0	0	0		
60-285								0	142		0	0	0	0		
50-3								6	131		5.1	0	13	0		
43-179								1	154		.1	11	.26	38		
30-171								0	142		0	0	0	0		
35-203								1	145		.1	2	.26	7		
41-142								3	139		2.1	0	6	0		
39-6								5	127		4.1	0	11	0		
56-48								1	150		.1	7	.26	24		
34-80								4	135		3.1	0	8	0		
40-35								0	153		0	10	0	34		
51-155								3	155		2.1	12	6	41		
38-75								5	141		4.1	0	11	0		
36-267								2	128		1.1	0	3	0		
28-240								3	141		2.1	0	6	0		
64-00								5	162		4.1	19	11	66		
25-25								4	137		3.1	0	8	0		
71-192	↓	↓	↓	↓	↓	↓	↓	5	140	↓	4.1	17	11	59	↓	↓

Printed Name: ROBB MERKEL	Project No.: 2002006.04	Notes: LARGE AREA WIPES TAKEN ON EACH DRUM WERE ALL <20 DPM/LAW α AND <1000 DPM/LAW β,γ.
Signature: R. Merkel	Project Location: CURTIS BAY, MD	

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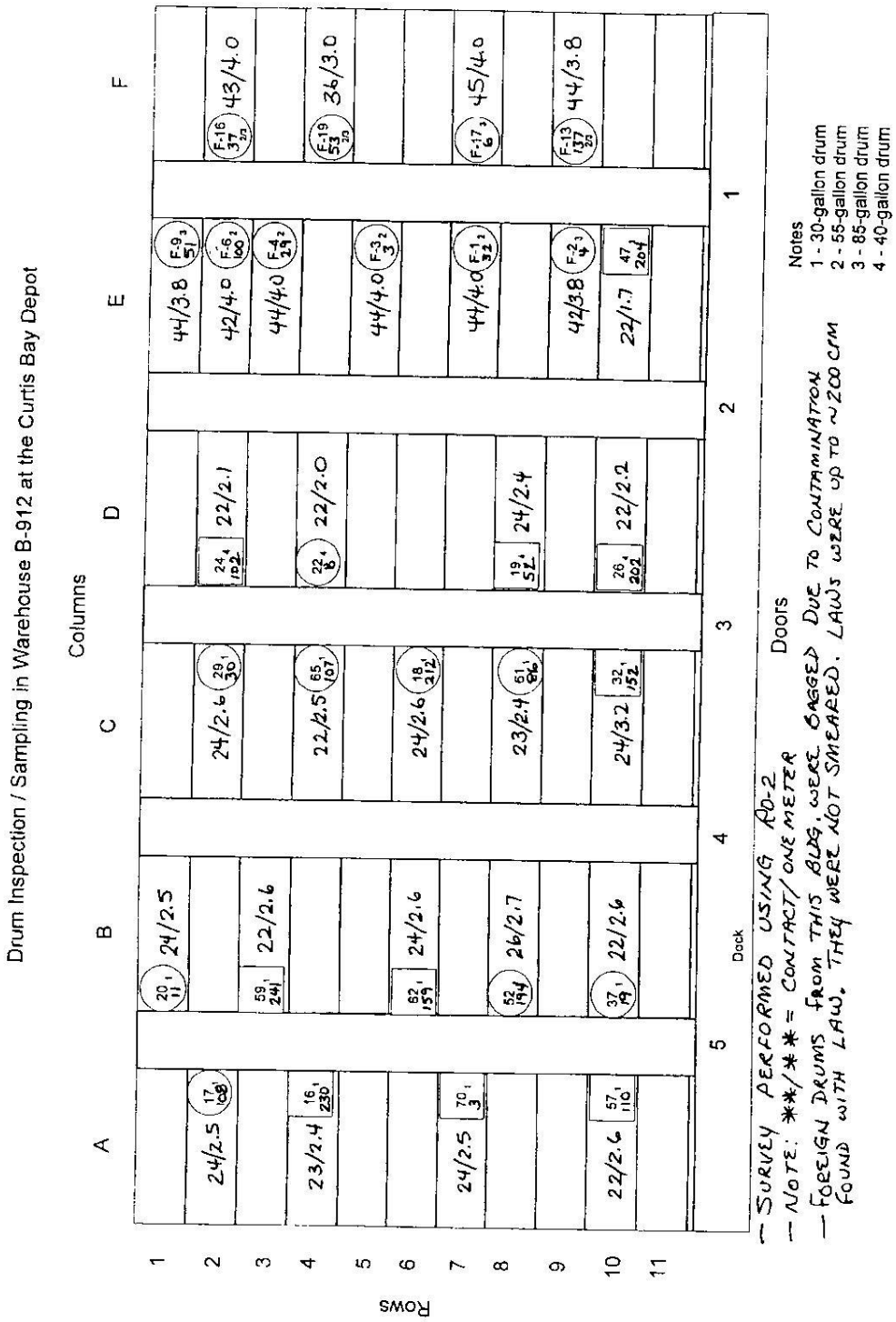
Drum Inspection / Sampling in Warehouse B-912 at the Curtis Bay Depot
Columns
A
B
C
D
E
F
Rows
1
2
3
4
5
6
7
8
9
10
11
Dock
Doors
1
2
3
4
5
Notes
1 - 30-gallon drum
2 - 55-gallon drum
3 - 85-gallon drum
4 - 40-gallon drum
- SURVEY PERFORMED USING AD-2
- NOTE: **/** = CONTACT/ ONE METER
- FOREIGN DRUMS FROM THIS BLDG. WERE GAGGED DUE TO CONTAMINATION FOUND WITH LAW. THEY WERE NOT SMEARED. LAWS WERE UP TO ~200 CPM

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)		(1) Avg. Daily Bkg. Rate (cpm)		(2) Sample counts		(3) Sample count time (min)	(4) Net Sample count/rate (2÷3 - 1) cpm		(5) dpm (4 ÷ Eff)		MDA	
				α	β,γ	α	β,γ	α	β,γ		α	β,γ	α	β,γ	α	β,γ
BLDG. 912 DRUMS																
26-~~103~~ 202	7/8/02	7/8/02 1500	LUD 2929 126129	37	29	.7	151	1	181	1 MIN	.3	30	1	103	18	206
32-152								1	176		.3	25	1	86		
61-86								5	200		4.3	49	12	169		
18-212								2	173		1.3	22	4	75		
65-107								2	202		1.3	51	4	176		
29-30								4	187		3.3	36	9	~~125~~ 124		
19-52								1	183		.3	32	1	110		
22-8								3	167		2.3	16	6	55		
24-~~108~~ 102								3	184		2.3	33	6	114		
57-~~232~~ 110								2	189		1.3	38	4	131		
37-19								1	173		.3	22	1	76		
52-194								1	196		.3	45	1	155		
62-159								1	169		.3	18	1	62		
70-3								1	188		.3	37	1	128		
16-230								3	184		2.3	33	6	114		
59-241								2	179		1.3	48	4	166		
20-11								3	191		2.3	40	6	138		
17-108								1	177		.3	26	1	90		
47-204	↓	↓	↓	↓	↓	↓	↓	2	175	↓	1.3	24	4	83	↓	↓

Printed Name: ROBB MERKEL	Project No.: 2002006.04	Notes: LARGE AREA WIPES TAKEN ON EACH DRUM WERE ALL <20 DPM/LAW α AND <1000 DPM/LAW β,γ.
Signature:	Project Location: CURTIS BAY, MD	

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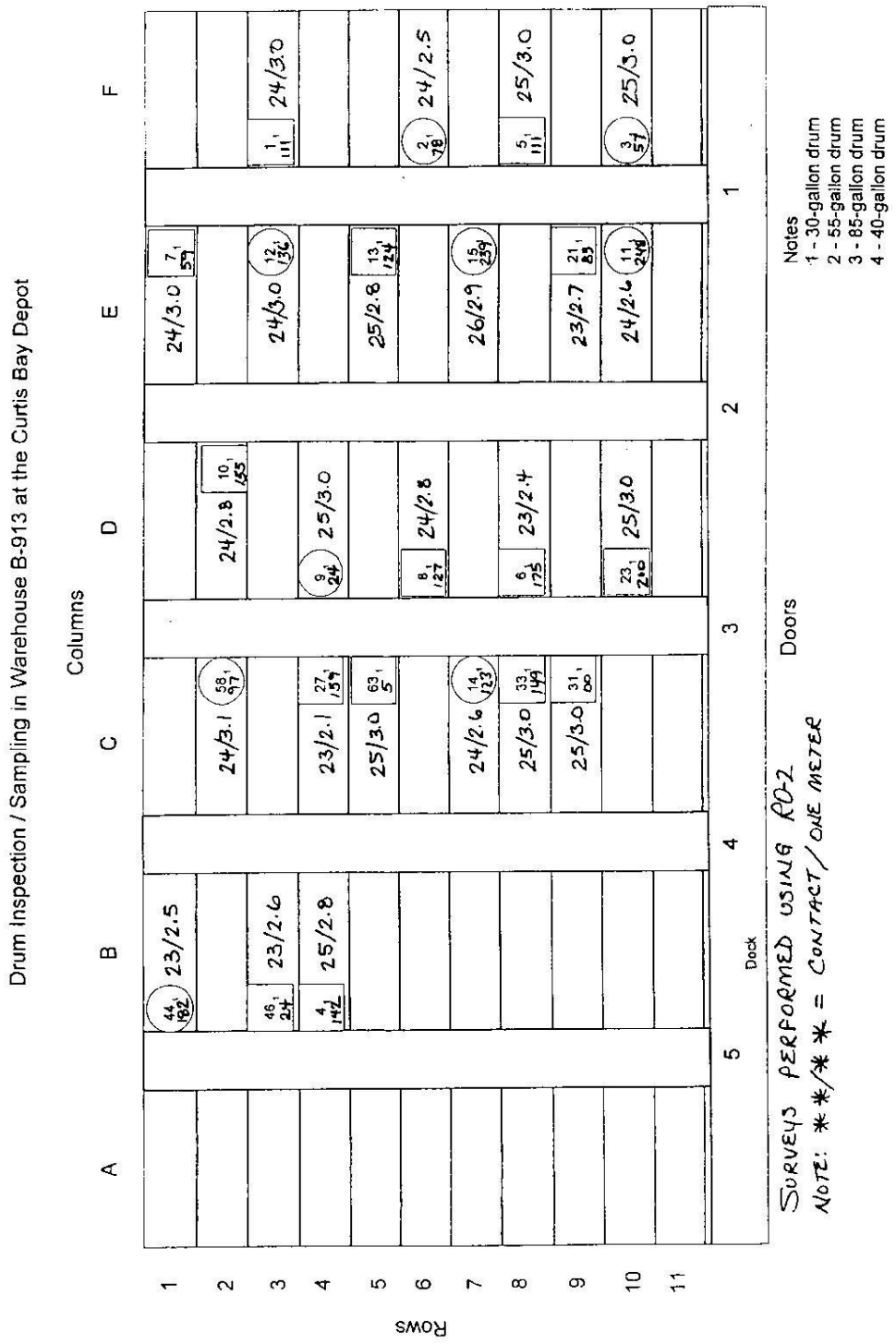
Drum Inspection / Sampling in Warehouse B-913 at the Curtis Bay Depot
Columns
A
B
C
D
E
F
Rows
1
2
3
4
5
6
7
8
9
10
11
Dock
Doors
Notes
1 - 30-gallon drum
2 - 55-gallon drum
3 - 85-gallon drum
4 - 40-gallon drum
SURVEYS PERFORMED USING RO-2
NOTE: **/** = CONTACT/ONE METER

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d) ∝	Inst. Efficiency (c/d) B,γ	(1) Avg. Daily Bkg. Rate ∝ (cpm)	(1) Avg. Daily Bkg. Rate B,γ	(2) Sample counts ∝	(2) Sample counts B,γ	(3) Sample count time (min)	(4) Net Sample count rate (2 + 3 - 1) cpm ∝	(4) Net Sample count rate (2 + 3 - 1) cpm B,γ	(5) dpm (4 ÷ Eff) ∝	(5) dpm (4 ÷ Eff) B,γ	MDA ∝	MDA B,γ
BLDG. 913 DRUMS	7/12/02	7/12/02 1430	LUD 2929 126/29	38	28	.6	142	SEE BELOW		1 MIN	SEE BELOW		SEE BELOW		17	208
1-111								2	139		1.4	0	4	0		
2-78								0	149		0	7	0	25		
5-111								3	150		2.4	8	6	28		
3-57								1	167		.4	25	1	89		
7-59								0	190		0	48	0	171		
12-136								1	143		.4	1	1	4		
13-124								2	143		1.4	1	4	4		
15-239								2	152		1.4	10	4	36		
21-83								3	151		2.4	9	6	32		
14-123								3	169		2.4	27	6	96		
33-149								2	146		1.4	4	4	14		
31-00								3	135		2.4	0	6	0		
44-182								1	152		.4	10	1	36		
46-24								3	125		2.4	0	6	0		
4-142								1	145		.4	3	1	11		
11-248								1	164		.4	22	1	79		
10-135								2	131		1.4	0	4	0		
9-24	↓	↓	↓	↓	↓	↓	↓	2	139	↓	1.4	0	4	0	↓	↓

Printed Name: ROBB MERKEL	Project No.: 2002006.04	Notes: LARGE AREA WIPES TAKEN ON EACH DRUM WERE ALL <20 DPM/LAW ∝ AND <1000 DPM/LAW B,γ.
Signature: Robb R. Merkel	Project Location: CURTIS BAY, MD	

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)		(1) Avg. Daily Bkg. Rate (cpm)		(2) Sample counts		(3) Sample count time (min)	(4) Net Sample count rate (2 ÷ 3 - 1) cpm		(5) dpm (4 ÷ Eff)		MDA	
913 DRUMS CONT.				α	β,γ	α	β,γ	α	β,γ		α	β,γ	α	β,γ	α	β,γ
8-127	7/12/02	7/12/02 1430	LUD 2929 126129	38	28	.6	142	1	176	1 MIN.	.4	34	1	121	17	208
6-175								3	159		2.4	17	6	60		
23-200								0	164		0	22	0	79		
58-97								1	150		.4	8	1	29		
27-159								1	151		.4	9	1	32		
63-5								2	167		1.4	25	4	89		

Printed Name: ROBB MERKEL	Project No.: 2002006.04	Notes: LARGE AREA WIPES TAKEN ON EACH DRUM WERE ALL <200 DPM/LAW α AND <1000 DPM/LAW β,γ.
Signature:	Project Location: CURTIS BAY, MD	

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APPENDIX M

POTENTIAL MECHANISMS FOR GENERATION OF HEADSPACE GAS IN THE MD-1 DRUMS

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The analytical results from the gas samples collected from an MD-1 drum's headspace are reported by Mattus (2003). Table 9 in the main body of the report presented the analytical results of the major constituents in the headspace gases of the MD-1 drums. With respect to atmospheric air, the major constituent that contributed to the headspace gas was carbon dioxide. The results also showed the presence of small quantities of NO_x in the headspace gas. This can be attributed to the decomposition of nitric acid which was present in the ThN matrix. Potential mechanisms for the formation of carbon dioxide in the drum's headspace gas are discussed below.

M.1 CARBON DIOXIDE GENERATION

The thorium nitrate matrix was formed from a crystallization technique. The objective was to have the thorium solidified as a nitrate matrix, so excess nitric acid was necessary. Thus, some nitric acid remained in the thorium nitrate matrix. Most likely, over time, the nitric acid seeped from the thorium nitrate matrix and into the polyethylene bag. The acid then penetrated through the polyethylene bags (through pin holes) and fiber board drums until it reached the slaked lime (calcium hydroxide) that was present in the void space between the polyethylene liner and the outer polyethylene bag.

Equation M-1 shows the chemical reaction that occurs when nitric acid reacts with calcium hydroxide. Initially, the water that is formed would be present as hydrate molecules on the calcium nitrate product rather than a free liquid. At first glance, it does not appear that the reaction of nitric acid with the slaked lime could explain the generation of carbon dioxide gas since there is not any carbon dioxide in the products shown in equation M-1.

$$Ca(OH)_2 + 2HNO_3 \longrightarrow Ca(NO_3)_2 + 2H_2O \qquad \textbf{(M-1)}$$

Equation M-4 shows that carbon dioxide would be formed if nitric acid reacted with calcium carbonate.

$$CaCO_3 + 2HNO_3 \longrightarrow Ca(NO_3)_2 + CO_2 + H_2O \qquad \textbf{(M-2)}$$

Since historical records indicate that slaked lime (calcium hydroxide and not calcium carbonate) was used in the drums, a mechanism for the presence of calcium carbonate in the drums would have to be defined for the reaction shown in Eq. M-2 to explain the presence of CO_2. Two potential mechanisms have been identified.

The first potential mechanism for calcium carbonate to be present in the slaked lime is that it was present as an impurity in the slaked lime when the slaked lime was originally purchased. The purity of the slaked lime that was used by the drum repackaging vendor is not known, but the vendor probably did not use slaked lime of high purity. Different purities of slaked lime are commercially available, and slaked lime commonly contains some calcium carbonate. One vendor for lime found on an internet site listed the following composition for their lime: $Ca(OH)_2$ 92%, MgO 1.4%, SiO_2 1.1%, Mn_2O_3 0.8%, and $CaCO_3$ 1.5%. Another manufacturer of lime listed the following as their composition: Calcium Hydroxide 30 – 45%, Magnesium Hydroxide 0 – 5%, Silicon Dioxide 0 – 20%, Calcium Carbonate 0 – 15%, Aluminum Oxide 0.1 – 1%, and Iron Oxide 0 – 0.5%. These two examples illustrate that a wide range of purities of lime are available, and that calcium carbonate could have been in the slaked lime used by the drum repackager.

The physical packaging layer conditions and sampling experience indicates the inner bag (heat sealed during the 1984 repackaging campaign) in contact with the polyethylene liner hold pressure after the drum is opened. The mechanism by which the gas entered this bag cannot be stated with complete assurance. The gases may have entered through the same leak path that the nitric acid fumes escaped and condensed on the outer packaging surfaces. The original repackaging records (prior to the metal drum repackaging in mid 1984) do not mention that calcium hydroxide was used for neutralizing nitric acid leaks, so the CO_2 present in the inner bag sample is assumed to have leaked and/or diffused over the past 18 years from the liner head space. Gas diffusion can be expected through the polyethylene liner, which has a slip-fit head, and through the polyethylene bags. The diffusion rate varies for different gas species (e.g., CO_2 versus O_2 molecules), and it is also affected by temperature, pressure, and concentration gradient.

The second potential mechanism for the presence of calcium carbonate in the slaked lime would be by direct reaction of carbon dioxide (in air) with the calcium hydroxide as shown by Eq M-3. This could have occurred if the drum repackager did not provide special care to maintain the material separate from air.

$$Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O \qquad \textbf{(M-3)}$$

Other possibilities for the generation of carbon dioxide include, but are not necessarily limited to, the following: the reaction of nitrates with fiberboard drum or wood (would also cause a reduction in NO_2), reaction of oxygen with wood (would cause a reduction in oxygen), and the bacterial metabolic action (would cause a reduction in oxygen).

If calcium hydroxide was still present (i.e., unreacted) when the reaction represented by Eq. M-2 occurred, then it would have consumed the carbon dioxide gas that was generated by Eq. M-2 to form additional calcium carbonate, as previously illustrated in Eq. M-3. Therefore, carbon dioxide should not appear as a gas product until the calcium hydroxide is saturated or protected by a diffusion barrier of reaction products.

The exact amount of slaked lime in the drums is not crucial to understanding and bracketing the internal pressures. The availability of $Ca(OH)_2$ is not the limiting reactant since only a small quantity of calcium carbonate is required to produce elevated pressures. Under those conditions, all the drums would be seriously bowed and failing. The availability of the nitric acid condensation and its associated mass transfer to the calcium carbonate are the likely factors that limit the gas pressure. These factors are likely to vary from drum to drum, and thus the internal pressure will likewise vary from drum to drum.

Thermochemical software (HSC Chemistry version 5) was used to evaluate an environment that was typical for the MD-1 drums. The pressure was assumed to be 1 atmosphere, and temperature was assumed to be 20˚C. The starting materials included air (4:1, N_2:O_2), calcium hydroxide (30% converted to calcium carbonate), and varying quantity of nitric acid (from a small amount to an excess). The calculation allowed product species (but not necessarily present in the calculated equilibrium) as shown below.

Gases
- All NO_x type gases (NO, N_2O, etc.) and HNO_3
- CO and CO_2
- H_2O, N_2, O_2

Solution (ideal)
- H_2O and HNO_3, but no carbonates, etc.

Distinct solid phases

$Ca(OH)_2$

$CaCO_3$

$Ca(NO_3)_2 \cdot nH_2O$, where n = 0 to 4

The results from the calculation included the following.

1. HNO_3 formed $Ca(NO_3)_2$ or its hydrates when $Ca(OH)_2$ or $CaCO_3$ were present.
2. $Ca(OH)_2$ was consumed before $CaCO_3$; therefore, no CO_2 appeared until the $Ca(OH)_2$ was consumed.
3. Water that was generated by the reaction of calcium hydroxide and nitric acid (see Eq. M-3) hydrated the calcium nitrate molecules rather than forming solutions.
4. Oxygen and nitrogen formed additional nitrate.

Results 1 through 3 are considered plausible, but result 4 would not be expected to occur.

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APPENDIX N

DEPARTMENT OF ENERGY'S EXPERIENCE WITH PRESSURIZED DRUMS

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The history of U.S. Department of Energy (DOE) experience with pressurized drums is summarized in several sources prepared by DOE (February 1993 and January 1997) and other references (Sferrazza May 2002) from the commercial sector. Routine drum management activities at DOE sites have included storage, handling, sampling, shipment, and waste treatment – all of which have required drums of materials to be opened. The same types of activities with drum containers have also been practiced at sites and material storage depots managed by the Defense National Stockpile Center (DNSC).

Several drum openings at DOE sites activities have resulted in violent pressure releases that resulted in either serious worker injury and/or the spread of contamination. Injuries have occurred from open-head drum lids and retaining rings being released under pressure as high-speed projectiles. Such releases can cause the drum contents to be sprayed out, contaminating the surrounding area, exposing hazardous materials and requiring expensive decontamination and cleanup.

During the 1990s, drum handling activities at DOE sites increased significantly, which contributed to the increased number of incidents involving pressurized drums. During the period 1992 – 1999, there were approximately 120 incidents at DOE sites that involved incompatible chemical mixing and pressurization of drums to unknown levels (Larranaga, Volz, and Bolton 1999). A list and description of some of the most significant of these events is given in Table N-1. These events were associated with drums containing various types of materials. DOE has developed its own database for pressurized drums. Information in this database for incidents that occurred through 1999 shows the following distribution of root causes for events involving pressurized drums: management problem (42 %), procedure problem (22 %), design problem (18 %), and personnel error (18 %). Such events can also be divided into three major groups of causes: inadequate administrative control (44 %), work organization/planning deficiency (33%), and handling policy not adequately defined, disseminated , or enforced (23 %).

There are two major characteristics of pressurized drum reactions from lid removal activities. It has been noted that violent reactions are possible even with drums that have relatively low internal pressures. In addition, violent reactions from large upward forces will occur on the drum lid. As an example, an initial internal drum pressure of 8 psi in a 55-gal open-head drum is associated with an initial force (as measured by the moment of inertia) of over 3000 lb-ft.

Minimizing the hazards from opening drums can be achieved by implementing a sound health and safety (H&S) program, recognizing the characteristics of potentially pressurized drums, and employing and observing safety practices.

Major characteristics of pressurized drums include the following:

- Bulging at top or bottom,
- Difficulty in depressing lid with flex test,
- Lid has higher tone after being tapped compared to the lid of a drum not under pressure, and
- Material contents are subject to degradation, chemical reaction, and changes in temperature and pressure.

Internal pressure in a drum can result from biological reactions, chemical reactions, radiological degradation, or reaction of the drum with its contents; volatilization of vapor pressure from liquids or solids stored in the drum; and changes in storage conditions such as temperature or elevation.

To develop training criteria and a method for determining internal drums pressures, recent research at Los Alamos National Laboratory (LANL) examined the effect of pressure on new closed- and open-head metal drums and metal overpacks (Larranaga, Volz, and Bolton, 1999; Brown March 1999). The scope of the LANL research covered drums of various sizes, but the results are

Table N-1. Significant events of DOE pressurized drum experience

Date	Site	Container (material)	Incident description	Reference[a]
1976	ANL-E	55-gal drum	Explosion of drum in truck. Caused by xylene and pentane in drum diffusing through a polyvinylchloride pouch and collecting in drum's void space. Mixture was ignited by an electrical discharge from either plastic bags containing solid radioactive waste or by electricity from the piezoelectric crystals of a discarded ultrasonic cleaner.	Silva 1992
1992	ANL-W	Not identified	A hazardous waste accumulation container ruptured because incompatible wastes were mixed in an analytical laboratory. Two quarts of liquid acidic waste were mixed with 4 gal of acidic wastes in a 5-gal plastic container. A technician immediately placed the lid on the container. The oxidation between dilute nitric acid and the waste cause a gas buildup that ruptured the container.	DOE April 1992
1991	Fernald	55-gal drum	Drum containing waste materials violently ruptured when moved with a forklift. Chemical reaction of wastes in drum produced hydrogen, which overpressurized the drums.	DOE January 1991
1992	Fernald	55-gal drum inside an 85-gal overpack	Lid on 85-gal drum blew off when operator removed the bolt on the drum lid-locking ring. The 85-gal drum lid was rusted and the 55-gal drum lid had rusty holes, one of which had bulges around it. The bulges suggest that 55-gal drum may have ruptured prior to blow off of the larger drum's lid. Carbon dioxide buildup in the drum caused the overpressure. The drum contained bio-nitrification sludge.	DOE September 1992
1992	RFETS	55-gal drum	Deformed liquid waste drum found during an inspection. Container was made of a translucent plastic without vents and held about 15 gal of hazardous materials with vapor pressures sensitive to temperature changes. Rising temperatures volatilized the chemical wastes and overpressurized the container.	DOE August 1992
1992	Paducah	Container not identified	Swelling waste containers that had organic materials with the potential to generate gases when stored. Gas generation is believed to occurred from incompatibility of the container with the wastes, bacterial growth in wastes, and storage of wastes with low boiling points.	DOE July 1992
1992	Hanford	55-gal drums	Bulging containers found in the 200 West Area of the site. Emergency response teams moved drums into a building. One of the drums was opened; the others will be opened later. Incident report fails to cite the cause of vapor generation that caused the overpressurization of the drums.	DOE August 1992a

Table N-1. (continued)

Date	Site	Container (material)	Incident description	Reference[a]
1995	PNNL	Drum (capacity not identified)	Workers loosened a drum lid's clamp ring, and the lid forcibly dislodged from the drum and hit an overhead light fixture. Four 120-ml bottles were thrown from the drum and the contents spilled on the floor.	DOE January 1995
1995	Grand Junction (GJPO)	55-gal drum (new open-top metal drum)	A radiation technician was removing the lid of a new open-top metal drum when pressure buildup within the drum caused the lid to blow off. The technician was preparing the drum for storage of solid mixed waste. There was no visible indication of pressurization such as bulging or distortion.	Rust Geotech, Inc. June 1995

[a]References cited in this table are included in the reference list.

summarized below for 30-gal and 85-gal drums because of their relevance to the DNSC thorium nitrate stockpile. From the standpoint of these drums, the objectives of the LANL research was to determine at what pressures 30-gal and 85-gal overpacks experience failure. In this investigation, the drums were pressurized from 0 psig to failure in intervals of 5.0 psig. Linear deformation was along the center line of the metal drums was measured and recorded with the corresponding pressures. Observations of the deformation were made with a spotting scope approximately 75 ft from the test apparatus.

Summary of LANL Tests for 30-gal Drums (Metal Drums)

Four 30-gal metal drums (2 open-head, 2 closed head) revealed the presence of significant hazards when they were pressurized in these tests. Hazards found when the containers were subjected under high pressure resulted in the following observations or conclusions:

- Extremely high pressures (> 120 psig) can occur in the 30-gal metal closed head drums.
- 30-gal metal drums can maintain extremely high pressures without venting.
- Failure of 30-gal metal drums under high pressure conditions can be anticipated as catastrophic and extremely violent.
- Other than bulging, no apparent failure indicators (e.g., pinging) can be noted.
- 30-gal metal drums (both closed-head and open-head) appear to bulge at only the top and bottom ends.
- Of the two 30-gal metal open-head drums tested, one failed explosively, and one self-vented. Both of these drums maintained pressures greater than 50 psig.

Features found in five 30-gal high-density polyethylene (HDPE) plastic drums when pressurized included:

- Both seam and seamless construction drums failed at pressures above 45 psig.
- Both seam and seamless construction drums can maintain high pressures for extended periods.
- Four of five seamless construction drums failed explosively from the side at no particular location on the drum, making the drum a projectile.
- The drums appear to bulge from the top, bottom, and sides.

Summary of LANL Tests for 85-gal Drums (Metal Overpacks)

Six 85-gal metal overpacks tested failed at or below 16 psig and appeared to self-vent immediately adjacent to the placement of the nut and bolt fastener on the ring. The overpacks appeared to bulge only at the top and bottom ends of the drum.

Recommendations from the LANL Tests that Pertain to 30-gal and 85-gal drums are:

1. A strong potential exists for both closed- and open-head 30-gal metal drums to fail explosively.
2. All of the open-head 85-gal drums tested self-vented.
3. 30-gal metal closed head drums can hold and maintain pressures in excess of 120 psig.
4. One of two open-head 30-gal metal drums tested failed explosively.
5. Two of four 30-gal drums of HDPE failed explosively out of the side of the drum, and other two self-vented.

Based on past experience, potential useful equipment can be used for depressurizing drums. Such equipment are a part of engineering controls (Sferrazza May 2002) and includes:

- Straps
  Contact (phone): Louie Sferrazza/EET Corporation (865/671-7800)
- High-efficiency particulate air (HEPA) filters
  Contact (phone): Terry Wickland/Nuclear Filter Technology (303/384-9785)

Documentation of the DOE experience with pressurized drums has also been incorporated in an emergency responder reference video, "Bulging Drums – What Every Responder Should Know," recently developed by LANL (LANL 1999). The video is a useful educational tool for waste handlers, hazardous materials teams, and fire fighters; and is available upon request from either Meredith Brown (phone: 505/667-0604; e-mail: racer@lanl.gov) or Michael Larranaga (phone: 505/665-9396) of LANL.

In summary (Sferrazza May 2001), each unopened drum container should be treated as follows:

- Follow documented procedures and implement adequate controls,
- Evaluate material contents and storage container history for potential problems,
- Observe for any bulging,
- Perform flex test,
- Perform tone test and note unusually high tone,
- Use engineering controls to ensure worker safety.

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APPENDIX O

FOLLOW-UP DRUM PRESSURE TESTING

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During the 2002 sampling campaign, approximately half of the MD-1 drums that were opened showed some evidence of gas pressurization. This section discusses the series of drum pressurization experiments performed on the MD-1 and IN-1 packages. These experiments were designed to attempt to answer several questions:

- How much pressure might an MD-1 drum hold and would it self vent prior to reaching approximately 7 psig (about 1.5 atmospheres–allowed by the NTS WAC);
- Could deformation of the MD-1 drum lid be used to quantify current or past pressurization;
- How much pressure was required to "pop" the lid of an MD-1 drum through a loosened locking ring;
- Why was no pressure noted in the IN-1 packages (even though both the MD-1 and IN-1 packages potentially have slaked lime in contact with nitric acid); and
- Would the IN-1 package hold pressure if the closure was changed from the current lever lock to a bolt-type locking ring?

ORNL staff members at the National Transportation Research Center (NTRC) carried out the experiments.

O.1 INTRODUCTION

During the sampling campaign designed to collect ThN samples for trace metal analysis and oxidizer classification testing, it became apparent that several of the MD-1 drums were pressurized to some extent. During the drum opening process, gas could be heard escaping from many drums. Often the internal polyethylene bags would rise up after the lid was removed, and in a few cases, the lid popped off when the locking ring was loosened.

Final sampling records indicated that only 20 of the 60 drums opened did not have either head space pressure, pressure from internal packaging (i.e. bags) or both. In addition to the quantitative data developed during the drum opening process, one drum was observed to have blown its lid (Fig. 28). Several other drums were observed to have permanently deformed lids. All these effects are presumably from gas pressure.

These findings, coupled with the NTS WAC requirement that waste packages must not be pressurized to more than 1.5 atmospheres at 20°C (approximately 7 psig), raised the question of how much pressure could the MD-1 package contain. Would the MD-1 drum self vent prior to 7 psig by blowing or creasing the drumhead?

Almost as striking as the discovery of pressure in the MD-1 drums was the lack of pressurization observed in the IN-1 drums. Both packages have slaked lime used as part of the packaging. In both cases, the slaked lime is designed to neutralize any nitric acid that leaks from the inner packages. In the case of the IN-1 packages, the reason for repackaging was that the original, now the inner, packages were leaking nitric acid. Thus it was expected that the IN-1 packages should have evolved gas in much the same manner that the MD-1 packages had. However, there was no pressure observed in any of the IN-1 packages; why?

To answer these questions two copies of both the MD-1 and IN-1 packages were shipped to the NTRC. These copies were pressurized under a variety of conditions and locking ring configurations. Briefly, the tests showed the following.

- MD-1 drums with a poor drum to lid seal (e.g., rust on the drum curl surface, aged gasket, dented lid edges) leak at low pressure and probably will not be pressurized if stored more than a few days
- MD-1 drums with a good lid seal, in other words in a new or like new condition, hold pressure up to at least 15 psig without leaking. The drum lids demonstrated plastic deformation of over 0.1 in. at 7 psig. Creasing began at 14 psig and was visible at 15 psig. The drums did not necessarily leak once the crease formed.
- MD-1 drums with loosened locking rings and a pressurized bag inside lost the drumhead at approximately 3 psig.
- IN-1 drums with the current lever locking rings installed leak at less than 1 psig.
- IN-1 drums with the new bolted locking rings installed will hold pressure up to at least 15 psig.

O.2 TEST SETUP

The packages consisted of drum bodies, drum lids, and locking rings. In the case of the IN-1 package, a pair of new bolt rings were also sent. All of these components were unused original parts that had been stored at the depots after the repackaging operations were completed. In the case of the MD-1 drumheads, there are two configurations: (1) Flat (Fig. O-1) and (2) Corrugated with three concentric folds (Fig. O-2).

A system for safely pressurizing the test drums was designed and built at the Package Research Facility (PRF) of the NTRC. This system used the facility compressed air supply (~100 psig clean dried air) as the pressure source. This high-pressure air was regulated to the appropriate pressure and delivered to the package being tested via a control board built for this test. The control board consists of

- a precision gas pressure regulator, used to reduce the air pressure going to the test package;
- a 0-60 psi pressure gauge that is incremented in 1 pound divisions;
- a 0-10 cc/min flow meter that was used to determine if a package had begun to leak (the flow meter could be bypassed for the initial pressurization of the package); and
- a set of valves that allowed air into the package or permitted air to be released from the package.

Fig. O-1. MD-1 package with flat drumhead.

Fig. O-2. MD-1 drumhead showing corrugated drumhead.

Figure O-3 shows a schematic of the control board that was used to introduce air into the package during testing, and Fig. O-4 shows a photograph of the board. This control board was located approximately 30 ft from the package undergoing testing. In addition, researchers were shielded from possible fragments due to a package rupture by surrounding the test package with drums filled with water and placing the test package under the slightly raised platen of a static compression machine (Fig. O-5).

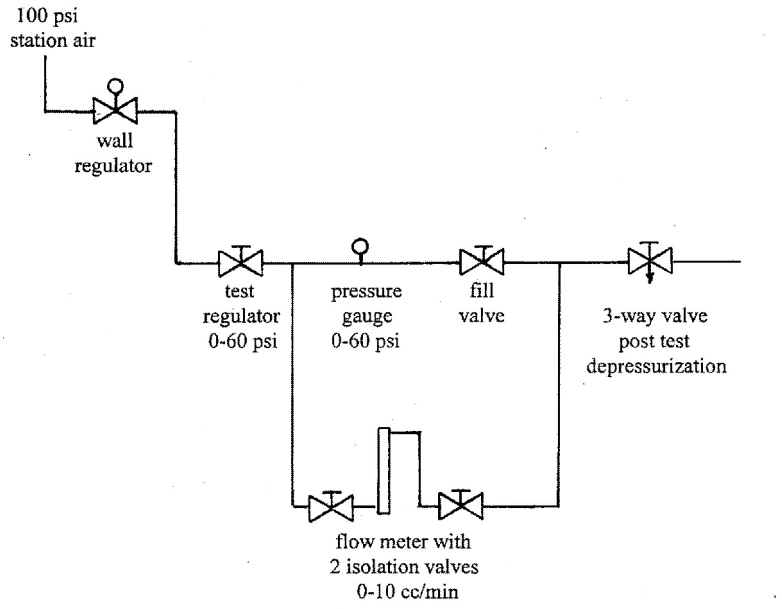

Fig. O-3. Schematic of air pressure control board.

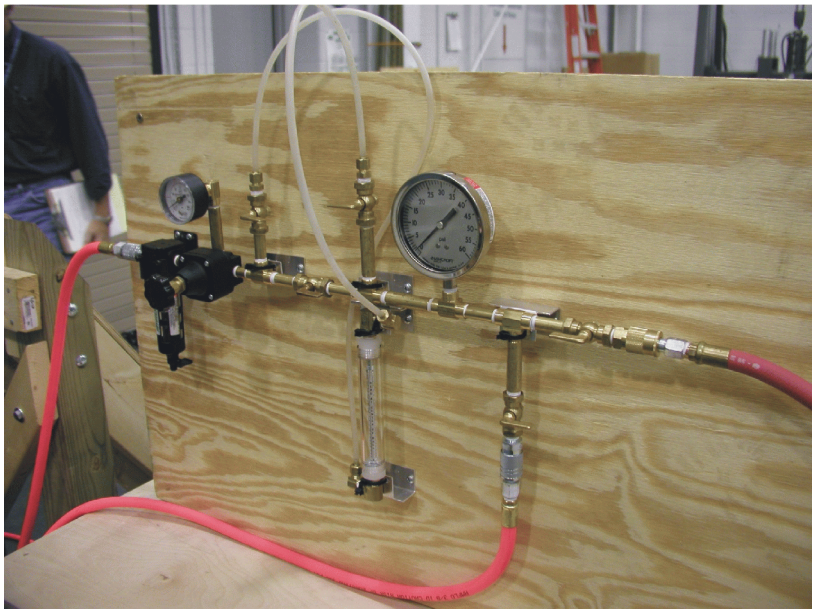

Fig. O-4. Photograph of air pressure control board.

In order to introduce the pressurized air, the drums were drilled approximately 2 in. below the top curl, and a bulkhead fitting was installed. To minimize the amount of compressed air contained in the test package and the amount of energy should the package rupture, the drums were filled with water to just below the bulkhead fitting. Figure O-6 shows an MD-1 drum with the bulkhead fitting and filled with water just prior to installation of the drumhead.

A dial micrometer was used to measure head deflection. The micrometer was attached to the compression tester cross head bar using a magnetic base. This provided a shielded stationary position for the instrument. A bolt in the platen head was removed and replaced with a bolt that had been drilled to pass a 1/8-in. diameter rod. One end of this rod rested on the drumhead during testing. The dial micrometer probe rested on the other end of the rod. This arrangement allowed the accurate transmission of head deflection without requiring the dial micrometer be adjacent to the package should it rupture. Figure O-5 shows the head deflection measurement system in use.

O.3 PACKAGE TEST SCENARIOS

There were a total of four tests performed on the MD-1 and IN-1 packages. Two tests were performed on each package configuration. For the MD-1 package, two different types of tests were performed:

1. drum pressurization with the goals of determining elastic and plastic drumhead deformation and whether the drum would self vent at less than 15 psig, and
2. drumhead removal by a pressurized bag located inside the drum with the goal of determining at what pressure the drumhead would "pop" through a loosened locking ring.

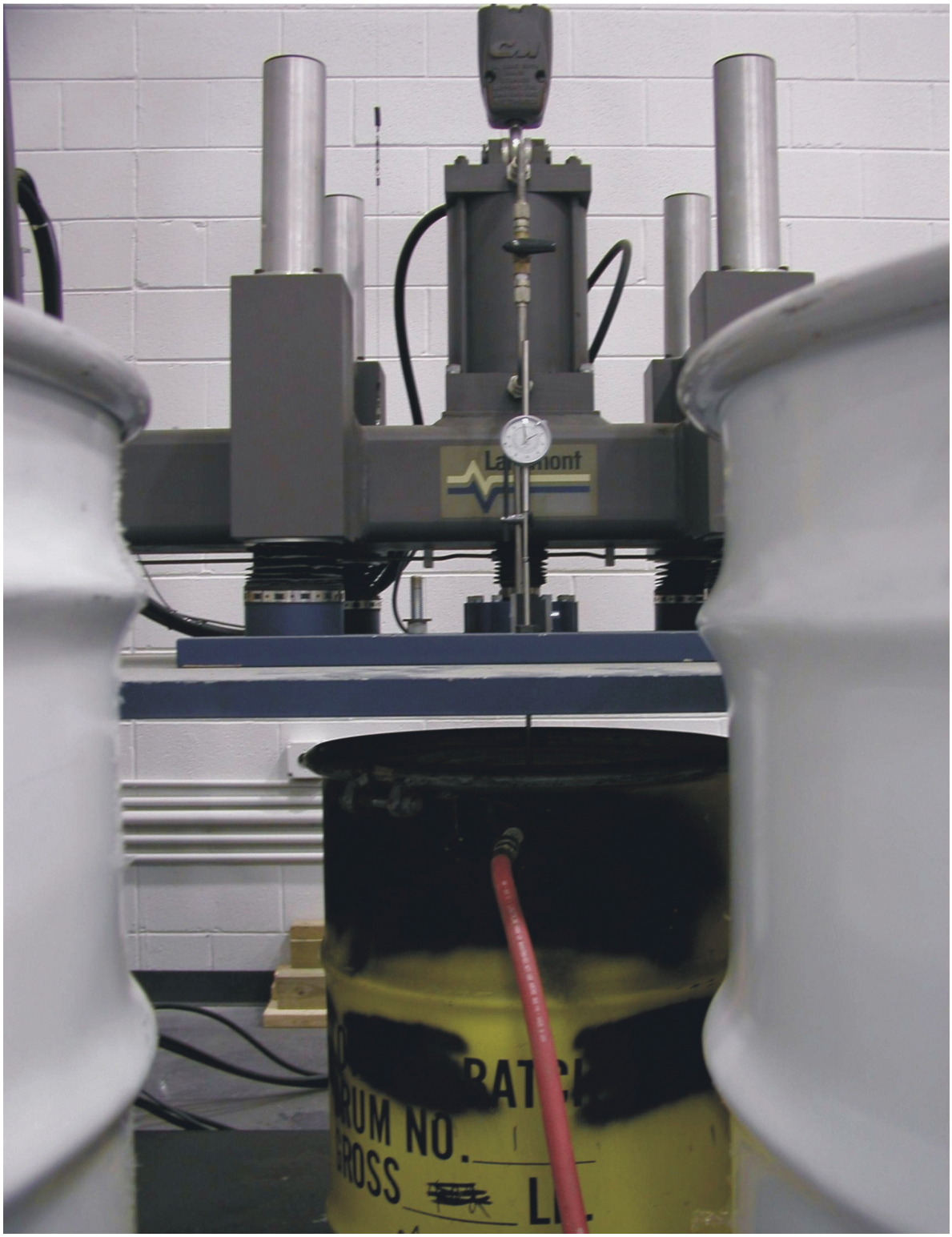

Fig. O-5. MD-1 drum undergoing test. The photograph shows drums used as shields, the slightly raised compression test machine platen, and the dial indicator used to measure head deflection.

Fig. O-6. MD-1 drum showing bulkhead fitting and filled with water ready to have the drumhead closed.

For the IN-1, only the drum pressurization test was performed; however, two different locking rings were used. In the first test, the current lever-locking ring was used. The goal of the test was to determine if that package configuration would hold pressure. The second configuration used a new bolt-type locking ring. It has been proposed to use this type of locking ring to improve the closure of the IN-1 drums. The goal of this test was to determine how much pressure the IN-1 drums could hold using the bolt-type locking ring.

O.3.1 MD-1 Pressurization

Several preliminary tests were run in an attempt to determine the proper method to prepare an MD-1 drum to best represent those in the stockpile. Results from those tests indicated that the gasket and drum lip must be clear of all flaws or contamination (e.g., no rust on the drum lip and no paint chips on the gasket). These observations are consistent with new clean drums, drum lids, and gaskets.

In addition to investigating how to ensure a good seal on the MD-1, the effect of the amount of torque placed on the closure bolt was investigated. This is an issue because the MD-1 drums are closed in a very consistent manner with the jam nut on the outside of the lock ring lugs and one or two threads of the locking bolt showing through the jam nut. Figure O-7 shows the closure bolt on a typical MD-1 package in a Curtis Bay warehouse. During the preliminary investigations this type of closure was replicated (Fig. O-8). The amount of torque required to produce this closure configuration

Fig. O-7. MD-1 drum at Curtis Bay Depot showing the typical closure bolt configuration.

Fig. O-8. MD-1 drum in the test lab showing the closure configuration used during testing.

was about 15 ft/lb. This is considerably less than the 40 – 50 ft/lb called for in most current hazardous materials drum closing instructions. However, the closure observed on the MD-1 packages was shown to hold pressure, over the range tested, as well as the same package with the higher closure bolt torque.

After the completion of the preliminary tests, an MD-1 drum with the flat type drumhead was used for the testing. The drum head and gasket were cleaned to ensure a good seal. The drum was placed under the compression platen and filled with water. Then the drum lid was installed, and the locking ring was installed to replicate the locking ring configuration seen in the field (Fig. O-8).

The test was initiated by recording the dial micrometer reading to determine the undeflected drumhead position. Air pressure was applied in one-pound increments. Flow through the flow meter was used to determine when the drum pressure had stabilized after each pressure rise. After the pressure in the drum stabilized and the dial micrometer readout stabilized, the dial micrometer was read to determine deflection produced by the selected pressure. Once the head deflection produced by the pressure was read from the dial micrometer, the pressure was released, and the dial micrometer was again read. The second reading indicates plastic (i.e., permanent) deformation of the drumhead. This process was repeated until either a test pressure of 15 psig was reached or the drum leaked so badly that the air pressure in the drum could not be increased.

If the flow meter continued to indicate airflow after a reasonable settling time (1-2 minutes), this indicates a leak in the system downstream of the flow meter. The leak was presumed to be in the drum body/head interface (although during one preliminary test the leak was in the bulkhead fitting). The drum locking ring was swabbed with a soap solution in an attempt to determine the location of the leak. This proved to be of limited utility because the leaking air tended to be channeled by the locking ring toward the gap at the locking ring bolt.

O.3.2 MD-1 Drum Head Removal

During the 2002 sampling campaign several MD-1 drumheads "popped" through the locking ring as the ring was being loosened. The energy to "pop" the drumhead came from gas pressure captured in polyethylene bags used as some of the inner packaging in the MD-1. Because the drumheads only raised 1-2 ft into the air the gas pressure was thought to be quite low.

A package configuration similar to the MD-1 configuration in the field was tested (e.g., a pressurized plastic bag inside an MD-1 with a loosened locking ring). The goal of the test was to quantify and bound the pressure required to produce the sort of drumhead "pop," observed in the field. Drumhead movement was not monitored because the shock of the sudden final movement of the drumhead would have destroyed the dial micrometer.

One of the MD-1 drum bodies used in the pressure testing and a previously untested (i.e., undeformed) drum head were used. A 3-mil polyethylene bag was secured to the inside tube of the bulkhead fitting used to feed air into the test drum (Fig. O-9). The drumhead was secured with an MD-1 locking ring. The test drum was placed under the slightly raised compression test machine platen. The locking ring was tightened to the MD-1 field configuration (Fig. O-8); then it was loosened so that not more than two threads of the locking bolt remained in the threaded locking ring lug. The locking ring remained undisturbed after the locking bolt was loosened. This configuration was intended to simulate the field condition where the locking ring was being removed with a long-handled air operated wrench and the drumhead "popped". After the locking ring was loosened, air pressure, in one-pound increments, was applied to the bag through the bulkhead fitting. Air pressure was recorded after each pressure increase until the drumhead “popped”. The drumhead was captured between the slightly raised platen and the expanded polyethylene bag (Fig. O-10).

Fig. O-9. MD-1 with polyethylene bag attached to the bulkhead fitting.

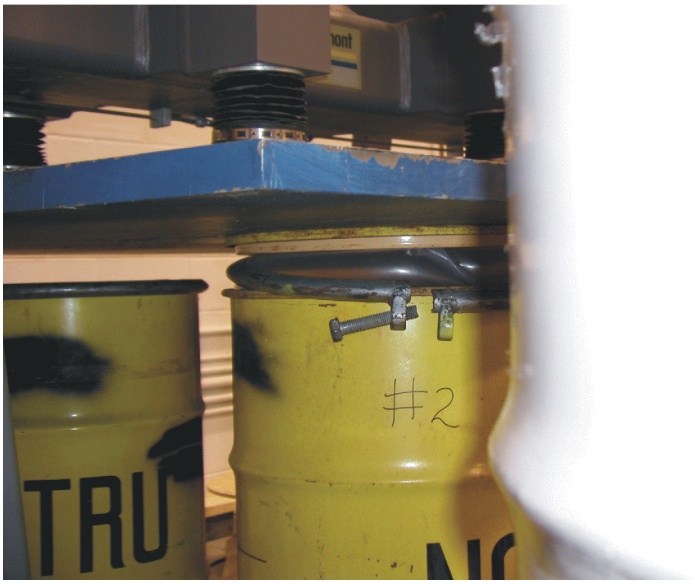

Fig. O-10. MD-1 with popped drumhead showing still inflated polyethylene bag and captured drumhead.

O.3.3 IN-1 Current Configuration

The IN-1 packages have contents similar to the MD-1 packages (e.g., inner drums containing ThN leaking nitric acid cushioned by a layer of slaked lime). However, during the 2002 sampling campaign, none of the IN-1 packages showed any evidence of pressurization. This was a somewhat surprising observation because the chemical constituents were similar and thus would be expected to generate gas in a similar manner. In an effort to determine if the closure leaked and, thus, was the reason that the IN-1 packages were pressurized, a test similar to the MD-1 pressurization test was performed on an IN-1 package.

An IN-1 drum body was fitted with a bulkhead fitting approximately two in. below the top lip of the drum. The drum was placed under the compression tester platen and filled with water to just below the bulkhead fitting (Fig. O-11). The drumhead was put in place and secured using the lever-type locking ring that is currently installed on all IN-1 packages. Air pressure was applied in one-pound increments, and the pressure was recorded when leaking began. After the drum began leaking, a soap solution was applied to determine the location of the leak(s).

Fig. O-11. IN-1 fitted with a bulkhead fitting and filled with water ready for closure prior to testing.

O.3.4 IN-1 New Locking Ring

Because the lever-type locking rings currently installed on the IN-1 packages were recognized to be somewhat flimsy, the DNSC has procured bolt type locking rings for installation on the IN-1 packages prior to shipment. A pressurization test was performed using the bolt-type locking rings. The goal of the test was to determine if use of the bolt-type locking rings would cause the IN-1 drums to seal and possibly pressurize.

An IN-1 drum body with a bulkhead fitting installed was placed under the compression tester platen and filled with water to just below the bulkhead fitting (Fig. O-11). The drumhead was put in place and secured using the bolt-type locking ring. As with the MD-1 pressure tests, a dial micrometer was used to measure drumhead deflection as a function of pressure.

The test was initiated by recording the initial dial micrometer reading to determine the undeflected drumhead position. Air pressure was applied in one-pound increments. As before, flow through the flow meter was used to determine when the drum pressure had stabilized after each pressure rise. After the pressure in the drum stabilized and the dial micrometer readout stabilized, the dial micrometer was read to determine deflection produced by the selected pressure. The pressure was released and the dial micrometer was again read to determine the plastic (i.e., permanent) deformation of the drumhead. This process was repeated until either a test pressure of 15 psig was reached or the drum leaked so badly that the air pressure in the drum could not be increased.

O.4 MD-1 RESULTS

O.4.1 Drum Pressurization

Two pressurization tests were performed on the MD-1 package. During the first test at 12 psig, a crease formed in the drumhead adjacent to the gap in the locking ring and the package leaked. Pressure was reduced to 10 psig, and the leak stopped. The pressure was again raised to 12 psig, and the leak returned. The center of the drumhead showed a deformation of 0.432 in. at 12 psig and plastic (permanent) deformation of 0.265 in. at the end of the test. Table O-1 shows the results of the first test.

Table O-1. MD-1 drum first pressurization test observations

Pressure reading (psig)	Drumhead deflection (in.)	Comments
5	0.030	No leak
10	0.251	No leak
12	0.408	Leak between ends of locking ring
10	0.400	No leak
11	0.408	No leak
12	0.420	Leak between ends of locking ring
13	0.432	More severe leak
0	0.265	Permanent drum deformation. A similar permanent deformation of the drum bottom was observed.

The second test was performed to more fully document the onset of plastic deformation of the drumhead. In this test, the pressure was raised to a selected point, the drumhead deflection was read, the pressure was released, and the drumhead deflection was again read. This drum did not leak up to the ending test pressure of 15 psig. At 13 psig, a crease began to form in the drumhead at the locking ring gap. The size of the crease continued to increase with increasing pressure. Slight (e.g., a few thousandths of an inch) permanent deformation of the drumhead was observed immediately. At 11 psig, the permanent deformation reached 0.018 in. and began a rapid increase up to an ending value of 0.468 in. at 15 psig. Figure O-12 shows the final conformation of the drumhead. Table O-2 shows the results of the second test. Drumhead deflection readings at 0 psig indicate permanent deformation induced by the previously applied pressure.

Fig. O-12. MD-1 package showing lid deformation due to application of 15 psig air pressure.

O.4.2 Drumhead Removal

Two tests were performed to determine how much pressure was required to "pop" an MD-1 drumhead off. For the first test, the locking bolt was loosened and two threads were left engaged in the threaded locking ring lug. For the second test, the locking bolt was completely removed from the threaded locking lug. In both cases, 3-psig air pressure was required to "pop" the drumhead off the drum body.

Table O-2. Results of second pressurization test of MD-1 package

Pressure reading (psig)	Drumhead deflection (in.)	Comments
0	0.001	
1	0.040	No leak
0	0.001	
2	0.059	No leak
0	0.001	
3	0.082	No leak
0	0.001	
4	0.105	No leak
0	0.002	
5	0.124	No leak
0	0.003	
6	0.141	No leak
0	0.003	
7	0.159	No leak
0	0.005	
8	0.178	No leak
0	0.006	
9	0.193	No leak
0	0.007	
10	0.207	No leak
0	0.008	
11	0.225	No leak
0	0.018	
12	0.252	No leak
0	0.040	
13	0.297	No leak
0	0.094	Bump felt on drumhead at gap in lock ring ends
14	0.349	No leak
0	0.162	Large crease at gap in lock ring ends
15	0.636	No leak
0	0.468	

O.5 IN-1 RESULTS

Two drum pressurization tests of the IN-1 package were performed. The first test used the current lever-type locking ring to secure the drumhead. The second test used a bolt-type locking ring. In the first test the IN-1 had such a large leak that pressure in the drum could not be raised above 1 psig. In the second test the IN-1 was leak tight to the end test pressure, 10 psig, despite the drumhead showing a plastic (permanent) deformation of approximately 1.25 in. and several creases.

O.5.1 Current Configuration

The IN-1 package in the current configuration that uses the lever-type lock ring to secure the drumhead does not form a gas tight seal. The leaks in the drum body/drumhead "seal" were so large that the drum could not be pressurized above 1 psig, even though a system capable of delivering air at several tens of cubic feet per minute was used.

O.5.2 New Lock Ring Configuration

When the IN-1 package was tested using a conventional bolt-type locking ring, the drum was leak tight up to 10 psig. Because the purpose of this test was to determine if the bolt-type locking ring would seal the drum to the point where it would violate the NTS WAC pressure requirement (approximately 7 psig), the test was terminated at 10 psig. At the end of the test, the IN-1 drumhead showed a plastic (permanent) deformation of 1.251 in. and a deformation under pressure of 1.562 in. Both of these values are large enough that pressurization of an IN-1 drum would be obvious upon casual inspection of the drumhead.

APPENDIX P

COPIES OF CORRESPONDENCE BETWEEN THE DNSC AND THE DOT

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DNSC-E

RSPA Office of Hazardous Materials Standards (DHM - 10)
U.S. Department of Transportation
400 Seventh Street
Washington DC 20590-0001

Dear Sir or Madam:

The Defense Logistics Agency (DLA) Defense National Stockpile Center (DNSC) has over 2.3 million kg (5.1 million pounds) of Th(NO3)4 • 5H2O (thorium nitrate hydrate) in storage. Because of its highly hydrated state this material has solidified into a non-friable rock-like monolith inside the packages during storage. The thorium in this material has the naturally occurring isotopic distribution and has not been irradiated or isotopically concentrated.

The DNSC is considering transporting this material as part of a final disposition plan. Some prior testing of this material, performed at the direction of DNSC, indicates that the 5 hydrate form of thorium nitrate will not qualify as an oxidizer under the test protocol provided in the UN Manual of Test and Criteria "Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances for Division 5.1". If the UN Manual of Test and Criteria "Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances for Division 5.1" test protocol is performed on a representative sample of the Th(NO3)4 • 5H2O in the DNSC inventory and the material does not qualify as an oxidizer, can this material be classified, packaged, and shipped as "Radioactive materials, LSA, n.o.s"?

Sincerely,

F. KEVIN REILLY
Director,
Directorate of Environmental Management &
Quality Assurance

bcc: Off. File, DNSC-EQ, P. Singley, W. Hermes

Fig. P.1. Letter from DNSC to DOT concerning the potential shipment of ThN classified as "Radioactive materials, LSA, n.o.s".

U.S Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

MAR 13 2001

Mr. F. Kevin Reilly
Director
Defense Logistics Agency
Defense National Stockpile Center
8725 John J. Kingman Road, Suite 4616
Ft. Belvoir, Virginia 22060-6223

Reference No.: 01-0064

Dear Mr. Reilly:

This is in response to your February 21, 2001 letter, inquiring whether your thorium nitrate hydrate may be offered for transportation as "Radioactive materials, LSA, n.o.s." under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180).

You state that because of its highly hydrated state, the material has solidified into a non-friable rock-like monolith mass inside the packages during storage. Also, you state that prior testing indicate the material does not meet the defining criteria for a Division 5.1 under the test protocol in the United Nations Manual of Test and Criteria, "Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances for Division 5.1."

Based on the information you provided, we concur that if the material meets the definition of Low Specific Activity (LSA) as defined in 49 CFR 173.403 and does not meet any other hazard class, it would be most appropriately described as "Radioactive material, LSA, n.o.s."

I hope this information is helpful. Should you have further questions, please contact us.

Sincerely,

Hattie L. Mitchell

Hattie L. Mitchell
Chief, Regulatory Review and Reinvention
Office of Hazardous Materials Standards

Fig. P.2. Letter of reply from DOT to DNSC concerning the potential shipment of ThN classified as "Radioactive material, LSA, n.o.s".

OCT 10 2002

DNSC-E

Mr. Edward T. Mazzullo
Director, Office of Hazardous Materials Standards
Research and Special Programs Administration
U. S. Department of Transportation
400 7th Street, S. W.
Washington, DC 20590-0001

Dear Sir,

The Defense Logistics Agency, Defense National Stockpile Center, is charged with responsibility of reducing the amount of material in the national strategic stockpile. Some of these materials qualify as hazardous materials in accordance with Title 49 Parts 171-180. I am writing to you to confirm our understanding of how these regulations can be met for the shipment of a particular material we need to transport.

The material is a low level radioactive material, originally purchased from various sources around the world in the 1950's and 1960's as Thorium Nitrate. We have tested representative samples of the material lots and have determined that they do not meet the definition of an oxidizer as specified in 49 CFR 173.127 and in accordance with the prescribed tests in the UN Manual of Tests and Criteria. Earlier guidance provided by your office (letter of March 13, 2001, reference number 01-0064), states "...if the material meets the definition of Low Specific Activity (LSA) as defined in 49 CFR 173.403 and does not meet any other hazard class, it would be most appropriately described as "Radioactive material, LSA, n.o.s." Therefore, we plan to ship the materials domestically as *Radioactive material, low specific activity, n.o.s.*

We will be shipping the material under exclusive use conditions and the total activity in a package will always be less than A_2 since this value is unlimited. The current packagings (drums) in which the materials are loaded are in impaired condition and will not qualify as strong tight packages. Since repackaging this material would be expensive and would result in radiation exposure to workers, we would like to ship the material in bulk packagings in accordance with §173.427(c)(1).

The bulk packagings we propose to use are intermodal freight containers that are sufficiently tight that there would be no release of contents during routine transport, even if the material were loose inside the freight container. However, the definition of 'bulk packaging' in §171.8 states, "...in which hazardous materials are loaded with no intermediate form of containment..." Since the drums themselves are not strong tight

Fig. P.3. Letter from DNSC to DOT concerning the potential use of ISO containers as a shipping package.

packages, we would like to confirm that they would not constitute an 'intermediate form of containment' that would negate shipping them inside a 'bulk packaging'.

Please confirm our understanding that since the current packagings themselves are not strong tight packages they would not constitute an 'intermediate form of containment' that would negate shipping them inside a 'bulk packaging.

Sincerely,
F. KEVIN REILLY
Director,
Directorate of Environmental Management Division

F. KEVIN REILLY
Director, Environmental Management
AREA 703 767-6522

Cc: Official, DNSC-O, DNSC-G, ORNL:P.Singley, ORNL:W. Hermes
P. Singley/ORNL/(865) 576-2068/10/10/02/mjp

Fig. P.3. Letter from DNSC to DOT concerning the potential use of ISO containers as a shipping package (cont.).

U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

NOV 13 2002

Mr. F. Kevin Reilly
Director, Environmental Management
Defense Logistics Agency
8725 John J. Kingman Road, Suite 3229
Ft. Belvoir, Virginia 22060-6223

Ref. No. 02-0278

Dear Mr. Reilly:

This is in response to your letter dated October 10, 2002 regarding the shipment of Radioactive material, low specific activity, n.o.s. (UN2912) that is packaged in a non-specification strong tight bulk packaging (i.e., freight container) in accordance with § 173.427(c)(1)of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask whether the material may be contained in inner non-bulk packagings.

The answer is yes. Section 173.427(c)(1)authorizes the use of a non-specification strong tight bulk packaging for Radioactive material, low specific activity, n.o.s. (UN2912). The fact that the material is further contained in non-bulk packagings is not relevant.

I hope this information is helpful

Sincerely,

Hattie L. Mitchell

Hattie L. Mitchell
Chief, Regulatory Review and Reinvention
Office of Hazardous Materials Standards

Fig. P.4. Letter of reply from DOT to DNSC concerning the potential use of ISO containers as a shipping package.

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APPENDIX Q

MICROSHIELD DOSE RATE MODELING OF AN ISO CONTAINER LOADED WITH 40,000 lb OF THORIUM NITRATE

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Setup for MicroShield Modeling of Dose Rates around an Intermodal Container

$X := \left(19 + \frac{4.25}{12}\right) \cdot ft$ $\quad X = 19.354\,ft$ $\quad gm := \frac{1}{453.592} lb$

$Y := \left(7 + \frac{9.875}{12}\right) ft$ $\quad Y = 7.823\,ft$ $\quad cm := \frac{1}{2.54} in$

$Z := \left(7 + \frac{8.5}{12}\right) ft$ $\quad Z = 7.708\,ft$

The dimensions are arranged as follows: the X dimension is the length of the intermodal container; the Y dimension is its height; and the Z dimension is its width. These dimensions will be exchanged as the source is rotated to calculate the dose rate from each side of the intermodal container.

Assume that the intermodal container is holding 40,000 lb of thorium nitrate which has a density of 1.65 gm/cm^3.

$m := 40 \cdot 10^3 lb$ $\quad \rho := 1.65 \frac{gm}{cm^3}$ $\quad \rho = 103.006 \frac{lb}{ft^3}$

$v := \frac{m}{\rho}$ $\quad v = 388.326\,ft^3$ $\quad x/y = X/Y$ and $x/z = X/Z$

$y = (Y/X)x$ and $z = (Z/X)x$

$v = xyz = x[(Y/X)x][(Z/X)x]$

$x^3 = v/[(Y/X)(Z/X)]$

$x := \left(\frac{X}{Y} \cdot \frac{X}{Z} \cdot v\right)^{\frac{1}{3}}$ $\quad x = 13.411\,ft$ $\quad x = [v(X/Y)(X/Z)]^{1/3}$

$y := \frac{Y}{X} \cdot x$ $\quad y = 5.421\,ft$

$z := \frac{Z}{X} \cdot x$ $\quad z = 5.341\,ft$

$t := 0.125 in$ $\quad t = 0.0104\,ft$

The thickness, t, of the intermodal container walls is assumed to be greater than 0.125 in, but 0.125 in is used for conservatism.

The volume of the 40,000-lb block of ThN is 13.411 ft x 5.341 ft x 5.421 ft = 388.326 ft^3. Because of round-off errors, Microshield calculates the volume to be 388.296 ft^3. This configuration retains the ratio of dimensions that is characteristic of the intermodal container.

Assume that one dose rate measurement location is centered in each dimension.

$x_{half} := \frac{x}{2}$ $\quad x_{half} = 6.706\,ft$

$y_{half} := \frac{y}{2}$ $\quad y_{half} = 2.71\,ft$

$z_{half} := \frac{z}{2}$ $\quad z_{half} = 2.671\,ft$

$s_{dose} := 100 cm$ $\quad s_{dose} = 3.281\,ft$

$x_{Air} := X - x$ $\quad x_{Air} = 5.943\,ft$ $\quad x_{AirGap} := \frac{x_{Air}}{2}$ $\quad x_{AirGap} = 2.971\,ft$

$x_{dose} := x + x_{AirGap} + t + s_{dose}$ $\quad x_{dose} = 19.674\,ft$

$y_{Air} := Y - y$ $y_{Air} = 2.402\,ft$ $y_{AirGap} := \frac{y_{Air}}{2}$ $y_{AirGap} = 1.201\,ft$

$y_{dose} := y + y_{AirGap} + t + s_{dose}$ $y_{dose} = 9.913\,ft$

$z_{Air} := Z - z$ $z_{Air} = 2.367\,ft$ $z_{AirGap} := \frac{z_{Air}}{2}$ $z_{AirGap} = 1.183\,ft$

$z_{dose} := z + z_{AirGap} + t + s_{dose}$ $z_{dose} = 9.816\,ft$

Assume that the air gap does not exist, i.e., $x_{AirGap} = y_{AirGap} = z_{AirGap} = 0$.

$x_{AirGap} := 0.00ft$ $x_{dose} := x + x_{AirGap} + t + s_{dose}$ $x_{dose} = 16.703\,ft$

$y_{AirGap} := 0.00ft$ $y_{dose} := y + y_{AirGap} + t + s_{dose}$ $y_{dose} = 8.712\,ft$

$z_{AirGap} := 0.00ft$ $z_{dose} := z + z_{AirGap} + t + s_{dose}$ $z_{dose} = 8.633\,ft$

Assume that the thorium nitrate is spread throughout the intermodal container with uniform density.

$V := X \cdot Y \cdot Z$ $V = 1.167 \times 10^3\,ft^3$

$\rho_{spread} := \frac{m}{V}$ $\rho_{spread} = 34.273\,\frac{lb}{ft^3}$ $\rho_{spread} = 0.549\,\frac{gm}{cm^3}$

$X_{half} := \frac{X}{2}$ $X_{half} = 9.677\,ft$

$Y_{half} := \frac{Y}{2}$ $Y_{half} = 3.911\,ft$

$Z_{half} := \frac{Z}{2}$ $Z_{half} = 3.854\,ft$

$X_{dose} := X + t + s_{dose}$ $X_{dose} = 22.645\,ft$

$Y_{dose} := Y + t + s_{dose}$ $Y_{dose} = 11.114\,ft$

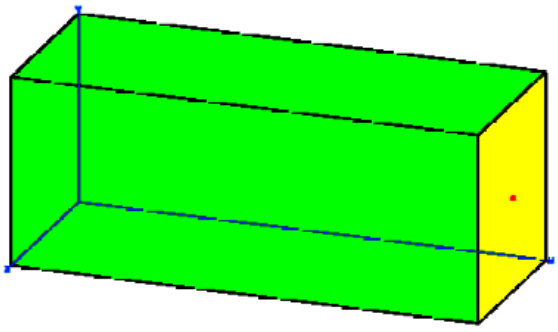
$Z_{dose} := Z + t + s_{dose}$ $Z_{dose} = 11.000\,ft$

MicroShield v5.05 (5.05-00456)
Oak Ridge National Laboratory

Page : 1
DOS File : ISOEND-1.MS5
Run Date : October 17, 2002
Run Time: 10:23:37 AM
Duration : 00:00:11

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: ISO end ~contact
Description: Rad Field at 1 cm from the ISO end-spread out source
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	589.91 cm	19 ft 4.2 in
Width	234.94 cm	7 ft 8.5 in
Height	238.445 cm	7 ft 9.9 in

Dose Points

	X	Y	Z
# 1	590.965 cm	0 cm	0 cm
	19 ft 4.7 in	0.0 in	0.0 in
# 2	590.965 cm	1.19e+02 cm	1.17e+02 cm
	19 ft 4.7 in	3 ft 10.9 in	3 ft 10.2 in

Shields

Shield Name	Dimension	Material	Density
Source	1167.04 ft³	ThN-Diffuse	0.549
Shield 1	.01 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ac-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-210	7.3314e-004	2.7126e+007	2.2185e-005	8.2084e-001
Bi-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Pa-234	3.8640e-008	1.4297e+003	1.1693e-009	4.3263e-005
Pa-234m	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Pb-210	7.3360e-004	2.7143e+007	2.2199e-005	8.2136e-001
Pb-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Pb-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Po-210	7.2043e-004	2.6656e+007	2.1800e-005	8.0661e-001
Po-212	5.2255e-001	1.9334e+010	1.5812e-002	5.8506e+002
Po-214	1.4838e-003	5.4901e+007	4.4900e-005	1.6613e+000
Po-216	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Po-218	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Ra-224	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Ra-226	1.4849e-003	5.4940e+007	4.4932e-005	1.6625e+000
Ra-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-220	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-222	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Th-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-230	6.9281e-002	2.5634e+009	2.0964e-003	7.7568e+001

Fig. Q.1. MicroShield model of dose at 1 cm from end of ISO.

Page : 2
DOS File : ISOEND-1.MS5
Run Date : October 17, 2002
Run Time: 10:23:37 AM
Duration : 00:00:11

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Th-232	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-234	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Tl-208	2.9304e-001	1.0843e+010	8.8675e-003	3.2810e+002
U-234	6.8390e-009	2.5304e+002	2.0695e-010	7.6571e-006
U-238	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002

Buildup
The material reference is : Air Gap

Integration Parameters

X Direction	10
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (1.94e+01,0,0) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	1.504e-19	2.953e-17	6.650e-22	1.306e-19
0.05	1.706e+06	7.203e-14	2.406e-11	1.919e-16	6.408e-14
0.06	2.182e+08	7.100e-08	2.179e-05	1.410e-10	4.328e-08
0.08	1.304e+10	1.271e-02	1.721e+00	2.012e-05	2.723e-03
0.1	2.141e+09	5.998e-02	3.524e+00	9.176e-05	5.392e-03
0.15	1.270e+09	1.915e-02	1.333e+00	3.153e-05	2.195e-03
0.2	1.640e+10	4.862e+00	1.016e+02	8.580e-03	1.794e-01
0.3	7.879e+09	2.269e+01	1.668e+02	4.303e-02	3.164e-01
0.4	7.350e+08	5.689e+00	2.883e+01	1.109e-02	5.618e-02
0.5	4.187e+09	5.926e+01	2.486e+02	1.163e-01	4.879e-01
0.6	9.622e+09	2.097e+02	7.751e+02	4.093e-01	1.513e+00
0.8	9.621e+09	3.864e+02	1.207e+03	7.349e-01	2.296e+00
1.0	1.759e+10	1.095e+03	3.067e+03	2.018e+00	5.654e+00
1.5	4.058e+09	5.271e+02	1.245e+03	8.868e-01	2.095e+00
2.0	1.063e+08	2.207e+01	4.724e+01	3.412e-02	7.306e-02
3.0	1.082e+10	4.121e+03	7.818e+03	5.591e+00	1.061e+01
TOTALS:	9.799e+10	6.454e+03	1.471e+04	9.854e+00	2.329e+01

Results - Dose Point # 2 - (1.94e+01,3.911,3.854) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	8.165e-19	1.643e-16	3.611e-21	7.268e-19
0.05	1.706e+06	4.376e-13	1.429e-10	1.166e-15	3.806e-13
0.06	2.182e+08	3.550e-07	1.012e-04	7.052e-10	2.010e-07
0.08	1.304e+10	4.997e-02	6.617e+00	7.908e-05	1.047e-02
0.1	2.141e+09	2.327e-01	1.390e+01	3.560e-04	2.127e-02
0.15	1.270e+09	7.404e-02	5.204e+00	1.219e-04	8.569e-03
0.2	1.640e+10	1.911e+01	4.051e+02	3.373e-02	7.151e-01
0.3	7.879e+09	9.025e+01	6.661e+02	1.712e-01	1.264e+00
0.4	7.350e+08	2.269e+01	1.152e+02	4.420e-02	2.245e-01

Fig. Q.1. MicroShield model of dose at 1 cm from end of ISO (continued).

Page : 3
DOS File : ISOEND-1.MS5
Run Date : October 17, 2002
Run Time: 10:23:37 AM
Duration : 00:00:11

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.5	4.187e+09	2.365e+02	9.928e+02	4.642e-01	1.949e+00
0.6	9.622e+09	8.371e+02	3.090e+03	1.634e+00	6.032e+00
0.8	9.621e+09	1.542e+03	4.783e+03	2.932e+00	9.097e+00
1.0	1.759e+10	4.361e+03	1.206e+04	8.040e+00	2.222e+01
1.5	4.058e+09	2.085e+03	4.799e+03	3.507e+00	8.074e+00
2.0	1.063e+08	8.661e+01	1.793e+02	1.339e-01	2.773e-01
3.0	1.082e+10	1.597e+04	2.911e+04	2.167e+01	3.949e+01
TOTALS:	9.799e+10	2.525e+04	5.622e+04	3.863e+01	8.939e+01

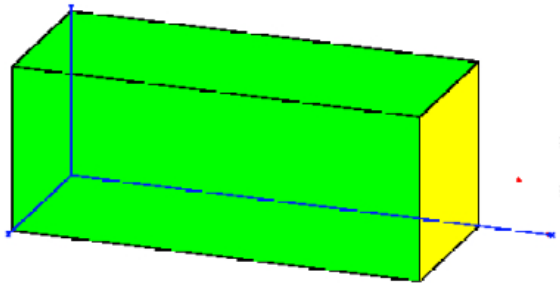
Fig. Q.1. MicroShield model of dose at 1 cm from end of ISO (continued).

MicroShield v5.05 (5.05-00456)
Oak Ridge National Laboratory

Page : 1
DOS File : ISOEND-D.MS5
Run Date : October 14, 2002
Run Time: 11:57:20 AM
Duration : 00:00:10

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: ISO end spread out
Description: Rad Field at 1 m from the ISO end-spread out source
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	589.91 cm	19 ft 4.2 in
Width	234.94 cm	7 ft 8.5 in
Height	238.445 cm	7 ft 9.9 in

Dose Points

	X	Y	Z
# 1	690.2196 cm	0 cm	0 cm
	22 ft 7.7 in	0.0 in	0.0 in
# 2	690.2196 cm	1.19e+02 cm	1.17e+02 cm
	22 ft 7.7 in	3 ft 10.9 in	3 ft 10.2 in

Shields

Shield Name	Dimension	Material	Density
Source	1167.04 ft³	ThN-Diffuse	0.549
Shield 1	.01 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ac-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-210	7.3314e-004	2.7126e+007	2.2185e-005	8.2084e-001
Bi-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Pa-234	3.8640e-008	1.4297e+003	1.1693e-009	4.3263e-005
Pa-234m	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Pb-210	7.3360e-004	2.7143e+007	2.2199e-005	8.2136e-001
Pb-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Pb-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Po-210	7.2043e-004	2.6656e+007	2.1800e-005	8.0661e-001
Po-212	5.2255e-001	1.9334e+010	1.5812e-002	5.8506e+002
Po-214	1.4838e-003	5.4901e+007	4.4900e-005	1.6613e+000
Po-216	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Po-218	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Ra-224	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Ra-226	1.4849e-003	5.4940e+007	4.4932e-005	1.6625e+000
Ra-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-220	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-222	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Th-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-230	6.9281e-002	2.5634e+009	2.0964e-003	7.7568e+001

Fig. Q.2. MicroShield model of dose at 1 m from end of ISO.

Page : 2
DOS File : ISOEND-D.MS5
Run Date : October 14, 2002
Run Time: 11:57:20 AM
Duration : 00:00:10

Nuclide	curies	becquerels	μCi/cm³	Bq/cm³
Th-232	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-234	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Tl-208	2.9304e-001	1.0843e+010	8.8675e-003	3.2810e+002
U-234	6.8390e-009	2.5304e+002	2.0695e-010	7.6571e-006
U-238	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002

Buildup
The material reference is : Air Gap

Integration Parameters

X Direction	10
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (22.645,0,0) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	1.352e-19	2.700e-17	5.979e-22	1.194e-19
0.05	1.706e+06	7.480e-14	2.509e-11	1.993e-16	6.684e-14
0.06	2.182e+08	7.209e-08	2.188e-05	1.432e-10	4.346e-08
0.08	1.304e+10	1.241e-02	1.687e+00	1.964e-05	2.669e-03
0.1	2.141e+09	5.850e-02	3.455e+00	8.950e-05	5.285e-03
0.15	1.270e+09	1.873e-02	1.312e+00	3.084e-05	2.160e-03
0.2	1.640e+10	4.734e+00	9.731e+01	8.356e-03	1.718e-01
0.3	7.879e+09	2.105e+01	1.384e+02	3.993e-02	2.626e-01
0.4	7.350e+08	4.997e+00	2.202e+01	9.736e-03	4.290e-02
0.5	4.187e+09	5.002e+01	1.829e+02	9.818e-02	3.591e-01
0.6	9.622e+09	1.721e+02	5.580e+02	3.359e-01	1.089e+00
0.8	9.621e+09	3.052e+02	8.442e+02	5.804e-01	1.606e+00
1.0	1.759e+10	8.419e+02	2.103e+03	1.552e+00	3.877e+00
1.5	4.058e+09	3.875e+02	8.253e+02	6.520e-01	1.389e+00
2.0	1.063e+08	1.579e+01	3.067e+01	2.441e-02	4.743e-02
3.0	1.082e+10	2.855e+03	4.969e+03	3.873e+00	6.741e+00
TOTALS:	9.799e+10	4.658e+03	9.777e+03	7.174e+00	1.560e+01

Results - Dose Point # 2 - (22.645,3.911,3.854) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	5.408e-19	1.080e-16	2.392e-21	4.776e-19
0.05	1.706e+06	2.992e-13	1.004e-10	7.971e-16	2.674e-13
0.06	2.182e+08	2.882e-07	8.744e-05	5.725e-10	1.737e-07
0.08	1.304e+10	4.885e-02	6.493e+00	7.731e-05	1.028e-02
0.1	2.141e+09	2.179e-01	1.174e+01	3.334e-04	1.797e-02
0.15	1.270e+09	7.170e-02	4.712e+00	1.181e-04	7.759e-03
0.2	1.640e+10	1.623e+01	2.817e+02	2.865e-02	4.972e-01
0.3	7.879e+09	6.007e+01	3.237e+02	1.140e-01	6.141e-01
0.4	7.350e+08	1.310e+01	4.996e+01	2.552e-02	9.734e-02

Fig. Q.2. MicroShield model of dose at 1 m from end of ISO (continued).

Page : 3
DOS File : ISOEND-D.MS5
Run Date : October 14, 2002
Run Time: 11:57:20 AM
Duration : 00:00:10

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.5	4.187e+09	1.258e+02	4.082e+02	2.470e-01	8.012e-01
0.6	9.622e+09	4.223e+02	1.226e+03	8.242e-01	2.394e+00
0.8	9.621e+09	7.251e+02	1.812e+03	1.379e+00	3.446e+00
1.0	1.759e+10	1.956e+03	4.434e+03	3.606e+00	8.173e+00
1.5	4.058e+09	8.675e+02	1.692e+03	1.460e+00	2.847e+00
2.0	1.063e+08	3.457e+01	6.188e+01	5.346e-02	9.569e-02
3.0	1.082e+10	6.092e+03	9.859e+03	8.265e+00	1.338e+01
TOTALS:	9.799e+10	1.031e+04	2.017e+04	1.600e+01	3.238e+01

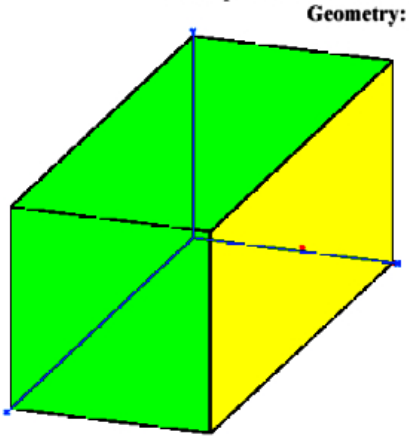
Fig. Q.2. MicroShield model of dose at 1 m from end of ISO (continued).

MicroShield v5.05 (5.05-00456)
Oak Ridge National Laboratory

Page : 1
DOS File : ISOSID-1.MS5
Run Date : October 17, 2002
Run Time: 10:40:13 AM
Duration : 00:00:11

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: ISO side ~contact
Description: Rad Field at 1 cm from the ISO side-spread out source
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	234.94 cm	7 ft 8.5 in
Width	589.91 cm	19 ft 4.2 in
Height	238.445 cm	7 ft 9.9 in

Dose Points

	X	Y	Z
# 1	2.36e+02 cm	0 cm	0 cm
	7 ft 8.9 in	0.0 in	0.0 in
# 2	2.36e+02 cm	1.19e+02 cm	2.95e+02 cm
	7 ft 8.9 in	3 ft 10.9 in	9 ft 8.1 in

Shields

Shield Name	Dimension	Material	Density
Source	1167.04 ft³	ThN-Diffuse	0.549
Shield 1	.01 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	uCi/cm³	Bq/cm³
Ac-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-210	7.3314e-004	2.7126e+007	2.2185e-005	8.2084e-001
Bi-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Pa-234	3.8640e-008	1.4297e+003	1.1693e-009	4.3263e-005
Pa-234m	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Pb-210	7.3360e-004	2.7143e+007	2.2199e-005	8.2136e-001
Pb-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Pb-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Po-210	7.2043e-004	2.6656e+007	2.1800e-005	8.0661e-001
Po-212	5.2255e-001	1.9334e+010	1.5812e-002	5.8506e+002
Po-214	1.4838e-003	5.4901e+007	4.4900e-005	1.6613e+000
Po-216	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Po-218	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Ra-224	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Ra-226	1.4849e-003	5.4940e+007	4.4932e-005	1.6625e+000
Ra-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-220	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-222	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Th-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-230	6.9281e-002	2.5634e+009	2.0964e-003	7.7568e+001

Fig. Q.3. MicroShield model of dose at 1 cm from side of ISO.

Page : 2
DOS File : ISOSID-1.MS5
Run Date : October 17, 2002
Run Time: 10:40:13 AM
Duration : 00:00:11

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Th-232	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-234	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Tl-208	2.9304e-001	1.0843e+010	8.8675e-003	3.2810e+002
U-234	6.8390e-009	2.5304e+002	2.0695e-010	7.6571e-006
U-238	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002

Buildup
The material reference is ; Air Gap

Integration Parameters

X Direction	10
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (7.74085,0,0) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	5.283e-12	4.806e-10	2.337e-14	2.125e-12
0.05	1.706e+06	1.695e-09	2.045e-07	4.515e-12	5.448e-10
0.06	2.182e+08	4.006e-05	4.012e-03	7.957e-08	7.969e-06
0.08	1.304e+10	2.509e-01	1.121e+01	3.971e-04	1.774e-02
0.1	2.141e+09	3.001e-01	6.535e+00	4.591e-04	9.997e-03
0.15	1.270e+09	2.323e-01	4.293e+00	3.826e-04	7.070e-03
0.2	1.640e+10	1.491e+01	1.326e+02	2.637e-02	2.340e-01
0.3	7.879e+09	3.174e+01	1.753e+02	6.022e-02	3.326e-01
0.4	7.350e+08	6.666e+00	2.979e+01	1.299e-02	5.805e-02
0.5	4.187e+09	6.543e+01	2.548e+02	1.284e-01	5.001e-01
0.6	9.622e+09	2.254e+02	7.912e+02	4.399e-01	1.544e+00
0.8	9.621e+09	4.054e+02	1.226e+03	7.711e-01	2.333e+00
1.0	1.759e+10	1.136e+03	3.109e+03	2.095e+00	5.730e+00
1.5	4.058e+09	5.407e+02	1.259e+03	9.098e-01	2.117e+00
2.0	1.063e+08	2.254e+01	4.769e+01	3.485e-02	7.375e-02
3.0	1.082e+10	4.193e+03	7.885e+03	5.689e+00	1.070e+01
TOTALS:	9.799e+10	6.643e+03	1.493e+04	1.017e+01	2.366e+01

Results - Dose Point # 2 - (7.74085,3.911,9.677) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	1.004e-13	1.266e-11	4.442e-16	5.598e-14
0.05	1.706e+06	5.110e-10	9.143e-08	1.361e-12	2.436e-10
0.06	2.182e+08	4.143e-05	6.061e-03	8.229e-08	1.204e-05
0.08	1.304e+10	6.363e-01	3.813e+01	1.007e-03	6.034e-02
0.1	2.141e+09	1.016e+00	2.745e+01	1.554e-03	4.200e-02
0.15	1.270e+09	7.698e-01	1.794e+01	1.268e-03	2.954e-02
0.2	1.640e+10	5.834e+01	5.570e+02	1.030e-01	9.831e-01
0.3	7.879e+09	1.298e+02	7.129e+02	2.462e-01	1.352e+00
0.4	7.350e+08	2.722e+01	1.204e+02	5.304e-02	2.345e-01

Fig. Q.3. MicroShield model of dose at 1 cm from side of ISO (continued).

Page : 3
DOS File : ISOSID-1.MS5
Run Date : October 17, 2002
Run Time: 10:40:13 AM
Duration : 00:00:11

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.5	4.187e+09	2.664e+02	1.027e+03	5.230e-01	2.015e+00
0.6	9.622e+09	9.158e+02	3.183e+03	1.787e+00	6.213e+00
0.8	9.621e+09	1.642e+03	4.914e+03	3.123e+00	9.347e+00
1.0	1.759e+10	4.590e+03	1.240e+04	8.460e+00	2.286e+01
1.5	4.058e+09	2.171e+03	4.965e+03	3.652e+00	8.353e+00
2.0	1.063e+08	9.003e+01	1.865e+02	1.392e-01	2.885e-01
3.0	1.082e+10	1.662e+04	3.051e+04	2.255e+01	4.139e+01
TOTALS:	9.799e+10	2.651e+04	5.866e+04	4.064e+01	9.316e+01

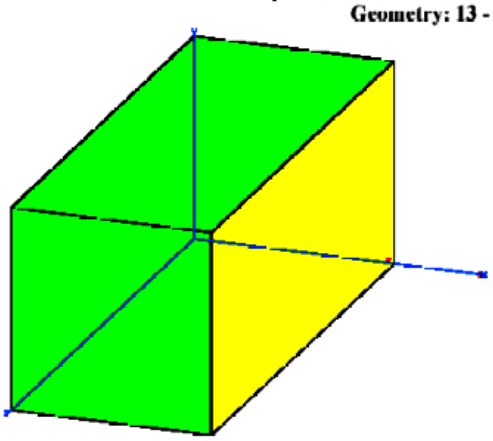
Fig. Q.3. MicroShield model of dose at 1 cm from side of ISO (continued).

MicroShield v5.05 (5.05-00456)
Oak Ridge National Laboratory

Page : 1
DOS File : ISOSID-D.MS5
Run Date : October 14, 2002
Run Time: 11:52:55 AM
Duration : 00:00:10

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: ISO side spread out
Description: Rad Field at 1 m from the ISO side-spread out source
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	234.94 cm	7 ft 8.5 in
Width	589.91 cm	19 ft 4.2 in
Height	238.445 cm	7 ft 9.9 in

Dose Points

	X	Y	Z
# 1	335.28 cm	0 cm	0 cm
	11 ft	0.0 in	0.0 in
# 2	335.28 cm	1.19e+02 cm	2.95e+02 cm
	11 ft	3 ft 10.9 in	9 ft 8.1 in

Shields

Shield Name	Dimension	Material	Density
Source	1167.04 ft³	ThN-Diffuse	0.549
Shield 1	.01 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ac-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-210	7.3314e-004	2.7126e+007	2.2185e-005	8.2084e-001
Bi-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Pa-234	3.8640e-008	1.4297e+003	1.1693e-009	4.3263e-005
Pa-234m	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Pb-210	7.3360e-004	2.7143e+007	2.2199e-005	8.2136e-001
Pb-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Pb-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Po-210	7.2043e-004	2.6656e+007	2.1800e-005	8.0661e-001
Po-212	5.2255e-001	1.9334e+010	1.5812e-002	5.8506e+002
Po-214	1.4838e-003	5.4901e+007	4.4900e-005	1.6613e+000
Po-216	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Po-218	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Ra-224	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Ra-226	1.4849e-003	5.4940e+007	4.4932e-005	1.6625e+000
Ra-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-220	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-222	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Th-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-230	6.9281e-002	2.5634e+009	2.0964e-003	7.7568e+001

Fig. Q.4. MicroShield model of dose at 1 m from side of ISO (continued).

Page : 2
DOS File : ISOSID-D.MS5
Run Date : October 14, 2002
Run Time: 11:52:55 AM
Duration : 00:00:10

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Th-232	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-234	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Tl-208	2.9304e-001	1.0843e+010	8.8675e-003	3.2810e+002
U-234	6.8390e-009	2.5304e+002	2.0695e-010	7.6571e-006
U-238	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002

Buildup
The material reference is : Air Gap

Integration Parameters

X Direction	10
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (11,0,0) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	1.229e-11	9.997e-10	5.437e-14	4.421e-12
0.05	1.706e+06	1.915e-09	2.125e-07	5.102e-12	5.660e-10
0.06	2.182e+08	3.665e-05	3.499e-03	7.279e-08	6.950e-06
0.08	1.304e+10	2.123e-01	9.729e+00	3.360e-04	1.540e-02
0.1	2.141e+09	2.602e-01	5.994e+00	3.980e-04	9.170e-03
0.15	1.270e+09	2.013e-01	3.935e+00	3.315e-04	6.479e-03
0.2	1.640e+10	1.330e+01	1.172e+02	2.347e-02	2.069e-01
0.3	7.879e+09	2.787e+01	1.458e+02	5.287e-02	2.766e-01
0.4	7.350e+08	5.759e+00	2.428e+01	1.122e-02	4.730e-02
0.5	4.187e+09	5.592e+01	2.051e+02	1.098e-01	4.026e-01
0.6	9.622e+09	1.910e+02	6.314e+02	3.728e-01	1.232e+00
0.8	9.621e+09	3.388e+02	9.649e+02	6.445e-01	1.835e+00
1.0	1.759e+10	9.389e+02	2.419e+03	1.731e+00	4.459e+00
1.5	4.058e+09	4.369e+02	9.592e+02	7.351e-01	1.614e+00
2.0	1.063e+08	1.794e+01	3.588e+01	2.774e-02	5.548e-02
3.0	1.082e+10	3.274e+03	5.848e+03	4.442e+00	7.933e+00
TOTALS:	9.799e+10	5.301e+03	1.137e+04	8.151e+00	1.809e+01

Results - Dose Point # 2 - (11,3.911,9.677) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	4.917e-11	3.998e-09	2.175e-13	1.768e-11
0.05	1.706e+06	7.657e-09	8.493e-07	2.040e-11	2.262e-09
0.06	2.182e+08	1.460e-04	1.386e-02	2.899e-07	2.753e-05
0.08	1.304e+10	8.159e-01	3.557e+01	1.291e-03	5.629e-02
0.1	2.141e+09	9.423e-01	1.948e+01	1.442e-03	2.979e-02
0.15	1.270e+09	7.335e-01	1.282e+01	1.208e-03	2.111e-02
0.2	1.640e+10	4.449e+01	3.417e+02	7.851e-02	6.030e-01
0.3	7.879e+09	8.597e+01	4.120e+02	1.631e-01	7.815e-01
0.4	7.350e+08	1.727e+01	6.750e+01	3.364e-02	1.315e-01

Fig. Q.4. MicroShield model of dose at 1 m from side of ISO (continued).

Page : 3
DOS File : ISOSID-D.MS5
Run Date : October 14, 2002
Run Time: 11:52:55 AM
Duration : 00:00:10

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.5	4.187e+09	1.649e+02	5.623e+02	3.236e-01	1.104e+00
0.6	9.622e+09	5.561e+02	1.711e+03	1.085e+00	3.339e+00
0.8	9.621e+09	9.677e+02	2.568e+03	1.841e+00	4.885e+00
1.0	1.759e+10	2.642e+03	6.355e+03	4.870e+00	1.171e+01
1.5	4.058e+09	1.197e+03	2.465e+03	2.015e+00	4.147e+00
2.0	1.063e+08	4.836e+01	9.104e+01	7.478e-02	1.408e-01
3.0	1.082e+10	8.655e+03	1.464e+04	1.174e+01	1.986e+01
TOTALS:	9.799e+10	1.438e+04	2.928e+04	2.223e+01	4.682e+01

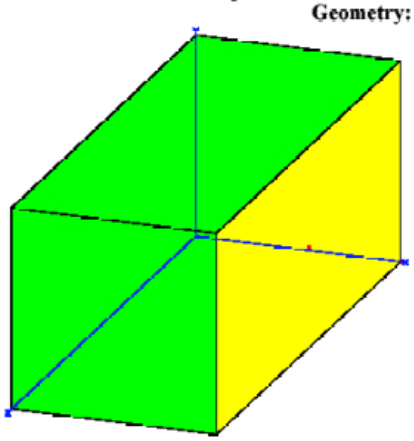
Fig. Q.4. MicroShield model of dose at 1 m from side of ISO (continued).

MicroShield v5.05 (5.05-00456)
Oak Ridge National Laboratory

Page : 1
DOS File : ISOTOP-1.MS5
Run Date : October 17, 2002
Run Time: 10:46:26 AM
Duration : 00:00:10

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: ISO top ~contact
Description: Rad Field at 1 cm from the ISO top-spread out source
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	238.445 cm	7 ft 9.9 in
Width	589.91 cm	19 ft 4.2 in
Height	234.94 cm	7 ft 8.5 in

Dose Points

	X	Y	Z
# 1	2.39e+02 cm	0 cm	0 cm
	7 ft 10.3 in	0.0 in	0.0 in
# 2	2.39e+02 cm	1.17e+02 cm	2.95e+02 cm
	7 ft 10.3 in	3 ft 10.2 in	9 ft 8.1 in

Shields

Shield Name	Dimension	Material	Density
Source	1167.04 ft³	ThN-Diffuse	0.549
Shield 1	.01 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ac-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-210	7.3314e-004	2.7126e+007	2.2185e-005	8.2084e-001
Bi-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Pa-234	3.8640e-008	1.4297e+003	1.1693e-009	4.3263e-005
Pa-234m	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Pb-210	7.3360e-004	2.7143e+007	2.2199e-005	8.2136e-001
Pb-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Pb-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Po-210	7.2043e-004	2.6656e+007	2.1800e-005	8.0661e-001
Po-212	5.2255e-001	1.9334e+010	1.5812e-002	5.8506e+002
Po-214	1.4838e-003	5.4901e+007	4.4900e-005	1.6613e+000
Po-216	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Po-218	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Ra-224	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Ra-226	1.4849e-003	5.4940e+007	4.4932e-005	1.6625e+000
Ra-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-220	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-222	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Th-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-230	6.9281e-002	2.5634e+009	2.0964e-003	7.7568e+001

Fig. Q.5. MicroShield model of dose at 1 cm from top of ISO.

Page : 2
DOS File : ISOTOP-1.MS5
Run Date : October 17, 2002
Run Time: 10:46:26 AM
Duration : 00:00:10

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Th-232	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-234	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Tl-208	2.9304e-001	1.0843e+010	8.8675e-003	3.2810e+002
U-234	6.8390e-009	2.5304e+002	2.0695e-010	7.6571e-006
U-238	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002

Buildup
The material reference is : Air Gap

Integration Parameters

X Direction	10
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (7.8559,0,0) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	4.532e-12	4.155e-10	2.004e-14	1.838e-12
0.05	1.706e+06	1.546e-09	1.886e-07	1.117e-12	5.024e-10
0.06	2.182e+08	3.782e-05	3.841e-03	7.512e-08	7.630e-06
0.08	1.304e+10	2.450e-01	1.109e+01	3.877e-04	1.755e-02
0.1	2.141e+09	2.966e-01	6.521e+00	4.538e-04	9.976e-03
0.15	1.270e+09	2.276e-01	4.269e+00	3.747e-04	7.030e-03
0.2	1.640e+10	1.482e+01	1.325e+02	2.616e-02	2.338e-01
0.3	7.879e+09	3.167e+01	1.752e+02	6.008e-02	3.324e-01
0.4	7.350e+08	6.658e+00	2.978e+01	1.297e-02	5.803e-02
0.5	1.187e+09	6.538e+01	2.547e+02	1.283e-01	5.000e-01
0.6	9.622e+09	2.253e+02	7.911e+02	4.397e-01	1.544e+00
0.8	9.621e+09	4.052e+02	1.226e+03	7.708e-01	2.333e+00
1.0	1.759e+10	1.136e+03	3.108e+03	2.094e+00	5.730e+00
1.5	4.058e+09	5.406e+02	1.258e+03	9.096e-01	2.117e+00
2.0	1.063e+08	2.253e+01	4.769e+01	3.485e-02	7.375e-02
3.0	1.082e+10	4.193e+03	7.885e+03	5.688e+00	1.070e+01
TOTALS:	9.799e+10	6.642e+03	1.493e+04	1.017e+01	2.365e+01

Results - Dose Point # 2 - (7.8559,3.854,9.677) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	9.419e-14	1.190e-11	4.166e-16	5.264e-14
0.05	1.706e+06	4.897e-10	8.794e-08	1.304e-12	2.343e-10
0.06	2.182e+08	4.017e-05	5.903e-03	7.980e-08	1.173e-05
0.08	1.304e+10	6.258e-01	3.779e+01	9.904e-04	5.980e-02
0.1	2.141e+09	1.008e+00	2.744e+01	1.542e-03	4.198e-02
0.15	1.270e+09	7.562e-01	1.786e+01	1.245e-03	2.941e-02
0.2	1.640e+10	5.800e+01	5.569e+02	1.024e-01	9.829e-01
0.3	7.879e+09	1.297e+02	7.129e+02	2.460e-01	1.352e+00
0.4	7.350e+08	2.722e+01	1.204e+02	5.303e-02	2.345e-01

Fig. Q.5. MicroShield model of dose at 1 cm from top of ISO (continued).

Page : 3
DOS File : ISOTOP-1.MS5
Run Date : October 17, 2002
Run Time: 10:46:26 AM
Duration : 00:00:10

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.5	4.187e+09	2.664e+02	1.027e+03	5.230e-01	2.015e+00
0.6	9.622e+09	9.158e+02	3.183e+03	1.788e+00	6.213e+00
0.8	9.621e+09	1.642e+03	4.913e+03	3.123e+00	9.344e+00
1.0	1.759e+10	4.590e+03	1.239e+04	8.460e+00	2.284e+01
1.5	4.058e+09	2.170e+03	4.960e+03	3.652e+00	8.345e+00
2.0	1.063e+08	8.999e+01	1.863e+02	1.392e-01	2.881e-01
3.0	1.082e+10	1.661e+04	3.046e+04	2.253e+01	4.133e+01
TOTALS:	9.799e+10	2.650e+04	5.860e+04	4.062e+01	9.308e+01

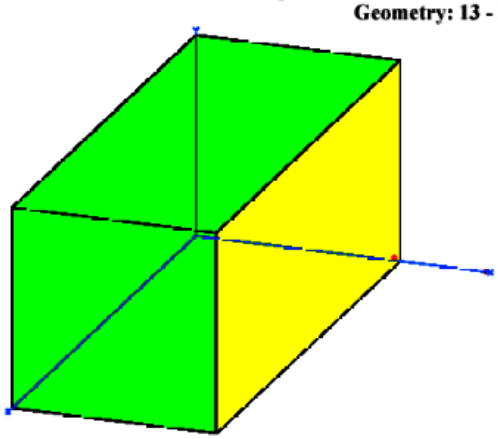
Fig. Q.5. MicroShield model of dose at 1 cm from top of ISO (continued).

MicroShield v5.05 (5.05-00456)
Oak Ridge National Laboratory

Page : 1
DOS File : ISOTOP-D.MS5
Run Date : October 14, 2002
Run Time: 11:01:54 AM
Duration : 00:00:10

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: ISO top spread out
Description: Rad Field at 1 m from the ISO top-spread out source
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	238.445 cm	7 ft 9.9 in
Width	589.91 cm	19 ft 4.2 in
Height	234.94 cm	7 ft 8.5 in

Dose Points

	X	Y	Z
# 1	3.39e+02 cm	0 cm	0 cm
	11 ft 1.4 in	0.0 in	0.0 in
# 2	3.39e+02 cm	1.17e+02 cm	2.95e+02 cm
	11 ft 1.4 in	3 ft 10.2 in	9 ft 8.1 in

Shields

Shield Name	Dimension	Material	Density
Source	1167.04 ft³	ThN-Diffuse	0.549
Shield 1	.01 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ac-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-210	7.3314e-004	2.7126e+007	2.2185e-005	8.2084e-001
Bi-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Pa-234	3.8640e-008	1.4297e+003	1.1693e-009	4.3263e-005
Pa-234m	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Pb-210	7.3360e-004	2.7143e+007	2.2199e-005	8.2136e-001
Pb-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Pb-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Po-210	7.2043e-004	2.6656e+007	2.1800e-005	8.0661e-001
Po-212	5.2255e-001	1.9334e+010	1.5812e-002	5.8506e+002
Po-214	1.4838e-003	5.4901e+007	4.4900e-005	1.6613e+000
Po-216	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Po-218	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Ra-224	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Ra-226	1.4849e-003	5.4940e+007	4.4932e-005	1.6625e+000
Ra-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-220	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-222	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Th-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-230	6.9281e-002	2.5634e+009	2.0964e-003	7.7568e+001

Fig. Q.6. MicroShield model of dose at 1 m from top of ISO.

Page : 2
DOS File : ISOTOP-D.MS5
Run Date : October 14, 2002
Run Time: 11:01:54 AM
Duration : 00:00:10

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Th-232	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-234	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Tl-208	2.9304e-001	1.0843e+010	8.8675e-003	3.2810e+002
U-234	6.8390e-009	2.5304e+002	2.0695e-010	7.6571e-006
U-238	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002

Buildup
The material reference is : Air Gap

Integration Parameters

X Direction	10
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (11.114,0,0) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	1.029e-11	8.468e-10	4.553e-14	3.745e-12
0.05	1.706e+06	1.738e-09	1.956e-07	4.631e-12	5.210e-10
0.06	2.182e+08	3.458e-05	3.350e-03	6.869e-08	6.653e-06
0.08	1.304e+10	2.072e-01	9.622e+00	3.280e-04	1.523e-02
0.1	2.141e+09	2.572e-01	5.980e+00	3.935e-04	9.149e-03
0.15	1.270e+09	1.971e-01	3.912e+00	3.246e-04	6.442e-03
0.2	1.640e+10	1.319e+01	1.169e+02	2.328e-02	2.063e-01
0.3	7.879e+09	2.777e+01	1.452e+02	5.267e-02	2.755e-01
0.4	7.350e+08	5.739e+00	2.417e+01	1.118e-02	4.710e-02
0.5	4.187e+09	5.572e+01	2.042e+02	1.094e-01	4.008e-01
0.6	9.622e+09	1.903e+02	6.285e+02	3.714e-01	1.227e+00
0.8	9.621e+09	3.375e+02	9.602e+02	6.420e-01	1.826e+00
1.0	1.759e+10	9.351e+02	2.407e+03	1.724e+00	4.437e+00
1.5	4.058e+09	4.349e+02	9.541e+02	7.318e-01	1.605e+00
2.0	1.063e+08	1.785e+01	3.568e+01	2.761e-02	5.518e-02
3.0	1.082e+10	3.258e+03	5.815e+03	4.420e+00	7.890e+00
TOTALS:	9.799e+10	5.277e+03	1.131e+04	8.114e+00	1.800e+01

Results - Dose Point # 2 - (11.114,3.854,9.677) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	4.117e-11	3.387e-09	1.821e-13	1.498e-11
0.05	1.706e+06	6.951e-09	7.816e-07	1.852e-11	2.082e-09
0.06	2.182e+08	1.377e-04	1.326e-02	2.735e-07	2.634e-05
0.08	1.304e+10	7.949e-01	3.509e+01	1.258e-03	5.553e-02
0.1	2.141e+09	9.290e-01	1.936e+01	1.421e-03	2.962e-02
0.15	1.270e+09	7.168e-01	1.271e+01	1.180e-03	2.093e-02
0.2	1.640e+10	4.397e+01	3.395e+02	7.761e-02	5.992e-01
0.3	7.879e+09	8.530e+01	4.086e+02	1.618e-01	7.750e-01
0.4	7.350e+08	1.713e+01	6.691e+01	3.338e-02	1.304e-01

Fig. Q.6. MicroShield model of dose at 1 m from top of ISO (continued).

Page : 3
DOS File : ISOTOP-D.MS5
Run Date : October 14, 2002
Run Time: 11:01:54 AM
Duration : 00:00:10

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.5	4.187e+09	1.636e+02	5.572e+02	3.211e-01	1.094e+00
0.6	9.622e+09	5.516e+02	1.695e+03	1.077e+00	3.309e+00
0.8	9.621e+09	9.596e+02	2.544e+03	1.825e+00	4.839e+00
1.0	1.759e+10	2.619e+03	6.295e+03	4.828e+00	1.160e+01
1.5	4.058e+09	1.187e+03	2.441e+03	1.997e+00	4.107e+00
2.0	1.063e+08	4.791e+01	9.015e+01	7.409e-02	1.394e-01
3.0	1.082e+10	8.574e+03	1.450e+04	1.163e+01	1.967e+01
TOTALS:	9.799e+10	1.425e+04	2.900e+04	2.203e+01	4.637e+01

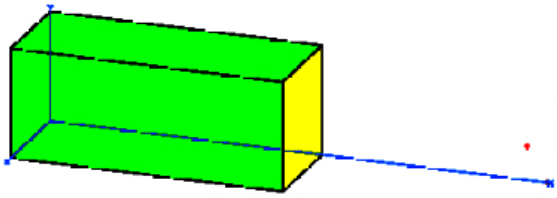
Fig. Q.6. MicroShield model of dose at 1 m from top of ISO (continued).

MicroShield v5.05 (5.05-00456)
Oak Ridge National Laboratory

Page : 1
DOS File : ISOEND16.MS5
Run Date : October 24, 2002
Run Time: 4:43:51 PM
Duration : 00:00:10

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: ISO end spread out
Description: Rad Field at 16 ft from the ISO end-spread out source
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	589.91 cm	19 ft 4.2 in
Width	234.94 cm	7 ft 8.5 in
Height	238.445 cm	7 ft 9.9 in

Dose Points

	X	Y	Z
# 1	1.08e+03 cm	0 cm	0 cm
	35 ft 4.4 in	0.0 in	0.0 in
# 2	1.08e+03 cm	1.19e+02 cm	1.17e+02 cm
	35 ft 4.4 in	3 ft 10.9 in	3 ft 10.2 in

Shields

Shield Name	Dimension	Material	Density
Source	1167.04 ft³	ThN-Diffuse	0.549
Shield 1	.01 ft	Iron	7.86
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ac-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-210	7.3314e-004	2.7126e+007	2.2185e-005	8.2084e-001
Bi-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Bi-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Pa-234	3.8640e-008	1.4297e+003	1.1693e-009	4.3263e-005
Pa-234m	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Pb-210	7.3360e-004	2.7143e+007	2.2199e-005	8.2136e-001
Pb-212	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Pb-214	1.4841e-003	5.4913e+007	4.4910e-005	1.6617e+000
Po-210	7.2043e-004	2.6656e+007	2.1800e-005	8.0661e-001
Po-212	5.2255e-001	1.9334e+010	1.5812e-002	5.8506e+002
Po-214	1.4838e-003	5.4901e+007	4.4900e-005	1.6613e+000
Po-216	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Po-218	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Ra-224	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Ra-226	1.4849e-003	5.4940e+007	4.4932e-005	1.6625e+000
Ra-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-220	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Rn-222	1.4844e-003	5.4924e+007	4.4919e-005	1.6620e+000
Th-228	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-230	6.9281e-002	2.5634e+009	2.0964e-003	7.7568e+001

Fig. Q.7. MicroShield model of dose at 16 ft from end of ISO.

Page : 2
DOS File : ISOEND16.MS5
Run Date : October 24, 2002
Run Time: 4:43:51 PM
Duration : 00:00:10

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Th-232	8.1559e-001	3.0177e+010	2.4680e-002	9.1315e+002
Th-234	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002
Tl-208	2.9304e-001	1.0843e+010	8.8675e-003	3.2810e+002
U-234	6.8390e-009	2.5304e+002	2.0695e-010	7.6571e-006
U-238	2.4150e-005	8.9356e+005	7.3079e-007	2.7039e-002

Buildup
The material reference is : Air Gap

Integration Parameters

X Direction	10
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (35.3644,0,0) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	1.201e-19	2.406e-17	5.312e-22	1.064e-19
0.05	1.706e+06	6.437e-14	2.147e-11	1.715e-16	5.719e-14
0.06	2.182e+08	5.622e-08	1.647e-05	1.117e-10	3.271e-08
0.08	1.304e+10	7.254e-03	8.559e-01	1.148e-05	1.354e-03
0.1	2.141e+09	2.581e-02	1.167e+00	3.949e-05	1.786e-03
0.15	1.270e+09	9.330e-03	5.158e-01	1.536e-05	8.494e-04
0.2	1.640e+10	1.660e+00	2.380e+01	2.929e-03	4.200e-02
0.3	7.879e+09	5.095e+00	2.534e+01	9.665e-03	4.806e-02
0.4	7.350e+08	1.066e+00	4.090e+00	2.077e-03	7.969e-03
0.5	4.187e+09	1.020e+01	3.425e+01	2.002e-02	6.723e-02
0.6	9.622e+09	3.439e+01	1.047e+02	6.713e-02	2.044e-01
0.8	9.621e+09	5.982e+01	1.583e+02	1.138e-01	3.012e-01
1.0	1.759e+10	1.634e+02	3.940e+02	3.011e-01	7.263e-01
1.5	4.058e+09	7.421e+01	1.544e+02	1.249e-01	2.597e-01
2.0	1.063e+08	3.006e+00	5.736e+00	4.648e-03	8.870e-03
3.0	1.082e+10	5.409e+02	9.294e+02	7.339e-01	1.261e+00
TOTALS:	9.799e+10	8.938e+02	1.837e+03	1.380e+00	2.931e+00

Results - Dose Point # 2 - (35.3644,3.911,3.854) ft

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.04	3.086e+08	3.651e-19	7.204e-17	1.615e-21	3.186e-19
0.05	1.706e+06	1.504e-13	4.816e-11	4.007e-16	1.283e-13
0.06	2.182e+08	1.067e-07	2.939e-05	2.119e-10	5.837e-08
0.08	1.304e+10	1.082e-02	1.180e+00	1.713e-05	1.867e-03
0.1	2.141e+09	3.447e-02	1.434e+00	5.274e-05	2.194e-03
0.15	1.270e+09	1.292e-02	6.536e-01	2.128e-05	1.076e-03
0.2	1.640e+10	2.087e+00	2.771e+01	3.684e-03	4.891e-02
0.3	7.879e+09	6.038e+00	2.904e+01	1.145e-02	5.508e-02
0.4	7.350e+08	1.246e+00	4.693e+00	2.427e-03	9.144e-03

Fig. Q.7. MicroShield model of dose at 16 ft from end of ISO (continued).

Page : 3
DOS File : ISOEND16.MS5
Run Date : October 24, 2002
Run Time: 4:43:51 PM
Duration : 00:00:10

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.5	4.187e+09	1.186e+01	3.917e+01	2.329e-02	7.689e-02
0.6	9.622e+09	3.987e+01	1.195e+02	7.783e-02	2.333e-01
0.8	9.621e+09	6.904e+01	1.800e+02	1.313e-01	3.425e-01
1.0	1.759e+10	1.879e+02	4.469e+02	3.464e-01	8.238e-01
1.5	4.058e+09	8.491e+01	1.743e+02	1.429e-01	2.933e-01
2.0	1.063e+08	3.428e+00	6.462e+00	5.301e-03	9.993e-03
3.0	1.082e+10	6.145e+02	1.045e+03	8.337e-01	1.417e+00
TOTALS:	9.799e+10	1.021e+03	2.076e+03	1.578e+00	3.315e+00

Fig. Q.7. MicroShield model of dose at 16 ft from end of ISO (continued).

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